The Four Horsemen of the Apocalypse: New narrative evidence on economic, currency, banking and sovereign crises*

Brendan Harnoys–Vannier†

Paris School of Economics - École Normale Supérieure

October 1, 2020

Over the last 50 years, developing and emerging markets have displayed more hectic growth patterns than advanced economies: their business cycle is twice as volatile, and they were exposed to twice as many financial crises. This research studies how the two phenomena are related. I consider this question through an empirical and narrative study of economic, currency, banking and sovereign crises between 1970q1 and 2020q1 for 54 countries worldwide. I notably provide a comprehensive econometric dating of business cycles. I develop a narrative methodology to treat IMF archives and apply it to (i) date candidate currency (and sovereign) crises and (ii) study the shocks and vulnerabilities at the origins of crises. Differences in growth volatility are not explained by a higher frequency of recessions but by higher intrinsic volatility during these phases.

Financial crises contribute 2 times more to aggregate volatility in less advanced markets. These countries are indeed highly exposed to multiple crises episodes occurring during recessions and associated to drastic economic losses. The more markets are developed, the lower the probability for crises to spill-over through the economy and multiply. Currency crises are frequent and central events. They play a critical role in driving business cycle volatility in non-advanced markets (roughly 50%). I study the history of Argentina to question the origins of complex crises. I identify three types of shocks and five key vulnerabilities that combine in precipitating trust debacles, economic collapse and financial crises.

Keywords: Financial Crises, Narrative Economics, Business Cycle, Volatility, Markov Switching Models.
JEL Codes: G01, E32, N01. (sub-level: F3, F4, C24)

*I thank Daniel Cohen, Matthieu Bussiere, Jean Imbs, Pierre-Olivier Gourinchas, Philippe Martin, Gilles Saint-Paul, Catherine Doz, Eric Monnet and Carmen Reinhart for insightful suggestions. I also thank workshop participants at a number of venues. This article does not represent the views of the Banque de France or the International Monetary Fund, which funded me during time of the research. All errors are my own.

†brendan.harnoysv@gmail.com

The crisis of the concept of crisis is the first step towards a theory of crises

Edgar Morin (2020), Sur la crise

Introduction

Our history is a history of economic and financial crises. Remnants of past episodes are never too far away and, as the Covid-19 pandemic reminded us, neither are fears of future debacles. The pandemic manifested as a global supply and demand shock for most economies across the planet. Consequently, countries faced growth slowdowns or downturns, heightened uncertainty, risk aversion and volatility on most markets. National authorities intervened rabidly to adapt to the shock. As an illustration, central banks worldwide innovated and introduced new unconventional asset purchases programs. Broadly speaking, interventions aimed at preventing the deepening of economic losses, decreasing risks of upcoming financial crises and soothing agents' expectations. A year ago[1], international institutions and the press debated whether an upcoming financial crisis would trigger the next major economic crisis among emerging markets. As history, even recent, highlights: the narration of ongoing developments always hints at the ghosts of past economic and financial troubles.

Over the last 50 years, when compared to advanced markets, developing and emerging countries have both faced higher economic volatility and a higher exposure to financial crises – among currency, banking and sovereign crises. As current times indicate, understanding what/when/how the next crisis shall hit seems to be a perpetual question. Theorizing crises is surely a 1 trillion dollar question beyond the scope and potential of this research. This article takes stock of how financial crises relate and contribute to economic volatility. I first question how economic and business cycle fluctuations vary worldwide. I then date financial crises to understand when they trigger. I taxonomize crisis episodes to highlight the key drivers of business cycle volatility differentials across countries. Finally, I build a new narrative methodology to study the shocks and vulnerabilities at the origin of multiple crises episodes.

[1]" a hard to predict financial crisis is the most probable source of the next downturn" in the *New York Times* – 09/03/19 – *"Recessions have become rare and more scary"*

Differences in volatility between income groups do not stem from countries switching more frequently between expansions and recessions. The magnitude and the volatility associated to recessions drive the bulk of the differentials. Business cycle volatility contributes more to aggregate volatility in developing and emerging markets. The latter are, respectively, 8 and 5 times more likely than advanced markets to experience a severe recession – with cumulated losses above -10% of real GDP. As discussed in Aguiar and Gopinath (2007), persistent negative growth shocks contribute more to volatility in less advanced markets. Yet I contrast their claim by identifying the sole role for intensity and none for the frequency of such shocks. Moreover, 73% of severe recessions are associated with at least one financial crisis (50% of all recessions). This result supports the competing view in the literature that identifies financial frictions as a key cog in amplifying macroeconomic fluctuations[2].

A central contribution of this article is a database combining business cycle turning points and the datation of currency, banking and sovereign crises' start. I rely upon Markov-Switching Models (Hamilton, 1989) to date business cycles' recessions and expansions for an unbalanced panel of 54 countries over 1970q1:2020q1 (developing/emerging/advanced: 15/15/24). Infering a non-linear growth process from the data allows for a better description of the heterogeneity of growth patterns accross countries. Limited by statistical convergence, this approach overcomes inherent ad-hoc rules in algorithmic approaches[3]. To date financial crises, I follow the empirical literature. For banking and sovereign crises, the literature converges around few common definitions[4]. For currency crises, several approaches compete[5]. To arbitrate among potential candidates, I rely upon recent novel literature using narrative economics – see notably Shiller (2017) and Romer and Romer (2017).

Narrative contributions complement empirical approaches by extracting information, from qualitative and often neglected textual sources, on agents' perceptions, sentiments and motivations. Given the current momentum of this literature, I contribute by proposing a go-to-guide for the key elements entailed in such methodologies. These approaches rely on textual sources to shed light on the global narrative of ongoing developments. To provide a

[2]See notably Uribe and Yue (2006), Neumeyer and Perri (2005) and Chang and Fernandez (2013)

[3]See Harding and Pagan (2002) for the main competing methodology and Calderon and Fuentes (2014) for an application of their filter to a similar initial sample as the one covered in this article. For 28 countries, Markov Switching Models estimations did not converge.

[4]Reinhart and Rogoff (2009), Cohen and Valadier (2011), Medas et al. (2018), Laeven and Valencia (2020)

[5]See seminal contributions: Frankel and Rose (1996), Sachs et al. (1996), Eichengreen et al. (1996)

meaningful and representative proxy, the sources are often diffused among a wide panel of agents, written by reliable authors and/or by insiders to key decision processes. Narrative approaches rely upon a conceptual framework derived from the theoretical literature to treat this qualitative *forgotten soft data*. Narrative contributions study how agents' perceptions of their environment and underlying motivations drive aggregate developments. I first apply the guide to date the start of currency crises. I read over 315 IMF publications – mainly article IV consultations – and identify 124 currency crises (out of 250 candidates). My database also includes 52 banking and 36 sovereign crises. These crises match with 239 expansions and 200 recessions (41 and 98 with financial crises respectivel).

I develop a taxonomy to study crisis episodes and document the severity, duration, steepness, rebound and sequencing of given events: currency and multiple crises form the main characteristics of developing and emerging markets' recent history.

Currency crises are pivotal determinants to volatility differentials, especially when they cumulate with other financial crises. Currency crises relate to roughly half of business cycle volatility in developing and emerging markets against a fourth in advanced markets. They are the most frequent type of crises for all countries. In developing markets, currency crises are a necessary but not sufficient source of volatility. They are associated to drastic losses when they combine with other crises. In emerging markets, currency crises are necessary and sufficient sources of volatility. In advanced economies, they are a non-necessary but sufficient trigger to business cycle volatility.

As economies develop, they experience less crises during which several markets collapse. Such multiple crises are a salient characteristics of developing and emerging markets. They are always associated with longer and more severe recessions. In emerging markets, these episodes are often not followed by any rebound. Multiple crises episodes contribute to 49% of business cycle volatility in developing markets, against 30% in emerging markets and 13% in advanced ones.

Yet, as temporality is no token of causality, I apply my narrative guide to study the shocks and vulnerabilities intermingling into economic and financial crises. I detail a case study for Argentina over 1990q1 and 2019q4 and identify the central role of the credibility gap in the countries repeated trust debacles. Argentina experienced 5 episodes cumulating 6 economic, 5 currency crises, 3 sovereign and 2 banking crises. The country experienced an additional major economic, currency and sovereign crises in 1989 just before the start of the sample.

All episodes originate as the result of three types of shocks – (i) political failures

and confidence shocks ; (ii) external financing costs shocks ; (iii) forex revenues shocks – and five key vulnerabilities – (α) political uncertainty and weakened social contract ; (β) fiscal needs instability ; (γ) nominal anchors stability ; (δ) underdeveloped domestic capital markets ; (ϵ) underdeveloped and undiversified export sector.

Argentina experienced two cycles of crises. The first cycle was driven by constraints on monetary and forex policies and the concentration of all trust in the currency. Dire financing needs constrained fiscal policy throughout the second cycle. At the end of each cycle of crises, before the final debacle, poverty and inequality rise threatening an ever weakened social contract. When the latter is about to break, political incentives and biases towards populist interventionism increases. The marginal gains in image, confidence and support appear at their greatest.

As soon as confidence shocks hit such a system – and they always do when uncertainty increases – political divides and social unrest cumulate. These developments fuel and feed upon ongoing pressures and transmission across economic and financial markets. For crises to unravel, external financial or trade shocks and discontinuities are needed to precipitate the country from an apparently stable path into a self-fulfilling cumulation of crises and losses. All spheres sub-/con-sequently fall to drastic developments. When trust fails, four horsemen bring down the apocalypse[6]: economic crises on the white horse of conquest, currency crises on the red horse of war, banking crises on the black horse of famine and sovereign crises on the pale horse of death.

Section 1 focuses on economic volatility differentials across countries. I present the datation of business cycles using Markov Switching Models and highlight key stylized facts on volatility worldwide. Section 2 focuses on financial crises and details the datation procedure. I develop how narrative economics can help provide a comprehensive dating of currency crises and present the main features of countries exposure to financial crises. In section 3, I combine the databases on financial crises and business cycles to shed light upon the heterogeneity of crises across country groups. I discuss how multiple crises episodes and exposure to currency crises contribute to increased volatility in less advanced markets. Section 4 details my narrative methodology to study the shocks and vulnerabilities behind crises. I provide a case study on Argentina's numerous crisis episodes and discuss the factors present in major crises. I conclude in 5 and discuss the relevance of my results for shedding light on current developments.

[6]The four horsemen of the Apocalyse are an allegory in Christian faith,. Four figures are said to descend upon Earth to deliver the last judgment and unleash hell.

1 Growth volatility and business cycles

Growth patterns (and crises experiences) differ greatly across countries. Figure 1 illustrates said heterogeneity over a selection of countries. Growth histories have been both chaotic and hampered (e.g. Argentina, Greece) or marked by long lasting periods of stagnation (e.g. Russia, Portugal). In emerging and developing markets, fluctuations can be either frequent and *relatively* mild (e.g. Mexico, South Africa, Philippines) or occasional and of great magnitude/duration (e.g. Hungary, Roumania). Several countries in advanced markets have steady though decreasing growth, frequently interrupted by mild fluctuations (e.g. the USA, Canada, South Korea) ; or downturns as damaging as in less advanced countries (e.g. Greece, Finland, Portugal).

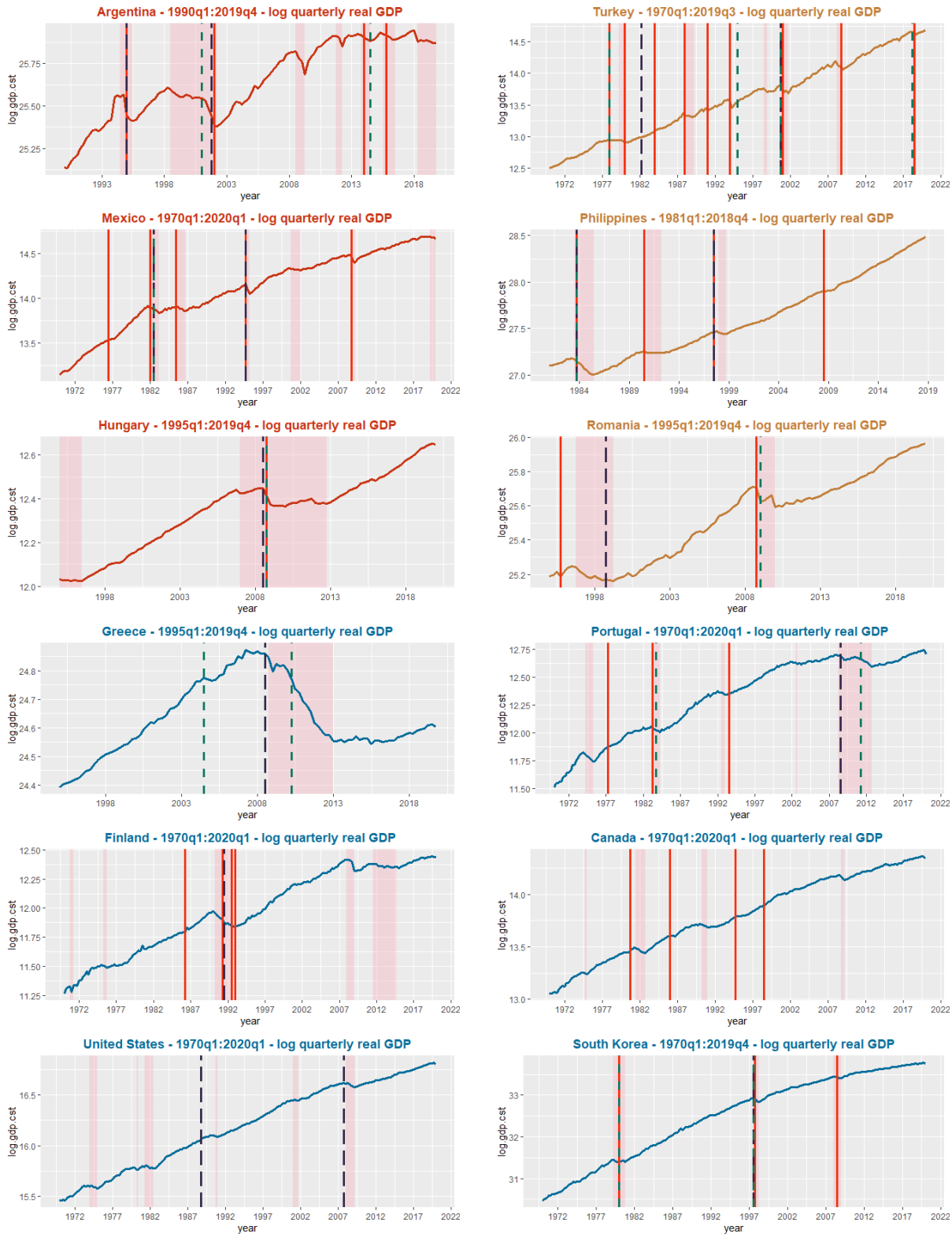
Downturns can be sudden and steep (e.g. Mexico 1995) ; jolting (e.g. Romania 2010) ; stall and stop (e.g. Hungary 2007) ; mild trend inversion (e.g. Canada 1990 Philippines post 1985). Downturns end as differently as they start. A non-negligible fraction entails more or less temporary deviations and a return to the previous trend[7]. A second non-negligible fraction of downturns entails permanent losses and a new trend. There are little emerging and developing economies that have not experienced at least one such bad episode. The pattern is not extraneous to advanced markets too, but very often in (much) milder proportions. Southern Europe is particularly plagued by these specific downturns. South Korea offers an interesting illustration as every recession gently dents the trend and slows overall growth.

Often fluctuations occur in different countries at the same time. This pattern is observed broadly across income groups (emerging/developing/advanced markets) and by region. Across history and countries, heterogeneity of patterns takes root simultaneously at different frequencies and levels (long-/short-run ; permanent/transitory). Beyond fluctuations in real aggregate activity, most key macroeconomic variables – output, current account, consumption etc – exhibit an important variability. Growth failures are a characteristic pattern of all but the very rich countries. They are associated with reduced investment and higher price instability[8].

[7]Short fluctuations can be observed in South Korea or Mexico in 1995. Finland over 1990-2000 illustrates a long deviation from trend that in the end brought back the economy on trend. Argentina in 2009 is a good example of a rebound where growth seemed to start back on previous trend but failed to sustain the dynamics.

[8]Agenor et al. (2000), Loayza et al. (2007), (Jones and Olken, 2008), Sirimaneetham and Temple (2009)

Figure 1: Real GDP, recessions and crises – a selection



Shaded areas indicate recessions as dated using Markov switching models. Red bars indicate currency crises, blue bars banking crises and grey bars sovereign crises.

1.1 Structural and cyclical factors of volatility

As an echo to the different features of economic volatility (high/low frequency, permanent/temporary fluctuations) the literature has discussed a set of structural and cyclical factors to explain the heterogeneity. Present sub-section presents this main determinants and sets the context of this article.

1.1.1 Structural Factors

A first strand of the literature has tried identifying **country-specific fundamental factors** discussing (a) the role of the structure of the economy: the lack of economic diversification coupled with the dependence on few volatile sectors often act as sources of volatility for employment and valued as for tax revenues[9] (b) the role of institutional and political factors which define the scope within which the economic and financial system operates: weak institutions and poor economic policy frameworks often entail more uncertain futures, limitations to the developments of markets, more uncertainty and a less policy space for intervention, e.g. a lower tax base[10].

Commodity dependence deserves particular notice as an illustration of a production structure specialized in few commodities. The prices of these goods are set on world markets and subject to vivid fluctuations. Hence countries suffer from more volatile growth patterns Fernandez et al. (2018) due to exogenous shocks.

A second line of research has considered **external factors and shocks** as responsible for a less secure environment and greater volatility in emerging and developing markets. Key candidates include: (a) terms-of-trade shocks that capture important fluctuations in godds and services' world prices[11] ; (b) foreign interest rate shocks that represent, for small open economies, fluctuations in the cost of external borrowing[12] ; (c) natural disasters that entail major environmental catastrophies (e.g. earthquakes etc.)[13].

Overall, regional and global forces are important drivers of aggregate volatility. As economies integrated in world trade and financial markets, they synchronized and shared

[9]Imbs (2007), Koren and Tenreyro (2007). Interestingly, narrative evidence detailed in chapter 2, links this structural fundamental to several currency crises.

[10]Alesina et al. (1996), Cuberes and Jerzmanowski (2009), Kerekes (2012), Lane (2003), Fatas and Mihov (2013), Aguiar and Gopinath (2007), Fricke and Sussmuth (2014)

[11]Broda (2004), Andrews and Rees (2009). Schmitt-Grohe and Uribe (2018), Fernandez et al. (2017). Drechsel and Tenreyro (2018)

[12]Neumeyer and Perri (2005), Uribe and Yue (2006). Chang and Fernandez (2013)

[13]Noy (2009), Loayza et al. (2012)s, Fomby et al. (2013), Felbermayr and Groschl (2014)

common volatile episodes[14].

Another important determinant studied in the literature relates to how financial development and liberalization shape growth and volatility[15]. The balance between the gains (e.g. better resource allocation) and losses (e.g. higher exposure to costly financial crashes) of financial globalization has not yet settled and the overall effect is a function of structural and institutional features[16]. The global financial cycle, which illustrates price and quantity fluctuations on main financial markets, has also been identified as a key factor to consider volatility. It usually constrains monetary stabilizing policies, regardless of the exchange rate regime, when dampening fluctuations and [17]. Finally, differences in financial characteristics and developement have contributed to explain volatility patterns. Emerging financial markets are often too shallow and without enough local liquidity to ensure stable turnover and expected returns. They are also highly exposed to neighbouring economies. Hence they fail to allocate liquidity efficiently and dampen shocks. On the contrary, constraints amplify shocks. Contagion from external sources is frequent[18].

Financial crises form the most frequent manifestation of these underlying determinants. Illustrated in figure 1, it is visible that they are often paired with recessions. Financial crises are often associated with severe persistent economic losses regardless of the income group of the country considered. Nevertheless, EMDE have been shown to recover and rebound from such traumatic events more rapidly than AE[19].

Beyond long-term structural determinants, higher frequency shocks have also been perturbating economies throughout history. Amplified by frictions and rigidities, they constitute an important source of volatility.

[14]Bordo and Helbling (2003), Kose et al. (2008), Kose et al. (2003)

[15]Buera et al. (2011), Reinhart and Reinhart (2015)

[16]Martin and Rey (2006), Ranciere et al. (2008), Loayza et al. (2018), (Bekaert and Harvey, 2003), Bekaert et al. (2003), Bekaert and Harvey (2000), Bekaert et al. (2006), (Broner and Ventura, 2016)

[17]Claessens et al. (2011), Claessens et al. (2012), Borio (2014), Rey (2018), Cerutti et al. (2019), Ha et al. (2020)

[18]Bordo and Helbling (2003), Bekaert et al. (2007)

[19]Howard et al. (2011), Wan and Jin (2014), Bordo and Haubrich (2017)

1.1.2 Cyclical Factors

The initial theoretical contributions on Small Open Economy (SOE) - Real Business Cycles (RBC) models[20] failed at capturing differences in volatility across countries. Over the past 15 years, researchers have debated the sources of EMDE higher volatility and discussed necessary changes in assumptions. They have put forward different shocks and transmission mechanisms that prove essential to my study of the origins of financial crises and volatility[21].

Two main explanations have been given to justify differences in business cycle volatility. On one hand, higher degrees of financial frictions in less advanced markets amplify exogenous foreign interest rate shocks and generate volatility[22]. On the other hand, emerging markets are subject to frequent high/low-growth regime changes, captured by a higher importance of trend versus transitory productivity shocks. This explains the overreactions of key macroeconomic variables as EMDE agents anticipate more persistent episodes of trouble[23].

Arguably, both play a role. Hence, many studies aimed at identifying the source of volatility dominating the data. By relying upon a more advanced modeling of risk pricing and additional preference and demand shocks, a first branch advocated in favor of the first strand[24]. A second branch, focusing on the modeling of agents' learning and consumption behavior and of productivity spillovers and real exchange rates comovement, underlined the importance of the second channel[25].

Overall, the literature points in one direction. Introducing frictions is key to replicate differences in business cycle volatility. First and foremost, financial frictions make for the guilty party according to all indications. Working capital constraints combine with firms inability to substitute inputs in production and hamper activity.[26]. Endogenous country spreads are a widely supported financial friction in the literature for EMDE, and often stem from the demand side of the credit market. Different microfoundations have helped source the risks that spark off uncertainty and volatility, e.g. default risk and productivity shocks at the country or firm level ; agency or costly state verification problems[27]. Fric-

[20] Mendoza (1991), Schmitt Grohe and Uribe (2003)
[21] Durdu (2013) proposes similar a literature review which I extend to some recent contributions.
[22] Neumeyer and Perri (2005), Uribe and Yue (2006)
[23] Aguiar and Gopinath (2007), Aguiar et al. (2017), Naoussi and Tripier (2013)
[24] Garcia-Cicco et al. (2010), Seoane (2013), Seoane and Yurdagul (2017), Chang and Fernandez (2013), Miyamoto and Nguyen (2017), Hevia (2014), Boz et al. (2011)
[25] Alvarez-Parra et al. (2013), Varela (2017), Chen and Crucini (2016), Seoane (2016), Cao et al. (2016)
[26] Oviedo and Yue (2009), Chang and Fernandez (2013), Mendoza and Yue (2012), Mendoza (2010)
[27] Arellano (2008), Gordon and Guerron-Quintata (2018), Fernandez and Gulan (2015), Akinci (2017)

tions on the supply side, whereas banks accelerate shocks, have also proven important, especially in advanced markets: liquidity and collateral constraints, external borrowing costs, moral hazard problems and liquidity shortages[28]. Risk pricing and varying uncertainty also prove salient amplifiers of volatility when agents face precautionary saving motives or varying degrees of risk aversion.[29].

Finally, labor market frictions are a salient amplifier of perturbations and shocks in emerging and developing markets. A higher share of the labor force works in a poorly measured informal sector, is self-employed or depends upon remittances. This stirs up vulnerabilities in gloomier times. Higher search-and-matching frictions and suboptimal Nash-(wage) bargaining processes contribute to the build-up of vulnerabilities that increase volatility[30].

1.1.3 Volatility and non-linearities

Economic volatility arises as fundamental determinants and vulnerabilities – structural, institutional or financial – fail to dampen or else magnify shocks and discontinuities, thus amplifying aggregate fluctuations. As this article entails empirical contributions, I retain key factors of volatility from the literature in the rest of the article.

I rely upon three main fundamental characteristics: development (proxied by countries' income groups), regional affiliation (a proxy for contagion and regional synchronization) and commodity dependence. Section 2 and following discuss in greater detail the case of financial crises, which coalesces part of the discussions on financial factors and frictions.

Conceptually, my research contributes to previous literature by underlining the importance of non-linearities. The latter are broadly present accross the literature, often modeled through different growth regimes, more or less persistent shocks, binding constraints etc. In particular, I focus on non-linearities in output growth processes. As illustrated in figure 1, growth patterns and economic volatility differ widely across countries.

When taking non-linearities to the data, any chosen framework should encompass this heterogeneity in frequency and magnitudes of the switches. Markovian processes, used in Markov Switching Models, provide such possibility and are the focus of the next

[28]Schularick and Taylor (2012), Hwang (2012), Grosse Stefen (2015), Chang et al. (2017)

[29]Fernandez-Villaverde et al. (2011), Fogli and Perri (2015), Gete and Melkadze (2018), Gete and Melkadze (2018), Akinci (2013)

[30]Boz et al. (2015), Altug and Kabaca (2016), Restrepo-Echevarria (2014) and Fernandez and Meza (2015), Horvath (2018), Finkelstein Shapiro and Gonzalez Gomez (2017), Finkelstein Shapiro and Mandelman (2016)

sub-sections.

Existing literature using Markov Switching Models to capture differences in economic volatility focuses on longer-term growth patterns (Jerzmanowski (2006), Kerekes (2012)). In this article, I work at the business cycle frequency, i.e. between 2 and 12 years on average. This frequency is essential as it is the one studied and identified in previous subsection. Hence, business cycle non-linearities offer an empirical counterpart to positive/negative growth shocks and a mean to decompose economic volatility.

As such I chose to use business cycles as a starting point to approach volatility empirically.

1.2 Dating business cycles: methodology & sample

Many definitions of the Business Cycle are to be found in the empirical literature. This concept underpins indeed several features on which economists do not always conciliate. Burns and Mitchell (1946), when shaping the methodology to be used by the National Bureau of Economic Research, defined *cycles* as

> *"expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle".*

Two important features are highlighted here: the co-movement of various macroeconomic variables and the alternation of different phases, namely expansions and recessions. In this article, I focus on the latter as I aim at comparing Business Cycles worldwide at a quarterly frequency. Data quality, comparability and availability at a quarterly frequency of many variables might constrain the sample. Burns and Mitchell's approach relied upon graphical methods to identify specific cycles. Since then, statistical methodologies have been proposed to automatize the process. As discussed extensively in Harding and Pagan (2005), two main approaches are being used to date these cycles empirically.

1.2.1 The empirical datation of cycles

The first one consists in identifying country output gaps – that is the difference between observed and potential output. The latter is a theoretical concept illustrating what output could be should all factors of production be used at their best potential in a frictionless world. By definition, the output gap is unobserved and has to be infered from the data, often as the cyclical component of an Hodrick Prescott filter. The second and most commonly employed approach follows from the Turning Point Cycles view. Its funding

principle is to identify the moments at which an economy moves from an expansion to a recession and reversely. Because it doesn't require as much data and is easily reproducible, I follow this strand of the literature.

To date turning points, the first line of research, following the work developed at the NBER, relied upon a non-parametric set of rules to characterize GDP growth dynamics[31]. The most commonly used procedure is the application of the Bry-Boschan algorithm to quarterly GDP (BBQ), as developed in Harding and Pagan (2002). It combines a rule for identifying local extrema and a selection procedure to constrain cycle length.

The main critics made to this approach relates to the fact that the true nature of the events, i.e. the true data generating process, is unknown and unobserved by the econometrician, who can only form inferences about said events (Hamilton, 2003). A direct consequence is that any attempt at using a common rule for comparing time series for different countries, i.e. different data generating processes, might lead to spurious analysis. That is, we would want to specify a different dating rule for countries experiencing high or low average growth, or even depending on data quality. This method has nevertheless been widely accepted by the literature for its ease-of-use and its success in matching US BC facts.

Calderon and Fuentes (2014) use BBQ to date BC at a quarterly frequency for 77 countries. They find that if EMDE experience costlier recessions than AE, though of similar duration, whereas their expansions are stronger but shorter. I start this research by repeating the exercise over an unbalanced panel of 81 countries (24 AE and 57 EMDE, for a total of 4568 and 5236 quarters). A critical aspect when comparing such a wide coverage of countries at a quarterly frequency is tied to data quality. As such, I chose to rely only on data collected by international organisations (IMF, OECD, BIS, WB) to ensure best achievable comparability. Annex D presents the country coverage as well as country groups.

1.2.2 Infering the cycle using Markov Switching Models

The second approach to dating BC turning points follows from the seminal work of Hamilton (1989) (1990). He fits a parametric stastitical model to the data and then uses it to identify turning points. More specifically, he builds a regime-switching model in which an unobserved state, used to describe the phases of a BC, follows a first-order Markov

[31] A widespread approach, often used in the media, defines a recession by two consecutive quarters of negative growth. This rule, whose economic fundamentals are not ascertained, fails at replicating some NBER dates for the US and is seen as flawed by most of the literature Harding and Pagan (2001)

process - Markov-Switching Models (MSM). As such, the different states of the cycle are infered from the data without any a priori specification but the number of regimes. Extended afterwards to more complex specifications (such as heteroskedasticity, multi-variate framework or time-varying transition probabilities for the Markov process), Hamilton's approach has concentrated the focus of numerous researchers. This accrued interest echoes the importance of non-linearities in economic time series (Hamilton, 2016).

When comparing MSM with non-parametric dating algorithms on monthly US variables, Chauvet and Piger (2008) find that, if MSM outperforms BBQ in real time predictions, both methds perform similarly in identifying historical turning points. Nevertheless, Harding and Pagan (2002) (2003) warn that MSM are a less transparent methodology that might be sensitive to the parametrization choice and the sample period studied.

If MSM have been widely used to study national BC or drive comparisons between countries, the bulk of existing studies has focused essentially on AE. Jerzmanowski (2006) and Kerekes (2012) form notable exceptions. However, their main focus revolves on the identification of growth patterns rather than business cycle dating, that is a longer run view. Altug and Bildirici (2012) is the closest to this article as they compare BC datations using BBQ and MSM for 27 developed and developing countries. I extend their approach to a wider set of countries and explore and identify the key role of financial crises.

Estimating Markov Switching Models

The Markov-switching autoregressive model proposed by Hamilton's seminal contribution considers the first difference of the observed series as a non-linear process. Nonlinearities stem out from discrete shifts in regimes, characterized by different means. MSM identify stochastic business cycles, with the different regimes identified as the most statistically relevant states given the data. The model is estimated through solving the actual marginal likelihood and maximizing the likelihood function with respect to the population of parameters.

Since its introduction, Hamilton (1989)'s approach has been extended to more complex specifications so as to refine inference on the true DGP.

$$y_t = \nu_{s_t} + \sum_{j=1}^{p} a^j y_{t-j} + \epsilon_t^{s_t} \tag{1}$$

where y_t represents the quarterly growth rate of GDP; $s_t \in \{1, 2\}$ the regime; ν_{s_t} the regime-specific intercept; p the number of lags considered; a^j the autoregressive coeffi-

cient of the jth lag and ϵ_t an i.i.d. process with variance σ[32].

The second core equation of MSM provides information on the regime dynamics. The stochastic process that generates the unobserved regimes is an ergodic Markov Chain defined by following transition probabilities:

$$p_{ij} = Pr(s_{t+1} = j|s_t = i) = Pr(s_{t+1} = j|s_t = i, s_{t-1} = k, ...), \ \forall i \ \sum_{j=1}^{2} p_{ij} = 1 \qquad (2)$$

Annex F presents the estimation procedure used to infer the two regimes and the transition probabilities from the data. For all countries in the initial sample, five specifications are estimated depending on the number of lags included (0 to 4). Specifications are then tested to ensure that no state is absorbing or transitory[33]. The best specification is selected using the corrected Akaike Information Criterion[34].

As a by-product of the estimation, I obtain the smoothed probabilities which provide an inference on the unobserved state using all the information available in the sample. These time series can then be used to date the cycle (Hamilton, 1989). We consider date t to be in the regime s if the smoothed probability of observing state s is above 0,5 at date t[35].

[32]In this article the set of specifications only includes various number of lags. It also extended estimations to include heteroskedasticity with little success. I could also include regime-dependent autoregressive coefficients. Nevertheless as some countries have few observations, given the computationally burdensome nature of MSM, I choose not to extend these specifications to any country to ensure comparability between estimates.

[33]An absorbing state is one where the probability to remain in this state is equal to one. A transitory state is such that the probability to remain in that state is null.
Having absorbing states would not echoe the repeting nature of BC but rather identify the existence of a structural break in the series, which is not the object of this article.

[34]I also consider the Bayesian Information Criterion and the Markov Switching Criterion developed by Smith et al. (2006). In most cases the differences, criterion-wise, between different specifications are tenuous. Hence, country by country, I verify graphically that the selected specification signals the main episodes for which the log real gdp curve displays a switch in trend.

[35]For some countries, given that some recessions are associated to drastic output losses and steep changes in trend growth, others might be considered too mild for the algorithm to signal. The smooth probability of being in the low regime might thus increase but not reach the 0,5 threshold. While I check graphically the meaningfulness of the estimation, I also verify if milder recessions, acknowledged in other typical sources –NBER-OECD-ECRI datations – that fail to pass the threshold can actually be dated by lowering it. This is notably the case for Austria, Denmark, Estonia, France, Italy, South Korea, Lithuania, Switzerland and Turkey.

1.2.3 Sample and descriptive statistics

This research focuses on an initial unbalanced panel of 81 countries over 1970q1-2020q1. Countries are selected if there is long enough time series for quarterly real Gross Domestic Product (GDP). I set the threshold to a minimum of 44 observations, which is more or less the length of one business cycle as acknowledged in the literature. Moreover it ensures a minimum of observations below which the econometric datation of turning points might have been spurious.

Time series are collected from the International Monetary Fund – International Financial Statistics database as well as from the Organisation for Economic Cooperation and Development. To ensure that the country-time coverage is the widest possible, alongside available time series for real GDP, I check if nominal GDP and GDP deflator time series allow for the construction of a longer time series. For each country, I pick the longest. Time series are seasonally adjusted following the usual X13-ARIMA procedure.

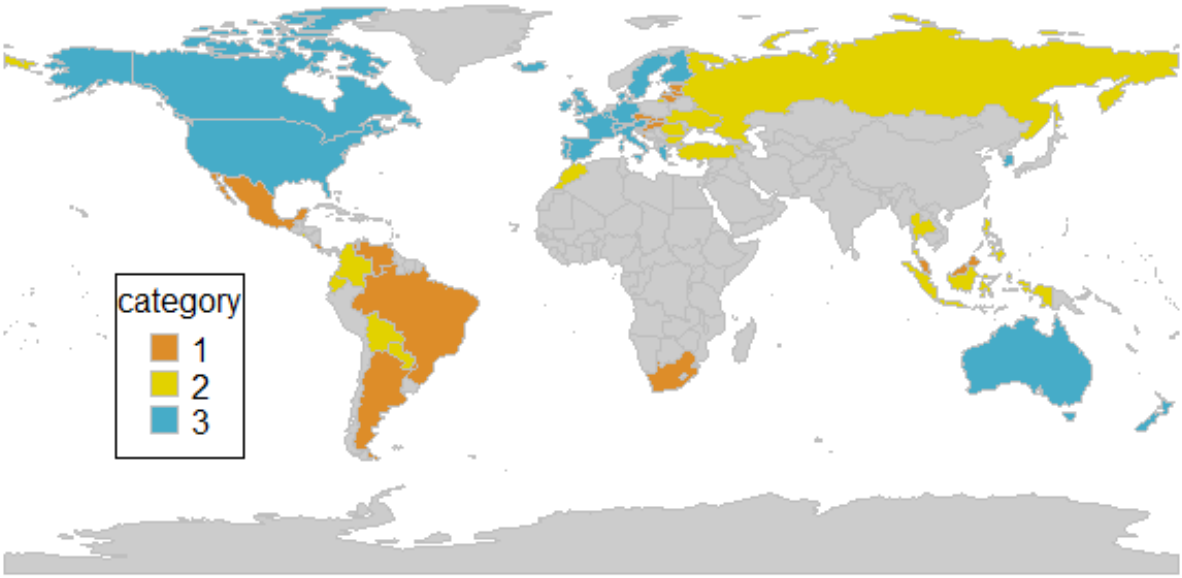
As noted in Harding and Pagan (2002), MSM estimation procedure is sensitive to sample size. For 27 countries the estimation did not converge. As such, results presented in the remainder of the article focus on those countries for which it did (24 AM, 15 EM and 15 DM). They are identified in figure 2. Annex D presents the country-time-source coverage for the whole dataset and details countries that have BC dates using MSM.

I split countries into three groups based on their World Bank income classifications in 1995[36]. Advanced markets correspond to the high-income group, emerging markets to the upper-middle income countries and the developing markets label groups the lower-middle and low income countries. To echoe previous sub-section, I also compare groups based on their regional affiliation and their dependency upon commodities[37]. I do not detail tables and figures for regional and commodity groups in the core of the article. They can be found in annex E.

[36] I chose 1995 as it is slightly after the middle of the time period, ensuring that countries that switched group before/after this date will have spent half of the sample in the same one. For some central and eastern European countries, the data is not available at this period and I use their classification based on 2000 data. Note however that few countries switch group and results are robust to changing the date of the classification.

[37] I consider three sources: the IMF World Commodity Exporter Database focusing only on non-renewable commodities. Aslam et al. (2016) focuses on commodities including renewable resources such as food and raw materials (e.g. wood...). The United Nations Conference on Trade and Development offers country-level information in its series of *State of Commodity Dependence Reports* starting 2012. All commodities and countries are included. I use this source to check the cases in which the former two might disagree and for potential advanced economies that might be dependent upon renewable commodities (e.g. New Zealand).

Figure 2: Database coverage post MSM estimation - by country group



1 = Emerging Markets, 2 = Developing Markets, 3 = Advanced Markets.

Table 1 present some descriptive statistics by country groups. Business Cycle volatility is computed as the standard deviation of growth rate time series, it is then averaged by group[38].

Table 1: Descriptive Statistics by income group - real GDP and BC volatility

	Nb of Country	Nb of Obs.	Business Cycle Volatility – $\sigma^2_{\Delta g}$						
			mean	std	max	qrt3	median	qrt1	min
DM	15	1646	1.88	1.19	5.26	1.96	1.59	1.08	0.69
EM	15	1738	1.34	0.46	2.19	1.56	1.13	1.01	0.90
AM	24	4682	1.09	0.42	2.18	1.35	1.04	0.75	0.50

DM - Developing Markets, EM - Emerging Markets, AM - Advanced Markets
Obs stands for observations, *std* for standard deviation, *qrt* for quartile.

Growth in Advanced Markets is statistically less volatile than in Emerging and in Developing Markets by, respectively, 24** and 73** % and EM are 40* % less volatile than DM.[39].

[38]To compare group averages, here and in the rest of the article, I first use a Shapiro-Wilk test to check if variables are normally distributed. When this is the case, I use a Student's t test to compare group averages; if not I use a Wilcoxon test.

[39]For the three groups, the null hypothesis of a normal distribution is rejected with p-values of 0.0239

Overall I confirm two main facts from the literature:

Stylized facts

- ▷ Growth is more volatile in Developing Markets than in Emerging Markets than in Advanced Markets.
- ▷ Emerging and Developing Markets form a more heterogeneous group than advanced markets.

1.3 Business cycles and volatility worldwide – some facts

Two sets of information can be used to compare countries. The first batch relates to the growth regimes that characterize the data generating process behind the time series. The second considers the phases that can be identified in the data using smoothed probabilities.

1.3.1 Growth regimes: differences in magnitude not frequency

Table 2 presents, by country group (DM-EM-AM), information on the distribution of the main characteristics of the estimated parameters from the Data Generating Processes:

- the average growth per regime g_{Exp}/g_{Rec}[40] which highlight the strength of the dynamics, how much can an economy gain/lose as long as she remains in the same state.
- the standard error of the residuals which captures the volatility of the shocks in the gdp time-series that remain unexplained by the model, e.g. perturbations not related to business cycle dynamics.
- the probability to enter/exit a recession, which highlights the inherent dynamics to the non-linear two-regime growth process.

(AM), 0.0133 (EM) and 0.00274 (DM). Average volatility in AM is statistically less than in EM with a p-value of 0.03318, and than in DM with a p-value of 0.005629. EM vs DM: p.value = 0.0803

[40] As different specification were tested, the average growth per regime was computed country-wise depending on the state-dependent values for the intercepts and, when necessary, the value for the autoregressive parameters: $\bar{g_s} = \frac{\mu_s}{1-\sum_{l\in[0,p]}\phi_l}$, $\bar{g_s}$ the average growth in state s, μ_s the estimated intercept in state s, ϕ_l the estimated autoregressive coefficient for lag l and p the number of lags of the selected specification (between 0 and 4).

Table 2: MSM estimations - Regime Analysis

(in %)	Mean g_{Exp}	Mean g_{Rec}	Std.Err.(rsdls)	P(Enter Rec)	P(Exit Rec)
Developing Markets					
avg	1.35	-2.69	1.33	3.99	31.6
std	0.579	2.54	0.881	2.31	15.6
med	1.22	-1.88	1.05	3.60	30.8
nb	15	15	15	15	15
Emerging Markets					
avg	1.20	-2.01	0.989	4.24	27.6
std	0.255	1.87	0.336	3.17	20.1
med	1.15	-1.59	0.833	3.51	23.1
nb	15	15	15	15	15
Advanced Markets					
avg	0.963	-1.02	0.870	3.89	27.9
std	0.390	0.706	0.379	1.66	13.5
med	0.829	-0.930	0.783	3.65	27.4
nb	24	24	24	24	24

avg - average, std - standard deviation , med - median

The average growth rates for Advanced Economies are +0.96% and -1.02% per quarter in expansion/recession. Emerging and Developing Markets, on the other hand, gain respectively 1.20 and 1.35% growth per quarter in expansion and lose -2.01% and -2.69% growth per quarter in recession. In other words, if EM (DM) grow 25% (40%) faster in good times, they lose twice (2.5 times) as much as AM in bad times. The differences are statistically significant between AM and EM as well as between AM and DM[41]. Nevertheless, there is no statistical difference between EM and DM.

When considering the dynamics of the underlying Markovian process infered from the data, we can see that Advanced, Emerging and Developing Markets face similar probabilities to enter a recession (3.9%, 4.2% and 4.0% respectively) and to exit one (27.9%, 27.6% and 31.6% respectively). None of these averages are statistically different at the 5% level, only DM exit probability seems to be higher at the 10% level.

Expressed in terms of duration, this means that recessions last around 3 to 4 quarters, whereas expansions can be expected to last around 25 quarters[42].

[41] Annex P provides the results of the Shapiro-Wilk test for normality for all variables. Annex Q presents by pair of country groups the results of a test to compare the average by variable.

[42] The probability of exiting a given regime and the duration of said event are inversely related. Denoting D_s the duration of regime s and p the probability to remain in said regime, we derive the probability

Stylized facts

- ▷ Business cycle dynamics is the same on average between country groups. Countries face a probability of 4% to enter a recession and 28.8% to exit one.
- ▷ If expansions are 25% (40%) stronger in emerging (developing) than in AM, recessions are 2.0 (2.6) times costlier in the former.

Hence I observe that most of the difference in business cycle growth patterns between country groups stems not from differences in terms of the probability to switch regimes but from differences in the way that countries undergo each phase of the cycle.

1.3.2 Expansions and Recessions worldwide

The previous subsection showcased what similarities and differences underline estimated data generating processes. In this subsection, I use the MSM smooth probabilities to date turning points and business cycle phases. This allows constructing a database where each episode highlights a cycle phase (expansion – recession).

Table 3 recovers, for country groups, the main information regarding each BC phases. To describe episodes and identify (dis)likeness across group, I define four main layers for the economic taxonomy of episodes: **duration**, **amplitude/severity**, **steepness**, **rebound**. The table also provides information on the share of observations each regime represents.

- **Duration** relates to the length (in quarters) of an episode (expansion/recession).
- **Amplitude/Severity** relates to the total amplitude of the episode (difference between the first and the last quarter of log real gdp – Peak-to-Through or Through-to-Peak). It captures the cumulated gains/losses covered over the episode (in % of GDP).
- **Steepness** measures the speed at which countries gain/lose real gdp per quarter in recession, i.e. the slope of the episode. It is defined, by episode, as the amplitude divided by duration and measures average growth by quarter.
- **Rebound** measures how quickly countries grow in the year after a recession ends, relative to the average growth in expansion. Comparing the strength of the rebound,

that the duration is equal to k quarters by : $P(D_s = k) = p^{k-1} * (1-p)$.
Summing over all possible durations we obtain $\mathbb{E}(D_s)$ the expected duration of regime s:
$\mathbb{E}(D_s) = \sum_{k=1}^{\infty} k * P(D_s = k) = \sum_{k=1}^{\infty} k * p^{k-1} * (1-p) = \frac{1}{1-p}$

rather than the cumulated losses over the year that succedes a recession allows for controlling for the higher growth of emerging and developing economies relative to advanced markets. It is computed as the cumulated losses after the recession divided by four times the average growth rate over expansions.[43].

On average EM and DM times series display 4 expansions and 3 recessions by country. AM have more observations and hence display higher figures (respectively 6 expansions and 5 recessions by country).

Expansions:

Overall, expansions last around 6 years and a half for Emerging and Developing Markets (25.7 and 25.4 quarters respectively). Advanced Markets' expansions last on average one year more (29.2 quarters). Yet the difference is not statistically significant between AM and EM (p.value for a Wilcoxon test: 0.181). It is only so at the 5% level between AM and DM (p.value= 0.051). During these periods, EM and DM grow faster than AM, respectively 23 and 52% faster(+1.23, +1.52, +1.00% growth per quarter). The difference is statistically significant at the 1% level (p.values for a Wilcoxon test testing a lower slope in AM than in the other group: 0.000869 vs EM and 1.61e-06 vs DM). DM outperform EM by 23% (p.value = 0.0559). For all groups, this amounts to median cumulated gains of roughly 30% (difference not significative with p.values of 0.114 and 0.144 ; AM vs EM and vs DM respectively).

Recessions:

For all groups, recessions last on average a year and a half. EM tend to spend one more quarter in recession than AM and DM (6.7 quarters on average for EM, 5.6 for DM and 5.8 for AM. Stat.sig = 5%, p.value = 0.0514 vs AM and = 0.0503 vs DM). Yet per quarter, a recession is around 80% costlier in EM than in AM and 60% costlier in DM than in EM (respective averages, AM -0.79%, EM -1.41 and DM -2.29). It is thus on average 2.8 times costlier in DM than in AM. The difference is statistically significant at the 5% level between AM and EM (p.value = 0.0111) and at the 1% level with DM (p.value = 3.51e-05). Cumulated losses in a recession are 2 times bigger in EM than in AM (-7.24 vs -3.54% over the episode) and 2.3 times bigger in DM than in AM (-8.26% in DM). These differences are significant at the 1% level between AM and EM/DM (p.val = 8.97e-04 AM-EM and 9.48e-06 AM-DM) but not between EM and DM (p.value = 0.133). Finally,

[43]In practice, there are different definitions for *recoveries*. The most notable one is the period between the through of a recession and the date at which output recovers previous peak-level. Here I choose a different approach. I am interested in the strength of the dynamics in the year following the recession ends. This is closer in line with discussions on the "types" of recessions – L-U-V shaped.

in the year following the end of a recession, no group displays particularly stronger growth than during expansions. AM and EM grow on average 2% faster and DM 12% faster. None of these differences are statistically higher than 1 – p.value = 0.61 (AM), 0.62 (EM), 0.19 (DM). Countries do not seem to bounce back after recessions.

In a nutshell: As can be expected with similar transition probabilities, expansions and recessions do not differ much in length:

Stylized facts

- ▷ On average, expansions last 7 years (28 quarters) and recessions 1 year and a half (6 quarters). All country groups behave similarly.

Confirming the information on regimes average growth rates, emerging and developing markets outpace advanced markets in both phases:

- ▷ Whereas expansions total similar cumulated gains (+30%) for all country groups, recessions are twice as costly for emerging and developing than for advanced markets.
- ▷ Emerging markets grow 1.2 times faster than advanced markets per quarter in expansion but lose 1.8 times more while in recession.
- ▷ Developing markets grow 1.5 times faster than advanced markets per quarter in expansion but lose 2.8 times more while in recession.
- ▷ Countries do not grow statistically faster in the year following the end of the recession than during expansions.

If expansions do not seem to imply major difference between groups in terms of cumulated gains. Cumulated losses experienced during recessions impose a heavier cost on the EM's and DM's growth path. Recessions are as such the first candidate in mind when exploring empirically differences in volatility. Annex G details the distribution, by country groups, of recessions by duration (short to protracted) and by severity (mild to severe/drastic). Following facts can be drawn:

- Advanced markets are more prone to experiencing shorter and milder recessions.
- Emerging and developing markets are 5/8 times more likely to experience recessions associated with drastic cumulated output losses (bigger than 10% of GDP).
- Stagnation episodes are a recurrent feature of business cycles, especially for advanced markets.

Table 3: Business Cycle characteristics by phase - MSM estimations - Results

	Expansions				Recessions				
	Time (%) of Obs)	Durt. (qrtr)	Ampl. (%)	Slope (%/qrtr)	Time (% of Obs)	Durt. (qrtr)	Svrt. (%)	Slope (%/qrtr)	Rebound Strength
All Countries (54c.)									
avg	84.44	27.92	30.34	1.17	15.56	6.16	-5.41	-1.23	1.04
std	10.96	19.62	25.54	0.74	10.96	5.57	6.27	1.56	0.66
nb	54	243	243	243	54	204	204	204	193
Emerging Markets (15c.)									
avg	81.54	25.69	31.00	1.23	18.46	6.72	-7.24	-1.42	1.02
std	13.15	17.26	23.55	0.56	13.15	5.40	7.56	1.41	0.69
med	83.00	22.00	23.12	1.04	17.00	5.00	-5.11	-0.82	0.97
nb	15	55	55	55	15	47	47	47	43
Developing Markets (15c.)									
avg	85.58	25.80	34.04	1.50	14.42	5.73	-8.33	-2.32	1.12
std	13.17	20.92	28.21	1.00	13.17	5.83	7.58	2.54	0.76
med	89.04	22.00	25.11	1.26	10.96	4.00	-6.70	-1.51	1.03
nb	15	54	54	54	15	41	41	41	39
Advanced Markets (24c.)									
avg	85.53	29.75	28.53	1.01	14.47	6.07	-3.56	-0.75	1.02
std	7.65	19.96	25.21	0.63	7.65	5.57	4.24	0.70	0.60
med	86.75	26.00	21.38	0.90	13.25	4.00	-2.43	-0.58	0.93
nb	24	130	130	130	24	112	112	112	111

The table presents information on the distributions (*av*era*g*e, *st*andard *d*eviation, *max*imum, 3rd *q*uar*t*ile, *med*ian, 1st *q*uar*t*ile, *min*imum and the number of episodes *nb*) of four characteristics from the economic taxonomy: **Duration** (durt) measures the number of quarters in an episode, **amplitude/severity** (ampl/svrt) the cumulated gains/losses, **slope** the gain/loss per quarter and **rebound** the strength of growth in the year after the recession relative to average growth in expansion.

1.3.3 The contribution of growth shocks to economic volatility

Another useful feature from the MSM inferences on the data generating process is the fact that they allow an exact decomposition of economic volatility (the standard deviation of growth rates).

Timmermann (2000) provides the expression for the exact decomposition of the variance of a MSM generated time serie σ^2 based on the frequency (ie.e ergodic probabilities associated to each regime ${\pi_i}^{44}$) and the intensity of each phase (i.e. differences between each regime's average growth rate μ_i and the average growth rate of the country μ), and on unexplained variance σ_ϵ^2:

$$\sigma^2 = \sigma_E^2 + \sigma_R^2 + \sigma_\epsilon^2 \tag{3}$$

[44]Denote p the probability to enter a recession and q the probability to exit one. Then the ergodic probability to be in a recession π_R is p/(p+q) and $\pi_E = 1 - \pi_R$. This derives from observing that P(in expansion) = P(being in a recession)*P(enter a expansion)+ P(being in an expansion)*P(staying in expansion) ie $\pi_E = \pi_R * q + \pi_E * (1 - p)$.

with

$$\sigma_r^2 = \pi_r * (\mu_r - \mu)^2 \ , \quad r \in (R, E) \tag{4}$$

Equation 3 states that the variance of the time series is explained by three elements:

- σ_E^2, variance due to being in the good regime and deviating from average growth,
- σ_R^2, variance due to being in the bad regime and deviating from average growth,
- σ_{rsdl}^2, the variance which is unexplained by the model, i.e. the residuals' variance.

As equation 4 illustrates, the variance associated with a given business cycle phase corresponds to that, conditional on being in regime r (π_r), of growing more/less than average growth ($(\mu_r - \mu)^2$).

Overall the volatility is explained by positive/negative persistent growth shocks, comparable to that of a Poisson process, and temporary Noise shocks normally distributed, comparable to that of a Brownian process.

Table 4 presents the variance decomposition for the three country groups based on values from table 2. EM and DM are 36/70% more volatile than AM. In EM, growth shocks explains a higher share of total variance than exogenous white noise shocks do (54.9%). In DM, the difference is less tenuous as growth shocks explain only 48% of the variance. For AM, the picture is much different as growth shocks only explain one third of the variance (35.9%).

For all countries, the variance associated to expansions represents the smallest source of volatility (7.3, 5.4 and 4.4% for EM, DM and AM respectively). The fact that this variance explains slightly more total variance in EM and DM stems from the fact that the intensity of these shocks is 3.1/3.5 times stronger on average, there is very little difference in the frequence of the positive perturbations.

The variance associated to recessions is 7 to 8 times more important than that of expansions (47.6, 42.6 and 31.5% for EM, DM and AM respectively). Once again the reason behind this observation can be found originating in negative growth shocks being 2.6/4.3 times stronger in AM than in EM/DM.

Results

- The bulk of volatility differentials comes from volatility within recession phases. Neither from expansion nor from the switch nor from residuals.
- Against the residual random walk component, persistent growth shocks explain

Table 4: Variance Decomposition of output growth for AE and EMDE

Group	vlt.gwth	σ_g^2	Of which in σ_g^2:						
			σ_E^2	frq_E	int_E	σ_R^2	frq_R	int_R	σ_{rsdl}^2
EM	1.47	2.17	0.16	0.87	0.18	1.03	0.13	7.75	0.98
in%		100	7.3			47.6			45.1
DM	1.84	3.39	0.18	0.89	0.21	1.45	0.11	12.89	1.76
in%		100	5.4			42.6			52.0
AM	1.09	1.18	0.05	0.88	0.06	0.37	0.12	3.03	0.76
in%		100	4.4			31.5			64.1
Relative to advanced markets:									
EM/AM	1.36	1.84	3.07	0.99	3.11	2.78	1.09	2.56	1.29
DM/AM	1.70	2.88	3.54	1.01	3.50	3.90	0.92	4.25	2.33

Decomposition is based on Timmermann (2000). vlt.gwth denotes growth volatility measured as the standard deviation of growth rates. σ_g^2 denotes the second moment/variance of the growth rates time series. σ_X^2 denotes the variance due to deviations from average growth in regime X. It is computed as the product of a measure of the frequency of the deviations (frq_X the ergodic probability of regime X) and the intensity of the deviations (int_X is the square of the difference between growth in regime X and average growth). σ_{rsdl}^2 denotes the variance unexplained by the Markovian process.

more total volatility in emerging and developing than in advanced markets (1.5 and 1.3 times more respectively).

Conclusions and contributions on economic volatility

In this section, I have dated business cycles for a panel of 54 countries using Markov Switching Models. Doing so, I expand the coverage of existing studies using the same methodology and concentrate on business cycle volatility and growth socks. I confirm and illustrate several common stylized facts from Calderon and Fuentes (2014), which uses the competing methodology from the literature.

- Business cycle volatility is higher in emerging and developing markets than in advanced ones (24 and 73% higher respesctively).
- Expansions are stronger in emerging and developing markets (1.25/1.40 faster than in advanced markets respectively). Yet recessions entail 2/2.6 times greater losses.
- Emerging and developing markets form a more heterogeneous group than advanced markets.

I contribute to the literature by deriving a new set of stylized facts and results on economic volatility. I highlight interesting (dis)likeness between business cycles worldwide and use Markov switching models to decompose output growth volatility.

- Differences in business cycle volatility do not stem from more frequent regime switches. The magnitude of the negative growth shocks experienced by less advanced markets is a key factor of differences in volatility.
- Emerging (developing) markets are 5 (8) times more likely to experience a recession with cumulated output losses above 10% of GDP.
- Business cycle volatility is responsible for roughly a half of aggregate volatility in emerging and developing markets (against unexplained White Noise shocks). In advanced markets, macroeconomic volatility explains only 36% of the total.
- Recession-associated volatility marks the key differing characteristics between emerging and developing versus advanced markets.

Of particular interest, the higher contribution of business cycle fluctuations (persistent growth shocks) to aggregate volatility in emerging and developing markets tends to support the view of Aguiar and Gopinath (2007). Nevertheless, business cycle fluctuations do not matter because they are associated to more frequent regime switches but because each switch entails wider fluctuations. Overall, this section identifies the pivotal role of recessions behind volatility differentials. A potential explanation could be that these particular downturns reflect the frequent occurrence of costly financial crises in emerging and developing markets. The latter are indeed often associated to high output losses, see in particular Claessens et al. (2009) on 21 OECD countries or Cerra and Saxena (2008) for a broader panel of countries. I now describe my database of currency, banking and sovereign crises.

2 A new database of financial crises: from theory and empirics to narrative economics

As figure 1 illustrates, recent history has been plagued with currency, banking and sovereign crises. Across countries, these episodes are too often concommittent with significant and visible downturns. Financial crises are not new patterns, yet ever since the globalization period that started with the Bretton Woods Agreements, their incidence and complexity has increased. Present section details the nature and origin of financial crises considered in this article. To build my database, I rely on existing empirical literature and develop a narrative methodology following the lines of Shiller (2017) and Romer and Romer (2017). I present my methodological contribution on narrative economics and detail my new database of currency crises using *'forgotten' soft data*.

2.1 Insights from the literature on financial crises

Broadly defined, **crises** are episodes in time during which the system is brought to the edge of collapse by unforeseen conditions. Crises are times of heightened uncertainty and speculation about potential futures. During crises, initial shocks magnify as they spill over the economic system. The perturbations come to pressurize existing vulnerabilities and inconsistencies. Hence, crises often constrain agents' policy space and are the source of drastic decisions and policy reactions.

In practice, given financial markets' (and associated participants) peculiarities, no one definition fits all. I now use the literature to define the three types of financial crisis I consider in this dissertation: currency, banking and sovereign.

2.1.1 Defining financial crises

The following definitions open the discussion by highlighting key elements: the signal for the crisis to start, the agents/sphere involved and the constraints on policy space.

Currency crises start when a country's external anchor – the exchange rate – looses suddenly a great share of its value (Frankel and Rose, 1996). Currency crises also includes abnormal periods of mounting pressures on foreign-exchange markets (including speculative attacks and self-fulfilling mechanisms) (Eichengreen et al., 1996), (Patnaik et al., 2017). Due to the central role of nominal anchors in the economy, troubles on the external monetary sphere can quickly pressurize the real and financial sphere as well as the whole system (Kaminsky et al., 1998). Hence currency crises are associated with policy intervention and often notable changes in the central bank's (CB) policy course. Notable measures include: interest rate policies, devaluations, foreign exchange interventions, capital flow measures, notable regime change (Kaminsky, 2006), (Kaminsky, 2016). Among EMDE, they are often associated to episodes of sudden stop or speculative attacks on exchange rate markets (Calvo, 1998).

Banking crises are signalled by periods during which financial distress in the banking system starts to pose systemic risks. This can be illustrated in situations during which confidence deteriorates greatly and some institutions face bank runs or endure great losses. Financial institutions can also fail to meet balance sheet requirements and be forced to undergo restructuring/renationalization/file for bankruptcy. Banking crises are trigerred when increases in systemic risk or cumulated losses provoke significant banking policy intervention measures. (Laeven and Valencia, 2020). Beyond banks and other financial institutions, the central bank or a related institution, often depositary of a financial stabitily mandate, are involved in the crisis. Banking crises are often adressed by macro-

prudential policies. In case of heightened investors risk aversion and ensuing market dysfunctionalities deterring the transmission channels of monetary policy, central banks might intervene and alleviate liquidity-related pressures faced by financial institutions.

Sovereign crises entail **sovereign defaults** that follow any breach of contract a country might decide/have to make regarding the repayment (principal, interest) and associated schedule of formerly emitted debt obligations – *signal* – (Reinhart and Rogoff, 2009). Most defaults are associated with haircuts on the schedule or part of the amount. Very few defaults in the recent period correspond to full repudiation. Moreover, a country is often considered in default if it has to subscribe new debt (often concessionnal at the IMF) to support the economy in the process of negociation (Kraay and Nehru, 2006), (Cohen and Valadier, 2011). Sovereign crises affect the national government (sovereign sphere) in its ability to meet a budget constraint. Depending upon independence and context, central banks can intervene to monetize part of the debt or alleviate it by inflating the nominal domestic/foreign anchor – inflation/exchange rate (Reinhart, 2019). As international episodes, these crises often involve market participants (domestic and/or foreign) on USD- or Local Currency bond markets. International institutions (e.g. the IMF) are often involved in their unfolding. Sovereign crises illustrate the dry-out of fiscal policy space and times of hightened dependency on external funding/world financial markets.

To devise more appropriate policies in the face of a crisis, the academic literature has questioned potential links between crises and activity. More specifically, the literature has debated whether financial crises prove to be the cause or the consequence of worsening economic conditions or some self-fulfilling side-event. I now discuss the main determinants of financial crises.

2.1.2 Theoretical foundations on the determinants of financial crises

In an unstable environment, shocks and fluctuations perturbate an vulnerable economic and financial system and trigger chains of events (i.e. the transmission mechanisms) giving rise to financial crises. Identifying how financial crises take root in a given context helps highlight the key inconsistencies/fragilities/frictions that should be the next target of policy making. Irrespective of the type of crisis[45], two main lines of ideas commonly oppose when identifying how crises take roots in a country. The interested reader can refer to annex J which provides the associated detailed literature review.

[45]See Lorenzoni (2014) for a detailed theoretical literature review of international financial crises.

The "fundamentals" story: The economic and financial system is characterized by structural fragilities, deficiencies and/or inconsistencies. Inherent frictions on diverse transmission mechanisms can amplify external shocks and fluctuations. This pressurizes existing vulnerabilities and threatens the whole system (negative feed-backs). Frictions and/or policy frameworks can also (or not) dampen part of the shocks/fluctuations (positive feed-backs). A crisis will then occur on different grounds. (i) Because shocks/ fluctuations are too large for the whole system to adapt. The (policy-) stance on a particular sphere of the economy has to change to evacuate some of the systemic pressure, (ii) because the initial, even if small, shock gets amplified through different transmission channels. More and more agents in the system get affected as frictions generate bottlenecks where pressures concentrate and vulnerabilities reveal. The limitations of existing frameworks are thus questioned and loopholes behind fundamental deficiencies reveal[46].

The "self-fulfilling" story: In theory, what allows a system to operate is, notably, its reliance upon functional markets. Markets (of all types) are places where different agents meet to exchange assets/claims. Each agent confronts the market with a set of policy rules in mind, determining her actions – the choices she makes regarding current decision.s and those that might have an impact of the future state.s of the world, often forward-looking considerations. They formulate these decisions against the set of information at their disposal in the current state of the world and given their knowledge of the structure of the economic and financial system (rational **expectations**). It is possible that, due to different structural characteristics or frictions, some agents, investors for example, come to expect somber futures more easily (hightened **risk aversion**). If agents' implication in the market is large enough (a large pool of investors, or systemic participants), their expectations matter/express at an *aggregate level*. These expectations can thus transform into impactful effective policy changes. At that point, other agents might understand and react to this new information (*heterogeneity* is a source of information). Depending on the context, other agents might use this negative signal to update their own expectations downwards with respect to what fundamentals signal. They adapt other policies accordingly and the phenomenon can spread and take real roots. Whatever the market, if fears are too strong, there is a chance for it to destabilize the whole system. Note that this particular mechanisms works not because there has been an anterior (sequence of) negative productivity/growth shock(s). **Self-fulling crises** fatal blow the

[46]See Krugman (1979) for currency crises ; Mishkin (1992), Mishkin (1996), Kiyotaki and Moore (1997) for banking crises and Eaton and Gersovitz (1981), Cohen and Sachs (1986), Aguiar et al. (2019) for sovereign crises.

economic and financial system because they create lethal interruptions/fluctuations in the liquidity on particular financial asset markets. These realizations are sudden and might surprise other agents. The new reality – i.e. the information set adjusted to capture negative effects of self-fulfilling mechanisms – might be one in which another agent has a very constrained policy space. For these particular policy reactions, there is a possibility, given fundamentals and the structure structure of the system, that the optimal choice is not unique. Multiple equilibria are often a source of indeterminacy. Self-fulfilling crises are thus episodes we can consider as a toss-of-coin away from having been avoided[47].

In practice, some crises do not fall under one of these two views, and are the result of pure political interplay for example (Herrera et al., 2020). Ecuador's default on $3 billion worth of bonds in 2008 is a good illustration of these special cases [48].

Because financial crises are complex phenomena, they often do not occur alone. Hence the literature has discussed how the different types of financial crises interrelated: (i) twin banking and currency crises (Kaminsky and Reinhart (1999), Chang and Velasco (1998), (2001), Kalemli-Ozcan et al. (2016a)) ; (ii) twin sovereign and currency crises (Reinhart (2002), Na et al. (2018)) ; (iii) twin sovereign and banking crises (Reinhart and Rogoff (2011) and Kalemli-Ozcan et al. (2016b), Bordo and Meissner (2016)) and (iii) triple crises (Reinhart (2012), Reinhart (2018), Kaminsky et al. (2003)). Given the general purpose of this article to provide layers to taxonomize crisis episodes, I later coin ***multiplicity*** the number of different financial crises associated in a given episode.

2.1.3 Non-linearities, Markovian processes and financial crises

In section 1, my empirical strategy identified different regimes of positive/negative growth[49]. As identified in the previous literature review, non-linearities are often a key modelling assumption to create uncertainty about future prospects and/or multiplicity of equilibria.

[47]See Obstfeld (1991), (1994), (1996), Morris and Shin (1998), Aghion et al. (2001) for currency crises ; (Diamond and Dybvig, 1983) for banking crises and Cole and Kehoe (2000), Aguiar et al. (2017) for sovereign crises.

[48]The economy was expanding, the Central Bank had $5,6 billion worth of foreign reserves. There were no pressure on international markets on the domestic economy. Yet, following sheer political motives, president Rafael Correa declared part of the national debt "illegitimate" and refused to pay interest to foreign lenders.

[49]From an empirical point of view, growth in a particular quarter will deviate from average for two reasons: (i) it is subject to regime change and endures a persistent series of positive/negative sizable shocks, and (ii) it is subject to shocks, normally distributed around 0 (exogeneous to the data generating process of growth). It is interesting to find the theoretical counterpart to these shocks. Jumps between regimes can be thought of as sudden changes in the fundamentals or as the manifestation of a negative sunspot realization. The white noise, on the other hand can be considered as unaccounted random shocksand sources of volatility.

The literature has been keen on such using Markovian processes to model sunspot variables or fundamentals (Jeanne and Masson (2000) on currency crises, Davig et al. (2011), Bi (2012) and Greenlaw et al. (2013) on sovereign defaults and fiscal crises). A key illustration of this rationale applied to sovereign crises can be found in Carre et al. (2019). Next subsection details how financial crises are dated in the empirical literature. For that purpose, Markovian processes are not common practice. MSM have already been used to study financial crises (Hamilton, 2016), but in comparison to other methodologies they haven't taken much sun over recent history. Empirically Hamilton (2005) studies banking crises and Hubrich and Tetlow (2015) use MSM to study episodes of heigthen financial stress in the US. Considering currency crises Cerra and Saxena (2005) and Martinez-Peria (2002) offer an empirical investigation of currency crises in Asia during the end of the 90s and in Europe during the EWS. Jeanne and Masson (2000) show that for the case of the French Franc in 1987–1993, the window for which Obstfeld (1994) studies escape clause models, using a MSM dated sunspot to influence devaluation expectations significantly improve the fit of the model.

2.2 Dating financial crises and *the 'forgotten' soft data*

Financial crises differ in the way they manifest and diffuse. Yet, there are 3 key common elements behind every financial crisis: (1) particularly important shocks or magnified fluctuations ; (2) (systemic) agents' policy space being suddenly and drastically constrained and (3) national authorities intervene greatly or change policy course permanently.

Echoing these elements, the empirical literature focuses on identifying: (i) abnormal movements for key macrofinancial variables related to specific mechanisms of a crisis and (ii) events that mark important related policy interventions. These conditions and booleans define the algorithm dating the start of a crisis. They are the focus of next sub-section. The latter two focus on narrative economics and the analysis of archives to derive information on crises start dates.

2.2.1 Empirical datations of financial crises

I now present the main dating algorithms used in the literature and this article. Details on the rules and data sources are available in annex I.

Currency Crises

Currency crises form a frequent historical pattern described by many cohabiting theories. The empirical literature has focused on diverse macroeconomic indicators to capture (i)

the manifestation of the crisis (exchange rate fluctuations), (ii) conventional policy reactions aimed at dampening the shock (international reserves, policy rates) (iii) significative policy changes (devaluations, change in the exchange rate regime).

Two main approaches are found in the literature to date currency crises. The first one focuses on large fluctuations of the nominal exchange rate (either effective or bilateral vis-à-vis USD). Frankel and Rose (1996) date crises if, during a year, (i) the domestic currency faces a year-over-year depreciation of at leat 25% and (ii) the depreciation exceeds previous y-o-y change in the exchange rate by at least 10%. Signals are then filtered over 3-year windows. Laeven and Valencia (2020) adapt the filter to quarterly data by extending the window of observation to 5 years and the threshold for a significant depreciation to 30%. The second one constructs an Exchange Market Pressure Index (EMPI), the variations of which allow dating episodes of heightened stress in forex markets:

- Sachs et al. (1996) and Kaminsky and Reinhart (1999) construct the index as the weighted average of the quarterly growth rate of nominal exchange rates and the change in the stock of reserves foreign reserves.
- Eichengreen et al. (1996), Bordo et al. (2001), Gourinchas and Obstfeld (2012) adopt a broader approach by including the change in interest rates in the index. For each country, the obtained EMPI time series is then filtered. A rule ensures the algorithm retains only quarters in which the EMPI deviates from the average by more than 2-to-3 standard deviations. The main constraint when applying these methods for a wide panel of countries is quarterly data availability.
- Bussiere and Fratzscher (2006) construct a similar EMPI using real exchange and interest rates.

I apply these different approaches to my sample of 54 countries and identify potential currency crises. I apply the Frankel & Rose filter with a 3 (5) -year window and date 79 (67) episodes. I construct three EMPI, using either (EMPI1) quarter-over-quarter nominal exchange rate growth and change in foreign reserves (excluding gold), (EMPI2) case one and change in the monetary policy rate and (EMPI3) case one and change in the money market rate. I date currency crisis episodes using a 3 (2) -standard deviation thresholds. EMPI1 dates 31 (132) quarters of heightened stress, EMPI2: 15 (58) and EMPI3: 31 (132). Crises dates vary greatly accross approaches. They often overlap but not always. Part of the reason behind this heterogeneity is the fact that not all source variables are available for all countries. EMPI1 is constructed over 6209 quarters, EMPI2 2590 quarters and EMPI3 4408 quarters. An obvious second reason is the fatc that the

algorithms focus on different aspects underlying currency crises. To settle the case, I decide to rely upon narrative economics and IMF archives. I detail this contribution in the next sub-sections.

Banking Crises

In 2008, as the Global Financial Crisis unfolded, Luc Laeven and Fabian Valencia published a wide cover database on banking crises dates at a quarterly frequency (Laeven and Valencia, 2008). The database has since then been subject to frequent extensions and updates, Laeven and Valencia (2010), (2012), (2018). In the most recent update Laeven and Valencia (2020) identify banking crises based upon two subsets of signals/information:

- There are signs of financial distress in the banking system. Such a situation is defined by Laeven and Valencia if the share of nonperforming loans is above 20 percent of total loans, if the share of bank closures is at least 20 percent of banking system assets or if the fiscal restructuring costs of the banking sector exceed 5 percent of GDP,. This condition can be the sole trigger of a crisis.
- There have been significant banking policy intervention measures to cope for losses in the banking system. Six policy interventions are considered: deposit freeze and/or bank holidays ; significant bank nationalizations ; high bank restructuring fiscal costs ; extensive liquidity support ; significant guarantees put in place ; significant asset purchases

The quarterly dates are taken from the initial dataset of Laeven and Valencia (2020), which provides additional narrations for a sub sample of cases. In four instances, their database does not provide an quarterly start date for the crisis. I rely upon IMF archives to date specific episodes. Overall, my database includes **52 banking crises**, which gives an average of one per country. In practice 10 countries experience 2 banking crises (including Argentina and Ukraine)[50].

Sovereign Crises

Sovereign debt crises are identified if at least one of three main propositions is verified (Kraay and Nehru (2006), Cohen and Villemot (2015)):

- A country is unable or unwilling to repay its debt, identified when a country's cumulated arrears represent more than 5% of total debt. Data on debt arrears are taken from the International Monetary Fund - International Financial Statistics.

[50] As a reference point, over their initial sample of 151 crises (136 countries, unbalanced panel over 1970–2017), Laeven and Valencia (2020) find that countries face on average at least one banking crisis. Few countries actually cumulate banking crises over 3 episodes (e.g. Argentina, Ukraine in my sample).

- A country enters a debt restructuring plan with the Paris Club (rescheduling and/or debt reduction). HIPC initiatives are excluded from the sample as they often take place when the country has already built back some fundamentals.
- A country receives significant nonconcessional financial assistance from the IMF (Stand-By Agreements, Extended Fund Facilities or access to specific Credit and Liquidity lines), allowing up to more than 300% of quota cumulatively. To act as a trigger, the program must represent at least 50% of the country's quota at the Fund. To trigger the crisis, the program must be disbursed by the country in quantities that overpass this same threshold. This ensures selecting cases of external financing *uses* and further eliminates cases in which only small disbursal are needed to calm the situation[51].

This database of Sovereign Defaults was then compared to Reinhart and Rogoff (2009) and Laeven and Valencia (2020) datations, which provide additional narrative evidence. For crises without quarterly datation, I relied upon IMF article IV to identify the starting quarter. Medas et al. (2018) make for a recent empirical database contributing to the broad discussions on crises involving a government in financing needs. Their definition of **fiscal crises** covers wider ground than mine. By broadening the set of triggers, and in the case of IMF programs lowering it[52], their notion of a crisis expand to that of a government facing heightened constrained policy space to act. My definition of a sovereign crisis relates to sovereigns in dire external financing needs, and thus cover a sub-sample of the fiscal crises.

As robustness, I compare the two databases over the sample of interest. Our databases differ in 26 cases (25 missing and 1 different date). I delve deeper into each case by consulting IMF archives to identify if there are mentions of crises, strong related policy change, or troubles in the fiscal/sovereign sphere. Out of the 26 initial fiscal crises, (i) 10 are coined as sovereign crises and remain in the database, (ii) 1 is redated and (iii) 15 are excluded[53]. Overall, my database includes **36 sovereign debt crises episodes** in 54 countries[54].

[51]It is worth noting thatprogram size has increased over time, thus augmenting the probability of detection of crises. On the other hand, quotas are changed at a low frequency and might thus not reflect adequately the size of the country's issues at hand Reinhart and Trebesch (2016)

[52]The threshold of 100% is indeed higher, but there is no constraint on using at least 50% to trigger a crisis.

[53]Out of the 15 cases excluded: (a) 4 were linked to HIPC initiatives and indeed associated with a favorable economic environment and policy space ; (b) 2 had contracted SBA but used less than 50% of the quota. In one case there are clear mentions of remaining policy room and access to external financing, in the other the shock is common (terms-of-trade) and little disbursements act as transitional adjustments ; (c) 9 had no mention of the sovereign being in trouble or of a drastic policy change.

[54]As a reference point the most recent and wide database, Laeven and Valencia (2020), date 79 sovereign

2.2.2 Narrative economics and *the forgotten soft data*

In the literature, databases of financial crises are often accompanied by short narrations describing the episodes. Economic historians and economists have long narrated crises episodes to better describe their functioning. This is particularly true for banking and sovereign crises, and more disperse in the case of currency crises. There are many types of "narrations": from long detailed descriptions of historical developments – in economic history and earlier research – to shorter and more conceptual descriptions (highlighting a mechanism for example) and even shorter to a line describing an event (e.g. "currency was devalued by 15%"). They also differ content-wise – factual, story-telling, quotes, descriptive, methodological analysis – and purpose-wise – some act as the object of discussion, others as a source of information/shocks, others as robustness checks, others as material for the analysis. Narratives are old tools currently reviving as a practical tool to research.

Narrations have always existed, in the literature on crises but more generally in economics, as a fundamental part of the research process. Yet as quantitative tools and access to data developed, a *"hardness bias"*[55] developed (Akerlof, 2020) and narrative contributions saw their place in the literature shrink. Narrations were mostly left to introductions and motivations as a practical illustration. Outside economic history (a major exception), they rarely made for a noble chair at the table. Yet, over the last two decades, they started gaining in momentum (Shiller, 2019). From the point of view of the international macroeconomic and financial literature' point of view, small narrative elements (often 5 lines or less)[56] have guided the study and identification of economic and financial crises over the last 50 years. Recently, Christina and David Romer (RR) launched a vast methodological work building upon narrative elements. Said research has yielded important results across fields Romer and Romer (2004), (2010), (2017), (2018), (2019). To structure my own database, I follow their hindsights.

Narrative economics can be defined as the branch of the literature using official archives and publications to analyze and research key economic and financial concepts. As the primary source is textual, this approach entails treating soft data. That is information

crises for 136 countries.

[55]That is towards more mathematical and hard-data driven approaches.

[56]There is of course a large variance in the size of narrative elements. From my own experience manipulating existing datasets, I feel the distribution to be skewed to the left. For example Eichengreen et al. (1994) and Reinhart and Rogoff (2009) have around 4-5 lines descriptions, Kaminsky (2006) has 1(2) lines descriptions. Laeven and Valencia (2020) uses 5 to 10 lines narrations. The reason the length of the narration matters is that it directly impacts the volume of information conveyed. Naturally too much of it disserves the exercise. As a reference point closer to my approach, recent work by Romer and Romer (2019) display narrative elements inbetween 5 and 25 lines.

which is not directly measurable/quantifiable and thus based upon human observations. Because the raw data entails subjective evaluations, it is often coined as less reliable or suffering from a stronger biases, for example if the authors are known to support a particular dogma/view of the markets.

Yet, because raw data is soft, she provides complementary information absent (without treatment) from hard data, notably on causal links, transmission mechanisms and agents' motivations. As the authors of the documents are often close to decision centers or trained analysts and economists following particular topics, inputs to narrative contributions are particularly loquacious on the developments discussed in the source, their origins and implications. The contribution (and challenge) of narrative economics is to extract this particular causal information from textual sources and control for potential biases. Narrative contributions entail the production of novel information, more objective (verifiable by other researchers) and easily treated. Narrative economics suffer from a certain drawback, which might have discouraged previous approaches: there are irreducible fixed costs to reading a large number of documents.

A recent approach of the literature uses key words and large text scrapping codes to gauge long or numerous textual sources. These studies have a different purpose as they usually either try to extract stylized elements or evaluate the general tone of the document. From a conceptual perspective, projects using text scrapping are inherently aimed at a more specific question and literature. This is due to the fact that, by focusing only on a finite set of keywords, this approach prevents adressing broader/more theoretical linkages. It also overlooks all the *insider's hindsight* additional information provided when reading. A great review of these methodologies can be found in Fayad et al. (2020), which uses text analysis to develop a sentiment index measuring country's responses to IMF Article IV advices.

I now rely upon the RR series to identify and organize the key elements entailed in narrative contributions. Given the renewed dynamics of the literature in terms of narrative economics, as a practical side-contribution to present literature review, in annex K I dress a go-to-guide of the key elements that narrative contributions should encompass.

The first object that deserves attention is the source of the data in the RR series. They are diverse but a clear pattern arises. The source is often official and intended for broad diffusion (FOMC minutes and the Federal Reserves *internal reports* in RR04, US *Economic Reports*, presidential speeches and statements in RR10, *OECD Economic Outlook* in RR17/18/19) or written by analysts and specialists and intended at key economic and financial agents of the system (Economic Intelligence Unit *Country Reports* in RR19).

The concept.s of interest[57] does not need to be at the center of the documents. Nevertheless they need to discuss it frequently and help identify sequencing of events or conditions that might reveal essential. Because of the source of the document (e.g. policy-makers) the document can help shed light on key motivations behind developments key to concept being studied. Often the source includes an analytical presentation of the developments shedding light on possible causal links.

The second element that comes in any of the RR articles is actually an essential element to every research: a clear definition of the concepts and events studied backed by clear research question(s). In the case of narrative contributions, this deserves particular attention because the research is bound to *match* "different languages"[58]. Because the focus of the article is often taken from the point of view of the contribution to the literature, it might be described in a more conceptual – theoretical – way than in more descriptive writtings. The RR series focuses on two notions: tax changes/fiscal shocks and financial distress. All narrative contributions include a clearly stated definition, backed by the literature, of the concept at hand. This definition acts as a reference for the 'more practical' terms of the source. To first bridge the two 'languages', the narrative approach defines a sample of episodes, often based on quantitative indices[59], that can set the initial scope for the study or act as a benchmark for comparison. Finally the RR series also define a set of questions to ask when reading the article. These questions further illustrate how the research concept will take ground in the documents.

The third and final element in all RR contributions is the clearly identified methodology they adopt when reading the documents. This usually consists in defining a broad (open) set of economic and financial developments[60]. The latter relate directly (or indirectly) to key factors behind the topic of interest by shedding light upon key factors. These factors often group into two main aspects: those relating directly to the manifestation of the event studied and those relating indirectly to it via developments of more fundamental/structural determinants that guide the behavior of agents involved in said event[61].

[57] They apply their methodology to monetary policy shocks, tax changes/fiscal shocks and to financial distress/financial crises.

[58] What I mean is that approaches to the same concept might differ between the academic literature and, for example, policy-oriented reports.

[59] RR10 focus on "significant legislative changes" based on the number of "incidental mention". RR17/18/19 take a range of existing datations of financial crises as a benchmark against which to confront their measure and start their analysis by filtering episodes based on hitcounts for a set of key words. A key aspect of RR aproach is that the initial filtering of episodes is based on quantitative text analysis.

[60] For example, RR10 uses discussions on macroeconomic developments that might justify an endogeneous adaptation of tax rates.

[61] In RR17/18/19 financial distress is identified if there are discussions on clear markers of increased cost of intermediation – the concept taken from the literature (Bernanke, 1983) – or references to developments

Two last elements are needed to complete the methodology. They both depend on the research questions being asked. First, the methodology should present the *format* of the narrative contributions (i.e. what is taken from the data and how is it presented). Second, most narrative approach include a *box-ticking* step. A direct/side purpose of a narrative approach often entails some elements for a taxonomy of episodes[62] or a clear decision on the nature of an event[63]. In practice, this consists in ticking the boxes associated to those factors that actually mattered, given the narration.

2.2.3 A new narrative database on currency crises

This sub-section adresses in detail the sources and methodology behind my database of narrative quotes on currency crises. I rely upon annex K's guide to structure the information. Annex L and M provide more detail on the source and the methodological framework.

A. Source

The source is the *International Monetary Fund*'s ***article IV publications***, I also rely on other publications that entail elements from economists country reports (descriptive and analytival views). These include: (1) *Recent Economic Development country reports*, that act as internal background papers to article IV final reports ; (2) program-related documents including *requests for assistance* and *reviews of program's advancements* ; (3) Independent Evaluation Office reports on the implication of the IMF in selected crises or topical reports, e.g. on the role of statistics and data quality in past experience ; (4) in few occasion I also consult press releases[64].

(i) Given the insitution primary mandate, currency crises and associated determinants are a key item of discussion in IMF country reports. This primary mandate actually ensures that the IMF discusses/follows issues related to currency crises as they identify as key disruptions in the functioning of the international monetary system. The conceptual framework that the IMF uses in assessing countries risks also ensures a wide covering discussion of potential determinants.

(ii) Article IV publications are available at a regular but not high frequency. Their are often biennial/annual. Expanding the scope to other publications that entail the same descriptive/analytical elements, allows for a more detailed study. These publications cover the panel of member countries, which includes my sample of

that might impair financial institutions (the agents involved in the event) thus affecting indirectly the cost of intermediation.

[62]See for example the intensity of credit disruptions/crises in RR17/18/19.

[63]See for example the opposition endogenous/exogenous tax changes in RR10.

[64]For Switzerland, I also relate to historical work and OECD archives

study. For all countries, IMF publications are directed by one consistent policy-view, which enables consistency of the approach, and a comprehensive framework, which enables the comparability of economic and financial systems worldwide. Moreover the IMF's conceptual framework has been known to adapt to changing international conditions and realizations. For crises as diverse as currency (financial, works as well), this is a notable advantage.

(iii) Article IV publications are written by the IMF's staff (economists). They are the results of consultations with national authorities and representatives. They often incorporate the Fund's descriptions, analysis and policy views on the recent, current and prospective state of the country. The Fund might also form an opinion on policy relevant issues (advisory or, in a program, a bit more). The view of the national authorities has been introduced in a clearer way in the documents through time, but overall the Fund speaks with her own voice. Documents are written not long after or at the time of the events. They entail detailed description of specific events and manifestations as well as more general analysis of the transmission of macroeconomic and financial perturbations. Given the policy-view, motivations are an essential element considered.

(iv) IMF publications are widely consulted documents. They are accessible, weel sourced and referenced. The publications are often written by economists, who also work on research projects[65]. Her position on the international stage acts both as a source of potential biases and a source of potential auto-censorship. It is possible to gauge these biases in the documents.

B. Angle of Attack

(i) **Concept:** A currency crisis is a particular type of financial crisis. It is a financial crisis because she entails heightened disruptions on the foreign exchange markets. Forex markets include transactions related to the exchange rate(s) and the products derived from it. It is particular because of the nature of the asset traded (in-)directly on these markets: domestic currencies. As the external nominal anchor, the exchange rate measures the relative value of a currency against another and acts as a proxy for the relative trust in a given currency. This is particularly important because the exchange rate is associated to all current and future decisions by economic and financial domestic agents when interacting with foreigners.

A **currency crisis** occurs when substantial pressures accumulate on forex markets

[65]The research objective is often not the same as academic research, but this ensures that the ideas of the staff remains connected with current research.

due to agents sharing conflicting views as to what the actual value of a currency should be. The pressures unveal the inherent vulnerability/inconsistency/indeterminacy of the present situation. This, in turn, forces a marked change in the policy course of an agent(s) or a substantial adjustment in prices – re-valorization. This action can solve the issue and align agents considerations on a new path for the currency. It can also prove insufficient to tame divergences and lead to a resurgence of troubles.

(ii) **Initial sample:** Textual recognition failed to converge on part of the archives. As a result, I follow the approach by Boonman (2019)[66]. I set my initial sample using previously presented empirical datations: Frankel&Rose-3years, Frankel&Rose-5years, $EMPI_2^1$, $EMPI_3^1$, $EMPI_2^2$, $EMPI_3^2$, $EMPI_2^3$, $EMPI_3^3$. Relative to his work, my database covers a wider set of countries (70 against 35). I intersect the previous different datations and identify 250 episodes for which at least one signal suggest a currency crisis. These episodes can cover signals occurring at different quarters. Given the frequency of the publications, I can verify in publications surrounding the signal, the exact starting quarter of the crisis.

(iii) **Research question:** In present section, I use the narrative approach to date the start of currency crises. Hence I focus on following questions: Are there detailed descriptions of heightened fluctuations on forex markets? Are there fundamental vulnerabilities/inconsistencies impairing the functioning of forex markets? Are agents stressing/stressed by developments on forex markets? Are agents expecting/speculating on a depreciation? Are agents constrained in their policy choices? Are national authorities intervening to dampen developments/pressures? Do announcements relate to substantial/novel policy implementation or significant change in the global policy framework?

C. Methodology

(i) **Documents read:** I refered to over 208 article IV publications documents, 59 recent economic developments, 6 IEO reports, 31 program reviews and 9 other sources (IMF press releases mostly. For Switzerland, as the country joined the IMF late, I rely upon OECD publications[67] and Baltemsperger and Kluger (2017) for a monetary history of he country). Given that my current focus is on currency crises, I read in detail the most relevant parts of the documents: those that related to

[66] Whereas he relies upon academic research articles and press releases, I attempt at using a consistent source and narrative methodology to dating all crises. I also adopt another form of output for the database by relying upon quotes from IMF publications that allow for direct ex-post external judgments.

[67] See RR17/18/19 for a discussion of the source.

the external sector and monetary policy first, sovereign, financial and real factors next. I focused on the latter elements with particular attention whenever I felt the narration missed a link or information was insufficient to conclude.

(ii) I consider three sets of **factors and developments** of interest when analyzing whether the episode studied entails a currency crisis: (i) key (systemic) domestic agents/sectors involved in cross-border transactions and likely to be constrained or stressed around a currency crisis ; (ii) key fundamentals determining how forex markets function – exchange rate regime, trade and financial liberalization, external/global imbalances, trade diversification, financial development, balance sheet risks and (iii) key policy changes and interventions – exchange rate devaluation, foreign exchange intervention, change in policy rates, capital flow measures, announcements and expectations realignment, open market operations etc. I look for staff statements articulating these different factors with "periods of heightened pressure", "abrupt" or "substantial" changes and policy interventions. In particular, I identify key stated events or causal/qualitative statements providing information on the origin and starting quarter for the crisis.

(iii) **Output:** For each episode considered, I code whether it identifies as a currency crisis or not. If so, I keep track of the starting quarter. I record the main quotes and descriptions from the textual sources that allow identifying the nature of the episode considered[68]. Quotes and details are available in the associated database.

From the intial sample of 250 episodes, **I identify 124 as currency crises**.

2.3 Taking stock of 50 years of crises

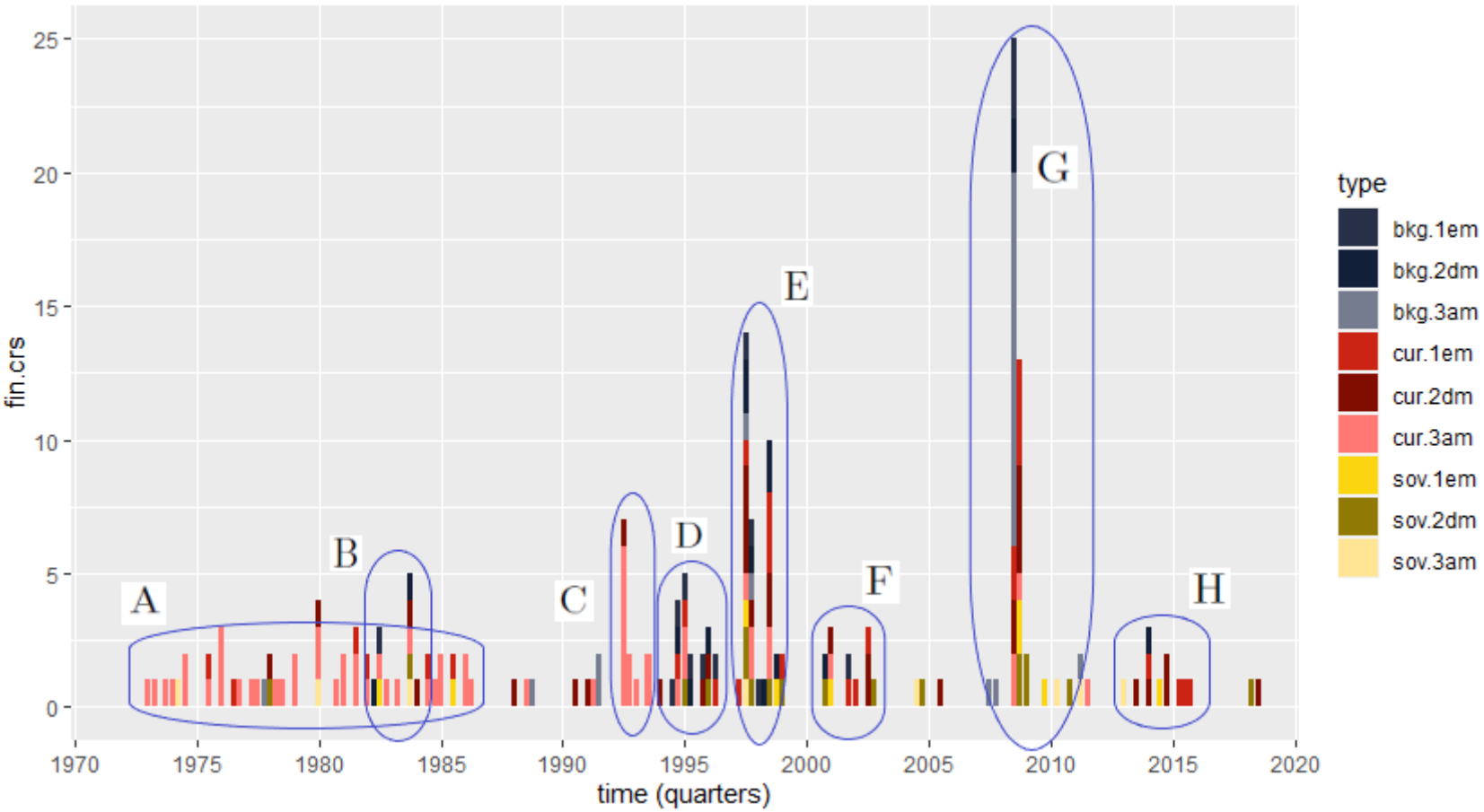
I now detail and illustrate the database's descriptive statistics.

2.3.1 Waves of crises and historical patterns

Figure 3 presents the distribution of all crises in the sample. The first observation striking the eye is the wave-shaped pattern. For the 54 countries considered, there were some periods of relative tranquility with fewer crises (around 1990 and 2005). Inbetween an increasing number of crises signal. The first part of the sample displays a high number of currency crises (in red), whereas after 1990, banking and sovereign crises signal ever more frequently (in black and yellow respectively).

[68]The purpose of applying my narrative methodology was to date crises starts. Using narrations and identified quotes, future research, beyond the scope of this article, will code the key factors and developments that played a role in each currency crisis. A second contribution of this database entails the classification and analysis of currency crises.

Figure 3: Number of crisis per quarter, by type and country group, over the sample



sov... correspond to the number of sovereign debt crises, cur... for currency crises and bkg... for banking crises.
...1em means the crisis occurred in an Emerging Market, ...2dm in a Developing Market and ...3am in an Advanced Market

The first 15 years of the sample are predominantly marked by currency crises in advanced markets (A: 1972–1986). On one hand, small open advanced economies, often commodity exporters, were exposed to currency attacks and speculation. On the other, Western European countries struggled several years with the construction of a common monetary system. In emerging markets, few events are actually recorded before 1980 due to reduced availability of quarterly real gdp data. Most crises occurring over the period are currency crises stemming from similar issues (gold dependency in South Africa, external trade-driven balance of payments pressures in Mexico and Turkey). The first multiple crises episodes hit emerging and developing markets at the beginning of the 80's (B). In 1982q1, as Mexico enters a recession, a currency crisis triggers. 2 quarters later, a sovereign and a banking crises hit the country. For Philippines, as the country enters its second quarter of recession in 1983q4, the three financial crises trigger.

Beginning of the 1990's, Western Europe once again faced a currency debacle (C). The exchange rate mechanism which bounded domestic currency to one another submitted to market pressures as inconsistencies in domestic policies and unemployment rose. Mid 90's, emerging markets suffered a first wave of banking (and currency) crises (D). In most cases, financial markets were poorly developed and the banking system poorly regulated. Banks faced increasing external and domestic funding costs, which forced the closure or privatization of numerous banks in Latin and South America (Bolivia, Brazil). In some cases, the liberalization process had exposed vulnerable financial institutitions to external pressures and capital flight (Costa Rica, Paraguay). Following the Mexican *Tequila crisis* of December 1994, Argentina suffered a similar fate but contagion remain contained. In Central and Eastern European countries, several banking crises shook the region at that period. Most of them resulted from poorly regulated financial institutions, often scarred by political interference (Bulgaria, Romania, Latvia, Lithuania etc.).

By the end of the 90's the situation deteriorated quickly for emerging and developing markets worldwide. The global crisis episode started with Thailand in July 1997. As many Asian countries, Thailand benefitted from large capital inflows that fueled speculative investments and further constrained the Central Banks exchange rate objectives. As the economy slowed down (following external perturbations), the situation became unsustainable and heightened risk aversion and panic precipitated a full-on crisis. Soon, the trouble contaminated most Asian countries and the panic reached other emerging and developing markets (E). In some countries, this period of trouble had long lasting effects and as the 21st century started, several emerging and developing markets suffered

from continued external pressures and speculative attacks (F). Argentina triple crises in 2001-02, which followed from the recession initiated in 1998 by world financial troubles, acts as the most famous example in this bucket.

After a period of relative tranquility mid 2000's, financial markets and the world economy completely collapsed during the Global Financial Crisis (G). The crisis originated in the USA and soon spilled over to most advanced arkets. Overall, most emerging and developing markets faced troubled forex markets but managed to navigate the period more or less uninjured. The GFC was followed, in Western Europe, by continued difficulties as Southern European countries faced spikes in risk premia. Mid 2010's, as external conditions worsened for many emerging markets and developing countries, the spike in financial crises is unexpectedly low (H). Usual crises countries – Argentina and Turkey – did display troubled markets but with little echoes elsewhere. Carmen Reinhart argues that, as China's worldwide financial activities is grossly undervalued, defaults that could have been expected, were not signalled, i.e. the *missing defaults* (Reinhart, 2019).

What this overview of the recent crises history confirms is the importance of contagion within region and income groups. I now present the main descriptive statistics of the database along these lines.

2.3.2 Exposure to financial crises: the facts

Table 5 presents descriptive statistics on the financial crises covered in the sample (MSM) and associated annual probabilities. On average, whatever the income group, over available data, countries face 2 to 3 currency crises and one banking crisis. For sovereign crises, the picture is different as emerging and developing markets are more exposed to this type of event (on average a third of AM might be exposed to sovereign crises, against two thirds for EM and all DM.). For all groups, currency crises are around 2 to 3 times more frequent than other episodes (7.5 times more frequent than sovereign crises in AM). For advanced markets, 50% of currency crises occured before 1991Q4 and 75% before 1998Q4 (against 17 and 40% on average for emerging and developing markets).

Emerging markets face an annual probability of experiencing a sovereign crisis of 2.31%, 6.71% for a currency crisis and 3.24% for a banking crisis. Developing markets face higher probabilities for all crises (4.42 for sovereign crises, 8.11 for currency crises and 3.93 for banking crises). Advanced markets face lower probabilities than the two other groups: 0.70, 5.36 and 1.93 for sovereign, currency and banking crises respectively. The

Table 5: Descriptive Statistics - Annual probability of experiencing a financial crisis by type and country group

	Nb. Obs.	Prob(cur.crs)	Prob(bkg.crs)	Prob(sov.crs)
DM (15c.)	1628	8.36 (34)	3.93 (16)	4.42 (8)
EM (15c.)	1729	6.71 (29)	3.24 (14)	2.31 (10)
AM (24c.)	4548	5.36 (62)	1.93 (22)	0.70 (18)
AME (3c.)	498	12.9 (16)	1.61 (2)	4.82 (6)
Asia (7c.)	1048	6.37 (17)	2.25 (6)	2.62 (7)
CEE (13c.)	1250	4.48 (14)	4.48 (14)	1.92 (6)
LSA (10c.)	1107	7.95 (22)	3.25 (9)	3.97 (11)
WE (17c.)	3187	5.40 (43)	2.38 (19)	0.75 (6)
WC (4c.)	795	6.04 (12)	1.01 (2)	0.00 (0)
CMD (13c.)	1703	9.63 (41)	2.58 (11)	3.05 (13)
NO.CMD (41c.)	6202	5.35 (83)	2.64 (41)	1.48 (23)

The table displays the yearly probability of facing one type of crisis and in brackets the number of corresponding crisis for the group considered: Developing, Emerging and Advanced Markets (D/E/A-M) – Africa and the Middel East (AME), Central and Eastern Europe (CEE), Latin and South America (LSA), Western Europe (WE) and countries (WC). CMD indicates commodity dependent countries.

main source of heterogeneity between the grountry groups stems from sovereign crises episodes.

Overall, advanced markets are less likely to encounter any type of crisis than emerging and developing markets (1.2/1.5 less likely for currency, 1.5/2 for banking, 3/6 for sovereign crises.). Developing markets face twice the increase of exposure to crises than emerging ones when compared to AM (+20.9/+51.3% more currency crises, +67.9/+104% for banking crises and +297/+631% for sovereign debt crisis).

Currency crises are frequent crises for all countries (2 to 3 times more than sovereign and banking crises). DM are the more exposed (8.4%), EM follow (6.7%), AM close (5.4%), country groups display different types of currency crises. On average, commodity exporters are 2 times more likely to experience a currency crises than non-commodity exporters.

here is little heterogeneity in exposure to banking crises. Central and Eastern European countries for a notable exception, with twice the exposure as other regions (Latin and South America excluded, 1.5 the others' exposure). Advanced markets displaying often longer time series they are over the sample, less likely to encounter one. Nevertheless AM banking crises are mostly recorded around the GFC. Other cases include inter alia

the Nordic crises beginning of the 90's.

Over the recent history, Sovereign Crises mark a pronounced difference between AM and EMDE (3/6 times bigger – 0.7<2.3<4.4%). Defaults have been a key characteristics of the recent history of emerging and developing markets. Serial defaulters (e.g. 3 events for Argentina and Turkey) boost the results in Africa and the Middle East and in Latin and South America, but default is a widespread disease. Defaults in advanced markets include those associated to the 2012 European crisis and past financing issues in the 70/80's.

These figures, if very informative, miss the fact that financial crisis episodes are often a combination of different sorts of crisis. It is therefore important to associate crises temporally with one another. To that end, I rely upon the MSM business cycle datations derived from the previous section.

3 A taxonomy of crises: *multiplicity* and '*currencity*'

By combining the databases on business cycle phases and financial crises, present section aims at answering following questions: When do financial crises occur? How are crises interrelated? What is the contribution of financial crises to economic volatility?

3.1 When business cycles meet financial crises: sequencing and multiplicity

To analyze crises, I structure my databse around business cycle phases related (or not) to one or more financial crises.

3.1.1 Pairing cycles and crises

I use an algorithm[69] to first associate financial crises with BC phases (MSM). The algorithm relies upon three rules to associate financial crises and recessions:

- **a simultaneity rule:** If a financial crisis starts **during** a recession, the two are paired.
- **a backward looking rule:** If a financial crisis hits the country in the year **before** the recession starts, they are paired. In practice, among the four quarters before a switch that are in expansion I consider only those in expansion, e.g. if the expansion has a short duration.

[69]This filter allows for no claims on causality

– **a forward looking rule:** If a financial crisis starts in the year **after** the end of a recession, they are paired. In practice, the backward looking dimension takes precedence. For example, if the ensuing expansion lasts for 6 quarters, there is two quarters expansion of the window of study.

A prior to the backward and forward dimensions of this algorithm – centered around recessions – is the duration of the expansions before and after the episode. I first develop a brief taxonomy of expansions depending on their length[70].

If the expansion lasts 4 quarters or less, I coin the episode *"a double dip expansion"*. All crises occurring in this expansion are associated to the recession that follows (backward looking rule). There is no use of the forward-looking rule on this expansion. If the expansion lasts 5 to 8 quarters, I coin the episode *"a transitive expansion"*. The last four quarters are, by backward looking dominance, associated to the recession that follows. The remaining 1 to 4 quarters are associated to the recession that precedes. If the expansion lasts more than 9 quarters, I separate them in 4 groups: *"short"* (9-16 quarters), *"average"* (17-32q.), *"long"* (33-64q.) and *"protracted"* (above 64q.) . The following and preceding recessions each encroach on the expansion's duration by 4 quarters.

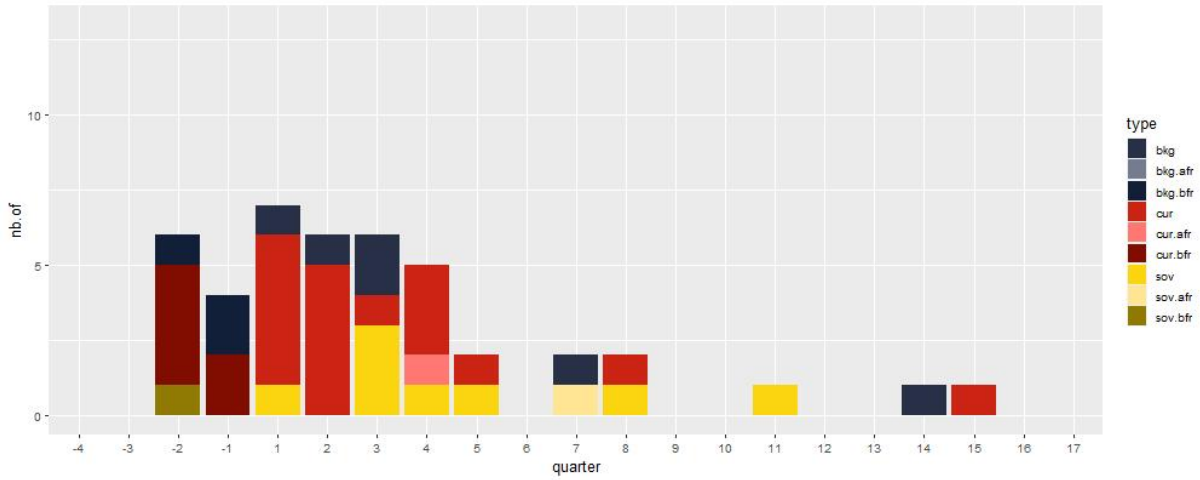
Because the filter is both forward and backward looking, double dips and transitive expansions might only be mild positive jolts offering temporary and illusionary relief in otherwise longer recessions. In that case, the recessions before and after should be related. Of particular interest in my case, if the recessions around a double dip expansion display financial crises, the episodes might well be more complicated than recorded. As robustness, I review and adjust the list of episodes to account for double dips (10 cases) and transitive expansions. For the latter, I focus on expansions during which a country fails to recover previously endured losses (5 out of 23 cases). In 4 out of 15 cases, I adapt the database and the classification of episodes. Annex N provides more detail on these cases.

3.1.2 When do financial crises occur?

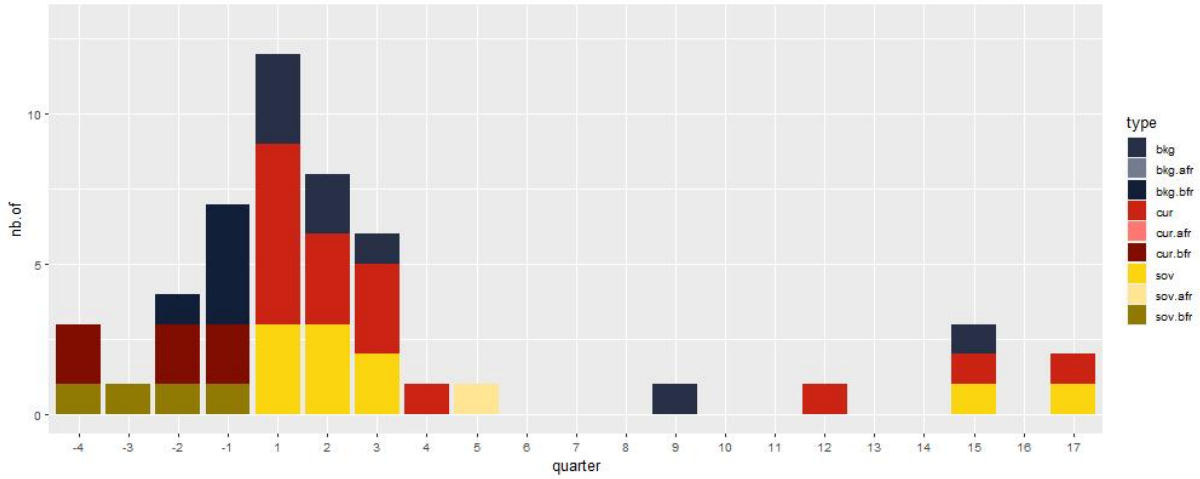
Having associated the 3 types of financial crises with recessions, I can extract information on two aspects of these episodes. First, Figure 4 locates financial crises with respect to the beginning of the recession they're associated with.

[70]When presenting the link between the taxonomy of expansion and the rules of the algorithme, I restrain from specifying how the algorithm takes into account the first and the last episodes of a country's history. Given sample limits, I apply in the same order the backward and forward rules. A caveat of my approach is the fact that all episodes at the beginning/end of the sample are shorter than in reality. A second caveat is the fact that I do not consider informations on crises occurring before the real gdp time series starts. Because I understate the number of crises, I believe my results to be underbiased.

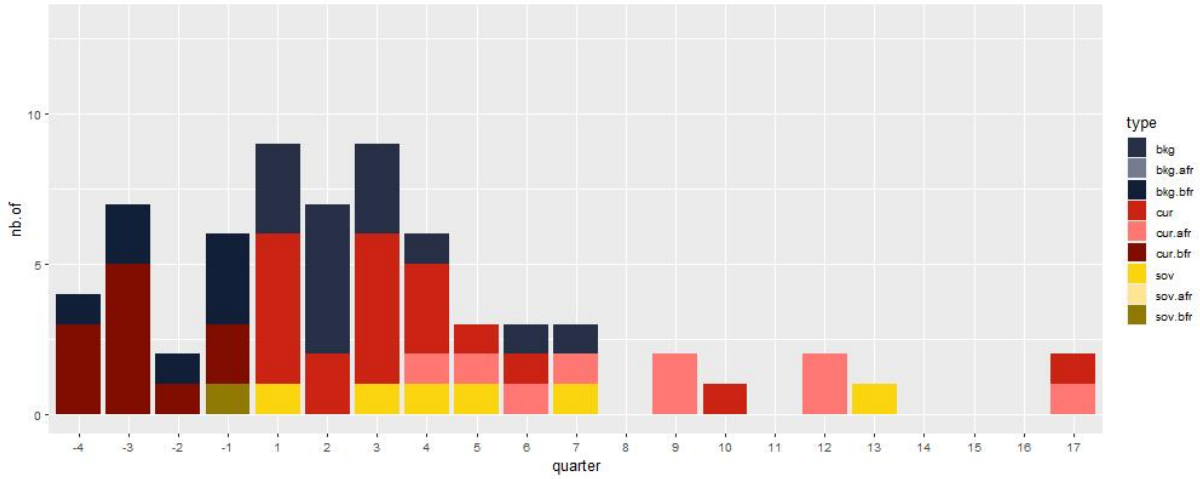
Figure 4: Location of Financial Crises (by type) around Recessions



(a) EM



(b) DM



(c) AM

Quarter 17 includes all crises occurring after 4 years in recession (ie. 16q).
Dark colors correspond to crises occurring before the switch.
Light colors to crises occurring after the end of a recession.

Overall, the wide majority of crises occur in the two years around the switch (-4:+4 quarters). For EM and AM, crises keep arising the second year into the recession at a much lower frequency. DM, and EM to a lower extent, face several cases of late bloomer crises for all types of financial event (sovereign/currency/banking crises occuring after 8 quarters at least). For AM only currency occur deep into/after the end of long recessions. The localization of each type of crises might echoe some of the theoretical considerations evoked at the beginning of this chapter regarding the sequencing of crises and growth shocks. For example, if a crisis occurs after 4 quarters of recession, the economy's growth fundamentals will have been weakened by a sequence of four low regime economic growth rates (eg output losses with respect to average growth).

Currency crises are usually distributed in the two years around the switch (-4:+4 quarters), even if there is some heterogeneity. In emerging markets, crises are usually contemporaneous to the switch (-2:+2 quarters). For developing economies 6 crises precede the switch and 13 occur in the year following it. For advanced markets, currency crises are roughly distributed in the two years around the switch. Nevertheless in advanced markets, there are an important share of currency crises occurring either after the first year of recession or in the first year following its end. For emerging and developing markets, all currency crises tend to occur during recession and in few cases after 2 years of negative shocks. Crises deep into recessions can illustrate the fact that countries fail to maintain a policy course over the expanded period of time, thus leading to a currency crises. Moreover, the high propensity for currency crises triggering around switches can partially illustrate self fulfilling phenomena. Because the latter entail speculative attacks, it is possible that the latter entail both real losses and a expectation realizing policy change triggering a crisis.

Banking Crises occur predominantly in the two years around the switch, but can also be found at various depth into a recession. In emerging and developing economies, except for 2 late blooming banking crises in each group, all events occur just before and after the switch (-2:+3 quarters). In advanced economies, there are twice as many banking crises as in other groups, occuring in the year up to a switch. The majority of banking crises can be found during the first year in recession, albeit two later crises in a second year of recession. This duality can illustrate (i) credit boom reversals in which the build-up of fragilities and losses in the banking sector suffocate the economy into the recession, (ii) bank runs following signs of economic enfeeblement or (iii) drastic losses endured by banks facing weakened growth/income fundamentals.

Sovereign debt crises are distributed differently across country groups. In advanced

markets, two crises surround the switch (before and on the same quarter), One crisis can be found deep into recession (>8quarters). The rest of the crisis occurs in the two years after a switch. In emerging markets, two cases are located around the switch for one case when the crisis predates by one quarter the switch and a coincident crisis. There is one case of late blooming crisis. Else sovereign crises occur after a country has always been three quarters in recession. In developing markets, there are several cases of sovereign crises preceding the switch. The majority occurs in the three quarters following the entry into recession. Developing markets display two cases of late blooming sovereign crises (15q++).

As crises rarely come alone, I now identify if financial crises are involved in single, double or triple crises episodes.

3.1.3 Multiplicity and exposure to crises

The classification simply follows from the number of financial crises that can be associated to the same economic crisis[71].

1. **Single crises:** When a sovereign or a currency or a banking crisis is associated to a recession
2. **Double crises:** When a recession is associated either to (i) sovereign & currency, (ii) banking & currency or (iii) sovereign & banking crises
3. **Triple crises:** When all types of events are associates to the same recession.

Table 6 presents the detailed information on crises episodes, which entails a better description of how financial crises, overall, related to the business cycle.
Two main observations can be made on crises episodes globally:

1. The majority of crises episodes entail one single financial crises. The less advanced the markets, the more frequent are multiple crises (16% of the cases in advanced markets against 41% in emerging and 51% in developing markets).
2. The wide majority of crises is associated to recessions whatever the income group (74/68/68% in E-/D-/A-M).

Using multiplicity to organize episodes, some specificities appear group-wise. On **single crises episodes**: on average, there is 1.3/1.2 single crisis episode for emerging/developing

[71]There can be several currency crises per episode, whereas this is never the case for sovereign and banking crises. Overall there are 6 episodes displaying 2 currency crises, and 1 has 3 crises. 3 recessions last longer than 10 quarters. 5 crises occur after the end of the recession. In 3 of these cases, a crisis also predates the initial entry in recession.

Table 6: Crises episodes – by multiplicity, country group and BC localisation

Type of Episode	**DM**, 15c. exp.	rec.	**tot.**	**EM**, 15c. exp.	rec.	**tot.**	**AM**, 24c. exp.	rec.	**tot.**
crs.epsds in total	11	28	**39**	9	25	**34**	22	51	**73**
Single	**11**	**10**	**21**	**8**	**12**	**20**	**22**	**40**	**62**
Single – cur	7	6	**13**	4	11	**15**	20	23	**43**
Single – bkg	2	1	**3**	4	1	**5**	1	12	**13**
Single – sov	2	3	**5**	0	0	**0**	1	1	**2**
Double	**0**	**10**	**10**	**1**	**8**	**9**	**0**	**10**	**10**
Double – cur.bkg	0	5	**5**	1	3	**4**	0	5	**5**
Double – cur.sov	0	5	**5**	0	5	**5**	0	2	**2**
Double – bkg.sov	0	0	**0**	0	0	**0**	0	3	**3**
Triple	0	8	**8**	0	5	**5**	0	1	**1**

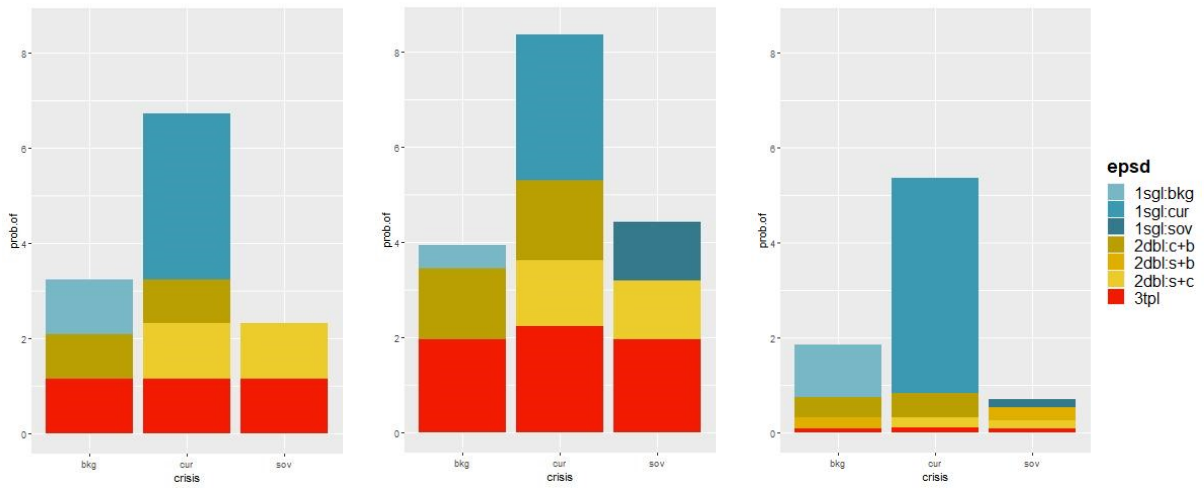
This table details the number of crises episodes by the number of financial crises that are associated to it. Episodes are counted: (a) by country group – emerging, developed and advanced markets ; (b) by regime – *exp* for expansions and *rec* for recessions ; (c) by multiplicity – single, double or triple financial crises episode

markets against 2.4 for advanced markets. This is not taking into account the wider time coverage of this group. For all country groups, currency crises dominate single crises episodes. This is particularly true for advanced markets. In emerging markets, sovereign crisis never occur alone. A fourth of single crises episodes are banking crises, hitting the countries mostly in expansion. These episodes are either not associated to significant economic losses (stagnation) or are beginning of sample cases. In developing markets, sovereign crises often occur alone. Both defaults in expansion for developing countries are due to political developments.

On **double and triple financial crises episodes**: multiple crises occur during recessions. This is true for all triple crises episodes and the wide majority of double crises episodes. They are only three occurrences of sovereign and banking double crises episode, they are associated to the struggle that ensued from the Global financial Crises and the European sovereign debt crises. On average there are 2.3/3.3 times more multiple crises episodes per country in emerging/developing markets versus advanced markets (13/15 and 19/15 versus 9/24 crises/country by group). Triple crises episodes are a key characteristic of emerging and developing markets. Note that the only occurrence of a triple crises episode for an advanced market is that of South Korea in 1998. Hence in nature, the crisis is very similar to several other triple crises episodes that occurred at the same time.

This classification provides another interesting set of stylized facts illustrated in figure 5: (1) The exposure to crises is highest for developing economies followed by emerging and, last, advanced markets. DM are 3% more exposed to currency crises than AM (EM are 1.1% more exposed relatively) and 2% more exposed to banking crises when compared to AM (EM are 1.3% more exposed) and (2) There is a clear difference when it comes to sovereign crises. Advanced markets face a very low exposure to sovereign crises (0.7%) which contrasts heavily with developing and emerging markets (4.4% and 2.1%).

Figure 5: Annual probability of a Financial Crisis, by type and episode



(a) EM **(b)** DM **(c)** AM

The figure decomposes the yearly probability of facing a given type of crisis – banking, currency and sovereign – by the multiplicity of the episode.

Comparing countries, crises and multiplicity yields following facts and country characteristics:

In **developing markets**, the majority of currency crises is associated with other financial crises: first with both sovereign and banking crises, second with banking crises only and third with sovereign crises only. Single currency crises remain a non negligible minority (the first one when all layers of the taxonomy are detailed). The vast majority of banking crises happen during multiple episodes, either with both sovereign and currency or just wthe latter face a non negligible share of single sovereign defaults. For developing markets, triple financial crises episodes appear as a consequent contribution for all types of crises. This confirms the view of multiple crises being a true stigmata of developing markets' recent history.

In **emerging markets**, a short majority of currency crises are single episodes. Nevertheless they often associate with ofther financial crises (one third of the cases with a banking, a sovereign or both crises). A short minority of banking crises are single episodes. Sovereign crises are always associated with either a currency crisis or both banking and currency crises (in roughly similar shares). Triple crises episodes are a salient marker of emerging markets recent history of crises.
Advanced markets provide the clearest picture of them all, with an almost completely blue sky of single crises episodes. Only in advanced markets are all layers of the taxonomy observable, even if in little quantities. Sovereign crises are very rare and, in the majority of cases, they are associated with at least another type of crises. Currency crises denote a clear distinction for the group when compared to emerging and developing markets. The exposure to single currency crises episodes is by far the largest in advanced markets. A potential reason behind this observation is the fact that there are fewer historical observations for emerging and developing markets.
Overall **multiplicity** is a resourceful taxonomy layer to explore heterogeneity across country groups.

3.2 The facts of financial crises and volatility

When describing business cycle phases in section 1, I relied upon three main attributes: duration ; severity/amplitude ; steepness/slope. For recessions I also discussed recoveries/rebounds. I now discuss how crises episodes fare along these characteristics. As a reminder, I identified that the principal driver of the difference in volatility was the severity of recession episodes. A key difference of emerging and developing markets was the more frequent occurrence, at all durations, of very costly episodes. Expansion on the other hand were little responsible for business cycle volatility.

3.2.1 Business cycle phases and financial crises

Overall the database contains 439 episodes: (e) 239 expansions – 54/55/130 in developing/emerging/advanced markets and (r) 200 recessions – 41/47/112 in D-/E-/A-M. Around a sixth of expansions are associated to financial crises (41 vs 198). 70% of financial crises are associated to recessions, which confirms expectations and previous observations. On the other hand, one in two recession in the sample is associated to a financial crisis. The less advanced the market the higher the exposure to crises episodes: 63/53/42% of the cases in D/E/A-M (26/41 ; 25/47 ; 47/112). As expansions provide little information on business cycle volatility, I concentrate my analysis on recessions. Annex N provides

detailed information on expansions with/without financial crisis.

Table 7 presents the main characteristics of recessions conditional on being associated or not with at least a financial crisis: duration, amplitude, slope and rebound[72].

Table 7: Recessions and financial crises – by country group

	Recessions ∩ No crisis				Recessions ∩ Crisis episode			
	Duration	Severity	Steepness	Rebound	Duration	Severity	Steepness	Rebound
All Countries								
avg	5.22	-3.93	-0.97	1.09	7.13	-6.94	-1.50	0.99
std	4.71	1.27	5.82	0.69	6.21	6.37	1.77	0.62
nb	102	102	102	97	98	98	98	96
Developing Markets (15c.)								
avg	3.13	-5.69	-1.93	1.27	7.23	-9.85	-2.55	1.04
std	1.25	6.81	2.14	0.96	6.86	7.70	2.76	0.64
med	3.00	-3.49	-0.87	1.14	5.00	-10.18	-1.64	1.00
nb	15	15	15	14	26	26	26	25
Emerging Markets (15c.)								
avg	7.55	-7.70	-1.26	1.10	6.00	-6.85	-1.56	0.95
std	5.82	8.84	1.34	0.78	5.02	6.39	1.48	0.62
med	6.00	-4.20	-0.58	1.05	5.00	-5.49	-1.01	0.97
nb	22	22	22	19	25	25	25	24
Advanced Markets (24c.)								
avg	4.91	-2.24	-0.66	1.05	7.68	-5.39	-0.88	0.98
std	4.54	3.02	0.78	0.60	6.45	4.99	0.57	0.62
med	3.00	-1.49	-0.36	0.89	5.00	-4.17	-0.64	0.99
nb	65	65	65	64	47	47	47	47

The table presents, for emerging developing and advanced markets, information on the distributions – *av*era*g*e, *st*andard *d*eviation, *max*imum, 3rd *q*uar*t*ile, *med*ian, 1st *q*uar*t*ile, *min*imum and the number of episodes *nb* – of four characteristics from the taxonomy of recessions.
Duration measures the number of quarters in an episode, **severity** the real gdp cumulated losses over the expansion and **steepness** the loss per quarter and **rebound** the ratio of growth in the year after the recession relative to average growth in expansion.

Overall financial crises episodes represent one in two recessions. On average, these economic crises are 2*** quarters longer and 1.8*** times costlier (7.1 quarters and -6.9% losses versus 5.2 quarters and -3.93% losses). When associated to at least one financial crisis, each quarter in recession is 55%*** costlier (-1.50 vs -0.97% per quarter)[73]. More-

[72]I also discuss how countries bounce back after recession, is the rebound is strong after a financial crisis, then one might assume that the financial crisis alleviated some pressures that were slowing down the economy. On the contrary, if after a financial crisis, the economy fails to recover as quickly as usually, it can be a sign that the financial crisis has triggered more structural changes or that the resolution of the initial weaknesses takes more time to correct.

[73]The averages are different at the 1% level, using a one sided Wilcoxon test. Pvalues: 1.6e-3 for duration, 2.6e-7 for severity and 1.1e-3 for steepness.

over, the rebound is slightly stronger on average without a financial crisis, this difference is however not significant[74] and none of the values for rebound are statistically different from 1[75].

In **developing markets**, financial crises represent almost two-thirds of recessions (63% of 41 episodes). When at least one financial crisis hits a developing economy, the associated recession is 1*** year longer (7.2 vs 3.1 quarters). On average the recession is associated to 1.7** times bigger cumulated losses (-9.9 vs -5.7%). On average this means a 32% steeper fall[76]. After a recession, growth is faster than during expansions, both with and without a financial crisis. The diversity of experiences nevertheless prevents from making any claim on statistical significance.

In **emerging markets**, recessions associated with financial crises make for a short majority (53%) of the 47 episodes at hand. Interestingly, for emerging markets, recessions cannot be told apart looking only at the occurrence of financial crises[77]. On average, complications on financial markets do not necessarily entail wider losses. Rebound is slightly smaller after a financial crisis (5%) and stronger without (10%), but none of these figures are statistically different from one and each other.

In **advanced markets**, recessions associated to financial crises are a minority of cases (42% of 112 episodes). These episodes are 2 to 3 quarters longer (56%*** longer) and are 2.4*** times more severe. On average, recessions with financial crises are 1/3** times steeper than without[78]. On average there is little rebound effect in advanced markets, once the recession ends, business goes back to normal.

Stylized facts

Crises episodes are frequent episodes worldwide. Exposure to financial crises decreases by 10% as markets develop.

Without financial crises, recessions entail 3.4***/2.5** times bigger losses in emerging/developing markets when compared (-7.7/-5.7% vs -2.2%). Recessions are longer** in emerging markets than in advanced markets (7.6 vs 4.9 quarters). In turn recessions are shorter*** in developing markets (3.1 quarters) than in advanced

[74] One-sided Wilcoxon test, p.value = 0.45

[75] One-sided Wilcoxon test, pvalues = 0.48 for recessions with crises and = 0.44 without.

[76] The differences are statistically significant at the 1% level for duration (t.test, p.value = 3.1e-3) and at the 5% level for severity (t.test, p.value = 4.1e-2). The difference is not statistically signigicant for steepness (p.value = 0.21).

[77] No p.value below 0.42, 0.20, 0.58 for severity, steepness and rebound.

[78] All these differences are statistically significant when using a one-sided test: at the 1% level for duration (p.val = 6.7e-3) and severity (p.val = 1.3e-4), at the 5% level for steepness (p.val = 4.0e-2).

markets. The recessions are 2**/3*** times steeper in emerging/developing markets when compared to advanced markets[a].

With financial crises, recessions entail 1.8***/1.4* times bigger losses in developing versus advanced/emerging markets markets (-9.9 vs -5.4/-6.9%). On average recessions associated to a financial crisis last one year and a half (6 to 7.7 quarters). Recessions are 1.8**/2.9*** times steeper in emerging/developing markets when compared to advanced economies[b].

Emerging Markets display very similar recessions with or without a financial crisis. This suggests that, for these countries, the economic and financial system might already have trouble attenuating macroeconomic fluctuations, e.g. lacking good macro-stabilizers. Structural weaknesses and frictions might exacerbate any shock greatly irrespective of financial complications.

In developing and advanced markets, a financial crisis markedly increases the duration of a recession, her steepness and severity[c]

[a]P.values, in the same order: 4.7e-3 ; 3.7e-3 ; 3.1e-2 ; 3.9e-3 ; 2.9e-2 ; 2.0e-2. Rebound does not highlight statistical differences.

[b]P.values, in the same order: 5.8e-3 ; 6.8e-2 ; 1.8e-2 ; 2.7e-3. Rebound does not highlight statistical differences. Duration is not statistically across groups.

[c]Only statistically significant results are highlighted. The strength of rebound falls if the country experienced a financial crisis. None of the comparisons yield significant results.

I now explore how financial crises contribute to business cycle volatility.

3.2.2 Contributions to volatility

Table 8 presents variance decomposition results by splitting episodes between regime and association to financial crises.

As previously observed, expansions represent a minor share of aggregate variance[79] – 6.3/5.5/3.9% in emerging/developing/advanced markets.

Simple economic crises represent a non-negligible contributor to aggregate volatility around 13.7%. In emerging/developing markets the contribution is 2.2 points higher/lower. When recessions are associated to financial crises, quite as expected, there is wider heterogeneity across countries. In advanced markets, financial crises episodes do not contribute more to aggregate volatility than simple economic crises (13.2 vs 13.7%). In emerging markets, financial crises generate 23.5% of aggregate volatility (+7.6 points). These episodes

[79]As a reminder, this is mechanic when considering the assymetry of the business cycle. Because expansions are long events they tend to drive the average growth more than do recessions. Hence, in expansion, deviations from the average are smaller.

Table 8: Variance decomposition of output growth emerging/developing markets based on expansions/recessions with/without financial crises

Group	vlt.gwth	σ_g^2	σ_{E+NC}^2	σ_{E+FC}^2	σ_{R+NC}^2	σ_{R+FC}^2	σ_{rsdl}^2
DM	1.80	3.24	0.17	0.00	0.37	0.93	1.76
(%)		(100)	5.3	0.2	11.4	28.8	54.4
EM	1.34	1.80	0.08	0.03	0.29	0.42	0.98
(%)		(100)	4.5	1.7	15.9	23.5	54.5
AM	1.05	1.10	0.04	0.00	0.15	0.14	0.76
(%)		(100)	3.7	0.2	13.7	13.2	69.2
Relative to AM			Relative contribution to σ_g^2 vs AM				
EM/AM	1.28	1.63	1.21	8.42	1.16	1.78	0.79
DM/AM	1.72	2.94	1.44	0.78	0.83	2.18	0.79

Variance decomposition for 15 **emerging**, 15 **developing** and 24 **advanced** markets.
vlt.gwth denotes growth volatility measured as the standard deviation of growth rates. σ_g^2 denotes the second moment/variance of the growth rates time series. σ_x^2 denotes the variance due to deviations from average growth in regime x. σ_{rsdl}^2 denotes the variance unexplained by the Markovian process.
Regimes considered are expansions/recessions without/with financial crises.

The bottom part of the table gives, for each element of the decomposition, the ratio of emerging|developing characteristics relative to advanced markets.

are the first contributor to business cycle volatility. In developing markets, the picture is even more striking, as financial crises are associated to 2.5 times more volatility (+17.4 points to 28.8%). They are by far the drivers of business cycle volatility.

Whereas the contribution of simple recession is quite similar across countries (+16/-17% in EM/DM vis a vis AM), **financial crises contribute 1.78/2.18 times more to aggregate volatility in emerging/developing markets when compared to their advanced counterparts**.

Table 9 details how each type of phase (exp/rec , without/with crises) contributes to business-cycle volatility (i.e. without unexplained variance).

Table 9: Contributions to business cycle volatility: crises - no crises

Relative to AM			Relative contribution to $\sigma_b c^2$ (in %)			
Group	bc.vlt	$\sigma_b^2 c$	$exp. + no.crs$	$exp. + crs$	$rec. + no.crs$	$rec + crs$
DM	1.21	1.47	11.5	0.3	28.1	63.1
EM	0.91	0.82	9.8	3.7	35.4	51.2
AM	0.58	0.33	12.0	0.2	45.2	42.2

Overall, business volatility is 1.6/2.1 times higher in emerging/developing markets than in advanced ones. Expansions contribute to 1/8th of business cycle volatility. As markets develop, the contribution of financial crises falls: from 63.1 to 51.2 to 42.2% in developing/emerging/advanced markets. Mechanically the contribution of simple economic crises increase. Comparing the contributions of frequency and intensity to each regime volatility, what matters with crises is the magnitude of the fluctuations. It is always 2/4 times more intense in emerging/developing markets relative to advanced markets. Crises episodes are also 40% more frequent in emerging and developing markets. Hence the component of business cycle volatility which is associated to crises episodes is 3/6 times bigger in emerging/developing markets relative to advanced ones.

That financial crises matter for business cycle volatility is no surprise. I now study how crises characteristics can help shed light on key country differences.

3.3 The role of currency and multiple crises

In present sub-section I focus on two main aspects:

Currencity describes whether a country experiences troubled forex markets or not.

Currency crises are the most frequent crisis encountered. Often they combine with other financial crises. I separate recessions into three groups: no currency issues, only a currency crisis and both a currency crisis and at least another type.

Multiplicity translates the number of different stressed financial markets in an episode.

Multiple crises are a salient illustration of the differences between country groups. Advanced markets are in a minority of cases (12.6%) confronted to double or triple financial crises episodes. In emerging/developing markets, 47/46% of crises episodes is multiple. Of particular interest, among these crises, emerging display 35.7% of triple crises episodes ; developing markets 42.1%, figures **3 times bigger** than for advanced markets (triple crises episodes represent 12.5% of multiple crises)

3.3.1 Recessions, currencity and multiplicity

Currencity:

Table 11 presents the key characteristics of crises episode by country group based on *currencity*. This element from the taxonomy characterizes whether episodes are or not associated to a currency crisis (1st/2nd columns). I also differentiate the cases for which other financial crises also signal (3rd column). The table concentrates on recessions[80].

[80]For expansions, see annex N

In **developing markets**, recessions without currency crises are short episodes (3.1 quarters on average), that entail important and steep losses (-6.3% aggregated, -2.2% per quarter). On average, the recessions are followed by a 22% stronger recovery. There are few cases of recessions with only a currency crisis. When the case, the recession is 4 times longer and half as severe, but the differences are not statistically signigicant (p.val = 0.13 ; 0.27). When other financial crises supplement currency crises, compared to recessions without currency crises, the episodes are on average 2.3*** times longer (7.1 quarters), 1.9** times more severe (-11.7% cumulated losses). These episodes are numerous and as frequent as episodes without currency crises. They are not significantly steeper. On average, the rebound effect that was present is cancelled and countries do not benefit from stronger growth in the aftermath of recessions[81].

In **emerging markets**, recessions not associated to currency troubles are steep, long and severe episodes – on average, 7.4 quarters, -7.8% of real cumulated losses and -1.33% per quarter. These recessions are not followed by stronger growth than during expansions. This is in line with previous observations as this category of recession includes recessions without financial crises or with only banking/sovereign crises, both costly for this group. When only a currency crisis hits the economy the recession is 42%** shorter and 46%** less severe. When the currency crisis combines with other financial crises, the duration and losses fall in the same range as without currency crises. In the multiple cases, the average episode is steeper and followed by slower growth than usually in expansion but these differences are not significant[82].

For **advanced markets**, recessions without currency crises or with only a currency crisis are very much alike. They last on average 5.8 quarters, entail -3.3% cumulated losses at a -0.73% per quarter mean slope. They are not followed by sluggish growth. Moreover these episodes represent the bulk of recessions (out of 112: 81 without, 23 with one currency crisis). When other financial crises trigger, recessions are 2*** times more severe (-6.2% cumulated losses). If these episodes 1.5 times longer on average (8.5 quarters), given the fewer observations, this difference is not significant.

[81] p.values (in order): 3.0e-3 ; 1.1e-2

[82] p.values (in order): 2.0e-2 ; 4.4e-2 ;

Table 10: Recessions by country groups through the taxonomy: *currencity*

	taxonomy – *currency trigger*		
epsd.	no.currency	currency.only	currency&co
Developing Markets (15c.)			
durt	3.11 (1.15)	12.25 (13.23)	7.06 (5.3)
svrt	-6.28 (6.98)	-3.01 (9.37)	-11.68 (6.68)
stpn	-2.23 (2.4)	-1.07 (1.61)	-2.7 (2.85)
rbnd	1.22 (0.86)	1.13 (0.69)	1.03 (0.7)
nb	19 (18)	4 (3)	18 (18)
Emerging Markets (15c.)			
durt	7.35 (5.77)	4.27 (2.65)	7.69 (6.16)
svrt	-7.75 (8.64)	-4.22 (2.83)	-8.91 (7.98)
stpn	-1.33 (1.36)	-1.23 (1)	-1.73 (1.8)
rbnd	1.03 (0.83)	1.16 (0.61)	0.87 (0.52)
nb	23 (20)	11 (11)	13 (12)
Advanced Markets (24c.)			
durt	5.93 (5.77)	5.74 (4.69)	8.5 (5.83)
svrt	-3.42 (4.6)	-3.16 (2.13)	-6.2 (4.59)
stpn	-0.74 (0.75)	-0.72 (0.53)	-1.02 (0.64)
rbnd	1.02 (0.6)	1.04 (0.67)	0.94 (0.53)
nb	81 (80)	23 (23)	8 (8)

The table presents, for **emerging**, **developing** and **advanced** markets, the *av*erag*e* and *st*andard *d*eviation for four elements from the taxonomy on economic crises:
Duration measures the number of quarters in an episode, **severity** the real gdp cumulated losses over the expansion and **steepness** the loss per quarter and **rebound** the strength of growth in the year after the recession when compared to average growth in expansion.
Episodes are classified based on the exposure of the recession to currency crises: (0) there are no currency crisis in the episode, (1) there is(are) only currency crisis(es) in the episode, (2) the recession is associated with a currency crisis and at least another financial crisis.

Overall, through the lens of currency crises, some key patterns emerge:

Results: crises and currencity

In emerging and developing markets, recessions without currency crises are costly. When only a currency crisis triggers this is not sufficient to entail significantly higher losses.

For these – and especially developing – countries, in the majority of the cases currency crises associate with other financial crises and long and severe economic crises.

For advanced markets, currency crises only do not affect the nature of recessions which remain, on average, short and half as costly (as in emerging/developing mar-

kets). In few cases, currency crises combine with other financial crises and entail twice as important cumulated losses.

MULTIPLICITY:

Table 11 presents the key characteristics of crises episode by country group based on multiplicity, defined by episode as an index between 1 and 4. 1 means that the episode is 'only' an economic crisis, a recession. 2 means that the economic crisis is associated with only one other financial crisis – sovereign, currency or banking. 3 means there are two distinct financial crises and 4 means that all indicators flashed red.

'Simple' economic crises are longest in emerging markets (7.6 quarters), followed by advanced markets (4.9 q.) and developing markets (3.1 q.). They are the most severe in emerging and developing markets (-7.7 and -5.7% cumulated losses) whereas for advanced markets, recessions are by themselves little costly (-2.2%). The less advanced the market, the steeper the fall experienced in recession (-1.9/-1.3/-0.7% per quarter in D-/E-/A-M). Nevertheless, developing markets tend to grow 27% faster after a recession than on average during expansion. For emerging and advanced markets, this feature is, by far, less salient (+10/5%).

These episodes represent a short minority of recessions for emerging markets (47%). Developing markets experience less simple economic crises (37%); advanced markets far more (58%). Beyond simple crises, it is interesting to observe that, as market develop, the more crises involved, the less likely they are to occur. The pattern is striking when looking at the share of single/double/triple financial crises among multiple episodes by country groups: 31/38/31% for developing markets, 48/32/20% for emerging markets and 77/21/2% for advanced markets.

I now detail the characteristics of the economic crises associated to financial crises by country groups. I am particularly interested in two things: (i) whether financial crises amplify losses and duration when compared to 'simple' recessions and (ii) whether multiplicity is positively correlated to duration/severity/steepness and negatively to rebound or not.

The naive prior I formulate when making these assumption is the following: because financial crises signal a worsening of a market to the point when drastic policy changes are needed, if more markets are dysfunctional, it is more likely the combined issues take longer to resolve. If more markets are hampered in their functioning, the number of

Table 11: Recessions by country groups through the taxonomy: multiplicity

	taxonomy – multiplicity			
epsd.	1	2	3	4
Developing Markets (15c.)				
durt	3.13 (1.25)	7.62 (9.98)	7.9 (6.08)	6 (4.28)
svrt	-5.69 (6.81)	-5.74 (8.67)	-10.48 (7.89)	-13.18 (4.87)
stpn	-1.93 (2.14)	-2.21 (2.7)	-1.94 (2)	-3.64 (3.58)
rbnd	1.27 (0.96)	1.07 (0.48)	0.91 (0.83)	1.18 (0.51)
nb	15 (14)	8 (7)	10 (10)	8 (8)
Emerging Markets (15c.)				
durt	7.55 (5.82)	4.17 (2.55)	5.62 (2.88)	11 (8.77)
svrt	-7.7 (8.84)	-4.61 (3.02)	-5.36 (5.33)	-14.6 (8.69)
stpn	-1.26 (1.34)	-1.38 (1.08)	-1.44 (1.89)	-2.2 (1.74)
rbnd	1.1 (0.78)	1.03 (0.73)	0.98 (0.45)	0.72 (0.62)
nb	22 (19)	12 (12)	8 (7)	5 (5)
Advanced Markets (24c.)				
durt	4.91 (4.54)	6.94 (6.35)	10.7 (6.46)	4 (NA)
svrt	-2.24 (3.02)	-4.24 (2.71)	-9.29 (8.7)	-7.54 (NA)
stpn	-0.66 (0.78)	-0.82 (0.55)	-1.02 (0.6)	-1.89 (NA)
rbnd	1.05 (0.6)	1.06 (0.6)	0.64 (0.59)	1.54 (NA)
nb	65 (64)	36 (36)	10 (10)	1 (1)

The table presents, for **emerging**, **developing** and **advanced** markets, the *av*erag*e* and *st*andard *d*eviation for four elements from the taxonomy on economic crises:
Duration measures the number of quarters in an episode, **severity** the real gdp cumulated losses over the expansion and **steepness** the loss per quarter and **rebound** the strength of growth in the year after the recession when compared to average growth in expansion.
Episodes are classified based on the multiplicity of the recession: (1) it is a 'simple' economic recessions, (2) the recession is associated to either a sovereign, a currency or a banking crisis, (3) the recession is associated with two different financial crises and (4) the recession is associated with all types of financial crises.

market participants constrained increases. These constraints can easily diffuse and amplify across agents in the economic and financial system. Multiple crises entail a broader coverage of agents, I expect them to entail larger losses, and steeper falls as negative feedbacks often reinforce. Moreover if multiple crises signal, it is more likely for the system's fundamentals to be damaged and for growth to struggle kickstarting again once the recession has ended (rebound < 1). An opposite view in defense of strong rebound after multiple crises episodes follows from the idea that if the drastic policy changes are large and efficient enough, they can address structural vulnerabilities or inconsistencies. The resolution of these issues transforms existing pressures into a renewed source of growth dynamics (rebound > 1).

In **emerging markets** single crises recessions are 45%** shorter than simple recessions. Double crises recessions display 1 quarter longer recessions on average (5.6 vs 4.2 quarters). Triple crises episodes are 2.6* times longer than single ones (11 quarters)[83]. Multiple crises (3+4) are not statistically shorter/longer than simple recessions (p.values = 0.12 ; 0.22). Single crises episodes are also 40%* less costly than simple recessions. As crises multiply, losses cumulate: triple crises episodes are 3.2** times costlier than single episodes[84]. Double crises episodes are costlier and longer than single crises but not statistically so. Finally I identify that steepness/rebound is positively/negatively correlated with multiplicity. As emerging markets experience more multiple crises, they endure steeper falls and fail to bounce back. On average, for triple financial crises, recessions are followed by sluggish growth. After simple recessions, the strong rebound fails to signal as statistically higher than 1 (with a p.value of 15.77%).

For **developing markets**, all multiple crises entail long recessions between 6 and 8 quarters, statistically longer than simple recessions[85]. Severity is positively correlated with multiplicity. If single crises episodes entail similar losses than simple recessions, triple/double crises multiply the cumulated losses by 2.3**/1.8[86]. Moreover multiple crises episodes make for the first group of recessions in developing markets (18 episodes for double+triple crises against 8 single episodes and 15 simple). Finally recessions display similar average steepness across simple, single and double crises. Triple crises are almost 2 times steeper than the others. Nevertheless the differences are not significant (p.values for triple vs simple/single/double: 0.122 ; 0.192 ; 0.128). When financial crises accumulate up to double episodes, the strength of the (19% slower growth in recovery after a double crisis than in expansion). Yet, for triple crises episodes, on average, the recession is followed by a strong rebound.

For **advanced markets**, as discussed, there is only one triple crises episode for advanced markets (South Korea). The episode displays a short and steep recession (1 year) with large losses. The recession is followed by a very strong rebound. I focus the remaning of my analysis on the other layers of the taxonomy. Recessions' duration, severity and steepness are positively correlated with multiplicity. The average duration increases by 2 quarters as a recession associates to 1 crisis and by an additional 4 quarters if a second

[83] p.values (in order): 1.3e-2 ; 7.9e-2
[84] p.values (in order): 7.4e-2 ; 3.0e-2
[85] p.values for simple vs single/double/triple duration 0.122/1.8e-2/5.1e-2
[86] p.values = 2.9e-2 ; 0.125

crisis hits the country[87]. Severity is multiplied by 1.9*** is a single crisis hits the country, and again by 2.2** if a second crisis triggers[88]. Overall, this translates into the fact that every single time a crisis hits the country, the recessions is 1.24 times steeper[89]. Finally, it is interesting to note that if simple and single crises are followed by a year of recovery in line with the average growth in expansion (5/6% faster), when the recession is associated to two financial crises, the recovery is sluggish and 40%** slowlier than usually the case[90].

Overall, looking at crises episodes through multiplicity provides key insights:

Results

Simple economic crises are very different across country groups and become more frequent as markets develop.

In emerging markets they are long and costly: 2 years and -7.0% real losses. In developing markets they tend to be transitive and costly: 3 quarters and -5.6% real losses. In developed markets, they are short and mil: 5 quarters and -2.2% real losses. The more developed the market, the higher the frequency of simple crises (37/47/58%). The more developed the market, the lower the exposure to multiple crises: double and triple crises represent 23.4 / 52.0 / 69.2% of the episodes with financial crises for advanced/emerging/developing markets.

Multiplicity is broadly positively related to duration, severity and steepness and negatively related to rebound. There are insightful differences across groups.

In **developing markets**, single crises episode are two times longer as simple crises but they entail similar losses. Double and triple crises entail both two times longer recessions and two times bigger losses. The severity of double crises is driven by the longer duration of these episodes (2 years for -10.5% cumulated losses on average) whereas for triple crises the steepness of the fall appears as a key driver (-3.6% per quarter, 6 quarters, 13.2% on average). Triple crises are followed by higher than average recoveries.

In **emerging markets**, single crises episodes – 11 currency crises, 1 banking crisis

[87]Double crises are statistically longer than simple/single episodes at the 1/10% level (p.values = 1.0e-2 ; 6.2e-2). Single crises are longer than simple episodes at the 5% level (p.value = 4.8e-2).

[88]Simple vs single/double amplitude p.values = 5.2e-4 ; 1.5e-2. Single vs double crises amplitudes, p.value = 5.1e-2

[89]The difference is significant between simple and double recessions (p.value = 5.7e-2), but not between single and double (p.value = 0.181) nor between simple and single episodes (p.value = 0.115)

[90]p.values double vs simple/single rebound = 3.3e-2/3.4e-2.

– are associated to short and less severe recessions. Double crises are as costly and long as simple recessions. Triple crises entail 2.6 times longer and 3.2 times costlier recessions when compared to single episodes: close to 3 years and - 14.6% real losses on average.

In **advanced markets**, single crises – 23 currency, 1 sovereign and 12 banking crises – are associated to 40% longer and 2 times costlier recessions. Double crises entail 2.2 times longer and 4 times costlier recessions: 2 years and a half and -9.3% real losses on average. Multiple crises remain rare events. These recessions are followed by 40% slower recoveries, below the average growth rate in expansion.

3.3.2 Contributions to volatility

I focus on two main layers of the taxonomy, namely *currencity* and **multiplicity**. Table 12 presents the variance decomposition depending on whether regimes are exposed or not to a currency crises, and whether currency crises act alone. Overall, recessions without currency crises are a major contributor to business cycle volatility almost 40% in emerging and developing markets against 62% in advanced markets. Single currency crisis episodes represent 17% of business cycle volatility for emerging and advanced markets. Given their low occurrence in developing markets, their contribution is 5 times lower.

When currency crises combine with other crises, business cycle volatility is affected in varying ways. For advanced markets, the contribution is half that of single currency crisis episodes(8.5%). This is in part driven by a relatively lower share of currency-multiple crises in advanced markets. In emerging and developing markets, the figure is 3.5/5.5 times bigger (10.7/47.1% respectively). Crises including at least a currency crisis are the first contributors to developing markets' volatility and the second for emerging markets. Overall, currency crises are associated to 50.9/48.8/26.2% of developing/emerging/advanced markets' business cycle volatility. Currency market vulnerabilities are a key determinant of differences in volatility worldwide.

I now procede to analyzing how **multiplicity** helps understanding differences in volatility. Table 13 presents the variance decomposition based upon multiplicity (focusing only on components related to business cycle volatility). Table 14 presents the contribution of frequency and intensity by type of episode. Overall, multiplicity affects country groups decomposition very differently. Opposing simple/single crises to double/triple episodes, the latter represent 48.8/31.2/12.9% of aggregate BC volatility in developing/emerging/advanced markets. In developing markets, the major contributor to business cycle volatility

Table 12: Variance decomposition of output growth based on *currencity*

Group	bc.vlt	σ^2_{bc}	$\sigma^2_{E\cap NoCur}$	$\sigma^2_{e\cap Cur}$	$\sigma^2_{R\cap NoCur}$	$\sigma^2_{R\cap 1Cur}$	$\sigma^2_{R\cap +Cur}$
DM	1.22	1.49	0.16	0.01	0.57	0.05	0.70
(%)		(100)	11.0	0.4	38.1	3.4	47.1
EM	0.91	0.82	0.10	0.01	0.32	0.14	0.25
(%)		(100)	12.2	1.1	39.0	17.0	30.7
AM	0.58	0.34	0.04	0.00	0.21	0.06	0.03
(%)		(100)	12.0	0.6	61.8	17.1	8.5
Relative to AM			Relative contribution to σ^2_{bc} vs AM				
DM/AM	2.10	4.38	0.92	0.71	0.92	0.20	5.5
EM/AM	1.57	2.41	1.01	1.89	0.63	0.99	3.6

Business cycle volatility σ^2_{bc} is decomposed as the sum of five components reflecting characteristics from a given regime (0) expansion & no currency crisis $\sigma^2_{E\cap NoCur}$; (1) expansion & no currency crisis $\sigma^2_{E\cap Cur}$; (2) recession & no currency crisis $\sigma^2_{R\cap NoCur}$; (3) recession & only currency crisis $\sigma^2_{E\cap 1Cur}$; (4) recession & currency crisis & others $\sigma^2_{E\cap +Cur}$.
For each country group, the first line gives the values of the different components and the second line give the share of bc volatility each episode type identifies. The darker the color, the more frequent the event: less than 5%, 15%, 25% and above 25
The bottom part of the graph gives the relative (EM or DM vs AM) contributions to bc volatility (columns 4:8). Columns 2/3 give the relative volatility/variance.

is triple crises episodes (32%), simple recessions follow (25%) and double/single episodes are not far behind (17/16%). In emerging and advanced markets, as multiplicity increases, the contribution to volatility falls. Emerging markets display a marked higher contribution of triple crises episodes.

In a nutshell, as markets develop, the contribution of multiple crises falls importantly (divided by 2 between DM and EM and by 10 between EM and AM). Mechanically, the contribution of single crises episodes and simple economic crises increase. The trend is most striking for simple recessions, which are the first contributor to business cycle volatility in advanced markets.

Simple recessions highlight differences in contributions between DM/EM/AM because they are more frequent and less intense in advanced markets. As markets develop, simple economic crises represent a greater share of economic volatlity: from 24.6% for developing markets to 34.6 and 44.5% in emerging and advanced markets. Deviations associated to pure economic recession entail 2.2/4.3 times more intense fluctuations in emerging/developing markets when opposed to advanced markets. Nevertheless, these events are 12/42% less likely to occur for the former groups. For single financial crises episodes, we observe a similar pattern across groups in lower magnitude: as markets develop, single crises represent a higher share of volatility (15.7, 21.1 and 30.4%). Interestingly differences in the

Table 13: Variance decomposition of output growth based on multiplicity

Group	bc.vlt	σ^2_{bc}	σ^2_E	$\sigma^2_{R\cap NoCrs}$	$\sigma^2_{R\cap 1Crs}$	$\sigma^2_{R\cap 2Crs}$	$\sigma^2_{R\cap 3Crs}$
DM	1.23	1.51	0.16	0.37	0.24	0.25	0.49
(%)		(100)	10.9	24.6	15.7	16.5	32.3
EM	0.91	0.82	0.11	0.29	0.17	0.12	0.13
(%)		(100)	13.2	34.6	21.1	14.8	16.4
AM	0.59	0.35	0.04	0.15	0.10	0.04	0.01
(%)		(100)	12.1	44.5	30.4	10.6	2.3
Relative to AM			Relative contribution to σ^2_g vs AM				
DM/AM	2.07	4.31	0.90	0.55	0.52	1.40	14.0
EM/AM	1.53	2.34	1.09	0.78	0.69	1.56	7.13

Business cycle volatility σ^2_{bc} is decomposed as the sum of five components reflecting characteristics from a given regime (0) no crisis σ^2_E ; (1) 'simple' economic crisis $\sigma^2_{R\cap NoCrs}$; (2) economic and one financial crisis $\sigma^2_{R\cap 1Crs}$; (3) economic and two financial crises $\sigma^2_{R\cap 2Crs}$; (4) economic and three financial crises $\sigma^2_{R\cap 3Crs}$.
For each country group, the first line gives the values of the different components and the second line give the share of bc volatility each episode type identifies. The darker the color, the more frequent the event: less than 5%, 15%, 25% and above 25
The bottom part of the graph gives the relative (EM or DM vs AM) contributions to bc volatility (columns 4:8). Columns 2/3 give the relative volatility/variance.

contribution of single crises to volatility between emerging and advanced markets stems mostly from the 2 times more intense fluctuations. In developing markets, fluctuations are 4 times more intense than in advanced counterparts but the episodes are twice as rare.

Double crises marks the shift between, on one hand, developing markets and, in the other, emerging and advanced markets. For the latter, as multiplicity keeps intensifying the contribution of double episodes keeps falling (14.8 and 10.6%). In developing markets, double crises episodes contribute roughly the same amount (16.5%) to volatility. For emerging/developing markets double crises are 2.1/2.5 times more frequent than in advanced markets. They entail 1.6/2.8 times bigger fluctuations. Interestingly, whereas simple and single crises were less frequent and 2/4 times more intense, double crises are now more frequent but relatively less costlier than before when comparing EMDE to AM.

Triple crises mark the separation between advanced markets and the other two groups. In the former they are too rare to carry significant importance. In developing markets they make for a third of BC volatility and in emerging markets for a sixth. Obviously, both frequency and intensity contribute far more in emerging and developing markets to volatility. Comparing the two groups together, provides confirmation that developing markets suffer from multiple crises both because they are more frequent and more intense. In developing markets, triple crises are 1.6 times more frequent, but more importantly

Table 14: Frequency/intensity: contributions to BC volatility by multiplicity

reg	*Expansion*			*Rec* $\cap$ *NoCrs*		
Group	σ^2_{reg}	frq	int	σ^2_{reg}	frq	int
DM	0.16	88.8%	0.18	0.37	4.1%	9.0
EM	0.11	86.7%	0.13	0.29	6.2%	4.6
AM	0.04	87.8%	0.05	0.15	7.1%	2.1
relative to AM :						
DM/AM	4.00	1.01	3.96	2.47	0.58	4.27
EM/AM	2.66	0.99	2.69	1.90	0.88	2.17

reg	*Rec.* $\cap$ 1*Crs*			*Rec.* $\cap$ 2*Crs*			*Rec.* $\cap$ 3*Crs*		
Group	σ^2_{reg}	frq	int	σ^2_{reg}	frq	int	σ^2_{reg}	frq	int
DM	0.24	2.2%	10.8	0.25	2.7%	9.08	0.49	2.2%	22.2
EM	0.17	3.4%	5.10	0.12	2.3%	5.38	0.13	1.4%	9.50
AM	0.10	3.9%	2.60	0.04	1.1%	3.27	0.01	0.1%	7.17
relative to AM :									
DM/AM	2.32	0.56	4.16	6.95	2.51	2.77	62.1	20.0	3.10
EM/AM	1.70	0.86	1.97	3.41	2.07	1.64	17.2	13.0	1.32

σ^2_{reg} denotes the variance due to deviations from average growth in regime *reg*. It is computed as the product of a measure of the frequency of the deviations (frq_{reg} the ergodic probability of regime *reg*) and the intensity of the deviations (int_{reg} is the square of the difference between growth in regime *reg* and average growth).

they entail 2.3 more intense fluctuations when compared to emerging markets (overall the contribution is 3.6 times more important).

Before summarizing the results that these decompositions have highlighted it is important that a non-negligible fraction of aggregate volatility remains unexplained by the model and should deserve future attention.

Results

On currencity:

Currency crises are associated to half of business cycle volatility in emerging and developing markets, whereas in advanced economies they represent just a fourth of the aggregate. In developing markets, currency crises by themselves do not generate a lot of volatility. Nevertheless they are very often associated to other crises and a huge share of volatility. In emerging and advanced markets, single currency crisis episodes contribute the same amount to BC volatility, nevertheless, when other crises accumulate the episode becomes a greater contributor to volatility.

In developing markets, currency crises are a necessary but non sufficient source of economic volatility. In emerging markets they are necessary and sufficient, whereas in advanced markets they are non-necessary but sufficient.

On multiplicity:

As markets develop, multiplicity matters less for BC volatility. Multiple crises are associated to half of business cycle volatility in developing markets, a third in emerging markets and one eighth in advanced markets. As crises multiply, they become relatively less costlier in emerging markets than in advanced markets. In developing markets, whatever the ultiplicity, crises are at least 3 times more intense than in advanced markets.

In developing markets, economic and financial crises combine to generate excessive volatility. In emerging markets, economic crises are already an important source of losses and volatility. Multiple financial crises demultiply intensity to generate important macroeconomic volatility. In advanced markets, financial crises by themselves are not a key supplementary factor of volatility.

4 Narrative hindsight on causality: the origins of crises

The writing of this section is currently work in progress.

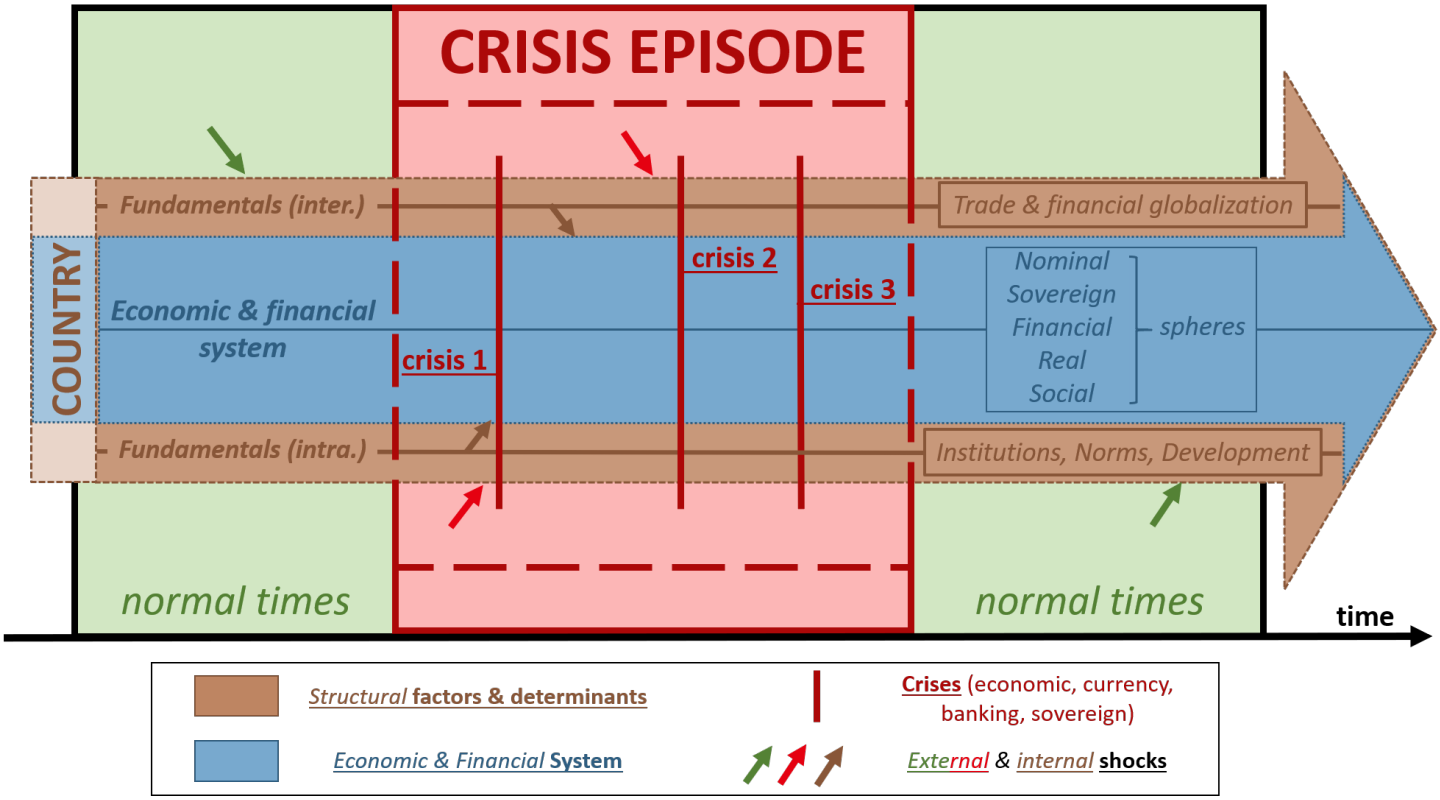
4.1 A conceptual framework to study crisis episodes

4.1.1 Key concepts

In time, a country is characterized by a set of structural/fundamental characteristics that define its limits, place and exposure to the rest of the world. In itself it can be represented as a set of interrelated (simplifying) spheres – nominal, sovereign, financial, real, socio-political – that cover most of the activity that make the system adapt and evolve.

Figure 6: Crises episodes: a first look

The schematic identifies a crisis episode in time (x axis). It represents how a changing economic and financial system (blue), shaped by internal and external fundamentals (brown) is exposed to shocks (red/external and darker brown/internal). At times, financial and economic crises signal (red bars).



Crises are episodes in time during which the system is brought to the edge of collapse by unforeseen conditions. Crises are times of heightened uncertainty and speculation about potential futures. During crises, initial shocks magnify as they spill over the economic and financial system. The perturbations come to pressurize existing vulnerabilities and inconsistencies. Hence, crises often constrain agents' policy space and are the source of drastic decisions and policy reactions.

Shocks and perturbations: Crisis episodes start because **perturbations** disrupt the economic and financial environment of some agents. These unexpected events entail an abrupt update of agent's information set. These **shocks** are diverse and can take the form of internal shocks – such as a surprised policy announcement (monetary/fiscal shock), a sudden news of wide-coverage corruption or the falsification of important data – or external – such as a natural disaster, a fall in external demand from an important trade partner or exogeneous changes on world financial markets. Shocks often form the first triggers to agents taking new actions and decisions. Shocks in crisis episodes are often

either of a very large magnitude or able to affect a broad coverage of agents. As such they always entail a sudden and important change in the information available to agents when forming decisions.

Vulnerabilities and frictions: The effects of shocks on an economic and financial system depend on its fundamentals. As countries developed, they defined the rules that organize their structure and agents interactions: (i) internally – political and legal institutions; norms and considerations on redistribution and property rights; infrastructures and demographics etc and (ii) externally – trade development and dependency; financial markets development and interconnectedness; trade/financial liberalization and globalization. Each interaction involving one or several domestic agent is asymmetric in essence: some will hold more information or power and objectives might differ and contradict among participants. Over time, these asymmetries might have resorbed, been (partially) corrected or, on the contrary, might have accumulated into: (i) structural **frictions** – market specificities that prevent an interaction to be optimal given agents' objectives and (ii) **vulnerabilities** – fundamental weaknesses that increase the exposure of agents to uncertainties and decrease their ability to manage associated risks. In normal times, vulnerabilities and frictions are counteracted by feed-back/stabilizing mechanisms. During crisis episodes, shocks and perturbations pressurize existing vulnerabilities and amplify the constraints that frictions impose on specific agents. Shocks, even if small, can have broad and devastating effects if they interact well enough with underlying weaknesses.

Transmission and policy changes: The combination of shocks and vulnerabilities forces agents to adapt policy decisions, affecting potentially other agents. Because shocks entail a new wave of (un)evenly distributed information, this blurs what could have been expected of others' actions, which creates uncertainty. These pertubations **transmit** through markets and agents to the whole system, being amplified by new vulnerabilities/shocks. During crisis episodes, there comes a time when the cumulated effects prevent the system from functioning. National authorities are forced to intervene and adapt their policy course, be it sustainable in itself or inconsistent and part of the problem. Policy action is meant to counteract the negative effects and coordinate agents' expectations on a new course, away from the vicious cycle of crises transmission. Policy intervention is in no way a synonym of crisis resolution. In practice, the measures can have detrimental effects on other markets.

4.1.2 Source

I rely upon the same source used to date currency crises: IMF's article IV publications and staff reports, country reports (Recent Economic Developments), program associated reports (stand-by arrangement requests and reviews) and the IMF's Independent Evaluation Office's reports. Hence I do not repeat the main information on these documents that has already been provided. Yet, my previous presentation of the article IV country reports was oriented towards factors and developments related to currency crises. I now complete my presentation of the conceptual principles underlying IMF publications to adapt the focus to current chapter's objectives. I also discuss potential biases that might be more relevant to the current research question.

Today, when writing country reports, the IMF staff relies upon the overall risk evaluation architecture provided by the institution's publications: global and topical cross country coverages (*World Economic Outlook*, *Regional Economic Outlook*, *Global Financial Stability Report*, *Fiscal Monitor*), article IV's reference methodology (Country and Global *Risk Assessment Matrices*), and specific topical risk assessments (*Financial Sector Assessment Program*, *External Sector Report*). This infrastructure allows the authors of my sources to identify the main developments and topics of interest for the countries they cover at the time of writing. This infrastructure moreover ensures that the considerations are consistent across countries. All of the documents that make the previous list were introduced 'recently'. This doesn't mean that the infrastructure lacked these elements and consderations before that. The IMF adapted its portfolio of publications and communications to clarify its position and help stimulate debates on policy practices. (Ahuja et al., 2017) details the main sectors of considerations for country evaluations: external/contagion, public/fiscal, financial/asset prices, real/macro sectors. The IMF risk assessment methodology is the result of an evolutionary conceptualization. For example financial elements and considerations on asset prices are but recent additions. These 'new' elements were often introduced after significant economic and financial troubles in member economies. Former editions discussed and analyzed economic and financial developments comprehensively but spent less ink on those elements when not at the very center of the action. Annex R presents the table of contents for article IV consultations and Recent Economic Development staff reports as illustration for the coverage of the documents and the evolution through time. Of particular interest, the main trends are towards including more narrative elements (description and analysis of events as in the Recent Economic Developments' series) in the article IV consultations. Moreover, as time passed, the doc-

uments have discussed banking and financial considerations with greater emphasis.

I extract from the table of contents the main topics that are being discussed. I identify:
{1} **categories of fundamentals** – (a) internal, e.g. "*Structural reforms*", "*Institutional and legal structures*", "*statistical issues*" and (b) external, for example "*trade relations*" ; and
{2} **categories of topic/areas of interest** : (a) nominal developments – e.g. "*monetary policy*", "*exchange rate policy*" – (b) sovereign developments – e.g. "*fiscal policy*", "*government finance*", "*external debt and claims*" – (c) financial developments – e.g. "*financial sector reforms*", "*financial and corporate sector issues*", "*capital market*" , "*capital account*" – (d) real developments – "*domestic economic development*" , "*macroeconomic developments*", "*production, employment situation, wages*", "*current account*" – (e) socio-political developments – e.g. *social unrest*, *poverty issues*, *elections*.

I detail the categories that guide the analysis in annex S.

4.1.3 Output

Each crisis is described in three steps: (A) a summary of the episode detailing crises start dates, business cycles dates. The summary provides a list of shocks and vulnerabilities at the origin of the crisis and a short summary of the event. (B) a narration of the crisis detailing the context, vulnerabilities and key shocks and triggers using quotes and references as well as the unfolding, transmission and policy management of the crisis. (C) a list of the main sources.

Methodology - Template for narrative contributions

Country – Year:

(A) Crisis iD

- Crisis type (economic &/or currency &/or banking &/or sovereign): dates and key fact.
- Business cycle turning points as derived from chapter **??**.
- Origins of the crisis
- In a nutshell

- List of key triggers and events
- List of strucutral vulnerabilities and policy inconsistencies

(B) Narration

- Context and vulnerabilities
- Triggers: key news, shocks and decisions
- Unfolding and crisis management

(C) Main sources

Detailed narrations of Argentina's crises can be found in annex **??**. Next subsection provides a shortened global narrations of the last 50 years of crises in Argentina.

4.2 A brief history of Argentina's crises

As a guide through the narration, figure 7 illustrates the log of real GDP for Argentina in-between 1990q1 and 2019q4. Markkov-switching dated recessions are indicated by shaded areas and crises by vertical bars (in red for currency crises, dark blue for banking crises and gray for sovereign crises). Table 15 lists business cycle turning points and financial crises' start quarters.

Figure 7: Argentina – log real GDP, recessions and financial crises

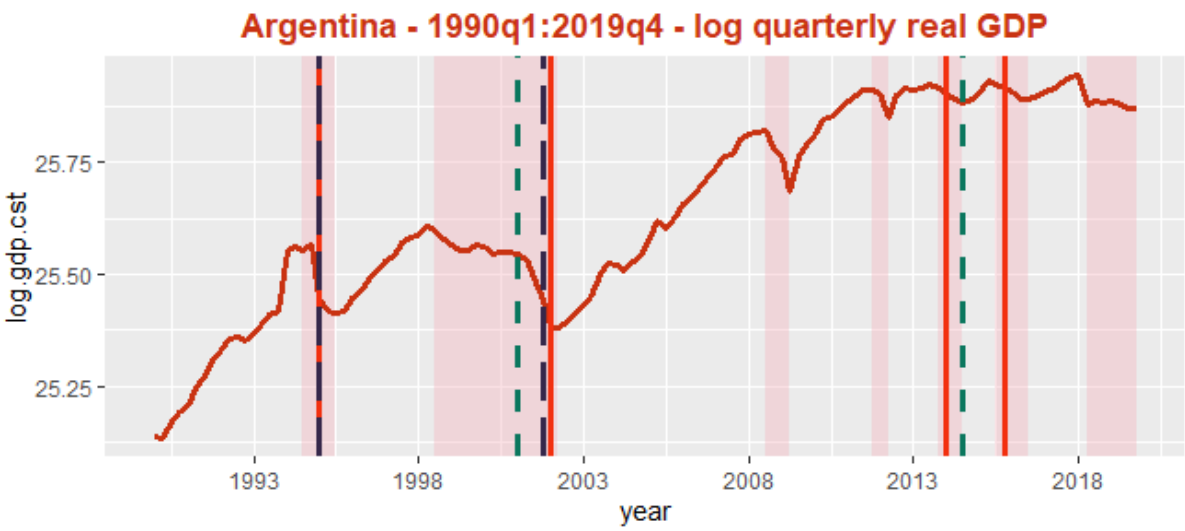


Table 15: Business cycles and financial crises dates

Dates	Business Cycle dates		Financial crises start date		
Episode	Start	End	Currency	Banking	Sovereign
Expansion	1990q1	1994q2	.	.	.
Recession	1994q3	1995q3	1995q1	1995q1	.
Expansion	1995q4	1998q2	.	.	.
Recession	1998q3	2002q2	2002q1	2001q4	2001q1
Expansion	2002q3	2008q2	.	.	.
Recession	2008q3	2009q2	.	.	.
Expansion	2009q3	2011q3	.	.	.
Recession	2011q4	2012q2	.	.	.
Expansion	2012q3	2013q3	.	.	.
Recession	2013q4	2014q3	2014q1	.	2014q3
Expansion	2014q4	2015q2	.	.	.
Recession	2015q3	2016q3	2015q4	.	.
Expansion	2016q4	2018q1	.	.	.
Recession	2018q2	2019q4	2018q2	.	2018q2

Business cycle turning points are derived from Markov switching estimations.

Narration

Argentina forms a compelling case. Since the 80's, the country has endured a wide variety of crises: hyperinflation, currency, banking or sovereign crisis. Crises have hit the country every 5 to 10 years, often multiplying upon another. Looking at history, the unfolding of each crisis proves key to understanding the following one. Policy choices and measures implemented to tackle initial vulnerabilities often either failed to stick in time or undermined other sectors and spheres of the economic and financial system. In the years following a crisis, these policy-limitations combined with other underlying vulnerabilities. When faced with unexpected developments, these new weaknesses often proved key in precipitating Argentina in the next crisis.

The return to democracy and the lost decade

After years of military dictatorship, repression and violence, Argentina elected democratically a new president, Raul Alfonsin, in 1983. This marked a new era for the country. Faced with several gloomy macroeconomic vulnerabilities, the economic system was in bad shape. In 1984, the country managed to obtain external financing from the IMF and in 1985 adopted a new currency, the Austral. Macroeconomic policies, spoiled by large off-budget populist interventions and loose monetary policy, were broadly inconsistent and growth stagnated. In July 1987, the country managed to launch a new program with the

IMF but failed to respect conditionality and, 8 months later, the agreement collapsed. The government then introduced a broad set of heterodox policies, which failed to ameliorate economic conditions. Hyperinflation ensued as social unrest sparked over the country. The dire economic and political situation led to the resignation of prsident Alfonsin in June 1989. Opposition candidate, Carlos Menem, was elected the same year with the purpose of solving economic problems.

The 1989 crisis and the rise of the currency board

In 1989, Argentina's real GDP is the same as in 1980. The hyperinflation episode of 1989 followed a decade of stagnant growth, high inflation and failed macro-stabilization attempts. With the help of the IMF, Argentina introduced in April 1991 the convertibility plan that pegged her external nominal anchor to the USD. Autonomous money creation by the central bank became very constrained and monetary policy oriented towards foreign reserves management. A package of reforms backed the currency board so as to form a comprehensive macro-stabilizing policy framework. These measures fell in line with the Washington Consensus dogma, which the IMF was extensively promoting. The deregulation, privatization and liberalization processes greatly impacted and fragilized the banking and financial systems, which proved decisive fro future crises. Nevertheless, as confidence returned, growth resumed. From her past, Argentina inherited corrupt[91] and "failing[92]" fiscal institutions as well as a parcelled federal organization which lacked appropriate debt and fiscal management tools. Given the costs of the many ongoing structural reforms, little scope was given to building safety nets during expansions.

1995, passing the credibility test

In the context of a fixed exchange rate regime, the conduct of monetary policies is intimately linked to the circulation of private capital flows. Due to its relentless liberalization and privatization, Argentina's economic and financial system was greatly exposed to sudden stops and capital flow volatility. When the Tequila crisis hit Mexico in 1994-95, troubles spilled over to Argentina's financial system. The crisis brought to light inherent weaknesses in the financial and fiscal architecture. Confidence fell and the country experienced bank runs. The authorities intervened as soon and as strongly as possible to

[91] Provincial banks were often used by local and/or regional governments to provide liquidities for public expenditures.

[92] Reuters www.reuters.com/article/us-argentina-debt-chronology/chronology-argentinas-turbulent-history-of-economic-crises-idUSKBN0FZ23N20140730
"Under President Raul Alfonsin, public payrolls swelled while government revenues remained stagnant. In 1989, only 30,000 out of 30 million Argentines paid any income taxes."

maintain credibility of the peg. While exiting the crisis, the government committed to reforming the fiscal and tax-collection system and adressing fiscal weaknesses.

1998:2002, from recession to commplete collapse: a system bound to fail

If growth bounced back strongly after the 1995 crisis, the trade sector had failed to develop accordingly and remained too small to provide sufficient forex revenues in times of trouble. The government backed down on several tax-reforms. Fiscal vulnerabilities and nominal rigidities persisted. The end of president Menem second term was also marked by socio-political tensions. Increased political uncertainty and social tensions slowly dented agents confidence in future economic prospects. Nevertheless, trust in the currency board didn't erode. The latter had proven a very efficient tool to tame inflation and expectations but had driven a strong dollarization of private agents' and the government's balance sheets. Moreover, by constraining monetary policy through the exchange rate regime, macro-stabilization was left on the sole hand of fiscal policy. In 1998, faced with external trade and financial contagion, the economy entered a recession. Room for manoeuvre was too small to avoid a deepening of problems. Crisis management was marked by huge political crises and scandals and misconceived policies. Strikes, bank runs and social protests shook the country as the economy collapsed. Between end December 2001 and the beginning of January 2002, five presidents succeeded each other at the job. The country partially defaulted on its debt. The convertibility plan and associated currency board were terminated.

2012:14, policy inconsistencies and crisis in a financially closed economy

After the 2000's debacle, Argentina lost access to world financial markets. The new president, Nestor Kirchner, managed to launch the economy back on track as well as reduce poverty. When the Global Financial Crisis hit the world economy, Argentina weathered the shock without suffering major disturbances. Yet, in 2012, the country faced a severe drought and a fall in external demand. The export sector was too small to generate enough forex revenues and pressures on the currency accumulated. Moreover to face the recession, national authorities had launched a expansionary policy mix, which soon prove to be inconsistent. As balance of pressures accumulated, the gap between the official and the parallel exchange rates widened. The time was also marked by deep corruption scandals and revelations of falsified statistics. This completed the erosion of confidence and precipitated the political demise of Cristina Fernandez de Kirchner. Unresolved debt problems with *the Vulture funds* forced the country in legal default in July 2014. This politically motivated decision received broad support in the population but

crisis management critics were too strong.

2015, political U-turn and austerity

With political uncertainty at very high levels, the country was shocked by the severe rainfalls and a costly terms-of trade shocks over 2015. As balance of payments pressures accumulated, domestic and external imbalances culminated. The country entered a recession in 2015q3. Soon after his election end October, Mauricio Macri launched a wide pro-business reform plan. The program included a currency devaluation, structural reforms and a plan to reaccess world capital markets. If austerity measures deepened economic losses and weakened the social sphere, they allowed the country to bounce back id 2016 by rebuilding private agents confidence and allowing the country to return to world financial markets.

2018:19, the debt trap ... again

Driven by private consumption and investment, growth resumed strongly over 2017. Yet, despite improving conditions, the government failed to obtain broad political support. Thus, to maintain social cohesion, the authorities enforced reforms only gradually, notably on the fiscal side. This had perverse effectsas it (i) prevented the reduction in several key vulnerabilities, (ii) halted the disinflationary trend and (iii) eroded market's condifende in the national authorities' commitments. As the government relied evermore on foreign currency debt for financing, interest payments increased. This occured at a time when the current account was widening and capital flew strongly inwards, driving an overvaluation of the currency. Beginning of 2018, the country was faced with a tightening of global financial conditions and the worst drought in the country's history. Faced with confidence losses, market panics and a negative debt dynamics, the country was forced into currency and sovereign crises as the authorities called for external financial assistance in 2018q2. As the situation deteriorated, the government announced rabid measures which failed to sooth expectations and volatility maintained. Over the end of 2018, contractionary monetary policy helped rebuild the economy and reverse external imbalances. Yet, as 2019 began, inflation (expectations) started increasing again and world financial conditions worsened. Capital flows reversed by the end of the first quarter. With major presidential at the end of the year, political uncertainty was at its highest. Financial markets calmed down temporarily as the central bank committed to a more consistent monetary policy and exchange rate regime. Political uncertainty and volatility were too strong and the recession continued. By the end of 2019, the opposition candidate, Alberto Fernandez was elected. He was then faced with a highly unsustainable stock of debt as

well as a population having suffered for a long time economic losses and austerity measures.

Looking back at Argentina's recent history, over 1995-2002 and 2010-2020 the country did not grow and experienced cycles of economic, currency, banking and sovereign crises. The first cycle builds upon a framework that concentrated confidence on the stability of the currency. It ended with a complete trust debacle and a complete ideological and political shift. Argentina inherited from this first sequence a damaged and frail confidence in the currency and more importantly lack of access to world capital markets. This constrained external financing, especially important for fiscal policy. Subsequent constraints on the latter prove fundamental to the second cycle of crises. During that episode, the currency acts as a jump variable to evacuate pressures, when agents' views dissensions widen driving confidence losses.

Several factors have repeatedly hindered the country's performance. Next sub-section details the shocks and vulnerabilities behind each episode and discusses underlying patterns.

4.3 Conclusive elements on the main factors behind crises

To shed light on the patterns behind the origins of crises, shocks and vulnerabilities must be considered together. I first detail and discuss the lists of shocks and of vulnerabilities. I analyze results and patterns afterwards in the next and final subsection.

Table 16 presents the key shocks and news associated to Argentina's last 5 crises. Each line provides a short description of the event, stylized information on the origin, dimension and type of perturbation, as well as indications on the main spheres and agents affected. I use two main layers of information to categorize the shocks: the origin (domestic/foreign) and the dimension of the perturbation (political/institutional/environmental/trade/financial). The third layer – type – provides additional precision within broader categories. The shocks that lie behind Argentina's crises can be grouped into three main categories:

External financing shocks: All of Argentina' crises are associated with foreign financial shocks. These entail either (i) a direct unexpected change in the costs of external financing for the public and private sector or (ii) shifts in market participants' confidence towards domestic financial assets. They are associated with heightened market volatility and often contagion from other emerging markets. They mark the start of an acceleration in increasing external pressures on the currency and domestic financial markets.

Confidence shocks and political failures: Argentina's political sphere is a

major source of perturbations that contribute to the build-up and the magnification of crises. They are associated to (i) corruption and other political scandals and revelations, (ii) failed policy announcements that blur confidence in the authorities or (iii) a drastic shift in the political ideology. These shocks entail unexpected news and development that update drastically agents' information set and confidence in future developments. Voters often react strongly to the news and domestic unrest ensues. Markets are globally shaken by these perturbations, which increase risk aversion and volatility.

Forex revenues shocks: Argentina's export sector has been historically small and highly dependent on agricultural commodities. Over the last 40 years, the country has been faced with (i) sudden and unexpected production losses, (ii) sudden and important fluctuations in world prices and (iii) unexpected fall in external demand from major trading partners. These perturbations are associated with heavy constraints on firms and a widening of current account deficits. In turn these perturbations augment external pressures on the currency.

Table 16: Argentina's crisis origins – Shocks

short description	Characteristics			Effects	
	origin	dimension	type	Sphere.s affected	Agent.s constrained
1995 – double currency + banking crises					
Contagion from the *Tequila crisis*	foreign	financial	contagion	nominal, financial	banks
1998:2002 – triple crises					
Russian and Asian crises	foreign	financial	contagion	financial	market participants
Menem's attempts at 3rd presidency	domestic	institutional	news/scandal	socio-political	voters, confidence
Fall in key commodity prices	foreign	trade	ToT/commodity	real	export sector
Regional slowdown and crisis (Brazil 1999)	foreign	trade/financial	contagion	nom., real, social	firms, consumers
US policy rate changes	foreign	financial	financing costs	sov., financial	market participants
Failed policy announcements	domestic	political	announcement	global	agents' confidence
2012:14 – double currency + sovereign crises					
Severe drought	domestic	environmental	disaster	real	primary/export sector
Terms-of-trade/commodity prices shocks	foreign	trade	ToT/commodity	real	export sector
Economic slowdown in Brazil and China	foreign	trade	contagion	nominal, real	export sector
Vulture funds related court rulings	foreign	financial	financing costs	sovereign	government
Revelations of inacurate official statistics	domestic	institutional	news/scandal	global	national authorities
2015 – single currency crisis					
Summer flash foods	domestic	environmental	disaster	real	export sector
Terms-of-trade shocks	foreign	trade	ToT/commodity	real	export sector
Corruption scandals and political divisions	domestic	political	news/scandal	sov., social	government, voters
Policy U-turn announcement	domestic	political	announcement	global	wide covering
2018:19 – double currency + sovereign crises					
Worst drought in 50 years	domestic	environmental	disaster	real	export sector
US monetary policy normalization	foreign	financial	financing costs	financial	market participants
High volatility on emerging markets	foreign	financial	contagion	financial	market participants
Failed policy announcements	domestic	political	announcement	global	agent's confidence

See appendix T for a detailed description of the shocks and their role in crisis unfoldings.

Table 16 presents the key shocks and news associated to Argentina's last 5 crises. Each line provides a short description of the event, stylized information on the origin, dimension and type of perturbation, as well as indications on the main spheres and agents affected. I use two main layers of information to categorize the shocks: the origin (domestic/foreign) and the dimension of the perturbation (political/institutional/environmental/trade/financial). The third layer – type – provides additional precision within broader categories. The shocks that lie behind Argentina's crises can be grouped into three main categories:

Political uncertainty and weakening social contract:

Fiscal needs instability:

Nominal anchors stability:

Underdeveloped domestic financial markets:

Small undiversified export sector

In a nutshell:

Argentina's crises occur because (i) forex revenues shocks suffocate quickly a frail and undiversified export sector. This usually constrains the government in its ability to service foreign currency debt ; (ii) external financing costs emananting directly from the US or resulting from contagion from other emerging markets. These shocks drive up risk aversion and trigger capital outflows that constrain an economy overly dependent on foreign capital ; (iii) confidence shocks that (α) increase market participants risk aversion towards the country and (β) shake the social sphere, often struggling with rising inequality and poverty. This drives political divides and social unrest and further prevent the room and support for policy interventions.

Argentina's crises are all associated with credibility gaps driven the authorities inconsistent or unconvincing measures. Failed policy announcements often act as unvertainty and volatility enhancer and precipitate drastic developments. At the end of each cycle of crises, before the final debacle, poverty and inequality rise threatening an ever weakened social contract. When the latter is about to break, political incentives and biases towards populist interventionism increases. The marginal gains in image, confidence and support appear at their greatest.

As soon as confidence shocks hit such a system – and they always do when uncertainty increases – political divides and social unrest cumulate. These developments fuel and feed upon ongoing pressures and transmission across economic and financial markets. For crises to unravel, external financial or trade shocks and discontinuities are needed to precipitate the country from an apparently stable path into a self-fulfilling cumulation of crises and losses. All spheres sub-/con-sequently fall to drastic developments. When trust fails, four

horsemen bring down the apocalypse[93]: economic crises on the white horse of conquest, currency crises on the red horse of war, banking crises on the black horse of famine and sovereign crises on the pale horse of death.

[93]The four horsemen of the Apocalyse are an allegory in Christian faith,. Four figures are said to descend upon Earth to deliver the last judgment and unleash hell.

Table 17: Argentina's crisis origins – Vulnerabilities

description	origin	scope	sphere.s	effect
1995 – double currency + banking crises				
Constrained policy space (currency board) and growing fiscal instability	conj.	int.	sovereign	macro-stabilization hindrance
Weaknesses in financial architecture (overburdened provincial banks)	struct.	int.	financial	trust destabilization
Overdependence on foreign capital, dollarization	struct.	ext.	real, financial	pressure accumulation
1998:2002 – triple crises				
Endangered social contract (political uncertainty, social unrest, widely perceived corruption)	struct.	int.	sovereign, social	trust destabilization
Complex fiscal architecture (federal/provincial) and shallow tax base	struct.	int.	sovereign	macro-stabilization hindrance
Small underdeveloped and underdiversified export sector, strong import growth, widening trade deficit	struct.	ext.	real	pressure accumulation
Shallow and underdeveloped domestic financial markets fueled dependence on external financing	struct.	int.	financial	pressure accumulation
Important downward nominal wage rigidities	struct.	int.	nominal	macro-stabilization hindrance
Constrained policy space entailed by the convertibility plan (fiscal dominance, no lender of last resort)	conj.	int. ext.	nominal, sovereign	policy-making inconsistency
Overly optimistic expectations	conj.	int. ext.	global	trust destabilization

Table 17: Argentina's crisis origins – Vulnerabilities

description	origin	scope	sphere.s	effect
2012:14 – double currency + sovereign crises				
Interventionism and inconsistent expansionary monetary and fiscal stance	conj.	int./ext.	nominal, sovereign	policy-making inconsistency
Overvalued exchange rate, strong import growth, widening trade deficits, BoP pressures	conj.	ext.	nom., fin., real	pressure accumulation
Lack of access to world financial markets	struct.	ext.	sovereign, financial	macro-stabilization hindrance, pressure accumulation
Weak institutions and historical lack of confidence in the country	struct.	int. ext.	sovereign, global	trust destabilization
2015 – single currency crisis				
Interventionism and expansionary policies driving domestic imbalances	conj.	int.	nom., sov., real	pressure accumulation, policy-making inconsistency
Lack of access to world financial markets	struct.	ext.	sovereign, financial	macro-stabilization hindrance, pressure accumulation
Weakening external demand increasing BoP pressures	conj.	ext.	nom., fin., real	pressure accumulation
Microeconomic distortions	struct.	int.	nominal	macro-stabilization hindrance
2018:19 – double currency + sovereign crises				
Growing fiscal needs (negative debt dynamics)	conj.	int./ext.	sovereign	pressure accumulation
Growing external financing needs (widening current acocunt deficit and debt amortization)	conj.	ext.	financial, real	pressure accumulation
Overvalued currency (inflation inertia and strong capital inflows)	conj.	ext.	nominal, financial	pressure accumulation
High political uncertainty (presidential elections)	conj.	int.	sovereign, social	trust destabilization

5 Conclusion

I have constructed a database of crises episodes for a panel of 54 countries worldwide to analyze how financial crises relate to economic volatility. I used Markov Switching Models to date business cycles for 54 countries and constructed a new database of currency crises using narrative evidence from IMF archives. I find that the bulk of volatility differentials stems from emerging and developing markets higher volatility during recessions. Surprisingly, business cycle dynamics is the same on average across income groups. What drives differences in the magnitude of negative growth shocks is the higher exposure to financial crises in less advanced markets.

As countries develop, they experience less episodes during which several financial markets collapse and crises multiply. These episodes are associated to much dire recessions (both longer and more severe). In emerging markets, these crises fail to trigger a good rebound once the recession ends. In particular, currency crises prove to be pivotal in most countries' recent history. They are by far the most frequent crisis. In emerging markets, they suffice to drive up business cycle volatility. In developing markets, they rarely signal on their own and associate often to sovereign and banking crises.

I apply my narrative methodology to study the shocks and vulnerabilities at the origin of these costly crises episodes in Argentina. I identify the central role of the credibility gap and differing views in driving key debacles.

References

Adler, G., Casas, C., Cubeddu, L., Gopinath, G., Li, N., Meleshchuk, S., Osorio Buitron, C., Puy, D., and Timmer, Y. (2020). Dominant currencies and exchange rate flexibility. Technical report, IMF.

Agenor, P.-R., McDermott, J., and Prasad, E. (2000). Macroeconomic fluctuations in developing countries. *World Bank Economic Review*, 14(2):252–285.

Aghion, P., Bachetta, P., and Banerjee, A. (2001). Currency crises and monetary policy in an ecnomy with constraints. *European Economic Review*, 45:1121–1150.

Aguiar, M., Amador, M., Hopenhayn, H., and Werning, I. (2019). Take the short route: equilibrium default and debt maturity. *Econometrica*, 87(2):423–462.

Aguiar, M., Chatterjee, S., Cole, H., and Stangebye, Z. (2017). Self fulfilling sovereign debt crises, revisited: the art of the desperate deal. *NBER Working Papers*.

Aguiar, M. and Gopinath, G. (2007). Emerging business cycles: the cycle is the trend. *Journal of Political Economy*, 115(1):69–102.

Ahuja, A., Syed, M., and Wiseman, K. (2017). Assessing country risks – selected approoaches – reference note. Technical Report 17/08, International Monetary Fund.

Akerlof, G. (2020). Sins of omission and the practice of economists. *Journal of Economic Literature*, 58(2):405–418.

Akinci, O. (2013). Global financial conditions, country spreads and macroeconomic fluctuations in emerging countries. *Journal of Iternational Economics*, 91:358–371.

Akinci, O. (2017). Financial frictions and macroeconomic fluctuations in emerging economies. Mimeo, submitted.

Alesina, A., Ozler, S., Roubini, N., and Swagel, P. (1996). Political instability and economic growth. *Journal of Economic Growth*, 1(2):189–211.

Altug, S. and Bildirici, M. (2012). Business cycles in developed and emerging economies: evidence from a univariate markov switching approach. *Emerging Markets Finance and Trade*, 48(6):4–38.

Altug, S. and Kabaca, S. (2016). Search frictions, financial frictions and labor market fluctuations in emerging markets. *Emerging Markets Finance and Trade*, 53(1):128–149.

Alvarez-Parra, F., Brandao-Marques, L., and Toledo, M. (2013). Durable goods, financial frictions and business cycles in emerging economies. *Journal of Monetary Economics*, 60:720–736.

Andrews, D. and Rees, D. (2009). Macroeconomic volatility and terms of trade shocks. *Reserve Bank of Australia Working Papers*, 05.

Arellano, C. (2008). Default risk and income fluctuations in emerging economies. *The American Economic Review*, 98(3):690–712.

Aslam, A., Beidas-Strom, S., Bems, R., Celasun, O., Kilic Celik, S., and Kozcan, Z. (2016). Trading on their terms? commodity exporters in the aftermath of the commodity boom. *IMF-Working Paper*, 16/27.

Baltemsperger, E. and Kluger, P. (2017). *Swiss monetary history since the early 19th century.* Cambridge University Press.

Bekaert, G. and Harvey, C. (2000). Foreign speculators and emerging equity markets. *The Journal of Finance*, 55(2):565–613.

Bekaert, G. and Harvey, C. (2003). Emerging markets finance. *Journal of Empirical Finance*, 10:3–55.

Bekaert, G., Harvey, C., and Lundblad, C. (2003). Equity market liberalization in emerging markets. *The Journal of Financial Research*, 26(3):275–299.

Bekaert, G., Harvey, C., and Lundblad, C. (2006). Growth volatility and financial liberalization. *Journal of International Money and Finance.*

Bekaert, G., Harvey, C., and Lundblad, C. (2007). Liquidity and expected returns: lessons from emerging markets. *Review of Financial Studies*, 20(6):1783–1831.

Benassy-Quere, A. (2015). *Economie monÃ©taire internationale*, economica edition. 2eme edition.

Berman, N., Martin, P., and Mayer, T. (2012). How do different exporters react to exchange rate changes. *The Quarterly Journal of Economics*, 127(1):437–492.

Bernanke, B. (1983). Nonmonetary effects of the financial crisis in the propagation of the great depression. *The American Economic Review*, 73(3):257–276.

Bi, H. (2012). Sovereign default risk premia, fiscal limits, and fiscal policy. *European Economic Review*, 56:389–410.

Boonman, T. M. (2019). Dating currency crises in emerging market economies. *The North American Journal of Economics and Finance*, 49:273–286.

Bordo, M., Eichengreen, B., Klingebiel, D., Martinez-Piera, M. S., and Rose, A. (2001). Is the crisis problem growing more severe? *Economic Policy*, 16(32):51–82.

Bordo, M. and Haubrich, J. (2017). Deep recessions, fast recoveries, and financial crises: evidence from the american record. *Economic Inquiry*, 55(1):527–541.

Bordo, M. and Helbling, T. (2003). Have national business cycles become more synchronized? *NBER Working Paper*.

Bordo, M. and Meissner, C. (2016). *Fiscal and financial crises*, volume 2 of *Handbook of Macroeconomics*, chapter 7, pages 355–412. Elsevier.

Borio, C. (2014). The financial cycle and macroeconomics: what have we learnt? *Journal of Banking and Finance*, 45:182–198.

Boz, E., Daude, C., and Durdu, B. (2011). Emerging market business cycles: learning about the trend. *Journal of Monetary Economics*, 58:616–631.

Boz, E., Durdu, B., and Li, N. (2015). Emerging market business cycles: the role of labor market frictions. *Journla of Money, Banking and Finance*, 47(1):31–72.

Broda, C. (2004). Terms of trade and exchange rate regime in developing countries. *Journal of International Economics*, 63(1):31–58.

Broner, F., Lorenzoni, G., and Schmukler, S. (2013). Why do emerging markets borrow short term? *Journal of the European Economic Association*, 11:67–100.

Broner, F. and Ventura, J. (2016). Rethinking the effects of financial globalization. *The Quarterly Journal of Economics*, 131(3):1497–1542.

Buera, F., Kaboski, J., and Shin, Y. (2011). Finance and development: A tale of two sectors. *The American Economic Review*, 101(5):1964–2002.

Burns, A. and Mitchell, W. (1946). *Measuring business cycles*. NBER.

Bussiere, M. (2013). Balance of payment crises: how "early" were the early warning signals? *Applied Economics*, 45(12):1601–1623.

Bussiere, M. and Fratzscher, M. (2006). Towards an early warning system of financial crises. *Journal of International Money and Finance*, 25(6):953–973.

Calderon, C. and Fuentes, R. (2014). Have business cycles changed over the last two decades: an empirical investigation. *Journal of Developement Economics*, 109:98–123.

Calvo, G. (1998). Capital flows and capital-market crises: the simple economics of sudden stops. *Journal of Applied Economics*, 1(1):35–54.

Calvo, G. and Reinhart, C. (2000). Fear of floating. *NBER Working Papers*, 7993.

Calvo, G. and Reinhart, C. (2002). Fear of floating. *The Quarterly Journal of Economics*, 117(2):379–408.

Cao, D., L'Huillier, J.-P., and Yoo, D. (2016). When is the trend the cycle? Mimeo.

Carrasco, M., Hu, L., and Ploberger, W. (2014). Optimal test for markov switching parameters. *Econometrica*, 82(2):765–784.

Carre, S., Cohen, D., and Villemot, S. (2019). The sources of sovereign risk: a calibration based on levy stochastic processes. *Journal of International Economics*, 118:31–43.

Cerra, V. and Saxena, S. (2005). Did output recover from the asian crisis? *IMF Staff Paper*.

Cerra, V. and Saxena, S. (2008). Growth dynamics: the myth of economic recovery. *American Economic Review*, 98(1):439–457.

Cerutti, E., Claessens, S., and Kose, A. (2019). How important is the global financial cycle? evidence from capital flows. *IMF Economic Review*, 67:24–60.

Chang, R. and Fernandez, A. (2013). On the sources of aggregate fluctuations in emerging economies. *International Economic Review*, 54(4):1265–1293.

Chang, R., Fernandez, A., and Gulan, A. (2017). Bond finance, bank credit, and aggregate fluctuations in an open economy. *Journal of Monetary Economics*, 85:90–109.

Chang, R. and Velasco, A. (1998). Financial crises in emerging markets: a canonical model. *NBER Workin Papers*, 6606.

Chang, R. and Velasco, A. (2001). A model of financial crises in emerging markets. *The Quarterly Journal of Economics*, 116(2):489–517.

Chauvet, M. and Piger, J. (2008). A comparison of the real-time performance of business cycle dating methods. *Journal of Business and Economic Statistics*, 26(1):42–49.

Chen, K. and Crucini, M. (2016). Trends and cycles in small open economies: making the case for a general equilibrium approach. *Journal of Economic Dynamics and Control*, 72:159–168.

Claessens, S., Kose, A., and Terrones, M. (2009). What happens duringrecessions, crunches andbusts? *Economic Policy*, 24(60):653–700.

Claessens, S., Kose, A., and Terrones, M. (2011). Financial cycles: What? how? when? *NBER International Seminar on Macroeconomics*, 7(1):303–344.

Claessens, S., Kose, M. A., and TErrones, M. E. (2012). How do business and financial cycles interact? *Journal of International Economics*, 87(1):178–190.

Cohen, D. and Sachs, J. (1986). Growth and external debt under risk of debt repudiation. *European Economic Review*.

Cohen, D. and Valadier, C. (2011). 40 years of sovereign debt crises. *World Bank Economic Review*.

Cohen, D. and Villemot, S. (2015). Endogenous debt crises. *Journal of International Money and Finance*, 51:337–369.

Cole, H. and Kehoe, T. (2000). Self-fulfilling debt crises. *Review of Economic Studies*, 67:91–116.

Cuberes, D. and Jerzmanowski, M. (2009). Democracy, diversification and growth reversals. *The Economic Journal*, 109:1270–1302.

Davig, T., Leeper, E., and Walker, T. (2011). Inflation and the fiscal limit. *European Economic Review*, 55:31–47.

Diamond, D. and Dybvig, P. (1983). Bank runs, deposit insurance and liquidity. *The Journal of Political Economy*, 91(3):401–419.

Drechsel, T. and Tenreyro, S. (2018). Commodity booms and busts in emerging economies. *Journal of International Economics*, 112:200–218.

Durdu, B. (2013). Emerging market business cycles: recent advances. *International Economic Journal*, 27(2):183–199.

Eaton, J. and Gersovitz, M. (1981). Debt with potential repudiation: theoretical and empirical. *Review of Economic Studies*, 48:289–309.

Eichengreen, B. and Hausmann, R. (1999). Exchange rates and financial stability. *NBER Working Papers*, 7418.

Eichengreen, B., Rose, A., and Wyplosz, C. (1994). Speculative attacks on pegged exchange rates: an empirical exploration with special reference to the european monetary system. *NBER working papers*, 4898.

Eichengreen, B., Rose, A., and Wyplosz, C. (1995). Exchange market mayhem: the antecedents and aftermath of speculative attacks. *Economic Policy*, 10(21):249–312.

Eichengreen, B., Rose, A. K., and Wyplosz, C. (1996). Contagious currency crises. *NBER working paper*, 5681.

Fatas, A. and Mihov, I. (2013). Policy volatility, institutions and economic growth. *The Review of Economics and Statistics*, 95(2):362–376.

Fayad, G., Huang, C., Shibuya, Y., and Zhao, P. (2020). How do member countries receive imf policy advice: results from a state of the art sentiment index. *IMF Working Papers*, 7.

Felbermayr, G. and Groschl, J. (2014). Naturally negative: the growth effects of natural disasters. *Journal of Development Economics*, 111:92–106.

Fernandez, A., Gonzalez, A., and Rodriguer, D. (2018). Sharing a ride on the commodities roller coaster: common factors in business cycles of emerging economies. *Journal of International Economics*, 111:99–121.

Fernandez, A. and Gulan, A. (2015). Interest rates, leverage and business cycles in emerging economies: the role of financial frictions. *American Economic Journal: macroeconomics*, 7(3):153–188.

Fernandez, A. and Meza, F. (2015). Informal employment and business cycles in emerging economies: the case of mexico. *Review of Economic Dynamics*, 18(2):381–405.

Fernandez, A., Schmitt-Grohe, S., and Uribe, M. (2017). World shocks, world prices and business cycles: an empirical investigation. *Journal of International Economics*, 108:S2–S14.

Fernandez-Villaverde, J., Guerron-Quintana, P., Rubio-Ramirez, J., and Uribe, M. (2011). Risk matters: the real effects of volatility shocks. *The American Economic Review*, 101:2530–2561.

Finkelstein Shapiro, A. and Gonzalez Gomez, A. (2017). Credit market imperfections, labor markets and leverage dynamics in emerging economies. *Journal of International Money and Finance*, 78:44–63.

Finkelstein Shapiro, A. and Mandelman, F. (2016). Remittances, entrepreneurship and employment dynamics over the business cycle. *Journal of International Economics*, 103:184–199.

Fioretos, O. (2019). Minilateralism and informality in internationalmonetary cooperation. *Review of International Political Economy*, pages 1–24.

Fogli, A. and Perri, F. (2015). Macroeconomic volatility and external imbalances. *Journal of Monetary Economics*, 69:1–15.

Fomby, T., Ikeda, Y., and Loayza, N. (2013). The growth aftermath of natural disasters. *Journal of Applied Econometrics*, 28(3):412–434.

Frankel, J. and Rose, A. (1996). Currency crashes in emerging markets: an empirical treatment. *Journal of International Economics*, 41:351–366.

Fricke, H. and Sussmuth, B. (2014). Growth and volatility of tax revenues in latin america. *World Development*, 54:114–138.

Gabaix, X. (2011). The granualr originins of aggregate fluctuations. *Econometrica*, 79(3):733–772.

Gabaix, X. (2016). Power laws in economics: an introduction. *Journal of Economic Perspectives*, 30(1):185–206.

Garcia, R. (1998). Asymptotic null distribution of the likelihood ratio test in markov switching models. *International Economic Review*, 39(3):763–788.

Garcia-Cicco, J., Pancrazi, R., and Uribe, M. (2010). Real business cycles in emerging countries? *The American Economic Review*, 100(5):2510–2531.

Geerolf, F. (2020). The phillips curve: a relation between real exchange rate growth and unemployment.

Gete, P. and Melkadze, G. (2018). Aggregate volatility and international dynamics. he role of credit supply. *Journal of International Economics*, 111:143–158.

Gordon, G. and Guerron-Quintata, P. (2018). Dynamics of investment, debt and default. *Review of Economic Dynamics*, 28:71–95.

Gourinchas, P.-O. and Obstfeld, M. (2012). Stories of the twentieth century for the twenty-first. *American Economic Journal: Macroeconomics*, 4(1):226–265.

Gourinchas, P.-O. and Rey, H. (2007). International financial adjustment. *Journal of Political Economy*, 115(4):665–703.

Gourinchas, P.-O. and Rey, H. (2014). *Handbook in international economics*, volume 4, chapter External Adjustment, global imbalances and valuation effects, pages 585–640. North Holland.

Greenlaw, D., Hamilton, J., Hooper, P., and Mishkin, F. (2013). Crunch times: fiscal crises and the role of monetary policy. *NBER working papers*, 19297.

Grosse Stefen, C. (2015). Business cycles with financial intermediation in emerging economies. Mimeo.

Ha, J., Kose, A., Otrok, C., and Prasad, E. (2020). Global macro-financial cycles and spillovers. *NBER Working Papers*, 26798.

Hamilton, J. (1989). A new approach to the economic analysis of nonstationary time series and the business cycle. *Econometrica*, 57(2):357–384.

Hamilton, J. (1990). Analysis of time series subject to changes in regime. *Journal of Econometrics*, 45(1-2):39–70.

Hamilton, J. (2003). Comment on "a comparison of two business cycle dating methods". *Journal of Economic Dynamics and Control*, 27(9):1691–1693.

Hamilton, J. (2005). What's real about the business cycle? *Federal Reserve Bank of Saint Louis Review*, pages 435–452.

Hamilton, J. (2016). *Handbook of macroeconomics*, volume 2, chapter Macroeconomic regimes and regime shifts, pages 163–201. Elsevier.

Hansen, B. (1992). The likelihood ratio test under nonstandard conditions: testing the markov switching model of gnp. *Journal of Applied Econometrics*, 7:62–81.

Harding, D. and Pagan, A. (2001). Extracting, using and analysing cyclical information. 2001, SSRN inbook.

Harding, D. and Pagan, A. (2002). Dissecting the cycle: a methodological investigation. *Journal of Monetary Economics*, 49(2):365–381.

Harding, D. and Pagan, A. (2003). A comparison of two business cycle methods. *Journal of Economic Dynamics and Control*, 27(9):1681–1690.

Harding, D. and Pagan, A. (2005). A suggested framework for classifying the modes of cycle research. *Journal of Applied Econometrics*, 20(2):151–159.

Hausmann, R. and Panizza, U. (2003). On the determinants of original sin: an empirical investigation. *Journal of International Money and Finance*, 22(7):957–990.

Hernandez, C. (2019). Imf flexibility or neoliberal adaptation: a discursive content analysis of article iv policy biases in argentina. *Governance*, 33:135–154.

Herrera, H., Ordonez, G., and Trebesch, C. (2020). Political booms, financial crises. *Journal of Political Economy*.

Hevia, C. (2014). Emerging market fluctuations: what makes the difference? *Journal of International Eocnomics*, 94:33–49.

Horvath, J. (2018). Business cycles, informal economy and interest rates in emerging economies. *Journal of Macroeconomics*, 55:96–116.

Howard, G., Martin, R., and Wilson, B. A. (2011). Are recoveries from banking and financial crises really so different ? Board of Governors of the Federal Reserve System International Finance Discussion Paper No. 1037.

Hubrich, K. and Tetlow, R. (2015). Financial stress and economic dynamics: the transmissionof crises. *Journal of Monetary Economics*, 70:100–115.

Hwang, Y.-N. (2012). Financial friction in an emerging economy. *Journal of International Money and Finance*, 31:212–227.

IEO (2003). The imf and recent capital account crises: Indonesia, korea, brazil. Technical report, IMF.

IEO (2004). The imf and argentina: 1991-2001. Technical report, IMF.

IEO (2007). Imf exchange rate policy advice. Technical report, IMF.

IEO (2013). The role of the imf as trusted advisor. Technical report, IMF.

IEO (2016a). Behind the scenes with data at the imf: An ieo evaluation. Technical report, IMF.

IEO (2016b). The imf and the crises in greece, ireland, and portugal. Technical report, IMF.

IEO (2019). Imf's work on encouraging international policy cooperation. *IEO Background Paper*, 19-01/06.

Ilzetzki, E., Reinhart, C., and Rogoff, K. (2019). Exchange arrangements entering the twenty-first century: which anchor will hold? *The Quarterly Journal of Economics*, 134(2):599–646.

Imbs, J. (2007). Growth and volatility. *Journal of Monetary Economics*, 54:1848–1862.

IMF (2009). *Balance of payments and international investment position manual:BPM6th edition*. IMF.

Jeanne, O. and Masson, P. (2000). Currency crises, sunspots and markov switching models. *Journal of International Economics*, pages 327–350.

Jerzmanowski, M. (2006). Empirics of hills, plateaus, mountains and plains: a markov-switching approach to growth. *Journal of Development Economics*, 81:357–385.

Jones, B. and Olken, B. (2008). The anatomy of start-stop growth. *Review of Economics and Statistics*, 90(3):582–587.

Kalemli-Ozcan, S., Kamil, H., and Villegas-Sanchez, C. (2016a). What hinders investment in the aftermath of financial crises: insolvent firms or illiquid banks? *Review of Economics and Statistics*, 98(4):756–769.

Kalemli-Ozcan, S., Reinhart, C., and Rogoff, K. (2016b). Sovereign debt and financial crises: theory and historical evidence. *Journal of the European Economic Association*, 14(1):1–6.

Kaminsky, G. (2006). Currency crises: are they all the same? *Journal of International Money and Finance*, 25:503–527.

Kaminsky, G. (2016). *Banking crises*, chapter Currency crises, pages 75–78. Palgrave Macmillan, London.

Kaminsky, G., Lizondo, S., and Reinhart, C. (1998). Leading indicators of currency crises. *IMF working paper*.

Kaminsky, G. and Reinhart, C. (1999). The twin crises: the cause of banking and balance-of-payments problems. *The American Economic Review*, 89(3):473–500.

Kaminsky, G., Reinhart, C., and Vegh, C. (2003). The unholy trinity of financial contagion. *Journal of Economic Perspectives*, 17(4):51–74.

Kerekes, M. (2012). Growth miracles and failures in a markov switching classification model of growth. *Journal of Development Economics*, 98:167–177.

Kiyotaki, N. and Moore, J. (1997). Credit cycles. *Journal of Political Economy*, 105(2):211–248.

Koren, M. and Tenreyro, S. (2007). Volatility and development. *The Quarterly Journal of Economics*, 122(1):243–287.

Kose, A., Otrok, C., and Whiteman, C. (2003). International business cycles: world, regional and country-specific factors. *The American Economic Review*, 93(4):1216–1239.

Kose, A., Otrok, C., and Whiteman, C. (2008). Understanding the evolution of world business cycles. *Journal of International Economics*, 75(1):110–130.

Kraay, A. and Nehru, V. (2006). When is external debt sustainable? *The Worild Bank Economic Review*, 20(3):341–365.

Krugman, P. (1979). A model of balance-of-payments crises. *Journal of Money, Credit and Banking.*, 11(3):311–325.

Laeven, L. and Valencia, F. (2008). Systemic banking crises: a new database. *IMF Working Papers*, 08/224.

Laeven, L. and Valencia, F. (2010). Resolution of banking crises: the good, the bad and the ugly. *IMF Working Papers*, 10/146.

Laeven, L. and Valencia, F. (2012). Systemic banking crises database: an update. *IMF Working Papers*, 12/163.

Laeven, L. and Valencia, F. (2018). Systemic banking crises revisited. IMF Working Papers - WP/18/206.

Laeven, L. and Valencia, F. (2020). Systemic banking crises 2. *IMF economic review*, 68:307–361.

Lane, P. (2003). Business cycles and macroeconomic policy in emerging markets economies. *International Finance*, 6(1):89–108.

Liu, Y. (2018). *Good governance and modern international financial institutions*, chapter 4. The rule of law in the international monetary fund: past, present and future, pages 61–78. Brill.

Loayza, N., Olaberria, E., Rigolini, J., and Christiaensen, L. (2012). Natural disasters and growth: going beyond the averages. *World Development*, 40(7):1317–1336.

Loayza, N., Ouazad, A., and Ranciere, R. (2018). Financial development, growth and crisis: is there a trade-off. *NBER Working Paper*.

Loayza, N., Ranciere, R., Serven, L., and Ventura, J. (2007). Macroeconomic volatility and welfare in developing country: an introduction. *The World Bank Economic Review*, 21(3):343–357.

Lorenzoni, G. (2014). *International financial crises*, volume 4, chapter 12, pages 689–740. Elsevier.

Martin, P. and Rey, H. (2006). Globalization and emerging markets: with or without crash? *American Economic Review*, 96(5):1631–1651.

Martinez-Peria, M. (2002). *Advances in markov switching models*, chapter 8: A regime-switching approach to the study of speculative attacks: A focus on EMS crises, pages 159–194. Elsevier.

Medas, P., Poghosyan, T., Xu, Y., Farah-Yacoub, J., and Gerling, K. (2018). Fiscal crises. *Journal of International Money and Finance*, 88:191–207.

Mendoza, E. (1991). Real business cycles in a small open economy. *The American Economic Review*, 81(4):797–818.

Mendoza, E. (2010). Sudden stops, financial crises, and leverage. *The American Economic Review*, 100:1941–1966.

Mendoza, E. and Yue, V. (2012). A general equilibrium model of sovereign default and business cycles. *The Quarterly Journal of Economics*, 127:889–946.

Minsky, H. P. (1978). The financial instability hypothesis: a restatement. *Thames Papers in Political Economy*, pages 1–24.

Minsky, H. P. (1992). The financial instability hypothesis. *Levy Economic Institute Working Paper Collection*, 74:1–9.

Mishkin, F. (1992). Anatomy of a financial crisis. *Evolutionary Economics*, 2:115–130.

Mishkin, F. (1996). Understanding financial crises: a developing country perspective. *NBER worpking papers*, 5600.

Miyamoto, W. and Nguyen, T. L. (2017). Business cycles in small open economies: evidence from panel data between 1900 and 2013. *International Economic Review*, 58(3):1007–1044.

Morris, S. and Shin, H. S. (1998). Unique equilibrium in a model of self-fulfilling currency attacks. *The American Economic Review*, 88(3):587–597.

Na, S., Schmitt-Groh; S., Uribe, M., and Yue, V. (2018). The twin ds: optimal default and devaluation. *American Economic Review*, 108(7):1773–1819.

Naoussi, C. F. and Tripier, F. (2013). Trend shocks and economic development. *Journal of Development Economics*, 103:29–42.

Neumeyer, P. and Perri, F. (2005). Business cycles in emerging economies: the role of interest rates. *Journal of Monetary Economics*, 52:345–380.

Noy, I. (2009). The macroeconomic consequences of disasters. *Journal of Development Economics*, 88(2):221–231.

Obstfeld, M. (1991). Destabilizing effect of exchange rate excape clauses. *NBER Working Paper*, 3603.

Obstfeld, M. (1994). The logic of currency crises. *Cahiers Economiques et Monetaires (Banque de France)*, 43:189–214.

Obstfeld, M. (1996). Models of currency crises with self-fulfilling features. *European Economic Review*, 40(3–5):1037–1047.

Obstfeld, M. (2019). A tie that binds: revisiting the trilemma in emerging market economies. *Review of Economics and Statistics*, 101(2):279–293.

Obstfeld, M. (2020). Harry johnson's "case for flexible exchange rates" - 50 years later. *NBER Working Papers*, 26874.

Oviedo, M. and Yue, V. (2009). World interest rate and business cycles in small open economies. Mimeo.

Patnaik, I., Feldman, J., and Shah, A. (2017). An exchange market pressure measure for cross country analysis. *Journal of International Money and Finance*, 73(A):62–77.

Ranciere, R., Tornell, A., and Westermann, F. (2008). Systemic crises and growth. *The Quarterly Journal of Economics*, 123(1):359–406.

Reinhart, C. (2002). Default, currency crises and sovereign credit ratings. *The World Bank Economic Review*, 16(2):151–170.

Reinhart, C. (2012). A series of unfortunate events: common sequencing patterns in financial crises. *NBER working paper*, (17941).

Reinhart, C. (2018). International financial crises. In *Nobel Symposium: Money and Banking*.

Reinhart, C. (2019). The curious case of missing defaults. *Journal of International of Money and Finance*, 95:272–280.

Reinhart, C. and Reinhart, V. (2015). Financial crises, development and growth: a long-term approach. *The World Bank Economic Review*, 29(S):52–76.

Reinhart, C. and Rogoff, K. (2009). *This time is different*. Princeton University Press.

Reinhart, C. and Rogoff, K. (2011). From financial crash to debt crisis. *The American Economic Review*, 101:1676–1706.

Reinhart, C., Rogoff, K., and Savastano, M. (2003). Debt intolerance. *Brookings Papers on Economic Activity*, 1.

Reinhart, C. and Trebesch, C. (2016). The international monetary fund: 70 years of reinvention. *Journal of Economic Perspectives*, 30(1):3–27.

Restrepo-Echevarria, P. (2014). Macroeconomic volatility: the role of the informal economy. *European Economic Review*, 70:454–469.

Rey, H. (2018). Dilemma not trilemma: the global financial cycle and monetary policy independence. *NBER Working Papers*, 21162. Initial version 2015.

Romer, C. and Romer, D. (2004). A new measure of monetary shocks: derivation and implications. *The American Economic Review*, 94(4):1055–1084.

Romer, C. and Romer, D. (2010). The macroeconomic effects of tax changes: estimates based on new measures of fiscal shocks. *The American Economic Review*, 100:763–801.

Romer, C. and Romer, D. (2017). New evidence on the aftermath of financial crises in advanced countries. *The American Economic Review*, 107(10):3.

Romer, C. and Romer, D. (2018). Why some times are different: macroeconomic policy and the aftermath of financial crises. *Economica*, 85:1–40.

Romer, C. and Romer, D. (2019). Fiscal space and the aftermath of financial crises: how it matters and why? *Brookings Papers on Economic Activity*, pages 239–313. Spring.

Sachs, J., Tornell, A., Velasco, A., Calvo, G., and Cooper, R. (1996). Financial crises in emerging markets: the lessons from 1995. *Brookings Papers on Economic Activity*, 1996(1):147–215.

Samuelson, P. (1994). Facets of balassa-samuelson thirty years laters. *Review of International Economics*, 2(3):201–226.

Schmitt Grohe, S. and Uribe, M. (2003). Closing small open economy models. *Journal of International Economics*, 61:163–185.

Schmitt-Grohe, S. and Uribe, M. (2018). How important are terms-of-trade shocks? *International Economic Review*, 59(1):85–111.

Schularick, M. and Taylor, A. (2012). Credit booms gone bust: Monetary policy, leverage cycles and financial crises, 1870-2008. *The American Economic Review*, 102(2):1029–1061.

Seoane, H. (2013). Firm dynamics, the trend and the cycle. Mimeo.

Seoane, H. (2016). Parameter drifts, misspecification and the real exchange rate in emerging countries. *Journal of International Economics*, 98:204–215.

Seoane, H. and Yurdagul, E. (2017). On overborrowing: trend shocks and capital controls. Revised and Resubmit at Journal of International Economics.

Shiller, R. (2017). Narrative economics. *NBER Working Papers*, 23075.

Shiller, R. (2019). *Narrative economics: how stories go viral and drive major economic events*. Princeton University Press.

Sirimaneetham, V. and Temple, J. (2009). Macroeconomic stability and the distribution of growth rates. *World Bank Economic Review*, 23(3):443–479.

Smith, A., Naik, P., and Tsai, C.-L. (2006). Markov-switching model selection using kullback leibler divergence. *Journal of Econometrics*, 134:553–577.

Timmermann, A. (2000). Moments of markov switching models. *Journal of Econometrics*, 96:75–111.

Uribe, M. and Yue, V. (2006). Country spreads and emerging economies: who drives whom? *Journal of International Economics*, 69:6–36.

Varela, L. (2017). Sector heterogeneity and credit market imperfections in emerging markets. *Journal of International Money and Finance*, 70:433–451.

Wan, C. and Jin, Y. (2014). Output recovery after financial crises: an empirical study. *Emerging Markets Finance and Trade*, 50(6):209–228.

Woodford, M. (1990). Self fulfilling expectations and fluctuations in aggregate demand. *NBER Working Papers*, 3361.

Annexes

A – Estimation Procedure & Robustness of Markov Switching Models

A.1 Estimation Procedure

Define:

$$y_t = \nu_{s_t} + \sum_{j=1}^{p} a^j y_{t-j} + \epsilon_t^{s_t} \tag{5}$$

where y_t represents the quarterly growth rate of GDP; $s_t \in \{1, 2\}$ the regime; ν_{s_t} regime-specific intercept; p the number of lags considered, ranging between 0 and 4; a^j the autoregressive coefficient of the jth lag and ϵ_t an i.i.d. process with variance σ.

The estimation of the model is obtained by using the filtered probabilities of the unobserved state. Let Ψ_{t-1} be the variable containing the past history of y_t such that $\Psi_t = \{y_t, \Psi_{t-1}\}$. Then the filtered probability of the unobserved state at time t, $Pr(s_t|\Psi_t)$, offers an inference about the unknown state given the information available up to time t. Given $Pr(s_{t-1}|\Psi_{t-1})$, $Pr(s_t|\Psi_{t-1})$ derives from:

$$Pr(s_t = j|\Psi_{t-1}) = \sum_{i=1}^{2} Pr(s_t = j|s_{t-1} = i) * Pr(s_{t-1} = i|\Psi_{t-1}), \forall j \in \{1, 2\} \tag{6}$$

Then the joint conditional density-distribution of y_t and s_t is given by:

$$f(y_t, s_t = j|\Psi_{t-1}) = f(y_t|s_t = j, \Psi_{t-1}) * Pr(s_t = j|\Psi_{t-1}), \forall j \in \{1, 2\} \tag{7}$$

Summing over j, i.e. all the possible states s_t, we obtain the conditional density of the tth observation on the past information:

$$f(y_t|\Psi_{t-1}) = \sum_{j=1,2} f(y_t, s_t = j|\Psi_{t-1}) \tag{8}$$

This allows us to derive the filtered probability of the state at time t, conditional on the information available at this time:

$$Pr(s_t = j|\Psi_t) = \frac{f(y_t, s_t = j|\Psi_{t-1})}{f(y_t|\Psi_{t-1})}, \forall j \in \{1, 2\} \tag{9}$$

At this stage we can also derive the smoothed probabilities $Pr(s_t|\Psi_T), t = 1, 2, ..., T$, which provides an inference on the unobserved state using all the information in the

sample upon time T:

$$Pr(s_t = j|\Psi_T) = Pr(s_t = j|\Psi_t) \times \frac{f(y_{t+1}|s_t = j, \Psi_t)}{f(y_{t+1}|\Psi_t)} \times \frac{f(y_{t+2}|s_t = j, \Psi_{t+1})}{f(y_{t+2}|\Psi_{t+1})} \times ... \times \frac{f(y_T|s_t = j, \Psi_{T-1})}{f(y_T|\Psi_{T-1})} \quad (10)$$

The sample conditional log-likelihood can then be derived from the previous computations as:

$$logf(y_T, y_{T-1}, ..., y_1|\Psi_0) = \sum_{t=1}^{T} logf(y_t|\Psi_{t-1}) \quad (11)$$

This can be maximized numerically with respect to the unknown parameters so as to estimate the model.

A.2 Robustness

As pointed out by Harding and Pagan (2003), MSM are limited by the validity of the statistical model. An important concern is the fact that the Data Generating Process might actually not be governed by Regime Switches but by a linear specification. Testing the existence of Markov Switching proves to be difficult, as under the null of no switches, parameters governing the dynamics of the model are not identified and the Information Matrix is singular. Hansen (1992) provides a computationally burdensome test to address this question. However his methodology only offers a bound for the Likelihood Ratio statistics and no critical value. On the other hand, Garcia (1998)'s proposal ignores the singularity of the Information Matrix under the null. Carrasco et al. (2014) have developed an optimal test for parameter stability. Their test has several advantages, as it solely requires the estimation of the model under the null but also does not require the entire specification of the dynamics of random coefficients. The test has, as a result, power against a wide variety of alternatives. Finally this test proves to be useful even with few observations, which is sometimes the case for me.

B Estimation results by country and selected specification

Country.Name	spec	Intrcpt H.	Intrcpt L.	Lag 1	Lag 2	Lag 3	Lag 4
Argentina	AR0	0.016 *** (0.00271)	-0.0152 *** (0.00271)				
Armenia	AR1	0.0451 *** (0.00616)	-0.0764 *** (0.00616)	-0.412 *** (0.0165)			
Australia	AR3	0.00824 ** (0.00262)	-0.00622 * (0.00262)	-0.0231 (0.0695)	-0.0374 (0.0667)	0.0478 *** (0.00116)	
Austria	AR0	0.00741 *** (0.000987)	-0.00367 *** (0.000987)				
Belgium	AR0	0.00624 *** (0.000502)	-0.0128 *** (0.000502)				
Bolivia	AR3	0.00901 *** (0.0015)	-0.00538 *** (0.0015)	-0.262 *** (0.0761)	0.193 * (0.0815)	0.331 *** (0.00233)	
Brazil	AR0	0.00962 *** (0.00101)	-0.00817 *** (0.00101)				
Bulgaria	AR0	0.0102 *** (0.00109)	-0.0272 *** (0.00109)				
Canada	AR0	0.00778 *** (0.000456)	-0.00891 *** (0.000456)				
Hong Kong	AR0	0.015 *** (0.00154)	-0.0159 *** (0.00154)				
Colombia	AR0	0.00938 *** (0.000859)	-0.0188 *** (0.000859)				
Costa Rica	AR3	0.00705 *** (0.00156)	-0.0121 *** (0.00156)	0.0423 (0.0894)	0.142 (0.0875)	0.201 *** (0.00543)	
Croatia	AR0	0.00956 *** (0.00102)	-0.00497 *** (0.00102)				
Cyprus	AR4	0.00628 *** (0.0012)	-0.0133 *** (0.0012)	0.0319 (0.0896)	0.102 (0.0816)	0.241 ** (0.0826)	0.0764 ** (0.00374)
Czech Rep.	AR0	0.0104 *** (0.00133)	-0.000884 (0.00133)				
Denmark	AR1	0.00634 *** (0.000954)	-0.0153 *** (0.000954)	-0.103 *** (0.00437)			
Ecuador	AR0	0.0102 * (0.00498)	-0.00922 . (0.00498)				
El Salvador	AR3	0.0116 *** (0.00205)	-0.00766 *** (0.00205)	-0.37 ** (0.109)	-0.356 * (0.135)	-0.0484 *** (0.00316)	
Estonia	AR0	0.0142 *** (0.00147)	-0.0185 *** (0.00147)				
Finland	AR3	0.00612 *** (0.0015)	-0.00613 *** (0.0015)	-0.0392 (0.0757)	0.139 * (0.0683)	0.175 *** (0.00226)	
France	AR2	0.00207 *** (0.000616)	-0.00495 *** (0.000616)	0.382 *** (0.0658)	0.284 *** (0.00259)		
Germany	AR0	0.00813 *** (0.00201)	-0.000608 (0.00201)				
Greece	AR0	0.0064 * (0.00299)	-0.0216 *** (0.00299)				
Hungary	AR0	0.00963 *** (0.000961)	-0.00199 * (0.000961)				
Iceland	AR1	0.0178 *** (0.00284)	-0.00134 (0.00284)	-0.379 *** (0.00469)			
Indonesia	AR0	0.0135 *** (0)	-0.079 *** (0)				
Ireland	AR0	0.0144 *** (0.0038)	-0.00365 (0.0038)				
Italy	AR2	0.00269 (0.00233)	-0.00641 ** (0.00233)	0.412 *** (0.07)	0.0924 *** (0.000679)		
Korea	AR2	0.0117 * (0.00458)	-0.0147 ** (0.00458)	0.272 *** (0.0661)	0.103 *** (0.00173)		

Country.Name	spec	Intrcpt H.	Intrcpt L.	Lag 1	Lag 2	Lag 3	Lag 4
Latvia	AR0	0.0123 *** (0.00184)	-0.0405 *** (0.00184)				
Lithuania	AR0	0.0128 (0.0129)	-0.017 (0.0129)				
Luxembourg	AR0	0.0138 *** (0.0022)	-0.00249 (0.0022)				
Malaysia	AR0	0.0166 *** (0.000944)	-0.0376 *** (0.000944)				
Mexico	AR0	0.0108 *** (0.000873)	-0.0102 *** (0.000873)				
Morocco	AR3	0.0168 (0.0133)	-0.0576 *** (0.0133)	-0.541 *** (0.11)	-0.0112 (0.0956)	0.259 *** (0.00339)	
New Zealand	AR2	0.0158 *** (0.00298)	-0.00384 (0.00298)	-0.32 *** (0.0689)	-0.289 *** (0.00182)		
Paraguay	AR1	0.0193 *** (0.00388)	-0.00982 * (0.00388)	-0.346 *** (0.0045)			
Philippines	AR0	0.012 *** (0.00163)	-0.011 *** (0.00163)				
Portugal	AR0	0.00854 *** (0.000921)	-0.00969 *** (0.000921)				
Romania	AR0	0.0125 *** (0.00286)	-0.0113 *** (0.00286)				
Russian Fed.	AR0	0.0177 (0.0152)	-0.00106 (0.0152)				
Singapore	AR0	0.0186 *** (0.00431)	-0.0156 *** (0.00431)				
Slovak Rep.	AR2	0.00768 *** (0.0011)	-0.0434 *** (0.0011)	0.0732 (0.074)	0.278 *** (0.00422)		
Slovenia	AR2	0.00531 *** (0.00106)	-0.0246 *** (0.00106)	0.24 ** (0.088)	0.175 *** (0.00558)		
South Africa	AR0	0.00984 *** (0.000934)	-0.00257 ** (0.000934)				
Spain	AR0	0.00881 *** (0.000522)	-0.00184 *** (0.000522)				
Sweden	AR0	0.00682 *** (0.000772)	-0.0151 *** (0.000772)				
Switzerland	AR0	0.00679 *** (0.000435)	-0.00611 *** (0.000435)				
Thailand	AR2	0.0137 *** (0.00163)	-0.0331 *** (0.00163)	-0.0958 (0.0738)	-0.0884 *** (0.00436)		
Turkey	AR0	0.0167 *** (0.00387)	-0.0238 *** (0.00387)				
Ukraine	AR4	0.00861 ** (0.0026)	-0.0569 *** (0.0026)	0.206 * (0.0936)	-0.0356 (0.119)	0.112 (0.111)	-0.261 (0.00929)
United Kingdom	AR2	0.00513 *** (0.000715)	-0.00921 *** (0.000715)	0.164 * (0.0653)	0.117 *** (0.00128)		
United States	AR0	0.00846 *** (0.00152)	-0.00692 *** (0.00152)				
Venezuela	AR0	0.0157 *** (0.00195)	-0.0159 *** (0.00195)				

C The Composite Leading Indicators by the OECD

Presentation: The Composite Leading Indicators (CLI) is a monthly index that aims at **predicting economic activity's turning points** (as measured by GDP and, before 2012, the index of Industrial Production). It is developed by the OECD for its members and six major emerging economies[94]. Business cycles and turning points (in economic activity and in the CLI) are then measured on deviation-from-trend time series (derived using the Hodrick-Prescott filter) and identified with the Bry-Boschan procedure (identifying local minima and maxima).

Data components: For each country a set of series are selected[95]. The scope and number of included series varies country by country. Component series are selected with respect to their predictive ability and four economic rationales[96]. Pre-selected candidates are evaluated for their cyclical performance using diverse statistical methods. The aim is to construct leading indicators whose lead times[97] are on average between 6 to 9 months and have relatively small variances.

Construction of the CLI: In case a component series is not of the right frequency, it is either aggregated or extrapolated linearly to a monthly frequency. Afterwards, they are filtered to remove the seasonal component and outliers, using X12 or TRAMO/SEATS methodologies. Finally series are detrended and smoothed using a Hodrick-Prescott filter, as a band-pass filter with parameters set, such that the frequency cut-off occurs at frequencies higher than 12-months and lower than 120 months[98]. The Bry-Boschan procedure is then applied to identify peaks and throughs. Finally, the CLI index is constructed as a simple average of the normalized component series[99].

[94]Members: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, South Korea, Luxembourg, Mexico, the Netherlands, New-Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States.
Non-members: Brazil, China, India, Indonesia, Russia, South Africa.

[95]These time series relate to different economic areas: Domestic production in the manufacturing/service sector; Housing & construction sector; Domestic trade & utilities; International trade; Finance, interest rates & money; Labor Market; Confidence & Expectations; Prices & selected commodities.

[96]Capturing early stages of production, responding rapidly to changes in economic activity, capturing/reacting to agents' expectations and/or relating to prime movers of economic activity

[97]Lead time is the number of months between the turning point component vs reference series.

[98]Up to November 2008, the OECD used the Phase-Average Trend methodology. It yielded however too many turning points under the BB approach and as such a too variable long term trend.

[99]The algorithm constrains a phase to last at least 5 months and a cycle at least 15. Component series are de-meaned, divied by the mean standard deviation of the series and centered around 100.

Conclusion: The CLI is a monthly indicator which does not aim at identifying cycles but at predicting them using a minimum set of indicators representative of a country's economic drivers. The component series differ country by country even if some are common to a wide set of countries (interest rate spreads or production in the manufacturing sector for example). Both the aim of the approach (prediction vs dating) and its replicability on a wider set of countries (the unautomated selection procedure of component time series) make it inappropriate with respect to the goal of this article.

D Data sources and MSM specification

Data on real GDP is collected from two main sources:

- OECD - Seasonally Adjusted quarterly GDP.
- IMF - Not Seasonally Adjusted (NSA) quarterly real GDP.
- IMF* - NSA quarterly nominal GDP divided by NSA quarterly GDP deflator.

Time series were seasonally adjusted using X13-ARIMA.

Country Groups are derived using World Bank Income classification as of 1995. When data was not available at that date, classification was derived with information from 2000. AM stands for advanced markets (high-income), EM for emerging markets (upper-middle) and DM developing markets (lower-middle and low income).

Countries are also split into the following regions: Africa & the Middle East (AME); Asia; Central and Eastern Europe (CEE); Latin & South America (LSA); Western Europe (WE) and Western Countries (WC) which includes the english speaking countries of North America (Canada, United States) and the Pacific zone (Australia, New Zealand).

Country.Name	name.source	y.beg	y.end	tot.obs	Grp	Reg.	is.cmd	has.msm
Albania	IMF - hist.	2005Q1	2019Q4	60	DM	CEE	0	0
Argentina	IMF - hist.	1990Q1	2019Q4	120	EM	LSA	1	1
Armenia, Rep. of	IMF - hist.	1999Q4	2017Q2	71	DM	CEE	0	1
Australia	IMF - hist. sa	1970Q1	2019Q4	200	AM	WC	0	1
Austria	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Belgium	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Belize	IMF - hist.	2000Q1	2015Q4	64	DM	LSA	0	0
Bolivia	IMF - hist.	1990Q1	2018Q3	115	DM	LSA	1	1
Bosnia and Herzegovina	IMF - hist.	2008Q1	2018Q4	44	DM	CEE	0	0
Botswana	IMF - hist.	1994Q1	2016Q4	92	EM	AME	1	0
Brazil	OECD	1996Q1	2019Q4	96	EM	LSA	1	1
Bulgaria	IMF - hist. sa	1995Q1	2019Q4	100	DM	CEE	0	1
Canada	OECD	1970Q1	2020Q1	201	AM	WC	1	1
Chile	IMF - hist.	1986Q1	2019Q4	136	EM	LSA	1	0
China, P.R.: Hong Kong	IMF - hist.	1973Q1	2019Q4	188	AM	Asia	0	1
China, P.R.: Macao	IMF - hist.	1998Q1	2019Q3	87	AM	Asia	0	0
China, P.R.: Mainland	IMF - hist.	2000Q1	2019Q3	79	DM	Asia	0	0
Colombia	OECD	1994Q1	2020Q1	105	DM	LSA	1	1

Country.Name	name.source	y.beg	y.end	tot.obs	Grp	Reg.	is.cmd	has.msm
Costa Rica	OECD	1991Q1	2019Q4	116	EM	LSA	1	1
Croatia, Rep. of	IMF - hist.	1997Q1	2019Q4	92	EM	CEE	0	1
Cyprus	IMF - hist. sa	1995Q1	2019Q4	100	AM	WE	0	1
Czech Rep.	IMF - hist.	1994Q1	2019Q4	104	EM	CEE	0	1
Denmark	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Dominican Rep.	IMF - hist.	2007Q1	2017Q4	44	DM	LSA	0	0
Ecuador	IMF - hist.	1991Q1	2019Q1	113	DM	LSA	1	1
Egypt, Arab Rep. of	IMF - hist.	2002Q1	2013Q4	48	DM	AME	0	0
El Salvador	IMF - hist.	2000Q1	2018Q4	76	DM	LSA	0	1
Estonia, Rep. of	OECD	1995Q1	2020Q1	101	EM	CEE	0	1
Finland	OECD	1970Q1	2020Q1	201	AM	WE	0	1
France	IMF - hist. sa	1970Q1	2020Q1	201	AM	WE	0	1
Georgia	IMF - hist.	1996Q1	2018Q3	91	DM	CEE	0	0
Germany	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Greece	OECD	1995Q1	2019Q4	200	AM	WE	0	1
Guatemala	IMF - hist.	2001Q1	2018Q3	71	DM	LSA	1	0
Hungary	OECD	1995Q1	2020Q1	101	EM	CEE	0	1
Iceland	OECD	1970Q1	2019Q4	200	AM	WE	1	1
India	OECD	1996Q2	2019Q4	95	DM	Asia	0	0
Indonesia	OECD	1990Q1	2020Q1	121	DM	Asia	1	1
Ireland	OECD	1970Q1	2019Q4	200	AM	WE	0	1
Israel	IMF - hist.	1980Q3	2019Q3	199	AM	AME	0	0
Italy	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Jamaica	IMF - hist.	1996Q1	2016Q3	83	DM	LSA	0	0
Japan	OECD	1970Q1	2020Q1	201	AM	Asia	0	0
Korea, Rep. of	IMF - hist. sa	1970Q1	2020Q1	201	AM	Asia	0	1
Kyrgyz Rep.	IMF - hist.	2000Q1	2014Q1	57	DM	Asia	0	0
Latvia	OECD	1995Q1	2020Q1	101	EM	CEE	0	1
Lithuania	IMF - hist. sa	1995Q1	2020Q1	101	EM	CEE	0	1
Luxembourg	OECD	1970Q1	2019Q4	200	AM	WE	0	1
Malaysia	IMF - hist.	1988Q1	2018Q4	124	EM	Asia	0	1
Malta	IMF - hist. sa	2000Q1	2019Q4	80	EM	WE	0	0
Mauritius	IMF - hist.	2000Q1	2018Q2	74	EM	AME	0	0
Mexico	OECD	1970Q1	2020Q1	201	EM	LSA	0	1
Morocco	IMF - hist.	1990Q1	2014Q4	100	DM	AME	0	1
Netherlands, The	OECD	1970Q1	2020Q1	201	AM	WE	0	0
New Zealand	OECD	1970Q1	2019Q4	200	AM	WC	0	1
North Macedonia, Rep. of	IMF - hist.	2000Q1	2019Q4	80	DM	CEE	1	0
Norway	OECD	1970Q1	2020Q1	201	AM	WE	0	0
Paraguay	IMF - hist.	1994Q1	2019Q4	104	DM	LSA	0	1
Peru	IMF - hist.	1979Q1	2017	153	DM	LSA	1	0

Country.Name	name.source	y.beg	y.end	tot.obs	Grp	Reg.	is.cmd	has.msm
Philippines	IMF - hist.	1981Q1	2018Q4	152	DM	Asia	1	1
Poland, Rep. of	OECD		2020Q1	101	EM	CEE	0	0
Portugal	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Romania	IMF - hist. sa		2020Q1	101	DM	CEE	1	1
Russian Federation	OECD		2019Q4	100	DM	CEE	0	1
Serbia, Rep. of	IMF - hist. sa		2019Q4	100	DM	CEE	0	0
Singapore	IMF - hist. sa	1975Q1	2019Q4	180	AM	Asia	0	1
Slovak Rep.	OECD	1993Q1	2020Q1	109	EM	CEE	0	1
Slovenia, Rep. of	IMF - hist. sa		2019Q4	100	EM	CEE	0	1
South Africa	OECD	1970Q1	2019Q4	200	EM	AME	1	1
Spain	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Sweden	OECD	1970Q1	2020Q1	201	AM	WE	0	1
Switzerland	IMF - hist. sa	1970Q1	2019Q4	200	AM	WE	0	1
Tanzania, United Rep. of	IMF - hist.	2001Q1	2013Q3	51	DM	AME	0	0
Thailand	IMF - hist. sa	1993Q1	2019Q3	107	DM	Asia	0	1
Tunisia	IMF - hist.	2000Q1	2010Q4	44	DM	AME	0	0
Turkey	OECD	1970Q1	2020Q1	201	DM	AME	0	1
Ukraine	IMF - hist.	2000Q1	2019Q4	80	DM	CEE	0	1
United Kingdom	OECD	1970Q1	2020Q1	201	AM	WE	0	1
United States	OECD	1970Q1	2020Q1	201	AM	WC	0	1
Uruguay	IMF - hist.	2005Q1	2018Q4	56	EM	LSA	1	0
Venezuela, Rep. Bol. de	IMF - hist.	1998Q1	2015Q4	72	EM	LSA	1	1

Summary Table:

Table 20: Countries by income group, region and commodity dependence

	Developing Markets
AME	Morocco, Turkey
Asia	**Indonesia**, **Philippines**, Thailand
CEE	Armenia, Bulgaria, **Romania**, Russian Fed., Ukraine
LSA	**Bolivia**, **Colombia**, **Ecuador**, El Salvador, Paraguay
Region	**Emerging Markets**
AME	**South Africa**
Asia	Malaysia
CEE	Croatia, Czech Rep., Estonia, Hungary, Latvia, Lithuania, Slovak Rep., Slovenia
LSA	**Argentina**, **Brazil**, **Costa Rica**, Mexico,**Venezuela**
	Advanced Markets
Asia	Hong-Kong, Korea, Singapore
WE	Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, **Iceland**, Ireland, Italy, Luxembourg, Portugal, Spain, Sweden, Switzerland, UK
WC	Australia, **Canada**, New-Zealand, USA

Commodity dependent countries in bold.
AME = Africa & the Middle East ; CEE = Central & Eastern Europe ; LSA = Latin & South America ; WE = Western Europe ; WC = Western Countries

E Results by region and commodity

E.1 Dataset – descriptive statistics

Countries located in Africa and the Middle East form the most volatile group, followed by Central and Eastern European countries. As can be expected, Western European countries and the other english-speaking countries display lower volatility than other regions. Surprisingly, Latin and South American countries do not display a high average volatility when compared to other regions that contain mostly emerging and developing markets. This seems to be the result of the low volatility displayed by some smaller countries (Bolivia, Costa Rica and El Salvador). On the other hand, Argentina, often taken in the literature as an example for emerging markets higher volatility, exhibits the highest volatility of the region and among the highest ones of the sample of countries. Commodity exporting countries do not differ statistically from the group of non-commodity exporters. This is most notably due to the high diversity of countries that make both groups.

	Nb of Country	Nb of Obs.	Business Cycle Volatility – $\sigma_{\Delta g}$						
			mean	std	max	qrt3	median	qrt1	min
by region									
AME	3	501	2.11	1.39	3.63	2.71	1.80	1.35	0.90
Asia	7	1073	1.54	0.26	1.83	1.65	1.59	1.52	1.01
CEE	13	1261	1.77	1.16	5.26	1.74	1.43	1.07	0.92
LSA	10	1118	1.32	0.55	2.19	1.75	1.08	1.01	0.69
WE	17	3311	1.02	0.39	2.18	1.14	1.03	0.76	0.50
WC	4	802	0.95	0.39	1.54	0.98	0.77	0.74	0.73
by commodity dependence									
NoCommod (all)	41	6354	1.41	0.86	5.26	1.61	1.14	0.92	0.50
NoCommod (AM)	22	4281	1.05	0.36	1.83	1.29	1.04	0.92	0.50
NoCommod (EM)	10	1134	1.31	0.39	2.19	1.47	1.19	0.92	0.92
NoCommod (DM)	9	939	2.38	1.32	5.26	2.63	1.80	1.68	1.00
Commod (all)	13	1712	1.28	0.53	2.19	1.59	1.04	0.91	0.69
Commod (AM)	2	401	1.46	1.03	2.18	1.82	1.46	1.09	0.73
Commod (EM)	5	604	1.40	0.62	2.19	1.95	1.04	0.91	0.90
Commod (DM)	6	707	1.13	0.30	1.59	1.27	1.08	1.02	0.69

Table 21: Descriptive Statistics - real GDP and BC volatility - by region

AME - Africa & Middle East, CEE - Central & Easter Europe, LSA - Latin & South America, WE - Western Europe, WC - Western Countries

E.2 Business Cycles – Growth regimes

Table 23 presents the main information on growth regimes region wise.

Table 23: MSM estimations: Regime Analysis – by region and commodity group

(in %)	Mean g_{Exp}	Mean g_{Rec}	Std.Err.(rsdls)	P(Enter Rec)	P(Exit Rec)
Africa and the Middle East (3 c.)					
avg	1.32	-2.36	1.46	6.09	35.6
std	0.343	2.10	0.891	3.65	15.7
Asia (7 c.)					
avg	1.51	-3.01	1.14	2.51	34.9
std	0.294	2.34	0.288	1.17	10.9
Central and Eastern Europe (13 c.)					
avg	1.34	-2.79	1.29	2.91	24.7
std	0.604	2.59	0.879	1.04	22.3
Latin and South America (10 c.)					
avg	1.16	-1.16	0.980	5.94	32.0
std	0.301	0.536	0.388	3.20	12.9
Western Europe (17 c.)					
avg	0.851	-0.974	0.804	4.09	27.0
std	0.287	0.713	0.357	1.76	15.3
Western Countries (4 c.)					
avg	0.855	-0.609	0.774	3.61	26.4
std	0.0886	0.273	0.339	1.63	7.70
Commodity dependent (13 c.)					
avg	1.18	-1.60	0.951	4.63	28.1
std	0.243	1.98	0.412	3.35	14.9
Non Commodity dependent (41 c.)					
avg	1.12	-1.81	1.06	3.82	29.0
std	0.497	1.81	0.624	1.86	16.4

Complete information on the distribution by region and by commodity group can be found in Annex **??**

Expansions and recessions are milder in Western Europe and Western Countries (WEC) than in other regions[100]. This illustrates the fact that this group aggregates mostly AM. The remaining AM can be found in Asia (Japan, Hong-Kong, Singapore and South Korea).

[100]For expansions, the difference is significant at the 5% level between WEC vs AME(p.val = 0.011), and at the 1% level with Asia (p.val = 5.7e-05), CEE (p.val = 1.4e-04) and LSA (p.val = 0.0029). For recessions, the difference is significant at the 1% with Asia (p.val = 2.8e-04), at the 5% level with CEE (p.val = 0.029) and at the 10% level with LSA (p.val = 0.087). The difference is not statistically significant with AME (p.val = 0.12). A one-sided wilcoxon test was used.

Asian and Central and Eastern European countries have lower probabilites to enter recessions than other country groups (2.5 and 2.9% respectively). On the other hand AME and LSA face twice as higher entrance probabilities (6.1 and 5.9% respectively).

WEC countries display inbetween probability to enter a recession (4.1 and 3.6%), nevertheless they exit recessions with a lower probability than other regions (27.0 and 26.4% respectively). CEE countries are an exception as they underperfom all other regions (24.7 vs 35.6 in AME, 34.9 in Asia and 32% in LSA).

As observed in the literature (Calderon and Fuentes, 2014), Emerging Markets and Developing Economies form a more heterogeneous group than Advanced Economies. CEE countries' growth can be described as an alternance of strong expansions and rare but prolonged and very costly recessions. Asian countries display even stronger expansions, but their recessions, if as rare and costly as in CEE, are more likely to end faster. As in Asia, AME countries display strong expansions and short and costly recessions but the latter interrupt the former more frequently. LSA countries display weaker expansions that are more frequently interupted by recessions, even if milder.

There are no significant differences between commodity and non-commodity countries. This can be explained by the greater heterogeneity of the second group of countries. Overall this translates the fact that being a commodity exporter is not a sufficient determinant to illustrate different business cycle patterns.

Stylized Facts 3 – On recessions

- ▷ Emerging and developing markets form a more heterogeneous group than advanced markets illustrated by more pronounced regional disparities.

E.3 Business Cycles - Expansions/Recessions

Region-wise, we observe that AME and LSA countries experience on average short expansions (20 quarters) that translate into low cumulated gains (+25%). There is a particularly high number of such episodes on average by country (7 in AME, 4 in LSA). As LSA countries tend to have shorter time series (40% less observations), the figures are in practice very similar. For recessions, these figures are again very high with around 6 recession per

country in AME and 4 in LSA.

In these countries, recessions are often short (5 quarters) but associated to significant cumulated losses (-5.9 and -6.5% respectively in AME and LSA). On average, recessions in Latin and South American countries are not too steep (-1.35% per quarter) when compared to other emerging and developing regions. In South Africa they follow more broadly emerging and developing patterns. Folowing a recession LSA (AME) countries tend to grow 20% (16%) faster than during expansions.

Asian countries display both fruitful (+59% cumulated gains) and very long (38 quarters) expansions. Quite mechanically, expansions in Asian countries are strong (+1.5% per quarter). On average Asian countries experience 3 to 4 expansions and around 2 recessions.

Recessions are the shortest among all regions (1 year), but they are associated to very severe economic crises. Cumulated losses average at -7.4% over a recession, underlying a steep slope (-2.2% per quarter, the highest average). Nevertheless recessions are followed by strong rebound, 36% faster than otherwise in expansion.

(in %)	Mean g_{Exp}	Mean g_{Rec}	Std.Err.(rsdls)	P(Enter Rec)	P(Exit Rec)
Commodity exporters (13)					
avg	1.18	-1.60	0.951	4.63	28.1
std	0.243	1.98	0.412	3.35	14.9
max	1.60	-0.097	1.92	10.3	52.5
qt3	1.29	-0.82	1.05	7.46	34.5
med	1.20	-1.10	0.822	3.45	28.1
qt1	0.98	-1.59	0.691	2.33	15.4
min	0.78	-7.90	0.479	0.848	8.9
nb	13	13	13	13	13
Non Commodity Exporters (41)					
avg	1.12	-1.81	1.06	3.82	29.0
std	0.497	1.81	0.624	1.86	16.4
max	3.19	-0.0608	3.99	10.0	74.4
qt3	1.38	-0.497	1.21	4.36	37.3
med	1.02	-1.29	0.887	3.54	27.3
qt1	0.813	-2.38	0.719	2.63	17.1
min	0.544	-7.65	0.351	1.14	3.27
nb	41	41	41	41	41

Table 24: MSM estimations - Regime Analysis

avg - average, std - standard deviation , qt - quartile, med - median

In Central and Eastern European countries, expansions last on average 31 quarters and are associated to significant gains (+40% over an expansion). These countries belong to the fastest growing regions, with an average slope of +1.55% per quarter. On average,

countries experience roughly 3 expansions and 2 recessions. As for Latin and South American countries, time series are shorter for this region as they start around 1995 (50% less observation than the maximum). When this factor is considered, the figures are much more in line with other emerging and developing regions.

Recessions are, on average, very long (2 years and a half) and very costly (-10.5% cumulated losses), displaying similar steepness as AME and Asia. Quite distinctively, recessions are followed by slower growth than average after recessions. CEE countries fail to rebound.

In WEC, expansions are on average 2 to 3 years long (30 quarters) and associated to modest gains (+24% for WE and +26% for WC). In Western Europe, the average slope in expansion is the lowest of all regions (0.87% per quarter). On average, expansions in WC – which includes, beyond the USA, Australia, Canada and New-Zealand – are as steep as in LSA. There is an average of 5 to 6 expansion and 5 recession per country.

On average, recessions in WEC countries are 2 to 3 times less severe and less steep than elsewhere (-3.4 and -3.1% cumulated losses respectively and -0.62% and -0.77% per quarter) and last around one year and a half (6.5, 5.5 quarters respectively). On average, in the year following a recession's end, WE countries fail to grow as fast as during expansions (8% slowlier) whereas WC experience 18% faster growth after recessions and do tend to bounce back quicklier. The particularities of WC as a group stems more certainly from the fact that most of these countries are small open economies who have struggled in the past with currency and external issues and volatility.

As could be expected from previous subsection, there are no significant differences between commodity and non-commodity dependent countries whatever the characteristics considered.

Stylized facts: There is important heterogeneity across regions.

- ▷ Africa, the Middle East and Latin and South America display short and relatilively slower expansions and costly and relatively short but frequent recessions.
- ▷ Asian countries experience long and fruitful expansions but short and very costly recessions that often lead to stron rebounds.
- ▷ Central and Eastern Europe display relatively long and strong expansions but their recessions are very long and costly. Interestingly they are associated to

growth slowdowns.

- ▷ Western Europe and Countries experience relatively long and mild expansions. Recessions are yet 2 to 3 times less severe and less steep than elsewhere.

E.4 Financial Crises - Descriptive Statistics and Probabilities

Financial crises by group

Table 28: Descriptive Statistics - Number of financial Crises by type and country-group

(nb of)	country	obs.	sov.crs	cur.crs	bkg.crs
EM	15	1729	10	29	14
DM	15	1628	18	34	16
AM	24	4548	8	61	22
AME	3	498	6	16	2
Asia	7	1068	7	17	6
CEE	13	1250	6	14	14
LSA	10	1107	11	22	9
WE	17	3187	6	43	19
WC	4	795	0	12	2
CMD	13	1703	13	41	11
NO.CMD	41	6202	23	83	41

Africa and the Middle East display a high frequency of currency crisis and default per country (5/1.6 per c.). This particular exposure to currency crises illustrates the cases of South Africa and Turkey (Morocco forms the last member of the trio). South Africa's exposure to currency crises stems mainly from the country's high exposure to the commodity roller coaster through gold prices. The turkish history has been one of weakened fundamentals, political uncertainty and speculative attacks. Over the first part of the sample, Turkey experiences a currency crises every 4 years. Beginning 90's, the pace slows to 7 years of break, but a currency crisis is never too far away from Turkey as the last crisis illustrates (2018.q3 10 years after the 2008q4 crisis).

Asian countries, well within the average, face 1 banking and sovereign crises and 2.4 currency crises per country.

Central and Eastern Europe displays a low number of sovereign crises (1 per 2 countries), and 1 currency and banking crises per country. Note that this region is the less exposed to currency crises. Currency crises shock the group in four waves, 2 to 4 countries at a time. The first in 1996. The second with the global emerging market crises end of

the 90's. The third with the GFC and the last in 2014. Romania faces 2 currency crises, Russia 3.

Latin and South American countries fell within average, with one sovereign and banking crises and two currency crises by country.

Western Europe displays a low occurrence of sovereign default by country (1 in 3). Banking crises are, as elsewhere, evenly distributed. On average western european countries face 2 currency crises. 93% of the currency crises occurred, as could be expected with the introduction of the Euro, before 1998 (before 1995 to be accurate).

Western countries – Australia, Canada, New Zealand and the United States – do not display any sovereign crises over the sample. 2 banking crises in the USA (1988q4 and 2007q4). Australia, Canada and New-Zealand experienced each 4 currency crises. These crises are key characteristics of small open advanced economies struggling with commodity dependence, challenging reserves management, speculative attacks and expressed doubts about the monetary policy stance.

Nevertheless, as AM display longer time series, it is more useful to compare probabilities between groups.

Exposure to financial crises:

Table 29: Descriptive Statistics - Annual probability of experiencing a financial crisis by type and country group

(in %)	Prob(sov.crs)	Prob(cur.crs)	Prob(bkg.crs)
EM (15c.)	2.31	6.71	3.24
DM (15c.)	4.42	8.36	3.93
AM (24c.)	0.70	5.36	1.93
AME (3c.)	4.82	12.9	1.61
Asia (7c.)	2.62	6.37	2.25
CEE (13c.)	1.92	4.48	4.48
LSA (10c.)	3.97	7.95	3.25
WE (17c.)	0.75	5.40	2.38
WC (4c.)	0.00	6.04	1.01
CMD (13c.)	3.05	9.63	2.58
NO.CMD (41c.)	1.48	5.35	2.64

Looking at differences and similarities between regions, we can observe that Sovereign Crises are particularly frequent in AME and LSA (from 1.5 to 5.5 times more likely). WEC are, as can be expected given group composition, less frequently exposed.

Currency crises are particularly frequent in AME (12.9%), followed by LSA (7.95%), but less so in CEE (4.48%). They remain frequent enough in Asia, WE and WC.

Banking crises are more frequent in CEE and LSA (4.48 and 3.25%) than in other regions, AME and WC are the less exposed regions (1.61 and 1.01%, but with lower country coverage (only 3 and 4 countries per group)).

Overall, AME are highly exposed to currency and sovereign crises.

LSA cumulate as well a high exposure to banking crises.

CEE have been little exposed to currency crises relative to other regions but have suffered in more occasions from banking crises.

Asian countries seem to experience the same share of banking and currency crises as WEC but present a 3 times bigger exposure to sovereign crises.

WEC experience far less sovereign crises. Currency crises are an important feature for these countries. This can be easily traced back to (i) the many currency crises in European countries during the construction of the Euro, to (ii) the many currency crises that have impacted small open advanced economies, often commodity exporters (e.g. New-Zealand, Australia, Canada, Iceland, Norway) and to (iii) the currency crises that have affected Asian countries that have reached the AM group (South Korea, Hong-Kong, Singapore).

Opposing non- to commodity exporter, it is interesting to note that, if there are no difference in exposure to banking crises, sovereign and currency crises are around twice a frequent. This observation comes along well with two main facts from the literature. First, commodity exporters are more exposed to terms-of-trade shocks and highly volatile world prices, the value of their currency being thus greatly influenced by trade flows, and subject to crises. Second commodity exporters have been described as often suffering from a natural resource curse. From a sovereign perspective, the more the economy is reliant upon one source of revenue the more likely she is to face shortening on her earnings, should said sector be severely affected.

E.5 Business cycle phases and financial crises

Tables 30 presents key characterisitcs for recessions without/with financial crises by region:

For countries in Africa and the Middle East and Latin and South America, there is no difference in the main characteristics of recessions whether we filter by financial crises

or not. Recessions last between one and one and a half year entail on average important losses, circa -6% of GDP. In AME, the rebound is stronger on average following a financial crisis, but the difference is not significant. For LSA, rebounds are very similar with and without financial crises.

In Asia, when associated to financial crises, recessions are 85%*** longer (+2 quarters). If these episodes are not associated to steeper losses, on average, as they are longer, these recessions entail larger cumulated losses. Nevertheless they are not associated to strongeer rebound. In particular, without a financial crisis, the countries bounce back 67%** faster after the end of a recession. If a financial crisis has hit the country, she will not endure slower growth after the recession but will neither recuperate faster than usual[101]. Another way of seeing this key Asian characteristic is to look at the interquartile information. Without financial crises, 50% of recessions are followed by, at least 18% faster than expansion growth, and up to 2.4 times faster! Never in another region does the third quartile pass the *2 thresholds.

[101]The respective p.values for the two statistically significant results are 2.0e-3 and 1.6e-2

Table 30: Recessions and financial crises – by region

epsd	Recession ∩ No Crisis		Recession ∩ Crisis Episode	
char	average (std.dev)	[qt1 : med : qt3]	average (std.dev)	[qt1 : med : qt3]
Africa and the Middle East (3 c.)				
durt	5.86 (4.41)	[2.5 : 4 : 8]	4.33 (1.83)	[2.75 : 5 : 5]
svrt	-4.95 (5.34)	[-6.97 : -4.69 : -0.82]	-6.42 (5.1)	[-11.97 : -4.85 : -2.42]
stpn	-2 (2.83)	[-2.99 : -0.36 : -0.18]	-2.05 (2.33)	[-2.58 : -1.07 : -0.61]
rbnd	0.97 (1.32)	[0.39 : 0.6 : 1.02]	1.25 (0.45)	[0.94 : 1.19 : 1.58]
nb	7 (6)	7 (6)	12 (12)	12 (12)
Asia (7 c.)				
durt	2.75 (0.89)	[2 : 2.5 : 3.25]	5.09 (2.02)	[4 : 5 : 6.5]
svrt	-6.23 (1.23)	[-7.22 : -5.7 : -5.28]	-8.24 (5.84)	[-13.07 : -7.54 : -3.32]
stpn	-2.4 (0.62)	[-2.69 : -2.34 : -1.93]	-2.08 (2.22)	[-2.15 : -1.89 : -0.61]
rbnd	1.77 (0.74)	[1.18 : 1.76 : 2.38]	1.06 (0.41)	[0.94 : 1.09 : 1.32]
nb	8 (8)	8 (8)	11 (11)	11 (11)
Central and Eastern Europe (13 c.)				
durt	9.2 (7.63)	[4.25 : 6 : 9.5]	10.14 (8.9)	[3.25 : 7 : 14]
svrt	-9.58 (9.3)	[-16.67 : -5 : -2.82]	-11.23 (9.99)	[-17.3 : -9.77 : -5.76]
stpn	-1.39 (1.56)	[-2.03 : -0.69 : -0.46]	-2.59 (2.92)	[-3.75 : -1.95 : -0.71]
rbnd	1.08 (0.44)	[0.8 : 1.06 : 1.15]	0.59 (0.8)	[0.23 : 0.63 : 0.96]
nb	10 (10)	10 (10)	14 (13)	14 (13)
Latin and South America (10 c.)				
durt	4.22 (2.13)	[3 : 4 : 5.75]	5.95 (4.95)	[3.5 : 4 : 5.5]
svrt	-6.2 (8.63)	[-6.26 : -2.69 : -1.6]	-6.85 (5.39)	[-8.41 : -7.06 : -3.53]
stpn	-1.24 (1.27)	[-1.64 : -0.80 : -0.53]	-1.45 (1.3)	[-1.64 : -1.01 : -0.78]
slpe	1.22 (0.89)	[0.58 : 1.08 : 1.31]	1.18 (0.51)	[[0.9 : 1.08 : 1.57]
nb	18 (15)	18 (15)	19 (18)	19 (18)
Western Europe (17 c.)				
durt	5.49 (5.17)	[2 : 3 : 6]	7.86 (6.76)	[3 : 5 : 10]
svrt	-1.71 (3.1)	[-2.29 : -0.89 : -0.2]	-5.58 (5.65)	[-7.66 : -3.92 : -1.98]
stpn	-0.44 (0.65)	[-0.84 : -0.22 : -0.05]	-0.86 (0.56)	[-1.21 : -0.62 : -0.47]
rbnd	0.97 (0.53)	[0.66 : 0.87 : 1.2]	0.84 (0.59)	[0.43 : 0.75 : 1.32]
nb	47 (46)	47 (46)	35 (35)	35 (35)
Western Countries (4c.)				
durt	3.58 (1.51)	[2 : 3.5 : 4.25]	8.71 (7.16)	[5 : 6 : 10]
svrt	-2.36 (1.51)	[-3.26 : -2.17 : -1.43]	-4.35 (1.36)	[-5.53 : -4.06 : -3.34]
stpn	-0.77 (0.53)	[-1.12 : -0.66 : -0.36]	-0.77 (0.5)	[-1.12 : -0.68 : -0.39]
rbnd	1 (0.56)	[0.6 : 0.94 : 1.34]	1.47 (0.63)	[0.9 : 1.66 : 1.88]
nb	12 (12)	12 (12)	7 (7)	7 (7)

The table presents, for all regions, information on the distribution – *av*era*g*e, *st*andard *d*eviation, 3rd *q*uar*t*ile, *med*ian, 1st *q*uar*t*ile – for four elements from the taxonomy of recessions.
Duration measures the number of quarters in an episode, **severity** the real gdp cumulated losses over the expansion and **steepness** the loss per quarter and **rebound** the strength of growth in the year after the recession when compared to average growth in expansion.

In Central and Eastern European countries, recessions are long: 9 to 10 quarters on average without/with financial crises. Recessions are 86% steeper[102] when associated to financial crises. Overall this does not entail statistically larger cumulated losses[103]. On average, after a 'normal' recession, CEE countries do not bounce back strongly (8% faster than during the average expansion). Yet, after a crises episode's recession, these countries grow 46%** slowlier than during expansions. This suggest that in CEE, financial crises tend to have long lasting effects on growth.

In Western Europe and Countries, recessions are on average 3 to 4 quarters longer with financial crises (duration is multiplied by 1.4** in WE and 2.4* in WC). They entail 1.5***/1.8*** bigger cumulated losses. In WE, this higher severity of recessions with financial crises is due both to longer recessions and 95%*** steeper falls. In WC, there is no difference in steepness with or without crises. Differences in cumulated losses stem from differences in duration only. On average, WE grow slowlier after a recession than during expansions, this is even more pronounced after financial crises episodes but the difference is not statistically significant. In WC there is no slowdown after a recession. When associated to financial crises, rebound are usually 47%* stronger. This can illustrate the fact that this group entail several small open advanced economies exposed to currency crises which can have ex post liberating effects on growth.

Table 31 repeats the exercise by classifying countries based on their dependence on natural resources. Commodity dependence highlight a key difference between countries.

[102] p.value = 0.102

[103] Steepness is computed by episode as the ration between amplitude and duration. It makes sense that the average steepness is not equal to the average amplitude divided by the average duration. There might be some combination effects (long but lesst costly recessions and short but very cosstly recessions).

Table 31: Recessions and financial crises – by commodity dependence

epsd	Recession ∩ No Crisis		Recession ∩ Crisis Episode	
char	average (std.dev)	[qt1 : med : qt3]	average (std.dev)	[qt1 : med : qt3]
Non commodity dependent (41c.)				
durt	4.92 (4.18)	[2 : 3.5 : 6]	7.56 (6.9)	[3 : 5 : 8]
svrt	-3.51 (4.9)	[-5.02 : -2.17 : -0.58]	-7.2 (6.61)	[-9.97 : -5.3 : -3.47]
stpn	-0.95 (1.26)	[-1.57 : -0.54 : -0.15]	-1.61 (1.86)	[-1.89 : -1.04 : -0.54]
rbnd	1.09 (0.65)	[0.69 : 0.94 : 1.38]	0.98 (0.66)	[0.5 : 1.01 : 1.41]
nb	84 (81)	84 (81)	70 (69)	70 (69)
Commodity dependent (13c.)				
durt	6.61 (6.64)	[3 : 4 : 7.75]	6.07 (3.91)	[4 : 5 : 7]
svrt	-5.86 (8.89)	[-6.26 : -3.47 : -0.57]	-6.3 (5.8)	[-8.43 : -4.76 : -2.35]
stpn	-1.11 (1.34)	[-1.55 : -0.73 : -0.14]	-1.23 (1.51)	[-1.44 : -0.79 : -0.58]
rbnd	1.09 (0.89)	[0.44 : 0.82 : 1.16]	1.01 (0.5)	[0.65 : 0.97 : 1.11]
nb	18 (16)	18 (16)	28 (27)	28 (27)

The table presents, for all regions, information on the distribution – *av*era*g*e, *st*andard *d*eviation, 3rd *q*uar*t*ile, *med*ian, 1st *q*uar*t*ile – for four elements from the taxonomy of recessions.
Duration measures the number of quarters in an episode, **severity** the real gdp cumulated losses over the expansion and **steepness** the loss per quarter and **rebound** the strength of growth in the year after the recession when compared to average growth in expansion.

Non-dependent countries, when hit by financial crises, experience 1.5*** times longer recessions, that are 70%*** steeper and thus associated to 2*** times more severe economic crises[104]. Financial crises tend to slow recovery (1.09 vs 0.98) but the difference is not statistically different (p.val = 0.156).

On the contrary, for dependent countries, there is little to no difference on average with vs without financial crises. This suggest that 'normal' recessions are already very costly, financial crises do not necessarily amplify the macroeconomic vulnerabilities and losses.

Looking at countries' experience of financial crises, the following facts can be noted:

Stylized facts

- There is lot of heterogeneity among regions involving emerging and developing markets.

[104] p.values (in order): 3.0e-3 ; 6.4e-3 ; 8.8e-5.

- Countries in Africa the, Middle East and Latin and South America experience costly recessions irrespective of the presence of financial crises
- When hit by financial crises, Asian countries experience longer recessions. Financial crises' recessions are not followed by strong rebound as is the case without.
- When hit by financial crises, Central and Eastern European countries experience steeper recessions that are followed by slow recoveries.

⊙ The two regions including mostly advanced economies display greater homogeneity. Financial crises are associated to longer and more severe recessions. In Western Europe, these recessions are steeper and not followed by a strong rebound. In Western Countries, duration is the sole driver of the higher economic costs of recessions with financial crises. The episodes are often followed by a stronger rebound.

⊙ If countries are commodity dependent, financial crises are not associated to costlier or longer recessions. If not, recessions are costlier, steeper and more severe.

(in %)	Mean g_{Exp}	Mean g_{Rec}	Std.Err.(rsdls)	P(Enter Rec)	P(Exit Rec)
Africa and the Middle East					
avg	1.32	-2.36	1.46	6.09	35.6
std	0.344	2.10	0.891	3.65	15.7
max	1.67	-0.257	2.44	10.3	53.1
qt3	1.48	-1.32	1.84	7.16	42.0
med	1.30	-2.38	1.25	4.02	30.8
qt1	1.14	-3.42	0.970	3.98	26.8
min	0.984	-4.46	0.691	3.95	22.8
nb	3	3	3	3	3
Asia					
avg	1.51	-3.01	1.14	2.51	34.9
std	0.294	2.34	0.288	1.17	10.9
max	1.87	-1.10	1.58	3.99	50.0
qt3	1.76	-1.58	1.26	3.46	40.1
med	1.50	-2.35	1.16	2.35	37.3
qt1	1.27	-3.28	1.04	1.73	30.7
min	1.16	-7.90	0.639	0.848	15.4
nb	7	7	7	7	7
Central and Eastern Europe					
avg	1.34	-2.79	1.29	2.91	24.7
std	0.604	2.59	0.879	1.04	22.3
max	3.19	-0.0884	3.99	4.42	74.4
qt3	1.28	-0.497	1.21	3.53	27.3
med	1.18	-1.85	0.972	3.23	19.3
qt1	1.02	-4.21	0.798	1.96	10.9
min	0.909	-7.65	0.680	1.14	3.27
nb	13	13	13	13	13
Latin and South America					
avg	1.16	-1.16	0.980	5.94	32.0
std	0.301	0.536	0.388	3.20	12.9
max	1.60	-0.432	1.68	10.0	52.5
qt3	1.38	-0.752	1.11	8.10	40.4
med	1.11	-0.971	0.845	6.75	29.8
qt1	0.976	-1.57	0.746	3.66	23.9
min	0.651	-1.98	0.479	1.19	11.5
nb	10	10	10	10	10
Western Europe					
avg	0.851	-0.974	0.804	4.09	27.0
std	0.287	0.713	0.357	1.76	15.3
max	1.44	-0.0608	1.92	8.45	52.7
qt3	0.881	-0.365	0.931	4.65	33.9
med	0.741	-0.969	0.720	3.54	22.9
qt1	0.640	-1.39	0.565	2.66	16.3
min	0.544	-2.41	0.351	2.42	8.60
nb	17	17	17	17	17
Western Countries					
avg	0.855	-0.609	0.774	3.61	26.4
std	0.0886	0.273	0.339	1.63	7.70
max	0.981	-0.239	1.28	5.56	31.8
qt3	0.880	-0.520	0.809	4.65	31.0
med	0.830	-0.653	0.618	3.33	29.4
qt1	0.805	-0.742	0.583	2.29	24.9
min	0.778	-0.891	0.579	2.19	15.1
nb	4	4	4	4	4

Table 26: MSM estimations - Regime Analysis

avg - average, std - standard deviation , qt - quartile, med - median

F – Estimation Procedure & Robustness of Markov Switching Models

F.1 Estimation Procedure

Define:

$$y_t = \nu_{s_t} + \sum_{j=1}^{p} a^j y_{t-j} + \epsilon_t^{s_t} \tag{12}$$

where y_t represents the quarterly growth rate of GDP; $s_t \in \{1, 2\}$ the regime; ν_{s_t} regime-specific intercept; p the number of lags considered, ranging between 0 and 4; a^j the autoregressive coefficient of the jth lag and ϵ_t an i.i.d. process with variance σ.

The estimation of the model is obtained by using the filtered probabilities of the unobserved state. Let Ψ_{t-1} be the variable containing the past history of y_t such that $\Psi_t = \{y_t, \Psi_{t-1}\}$. Then the filtered probability of the unobserved state at time t, $Pr(s_t|\Psi_t)$, offers an inference about the unknown state given the information available up to time t. Given $Pr(s_{t-1}|\Psi_{t-1})$, $Pr(s_t|\Psi_{t-1})$ derives from:

$$Pr(s_t = j|\Psi_{t-1}) = \sum_{i=1}^{2} Pr(s_t = j|s_{t-1} = i) * Pr(s_{t-1} = i|\Psi_{t-1}), \forall j \in \{1, 2\} \tag{13}$$

Then the joint conditional density-distribution of y_t and s_t is given by:

$$f(y_t, s_t = j|\Psi_{t-1}) = f(y_t|s_t = j, \Psi_{t-1}) * Pr(s_t = j|\Psi_{t-1}), \forall j \in \{1, 2\} \tag{14}$$

Summing over j, i.e. all the possible states s_t, we obtain the conditional density of the tth observation on the past information:

$$f(y_t|\Psi_{t-1}) = \sum_{j=1,2} f(y_t, s_t = j|\Psi_{t-1}) \tag{15}$$

This allows us to derive the filtered probability of the state at time t, conditional on the information available at this time:

$$Pr(s_t = j|\Psi_t) = \frac{f(y_t, s_t = j|\Psi_{t-1})}{f(y_t|\Psi_{t-1})}, \forall j \in \{1, 2\} \tag{16}$$

At this stage we can also derive the smoothed probabilities $Pr(s_t|\Psi_T), t = 1, 2, ..., T$, which provides an inference on the unobserved state using all the information in the

sample upon time T:

$$Pr(s_t = j|\Psi_T) = Pr(s_t = j|\Psi_t) \times \frac{f(y_{t+1}|s_t = j, \Psi_t)}{f(y_{t+1}|\Psi_t)} \times \frac{f(y_{t+2}|s_t = j, \Psi_{t+1})}{f(y_{t+2}|\Psi_{t+1})} \times ... \times \frac{f(y_T|s_t = j, \Psi_{T-1})}{f(y_T|\Psi_{T-1})} \quad (17)$$

The sample conditional log-likelihood can then be derived from the previous computations as:

$$logf(y_T, y_{T-1}, ..., y_1|\Psi_0) = \sum_{t=1}^{T} logf(y_t|\Psi_{t-1}) \quad (18)$$

This can be maximized numerically with respect to the unknown parameters so as to estimate the model.

F.2 Robustness

As pointed out by Harding and Pagan (2003), MSM are limited by the validity of the statistical model. An important concern is the fact that the Data Generating Process might actually not be governed by Regime Switches but by a linear specification. Testing the existence of Markov Switching proves to be difficult, as under the null of no switches, parameters governing the dynamics of the model are not identified and the Information Matrix is singular. Hansen (1992) provides a computationally burdensome test to address this question. However his methodology only offers a bound for the Likelihood Ratio statistics and no critical value. On the other hand, Garcia (1998)'s proposal ignores the singularity of the Information Matrix under the null. Carrasco et al. (2014) have developed an optimal test for parameter stability. Their test has several advantages, as it solely requires the estimation of the model under the null but also does not require the entire specification of the dynamics of random coefficients. The test has, as a result, power against a wide variety of alternatives. Finally this test proves to be useful even with few observations, which is sometimes the case for me.

G Frequency of recession by group, amplitude and duration

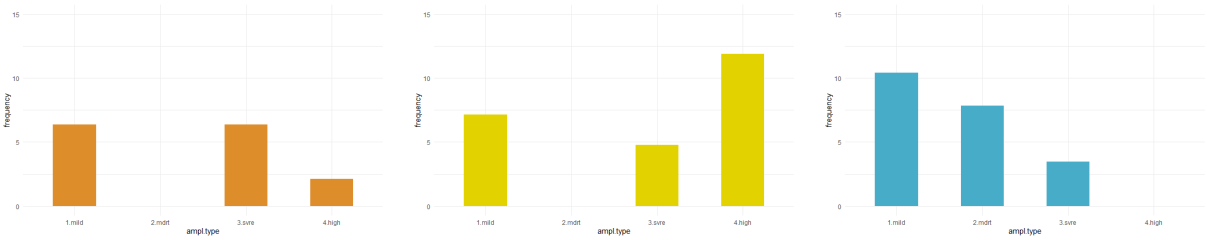
Figure 8d plots the distribution of recession by country group, each associated to a column/color (EM left, orange ; DM middle, yellow : AM right, blue). I separate the recessions along two characteristics:

- durations: (i) short recessions (2 quarters), (ii) medium recessions (2 to 4q.), (iii) long recessions (4 to 6q.) and (iv) protracted recessions (above 6q.);
- amplitude: recessions associated with (j) mild losses (above -2% of GDP), (jj) moderate losses (between -2 and -4% of GDP), (jjj) severe losses (between -4 and -10% of GDP) and drastic losses (below -10% of GDP).

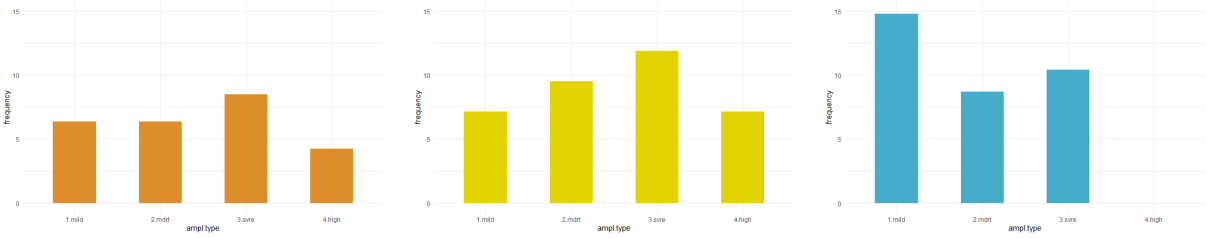
As a naive prior, I would assume that duration and amplitude to be positively related, id est shorter recessions associated with lower losses and longer recessions with higher losses. Hence recessions should be distributed along the diagonal from short&mild- to protracted&drastic- losses recessions: for each color/column, the distribution should be more concentrated from the top left to the bottom right, leaving the bottom left and top right areas loosely populated.

Three main observations can be made to summarize deviations from my initial assumption:

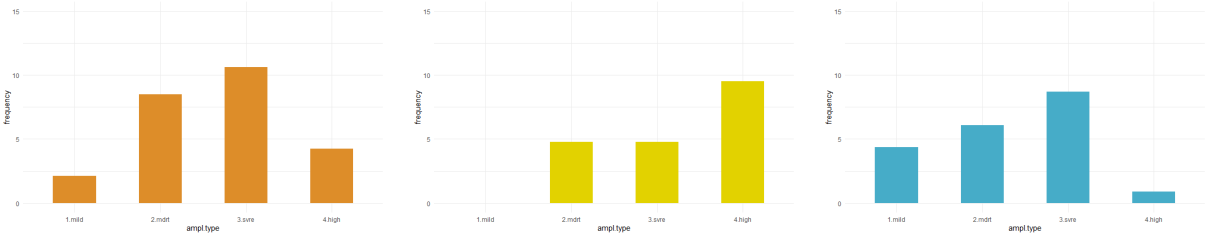
- AM's distribution is skewed to the top left of the distribution. AM's distribution displays a higher frequency for short to medium duration recessions associated with mild to moderate cumulated losses (first two lines, first two bars).
- EM and DM distributions are much more skewed to the right (drastic losses). Their distributions display a much higher fraction of very costly recessions (above 10% of GDP). When cumulating over all durations, EM(DM) experience 5(8) times more recessions associated with drastic losses than AM (25% of the cases for EM and almost 40% for DM against 5% for AM).
- All countries display a spike in the bottom-left of their distribution (first bar, last line). All country groups display a high number of protracted and mild recessions. The picture is even more striking for DM, whom has no long & mild- and protracted & moderate-losses recessions.



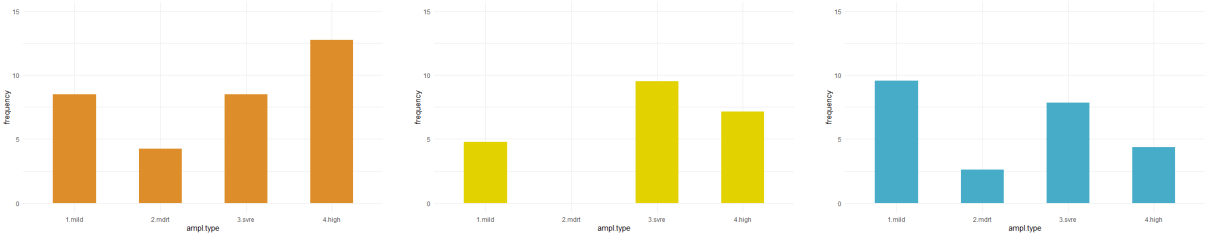
(a) Short recessions (2 quarters)



(b) Medium recessions (2 to 4 quarters)



(c) Long recessions (4 to 6 quarters)



(d) Protracted recessions (above 6 quarters)

(e) Frequency of recession by group, amplitude and duration
Left column (orange) corresponds to results for Emerging Markets, Middle Column (yellow) for Developing Markets and right column (blue) to Advanced Markets).
Recessions are classified according to: 1. duration: short (2 quarters), medium (2-4 quarters), long (5-6 quarters) and protracted (more than 7 quarters) and 2. amplitude: mild ($x > -2\%$), moderate ($-2 > x > -4\%$), severe ($-4 > x > -10\%$) or drastic ($-10\% > x$)

H Estimation results by country and selected specification

ESTIMATION RESULTS BY COUNTRY AND SELECTED SPECIFICATION

Country.Name	spec	Intrcpt H.	Intrcpt L.	Lag 1	Lag 2	Lag 3	Lag 4
Argentina	AR0	0.016 *** (0.00271)	-0.0152 *** (0.00271)				
Armenia	AR1	0.0451 *** (0.00616)	-0.0764 *** (0.00616)	-0.412 *** (0.0165)			
Australia	AR3	0.00824 ** (0.00262)	-0.00622 * (0.00262)	-0.0231 (0.0695)	-0.0374 (0.0667)	0.0478 *** (0.00116)	
Austria	AR0	0.00741 *** (0.000987)	-0.00367 *** (0.000987)				
Belgium	AR0	0.00624 *** (0.000502)	-0.0128 *** (0.000502)				
Bolivia	AR3	0.00901 *** (0.0015)	-0.00538 *** (0.0015)	-0.262 *** (0.0761)	0.193 * (0.0815)	0.331 *** (0.00233)	
Brazil	AR0	0.00962 *** (0.00101)	-0.00817 *** (0.00101)				
Bulgaria	AR0	0.0102 *** (0.00109)	-0.0272 *** (0.00109)				
Canada	AR0	0.00778 *** (0.000456)	-0.00891 *** (0.000456)				
Hong Kong	AR0	0.015 *** (0.00154)	-0.0159 *** (0.00154)				
Colombia	AR0	0.00938 *** (0.000859)	-0.0188 *** (0.000859)				
Costa Rica	AR3	0.00705 *** (0.00156)	-0.0121 *** (0.00156)	0.0423 (0.0894)	0.142 (0.0875)	0.201 *** (0.00543)	
Croatia	AR0	0.00956 *** (0.00102)	-0.00497 *** (0.00102)				
Cyprus	AR4	0.00628 *** (0.0012)	-0.0133 *** (0.0012)	0.0319 (0.0896)	0.102 (0.0816)	0.241 ** (0.0826)	0.0764 ** (0.00374)
Czech Rep.	AR0	0.0104 *** (0.00133)	-0.000884 (0.00133)				
Denmark	AR1	0.00634 *** (0.000954)	-0.0153 *** (0.000954)	-0.103 *** (0.00437)			
Ecuador	AR0	0.0102 * (0.00498)	-0.00922 . (0.00498)				
El Salvador	AR3	0.0116 *** (0.00205)	-0.00766 *** (0.00205)	-0.37 ** (0.109)	-0.356 * (0.135)	-0.0484 *** (0.00316)	
Estonia	AR0	0.0142 *** (0.00147)	-0.0185 *** (0.00147)				
Finland	AR3	0.00612 *** (0.0015)	-0.00613 *** (0.0015)	-0.0392 (0.0757)	0.139 * (0.0683)	0.175 *** (0.00226)	
France	AR2	0.00207 *** (0.000616)	-0.00495 *** (0.000616)	0.382 *** (0.0658)	0.284 *** (0.00259)		
Germany	AR0	0.00813 *** (0.00201)	-0.000608 (0.00201)				
Greece	AR0	0.0064 * (0.00299)	-0.0216 *** (0.00299)				
Hungary	AR0	0.00963 *** (0.000961)	-0.00199 * (0.000961)				
Iceland	AR1	0.0178 *** (0.00284)	-0.00134 (0.00284)	-0.379 *** (0.00469)			
Indonesia	AR0	0.0135 *** (0)	-0.079 *** (0)				
Ireland	AR0	0.0144 *** (0.0038)	-0.00365 (0.0038)				
Italy	AR2	0.00269 (0.00233)	-0.00641 ** (0.00233)	0.412 *** (0.07)	0.0924 *** (0.000679)		
Korea	AR2	0.0117 * (0.00458)	-0.0147 ** (0.00458)	0.272 *** (0.0661)	0.103 *** (0.00173)		

ESTIMATION RESULTS BY COUNTRY AND SELECTED SPECIFICATION

Country.Name	spec	Intrcpt H.	Intrcpt L.	Lag 1	Lag 2	Lag 3	Lag 4
Latvia	AR0	0.0123 *** (0.00184)	-0.0405 *** (0.00184)				
Lithuania	AR0	0.0128 (0.0129)	-0.017 (0.0129)				
Luxembourg	AR0	0.0138 *** (0.0022)	-0.00249 (0.0022)				
Malaysia	AR0	0.0166 *** (0.000944)	-0.0376 *** (0.000944)				
Mexico	AR0	0.0108 *** (0.000873)	-0.0102 *** (0.000873)				
Morocco	AR3	0.0168 (0.0133)	-0.0576 *** (0.0133)	-0.541 *** (0.11)	-0.0112 (0.0956)	0.259 *** (0.00339)	
New Zealand	AR2	0.0158 *** (0.00298)	-0.00384 (0.00298)	-0.32 *** (0.0689)	-0.289 *** (0.00182)		
Paraguay	AR1	0.0193 *** (0.00388)	-0.00982 * (0.00388)	-0.346 *** (0.0045)			
Philippines	AR0	0.012 *** (0.00163)	-0.011 *** (0.00163)				
Portugal	AR0	0.00854 *** (0.000921)	-0.00969 *** (0.000921)				
Romania	AR0	0.0125 *** (0.00286)	-0.0113 *** (0.00286)				
Russian Fed.	AR0	0.0177 (0.0152)	-0.00106 (0.0152)				
Singapore	AR0	0.0186 *** (0.00431)	-0.0156 *** (0.00431)				
Slovak Rep.	AR2	0.00768 *** (0.0011)	-0.0434 *** (0.0011)	0.0732 (0.074)	0.278 *** (0.00422)		
Slovenia	AR2	0.00531 *** (0.00106)	-0.0246 *** (0.00106)	0.24 ** (0.088)	0.175 *** (0.00558)		
South Africa	AR0	0.00984 *** (0.000934)	-0.00257 ** (0.000934)				
Spain	AR0	0.00881 *** (0.000522)	-0.00184 *** (0.000522)				
Sweden	AR0	0.00682 *** (0.000772)	-0.0151 *** (0.000772)				
Switzerland	AR0	0.00679 *** (0.000435)	-0.00611 *** (0.000435)				
Thailand	AR2	0.0137 *** (0.00163)	-0.0331 *** (0.00163)	-0.0958 (0.0738)	-0.0884 *** (0.00436)		
Turkey	AR0	0.0167 *** (0.00387)	-0.0238 *** (0.00387)				
Ukraine	AR4	0.00861 ** (0.0026)	-0.0569 *** (0.0026)	0.206 * (0.0936)	-0.0356 (0.119)	0.112 (0.111)	-0.0261 (0.00929)
United Kingdom	AR2	0.00513 *** (0.000715)	-0.00921 *** (0.000715)	0.164 * (0.0653)	0.117 *** (0.00128)		
United States	AR0	0.00846 *** (0.00152)	-0.00692 *** (0.00152)				
Venezuela	AR0	0.0157 *** (0.00195)	-0.0159 *** (0.00195)				

I Dating financial crises

I.1 Currency crises

Currency crises form a frequent historical pattern described by many cohabiting theories. Dating currency crises has thus been the subject of *many* articles in the literature[105]. The empirical literature has focused on diverse macroeconomic indicators to capture (i) the manifestation of the crisis (exchange rate fluctuations), (ii) conventional policy reactions aimed at dampening the shock (international reserves, policy rates) (iii) significative policy changes (devaluations, change in the exchange rate regime).

A first part of the literature has used large fluctuations of the nominal exchange rate (either effective or bilateral vis-à-vis USD) to date currency crises.

- In Frankel and Rose (1996), a crisis is identified if, during a year, (i) the domestic currency faces a year-over-year depreciation of at leat 25% and (ii) the depreciation exceeds previous y-o-y change in the exchange rate by at least 10%. Signals are then filtered over 3-year windows: after a crisis is signalled, in the three following years all positive signals are muted. Recently, to adapt the filter to quarterly data, Laeven and Valencia (2020) have extended the window of observation to 5 years and the threshold for a significant depreciation to a change of minimum 30%.

I first apply the initial filter to my sample of countries for which MSM converged and data is available i, t. To date crises $is.cur.crs == 1$, I use the year-over-year growth rate of the nominal bilateral exchange rate between the local currency and the USD (LCU per 1 USD) $g^{e,yoy}$, obtained from the IMF–IFS database.

$$\begin{aligned} is.cur.crs_{i,t} = 1 \;\; \text{if} \; \{ \; & g^{e,yoy}_{i,t} \; < \; \lambda; \\ & \& \;\; g^{e,yoy}_{i,t} > g^{e,yoy}_{i,t} + 0.10; \\ & \& \;\; \forall s \in \{t-\omega, t-1\} \; , \; is.cur.crs_{i,s} = 0 \; ; \\ & (\lambda, \; \omega) \; \in \; \{(-0.25, \; 12), \; (-0.30, \; 20)\}\} \end{aligned} \tag{19}$$

FR-3/5y: Using a 3-year window I find 79 currency crises. The database in Laeven and Valencia (2020) covers an unbalanced panel of 136 countries identifying 236 currency

[105] See upcomping description of Boonman (2019) for a literature review on the matter (with a focus on publications before 2012, online appendix).

crises over 1970–2017. The intersection of their database with mine[106] signals 67 currency crises.

The second part of the empirical literature has adopted a broader approach in trying to capture speculative attacks and policy reactions aimed at preventing bad expectations to coalesce and realize. Central banks need not to set the exchange rate to a new level (devaluations). They can counter downward pressures either by selling international reserves[107] or by adjusting key policy rates[108] Eichengreen et al. (1994), (1995), (1996).

- Crises, i.e. episodes of heightened stress in forex markets, are dated by identifying variations in an Exchange Market Pressure Index (EMPI). Sachs et al. (1996) and Kaminsky and Reinhart (1999)[109] construct the index as the weighted average of the quarterly growth rate of nominal exchange rates and the change in the stock of reserves foreign reserves[110]. Eichengreen et al. (1996), Bordo et al. (2001), Gourinchas and Obstfeld (2012) adopt a broader approach by including the change in interest rates in the index[111]. For each country, the obtained EMPI time series is then filtered. A rule ensures the algorithm retains only quarters in which the EMPI deviates from the average by more than 2-to-3 standard deviations. The higher threshold the more cases can be coined tail-events (wide magnitude, small frequency). Note that the index dates periods (i.e. including sequences of observations) of distress on forex markets, not just the starting points of currency crises. The main constraint when applying these methods for a wide panel of countries is quarterly data availability. Bussiere and Fratzscher (2006) construct a similar

[106] i.e. over the 51 countries and the time periods for which I have available growth rates data.

[107] This is key in Krugman (1979). By selling international reserves (i.e. denominated in foreign currency), the central banks affects directly the demand for the domestic currency. Increasing the demand for an asset (here the foreign exchange) is bound to increase its value, here the exchange rate. This effect might be enough to reverse downward pressures. The monetary model of exchange rate determination and Dornbusch's contribution on the role of expectations in driving excessive fluctuations are worth noting here.

[108] By increasing the rate at which assets in domestic currency are rewarded, the central bank motivates international investors towards buying them. She can prevent capital outflows if confidence is high enough. See Covered and Uncovered Interest Rate Parities for further information on the mechanism.

[109] During episodes of hyperinflation, large depreciations might have a very different economic impact/understanding than otherwise. As such the index is then studied separately accordingly Kaminsky and Reinhart (1999). An alternative to previous approach considers taking fluctuations in real exchange rate so as to cope for price disruptions Wan and Jin (2014).

[110] The weights are given by the variance of exchange rate fluctuations divided by the variance of the variable considered (exchange rates, and reserves). Change in reserves enter the index negatively to captures the fact that the central bank might fight off depreciations by selling reserves.

[111] Often weighted by the variance of exchange rate fluctuations divided by the variance of interest rate changes.

EMPI using real exchange and interest rates.

For all countries/quarters i, t of available data I construct 3 EMPI time series: one following the first part of the literature and two including interest rates as well[112].

For the first $EMPI^1$, the index aggregates two variables: (i) quarter-over-quarter growth rate of the nominal exchange rate (local currency unit per US Dollar) g^e - (ii) weighted change in foreign reserves (excluding gold) Δr. A currency crisis is signaled when the index deviates from average by 2 or 3 standard deviations.

$$\begin{aligned} empi^1_{i,t} &= g^e_{i,t} - \frac{\sigma_{g^e_i}}{\sigma_{\Delta r_i}} \Delta r_{i,t}; \\ is.cur.crs_{i,t} &= 1 \quad \text{if } \{(empi^1_{i,t} - \overline{empi^1_i}) > \kappa * \sigma_{empi^1_i}, \quad \kappa \in \{2, 3\}\} \end{aligned} \tag{20}$$

EMPI1: I find, over the unbalanced panel of 51 countries cumulating 6209 quarters, 132/31 crises with a 2/3*standard deviations threshold.

Due to data availability, the literature has considered two types of rates when introducing interest rates ir in EMPI: (i) the monetary policy-related interest rate $mon.pol.rt$ or (ii) the money market rate $mny.mkt.rt$ (a very liquid market that acts as proxy for the policy rate). I construct time series for these two version: $EMPI^2$ and $EMPI^3$:

$$\begin{aligned} empi^j_{i,t} &= g^e_{i,t} - \frac{\sigma_{g^e_i}}{\sigma_{\Delta r_i}} \Delta r_{i,t} + \frac{\sigma_{g^e_i}}{\sigma_{\Delta ir_i}} \Delta ir^i_{i,t}; \\ is.cur.crs_{i,t} &= 1 \quad \text{if } \{(empi^j_{i,t} - \overline{empi^j_i}) > \kappa * \sigma_{empi^j_i}, \ \kappa \in \{2, 3\}\}; \\ (j, ir) &\in \{(2, mon.pol.rt), (3, mny.mkt.rt)\}. \end{aligned} \tag{21}$$

EMPI2: Using data available for monetary policy-related interest rates, over 2590 observations, I find 58/15 quarters of crises depending on the threshold.

EMPI3: Using money market interest rates, it is possible to construct an EMPI for 4408 quarters. Conditional on the threshold, 102 or 35 quarters in crisis are dated.

Given the diversity of approaches and associated sample of crises, I decide to rely upon

[112] I do not construct measures using real variables or interest rate differentials. This is mainly because, as explained in next sub-section, I then review all potential episodes using narrative elements to date the crisis starting quarter. These three indicators already provide a handful of episodes to consider (251). I leave these 'real versions' as future robustness tests.

IMF archives to date crises starts. I detail this contribution in the next sub-section.

I.2 Banking crises

In 2008, as the Global Financial Crisis unfolded, Luc Laeven and Fabian Valencia published a wide cover database on banking crises dates at a quarterly frequency (Laeven and Valencia, 2008). The database has since then been subject to frequent extensions and updates, Laeven and Valencia (2010), (2012), (2018). In the most recent update Laeven and Valencia (2020) identify banking crises based upon two subsets of signals/information:

- There are signs of financial distress in the banking system. Such a situation is defined by Laeven and Valencia if the share of nonperforming loans is above 20 percent of total loans, if the share of bank closures is at least 20 percent of banking system assets or if the fiscal restructuring costs of the banking sector exceed 5 percent of GDP,. This condition can be the sole trigger of a crisis.
- There have been significant banking policy intervention measures to cope for losses in the banking system. Six policy interventions are considered: deposit freeze and/or bank holidays ; significant bank nationalizations ; high bank restructuring fiscal costs ; extensive liquidity support ; significant guarantees put in place ; significant asset purchases

The quarterly dates are taken from the initial dataset of Laeven and Valencia (2020), which provides additional narrations for a sub sample of cases. In four instances, their database does not provide an quarterly start date for the crisis. I rely upon IMF archives to date specific episodes.

Overall, my database includes **52 banking crises**, which gives an average of one per country. In practice 10 countries experience 2 banking crises (including Argentina and Ukraine)[113].

I.3 Sovereign crises

Sovereign debt crises are identified if at least one of three main propositions is verified (Kraay and Nehru (2006), Cohen and Villemot (2015)):

[113]As a reference point, over their initial sample of 151 crises (136 countries, unbalanced panel over 1970–2017), Laeven and Valencia (2020) find that countries face on average at least one banking crisis. Few countries actually cumulate banking crises over 3 episodes (e.g. Argentina, Ukraine in my sample).

- A country is unable or unwilling to repay its debt, identified when a country's cumulated arrears represent more than 5% of total debt. Data on debt arrears are taken from the International Monetary Fund - International Financial Statistics.

- A country enters a debt restructuring plan with the Paris Club (rescheduling and/or debt reduction). HIPC initiatives are excluded from the sample as they often take place when the country has already built back some fundamentals.

- A country receives significant nonconcessional financial assistance from the IMF (Stand-By Agreements, Extended Fund Facilities or access to specific Credit and Liquidity lines), allowing up to more than 300% of quota cumulatively. To act as a trigger, the program must represent at least 50% of the country's quota at the Fund. [114]. To trigger the crisis, the program must be disbursed by the country in quantities that overpass this same threshold. This ensures selecting cases of external financing *uses* and further eliminates cases in which only small disbursal are needed to calm the situation[115].

This database of Sovereign Defaults was then compared to Reinhart and Rogoff (2009) and Laeven and Valencia (2020) datations, which provide additional narrative evidence. For crises without quarterly datation, I relied upon IMF article IV to identify the starting quarter.

Medas et al. (2018) make for a recent empirical database contributing to the broad discussions around crises dates involving a government in financing needs. Their definition of **fiscal crises** covers wider ground than mine[116]. By broadening the set of triggers,

[114]It is worth noting that the increase in the size of programs over time increases the pass-through of this criterium. This dynamic has been a real source of discussions and debates. Academic on one hand: adapting to evermore complexifying crises, the IMF constantly had to reinvent its approach and its policy views (Reinhart and Trebesch, 2016). Note that, from a practical point of view, this translated into structural transformations for the IMF, e.g. the rise of the Independent Evaluation Office at the IMF; the increasing role of the Strategy, Policy and Review department that adapts the Fund's 'policy voice' to new research and new situations (e.g. the Covid-19 shock). Political on the other hand, as an increasing size of lending programs (liabilities) calls for an even greater contribution by member economies, thus affecting the decision process on quotas. Quotas reflect the share of votes a member disposes of at the board and acts as a good proxy for contribution. When the bill arrives at the table late at night, scenarii and debates on who should pay are fundamentally political, because they decide what the consensual scenario should be.

[115]Note that the increasing size of programs increases again the probability of detection of crises. In that case, as we control for the funding to be used, this becomes less of an issue in terms of detecting dire external financing needs. (Quotas are changed at a low frequency and might thus not reflect adequately the size of the country's issues at hand Reinhart and Trebesch (2016)))

[116]A fiscal crisis will detect if (i) the country is subject to a credit event as the government reduces the present value of the debt owed to creditors, (ii) the country has access to IMF financing in a program

and in the case of IMF programs lowering it[118], the notion of crisis expand to that of a government facing hightened constrained policy space to act. My definition of a sovereign crisis relates to sovereigns in dire external financing needs, and thus cover a sub-sample of the **fiscal crises**[119].

As robustness, I compare the two databases over the sample of interest. Our databases differ in 26 cases (25 missing and 1 different date). I delve deeper into each case by consulting IMF archives to identify if there are mentions of crises, strong related policy change, or troubles in the fiscal/sovereign sphere. Out of the 26 initial fiscal crises, (i) 10 are coined as sovereign crises and remain in the database, (ii) 1 is redated and (iii) 15 are excluded[120].

Overall, my database includes **36 sovereign debt crises episodes** in 54 countries[121].

of size superior to 100% of quota and containing fiscal adjustment objectives[117], (iii) when the country im/ex-plicitely defaults on debt due to very high inflation and/or domestic arrears, (iv) the country suffers from loss of confidence by markets, e.g. loss of market access and spike in financing costs on markets (spreads).

[118]The threshold of 100% is indeed higher, but there is no constraint on using at least 50% to trigger a crisis.

[119]Note recent interesting work on fiscal crises by Romer and Romer (2019). I discuss it in more detail in upcoming section.

[120]Out of the 15 cases excluded: (a) 4 were linked to HIPC initiatives and indeed associated with a favorable economic environment and policy space ; (b) 2 had contracted SBA but used less than 50% of the quota. In one case there are clear mentions of remaining policy room and access to external financing, in the other the shock is common (terms-of-trade) and little disbursements act as transitional adjustments ; (c) 9 had no mention of the sovereign being in trouble or of a drastic policy change.

[121]As a reference point the most recent and wide database, Laeven and Valencia (2020), date 79 sovereign crises for 136 countries.

J Financial crises – insights from the literature

In an unstable environment, displaying fluctuations in activity, inflation, unemployment, foreign exchange and financial disturbances, it is important to take stock of the channels of transmission that give rise to financial crises. In other words, it is important to understand which shocks and fluctuations have triggered which sequencing/chains of events (a.k.a. transmission mechanisms) for a given crisis to manifest.

Identifying how financial crises take root in a given context[122] helps highlight the key inconsistencies/fragilities/frictions that should be the next target of policy making.

Irrespective of the type of crisis [123], two main lines of ideas commonly oppose to discuss the origins of financial crises[124]:

- **The "fundamentals" story:** The economic and financial system is characterized by structural fragilities, deficiencies and/or inconsistencies. Inherent frictions on diverse transmission mechanisms can amplify external shocks and fluctuations. This pressurizes existing vulnerabilities and threatens the whole system (negative feed-backs). Frictions and/or policy frameworks can also (or not) dampen part of the shocks/fluctuations (positive feed-backs). A crisis will then occur on different grounds. (i) Because shocks/ fluctuations are too large for the whole system to adapt. The (policy-) stance on a particular sphere of the economy has to change to evacuate some of the systemic pressure[125], (ii) because the initial, even if small, shock gets amplified through different transmission channels. More and more agents in the system get affected as frictions generate bottlenecks where pressures concentrate and vulnerabilities reveal. The limitations of existing frameworks are thus questioned and loopholes behind fundamental deficiencies reveal.

[122]Models are, by essence, the very expression of the combined set of assumptions at their base. The mechanism they identify allows us to understand what may have given rise to an event that falls under a particular category of financial (sovereign/banking/currency) crises. The "reality" of the mechanism is, per se, subject to our ability to identify in real life situations these assumptions as shedding light upon existing specific frictions and decision processes. As the three generations of currency crises attest, a model might be adequate for a subset of the overall sample only.

[123]See Lorenzoni (2014) for a detailed theoretical literature review of international financial crises.

[124]I feel that the approach I develop in this dissertation calls for a more thorough discussion of Minsky (1978) and Minsky (1992).

[125]By sphere, I relate to the main elements from the narrative taxonomy of crises in section 4: the monetary, sovereign, financial, real and social spheres of the system. For example, a currency crisis wil imply pressure through the external nominal anchor (monetary sphere), which inflates the other spheres of the economy. In troubled times, if another part of the system presents allarming signals, a change of policy might be needed by the central bank.

- **Sovereign crises:** When poor countries access world financial markets (e.g international private capital markets), government may launch large-scale borrowing programs. These program involve government public debt assets traded usually on primary markets[126]. Structurally, debt contracts exist under the threat of a one-sided decision by the sovereign authority to repudiate part/all of existing obligations, something more probable if economic fundamentals deteriorate widely and the situation calls for a drastic policy change (negative feed-back). Hence to ensure the participation of foreign investors on financial markets (and the existence of an arbitrary condition), their must be a counter-effect ensuring governments will not default (positive feed-back). Investors ration credit and ensure they get rewarded for the risk of default. If countries default, they suffer persistent or temporary loss of resources and access to financial markets, (Eaton and Gersovitz, 1981). Of particular interest, Cohen and Sachs (1986) show that country's policy space is non-linear. In one regime, it is unconstrained and the debt-to-gdp ratio increases as gdp slows down. In the other regime, where growth is low, borrowing is rationed and the debt stock is contained. In the second regime, weaker growth fundamentals coerce the country after some time to default on part of her debt, namely on all interest payments that exceed the real growth rate. Recently Aguiar et al. (2019) develop a model detailing the maturity dilemna faced by governments on the management of their debt profile: bond prices usually move against goverment's intentions in intervening on long-term bond markets and thus entail losses. As such they are subject to relying only upon short-term debt (i.e. to roll over existing stocks[127]). Any deviation from this policy stance might imply losses and be the source of a default as a constrained policy space (maturity mismatch) prevents the government's ideal/wanted policy course.
- **Banking crises:** Because private agents do not dispose of the same status as a sovereign government, they have access to assets of differing nature. Thus, crises manifest differently in the financial sphere. Here I focus on those related to credit and banks/financial institutions. Kiyotaki and Moore (1997) constrain private agents borrowing to be backed by some collateral (seizable in case of default). If the private borrower's net worth falls due to a small neg-

[126]Developments on the secondary market largely include other institutions such as banks and private financial institutions.

[127]This is a key element behind self-fulfilling debt crises. I develop the theroretical framework later in this sub section and give empirical illustrations in the next sub section.

ative productivity shock. The collateral constraint might prevent them from further borrowing and entail cuts on investment expenditures/claims on future revenues by contrained. When the shock amplifies sufficiently, the losses and risks might have systemic levels and threatened lenders' balance sheet requirements. Mishkin (1992), Mishkin (1996) adress how asymetric information generates frictions on financial markets. If fundamentals deretiorate too much, issues of moral hazard and adverse selection (negative feedbacks) might lead to severe market dysfunctionalities and as losses occurs, end in banking crises. Here the structural deficiencies relating to access to information generate episodes in which riskier borrower access the pool of participants, increasing the probability of a systemic banking crisis.

  - **Currency crises:** They can occur on foreign exchange markets because there are inconsistencies in the underlying fundamentals, such as the exchange rate regime or the monetary policy rule and use of foreign reserves. In Krugman (1979), the central bank monetizes government deficits to prevent inflationary pressures and thus draws on limited reserves to maintain the peg. From the point of view of a fixed exchange rate regimes, in situations of fiscal dominancy, excessive government spending objectives may come to appear inconsistent. Currency crises occur when this inconsistency becomes too evident, a.k.a. the stock of foreign reserves reaches unsustainably low levels, and the country is subject to speculative attacks because current course of action contradicts what fundamentals practically allow for future developments. The fixed exchange rate regime prevents to completely evacuate inflationary pressures over time.

- **The "self-fulfilling" story[128]:** Usually, in an economic/financial theory, what allows the system to operate is, notably, its reliance upon functional markets. Markets (of all types) are the places where different agents[129] meet to exchange assets/-claims[130]. Each agent confronts the market with a set of policy rules in mind, determining her actions – the choices she makes regarding current decision.s and those that might have an impact of the future state.s of the world, often forward-looking considerations. They formulate these decisions against the set of information at

[128] I have not evoked the literature on self fulfilling economic crises in the last chapter. The interested reader might refer to Woodford (1990) if interested.

[129] from governments and central banks to banks, financial institutions, non-financial corporations, households and international institutions

[130] from physical assets, investments, goods and services, financial assets – foreign exchange and foreign exchange securities, private securities – to labor as a claim on someone's time or even knowledge and patents (the COVID 19 vaccine for example is an issue of current political debates.)

their disposal in the current state of the world and given their knowledge of the structure of the economic and financial system (rational **expectations**). It is possible that, due to different structural characteristics or frictions, some agents, let's take investors for the sake of the example, come to expect somber futures more easily (hightened **risk aversion**). If agents' implication in the market is large enough (a large pool of investors, or systemic participants[131]) or given particular market settings, their expectations matter/express at an *aggregate level*. These expectations can transform into effective policy changes[132]. At that point, other agents might understand and react to this new information (*heterogeneity* is a source of information). Depending on the context, other agents might use this negative signal to update their own expectations downwards with respect to what fundamentals signal. They adapt other policies accordingly and the phenomenon can spread and take real roots[133]. Whatever the market, if fears are too strong, there is a chance for it to destabilize the whole system. Note that this particular mechanisms works not because there has been an anterior (sequence of) negative productivity/growth shock(s). **Self-fulling crises**[134] fatal blow the economic and financial system because they create lethal interruptions/fluctuations in the liquidity[135] on particular financial asset markets[136]. These realizations are sudden and might surprise other agents[137]. The new reality – i.e. the information set adjusted to capture negative effects of self-fulfilling mechanisms – might be one in which another agent has a very constrained policy space. For these particular policy reactions, there is a possibil-

[131]For work on **granularity** see the seminal and enthralling work of Gabaix (2011), Gabaix (2016). At this stage in my research, the option at my disposal to "easily" mimic the concept of granularity is to build my analysis around my taxonomy's key characteristics: (i) with *complexity*, a higher number of red flags in the episode acts as a proxy for the importance of given episode and, (ii) *severity*, *duration* or *cumulated losses* which can be used as in-sample measures of the economic magnitude of these events. The starting assumption I will try to take to the data is the following: "The more complex the crises, the smaller their share in the total distribution of episodes and the bigger the economic effect they are associated with". I expect the distribution (along the spectrum of complexity) to be tilted towards very costly economic crises, whatever the definition.

[132]Keep in mind that I coin policy in a theoretical sense. From any agent's point of view, it is the set of decisions/actions taken in a given period, conditional on available information at the time. For example, household's policy rules will commonly focus on consumption, savings, labor decisions etc

[133]Many literatures, outside my area of expertise disserve a mention: herding behaviour in macroeconomics, market behaviour, comportemental economics, cognitive works and networks (check the work of former student Aymeric Vié.)

[134]Bubbles as well, as a matter of fact

[135]This could manifest through sharp increases in liquidity premia. In different contexts, notions of currency premia, term-premia, default-premia etc might also prove useful.

[136]Think broadly of markets (primary and secondary) as potentially including government securities or bank bonds.. private debt/equity.. money market.. forex.. forex securities.. etc

[137]They differ from what could be expected from the fundamentals' signal

ity, given fundamentals and the structure structure of the system, that the optimal choice is not unique. Multiple equilibria are often a source of indeterminacy. Self-fulfilling crises are thus episodes we can consider as a toss-of-coin away from having been avoided.

- **Sovereign crises:** It is common practice for governments to never repay existing debt but to roll it over, defaults occur when this becomes impossible. This particular nature of sovereign debt entails the roots of self-fulfilling mechanisms. In Cole and Kehoe (2000), each period begins with the realization of an exogenous sunspot variable[138] that settles, along the inherited fundamentals (state variables), the aggregate state of the world. Before repaying the debt she inherits from the past, the government first decides to emit new debt obligations on the market. International bankers evaluate the information at their disposal[139] and then decide what quantity of bonds to buy. In other words they decide at what price they agree to buy bonds. Because the government still has the possibility to default on existing stock of debt, bankers' earnings are yet undecided[140]. If the stock of debt is, given fundamentals, low enough there is no chance, whatever the state of the world, that this happens, and the day goes on. If the stock of debt is high enough the reverse might happen. Inbetween, there is indeterminacy, i.e. there is a given level of debt above which, if the sunspot realization is bad, agents fear default too much, and reality mimics expectations. In practice, they refuse to buy new bonds and a crisis happens as the government cannot roll over the debt, irrespective of the fundamentals. Nevertheless if the realization is good the day goes on[141]. Cole and Kehoe (2000) have in mind the Mexican default of 1994-95 in mind. Aguiar et al. (2017) refine their approach by adapting the market's auction process. This enables self-fulfilling defaults even when prices do not reach 0

[138]Imagine tossing a special coin each day that gives you a value, taken randomly from [0,1]. If you were the government, this value would act as a proxy for how many people, this day, would trust you.

[139]he aggregate state of the world, the new liquidity on the markets (the government's "offerings"), and what they can expect to earn back on their past obligations holdings

[140]Because of this difference in information set, and the importance of the sunspot variable, there is a risk for coordination issues.

[141]Using another sun-spot variable, it is possible to replicate the same type of self-fulfilling crisis from the point of view of the government. If the government feels bankers might be wary, she might decide to decrease exposure, a.k.a. her stock of debt to exit the crisis zone. Doing so, she might have avoided a crisis temporarily, but she will have constrained capital investors' policy space and potentially affected the capital stock. If capital investors become wary of the possibility for the government to default (i.e. for them to endure productivity losses), they might constrain their investments. Fundamentals might deteriorate such that otherwise solvable debt self-fulfillingly becomes unsolvable.

(i.e. the bankers refuse to roll over in previous model). A case more in line with emerging markets and developing economies recent history and the self fulfilling narrative behind them.

- **Banking crises:** Bank runs are well known banking crises. History textbooks often illustrate the 1929 depression with pictures of long lines of people in front of banks. More recently, in 2007, the UK institution *Northern Rock* witnessed, nationwide, thousands of customers rushing to the bank's offices. Bank runs are 'simply' that: faced with unexpected news (signal/information), private agents holding claims against a bank coodinate their expectations downward. Out of fear for their own liquidities, these agents claim suddenly and commonly their due at the bank. Her balance sheet[142] is constrained by an increased demand of shorterm liquidites (the bank's liabilities face downward pressures). She is forced to sell assets to meet the demand. For those fast enough to reach the door, the bank's own reserves and liquid assets, but soon the bank is left with illiquid assets that have not yet matured[143]. Selling them entails a loss – the interests that had yet to be claimed. When faced with too many losses, the balance sheet liquidity mismatch proves lethal to the bank and the fears realize. Because assets and liabilities in the portfolio of the bank have differing maturities, in face of uncertainty, agents' expectations might come to be self-fulfilling (Diamond and Dybvig, 1983).
- **Currency crises:** The *second generation model* of currency crises, that refers to self-fulfilling episodes, is developed in seminal contributions by Maurice Obstfeld (1991), (1994), (1996) [144]. If commited to a peg, a government with

[142]What the bank owes versus what the bank owns.

[143]In other words, the assets that have not matured yet are those for which the interests have not paid back yet. Or in other illustrated simpler ones: Imagine, for yourself, the other main activity, beyond deposits, that may bring you to your bank's doorstep. Should you want to invest in a new project (a new flat, a new business perhaps) or to reduce the constraints your current consumption's policy rule endures (anticipating a future promotion, who knows), you first think of going to your bank. Because she lends you a lot right away, you owe her a little bit for a long period, and you're safe to go on with your idea. If she were to come at your doorstep, soon after lending you, you'be perhaps a bit constrained too. Well at that moment, you're the bank I'm talking about, you sell whatever you can. If you own some stocks on a company that haven't paid anything yet, you might sell them, even if it's not the value you had in mind when buying them, or even if it's a lower value. They didn't mature as you planned.

[144]Aghion et al. (2001) provide another interesting mechanism for currency crises, which extends to both fixed and peg regimes. Nominal frictions and credit constraints of private domestic firms combine to create multiple equilibria. Including one in which any depreciation forcefully constrains exporters' balance sheets (currency mismatch). This creates a fall in investment and production. A depreciation ensues as there is lower demand for domestic exorts. The possibility for such an equilibria to exist, makes self-fulfilling crises possible. If fears of depreciation overtake exporting firms, they might create the fall in investment and production behind the now-realized depreciation.

good fundamentals might still be subject to speculative attacks, sometimes self-fulfilling. Subject to negative economic developments, a government might always be tempted to depreciate her currency so as to dampen economic fluctuations. Doing so, she might even aim to reach for higher production than the natural rate dictates[145]. Because of this stance's inconsistency with a fixed peg, to display commitment, the governement might even constrain herself with enduring, e.g. political, losses should she intervene on the forex market. Despite all these reasons, this inconsistency has layed the ground for speculative attacks to materialize self fulfillingly currency crises. Should investors and the government have different access to information on the shock affecting the economy[146], if enough investors come to believe that the government is abusing of the situation (reaching higher production than what, based on thier information should be), they might expect the government to depreciate the currency. Depreciationary pressures turn into inflationary and the government will always find it preferrable to depreciate to solve the accumulation of dysfunctionalities. As such as soon investors coalesce around the same negative idea that a dereciation occurs, it is bound to happen and the crisis triggers[147]

In practice, some crises do not fall under one of these two views, and are the result of pure political interplay for example (Herrera et al., 2020). Ecuador's default on $3 billion worth of bonds in 2008 is a good illustration of these special cases [148].

[145]The fundamental idea behind this assumption is the fact that production at equilibrium might be lower than the socially efficient one due to higher, e.g. labor-market, frictions.

[146]e.g. based on a sunspot variable, it is possible to extend the framework

[147]See Morris and Shin (1998) for a more realistic description of investors signal extraction when faced with a noisy information on the shocks.

[148]The economy was expanding, the Central Bank had $5,6 billion worth of foreign reserves. There were no pressure by international markets on the domestic economy. Yet, following sheer political motives, president Rafael Correa declared part of the national debt "illegitimate" and refused to pay interest to foreign lenders.

K A go-to-guide/check-list for an economist in for some narrative elements

a **The source:** The source of the documents that will be read is the first element to discuss. It is the raw data behind any narrative contribution. Source documents are written by agents from a different time/perspective, with a different approach than the one driving the research. Hence it is important to identify the signals/information they carry.

(i) The source must discuss frequently the topic of interest. The source should offer a descriptive, analytical &/or policy view of what unfolded. She adresses the effects of relevant policies/actions and other notable changes that may have contributed to related developments. The source discusses the topic of interest' main determinants and help shed light on the conditions that gave rise to the situation considered

(ii) The source covers, at a regular frequency, a long list of countries/cases on a broad historical window. She adresses the topic at hand in a universal and comprehensive manner, i.e. offering a comparable approach of key concepts across countries and through time.

(iii) The source clearly identifies *who speaks* in the documents. Authors are often analysts, economists or policy-makers discussing developments that happened – from their view – not long ago. They might be involved in the decision process to some actions that affected the course of events. They provide an insider's view[149] on the motivations behind (part of) the topic considered.

(iv) The source often targets/is available to a broad set of agents (not necessarily of direct systemic importance). This element should be clearly identifiable as it helps discuss potential biases inherently carried in the raw material[150]. Her sources must be clearly stated. She must display tokens of quality/seriousness and/or be recognised.

b **The angle of attack:** The documents considered are often long and might adress a broad range of topics. As I previously mentioned, each source also carries her own

[149] Or they discuss the motivations of what happened

[150] A document written for market participant might not have the same tone (bias) as one written by an international institution for a broad audience. There are biases in all cases, what I am saying is that they should be identifiable.

approach to the topic studied. Hence it is important to define, in the "words" of the research, what will drive the approach to the data. A narrative contribution should define the key concepts that will drive the analysis, identify an initial set of cases to consider, and present the question that guides the approach.

(i) Defining the concept(s) studied in the research project entails references to the literature to identify its(their) key characteristics and manifestations. The definition should offer an encompassing approach of the topic to act as a benchmark during the treatment process, also known as reading. It is often backed by theoretical elements.

(ii) Because a narrative approach entails treating a lot of data, it is important to first narrow down the study to a (reasonable[151]) set of cases. This decision often involves quantitative rule(s) that identify within the sources those that mention the topic relatively more[152]. Of particular interest, a benchmark set of episodes can be taken from key references in the literature to act as to shed light on the novelty/differences of the approach. It is possible[153] to then read documents relating to untreated cases to complete the picture and check for the existence of missed signals.

(iii) The research question that drives the project is often too broad to help guide efficiently reading the documents. This can be due to the source covering a broad range of topics. This can also occur because the topic in question can be discussed along several different characteristics and characterizations[154]. Hence a narrative approach includes a set of specific questions that help relate aspects of the research topic to more precise elements the narration should shed light upon. They act as an introduction to a more detailed description of the methodology because they organize the main grid a reader should have in mind.

c **A methodology:** Given the source and the initial scope of the study, the narrative approach should finally describe the methodology applied when reading the documents. The methodology has to clearly state the elements the researcher should be looking for when reading. The methodology acts as the bridge between the research

[151]There is an arbitrage condition between (+) the benefits of having access to enough information and heterogeneity to draw valid conclusions and (-) the inevitable/irreducible cost of treatment (active reading) for each document.

[152]They relate to numeric measures/ hitcounts on selected words mentioned in text.

[153]Not all approaches do this last step, given the gigantic volume of information to process.

[154]This is the most important reason.

scope and the raw data: identifying, given the literature and the questions, what are the main objects of interest and how they should be treated.

(i) To answer a constant question I get when mentioning narrative contributions and methodology: **you read**. The essence of a narrative approach is to understand key transmissions mechanisms based on the described sequencing of events. (Active) reading the document ensures a better evaluation of key details/references and their weights/place in the developments that are being described.

(ii) The methogology identifies the different set of developments that the reader should be looking for when reading. These developments act as proxies for factors related to the event studied. They can be the direct manifestation of an object of interest. They can also relate to more fundamental/structural determinants that affect the event and the mechanisms studied. These developments can be related to specific agents of the economic and financial system. They can also relate to specific transmission mechanisms and their effect on given macroeconomic/financial concept. The methodology should also evoke potential decisions, news, shocks that could be related. A particular focus should always be given to looking for statements on causal inferences. Because these developments might have different weights/roles in the event studied, the methodology should explain how/when to identify relevant matters.

(iii) So far, recent narrative contributions have aimed at offering for the events they consider either (α) a precise datation or (β) quantitative/qualitative taxonomical elements or (γ) time series illustrating a core concept. This last step of the methodology is conditional on the broad objective of the study. The methodology defines how the raw data, i.e. the writings, are recorded as the final output of the process. This includes, on one hand, the narrative contribution that details the factors identified in the previous point. This should be organized around quotes or page references from the source documents. On the other hand, for the events or documents treated, the methodology often entails a *box-ticking* stage during which key characteristics are recorded. These can include dates on a calendar, a ranking based on magnitude/intensity, boolean variables on the role of specific factors in a particular event etc. Overall these outputs should be easily treatable and aimed for diffusion.

L Detailed despcription of the narrative sources

The source is the *International Monetary Fund*'s ***article IV publications***, I also rely on other publications that entail elements from economists country reports (descriptive and analytival views). These include: (1) *Recent Economic Development country reports*, that act as internal background papers to article IV final reports ; (2) program-related documents including *requests for assistance* and *reviews of program's advancements* ; (3) Independent Evaluation Office reports on the implication of the IMF in selected crises or topical reports, e.g. on the role of statistics and data quality in past experience ; (4) in few occasion I also consult press releases[155].

L.1 General information

In this dissertation, I focus on the International Monetary Fund (IMF) as the principal source for narrative elements. I have been highly exposed to working with these publications while previously employed at the Banque de France[156].

I now describe the institution and present the context in which the staff prepares the documents I read. A description of the said documents follow..

The IMF is an international organization conceived in July 1944 at the Bretton Woods conference. Her primary mandate is to preserve the stability of the international monetary system – i.e. the system of exchange rates and international payments. She is a major actor in support of international economic and financial cooperation. See Fioretos (2019) for a discussion of the IMF's place in a globalizing world, in which new forums of discussion/action/coorperation develop. IEO (2019) reviews the institution's efforts to promote and sustain cooperation since the GFC.

The IMF is a Fund that builds upon member's economies[157] quotas/financial contributions[158] to provide external financing to other member economies in needs of assistance.

[155]For Switzerland, I also relate to historical work and OECD archives

[156]As an intern in 2012-13, I monitored dayly the evolution of the Greek crisis and associated institutional policy management (notably by the IMF). As an intern and later as an economist, I also contributed to the reactions of the French Central Bank to certain IMF publications. These reactions were aimed at the French representative at the Executive Board for discussion on said publications.

[157]The number of member economies rose from 44 in 1944 to 189 as of mid July 2020.

[158]At the end of my grant at the Banque de France, I got the occasion to work on the discussions regarding future IMF quotas/resources. The policy note aimed at estimate, conditional on different scenarii, expected costs associated with future crises management.

The IMF is governed by a board of directors that represent each member economy. The Fund is managed by a representative executive board – 24 chairs – chaired by the managing director[159], assisted by four deputies.

Overall, the Fund's position as an international institution responsible for a supranational mandate – the functioning of the international monetary system – makes her a key participant worldwide, with a distinct own voice.

The IMF's mandate[160] is broader than just financial assistance. The Fund's staff can provide technical assistance, build capacity locally, overview appliance to statistical standards... Of particular importance to me, the IMF's particular position endows her with a specific mandate of surveillance. This sometimes got the institution the title of "*gendarm* of world markets".

Surveillance is done at different levels: (i) from a global and wide perspective in publications such as the *World Economic Outlook*, (ii) on more specific topics/regions in recurrent periodics*Global Financial Stability Report, Fiscal Monitor, External Sector Report, Regional Economic Outook* or (iii) at a country level in ***Article IV*** and other country reports – the *Recent Economic Developments* series. Surveillance is often a key condition associated to the IMF's financing programs. Hence program-related documents such as requests for assistance or program review also entail 'surveillance' elements. In this dissertation, I focus on the lower level of surveillance: at the country level. Worth noting, there has been only few research using article IV publications and related background papers from a narrative perspective. Romer and Romer (2017) and Hernandez (2019) form recent notable exceptions.

Article IV publications are the practical application of the fourth article in the IMF mandate[161]. Indeed at the bilateral level, the IMF monitors and evaluates the situation of the economic and financial systems in order to identify potential sources of risk. To that end she relies upon a conceptual framework for assessing country risks applied to all members (Ahuja et al., 2017)[162].

[159]Currently Kristalina Georgieva.

[160]The interested reader can refer to Liu (2018) for legal considerations on the IMF's mandate and the Fund's inherent rule of law.

[161]Participants in the Fund's activities bound themselves more or less concretely to a set of agreements. Inter alia here on surveillance but also on the furnishing of information (art. VIII) and restrain from imposing unauthorized restrictions on international payments and transfers (art VIII).

[162]Note that, while at the Banque de France, I animated a seminar on behalf of the CB and the IMF's

What draws me towards these particular publications is the fact that I coordinated the conduct of the article IV France for the Banque de France two consecutive years[163]. Being confronted to the production process from the inside provides me, ex post, with (1) a great familiarity with the content of the documents and the different topics covered ; (2) a better understanding of the entire process engulfed in the article IV annual consultations ; (3) a direct experience[164] of the interactions between the IMF and national representatives and how the latter's views were discussed and taken into consideration. As of the present date[165], I have also been part of the IMF SPR department in the Macro Policy division. This new insider's view and discussions with colleagues provide me subsequently with (4) a better understanding of the internal 'article IV consultation' process and the making of the Fund's views. Having this insider's view on the insiders' writing the documents is, I believe, a good way for me to catch the underlying motivations in the information entailed in descriptions, analysis and policy views.

The article IV publications is only the final step in the process defined as the *article IV consultations*. These consultations entail exchange of informations/statistics, views on specific questions and topics, meetings between the IMF staff mission[166] during a few weeks visit in the country, etc. All participants in the process, evidently, anticipate the whole procedure and prepare in advance their analysis and their *a priori* views on certain specific topics of interest. As such, for the BdF/IMF, there are background papers that are prepared for internal diffusion. They are used to define the institutions' positions and scope for discussion. Note that, for the IMF, the ***Recent Economic Development*** series of country reports offers a good grasp of these background documents. During the visit, national representatives/authorities and IMF mission meet and discuss topics of interests.

Institute for Capacity Development on country risk assessment – focus on the external sector – with African economists. I mention that as another signal for my acquaintance with the Fund's documents.

[163]From the start of my PhD, my research has been confronted with current topical issues and a policy-view. I grew to learn about the making of economic decisions but also the institutional fundamentals underlying these processes. Looking back at my experiences at the Banque de France and currently as an intern at the IMF, I sort-of feel like a field-researcher involuntarily studying the making/fundamentals of the communication of international institutions and policy makers. This claim is not meant as a statement of authority but rather as the observation of a researcher discovering new approaches and questions.

[164]I notably coordinated the contribution of the BdF to the French answer to the Fund. I coordinated the briefing file for the BdF Governor's meeting with the Fund. I also assisted to meetings between the IMF staff mission and BdF/ACPR representatives.

[165]July 19th 2020

[166]What I denote the IMF staff mission includes all economists and staff from a regional department or, in rarer cases, from transversal departments at the Fund, who take part in the visit.

In practive the consultations conclude with the publication of the Article IV report, validated by the executive board of the IMF. The conclusions are often made public and associated with a press release. Nevertheless some countries refuse the release, and even sometimes the conduct of the mission – it is their own right. The textitde jure rule regarding the conduct of the consultations should lead to annual publications. In practice, and especially in the archives, publications are available at a lower frequency (biennial). Moreover as countries can refuse the publication of an article IV's conclusion, there might be gaps. Yet, searching archives allows for the recovery of other notable publications that make up for the loss[167].

IMF archives are widely accessible. The elibrary [168] offers a wide cover of countries economic and financial history. The library gives access to several types of publications: official or academic publications, reports (program-related or not), books... Accessing a country's page at the Fund also gives access to official country-related communications, news brief, speeches, transcripts etc... The many types of content provide many potential sources of information related to elements that mattered for each crisis. I concentrate my readings: (1) on article IV publications when availables; (2) on Recent Economic Development country reports (often more detailed than article IV publications, especially before the 1990's, when the formatting of the article IV muted a bit) ; (3) program-related request for financial assistance, which entail the staff's view on the economic and financial system and a recommendation for the executive's board decision, or the regular planned reviews of program's advancement and respect of conditionality ; (4) Independent Evaluation Office reports which relate to specific crises (notably Argentina 1991-2001 (2004), Korea, Indonesia and Brazil end 90's (2003), Greece, Portugal and Ireland in 2010's (2016b)) or that adress key elements that could have affected the Fund's view or the events: data issues (2016a), the IMF's role as a trusted advisor (2013) or the IMF's policy advices on exchange rates (2007).

The consistency of the Fund's view – and consequenty of the documents I treat – is ensured internally as the *Strategy and Policy Review* (SPR) department reviews all publications. Working with management and other departments, SPR ensures the unicity of

[167]The most salient example are the Recent Economic Development Argentinean country reports published in 2016 and covering in detail the years 2012/13, 13/14 and 14/15. The first two reports also discuss economic and financial developments since 2006 when the authorities decided to cut ties with the IMF.

[168]https://www.elibrary.imf.org or https://archivescatalog.imf.org

the Fund's voice. She builds upon analytical tools and research to evaluate the policy implications of recommendations and opinions. SPR also work internally on the adequacy of the conceptual framework[169] and follows/conducts recent research and unfoldings to adapt the view to the changing world[170].

The adequacy of the IMF's approach is of primary interest for my initiative. Indeed the framework behind the publications has multiple advantages: (i) currency crises as disruptions on the international monetary system are of key importance for the IMF, (ii) it is backed by a serious methodology, that borrows from academic literature and years of experience ; (iii) it allows for a comprehensive coverage and analysis of episodes ; (iv) the reports are written by economists, well sourced and recognized for their seriousness (v) the documents are considered as a reference view worldwide and media-wide (from press articles to academic research). It is also important to note that the IMF's framework has evolved over time. Reinhart and Trebesch (2016) discuss how the IMF adapted the conduct and scope of her activities to the different waves of financial crises and changes in the international monetary system.

Yet this doesn't mean that the Fund's approach is unbiased and uncriticized. The most discussed illustration of this statement is the huge wave of critics and mistrust that rose in the 2000's in Latin and South American Countries. Hernandez (2019) leads a discursive analysis of the policy biases in the treatment of Argentina over 1989-2006:2016-17. He uses article IV publications to estimate the bias in policy recommendations. Having read these documents with particular attention, I can only agree with his conclusions. When exploring the archives to define my methodology, I read, for Argentina, all of the IMF's press releases, information notices and the, key, speeches by the managing director. The speech by Michel Camdessus on May 27th, 1996 at the Academy of Economic Science in Buenos Aires, Argentina is a **must read** to understand in practice what is at stake here. Since the 1980's the Fund had been following, what was later coined in 1989, the *Washington Concensus*.

This was an economic dogma that revolved around a set of policy recommendations that covered fiscal and monetary discipline, tax reforms, flexible exchange rates, privatization of key activities, a wide process of liberalization (notably to inward capital flows,

[169]The previous reference is a technical note written by economists from the SPR department.

[170]A key illustration of this fact would be my research as a summer intern with co-authors from the SPR department on the effectiveness of unconventional monetary policies in open economies.

e.g. firect investment), market deregulation and an amelioration of institutions. Whether or not this is a good policy agenda is not for me to tell but for history. The drastic developments that engulfed emerging markets at the end of the 90's affected most consequently Latin and South American countries – Argentina widely exposed on the front lines (IEO, 2004). The country experienced one of the worst recessions in her history. In 2006 the country cut ties with the IMF to only enter in official 'normal' relations 10 years later. The IMF adapted her views on the Washington ex post and worked towards renewed cooperations.

The methodology and views of the Fund are changing but still remain a topic of discussion as illustrated in the following quote from IEO (2019).

> *"IMF staff developed the IV to provide a coherent framework for policy advice on dealing with volatile capital flows based on both detailed review of country experience and conceptual work. The IV has garnered praise but also generated some frustration. Some countries have wanted the IV to endorse the use of capital flow management (CFM) measures as part of a broader toolkit that could be used pre-emptively rather than as last in the hierarchy of policies. In addition, some advanced economy (AE) and EM officials feel the IV has been applied too rigidly, for example, in labeling as capital flow management measures some steps that countries view as having been taken for financial stability or social reasons."*

The quote illustrates very much a fundamental that, I, as a reader try to see in the documents: What is the IMF's view? And why? Because the IMF has a set of principles, her approach is fundamentally biased. When reading, I try to pay attention to cases where this could have mattered.

Finally due to her unique place in the International Monetary System, the IMF has indeed a voice of her own but she also has responsibilities and a restricted space for talking. Restricted *de jure* by her mandate that prevents from making any political judgments irrelevant to primary concerns. A key example for that is Peru in 1992[171]. In April, the president Alberto Fujimuri dissolved the Congress and assumed full powers using military support. Whereas this event acted as a deep constitutional crisis and

[171]This particular episode is dated as a currency crisis only using the Frankel and Rose 1996 method. My narrative quotes confirm that it is not a currency crisis

affected the position of international actors against Peru(and hence the relative value of the currency), the IMF rarely mentions it in its article IV publications for 1992 and for 1993: "Capital inflows resumed since 1990, in response to the Government's policy of normalizing relations with foreign creditors and the liberalization of the exchange system" [...] "Inflows slowed down with the uncertainties surrounding the political environment in early 1992, but continued being positive through September 1992".

Restricted *de facto*, because her voice is a key signal on markets worldwide. Leaks, uncertain claims, bad projections can be the source of heightened market risks[172]. Hence her communication has to be tailored.

L.2 Underlying methodology

Today, when writing country reports, the IMF staff relies upon the overall risk evaluation architecture provided by the institution's publications: global and topical cross country coverages (*World Economic Outlook*, *Regional Economic Outlook*, *Global Financial Stability Report*, *Fiscal Monitor*), article IV's reference methodology (Country and Global *Risk Assessment Matrices*), and specific topical risk assessments (*Financial Sector Assessment Program*, *External Sector Report*). This infrastructure allows the authors of my sources to identify the main developments and topics of interest for the countries they cover at the time of writing. This infrastructure moreover ensures that the considerations are consistent across countries. All of the documents that make the previous list were introduced 'recently'. This doesn't mean that the infrastructure lacked these elements and consderations before that. The IMF adapted its portfolio of publications and communications to clarify its position and help stimulate debates on policy practices.

(Ahuja et al., 2017) details the main sectors of considerations for country evaluations: external/contagion, public/fiscal, financial/asset prices, real/macro sectors. The IMF risk assessment methodology is the result of an evolutionary conceptualization. For example financial elements and considerations on asset prices are but recent additions. These 'new' elements were often introduced after significant economic and financial troubles in member economies. Former editions discussed and analyzed economic and financial developments comprehensively but spent less ink on those elements when not at the very center of the action.

[172]The IMF has a very strict security policy to ensure the safety and the awareness on *crown jewels* and procedures.

The following subsection presents examples of table of contents from article IV consultations and Recent Economic Development staff reports as illustration for the coverage of the documents and the evolution through time. Of particular interest, the main trends are towards including more narrative elements (description and analysis of events as in the Recent Economic Developments' series) in the article IV consultations. Moreover, as time passed, the documents have discussed banking and financial considerations with greater emphasis.

I extract from the table of contents the main topics that are being discussed. I identify broad
{1} categories of fundamentals – (a) internal, e.g. "*Structural reforms*", "*Institutional and legal structures*", "*statistical issues*" and (b) external, for example "*trade relations*" ; and
{2} categories of topic/areas of interest : (a) nominal developments – e.g. "*monetary policy*", "*exchange rate policy*" – (b) sovereign developments – e.g. "*fiscal policy*", "*government finance*", "*external debt and claims*" – (c) financial developments – e.g. "*financial sector reforms*", "*financial and corporate sector issues*", "*capital market*" , "*capital account*" – (d) real developments – "*domestic economic development*" , "*macroeconomic developments*", "*production, employment situation, wages*", "*current account*" – (e) socio-political developments – e.g. *social unrest*, *poverty issues*, *elections*.

L.3 Selection of table of contents

Article IV consultation staff reports

I provide examples for article IV in 1973 for Italy, 1995 for Paraguay and 2014 for India.

Italy – Article IV staff report – 1973 consultations:

1. Background
2. Report of the discussions
   (a) Domestic economic development
   (b) Fiscal policy
   (c) Monetary policy
   (d) The balance of payments and the exchange market

i. The balance of payments outturn in 1972 and the early part of 1973
ii. Exchange market developments in 1973
iii. The balance of payments outlook

3. Staff appraisal

4. Recommended decision

Paraguay – Article IV staff report – 1995 consultations:

1. Introduction

2. Recent developments

   (a) Macroeconomic performance

      i. Developments through 1994
      ii. Developments during 1995

   (b) Structural reform

3. Summary of discussions

   (a) Indexation mechanisms
   (b) Fiscal policy
   (c) Monetary policy and financial sector reform
   (d) External sector policies
   (e) Medium term projections
   (f) Statistical issues

4. Staff appraisal

India – Article IV staff report – 2014 consultations:

1. Context

2. Outlook and risks

3. Policy priorities

   (a) Monetary policy
   (b) Adressing external vulnerabilities
   (c) Fiscal policy
   (d) Financial and corporate sector issues
   (e) Structural policies to boost growth
4. Staff appraisal

Recent economic developments Recent Economic Development are the background material that shapes the staff's view of a country before the discussions with the national authorities. They are more detailed than the article IV staff reports. In general these documents were produced/available until the end 90's. I provide example of the table of contents for Korea in 1975 and Russia in 1999.

Paraguay – Recent Economic Developments – 1975:

1. Basic data
2. Internal economic developments
   (a) Introduction
   (b) Demand conditions
   (c) Production
   (d) Employment situation, wages and productivity
   (e) Prices
   (f) Monetary and credit policies
      i. Principal developments in 1974
      ii. Interest and credit poicies
      iii. Developments in the money and capital markets in 1974
   (g) Government finance
      i. Structure of the public sector
      ii. Central government operations
      iii. Revenue performance
      iv. Trends in expenditure

v. Extrabudgetary transactions

3. External developments

(a) Balance of payments developments in 1974

i. Exports

ii. Imports

iii. Services and transfers

iv. Capital movements

v. International reserves

(b) External debt

(c) Exchange and trade system

i. Exchange rate system

ii. Import system

Russian Federation – Recent Economic Developments – 1999:

1. Basic data table

2. Overview

(a) 1992-1996: the first five years of transition

(b) The zenith of expectations, January–September 1997

(c) Rising pressures and policy responses, October 1997 – July 1998

(d) The August 1998 crisis

(e) The post-crisis period

3. Domestic Economy

(a) Output and expenditure

i. Overview

ii. The main components of demand: 1996–98

iii. Sectoral developments

(b) Labor market trends

(c) Prices and wages

        i. Wages developments

4. Public finances
    (a) Overview 1996–99
    (b) Key features of 1996–99 developments
        i. Federal government revenue performance
        ii. Federal government expenditure
        iii. The regional and local budgets
        iv. Social extrabudgetary funds

5. Monetary developments
    (a) Overview
    (b) Institutional and legal structures
    (c) Trends in monetary and exchange rate policy 1995–99
        i. The pre-crisis period
        ii. The onset of the crisis
        iii. Development since the crisis
    (d) Commercial banking and broad money developments 1995–99
        i. Broad money and credit develoments
        ii. Developments in the commercial banking sector

6. External sector developments
    (a) Current account
        i. Merchandise trade
        ii. Exports
        iii. Imports
        iv. Service, net income, and transfers
    (b) Capital account
        i. Capital flows to the federal government
        ii. Capital flows to other sectors
        iii. The impact of the August crisis on Russia's relations with external creditors

(c) External debt and claims

i. Sovereign debt

ii. Nonsovereign debt

iii. Russia's external claims

(d) Trade policy, regional and CIS trade relations, and WTO accession

i. Overall trade policy

ii. External trade issues of Russian regional government

iii. Relations with the CIS and other countries in the region

iv. WTO accession

(e) Structural reforms

i. Introduction

ii. Private sector developments

iii. Industrial restructuring

iv. Reforms of the Infrastructure Monopolies

M Narrative methodology: conceptual factors for dating currency crises

A currency crisis[173] is a particular type of financial crisis. She is a financial crisis because she entails heightened disruptions on the foreign exchange markets. Forex markets include transactions related to the exchange rate(s)[174] and the products derived from it[175].

A currency crisis is particular because of the nature of the asset traded (in-)directly on these markets: domestic currencies[176]. As the external nominal anchor, the exchange rate[177] measures the relative value of a currency against another.

As such the exchange rate acts as a proxy for the relative trust/faith in a given currency. This is particularly important because the exchange rate is associated to all current and future decisions by economic and financial domestic agents when interacting with foreigners.

A currency crisis occurs when substantial pressures accumulate on forex markets due to agents sharing conflicting views as to what the actual value of a currency should be. The pressures unveal the inherent vulnerability/inconsistency/indeterminacy of the present situation. This, in turn, forces a marked change in the policy course of an agent(s) or a substantial adjustment in prices – re-valorization. This action can solve the issue and align agents considerations on a new path for the currency. It can also prove insufficient to tame divergences and lead to a resurgence of troubles.

To illustrate in more detail the key factors and developments behind currency crises in the literature[178], this definition uses three lines of reasoning: ⊎ given that all transactions

[173] I retain a non negligible part of the following references from having taught (TA) several years International Monetary Relations for Agnès Benassy-Quéré at Université Paris 1 - Panthéon Sorbonne. Her manual was detrimental in my approach of international macroeconomics and finance, Benassy-Quere (2015).

[174] e.g. bilateral between a country and partners.

[175] markets for spot/forwards, options, swaps, derivatives

[176] That the currency is, in essence, particular has been a key item of discussion in the history of economic thought. For starters, the interested reader can refer to Keynes' theory of money, the quantity theory and the neutrqlity of money (Friedman and the monetarists).

[177] The particular role of the exchange rate has also been a frequent topic of discussion in the history of economic thought. The reader can refer to Hume's price-specie flow mechanism (his reasoning relies on the value of flows, which in practice is illustrated in the exchange rate) to to discussions on the case for flexible exchange rates (Milton Friedman in 1950, Harry Johnson in 1953 or Maurice Obstfeld in 2020). Of particular interest for emerging markets and developing economies, the reader can also relate to dicussions on the fear of floating by Guillermo Calvo and Carmen Reinhart (2000) (2002).

[178] There are numerous empirical research that has studied the determinants of currency crises. These

including domestic and foreign agents find a counterpart in forex markets, I detail how different agents are exposed/related to it; $\otimes$ given that the value of the currency, at stake in these crises, is determined on markets I review key factors and determinants that might affect price determination; $\not\sim$ given that all crises entail nonlinearity in an agent's policies, I discuss the key markers of such actions.

Agents and transactions $\uplus$: The exchange rate matters for all transactions[179] involving agents valorising the utility of said transaction in different currencies. That makes for a lot of transactions and as many different types of agents as possible. Here, I describe the main possibilities for key agents to be affected by the external nominal anchor.

- $\uplus$ Households care (indirectly) about the exchange rate as it impacts the price of the imports aimed for consumption (durable and non-durable goods and services). Their perceived income can also be affected by the exchange rate, for example if they work across borders. Depending on (i) the liberalization and development of financial markets and (ii) the distribution of wealth in the economy, the external nominal anchor might enter into consideration for some household's investment/savings decisions and affect their earnings/dues on foreign assets/liabilities.

- $\uplus$ Firms and non-financial corporations care about the exchange rate if their balance sheet is exposed to risks of currency mismatch. This could be the result of (i) an important share of earnings coming from export receipts, (ii) a high dependency upon imported inputs. A firm's production, investment and pricing decisions might depend upon expected profits and thus be conditional on agent's expectations of future exchange rates. Exchange rate fluctuations can also affect firms ability to export based on their productivity[180]. Large or multinational firms may also care about the value/stability of the exchange rates in their direct investment decisions and/or want to insure against currency risk by diversifying their portfolio using swaps or derivative. Exchange rate flexibility has important effects on corporate debt currency denominations. Volatility often discourages currency mismatches.

studies usually combine a datation of currency crises following one of aforementioned algorithme. They then complement the database with time series for the main macroeconomic and financial indicators. Some filtering/econometric techniques are then usually employed to understand which variables, displaying insightful variations before the crisis, help predict it (see the large literature on Early Warning System Bussiere and Fratzscher (2006), Bussiere (2013)) or help characterize particular types of currecy crises (see Kaminsky (2006)'s use of regression tree analysis)).

[179] A reader interested in a **more** detailed approach can search the latest IMF's Balance of Payments manual. As of the date of writing this: IMF (2009).

[180] Berman et al. (2012)

- ⊎ Banks and financial institutions are also exposed to balance sheet risks due to currency mismatch. More importantly banks and financial institutions are key actors of forex markets. They are reponsible for an important share of these transactions as, beyond their own, they often act as an intermediary for private agents. Financial institutions also enter forex markets to manage their portfolio of assets and/or speculate (e.g. carry trade[181]). This can lead to various cross-border capital flows and episodes of speculative attacks – in which the value of a currency might be 'stress tested'. Exchange rate fluctuations also relate to large capital flows. In the case of a sudden loss of confidence, they can be associated to massive capital flights.

- ⊎ The government – sovereign authority – depends upon the exchange rate in different ways. Because of the particular nature of a country's income diversification, export earnings can prove to be a fruitful source of revenue for a government, e.g. natural resources etc. Nevertheless, should these receipts fall, the sovereign might see its policy space constrained by a rising debt service ratio. This might be a source of pressure for the exchange rate. The notion of *original sin*[182] has always been a key element when discussing sovereign's access to domestic/foreign currency borrowing.

- ⊎ The central bank, as the monetary authority, is the primary agent whose existence is related to the external nominal anchor. Her mandate stipulates her stance on the determination of the exchange rate and whether she should intervene on markets or not. Note that in some cases, authority over the exchange rate can be transferred to a currency board. Intervention can take many forms: print money, sell/buy foreign reserves, change interest rates. The central bank can also try to prevent fluctuations by imposing capital flow measures or macroprudential policies limiting currency exposure. Note that exchange rate fluctuations also pass-through to inflation and might create inflationary/deprecionary pressures on consumer/producer price indices[183].

The factors behind forex markets ⊗: To properly define currency crises, it it important to pay attention to fundamental/structural determinants of forex markets.

- ⊗ As previously mentioned the *de jure* exchange rate regime is perhaps the first determinant of the foreign exchange market. In practice though, central banks often

[181] See speculative mechanisms related to interest rate parities.

[182] See Eichengreen and Hausmann (1999), Hausmann and Panizza (2003) on the *original sin*. See also for emerging markets Broner et al. (2013) and Reinhart et al. (2003)

[183] See Geerolf (2020) for a discussion, by exchange rate regime, of CB's Philips Curve introducing real exchange rate growth and unemployment.

vary broadly in the exchange arrangements. *De facto* exchange rate regimes are thus a spectrum, see Ilzetzki et al. (2019) for an historical overview. The more constraining is the exchange arrangement (a fixed exchange rate/peg, a currency board, dollarization etc) bind the central banks to caring about the exchange rate. Should she face another shock, the situation on the forex market might well determine her remaining policy space given the exchange arrangement.

⊗ The more an economy opens/globalizes her trade and financial activity[184], the more she becomes reliant on forex markets. Hence a key friction that might be of interest for exchange rate fluctuations relate to existing barriers to trade and financial flows. More broadly, given exchange rate regimes, globalization can constrain monetary policy space following discussions on the Mundell trilemna, Rey (2018) Obstfeld (2019).

⊗ Global imbalances can be a key element to folow as they might suggest future expected external adjustment through valuation effects and potential app-/deprecionary pressures, Gourinchas and Rey (2007), (2014). (Adler et al., 2020) very recently discusses the impact of dominant currencies and trade invoicing patterns on the possibilities for flexible exchange rates to enable external adjustment in emerging markets. They identify exchange rate movements as a source for negative balance sheet effect in emerging markets by compressing importing firms' balance sheets.

⊗ The lack of trade diversification can also be a very important factor in building up vulnerabitilies on the exchange rates. If an economy relies too much on a specific set of goods and services[185], this might presage a higher dependency on external factors and a higher pass-through of exchange rate fluctuations to the real economy. Exporters could also be more vulnerable to external shocks such as bad harvests or natural disasters and might thus a source of vulnerability on the external front.

⊗ The development and liberalization of financial markets can also greatly affect exchange rates-related developments. Often liberalization periods in markets that are not enough developed can lead to increases in investors' risk aversion. This could expose the economy to speculative attacks or a constraining environment. Depending on the market's depth, number of participants, and the participation rate of foreign

[184]See Martin and Rey (2006) for broader considerations on financial crashes and globalization in emerging markets.

[185]Poorly diversified countries that rely a lot upon Tourism are a key example of services lead specialization, see e.g. Cyprus and Greece.

agents, developments on financial markets can spillover to forex markets and the exchange rate.

- ⊗ Agents facing balance sheet currency mismatch can be exposed to exchange rate fluctuations if their portfolio is short in foreign currency.
- ⊗ If a small open economy is developing, she might be subject to real apprecionary pressures to compensate for changes in relative labor productivity gains (e.g. Balassa Samuelson, see Samuelson (1994)). These dynamics might affect long run values of exchange rates.

Changes in policy ⌿: Because a crisis entails the evacuation of accumulated pressures, she is characterized by the revision by one or more agents of their optimal policy functions. I now describe the main policy adjustments that matter for the forex markets

- ⌿ Expectations realignments: because pressures on the currency often emanate from conflicting views on what today's price should be, new information or a clearer signal on an agent's intentions might help resolve par of the conflict. A key example woud be an independent central bank's clear communication.
- ⌿ When there is too much pressure on the exchange rate, if flexible, the latter adjusts. If not, it is possible for the central bank, to devalue the exchange rate to allow for a partial adjustment and a regain in external competitiveness.
- ⌿ Is she wishes to fight off app-/dep-recionary pressures the central bank can build up/down her stock of foreign reserves or gold. She can also enter swap aggreements with other central banks.
- ⌿ By influencing the key policy rates, the central banks affects the interests perceived on domestic currency assets and might thus affect existing developments on forex markets. The key theoretical framework to think of these episodes is that of interest rate parities.
- ⌿ By imposing import tariffs, export subsidies or various capital flow measures, a country's authorities can regulate cross border flows of the domestic currency and thus protect the economy from damaging capital outflows. These measure might nevertheless discourage foreign investors and entail missed opportunities and a less

efficient resource allocation. The policies are heavily debated in the changing multilateral world system but are found, in emerging markets and developing economies to have long-lasting effeects, hence representing sources of frictions on forex markets.

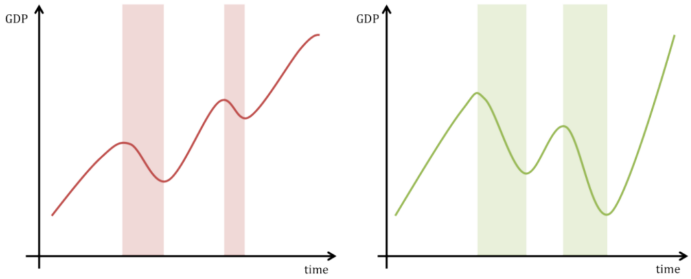
- As drastic a policy change can be, changes in exchange rate regimes are often the only option left to policy-makers to exit the current crisis equilibria into a new safe zone.

N A focus on Expansions

N.1 Double dips and transitive expansions

There are 10 double dips[186] in the sample. The majority of episodes can be found in advanced markets (6/10[187]). To first sort the episodes, I filter those for which the expansion's cumulated more gains fail to compensate for the losses accumulated before. The intuition for this filter can be taken from figure 9.

Figure 9: An illustration of double dips



The figures represent two imaginary real gdp time series illustrating two different cases of double dips. Shaded areas represent recessions.

The figure represents two different cases of double dips. These are two real gdp time series, shaded areas represent recessions. In the right panel, the expansion inbetween the two recessions is too mild to recover the losses endured before; The second recession worsens the situation and the recessions can be grouped. In the left panel, the expansion is strong enough to overcome the losses and the economy rebounds. The fact that a double dip is of a particular type offers no information on causal inferences between the two recessions. It only acts as a naive first proxy.

Only two double-dips (Paraguay in 1999q3:99q4 and Greece in 2009q2:09q4) fall in this category. These episodes are indeed false expansions in the sense that the second recession continued the first one..

Paraguay is associated to the emerging markets turmoil of the end 90's/begining 2000's. The Greek case illustrates the GFC and the European sovereign debt crises that

[186] 23 transitive expansions
[187] 12/23 for transitive episodes

hit Western European countries consequently around 2010's.

Of particular interest to me, I discuss in which cases the recessions that precede/follow the short expansion display financial crises.

First, there are no financial crises occurring during double-dip expansions. There are 4 cases without any financial crisis surrounding the expansion. For two episodes, the preceding recession displays a banking crisis and in one case the second recession displays a currency crisis. The first case that displays crises both in the first and second recession is Argentina around the expansion from 2014q4:15q2. As chapter **??** discusses, starting in 2012, Argentina is in a quasi constant state of crisis. I choose, for now, to discuss the episodes separately.

The second case is Paraguay. During the first recession the country experienced a currency crisis. In the second recession, the country experienced both a sovereign and a currency crises.

Finally, for Greece, the recession that precedes the expansion displays a banking crisis. the recession that follows displays a sovereign crisis. The GFC acted as the initial shock that troubled Greece and lead to the ensuing funest chain of events. Hence the database should record 1 more twin banking and sovereign crisis for advanced markets (and one less single banking/sovereign crisis).

For transitive expansions, as a firt pass, I only focus on those expansions that fail to recover the previous losses. There are 5 cases. Venezuela is a beginning of sample situation. Given that I don't have enough historical observations, I leave the episodes as they are. The four other cases occured in advanced markets. Luxembourg feeble expansion of 1975q4:76q4 is neither preceded nor followed by a crisis. Moreover if the expansion is followed by a recession, the latter is more akin to a stagnation episode.. In New Zealand, no crisis occurs in the recession before the transitive expansion. At the end of the latter, a currency crisis hits the country before the recession starts. Moreover, the expansion inbetween fails at recovering previous losses at a margin of 0.03% (out of -5.34%). I do not change the database for these episodes

The last two cases are Italy and Portugal expansions inbetween the GFC and the European crises in and 2009q2:10q3, respectively. This sequencing is very similar to the transitive expansions experienced Greece over the same periods. For Italy, nevertheless only a banking crisis signalled which doesn't change the current classification. For Portugal, the GFC and the associated banking crisis definitely acted as one among many factors behind the ensuing debt crisis. As for Greece, I increase the count of twin banking and sovereign crises for advanced markets and decreased respective single episodes.

N.2 List of double-dips and transitive expansions

episode iD				recession.bfr								
typo	country	code	is.weaker	beg	end	durt	sov.bfr	sov.drg	cur.bfr	cur.drg	bkg.bfr	bkg.drg
dbl.dp	Argentina	ARG	0	2013q4	2014q3	4	0	1	0	1	0	0
dbl.dp	South Africa	ZAF	0	2015q2	2017q1	8	0	0	0	0	0	0
trstv	Argentina	ARG	0	2011q4	2012q2	3	0	0	0	0	0	0
trstv	Argentina	ARG	0	2015q3	2016q3	5	0	0	0	1	0	0
trstv	Brazil	BRA	0	1998q2	1999q1	4	0	1	0	1	0	0
trstv	Brazil	BRA	0	2001q2	2001q3	2	0	0	0	0	0	0
trstv	South Africa	ZAF	0	1974q4	1975q1	2	0	0	0	0	0	0
trstv	South Africa	ZAF	0	1982q1	1983q1	5	0	0	1	0	0	0
dbl.dp	Bolivia	BOL	0	1998q3	1999q2	4	0	0	0	0	1	0
dbl.dp	Paraguay	PRY	1	1997q4	1999q2	7	0	0	0	1	0	0
trstv	Morocco	MAR	0	1995q1	1995q2	2	0	0	0	0	0	0
trstv	Paraguay	PRY	0	2000q1	2002q4	12	0	1	0	1	0	0
trstv	Russia	RUS	0	2008q2	2010q1	8	0	0	0	1	0	1
trstv	Turkey	TUR	0	1998q3	1999q1	3	0	0	0	0	0	0
trstv	Venezuela	VEN	1	1998q1	1999q2	6	0	0	0	0	0	0
dbl.dp	Austria	AUT	0	1980q2	1982q4	11	0	0	0	0	0	0
dbl.dp	Greece	GRC	1	2008q4	2009q1	2	0	0	0	0	1	0
dbl.dp	Italy	ITA	0	1990q3	1991q2	4	0	0	0	0	0	0
dbl.dp	New Zealand	NZL	0	1985q2	1986q1	4	0	0	1	0	0	0
dbl.dp	New Zealand	NZL	0	2008q1	2009q2	6	0	0	0	0	0	0
dbl.dp	United States	USA	0	1980q2	1980q3	2	0	0	0	0	0	0
trstv	Austria	AUT	0	2008q2	2010q1	8	0	0	0	0	0	1
trstv	Denmark	DNK	0	1977q4	1978q1	2	0	0	0	0	0	0
trstv	Ireland	IRL	0	1982q3	1983q2	4	0	0	0	0	0	0
trstv	Italy	ITA	0	1974q3	1975q1	3	1	0	0	0	0	0
trstv	Italy	ITA	1	2007q1	2009q1	9	0	0	0	0	0	1
trstv	Luxembourg	LUX	1	1974q3	1975q3	5	0	0	0	0	0	0
trstv	Luxembourg	LUX	0	1977q1	1977q2	2	0	0	0	0	0	0
trstv	Luxembourg	LUX	0	2007q4	2009q2	7	0	0	0	0	0	1
trstv	New Zealand	NZL	1	1986q4	1987q2	3	0	0	0	0	0	0
trstv	Portugal	PRT	1	2008q2	2009q1	4	0	0	0	0	0	1
trstv	Switzerland	CHE	0	1996q2	1996q3	2	0	0	0	0	0	0
trstv	Switzerland	CHE	0	1998q3	1998q4	2	0	0	0	0	0	0

episode iD				expansion								
typo	country	code	is.weaker	beg	end	durt	sov.bfr	sov.afr	cur.bfr	cur.afr	bkg.bfr	bkg.afr
dbl.dp	Argentina	ARG	0	2014q4	2015q2	3	0	0	0	0	0	0
dbl.dp	South Africa	ZAF	0	2017q2	2017q4	3	0	0	0	0	0	0
trstv	Argentina	ARG	0	2012q3	2013q3	5	0	0	0	0	0	0
trstv	Argentina	ARG	0	2016q4	2018q1	6	0	0	0	0	0	0
trstv	Brazil	BRA	0	1999q2	2001q1	8	0	0	0	0	0	0
trstv	Brazil	BRA	0	2001q4	2002q4	5	0	0	0	1	0	0
trstv	South Africa	ZAF	0	1975q2	1976q3	6	0	0	1	0	0	0
trstv	South Africa	ZAF	0	1983q2	1984q2	5	0	0	0	0	0	0
dbl.dp	Bolivia	BOL	0	1999q3	2000q2	4	0	0	0	0	0	0
dbl.dp	Paraguay	PRY	1	1999q3	1999q4	2	0	0	0	0	0	0
trstv	Morocco	MAR	0	1995q3	1996q4	6	0	1	0	0	0	0
trstv	Paraguay	PRY	0	2003q1	2004q3	7	0	0	0	0	0	0
trstv	Russia	RUS	0	2010q2	2011q4	7	0	0	0	0	0	0
trstv	Turkey	TUR	0	1999q2	2000q3	6	0	0	0	0	0	0
trstv	Venezuela	VEN	1	1999q3	2001q2	8	0	0	0	0	0	0
dbl.dp	Austria	AUT	0	1983q1	1983q4	4	0	0	0	0	0	0
dbl.dp	Greece	GRC	1	2009q2	2009q4	3	0	0	0	0	0	0
dbl.dp	Italy	ITA	0	1991q3	1992q2	4	0	0	0	0	0	0
dbl.dp	New Zealand	NZL	0	1986q2	1986q3	2	0	0	0	0	0	0
dbl.dp	New Zealand	NZL	0	2009q3	2010q2	4	0	0	0	0	0	0
dbl.dp	United States	USA	0	1980q4	1981q1	2	0	0	0	0	0	0
trstv	Austria	AUT	0	2010q2	2012q1	8	0	0	0	0	0	0
trstv	Denmark	DNK	0	1978q2	1980q1	8	0	0	0	1	0	0
trstv	Ireland	IRL	0	1983q3	1985q2	8	0	0	0	0	0	0
trstv	Italy	ITA	0	1975q2	1976q4	7	0	0	0	1	0	0
trstv	Italy	ITA	1	2009q2	2011q1	8	0	0	0	0	0	0
trstv	Luxembourg	LUX	1	1975q4	1976q4	5	0	0	0	0	0	0
trstv	Luxembourg	LUX	0	1977q3	1979q1	7	0	0	0	0	0	0
trstv	Luxembourg	LUX	0	2009q3	2011q1	7	0	0	0	0	0	0
trstv	New Zealand	NZL	1	1987q3	1989q2	8	0	0	0	1	0	0
trstv	Portugal	PRT	1	2009q2	2010q3	6	0	0	0	0	0	0
trstv	Switzerland	CHE	0	1996q4	1998q2	7	0	0	0	0	0	0
trstv	Switzerland	CHE	0	1999q1	2000q4	8	0	0	0	0	0	0

episode iD				recession afr								
typo	country	code	is.weaker	beg	end	durt	sov.drg	sov.afr	cur.drg	cur.afr	bkg.drg	bkg.afr
dbl.dp	Argentina	ARG	0	2015q3	2016q3	5	0	0	1	0	0	0
dbl.dp	South Africa	ZAF	0	2018q1	2019q4	8	0	0	0	0	0	0
trstv	Argentina	ARG	0	2013q4	2014q3	4	1	0	1	0	0	0
trstv	Argentina	ARG	0	2018q2	2019q4	7	1	0	1	0	0	0
trstv	Brazil	BRA	0	2001q2	2001q3	2	0	0	0	0	0	0
trstv	Brazil	BRA	0	2003q1	2003q2	2	0	0	0	0	0	0
trstv	South Africa	ZAF	0	1976q4	1977q3	4	0	0	0	0	0	0
trstv	South Africa	ZAF	0	1984q3	1986q2	8	1	0	1	0	0	0
dbl.dp	Bolivia	BOL	0	2000q3	2000q4	2	0	0	0	0	0	0
dbl.dp	Paraguay	PRY	1	2000q1	2002q4	12	1	0	1	0	0	0
trstv	Morocco	MAR	0	1997q1	1997q2	2	0	0	0	0	0	0
trstv	Paraguay	PRY	0	2004q4	2005q1	2	0	0	0	0	0	0
trstv	Russia	RUS	0	2012q1	2019q4	32	0	0	1	0	0	0
trstv	Turkey	TUR	0	2000q4	2001q4	5	1	0	1	0	1	0
trstv	Venezuela	VEN	1	2001q3	2003q1	7	0	0	0	0	0	0
dbl.dp	Austria	AUT	0	1984q1	1984q2	2	0	0	0	0	0	0
dbl.dp	Greece	GRC	1	2010q1	2013q1	13	1	0	0	0	0	0
dbl.dp	Italy	ITA	0	1992q3	1992q4	2	0	0	1	0	0	0
dbl.dp	New Zealand	NZL	0	1986q4	1987q2	3	0	0	0	0	0	0
dbl.dp	New Zealand	NZL	0	2010q3	2010q4	2	0	0	0	0	0	0
dbl.dp	United States	USA	0	1981q2	1982q3	6	0	0	0	0	0	0
trstv	Austria	AUT	0	2012q2	2014q2	9	0	0	0	0	0	0
trstv	Denmark	DNK	0	1980q2	1980q3	2	0	0	0	0	0	0
trstv	Ireland	IRL	0	1985q3	1986q2	4	0	0	1	0	0	0
trstv	Italy	ITA	0	1977q1	1977q3	3	0	0	0	0	0	0
trstv	Italy	ITA	1	2011q2	2013q1	8	0	0	0	0	0	0
trstv	Luxembourg	LUX	1	1977q1	1977q2	2	0	0	0	0	0	0
trstv	Luxembourg	LUX	0	1979q2	1982q4	15	0	0	0	0	0	0
trstv	Luxembourg	LUX	0	2011q2	2012q3	6	0	0	0	0	0	0
trstv	New Zealand	NZL	1	1989q3	1992q3	13	0	0	0	0	0	0
trstv	Portugal	PRT	1	2010q4	2012q4	9	1	0	0	0	0	0
trstv	Switzerland	CHE	0	1998q3	1998q4	2	0	0	0	0	0	0
trstv	Switzerland	CHE	0	2001q1	2003q2	10	0	0	0	0	0	0

N.3 Financial crises in expansions: details

Few multiple crises episodes occur in expansion:

1. For all country groups, currency crises dominate single crises episodes. This is particularly true for advanced markets.

2. In emerging markets, sovereign crisis never occur alone. A fourth of single crises episodes are banking crises, hitting the countries mostly in expansion. For the Slovak Republic banking crisis of 1997q4, the recession starts 5 quarters after the event. The recession starts in 1999q1, two years after a currency related unrelated in the narrations to the banking crisis. The Costa Rican banking crisis of 1994q3 is not followed by a recession. Indeed growth slows around zero for few quarters. The losses are too low for the Markov estimates to date a crisis. For the last two cases – Latvia 1995q2 and Lithuania 1995q4 – banking crises occur at the very beginning of the sample and I might not dispose of all necessary information to draw conclusion.

3. Both defaults in expansion for developing countries are due to political developments. The two defaults occurring in expansion for developing markets are Thailand in 2010q4 and Bolivia in 2004q4. The former default results from a purely political choice as the country experienced a political crises and violent social unrest and manifestations. For Bolivia, the country experienced in February 2003 severe social unrest and a run on banks' USD liabilities. The country requested/obtained external financing from the IMF in March. Authorities procede carefully with the program despite conflicting social and political conditions. In 2004q4, the authorities are forced to request for an extension of the deadline to respect the program's conditionality. The IMF agrees on December 23, 2004.

4. In developing markets, two banking crises occur in expansion: Bolivia 1994q4 and Paraguay 1995q2. Bolivia experienced severe capital flights that pressured a weak prudential framework and could not prevent the failure of banking institutions. The country experienced losses but little decline in growth. Paraguay is a different story. The country had accumulated heightened vulnerabilities from ill-conceived financial development and liberalisation processes. In May 1995, 2 banking institutions failed to meet obligations. In the following month, important statistical mismanagements were revealed as unrecorded deposits were discovered. The country entered a long crisis that lasted until 1999. The Markov estimates dates a recession from 1998q3-1999q2 (i.e. the worst part). This banking crisis is thus associated to this episode of crisis (still a single type).

5. In advanced markets, the two single crisis episodes that signal in expansion are the Greek default in 2004q3 and the US banking crisis of 1988q4. The Greek default is, in reality, associated to a recession. Nevertheless given the depth of the 2010s' Greek crisis, the Markov estimates do not detect the recession. This is a missed signal[188]. The US banking crisis of 1988 is the *Savings and Loans* crisis. It resulted, inter alia, from a policy rate increase by the Federal reserve that constrained financial institutions and, combined with imprudent practices and frauds, lead to the failure of many savings and investment institutions. Policy measures were implemented and little counter effects were felt at the aggregate level on real gdp. The NBER does not date a recession that could be associated to the crisis directly. The following recession starts in 1990q3/q4 for the NBER/MSM.

Second on multiple crises: **double and triple financial crises episodes**:

1. Multiple crises occur during recessions. This is true for all triple crises episodes and the wide majority of double crises episodes

2. In emerging markets, the currency and banking double crises episode in expansion is Croatia in 1998 (banking in q1, currency in q3). Because the quarterly real gdp time series starts in 1997q1 (q2 for the q-o-q growth rates). I do not dispose on much historical background and growth rates pass the 0 threshold only in 1998q4 by a large amount. Markov estimates are inconclusive and I do not pursue this crisis.

3. In developing crises, the currency/sovereign and currency/banking double crises episodes are associated to Turkey's history. I use the narrative quotes on currency crises to start my research on their links to economic activity. The twin currency+sovereign crises occur in the same quarter in 1978q1 as "The Turkish authorities recognize the urgent need to reverse the external policies of the recent past, which have brought the Turkish economy to a point where the balance of payments is now an overriding constraint."[189]. A recession ensues that starts according to Markov estimates in 1979q2, 5 quarters after the crises dates. In practice, 1978q4 to 1979q2 also display small negative quarter-over-quarter growth rates (circa -0.1% per quarter). Their magnitude is too small to trigger a recession in a MSM sense

[188] I chose not to decide myself the dates of decision as I am unsure how I could ensure external validity of my dates.

[189] IMF (1978), Turkey: 1978 article IV staff reportÂ ; IMF (1978), Turkey: Request for Stand-By-Arrangement

right away. The crises are indeed associated to the ensuing recession, which already has a currency crisis in 1980q1, hihlighting the Turkish extreme propensity to system overloads. I associate the two crises to the ensuing recession, as crises occurring before the recession. The episode moves from single currency crisis to a double crises episode[190]. The twin currency+banking crises is not fundamentally a double crises episodes but rather two financial crises that occurred in the same global context as the manifestation of turkish poor policy framework and institutions. The banking crisis in June 1982, illustrated by "the collapse of the Kastelli brokerage firm" is sad to have "added to the monetary difficulties as this necessitated support to several banks and made it impossible for the Central Bank to force them to make up their shortfalls in reserve requirements."[191]. The currency crisis results from long accumulated balance of payment imbalances that forced the country to widen the bands of her managed exchange rate by 8% in February 1984. "As a result of this new policy and the continued adjustment of the exchange rate the lira has depreciated by about 23 percent against the U.S. dollar between end-1983 and end-June 1984"[192]. Overall these crises are different manifestation and additional glitches to the overall weak system. There are little spheres[193] of the Turkish economy that are not cautiously described over all the periods I consider.

N.4 Expansions with/without crises: key characteristics

Expansions impacted by financial crises are longer and thus display higher gains. This might be an illustration of missed economic crises – recessions for which, the Markov estimates of the probability to be in the low regime fails to pass the threshold.

Overall expansions with a financial crisis are associated to slower growth, this is true dor developing and advanced markets. In and associated to lower growth. This observation can make sense if the missed recessions, which are associated to financial crises, are characterized by important losses and slower rebound effect.

Emerging markets display a different pattern as average growth is higher on average when there is a financial crisis. In the line of previous comment, this could be true if there are missed recessions associated to a financial crisis which did not trigger important losses or perhaps a strong rebound.

[190] I do not adapt figure **??** as these crises fall outside the line but they confirm DM's pattern of experiencing crises before recession start!

[191] IMF (1983) Turkey: 1983 Article IV staff report

[192] IMF (1984) Turkey: Recent Economic Development

[193] monetary, sovereign, financial, real, social

Table 33: Expansions and financial crises – duration, amplitude and steepness by country group

	Expansions without FC			Expansions with FC		
	Duration	Amplitude	Slope	Duration	Amplitude	Slope
All Countries						
avg	24.53	26.94	1.19	44.34	46.78	1.09
std	17.41	23.67	0.80	21.54	28.07	0.37
nb	198	198.00	198	41	41	41
Emerging Markets (15c.						
avg	23.22	26.87	1.21	38.33	52.11	1.34
std	16.38	20.87	0.60	16.97	26.35	0.28
nb	46	46	46	9	9	9
Developing Markets (15c.)						
avg	20.61	28.68	1.56	48.60	57.63	1.25
std	14.93	24.61	1.10	28.33	32.16	0.33
nb	44	44	44	10	10	10
Advanced Markets (24c.)						
avg	26.68	26.25	1.03	44.86	39.67	0.91
std	18.55	24.57	0.68	20.14	25.91	0.34
nb	108	108	108	22	22	22

The table presents, for **emerging**, **developing** and **advanced** markets, the average (*avg*) and standard deviation (*std*) of three characteristics of expansions.
Duration measures the number of quarters in an episode, **amplitude** the cumulated gains over the expansion and **slope** the average real gdp growth per quarter.

O A look at triple crises episodes

The first table presents information on the sequencing of triple crises episodes. Episodes are organized by historical episode (see section **??**) according to the starting quarter of the recession they are associated to. The second table details information regarding the income group, region and commodity type of the country. The second table also details the duration of the recession considered as well as preceding/ensuing expansions[194].

In 1982q1, as Mexico enters a recession a currency crisis triggers. 2 quarters later, a sovereign and a banking crises hit the country. For Philippines, as the country enters its second quarter of recession in 1983q4, the three financial crises trigger.

During the second episode, the crisis starts with a recession in Thailand in 1997q1, 3 quarters later the country experiences all three financial crises. Out of contagion, Indonesia experiences a currency and a sovereign crises followed by a banking crisis and a recession. Malaysia suffers as well from the pandemic and experiences in 1997q3 all three financial crises as well. The country enters a recession two quarters afterwards. In 1997q3, South Korea enters a recession and triggers both a bankind and a sovereign crises. The following quarter a currency crisis hits the country.

In 1997q3, again, Colombia experiences a currency crisis, the next quarter a sovereign crisis. In 1998q2 the country triggers a banking crisis and the next quarter enters a recession. In 1998q3, as Ecuador suffers from both a currency and a banking crises, the country moves into recession. 2 quarters later, the country defaults. In 1998q3, Russia, now at the end of a long recession, suffers from all three financial crises and soon sees the end of the recession and a rebound. In 1998q3, Argentina also enters a recession. Nevertheless as the country manages to maintain its consistency over 1 year of recession and the start of a rebound, the economic losses start to accumulate again as 2001 unfolds. In 2001q1, the country defaults, in 2001 q4 the banking system collapses and in 2002q1 the country exits the currency board and set a term to a violent currency crisis.

The last country of the panel is Turkey. The country first entered a recession over

[194]The categories are taken from the taxonomy of economic crises.
I define as short-lived recessions, those lasting 2 quarters (index = 1), transitive (id2) for 3:4q., short (id3) for 5:8q., medium (id4) for 9:16q., long (id5) for 17:32q. and protracted recessions (id6) over 33q.
I define as double-dip expansions, those lasting 2:4 quarters (index = 1), transitive (id2) for 5:8q., short (id3) for 9:16q., medium (id4) for 17:32q., long (id5) for 33:64q. and protracted recessions (id6) over 64q.

1998q3-1999q1 followed by a transitive expansion lasting 6 quarters. After that, in 2000q4 the country reenters a recession as the banking system collapses and the sovereign defaults. The next quarter, the country faces a currency crisis.

Triple crises episodes, highlight on the sequencing

episode iD		date		sovereign			currency			bkg.crs		
country	code	beg	end	tot	bfr	afr	tot	bfr	afr	tot	bfr	afr
Mexico	MEX	1982q1	1983q2	1	0	0	1	0	0	1	0	0
Philippines	PHL	1983q3	1985q3	1	0	0	1	0	0	1	0	0
Russia	RUS	1995q1	1998q3	1	na	0	1	na	0	1	na	0
Thailand	THA	1997q1	1998q2	1	0	0	1	0	0	1	0	0
Korea	KOR	1997q3	1998q2	1	0	0	1	0	0	1	0	0
Indonesia	IDN	1998q1	1998q2	1	1	0	1	1	0	1	1	0
Malaysia	MYS	1998q1	1998q3	1	1	0	1	1	0	1	1	0
Argentina	ARG	1998q3	2002q2	1	0	0	1	0	0	1	0	0
Colombia	COL	1998q3	1999q2	1	1	0	1	1	0	1	1	0
Ecuador	ECU	1998q3	1999q3	1	0	0	1	0	0	1	0	0
Turkey	TUR	2000q4	2001q4	1	0	0	1	0	0	1	0	0
Hungary	HUN	2007q1	2012q4	1	0	0	1	0	0	1	0	0
Latvia	LVA	2008q2	2009q3	1	0	0	1	0	0	1	0	0
Ukraine	UKR	2008q4	2009q1	1	0	0	1	0	0	1	1	0

The table details crises episodes by country group and layer of complexity (double currency+sovereign *cur.sov*, currency+banking *cur.bkg*, sovereign+banking *sov.bkg*, triple financial crises *tprl.crs*).
The table details by type of financial crisis (sovereign/currency/banking) whether said crisis occurred before/during/after the recession $bfr/drg/afr$.

The last wave of triple crises episodes affects Central and Eastern European countries around the Global Financial Crises. Hungary was the first affected by the crises as the country entered a recession in 2007q1. After close to two years of recession, a baking crisis hits the economy in 2008q3, followed the next quarter by a currency and a sovereign crises. The recessions lasted until 2012q4. In 2008q2, Latvia enters a recession, the next quarter the country suffers both a currency and a banking crises and the ensuing one, she triggers a sovereign crisis. The recession finished three quarters later in 2009q3. Ukarine, finally, experienced a banking crisis in the midst of the GFC in 2008q3. The next quarter the country suffers from a currency and sa sovereign crises as she enters a short lived but

very costly crises episode.

If these sequencing prove interesting and diverse, it is vain to try to identify relevant patterns out of sheers comments on temporality.

Triple crises episodes, highlight from the taxonomy

episode iD		date		group			taxonomy		
country	code	beg	end	inc.	reg.	cmd.	durt	exp.bfr	exp.afr
Mexico	MEX	1982q1	1983q2	1	4	0	3	5	3
Philippines	PHL	1983q3	1985q3	2	2	1	4	3	4
Russia	RUS	1995q1	1998q3	2	3	0	4	na	5
Thailand	THA	1997q1	1998q2	2	2	0	3	3	5
Korea	KOR	1997q3	1998q2	3	2	0	2	6	5
Indonesia	IDN	1998q1	1998q2	2	2	1	1	4	6
Malaysia	MYS	1998q1	1998q3	1	2	0	2	5	5
Argentina	ARG	1998q3	2002q2	1	4	1	4	3	4
Colombia	COL	1998q3	1999q2	2	4	1	2	4	6
Ecuador	ECU	1998q3	1999q3	2	4	1	3	4	5
Turkey	TUR	2000q4	2001q4	2	1	0	3	2	4
Hungary	HUN	2007q1	2012q4	1	3	0	5	5	4
Latvia	LVA	2008q2	2009q3	1	3	0	3	5	5
Ukraine	UKR	2008q4	2009q1	2	3	0	1	4	4

The table details crises episodes by country group and layer of complexity (double currency+sovereign *cur.sov*, currency+banking *cur.bkg*, sovereign+banking *sov.bkg*, triple financial crises *tprl.crs*).
The table presents the average duration of a recessions in quarters. I also give the average index from the taxonomy on the duration of recession – 1 = 2q. ; 2 = 3:4q. ; 3 = 5:8q. ; 4 = 9:16q.
Finally the last two columns present the average index from the taxonomy on the duration of expansion for the expansion before/after the crisis considered – 1 = 1:4q. ; 2 = 5:8q. ; 3= 9:16q. ; 4 = 17:32q. ; 5 = 33:64q ; 6 = '>64q'.

P BC group-wise – Shapiro-Wilk normality test results

The table below presents for each group and variable (mean in the high regime, in the low regime, probability to enter a recession, probability to exit a recession) the results of the Shapiro-Wilk normality test.

grp indicates the group considered, *var* the variable for which the test is applied, *Y/N* summarizes whether the variable is normally distributed (Y) or not (N). *p.val* gives the p-value of the test and *W* the statistics associated.

	grp	var	Y/N	p.val	W
		by country group			
1	AM	mean_h	N	0.00	0.84
2	AM	mean_l	Y	0.14	0.94
3	AM	p.enter	N	0.02	0.90
4	AM	p.exit	Y	0.20	0.94
5	EM	mean_h	Y	0.06	0.88
6	EM	mean_l	N	0.03	0.86
7	EM	p.enter	N	0.01	0.84
8	EM	p.exit	N	0.03	0.87
9	DM	mean_h	N	0.00	0.74
10	DM	mean_l	N	0.01	0.84
11	DM	p.enter	N	0.04	0.87
12	DM	p.exit	Y	0.52	0.95
		by region			
1	AME	mean_h	Y	0.90	1.00
2	AME	mean_l	Y	0.99	1.00
3	AME	p.enter	N	0.02	0.76
4	AME	p.exit	Y	0.49	0.93
5	Asia	mean_h	Y	0.37	0.91
6	Asia	mean_l	N	0.03	0.79
7	Asia	p.enter	Y	0.68	0.94
8	Asia	p.exit	Y	0.79	0.96
9	CEE	mean_h	N	0.00	0.64
10	CEE	mean_l	Y	0.13	0.90
11	CEE	p.enter	Y	0.49	0.94
12	CEE	p.exit	N	0.01	0.82
13	LSA	mean_h	Y	0.70	0.95
14	LSA	mean_l	Y	0.31	0.91
15	LSA	p.enter	Y	0.43	0.93
16	LSA	p.exit	Y	0.87	0.97
17	WE	mean_h	N	0.01	0.84
18	WE	mean_l	Y	0.22	0.93
19	WE	p.enter	N	0.01	0.85
20	WE	p.exit	N	0.04	0.89
21	WE	mean_h	Y	0.38	0.89
22	WE	mean_l	Y	0.73	0.95
23	WE	p.enter	Y	0.33	0.88
24	WE	p.exit	Y	0.10	0.80
		by commodity			
1	CMD	mean_h	Y	0.74	0.96
2	CMD	mean_l	N	0.00	0.59
3	CMD	p.enter	Y	0.07	0.88
4	CMD	p.exit	Y	0.21	0.91
5	No.CMD	mean_h	N	0.00	0.84
6	No.CMD	mean_l	N	0.00	0.83
7	No.CMD	p.enter	N	0.00	0.89
8	No.CMD	p.exit	Y	0.15	0.96

Q Group-wise BC regimes – Wilcoxon/Student test results

The table below presents for each group-pair () and variable the results of the Student's t test or Wilcoxon test to compare the average of both

compar indicates which groups are being compared, *var* the variable for which the test is applied (mean in the high regime, in the low regime, probability to enter a recession, probability to exit a recession). *test* indicates whether a Wilcoxon or a Student test is applied (depending on the results to the Shapiro6Wilk normality tests). *type* indicates whether the null that is being tested is one- or two-sided, and if one-sided whetehr the first group average is tested to be less/greater than the second group's average.*p.val* gives the p-value of the test and *W* the statistics associated.

	compar	var	test	type	Stat	p.value
1	AM-EM	mean_h	Wilcoxon	less	87.00	0.00
2	AM-DM	mean_h	Wilcoxon	less	94.00	0.01
3	EM-DM	mean_h	Wilcoxon	two.sided	99.00	0.59
4	AM-EM	mean_l	Wilcoxon	greater	237.00	0.05
5	AM-DM	mean_l	Wilcoxon	greater	277.00	0.00
6	EM-DM	mean_l	Wilcoxon	greater	143.00	0.11
7	AM-EM	p.enter	Wilcoxon	two.sided	203.00	0.52
8	AM-DM	p.enter	Wilcoxon	two.sided	182.00	0.97
9	EM-DM	p.enter	Wilcoxon	two.sided	105.00	0.77
10	AM-EM	p.exit	Wilcoxon	two.sided	195.00	0.68
11	AM-DM	p.exit	Student	less	-0.19	0.06
12	EM-DM	p.exit	Wilcoxon	less	75.00	0.06

R Annex – Article IV and Recent Economic Development: summary

This annex presents the tables of contents of Article IV consultations and Recent Economic Development staff reports to provide an overview of the topics covered in the documents.

R.1 Article IV consultation staff reports

I provide examples for article IV in 1973 for Italy, 1995 for Paraguay and 2014 for India.

R.1.1 Italy – Article IV staff report – 1973 consultations:

1. Background
2. Report of the discussions
   (a) Domestic economic development
   (b) Fiscal policy
   (c) Monetary policy
   (d) The balance of payments and the exchange market
      i. The balance of payments outturn in 1972 and the early part of 1973
      ii. Exchange market developments in 1973
      iii. The balance of payments outlook
3. Staff appraisal
4. Recommended decision

R.1.2 Paraguay – Article IV staff report – 1995 consultations:

1. Introduction
2. Recent developments
   (a) Macroeconomic performance
      i. Developments through 1994
      ii. Developments during 1995
   (b) Structural reform
3. Summary of discussions
   (a) Indexation mechanisms

   (b) Fiscal policy
   (c) Monetary policy and financial sector reform
   (d) External sector policies
   (e) Medium term projections
   (f) Statistical issues
4. Staff appraisal

R.1.3 India – Article IV staff report – 2014 consultations:

1. Context
2. Outlook and risks
3. Policy priorities
   (a) Monetary policy
   (b) Adressing external vulnerabilities
   (c) Fiscal policy
   (d) Financial and corporate sector issues
   (e) Structural policies to boost growth
4. Staff appraisal

R.2 Recent economic developments

Recent Economic Development are the background material that shapes the staff's view of a country before the discussions with the national authorities. They are more detailed than the article IV staff reports. In general these documents were produced/available until the end 90's. I provide example of the table of contents for Korea in 1975 and Russia in 1999.

R.2.1 Paraguay – Recent Economic Developments – 1975:

1. Basic data
2. Internal economic developments
   (a) Introduction
   (b) Demand conditions
   (c) Production
   (d) Employment situation, wages and productivity

(e) Prices

(f) Monetary and credit policies

i. Principal developments in 1974

ii. Interest and credit poicies

iii. Developments in the money and capital markets in 1974

(g) Government finance

i. Structure of the public sector

ii. Central government operations

iii. Revenue performance

iv. Trends in expenditure

v. Extrabudgetary transactions

3. External developments

(a) Balance of payments developments in 1974

i. Exports

ii. Imports

iii. Services and transfers

iv. Capital movements

v. International reserves

(b) External debt

(c) Exchange and trade system

i. Exchange rate system

ii. Import system

R.2.2 Russian Federation – Recent Economic Developments – 1999:

1. Basic data table

2. Overview

(a) 1992-1996: the first five years of transition

(b) The zenith of expectations, January–September 1997

(c) Rising pressures and policy responses, October 1997 – July 1998

(d) The August 1998 crisis

(e) The post-crisis period

3. Domestic Economy

(a) Output and expenditure

        i. Overview
        ii. The main components of demand: 1996–98
        iii. Sectoral developments
    (b) Labor market trends
    (c) Prices and wages
        i. Wages developments
4. Public finances
    (a) Overview 1996–99
    (b) Key features of 1996–99 developments
        i. Federal government revenue performance
        ii. Federal government expenditure
        iii. The regional and local budgets
        iv. Social extrabudgetary funds
5. Monetary developments
    (a) Overview
    (b) Institutional and legal structures
    (c) Trends in monetary and exchange rate policy 1995–99
        i. The pre-crisis period
        ii. The onset of the crisis
        iii. Development since the crisis
    (d) Commercial banking and broad money developments 1995–99
        i. Broad money and credit develoments
        ii. Developments in the commercial banking sector
6. External sector developments
    (a) Current account
        i. Merchandise trade
        ii. Exports
        iii. Imports
        iv. Service, net income, and transfers
    (b) Capital account
        i. Capital flows to the federal government
        ii. Capital flows to other sectors
        iii. The impact of the August crisis on Russia's relations with external creditors
    (c) External debt and claims

i. Sovereign debt
ii. Nonsovereign debt
iii. Russia's external claims

(d) Trade policy, regional and CIS trade relations, and WTO accession

i. Overall trade policy
ii. External trade issues of Russian regional government
iii. Relations with the CIS and other countries in the region
iv. WTO accession

(e) Structural reforms

i. Introduction
ii. Private sector developments
iii. Industrial restructuring
iv. Reforms of the Infrastructure Monopolies

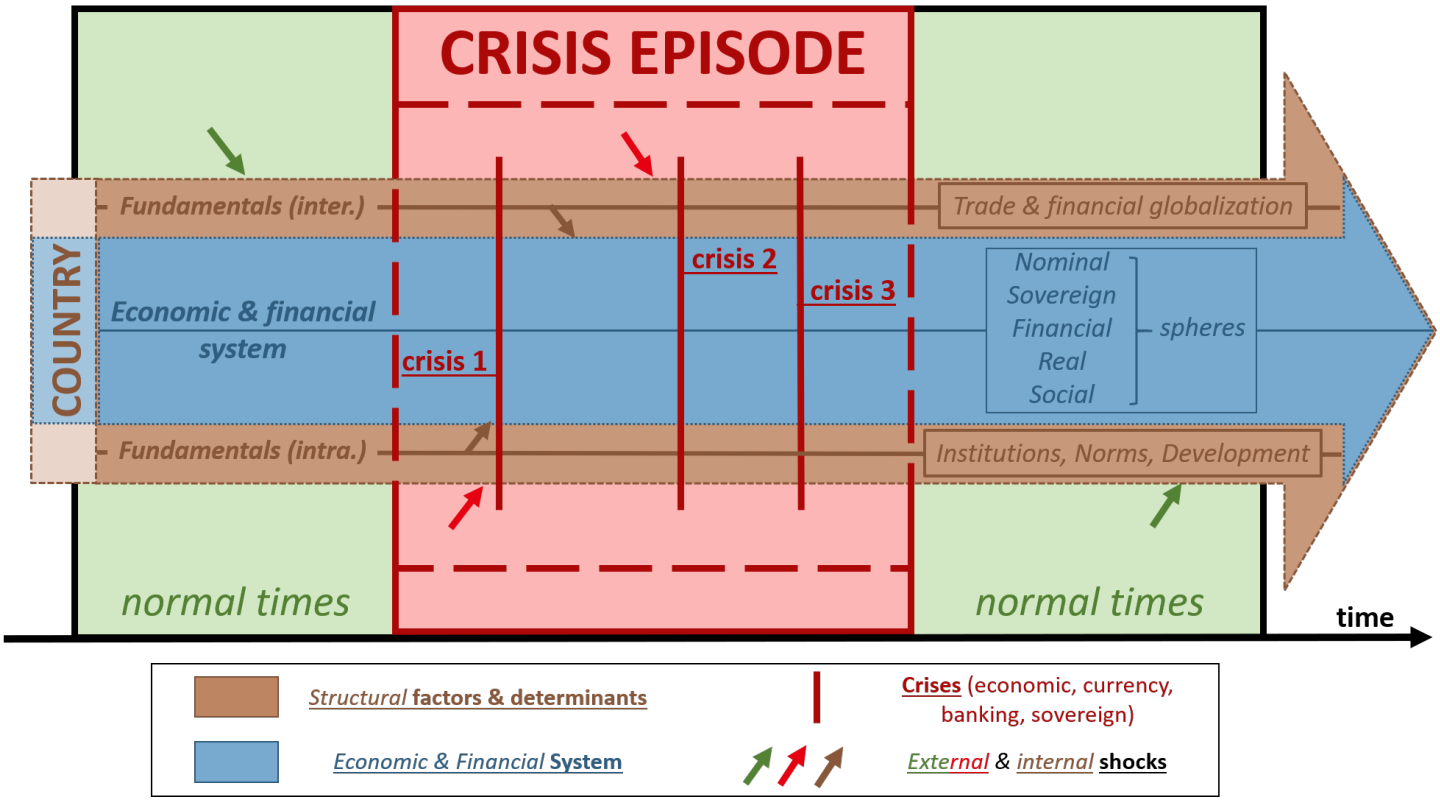
S Narrative methodology: conceptual factors for studying the origins of crises

S.1 Key concepts

In time, a country is characterized by a set of structural/fundamental characteristics that define its limits, place and exposure to the rest of the world. In itself it can be represented as a set of interrelated (simplifying) spheres – nominal, sovereign, financial, real, socio-political – that cover most of the activity that make the system adapt and evolve.

Figure 10: Crises episodes: a first look

The schematic identifies a crisis episode in time (x axis). It represents how a changing economic and financial system (blue), shaped by internal and external fundamentals (brown) is exposed to shocks (red/external and darker brown/internal). At times, financial and economic crises signal (red bars).



Crises are episodes in time during which the system is brought to the edge of collapse by unforeseen conditions. Crises are times of heightened uncertainty and speculation about potential futures. During crises, initial shocks magnify as they spill over the economic and financial system. The perturbations come to pressurize existing vulnerabilities and inconsistencies. Hence, crises often constrain agents' policy space and are the source of drastic decisions and policy reactions.

Shocks and perturbations:

Crisis episodes often start because **perturbations** disrupt the economic and financial environment of some agents. These **shocks** are unexpected events or experiences that entail an abrupt update of agent's information set. These shocks are diverse and conditional on the point of view that is considered. For agents in a country, this can take the form of internal shocks – such as a surprised policy announcement (monetary/fiscal shock), a sudden news of wide-coverage corruption or the falsification of important data – or external – such as a natural disaster, a fall in external demand from an important trade partner or exogeneous changes on world financial markets.

Shocks often form the first triggers to agents taking new actions and decisions. Countries and agents are subject to shocks and perturbations all the time (there is little room for certainty in an interconnected system). Shocks in crisis episodes are often either of a very large magnitude or able to affect a broad coverage of agents. As such they always entail a sudden and important change in the information available to agents when forming decisions.

Vulnerabilities and frictions:

How an economic and financial system is affected by a shock depends on its fundamentals. As countries developed through history, they defined[195] the rules that would organize their structure and how agents interact for different purposes: (i) internally – political and legal institutions; norms and considerations on redistribution and property rights; infrastructures and demographics etc and (ii) externally – trade development and dependency; financial markets development and interconnectedness; trade/financial liberalization and globalization.

Each interaction involving one or several domestic agent is asymmetric in essence: some will hold more information or power and objectives might differ and contradict among participants. Over time, these asymmetries might have resorbed, been (partially) corrected or, on the contrary, might have accumulated into: (i) structural **frictions** – market specificities that prevent an interaction to be optimal given agents' objectives and (ii) **vulnerabilities** – fundamental weaknesses that increase the exposure of agents to uncertainties and decrease their ability to manage associated risks.

In normal times, these vulnerabilities and frictions are counteracted by feed-back/stabilizing mechanisms that ensure the whole system functions. During crisis episodes, shocks and perturbations pressurize existing vulnerabilities and amplify the constraints that frictions impose on specific agents. Shocks, even if small, can have broad and devastating effects if they interact well enough with underlying weaknesses.

Transmission and policy changes:

Overall the combination of shocks and vulnerabilities forces agents to adapt their policy decisions, which then affects other agents involved on associated markets. Because shocks entail a new wave of (un)evenly distributed information, this also blurs what could have been expected of others' actions, which creates uncertainty. Overall these pertubations are **transmitted** through markets and agents to the whole system, they might be amplified through new vulnerabilities/shocks.

[195] actively or passively

During crisis episodes, there comes a time when the cumulated effects (threaten to) block the system from functioning. National authorities are forced to intervene and adapt their policy course, be it sustainable in itself or inconsistent and part of the problem. Policy action is meant to counteract the negative effects and coordinate agents' expectations on a new course, away from the vicious cycle of crises transmission. An intervention has a direct impact on the targeted market – because it affects demand/-supply/price setting/etc. An intervention can have spillover effects as participants affected by the policy action update their choices on other relevant markets. Finally an intervention can have an effect because it provides additional (new) information on the views and objectives of the national authorities.

A policy intervention is in no way a synonym of crisis resolution. In practice, the measures can have detrimental effects on other markets. An ill-devised policy coud end up missing target or constrain other agents – for example, if corruption or fraud captures an inflow of liquidity, if it is reinvested in speculative activities or for example when liberalization and austerity policies came at the expense of past accumulated social gains in Greece or, in Argentina, at the expense of the fight against poverty and inequality. The signal might also fail to coordinate agents – if the authority has little credibility/a history of misconduct. In itself, the intervention can also create more uncertainty if it signals an undesired mandate reorientation – e.g. if a government increases public spending backed by in increase in printed money. As such policy interventions (and announcements) can act both (i) as triggers for the resolution of a crisis and the definition of a new equilibrium or (ii) as a determinant transmission mechanism of the overall crisis.

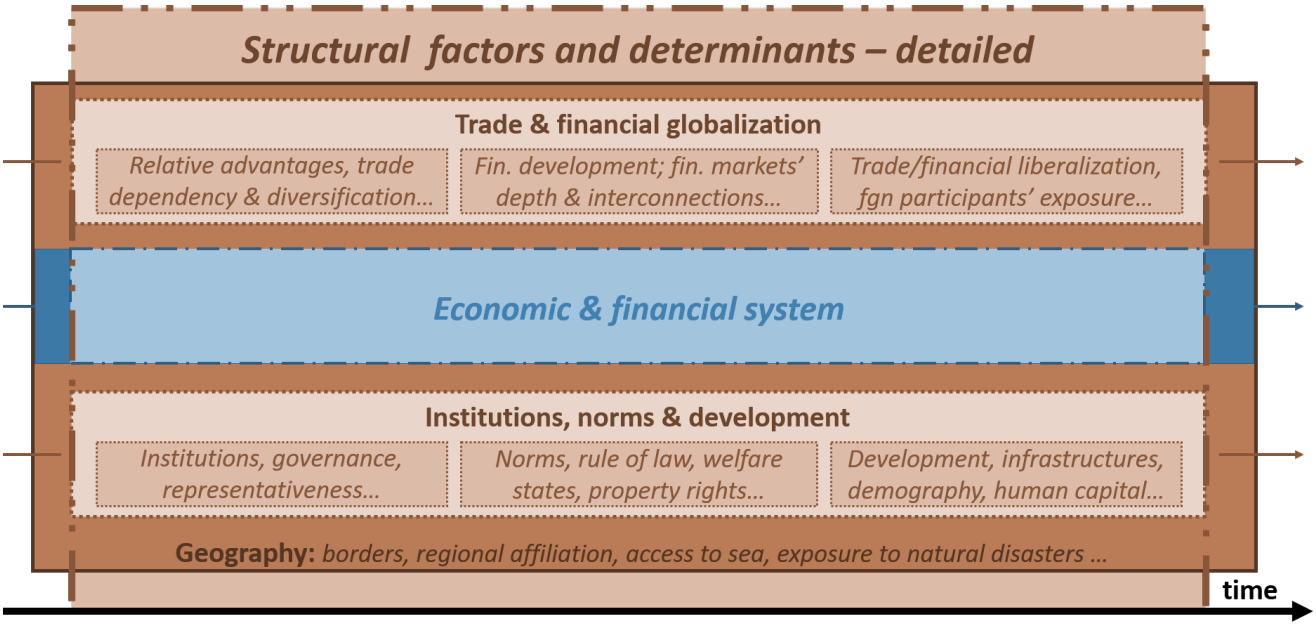
Two determinant aspects to take into account when discussing the role of policy action in the unfolding of a crisis episode are (1) the policy space of the authority concerned and (2) the type and scope of the measure introduced at the time of announcement (conventional/unconventional). The policy space characterizes how the fundamentals of the system shape the ability of authorities to act – if there is a deficit/inflation target for example – and how the current state of the system allows adjustment. The type and scope of intervention help agents identify how the authorities position themselves vis-à-vis ongoing announced/organic mandate.

S.2 Describing economic and financial systems

Structural factors and determinants:
Figure 11 summarizes the main factors that define the structure within which the economic and financial system evolve. They too change over time, even if usually at lower frequencies than previously discussed business cycle patterns. I identify the main categories of elements, from the literature, that can justify spikes in growth (and financial) volatility and contribute to crisis episodes.

From the point of view of my narrations, structural factors and determinants matter because they identify a first layer of vulnerabilities and shocks behind crises. In particular, fundamentals might determine the magnitude and the coverage of the impact of a shock. The following list details factors and provides examples of shocks and vulnerabilities (in the graph from the bottom upwards).

Figure 11: Fundamentals and structural determinants: a basic taxonomy



A. **Geography and 'exogenous' characteristics:** The first element that defines a country is its geographic bounders and the distribution of land by type (mountains, access to see, plains etc.). Usually exogenous through time, the recent *unilateral* annexion of Crimea by the Russian Federation reminds how little things remain constant through time. Beyond these dramatic and rare extremes, geography matters as the environment is a non negligible and growing source of shocks. At the level of humanity, these shocks are now sadly endogenous to man-driven climate change. At the level of a country, these shocks are often exogenous as they remain unexpected, even the man made natural disasters (Mauritius in this summer 2020 acts as another sad reminder). Given a country's localization, it might be more exposed to disasters of variable sizes (tycoons, tsunamis, earthqukes, droughts etc.). These shocks are a key element to consider when analysing the build-up and unfolding of crises. Another key related feature is the fact that countries are endowed with rare and prized natural resources, which, as identified before, makes countries more exposed to currency and debt crises..

B. **Internal Factors:** Institutions, norms and structural features make for the underlying architecture that supports the whole system. They define how the system's spheres organise among

themselves, their boundaries and how they develop through time. They set the grounds upon which agents interact and groups of power allocate resources. These factors also define the information that is available to agents and how it should be avialable. Given that, theoretically, the transmission of crises comes first and foremost through information flows and shocks, for my crisis episodes this is crucial. I identify three main categories to analyze potential shocks and vulnerabilities for crises.

- *Institutions* engulf all developments that are related to the legal settings that bind agents' actions. I identify several sub-layers, among which: *political regime, governance and representativeness* – a shock could be, for example, a coup d'etat or the regular conduct of democratic elections – ; *bureaucratie, corruption and quality of information* – for example an overcomplicated multilayered tax collection system that complicates fiscal policy space management, or the revelation of manipulated tax collection data or the safeguards that should prevent an official president in office to cut funding to a major public service provider essential to the proceeding of a true democratic election – ; *Central Bank mandate and objectives* – for example a country's CB organic law or its exchange rate regime, a key vulnerability could stem from accumulated discredibility that endangers a CB's effectiveness in achieving objectives etc...
- *Norms* define the values that govern and coordinate the behavior of the majority of domestic agents. It can be set in fundamental texts or be social constructs inherited from centuries of exposure to a dominant paradigm. Fundamental rights often discuss topics from *social organization to property rights* – in times of crises, when capital might be tempted to flow a country, a government might renege on the rights of, say, foreign investors to protect capital still present in the country. As societies develop economically and socially in an unequal manner, considerations on redistribution and welfare state characteristics prove determinant in conceiving crises – for example this defines part of the objectives of a benevolent government. In some cases, poverty prevents a country from building a resilient productive base, hence hampering any sustainable recovery and setting the stage for future crisis episodes – Argentina is but a painful illustration of this kind of vicious cycle. A value that can be of importance in times of uncertainty, such as crisis episodes, is *freedom of press*. More globally the possibility for a system to enable *enlightened access to information*, democratic *representation of heterogenous views* and discourses ...
- In the last category, I aggregate other fundamental characteristics shaping growth and agents considerations around two main lines: *demographic and structural developments*. The first sublayer engulfs several demographic factors that can prove important in transmitting crises, for example a country with a young population might be more prone to lead current account deficits, a large active workers base makes for a wider tax base etc. The second sub layer coins all topics that are the object of structural reforms. For example these include infrastructures (roads etc.) ; the economic structure of an economy (structural change) ; the education system and how the youth is educated, trained and informed ; healthcare and hospitals etc.

C. **External Factors: trade and financial development, liberalization and globalization**

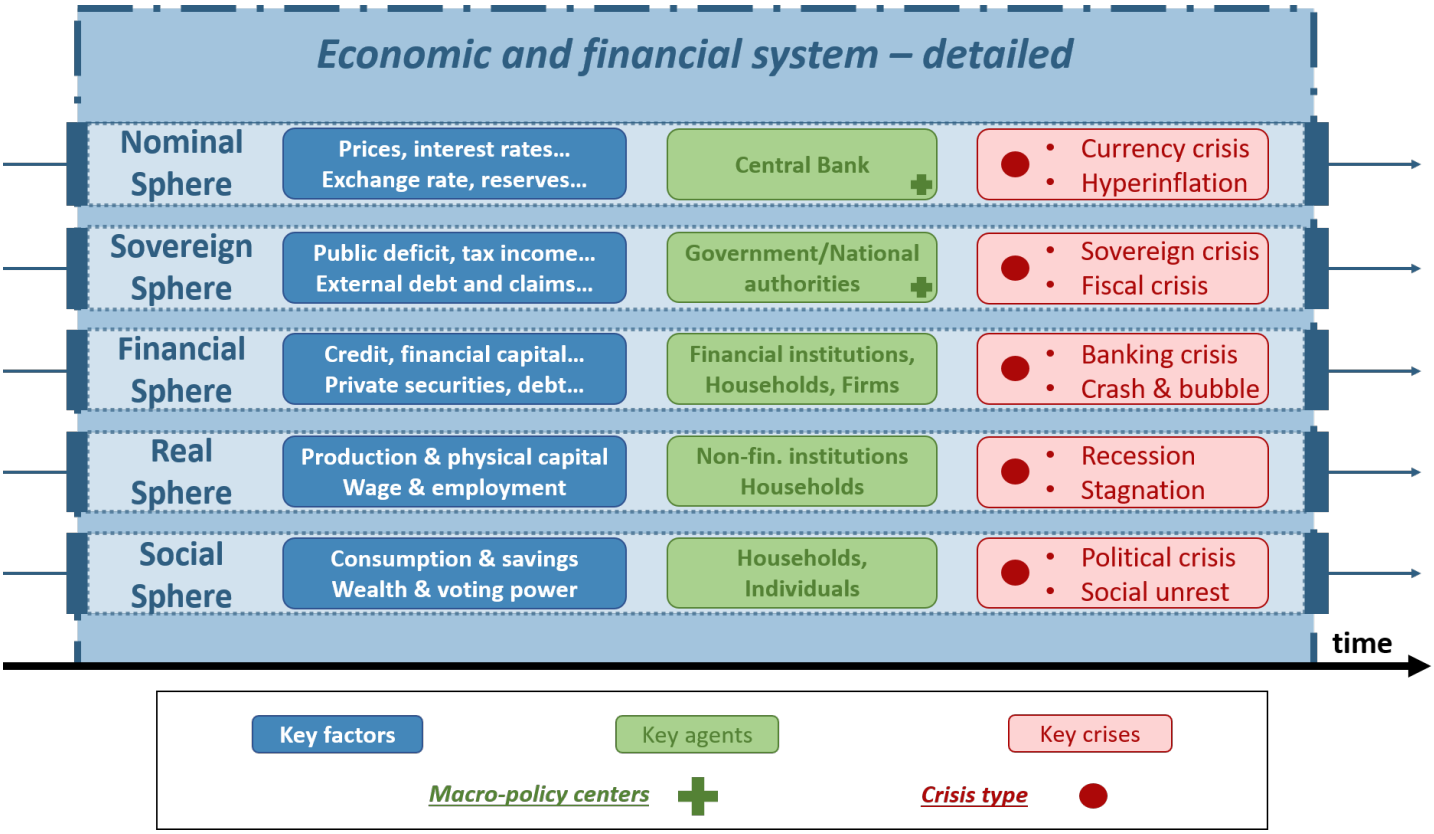
define how the system considered interacts with other foreign systems. Trade and finance are the main two channels through which a country is exposed to foreign perturbations and opportunities. I aggregate fundamentals around three main lines, the development and characteristics of each attibute, and the degree to which they are liberalized and integrated into the international system.

- Among the main *trade related factors* of interest for crises, relative advantages and a country's dependency on trade will amplify the exposition of an economic system to fluctuations in world demand and prices and potentially affect greatly a country. The less an economy's trade portfolio is diversified, the more it is vulnerable to the predominant good/service produced. For example, countries that relied predominantly upon tourism are currently, due to the Covid 19 pandemic, particularly stressed, but history displays several episodes during which this costed a lot to economic systems – for example Jamaica in 2009. If a country is highly dependent on imported energy this can also act as a key fragility, for example Greece in 1985.
- As already discussed intensively in chapters **??** and **??**, the *development of financial markets* is a key area to look after. In particular, several factors prove key to the trigerring and unfolding of crisis episodes: the diversity of financial markets and the possibility for market participants to access a diversified portfolio of assets and better insure against underlying ; the depth of financial and the turnover that characterize how efficient market participants absorb and price fluctuations in liquidity ; the higher the interconnectedness of markets the more crises and pressures can diffuse in a financial system ...
- Finally, conditional on trade and financial developments, the intensity of a country's exposure to foreign perturbations is driven by its advancement in the *liberalization and globalization processes*. In particular, the share of foreign participants allowed on domestic markets or reversely the regulations within which domestic residents are allowed to invest or trade abroad will be both the results of institutional and legal arrangements and the sources of greater flows at times of uncertainty. Financial and trade liberalization also increase the potential for currency mismatches in agents' balance sheets. A full financial liberalization and openness when domestic markets are too little advanced is often the exposure to predatory movements and a source of deregulation and volatility.

Economic, financial and socio-political system:
Figure 12 identifies the main blocks that I use to structure the analysis of the development and unfolding of crises. Each block focus on one key topic: nominal anchors, sovereign and fiscal matters, financial markets and assets, real development (production and employment) and socio-political factors (consumption and wealth).

1. the **nominal sphere** discusses all developments and factors that concern the nominal anchors of a country. The nominal sphere comes first in the list as the currency acts as a reference unit and value in all transactions in and out of a given system. The currency is the fundamental element around which agents coordinate expectations and manifest their trust in the economy. Hence, the

Figure 12: Economic and financial system – conceptual framework of analysis



nominal sphere often concentrates pressures on the system and act as part of the transmission of the crisis. Because of its central place, any shock or policy intervention can have broad and wide-covering impacts, both effectively and on agents' considerations on the current and future environment.

- *Key topics:* Prices and exchange rates, monetary aggregates and interest rates, money and forex market.
- *Key agents:* the Central Bank is the main agent that is responsible for the stability of the countries nominal anchors. Its mandate can include price stability and/or exchange rate stability and can include issues on macroeconomic and financial stability (spheres 3 and 4).
- *Key crises:* Hyperinflation and currency crises.

2. the **sovereign sphere** aggregates topics and considerations on the governing authorities of the country. These include all developments on the fiscal side: tax collection and government spending (from and to sphere 4 and 5 mainly). As discussed in chapter **??**, governments also participate on domestic and financial markets by issuing debts (sphere 3). Elected or not, the sovereign authority is the one narrating the dominant economic discourse. Hence she acts as a major reference in (dis-)coordinating agents effectively and in expectations. Often the sovereign authority is held accountable for her acts by the population and its, if existing, representative organs (social sphere)

or by more or less extreme processes (assasinations, coups, impeachments, elections). The sovereign sphere concentrates all agents' considerations and trust in the stability of the state and the country.

- *Key topics:* fiscal developments such as tax collection and evasion, government spending and infrastructure/investment policies ; debt developments on domestic and/or foreign currency government securities markets ...
- *Key agents:* the national authorities that are charged with the provision of public goods and finance themselves with tax collection and government securities.
- *Key crises:* Fiscal and sovereign crises.

3. the **financial sphere** entails all developments that are bound to key financial markets excluding the money, forex and government securities. These include the markets in which financial and non-financial institutions exchange owned and owed assets among bank/corporate debt/equity, financial derivatives, insurances, housing and mortgages ... The fundamental role of financial markets – enabling agents with different endowments and preferences to trade assets – makes them fundamental in the functioning of the overall system. In particular, through financial institutions, they allow the allocation of liquidity from savings to investments. Financial markets allow for the distibution of wealth within and across periods and the sphere concentrates agents considerations and trust in the future.

   - *Key topics:* Financial institutions' balance sheet developments (inter alia commercial and investment banks), households' financial wealth and liquidities, firms' equities, debt securities, FDI and other capital flows ...
   - *Key agents:* Banks and other financial institutions, corporates as supplier of financial assets and consumer of liquidity for investment purposes, households as consumer of investment and placement opportunities.
   - *Key crises:* Banking crises, financial crash and bubbles.

4. the **real sphere** entails factors and developments that relate to productive activities. It includes the contributions of non-financial private institutions to aggregate production of goods and services for domestic and foreign consumption. Developments on the labor markets and associated prices form the second main subcategory within the real sphere. This sphere aggregates agents' considerations and (dis-)trust in growth prospects and increasing productivity. At times of crisis, several of the transmission mechanisms behind the unfolding of the unfortunate events take roots in or are diffused by the real sphere.

   - *Key topics:* Production of goods and services, physical capital ; (Un)Employment and wages ; trade balance, remittances and other primary income ...
   - *Key agents:* Non-financial private institutions, from small lo large enterprises, workers and labor unions
   - *Key crises:* Stagnations and recessions.

5. the **socio-political sphere** entails considerations and activities by households and individuals, as themselves and as groups in the society. In the present conceptual framework, this layer is the

one that includes the highest level of disaggregation possible. Hence, it supports indirectly all the other spheres and covers/affects (indirectly) a wide range of topics. Given the institutional fundamentals of the country, individuals might aggregate as groups to express discontent and differing views and actions with respect to ongoing course of action. Extreme actions might even be taken when significant pressures accumulate and are rightly channeled/not oppressed.

- *Key topics:* Consumption, leasure and saving ; wealth, inequality and redistribution ; education, health, legal rights and safety ; Voting power, activism and self-coordination ...
- *Key agents:* Households, individuals as consumers, voters, groups of interest ...
- *Key crises:* Social unrest and political crises.

S.3 Research questions and methodology

The question goal of this chapter is to identify what lies at the origin of economic and financial crises? As crises are complex episodes with several interconnections and combining effects, answering that question is difficult. Relying sheerly on hard data prevents a more thorough study of all the determinants that make crises unfold.

What the narrations bring to the table is the ability to get an insider's view on the elements that came into place to trigger financial and economic crises. Because the soft information is produced 'on-the-spot', descriptions and analysis are more likely to reproduce the information as available and conceived by agents. Moreover, textual sources discuss in detail the particular sequencing and interrelations of shocks, vulnerabilities and policies.

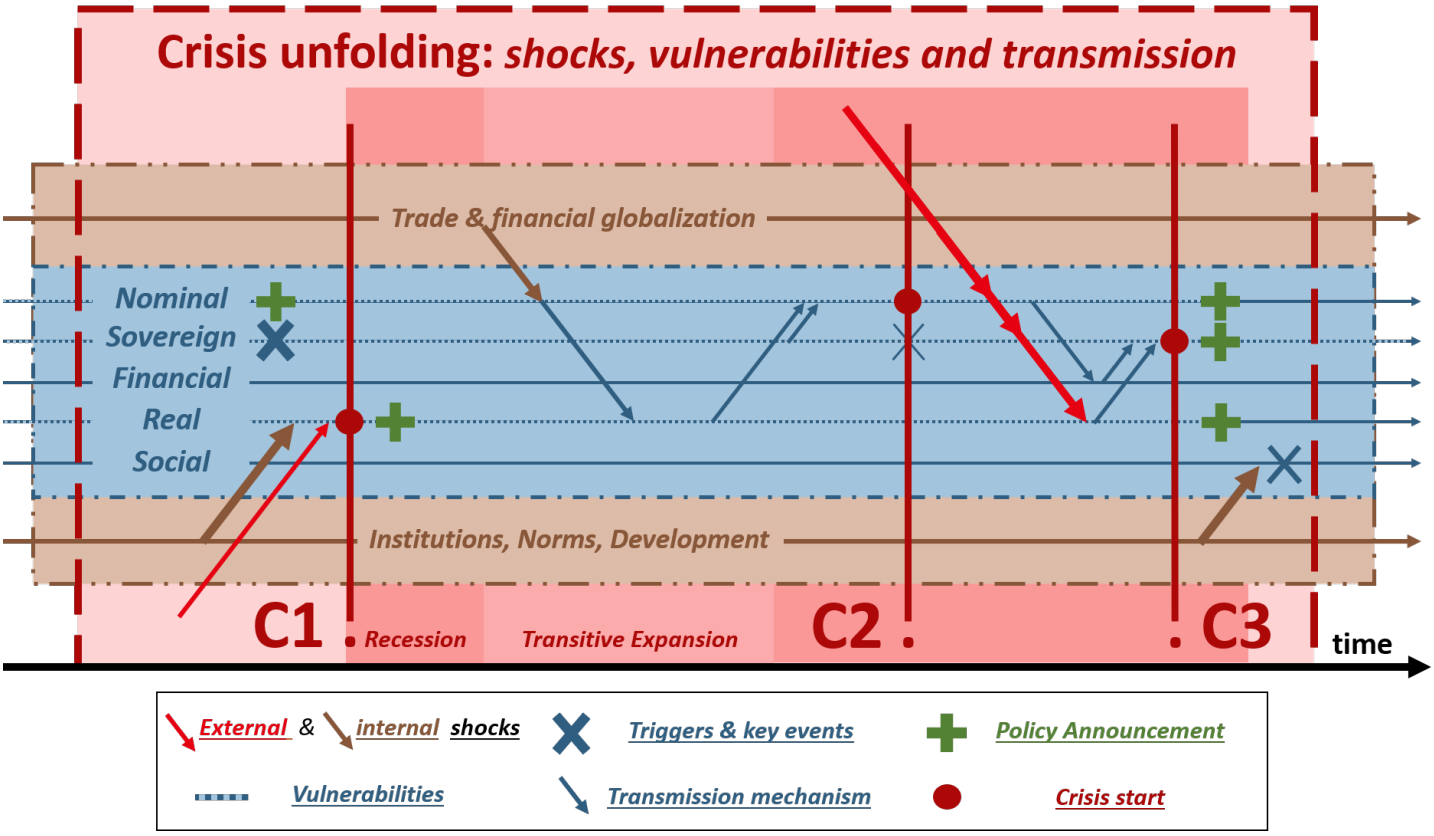
S.3.1 The schematic of a crisis

Backed by previously presented conceptual framework, figure 13 illustrates my definition of crisis episodes. Doing so, the figure summarizes the key elements that a narration should identify: fundamental vulnerabilities, key shocks and events, agents reactions, transmission of the perturbations and policy changes. Because an example is often the best way into a methodology, I used the Argentinean crisis of 2014 to model 'simplistically' and schematically a crisis episode.

At the beginning of the episode, in 2012, the economy has recovered from the GFC and is growing well (6-8%), but still suffers from several vulnerabilities. After the 2002 default, the country has lost access to world financial markets. National authorities have limited fiscal space and despite a favorable debt dynamics, the government is forced to exploit various means of funding. At the same time, the central bank which had been 'addressing' inflation concerns and exchange rate stability, saw her mandate evolve to include "the pursuit of economic development with social inclusion" (*Key Policy* – green plus). This change, early 2012, enshrined the ongoing inconsistent policy mix and further weakened existing vulnerabilities on the nominal and real side (*vulnerabilities* – dashed blue lines).

Around the crisis start, Argentina suffered from three main shocks/triggers: (i) news were released of inacurate official statistics (*internal shock* – brown arrow on schematic), (ii) the country was exposed to severe droughts that impaired production and a fall in demand from Brazil (*external shocks* – red arrow) and (iii) foreign investors sued the country for unresolved claims, the *Vulture Fund episode* that started end 2011 – blue 'cross' event. The first crisis (*crises* – C1 red bar) is a short recession that ensued from the external shocks. Authorities answer the shock with an expansionary policy mix (second green plus) and the economy grows again (transitive expansion in lighter red).

Figure 13: Crises' unfolding: a conceptual framework



Present example is a **simplified** version of Argentina 2014: crisis 1. is a 2 quarter recession in 2012q1-2. In 2013q4, the country entered a recession again (not displayed here). In 2014q1 the central bank devalued the currency (currency crisis 2.) and in 2014q3, the country defaulted on a part of the debt held by *Vulture Funds*.

Structural weaknesses (controls on forex transactions) constrain private investment and the real sphere. The pursuit of a stable exchange rate pressurizes further the central bank (second brown arrow), confidence falls and economic performances stall as domestic and external pressures keep rising (*transmission mechanisms* – blue arrow continuing the brown arrow). The inconsistent policy mix forces the

central bank at the same time (i) to increase deficit financing, (ii) to increase the money base and (iii) to sell foreign reserves and increase small nominal deprecionary adjustments (*transmission mechanisms* – two blue arrows pointing towards the nominal sphere).

As the tightening of capital controls end 2013 failed to tame deprecionary pressures, the central bank, faced in January 2014 with an unexpected fall in reserves, completely changes policy course (*crises* – C2 red bar): she devalues the peso, raises policy rates and further tighten capital controls. The measure failed to have the expected impact because, over 2014, the country was exposed to a fall in demand from major Chinese and Brazilian trade partners as well as a marked fall in commodity prices (*shocks and triggers* – second large red arrow).

At that point the whole real and social spheres collapsed: key exporting sector collapsed, real income and consumer confidence fell, aggregate demand fell. The increase in policy rates was associated with a rise in nominal wages. Only an increase in public employment managed to contain the fall in the labor force participation. The lack of external funding – ongoing court ruling on the *Vulture Funds* case – became even more stifling for the government as spending kept growing. To minimize the public deficit, the central bank continued financing the government demand crowding out private credit as banks' exposure to the government grew (*transmission mechanisms* – last three (simplified) blue arrows).

Despite a proposal to the Paris Club in January (*key events* – second blue cross, simultaneous to the currency crisis), in June 2014 the US Supreme Court refused to consider Argentina's appeal confirming the end of the grace period on July 31st. At that date, despite having enough availble resources, the government refused to repay the *Vulture Funds* and defaulted (*crises* – C3, third red bar). Following the default in the summer, Balance-of-Payments pressures cumulated, uncertainty rose (as a rough proxy, the gap between the official and parallel exchange rates widened), confidence fell sharply in September.

As the economy started recovering during the last quarter of 2014, several measures were implemented to boost the recovery, ensure access to liquidity and the build up of reserves. Nevertheless, despite a good appeal to the population for denying repayments, the government faced intense critics for its crisis mismanagement, the shadow of manipulated data hiding not far away. Over the year scandals and revelations of corruption shook the social sphere and voters as the next election neared (*Shocks and events* – last brown arrow and last blue cross).

S.3.2 Sample, questions and output

Based on the previous framework, the figure and narrated example provide a glimpse at how I match the key concepts I defined: vulnerabilities, shocks, events, crises, policy reactions and transmission mechanisms. To bounce back on my go-to-guide, I now present the initial sub-sample for the study, the sub-questions and the output methodology.

Initial sample for consideration:

Given the undeniable importance of multiple crises, I first concentrate on this set of episodes to lead my narrative study. At the date of completion of the dissertation, I could not cover all cases and complet-

ing the database remains work in progress. In particular, I focused extensively on the history of Argentina. The next step includes extending the study of shocks and vulnerabilities for all multiple crises episodes[196].

Questions to keep in mind when reading:

As the previous Argentinean example, if a crisis can only be understood as a global and complex episode, the key information can be organized around three main lines of questions identified in the following box.

Methodology – Questions towards the narrative sources

- **In what context did crises take root? Were there salient existing vulnerabilities, pressures, uncertainties or inconsistencies?**
  - Did institutions, norms or globalization advancement entail structural vulnerabilities exposing the economy to internal or external perturbations?
  - On the run-up to the first crisis, which spheres of the system are under pressure and why?
  - Are there any existing policy inconsistencies? Are there any existing sources of uncertainty?
- **What are the key shocks and triggers behind all crises? Overall were there any key events that helped shake the system beyond the point of rupture?**
  - Were there any external shocks – natural disasters, t-o-t shocks, pandemic, foreign interest rate shock ... – that affected the country throughout the window considered?
  - Were there any internal shocks – wars, social unrest, scandals, strikes ... – that affected the country throughout the window considered?
  - Are there key events, surprised policy announcements etc. that significantly updated agents' information set?
- **How do perturbations diffuse through the economy? What is the role of policy intervention in transmitting/resolving the crisis?**
  - Which constrained agents do shocks and perturbations affect at first?

[196] To speed up production, my future treatment of the remaining crises entails focusing first on identifying and listing shocks and vulnerabilities in quotes. Detailing narratively the transmission mechanisms and the role of policy interventions can be discussed in a second step.

Through which mechanisms does the perturbation spill over to the other spheres?

- Are structural factors (frictions) responsible for a magnification of the shocks? What made perturbations amplify?
- What are the major relevant policy interventions by national authorities? Did they succeed and why? Were there any negative feedbacks effects?

- **How do economic and financial crises relate?** *(this last line of questions is the one I use to analyze previous information to summarize the episode)*
  - Are they the results of common shocks and vulnerabilities?
  - Are there key inconsistency/regularities?
  - Was there a role for expectations and confidence in driving the crisis?

T Argentina – a case study

The following narration[197] aims at discussing the history of financial crises in Argentina since the 80's (return of the democracy in 1983). The objective underlying the following presentation of events is to shed light on the roots of crisis episodes: which triggers for which vulnerabilities? The note will carry great attention to identifying the roles of macro-economic policies, exchange rate policies, financial development and liberalization as well as agent's expectations, institutions and the social/political spheres.

T.1 Argentina – 1995

T.1.1 A. Crisis iD

Financial crises:

- 1995q1 – Banking crisis:
  "a decline of some Arg$8 billion or 18 percent of deposits of the domestic banking system from late December 1994 to mid-May 1995. [...] In the face of this crisis, in mid-March the Government implemented measures to strengthen the public finances and accelerate structural reforms. [...] The financial crisis in early 1995 revealed the structural weakness of some segments of the financial system. [...] Interest rates rose to peak levels in March, a number of banks experienced difficulties, and credit became virtually unavailable for many small- and medium-sized firms"
- 1995q1 – Currency crisis[198]
  "The margin for further BCRA support was virtually exhausted without violating the Convertibility Law. It was at this point that the government implemented a new program with the Fund and sought large scale financial assistance from multilateral organizations and the international financial community to set up trust funds as a backstop to the Central Bank and a way to facilitate the restructuring of the banking system. Following the announcement of this program and accompanying measures, the decline in peso deposits halted."

Business cycles:

(*exp.*) 1990q1:1994q2 – strong expansion (+2.3% per quarter on average)

[197] This note relies upon Vannier (2019)'s database of narrative description of crises. Extracts relating the Argentine crises of 1995, 2001 and 2014 can be found in the annex.

[198] None of the empirical methodologies I used dated an event around that episode. **?** and Boonman (2019) do identify a currency crisis. My rationale behind this choice follows: per se the currency was not attacked on forex markets, what the foreign investors fled was the financial instability of the banking system. The currency was only the vehicle of these fears. Nevertheless, the fact that (i) the Central Bank was forced to the limits of her mandate (ii) following a fall of 41.6% in reserves (inter alia due to reductions in reserve requirement and other interventions) and (iii) the government only intervened at the latest moment but failed to completely tame the dynamics (iv) only international support allowed the CB to manage the period. Overall the crisis was short-lived and the fact that the currency crisis didn't bloom completely is partially related to some regained confidence through the currency board.

(*rec.*) 1994q3:1995q3 – 5 quarter long recession, -14.9% cumulated losses[199], rebound in line with growth in expansion[200].

Origin of the crisis:

- Key shocks and events:
  - External Shock (contagion): The Mexican crisis in 1994q4 impacted Argentina by increasing stress on financial markets and risk aversion towards banks.
    "there was a sharp reversal in early 1995 as the Mexican crisis triggered an outflow of capital from the country."
- Vulnerabilities
  - Growing fiscal instability in an otherwise constrained policy space.
  - Relentless financial liberalisation and privatisation that exposed the financial and real spheres to sudden stops and capital flow volatility.
  - Weaknesses in the financial architecture (overburdened provincial banks).

In a nutshell:

"Coming on the heels of the weakening of financial policies in the second half of 1994, the Mexico crisis in December sharply affected confidence in Argentina, and led to an outflow of capital in early 1995."

If the trigger of the Argentinan banking crisis was the Mexican devaluation in 1994q4, the contagion could only permeate the economy given three main sources of vulnerabilities (without any ordering of importance). First, unstable and inconsistent fiscal policies burdened the private and the banking sectors, e.g. provincial banks were often required to provide liquidity to finance government deficits. Second, through the liberalization and deregulation process, private capital flows insulated the banking sector without any well-endowed mechanism to absorb potential trouble. The Argentinan economy was prone to experiencing bank runs which unravelled end 1994. Third, and as exemplified through the currency/-convertibility board, confidence acted as the pivotal gear in the functioning of the Argentinan economy. If the initial shock is purely extenal at first, it shook the Argentinan economy through the banking sector. The bond-holder closure at the start of the chain of events in january 1995 was soon followed by a generalized liquidity shortage in the banking sector. The prompt government reaction aimed at strengthening the financial system architecture and the disbursement of further international financial assistance backed by commitment to reforms in fiscal policy and the fiscal administration.

For international institutions and some market participants, the crisis unfolding proved the success of the convertibility plan confronted to a test of resilience, robustness and credibility. The V-shaped recovery comforted this view and market expectations improved.

[199] I fear that seasonal adjustment might be responsible for an overestimation of real GDP before the recession start, hence falsely increasing losses and pre-dating the recession.

[200] The strength of the rebound is given by the ratio of growth in the year following the end of a recession and the average growth in expansion. In the present case, the ratio is equal to 0.97.

There is undoubtedly a role for self-fulfilling expectations mechanisms in this crisis as exemplified by the bank runs and large capital outflows.

T.1.2 B. Narration

Context:

Currency board and the return of trust and credibility

Since 1991q1, Argentina is under an Extended Fund Facility agreement with the IMF, backed by her Convertibility Plan and a commitment to stabilization efforts and structural reforms. Argentina has pegged her currency to the USD and increased CB independence. Hence the country successfully tamed (hyper)inflation and soothed agents expectations[201]. To boost domestic and foreign agents' confidence in the economy and the currency board (seen as the keystone of Argentina's renewal), the initial program also aimed at alleviating fiscal imbalances and reducing authorities' interventions in the economy. A key aspect of the convertibility plan was the tight limits under which the central bank could purchase government bonds. Through the currency board, the central bank had nevertheless lost potential room for manoeuvre as Lender-of-Last-Resort for the banking sector. The convertibility board also prevented the use of the exchange rate as an adjustment tool to foreign shocks.

The return of growth...

In the years following the adoption of the convertibility plan, the country intensified its privatization program, regularized its position with external creditors through the Paris Club and Brady operations and finally renewed access to the international capital markets in these years, alongside other developing countries. In 1994, the central government also started issuing floating bonds on international markets. In its article IV consultation, the staff notes that "Serious shortcomings in available information pose problems for the presentation and interpretation of Argentina's balance of payments, [...] for example, data on public sector debt.". If these considerations do not play a particular role in the present crisis, they are worth noting for ensuing cases.

By the end of the 3-year program, economic conditions had greatly improved and growth was expected to maintain its increasing trend. One concern remained as the current account deficit had been constantly increasing as well. Financial liberalization and globalization had driven private capital inflows towards the real sector, acting as a key engine to the production and exports chains.

And the return of fiscal space constraints:

Conditionnal assistance is renewed in 1994 so as to further reduce inflation and decrease the CA deficit through fiscal policy. The introduction of limits to direct monetary financing had nevertheless contrained national authorities, committed to a 1% balance on the federal government's accounts. Hence,

[201] The september 1992 adoption of the ammended Central Bank Charter comforted and strengthened the commitment to the value of the domestic by editing the CB's mandate (parity objective, no financing of provincial and municipal governments nor of private fin & non-fin agents), giving it independence over the authorities (growth of dollar-denominated Argentina government bonds limited to 10% and a monetary base always backed by two thirds of foreign reserves). Additionally the two legal acts limited the role of the central bank as a lender of last resort in order to curb potential moral hazard in the private sector.

over 1991-1994, the federal government increased tax collection and reformed the tax system architecture.

Two aspects of the structural fiscal developments prove key in the upcoming crisis: (1) The program entailed a reallocation of revenues – e.g. employer social security contributions – to the federal level and expenditures – e.g. pension-related expenditures – at the provincial level. Yet, for the provinces, the contributions fell faster than expected and expenditures overran in the run up to 1994. Used to relying upon discretionary and earmarked transfers, this constrained provincial governments to cut expenditures and wage payments. Civil unrest ensued. (2) Provincial governments had been also *"encouraged to privatize and deregulate provincial finances"*, which had boosted the interconnections between provincial governments and local banks.

With monetary and exchange developments under mandate, pressure on fiscal policy was even greater and mid 1994, the federal government further accelerated the privatization process. In its recommendations, the IMF often suggested reforms to facilitate wage adjustment on labor markets, so as to alleviate the real rigidties preventing macro-stabilization.

Financial deregulation, banking system reforms and increased capital inflows.

As of 1994, Argentina reformed her banking system actively. In February 94, the CB was mandated with regulating the opening of new banks and branches, legal differences between domestic and foreign-owned banks were also removed. In June 1994, new regulations refined the classification of banks borrowers and extended required loan loss reserves to include guarantees on financial firms as well. From july to december 1994, the capital requirement was set to 10.5% of total bank risk-weighted assets (above the Basle recommendation of 8%). In january 1995, the capital adequacy rule reached 11.5% and banks were to lead interest rate risk-*stress-tests*.

Triggers: key news, shocks and decisions:

External shock and swift contagion

The crisis that affected Mexico at the end of 1994 initially shocked the banking system through bond traders. Those exposed to Mexico first lost access to bank credit. Others followed thereby impacting larger banks relying largely on bond transactions. Provincial banks also struggled raising funds (structurally as they had long funded unsustainable government deficits, and conjoncturally due to the fall in confidence). Overall, starting in january 1995, Argentina faced a tightening of bank liquidity, a fall in bank deposits, a surge in interest rates and a sharp fall in asset prices.

Unfolding and crisis management:

Financial strain, confidence loss and CB intervention

In the wake of the Tequila crisis and given remaining fiscal instability, Argentina faced a fall in confidence that translated into large private capital outflows and bank runs beginning in 1995. A february 1995 amendment of the Financial Institutions Law gave substantial bank-restructuring power to the CB. In the first few months of 1995, the Central Bank intervened in 14 private banks. This extensive liquidity supply came at the expense of a strong fall in international reserves and monetary liabilities (as soon as the Mexican crisis hit end-december 1994). By mid-March, the fall had been so important that *"the*

margin for further [CB] support was virtually exhausted without violating the Convertibility Law".

Crises, intervention and external liquidity:

At that time, the situation in the real sphere was particularly stern. "The credit squeeze and fiscal tightening, together with the uncertainty surrounding the presidential elections in mid-May, triggered a sharp decline in both consumption and investment in the second quarter of 1995." And " the credit squeeze and decline in consumption had a strong adverse impact on public sector revenues" further constraining the government. Following the weakening of the economy, the unemployment rate had jumped.

With Central Bank's liquidity completely constrained and evident risks for the currency, national authorities were forced to intervene greatly and seek external assistance to provide relief to the financial system and the CB. In early march, the government created two trust-funds to act as lender of last resort. The first managed the privatization of provincial banks and the second helped restructure and/or merge distressed private banks. Banks were suspended. The government negociated as well an extension of the EFF with the IMF and "large scale financial assistance from multilateral organizations and the international financial community."

In April 1995, the CB set up a limited mandatory program of deposit insurance. To ensure liquidity provision, the CB opened contingent repurchase agreements with 13 international banks, to be used discretionarily. Authorities also took policies to reinforce public finances. These measures were further complemented and reinforced as part of the SBC conditional program approved in april 1995. The latter aimed notably at restoring liquidity in the financial sector and increasing the system's robustness. The program managed to increase financial stability and agents' confidence. What truly marked the bounce backs of confidence and deposits was the victory in May 1995 of President Menem. This news managed to coordinate expectations on a new path.

Financial restructuring, and rebound.

From mid-May on, as deposits recovered, the liquidity constraints that weighed on the central bank diminished. The government regained access to world financial markets on August 1995. The financial system exited the crisis segmented and profundly changed. By the end of the year deposits had completely recovered but lending still lagged behind prior-crisis levels.

Nevertheless, if external financial conditions worsened, Argentina's external current account adjusted rapidly from a deficit to a surplus. This reflected "the slackening in domestic demand, strong foreign demand (particularly from Brazil) and good agricultural crops." Overall through the year, exporting firms gained on external competitiveness, which put the economy back on previous tracks.

T.1.3 C. Main sources

- **IMF (Sep. 10, 1995), *"Argentina: Recent Economic Developments"*. SM/95/248
- **IMF (Sep. 11, 1995), *"Staff Report for the 1995 Article IV Consultation and Request for Modification of the Extended Arrangement"*. EBS/95/150
- IEO (2003), *"The role of the IMF in Argentina 1991-2002"* (draft issue paper for IEO (2004)).
- IMF (Oct. 8, 2003), *"Lessons from the crisis in Argentina"*

- IMF Press Releases: PR/95/18 and PR/96/15

T.2 Argentina – 1998:2002

T.2.1 A. Crisis iD

Financial crises:

- 2001q1 – sovereign debt default: IMF emergency program in January + partial default/debt moratorium in December.
  The augmentation [in IMF external financial assistance] announced in December 2000 and formally approved in January 2001 had a favorable effect, but it was short-lived. [...] At the end of December, following the resignation of President Fernando De La RÃºa, the country partially defaulted on its international obligations.
- 2001q4 – banking crisis: in November, bank runs leading, inter alia, to a deposit freeze and a bank holiday.
  In late November 2001, there was a renewed bank run in which more than $3.6 billion in deposits was lost over three days, bringing the cumulative decline since the beginning of the year to $15 billion (or 20 percent of total deposits). On December 1, the government introduced wide-ranging controls on banking and foreign exchange transactions, placing limitations on deposit withdrawals and purchases of foreign exchange for travel and transfers abroad.
- 2002q1 – currency crisis: in January, the president announced the end of the convertibility plan.
  In early January 2002, Argentina formally abandoned the convertibility regime and replaced it with a dual exchange rate system.

Business cycles:

(*exp.*) 1995q4:1998q2 – strong expansion (on average, +1.7% per quarter)

(*rec.*) 1998q3:2002q2 – worst economic crisis in recent history: 4 years, cumulated losses of -22.7% of real GDP. After an initial year in recession with -1.3% losses per quarter (98q3:99q2), the country stagnated between 1999q3 and 2000q4 (-0.07% per q.). From 2001q1 to 2002q2, economic losses skyrocketed (-2.9% per q.).

(*exp.*) 2002q3:2008q2 – strong recovery associated with important poverty reduction.

Origins of the crisis:

- Key shocks and events:
  - External shocks (financial contagion): As Russia defaulted on emerging market bonds in August 1998, Argentina, as other EM, suffered from capital outflows and an increases in spreads and interest rates. This hampered private investment and consumption (closely related to the sovereign debt spread, a proxy for consumer's confidence in the economy). Note that the currency board helped dampen the effect on the domestic economy.

  - External shocks (t-o-t. and commodity prices): Argentina underwent t-o-t depreciation of 6% driven mostly by falls in world prices for commodities upon which Argentina depended.
  - External shocks (trade and financial contation): Through the Mercosur, Argentina was dependent on regional demand, especially from Brazil. When the latter experienced in 1998-99 a crisis and later devalued its currency in 1999, these perturbated Argentina. If the export sector was too small to transmit and amplify these shocks, their lowered confidence in economic prospects and increased real interest rates, thus decreasing sharply domestic demand and revealing the evermore precarious state of the public sector's external indebtedness. Overall these external shocks prolonged economic malaise.
  - External shocks (financing costs): the US Federal Reserve's intervention (increasing policy rates inbetween mid-99 and mid-00) exogeneously constrained Argentina's financing costs.
  - Failed crisis management: throughout the crisis, the national authorities announced measures that either failed to impact the economy enough, &/or were fundamentally inconsistent, signaled deviations from existing mandates and program targets, &/or acted as signal for desperate measures which multiplied confidence losses.
- Vulnerabilities
  - Political uncertainty acted as a key trigger behind the 1998 economic downturn. President Menem's aspirations to a third mandate awoke past political crises' ghosts, increased political uncertainty and undermined confidence. Inbetween February 1998 and November 1999 (Court ruling against the possibility of a second reelection), several political campaigns shed light upon deep political divides and fractions. These latter prove a key hindrance to an effective government command of economic and political developments. Overall, several deep-rooted social and political factors helped magnify and transmit the crisis: social unrest, widely perceived corruption... These structural tensionshad historically been solved through high inflation periods, but had now forced an increase in the public sector's indebtedness.
  - Weak political institutions, a complicated fiscal architecture – provincial deficits transfered to the central government[202], low data quality/availability – and a shallow tax base – widespread tax evasion and noncompliance – weakened greatly the fiscal sphere. This increased the reliance upon foreign capital inflows and financing. If off-budget transfers tapered off over time, on-balance spending and interest rates kept increasing, furher constraining policy space. Overall, the fiscal vulnerabilities were such that:
    (i) the system was bound to be vulnerable to slower growth,
    (ii) room for fiscal maneuver was hampered by the previous decentralization process and structural weaknesses both on the expenditure and the revenue side
    (iii) a rising debt ratio, generated steadily increasing financing needs and vulnerability to shifts in market confidence.
  - Argentina faced an ever widening trade deficit as the growth of imports overthrowed that of exports.

[202]Fiscal problems can, inter alia, be rooted to the provincial level and to (i) the little success met by the federal government in itss efforts to enhance fiscal discipline, (ii) constitutional limitations and (iii) lack of reliable and timely data.

    * In particular, the export sector was very small which (i) limited its ability to act as a buffer when domestic demand fell, (ii) increased vulnerability to shifts in market sentiment and (iii) implied a high debt-to-export ratio, hence conditioning external sustainability on export growth.
    * These issues stem from the fact, when it liberalized, the sector was underdeveloped and firms faced a real appreciation which prevented exports expansion and diversification. Moreover, being part of the Mercosur also diminished the incentives to diversify exports.
    * Finally, the strong growth of imports, highly responsive to income changes, was a key driver behind the rise in the external debt ratio during the 1990s. Economic growth, while mechanically decreasing the debt-to-gdp ratio, contributed to debt accumulation through a wider trade deficit.

- The shallowness of underdeveloped domestic financial markets, low domestic financial intermediation, low profitability of banks, little recourse to equity financing and a high exposure to the public sector participated to the build up of the country's extensive reliance upon foreign currency securities (and the dollarization provess). This also prevented the build up of domestic savinds and increased internal imbalances. This increased the vulnerability of the banking system to an economic slowdown, an exchange rate devaluation and a public sector default.
- Structural reforms petered or regressed after 1995 leaving important nominal rigidities behind. In particular, the labor market faced high downward frictions preventing adjustment through wages. After the doubling of the unemployment rate to 12% around the Tequila Crisis, employment did not recover over the 90's. The labor market had, historically, been protective of workers our of a political desire for social cohesion and fairness – a key pillar of the Argentine 'social' pact, coined by the IMF as "*an additional element hampering Argentina's ability to cope with external shocks.*". This left too little place and flexibility for enhanced job creation.
- The Currency Board compounded vulnerabilities and inconsistencies across the system. It had been narrated as the fundamental keystone of the whole system and concentrated and associated all existing pressures.The implied impossibility of an exit of the board, due to associated high costs, cristalized all problems. Note that, given side vulnerabilities across the whole system, legal and institutional costs to change the regime were not the most important issue here.
    * The convertibility plan entailed, in dowturns, fiscal dominance of the policy regime, left as the only macro-stabilizing tool. Second, it prevented the CB to act as Lender of Last Resort for the financial system, hence requiring the government to have low public debt and enough margin for intervention should liquidity conditions worsen. Third the currency board's viability depended upon government credibility, itself a function of fiscal solvency.
    * The currency board acted as a major engineer of the dollarization of the economy, which later proved lethal to mismatched private and public balance sheets. Hence it accentuated vulnerabilities on the financial and real spheres and ensured that any devaluation would deal a fatal blow to the economy.

  * Exiting the currency board remained an impossible idea until late in the crisis (2000's) and associated to huge costs. Political at first as President Menem had built his success upon the exchange rate regime. Political again as there was strong support for the plan both domestically and internationally, and no politician would have rationally chosen to exit. Finally, before 1998, there were very little times at which both emerging markets were not stressed and the idea of setting an exit path was on the table.

- Argentina benefitted from an overly optimistic view on its growth potential that (i) deflected interest from the public debt dynamics ; (ii) maintained a false impression on policy-makers skills to face and adapt to pressures – a trust bonus associated to the 1995 crisis ; (iii) decreased the incentive to reform the economy at a sustained pace and magnifying the government complacency bias – which was reinforced by the IMF's weak enforcement of fiscal conditionality in its programs and (iv) mistook the impressive growth gains as an indication of a new steady state whereas they resulted from temporary windfalls – catch-up from a low level of growth (post hyperinflation bounce back) and a temporary increase in durable consumption and private investment.

In a nutshell:

"*Like other recent financial crises in emerging markets, the Argentine crisis stemmed from a combination of fragility in balance sheets and the inability to mount an effective policy response. In Argentina, the fragility that turned out to be critical was in the public sector debt dynamics, which were made explosive by the effects of a prolonged economic slump and the difficulties in rolling over debt. The inability to mount a policy response stemmed from a combination of economic constraints and political factors – notably, as in many previous crises, insufficient political support and resolve.*"

Argentina's crisis was associated with one of the worst recent recessions. The episode lasted over four years. The initial economic downturn was caused by external shocks compounding with political uncertainty and cyclical correction. Argentina had been coined a growth success story and the country's performances and the currency board were lauded as an example for others.

Over the 1990s, the currency board came to be the cornerstone of the entire Argentine system, concentrating the trust of all agents in the currency, the sovereign, future prospects etc. Yet, this came at the expense of several missed (or under-discussed) vulnerabilities and imbalances. The trade sector had failed to grow and diversify, labor market were still facing high nominal downward frictions, the financial system if apparently well capitalized, had remained shallow and highly dependent on foreign capital.

More importantly fiscal performance/sustainability was impaired by structural weaknesses and deeply rooted socio-political tensions. This was all the more problematic as the convertibility plan transfered macro-stablization and emergency liquidity provision mandates to the government. The dollarization of the government's balance sheet moreover forced the government to fiscal solvency to avoid any damaging increase in risk premia and external borrowing costs.

As soon as the economic recession settled in, there was little room to maneuver to avoid a crisis. Crisis management was marked by huge political crises (resignations, corruption scandals, dislocation

of political support groups...) and misconceived policies that contributed to the fall in confidence and economic activity. Strikes, bank runs and social protests shook the country as economic activity collapsed. Elected President de la Rua resigned on December 20th. In three weeks that followed, four other presidents occupied the post and subsequently announced and confirmed partial default and a change in the exchange rate regime.

T.2.2 B. Narration

Context:

The perks of full-on Washington consensus: Narrating a growth success

Over the 90's, growth in Argentina was impressive. The economy bounced back well from the 1995 crisis. High inflation had been tamed and the introduction of a currency board, by limiting money-financed deficits, had rebuilt confidence. Once inflation had resorbed, despite less rationale for maintaining the peg, the convertibility plan was strongly encouraged by (inter)national authorities as a strong condidence enhancer.

The financial system was small in size but banks were, in appearance, sound and well capitalized. Yet many of the reforms suggested by the IMF to boost the stability of the financial system through the mid 90's involved a discussion/renewals of the CB mandate. This already hinted at some limits of a pure currency board and might have participated to private agents' future crisi.es expectations.

The country benefitted from low cost access to world capital markets. The Washington Consensus view dominated the broad policy agenda of deregulation, liberalization and structural reforms. In 1996, Michel Camdessus, acting managing director at the time, strongly lauded Argentina's economic and financial feats. His speech, available here, is perhaps the best illustration of (1) the bias that blurred the IMF policy view before the crisis and (2) the best prediction of what would precipitate a costly crisis.

> *For a number of years, the Fund shared such lessons with Argentina to spread the word about the "silent revolution" that was transforming countries from inward-looking, heavily regulated, undercapitalized economies into stable, outward-oriented, rapidly growing ones. (...)*
> *And a few years ago, Argentina became part of this revolution, moving decisively to overcome structural impediments and eliminate distortions. (...)*
> *My intention, then, is not so much to disseminate the lessons we have learned elsewhere - but to draw lessons from Argentina's experience that we can share with others.(...)*
> *And finally, a word on governance. Without question Argentina has come a long way in deregulating its economy: establishing a more transparent regulatory system; introducing a legal system that is not only independent and impartial but swift to the task and in step with the times, thereby ensuring certainty as to the law; and otherwise enhancing the confidence of savers and investors. Nevertheless, there is still work to be done. Is it not reasonable to believe that this recovery of confidence also reflects to some extent the expectation that this process will continue to be strengthened? This expectation of good governance ought not to be disappointed in this new environment where all countries are competing for the market's*

confidence.

Michel Camdessus (May 27th 1996), Speech on *Argentina and the Challenge of Globalization*

The IMF support to Argentina was in part driven by the responsibility assumed by the institution in directing the country's policies away from crisis. At the eve of the crisis, despite a widespread recognition of vulnerabilities and imbalances, Michel Camdessus kept 'coordinating' economic and financial agents' expectations around a success story. *"On October 1st, 1998, the performance of Argentina received the attention of the world when President Carlos Menem shared the podium of the Annual Meetings with the IMF Managing Director, who characterized "the experience of Argentina in recent years" as "exemplary". The Managing Director further remarked: "Argentina has a story to tell the world: a story which is about the importance of fiscal discipline, of structural change, and of monetary policy rigorously maintained"."* (IEO, 2004).

In truth, reality was dire.

The truth behind growth: fragilities, inconsistencies and rigidities

Since 1991, the country had been deregulating and liberalizing heavily under the auspices and external manna from the IMF. With underdeveloped domestic markets, this nevertheless came at the cost of heavy dependence upon external financing flows, both for the private and the public sector. With the dollarization of the economy, the currency board self-reinforced itself as the cornerstone of the whole system's sustainability.

Under these terms, fiscal policy proved to be (1) the sole tool for macro-stabilization and liquidity insurance on financial markets and (2) theoretically bound to government credibility and fiscal solvency. In practice, fiscal policy was constrained by (i) a complex and inefficient fiscal architecture ; (ii) frequent off-budget transfers and (iii) widespread tax evasion and noncompliance. Over the 1990s, the government rarely met its fiscal targets, but this never sullied markets' and agents' confidence nor the IMF support to the country, disregarding formerly stated program conditionalities.

Faced with a real appreciation of the currency after the liberalization, Argentina's export sector failed to diversify and grow. With little foreign currency revenues from trade, external debt sustainability was (i) dependent on the continuous growth of the sector and (ii) made vulnerable to shifts in market sentiments. Moreover, the dollarization of the economy had exposed private agents' balance sheet to drastic risks in case of a devaluation.

In a currency board framework, without any possible external adjustment, one needs to be done internally. Yet, the real economy also suffered from nominal rigidities and especially downward frictions on wages. Structural reforms had always been on the agenda. After the unemployment increase in 1995, the country never recovered as reforms petered out or even regressed. Overall political decisions often depended upon a commitment to further social cohesion and fairness. The public sector absorbed a huge share of employment up until in the crisis.

Overall, the currency board relied heavily on trust: in the currency, in the sovereign, in economic and financial prospects and in social betterments. Private agents expectations would thus be a core trans-

mission channel for the crisis. An overconfidence in the present situation drove the national authorities to complacently avoid reforms while the IMF turned a blind eye.

Triggers: key news, shocks and decisions:

"*With the economy operating above potential in the first half of 1998, the initial downturn occurred as consumer confidence was sapped by external financial shocks and domestic political uncertainties, compounded by tighter monetary conditions and traderelated shocks; thereafter, the structural weaknesses came into play.*"

After the 1997 Asia-originated Emerging Countries International Financial Crisis, even if prospects looked a bit more worriwome, the currency board managed to shed the economy from wide fluctuations. In february 1998, an IMF program expected a recovery to potential output as soon as 2000 with continuously improving domestic and external macroeconomic indicators.

External shocks, political uncertainty and economic downturn

Beyond a cyclical correction, a series of external financial shocks came to disrupt Argentina's financial markets (Russia's default in 1998q3, LCTM crisis in 1998q3, fall in commodity prices, later increased with Brazil 1999 devaluation) and trigger the downturn. As foreign investors risk aversion increased, Argentina faced an increase in risk premia interest rates and borrowing costs, partially loosing access to markets. This further constrained private investment and increased the spread vis-a-vis US-Treasuries. Overall, as market confidence fell, so did private consumption. The effect of trade contagion from the Brazilian partner were dealt with an announcement by the CB to further commit to an even starker dollarization of the economy. If this temporarily soothed expecations, the perturbations had settled in.

These shocks affected the economy because they combined with a global politically uncertain environment in which news of tensions and dissensions frequently agigated the socio-political spheres. In particular President Menem's relentless push for adapting the constitution to allow for a second reelection bashed domestic and foreign agents' confidence. It exacerbated oppositions between and inside political parties. These more than ever visible divisions contributed to undermine trust and confidence in better days.

Overall these shocks and uncertainties proved damaging for fiscal solvency. In the run-up to the elections in October 1999, an increase in government spending limited the dowturn and set the gorund for a very mild pick up. Yet, the elections that concluded on the nomination of President De la Rua in December 1999 were the theater of many internal fragilities and the show of the political authorities' inability to aggregagte broad political support.

Unfolding and crisis management:

Growth stall, debt dynamics and policy dilemma

Once the recession had started, depression and regression were almost unavoidable. As growth slowed down, a vicious debt dynamics set into place, driven by an adverse differential between interest rates and growth. The government first responded timidly and startedd contractionary fiscal policies only in 2000.

Meanwhile, despite sizable structuraal tightening, government financing needs skyrocketed, further speeding up debt dynamics.

In parallel, the appreciation of the USD and a dry-out of emerging financial markets kept increasing Argentina's borrowing costs. The national authorities had literally no policy instrument to stimulate the economy without compromising debt sustainability. The accumulated stock of sovereign debt combined with the currency board's constraint on policy mix forced the government into status quo, unable to give any decisive impulse to the economy. Small patches failed to reverse confidence losses, and risk premia kept rising to the continuous slippages. As the economy deteriorated, the disappointing news on real growth and inflation reinforced the policy dilemma faced by the government. At that point, faced with the unbearable stigma and political cost of negociating pre-emptive debt restructuring, the sole remaining hope to stop vicious debt dynamics and bolster agents' confidence was an economic recovery.

Currency board, adjustment and structural weaknesses

The modest room for monetary policy entailed in the currency board was also exacerbated by global emerging markets conditions. In practice, the exporting sector was too small to absorb the fall in domestic demand. Even if external adjustment had been possible, the necessary devaluation would have been far too big to be conceivable. At the same time it struggled with increased pressure from real exchange rate appreciation and falling commodity prices, underlying a need for downward adjustment. Yet nominal and real rigidities prevented any adjustments, unemployment rose and consumer confidence maintained its fall. At that point, the exchange rate regime had moved from "confidence-enhancer" to "confidence-damaging".

Yet, no doubt were expressed towards the currency arrangement so far. The foreign currency exposure of both public and private agents made it impossible to exit the peg without default.s and worse consequences. It was too late to use the exchange rate to provide potential relief. Structural weaknesses hampered policy reactions and prevented economic stimulus. Negative labor prospects had nevertheless agitated the social sphere beyond repair. National strikes and manifestations regularly halted the economy from February to June 2000.

In August and September 2000, allegations on bribes and corruption were carried against the government. The latter was forced to justify itself in any way necessary to maintain political trust. In October, the coallition in power collapsed as the prime Minister resigned. At the same time during fall 2000, the country lost access to voluntary sources of funding, pushing the government to ask for a new program at the IMF.

Late 2000, grave concerns about exchange rate and debt sustainability contaminated the whole system.

2001: the cacophony of policy interventions

Throughout 2001, as economic and financial conditions deteriorated, national authorities announced a wide set of measures to curb the now high economic losses. In January 2001, the IMF granted the country additional financing backed by a program including fiscal adjustment and structural reforms. Markets reponded positively. Yet, the hiatus was elusive as strong political opposition manifested against the measures. The government's actions prove too small to disrupt the vicious cycle on increasing interest

rates, falling growth and fiscal underperformance. Very quickly, it became obvious that the program's objectives would end up exceeded.

In March, over three weeks, two ministers of Economy resigned, afflicting yet another fatal blow to the current political situation. The latter was starting to drown in chaos as political alliances faltered and national strikes were announced. On March 20th, Domingo Cavallo was appointed as minister of Economy. The nomination aimed at using his experience as the 'founder of the convertibility plan' to gain popular support both domestically and internationally. Yet, he introduced a series of heterodox policy measures that were perceived by market participants as desperate, impractical or counterproductive. As confidence eroded throughout the first quarter, spreads continued to widen and positive prospects to falter away.

In April 2001, the central bank implemented a pseudo-devaluation by introducing, for foreign trade on non-energy goods, a parallel reference exchange rate based on a basket of USD and EUR[203]. Rather than stimulating the economy, this measure further harmed confidence. Until mid 2001, the banking system had proven relatively resilient, capitalization & liquidity wise. The modification of the parity initiated bank runs. Later in the month, the CB Governor was replaced over alleged charges of money laundering[204]. In June, the CB managed to implement a voluntary debt swap, offering temporary breathing space to the economy. Yet, as the amount traded exceeded markets' expectations, the measure increased concerns over public sector solvency. Mid-2001, the CB charter was amended to give more room for maneuver and liquidity injections.

In July 2001, the government passed a law setting a path to a zero-deficit target. There were considerable skepticisms regarding how social sphere would respond to the program, tus questioning its feasibility. Moreover, spreads were already too high for the policy to have any effect. Soon large-scale deposits withdrawals resumed. Banks relied upon government securities to meet liquidity requirements. Any haircut to sovereign bonds would entail serious liquidity problems for financial institutions. For market participants, banks' balance sheets were weak and highly exposed to the government due to politically motivated lending decisions.

In September 2001, the IMF provided new funding to restore market confidence. Given present circumstances, the program displayed evident weaknesses. In particular, the IMF introduced USD 3 billin to help resturcture debt, which was misinterpreted by market participants and fueled risk aversion. With upcoming elections, political support for the government collapsed and manifestations spread out. In November, as a last attempt, the government announces additional efforts to restructure public debt.

The worst case scenario was now unavoidable.

The debacle

Begining of November, the country's long term grading was lowered by Standard & Poor's to Selec-

[203]Exporters received a trasnfer for the difference between the two rates, whereas importers had to pay the difference. By reducing (increasing) the cost of foreign trade for exporters (importers), the CB reproduced the price effect a devaluation would have had on the foreign trade sector.

[204]At this stage it feel redundant, but every single news added to risk aversion and confidence losses.

tive Default. By the end the the month, the country witnessed both a run on private sector deposits and flight to quality (November 28/30). National authorities introduced a set of controls on banking and forex transactions, but the population's discontent vis-a-vis overall policy management was too high. Strikes, riots and protests took the streets as economic activity collapsed. Tax revenue fell, provincial and federal governments deficits exploded. On december 5, the IMF announced no further disbursement would be made under ongoing program.

The social tragedy culminated with a count of 20 deaths on December 20th, when President de la Rua resigned. Three days later, interim president announces a partial default on external debt. He resigned a week later. (alongside the president of the Senate). Interim president Duhalde is elected on January 1st, 2002 for a one year mandate. On January 3rd, the new president confirms the debt moratorium and announces the end of the convertibility plan (for a dual exchange rate regime). A month later, the dual exchange rate regime is unified but the government introduces an assymetric pezoisation of banks' balance sheets to spare firms and corporates from currency mismatches. This policy shifted the trouble from the non-financial institutions to banks, which finished overkilling troubled institutions. Impaired banks prevented any strong recovery after the crisis as they had no longer the means to circulate liquidity.

T.2.3 C. Main sources

Given the severity of the episode and the implication of the IMF in the crisis, I rely upon the Fund's own evaluation and that of the Independent Evaluation Office (IEO). The IEO was introduced after questions on the implications of Fund recommended policies in the making, management and solving of the crises that hit emerging markets at the end of the 90's. The IEO is an internal department in the IMF, which is independent and has a critical view on the Fund's Policy Views. Its staff relies on similar risk assessment methodologies but aims at providing a critical role and evaluation of the Fund's policy views and recommendation.

In particular, the report on present episode has a huge level of details on the unfolding and the sequencing of events. I substitute the report (and similar IMF publications that aimed at taking stock of the Argentina disaster) to usual article IV and Recent Economic Development (numerous over the period 1997:2003).

- IEO (2004) (as well as the draft issue: IEO (2003) *"The role of the IMF in Argentina 1991-2002"*).
- IMF (Oct. 8, 2003), *"Lessons from the crisis in Argentina"*
- IMF (May 27, 1996), Speech by Michel Camdessus, managing director of the IMF titled "Argentina and the Challenge of Globalization" at the Academy of Economic Science – 96/11.
- IMF (February 04, 1998), "IMF Approves Three-Year Extended Fund Facility for Argentina" – PIN 98/01
- Numerous other IMF Press Information Notices covering 1996-1998[205].

[205] I do not rely intensely on Press Information Notices, Speeches and Transcripts as a source for my narration. I did read an important number of such press releases for Argentina when defining the initial methodology. I didn't chose to follow this line given the extreme cost of reading dozens of press conferences transcripts. For Argentina, given the peculiarity of the country and the often troubled relations with the Fund, they do offer an interesting complementary hinsight. They also shed light vividly on the bias and the ideologies that might have blurred the IMF's staff in writing the reports.

- CB Governor P. Pou's article in *Finance and Development* (IMF, March 2000). "*Argentina's Structural Reforms in the 1990s*".

T.3 Argentina – 2012:14

T.3.1 A. Crisis iD

Financial crises

- 2014q1 – currency crisis (devaluation in January 2014)
  Policy inconsistencies were exposed in early 2014 when mounting balance of payments pressures culminated in a sharp devaluation of the peso. To curb the rapid fall in reserves, the central bank devalued the currency by 23 percent in January, tightened some foreign exchange regulations, and raised policy interest rates.
- 2014q3 – sovereign crisis (July 31st - arrears of payments with *Vulture Funds.*)
  In the ensuing days, the Argentine government refused to offer the holdouts better terms than those of the 2005 and 2010 debt exchanges, and the inability of interested parties to reach a negotiated settlement by July 30, 2014 (when the grace period for end-June interest payments expired), resulted in the non payment of any obligations on Argentina's foreign-law governed restructured bonds from that day onward.

Business cycles:

(*exp.*) Slowdown over 2011

(*rec.*) 2011q4:2012q2 – Short and costly recession (-6.1% cumulated losses) followed by a slightly slowlier recovery (0.8 times average expansion growth).

(*exp.*) 2012q3:2013q3 – Rebound followed by stagnation at a ca. 0.7% growth over 2013 (+7.5% cumulated gains).

(*rec.*) 2013q4:2014q3 – Recession, -4.0% cumulated losses, followed by a slow recovery (0.5 times average growth in expansion).

(*exp.*) 2014q4:2015q2 – Expansion (+4.6% cumulated gains).

Origins of the crisis:

- Key shocks and events:
  - Natural Disaster (severe drought 2012)
  - Commodity prices windfall and t-o-t shocks
  - Change in trade with major partners (Brazil (2012+14), China (2014))
  - *"Vulture Fund"* related Court Rulings
  - Revelations of inaccurate official statistics
- Vulnerabilities
  - Inconsistent monetary/fiscal/forex policy mix

- High BoP pressures on the exchange rate
- Lack of access to international financial markets
- Historical lack of confidence in the economy

In a nutshell:

Overall the currency crisis that affected Argentina in 2014 can be seen as the direct consequence of three things:

- an economic slowdown exacerbating pressures on the exchange rate
- an inconsistent expansionary policy mix backed by inexact data
- the lack of access to world markets at a time of favorable debt dynamics and need for financing.

The sovereign debt crisis can be impeded upon three main elements that interacted as Argentina was completely cut out from international financial markets:

- the conflicting ideologies of the Argentine authorities and people with that of a minority of international investors.
- an economic recession affecting all spheres of the economic and financial system - banks excluded – and preventing any room for manoeuvre
- looming expectations and a loss in confidence by most economic agents

I chose to treat the 2014 and 2015 events separately as my opinion is that they differ in nature. Yes, the elements that made the 2014 crises and the associated vulnerabilities (transfered and/or amplified) are detrimental explanations of the 2016 event. But, quite similarly, the 2014 events can be dated back to the 2002 crises and even to the accumulated Argentine past of crises and confidence losses. Nevertheless, the policy management and the events that lead to the 2016 devaluation deserve a different narration.

T.3.2 B. Narration

Context:

After the 2002 deep economic crisis, Argentina bounced back well. At the time of the 2006 article IV mission, the outlook is positive and most sectors are said to be recovering. The main concern made by the board of the IMF looks at the inflationary pressures that increasing aggregate demand puts on the economy vis-à-vis a slow-paced change in supply.

The executive board concludes that a continuous process of structural adjustment and a coherent macropolicy framework, should secure Argentina's future. The 2002 financial crisis has left the country traumatized and the authorities and the population blame the IMF. After the 2006 article IV mission, it will take 10 years for the IMF to return to the country.

Growth and external exposition:

Over the years leading to the 2014 crisis episode, Argentina grows at a high growth rate (6 to 9% over 2007-2010). The economy is highly dependent upon her foreign exchange revenues and recovers well from the GFC shock in 2009. The country benefits from positive and unexpected terms-of-trade gains and good performance among trade partners (Brazil and China).

A still depreciated exchange rate and expansionary government's initiatives support the manufacturing sector's growth. Meanwhile, reflecting good economic performances and negative real interest rates,

public and private consumption have grown steadily. Government interventions have alleviated poverty and the income distribution slowly ameliorated.

Overall if exports grew steadily, imports outpaced them and trade surpluses slowly transformed into deficits, fueling the decrease in current account balances over the years. After the 2002 crises, Argentina has lost access to world financial markets. The financial account balance remains weak in the period leading to the 2014 crisis and mostly signals capital outflows. The banking sector remains small with respect to historical standards but banks benefit from good conditions (available liquidity, high intermediation spreads as well as little non-performing loans).

Political bloc and policy mix:

During negociations in 2005 and 2010, Argentina's authorities manage to exchange a great majority of remaining sovereign debt (91%). If access to foreign financing remains nihil, to finance important public expenditures in face of decreasing primary surpluses, the government has exploited various means of financing (transfers and debt from public firms and banks, temporary advance and borrowing at the central bank, "arrears of payments"). Overall, strong real growth and low borrowing costs create a favorable debt dynamics. Argentina's public debt to gdp ratio falls.

Over the years the central bank has seen her mandate evolved. In March 2012, a new Charter is adopted that expands the existing monetary and financial stability mandates with "the pursuit of economic development with social inclusion". Beyond 'fighting' inflation, she also intervened frequently on foreign exchange markets to preserve nominal exchange rate stability. Finally the increase in central bank credit to the government during 2010–11 and the ensuing numerous foreign exchange measures aimed at containing the domestic demand for dollars confirmed a loose expansionary monetary stance.

Triggers: key news, shocks and decisions:

Three main triggers explain the ignition of the 2014 crises:

External Shocks and economic slowdown:

Facing a **lower demand from Brazil** and **a severe drought in 2012**, the economy enters a brief recession in 2012. If exports fall subsequently to this slowdown, the introduction and tightening of controls on imports in early 2012 increases their fall. Both the trade and the current account balances ameliorate. Nevertheless associated controls on foreign exchange transactions further constrain private investment and key sectors of the economy (e.g. construction).

To fight off the recession and boost economic recovery, both monetary and fiscal policies continue to be expansionary. The primary balance keeps deteriorating, central bank's deficit financing continues and broad money stock increases. Faced with changing BoP imbalances, the central bank is forced to sell foreign reserves and increase the pace of nominal depreciation. However the tight forex controls question the coherence of the interventions and a gap widens between parallel market and official exchange rates. Overall, following the economic slowdown in 2012, external fragilities have exacerbated the pressures on national authorities. This further highlighted existing policy inconsistencies that would pertain should growth remain low.

Issues on data quality:

Since early 2007, CPI and GDP data provided by the National Statistics Institute is being heavily debated and contradicted by private estimates. Bad-quality CPI data proved to be key in the misunder-

standing and mismanagement of the rising crises (e.g. underestimated measures for the real exchange rate). As a result, in July 2011, the IMF considers Argentina as having breached her obligation to provide data of accurate quality (cf article viii of the IMF statute). Despite the technical assistance provided by the Fund, the Executive Board adresses Argentina a statement of concern in september 2012. Soon after, in february 2013, the Board sets off a procedure for a declaration of censure. This procedure constrained national authorities to ammend and correct existing data if to avoid a declaration of ineligibility to use the general resources of the Fund. The revision process lead to the provision in early 2014 of a new national CPI indicator and revised GDP data.
As stated by the IEO in 2016, "data deficiencies were identified among the contributing factors for failing to foresee and/or mitigate the severity of the major economic crises of recent times." In the case of Argentina, the struggle to back policy decisions with data of good quality surely impacted the ability of the authorities to manage well the unfolding of the crisis. Moreover, the inability of economic agents to rely firmly upon the information provided by the government hampered their decisions and trust in the future, which surely nurtured households and firms' concern as well as risk perception by financial agents.

Vulture funds and remaining sovereign debt problems

The last set of triggers that explain the 2014 episode relates to the follow-up of the 2010 debt renegociation. In 2011, a group of hold-out investors, that had not participated in the debt exchange operation, filed a case against Argentina. They argued the authorities had violated the *pari passu* clause by conditioning debt repayment to the sole creditors involved in the debt renegociations. In december 2011, the Southern Disctrict Court of New York ruled in favor of the investors which lead to a series of appeals by Argentina up to the US Supreme Court over 2012-2014. As explained below, this series of events directly lead to the 2014q3 default. The fact that the procedure started in 2011, as the economy was slowing down, further prevented Argentina from gaining access to world markets at a time when she desperately needed to.

Unfolding and crisis management:

Poor economic performances and fall in confidence:

Following the 2012 recession, the economy bounced back in 2013 although growth stalled in the second semester. Exports to Brazil temporarily recovered, agricultural output as public spending increased before the october 2013 Congressionnal Elections some sectors were positively affected (e.g. construction). Nevertheless the economy remained vulnerable in an environment defined by the lack of confidence in the data and trust shocks to the authorities (even so Fernandez's party and allies manage to win the majority of seats during the elections). This climate of incertitude as well as interventionist policies still prevented the growth of private investment. The latter failed to boost economic performances with a contribution of less than 20% of GDP since 2006. 2012-13 confirmed the lack of confidence in the economy of domestic real actors of the economy.

Inconsistent policies, rising domestic and external pressures

The continued expansionary policy mix heavily pressured inflation and the balance of payments. Private inflation estimates reached 28% by end 2013, against 11% for official statistics. Net capital outflows increased drastically over 2013 despite a tightening of capital controls. FDI inflows also declined. The financial account balance deteriorated. At the same time the current account deteriorated as well,

reflecting a widening in both primary income balances and the trade balance. The latter deteriorated significantly as the government simultaneously crowded out private investment and domestic production through price regulation and boosted private energy consumption through subsidies.

Parallel exchange rate dissonance and currency devaluation 2014q1

All these BoP pressures impeded the central bank's room for manoeuvre and foreign reserves depleted at an increasing pace over 2013. At the same time the price of the USD kept rising on parallel markets. The fact that the authorities allowed for a faster depreciation rate of the official exchange rate only partially tackled the problem. The tightening in capital controls that was decided inbetween March and December failed to alleviate the pressure. In january 2014, following no apparent trigger, central bank reserves declined again and at an accelerated rate. By the end of the month, the central bank devalued the peso by 23%, capital controls further tightned and policy interest rates were raised.

External shocks and deteriorating domestic imbalances

If deemed appropriate (WEO - April 2014), the intervention failed at stabilizing the economy. Over 2014, Argentina was impacted by a fall in demand of major trade partners (China and Brazil), and a fall in commodity prices (starting June 2014). Despite the devaluation, the currency steadily appreciated in real terms over 2014. Harmed by an overvalued currency, exporting firms' competitivity fell. The sector, a keystone of the Argentine economy, was gravely affected. Yet, net exports contributed positively to growth, as imports contracted more given the fall in private consumption. With consumer confidence and real income falling, aggregate demand contracted. All the more so than fixed investment receded as well reflecting terms-of-trade shocks, a fall in business confidence and difficulty in accessing credit. In 2014, only financial intermediation, other services and agriculture contributed positively to growth.

Money & inflation ; Wages & employment

The january devaluation was followed by a burst of inflation (80%). To protect the currency, the central bank associated the devaluation with an increase in policy rates (from 16 to 20 percent). They remained high over the year. Inflation reversed as soon as february and decreased over the year, stabilizing around 18% (new official estimates). It was associated with a rise in nominal wages of around 30%. On the labor market, a sharp fall in the labor force participation and a spike in public employment managed to contain the increase in unemployment to only +0.5% over 2014.

Access to credit, crowding-out and fiscal deficits

To further prevent inflation, the central bank contained money creation and sterilized most of her activities. Nevertheless, she continued financing the growing government demands as the public deficit reached -2.5% of GDP. Without contributions from the CB and the social security system, the deficit would have reached -5.6%. This crowded out private credit as banks' exposure to the government grew. Measures implemented to constrain banks to lend to the private sectors failed at taming the decline. With domestic financing drying up, resorting on international markets was still not an option and FDI inflows were low. The lack of external financing was becoming even more stifling for the government, whose spending kept growing. This freflected, on one hand, gross transfers to the private sector, two thirds of which were directed at the already imbalanced energy sector. On the other, increasing nominal

wages and public employment paced real spending on wages and pension which accelerated quickly. In March, June and September the government was able to tap domestic financial markets.

Legal constraint and political choice: sovereign default 2014q3

Over 2014 and its pungent recessionary economic environment, the authorities struggled with the country's past problems with debt. Argentina submitted a proposal to the Paris Club as soon as January 23rd as the central bank tackled the currency crisis with a forced devaluation. The agreement concerned the Paris Club, Repsol and the International Center for the Settlement of Investment Disputes. As 2014 unfolded, stories of corruption and a badly managed crisis resulted in a rise in social and political turmoil. Given the high political cost of settling with the remaining hold-out investors, Fernandez' government continuously refused changing her proposal based on the grounds of already high economic losses. This stance was supported by the population, who manifested against the *"vulture funds"*. In June, the US Supreme Court refused to consider Argentina's case, leading to a status-quo situation. On July 31st the grace period ended and Argentina defaulted again, although the authorities had the resources prepared to repay non-holdout investors. The default occured during the last quarter of recession with all economic and financial indicators depressed.

BoP pressures, confidence losses and crisis management

With continuous current account deficits and increased payments over dollar denominated debt, pressures on the balance of payments kept increasing. This precipitated the fall in foreign reserves and a widening of the gap between the official and parallel exhcange rates. This dire loss of confidence peaked in september 2014. Several measures were then implemented as the economy recovered starting in 2014q4. The government negociated and activated a RenMinBi swap with the People's Bank of China. Authorities agreed with exporters of cereals and oilseeds to sell more of their inventory stocks and surrender a certain amount of dollars during the last quarter of 2014, as well as the sale of 4G telecommunications licenses at the end of 2014. Intensified foreign exchange controls complemented the set of reforms. This allowed gross international foreign reserves to recover, narrowed the gap between official and parallel exchange rates and tamed futures markets' expectations.

Recovery and political change

As 2014 ended and 2015 started, the economy recovered. Due to high political uncertainties as well as large and rising domestic and external macroeconomic imbalances, concerns remained high. Upcoming october elections would prove key in the rebound. Fernandez's decision to uphold the hold-out investors up to a default certainly gained her support in the population but she could not run for a third mandate. Ongoing revelations on corruption and the crisis missed management weakened her party's position greatly. In october a new president, Mauro Macri took power. He introduced a vast plan of reforms and austerity measures. End 2015 the country entered yet another recession leading to yet another currency crisis. This further augmented losses but the recession ended in 2016q2.

Overall the two episodes are fundamentally linked. I treat them as separate, because the shocks that gave rise to the economic and currency crisis are different in nature (more detail provided in next section).

T.3.3 C. Main sources

- IMF – PR11/279, PR212/319, PR13/33, WEO Conf. Apr. 16 2013, ST13.01.25, ST13.10.12, PR13/497, ST14.01.23, PR14/102, ST14.04.11, PR14/267, ST14.O7.24
- IMF – Staff Report on "Strengthening the Contractual Framework to Address Collective Action Problems in Sovereign Debt Restructuring "
- IMF – Country Reports 16/67 "Argentina: Economic Developments 2013"
- IMF – Country Reports 16/68 "Argentina: Economic Developments 2014"
- IMF – Country Reports 16/69 "Argentina: Economic Developments 2015"
- IMF – Staff Report for the 2016 Article IV consultation
- IEO (2016) "Behind the Scenes with Data at the IMF: An IEO Evaluation"

T.4 Argentina – 2015:16

T.4.1 A. Crisis iD

Financial crises:

- 2015q4 – currency crisis
  Remove the various FX controls and let the exchange rate float, unifying the official and parallel exchange markets, and correcting the overvaluation of the peso through a 40 percent depreciation of the official rate in December 2015.

Business cycles:

(*exp.*) Slow but steady increase in growth in 2014q4:2015q2 (+4.6% cumulated gains)
(*rec.*) 2015q3:2016q3 – Recession, -4.0% cumulated losses.
(*exp.*) 2016q4:2018q1 – Expansion; +5.4% cumulated gains.

Origins of the crisis:

- Key shocks and events:
  - External shocks (summer flash foods, terms-of-trade shocks)
  - Political news and shocks (corruption scandals, political divides) in the run-up to the October 2015 elections
  - Political U-turn after president Macri's election
- Vulnerabilities
  - Build up of external imbalances and BoP pressures: No access to international capital markets, weakening external demand (Brazil, China), widening current account deficit, dual exchange rate market, depleting international reserves...

- Microeconomic distortions: *Distortions at the micro level included an extensive network of administrative controls (for example, trade barriers, foreign exchange restrictions, and price controls) and a business environment that eroded competitiveness and undermined medium-term growth.*
- Political interventionism, inconsistent policy mix and domestic imbalances: *unsustainably high consumption levels, historically low levels of investment, and large fiscal deficits financed by money creation, which led to high inflation"* ; *weakening of the institutional framework for economic policymaking, perhaps most evident in the loss of credibility of the national statistics agency.*

In a nutshell:

In the first few months of the new administration, bold steps were taken. (...) These measures, while necessary to lay the foundation for robust future growth, inevitably had an adverse impact on the Argentine economy which had already began to contract in the last quarter of 2015.

While the exact form of the counterfactual is difficult to predict, failing to address the unsustainable path that the Argentine economy was on would have led to even worse outcomes that have been all-too-familiar to Argentina – potentially a run on local currency assets, spiraling inflation, an abrupt fiscal adjustment as financing sources were exhausted, and/or a depletion of foreign exchange reserves and balance of payments crisis.

The 2015 crisis episode takes roots in the political gridlock that ensued from the previous crisis. With no access to financial markets, accumulating imbalances and heavy microeconomic distortions, economic prospects soon deteriorated. Summer floods fragilized further the economy.

Despite wide support in the population after denying *Vulture Funds* their legal due, president Fernandez's crisis management rose several critics. Scandals of corruption further weakened and divided the Peronist party as elections narrowed at the end of 2015. The leader of the opposition, president Macri, got elected with a frail majority.

He implemented a wide reform agenda including an exchange rate devaluation and a commitment to float. The austerity measures that meant to rebuild confidence precipitated the recession but allowed the economy to start recovering mid-2016.

Based on the IMF's analysis, had the country not changed policy course, losses would have been much greater.

T.4.2 B. Narration

Context:

Recovery, expansionary policies and the regain in confidence

Most of the policy steps taken to resolve previous balance-of-payments pressures – currency crisis in January 2014 – fueled an economic slowdown over 2014. Inflation spiked and harmed consumer confidence. Terms-of-trade shocks, lack of foreign financing and limited domestic credit, and deteriorating confidence contributed to a fall in private investment. Growth rekindled at the end of the year as the

government intervened importantly to support the productive sector. As balance-of-payment pressures soothed over the year and agents expected policy-changes at the end-of-2015 presidential elections, confidence rekindled.

International situation, looming growth prospects and inconsistent policies

As 2015 started, Argentina's external economic situation deteriorated, driven by a slowdown in main trading partners, deteriorating terms-of-trade and generalized defiance vis-a-vis emerging markets. This weighed negatively on agents' expectations. Committed to tackling the growth engine, the authorities maintained their expansionary policy mix and a high degree of intervention. As a result, the primary sector deficit widened and inflation remained high. Growing fiscal demand and a decrease in Central Bank sterilization efforts further constrained the credibility of the forex regime. The gap between official and parallel exchange rates widened.

BoP pressures, accumulating imbalances and increasing distortions

Without any proper access to financial markets[206], as the trade balance slowly turned into widening deficits, balance of payments pressures resumed and accumulated again. Steady real appreciation and an overvalued currency hampered external adjustment. Late april, the government negociated and activated a renminbi swap line with the People's Bank of China which alleviated temporarily the tensions. Yet, to hold together the inconsistent policy mix, the authorities deepened administrative controls (trade tariffs, forex and price controls). This further pressured the business environment, competitiveness and medium-term growth prospects.

Political status quo and policy orientation

Previous crisis had signalled a weakening of the institutional policy-making framework, which undermined globally trust in the government. The end of the year general elections prevented any important policy changes and imbalances kept accumulating. Over 2015, revelations of corruption and critics of Fernandez crisis management weakened her party's position greatly. Sergio Massa gave a voice to the anti-Kirchner wing of the Peronist movement opposing Daniel Scioli's promises to pursue ongoing policies. This fragilized the governing Peronist party. The majority of candidates avoided criticizing Fernandez's past position on the hold-out investors. Yet, many political debates discussed the limits of Fernandez economic policies as the reduction in poverty had stalled.

Triggers: key news, shocks and decisions:

Flash floods

In August 2015, the country experienced record rains that precipitated floods in the provinces north of Buenos Aires. The natural disaster further destabilized the economy, already struggling with difficult external conditions, by constraining agricultural export revenues. A state of emergency was declared but runner-up and city mayor Mauricio Macri criticized the governement's reaction to the natural disaster and the role of Daniel Scioli – Fernandez's party candidate – as Buenos Aires governor. If flash floods proved destabilizing for the ongoing political debates, they more importantly marked the beginning of an

[206] A trauma inherited from the 2014 "Vulture funds" related default.

economic decceleration. This further constrained the costs of political inaction and accumulated domestic and foreign imbalances.

2015 general elections: from status quo to drastic policy change

In the October 25, 2015 elections, Scioli and Macri ran toe to toe (37.1 vs 34.2%) with Massa lagging behind. The ensuing month, Macri won the ballotage vote. He claimed to end the preceding era of macroeconomic 'mismanagement' with a strong political commitment to reforms. Even without a clear political majority – Peronist candidates had obtained two thirds of the votes in the October elections – Macri's win marked a shift towards pro-business policies and away from interventionist policies.

Unfolding and crisis management:
Policy U-turn and the December 2015 devaluation

Macri's economic program aimed at (i) reducing strains on the exchange rate regime ; (ii) kickstarting private investment ; (iii) increasing fiscal discipline and (iv) restoring central bank credibility. Table 34 presents the main policies Macri's government implemented over the begining of its mandate. Interestingly, they echoe item per item the concerns alluded to by the previous IMF staff report[207]. The 2016 article IV consultation commented on said reforms as being "indispensable" and the sole way to avoid usual 'inflationist spirals', 'run on local assets' and 'balance of payments crisis'. As a cornerstone to exit present economic and financial gridlock, on December 17th 2015, the government unified exchange rates, devalued the currency by 40% and let it float (currency crisis).

Table 34: 1st measures of Macri's economic program

Exchange rate	40% depreciation in Dec.2015 Removal of main FX controls Commitment to floating FX regime
Fiscal position	Fiscal consolidation plan Zero primary balance objective for 2019 Increase in utility tariffs, except for the poorest.
Monetary policy	Transition towards inflation targeting Reverse fiscal deficit monetization
Institutions	Provision of new data on inflation, GDP, etc
BoP	Eliminate export taxes on agricultural products Negociate a settlement with bond-holders Regain access to financial markets

Selected measures identified in the 2016 Article IV consultation staff report.

Recessionary effects of austerity measures

If deemed unavoidable by the Fund, the reforms had a negative effect on the economy. Alongside weaker demand from trading partners and bad weather conditions, these measures exacerbated the re-

[207]In 2016, for the first time since 2006, national authorities agreed to resume relations with the Fund. Previous staff reports were published publicly ex-post on February 26th, 2016.

cession that had started just before the elections. The depreciation and the rise in utility tariffs pushed inflation up. To control prices, the central bank quickly reduced money aggregates' growth, which impacted adversely the economy. With real wages and consumer confidence falling, consumption contracted in the first half of 2016. At the same time, public spending fell as the government tracked corruption and waste spending, further constraining the aggregate economy.

Rebound, confidence and recovery

In the second half of 2016, the government adapted policy course. They provided moderate fiscal stimulus through public infrastructure projects, transfers to the provinces, an increase in selected benefits and subsidies and a reduction in the tax-burden for small and medium enterprises. Soon, as confidence restocked, trivate consumption and investment gained momentum. With inflation expectations falling, the central bank lowered interest rates and contributed to stimulating the economy. Occasionally, the central bank managed to build-up reserves, notably as the government issued external sovereign debt.

Dangerous dynamics and concerns

If the trade balance and balance of payments developments ameliorated, the government's halt in deficit reduction increased the risks that future increases in financing costs might engender a negative debt dynamics.

Moreover, if employment managed to recover partially during 2016, most of the jobs created were low income and self-employed. These further constrained the social sphere as poverty rates remained high and heralded future political struggle.

T.4.3 C. Main sources

- IMF (Feb. 29, 2016) *"Argentina: Economic Developments"*. CR/16/69
- IMF (Oct. 19, 2016) *"Argentina: Staff Report for the 2016 Article IV Consultation"*. CR/16/346
- IMF (Dec. 1, 2017) *"Argentina: Staff Report for the 2017 Article IV Consultation"*. CR/17/409

T.5 Argentina - 2018:19

T.5.1 A. Crisis iD

Financial crises:

- 2018q2 – currency crisis
  The central bank responded to these pressures by raising interest rates by 300 bps on April 27, accompanied by substantial sales of international reserves amidst disorderly market conditions. This was insufficient to relieve pressures on the peso. On May 3, the central bank raised rates a further 300 bps. What was intended as a mechanism to stabilize markets, however, became a source of panic, and investors rushed to offload peso assets. On May 4, the government announced a package of measures to restore investor confidence.
- 2018q2 – sovereign crisis
  The Executive Board of the International Monetary Fund (IMF) today [June 20, 2018] approved a three-year Stand-By Arrangement (SBA) for Argentina amounting to US$50 billion (equivalent to

SDR 35.379 billion, or about 1,110 percent of Argentina's quota in the IMF). The Board's decision allows the authorities to make an immediate purchase of US$15 billion (equivalent to SDR 10,614 billion, or 333 percent of Argentina's quota).

Business cycles:

(*exp.*) 2016q4:2018q1: cumulated gains +5.4%
(*rec.*) 2018q2:2019q4 (end of sample): cumulated losses -7.3%

Origins of the crisis:

- Key shocks and events:
  - Natural disasters: worst drought in 50 years during the summer 2018.
  - Difficult external financing conditions: In 2018, USD strengthening and US monetary policy normalization. In the summer 2019, higher volatility on all emerging financial markets.
  - Various policy announcements often shocked the economy by increasing volatility and uncertainty as they often failed to convince market participants. Corruption scandals also shocked social cohesion.
- Vulnerabilities
  - Growing gross fiscal financing needs driven by rising interest payments as the government relied increasingly on foreing currency public debt. Combined with a depreciating exchange rate, this heralded risks of negative debt dynamics.
  - Widening current account deficit and higher debt amortization increased gross external financing needs.
  - Nominal frictions and the government's gradual fiscal adjustment policy prevented disinflation.
  - Overvalued currency (driven by the inflation inertia and strong capital inflows).
  - High political uncertainty associated to the 2019 presidential election cycle.

In a nutshell:
Despite these efforts, a gradual approach to fiscal consolidation, combined with a tightening of global financial conditions, a poor harvest, and the introduction of a tax on nonresident holdings of short-term central bank paper, generated significant anxiety among market participants. Starting in mid-April [2018], Argentina came under abrupt balance of payments pressures as both domestic and foreign investors decided to liquidate their position in onshore peso assets.

Faced with mixed political support and high poverty, Macri's government implemented fiscal adjustment gradually over 2017. This fueled macroeconomic vulnerabilities, including rising gross fiscal and external financing needs. In particular, interest payments on foreign currency debt increased, exposing the country to a negative debt dynamics should the currency depreciate and the economy slow down.

Overall, if the government managed to boost confidence, the latter remained frail and markets often doubted policy announcements. The central bank commitment to disinflation and the exchange rate regime came to be particularly questioned.

Over 2018, following prospects of US monetary normalization, external financial conditions worsened for Argentina. The country was also exposed to natural disasters (hot and dry conditions followed by a drastic drought). This impacted the agricultural exporting sector a lot and meant a fall in foreign exchange revenues. Overall, these drove a peso depreciation and soon after a generalized run on short term peso liabilities which forced the central bank to increase interest rates hugely and the government to request external assistance at the IMF.

T.5.2 B. Narration

Context:

Recovery, mixed political support and gradual adjustment

Over 2017, the economy recovered driven by strong private investment and consumption as well as increasing job creation. By the end of the year, the government managed to win senatorial elections in large population areas. Yet, the coallition failed to secure a majority in both houses of Congress. With mixed political support, the government set about reforming the economy in a gradual way to maintain social consensus. This was especially true for fiscal adjustment reforms.

Rising financing needs, imbalances and vulnerabilities

Largely as a by-product of gradualism, several vulnerabilities failed to resorb. If the primary deficit remained broadly unchanged, interest spending increased rapidly, as monetary financing and financial repression were not possible any longer. To compensate, the government issued foreign currency debt obligations. As a result, the overall fiscal deficit and fiscal financing needs increased strongly. In parallel, with the abolition of most FX controls and a regain in imports, the current account deficit widened. If capital inflows allowed the central bank to rebuild part of its reserves, a high current account deficit combined with debt amortization increased markedly external financing needs. Over 2017, strong nominal wage growth, insufficient fiscal retrenchment and a continued normalization of utility tariffs resulted in inflation inertia and a slowdown of disinflation. Combined with strong capital inflows (used to finance the government budget), this led to an overvaluation of the peso.

Triggers: key news, shocks and decisions:

Policy change and the return of doubts and uncertainty

On December 28, 2017, the government revised inflation targets upwards, which was followed by the central bank decreasing interest rates over January 2018. Overall, these policy changes rose concerns on central bank independency and commitment to stable inflation. As agents started expecting higher future inflation and with a high inflation inertia, the country moved away from its disinflation path: inflation stalled at 25% over most of 2018.

Rising US interest rates, natural disaster and and external pressures

By the end of 2017, global financial conditions tightened as the US dollar strengthened and markets

expected (and priced) a faster pace of US monetary policy normalization. This dented investors' appetite for Argentina's international bonds.

Starting in November 2017, up until March 2018, the country faced hot and dry conditions which reduced drastically crop yields. Heavy rains later in 2018 – one of the worst droughts over recent decades – further precipitated agricultural production and hence commodity exports revenues.

Unfolding and crisis management:

Speculation and panics

With high interest rates, short term central bank paper became a crowded carry-trade among asset managers. Yet, as the peso depreciated, returns shrinked. Announced in December, the introduction in late April of a tax on nonresident holdings of short-term central bank paper further discouraged investors. By early April, domestic and foreign agents looked to exit their peso position. The run on short term peso liabilities accelerated. This pressurized national authorities, notable forcing the central bank to intervene importantly and sell reserves over the month. On April 25 alone, the central bank sold up to USD 1.5 billion.

Rabid intervention and currency crisis

As April ended, the portfolio rotation out of domestic currency short term liabilities turned into a generalized run on Argentine assets. The central bank tried to halt the dynamics by raising interest rates but failed at doing so. On May 4th, the government announced a new set of measures including another increase in interest rates bringing the total cumulated increase to 1275 bps in one week (currency crisis). The government also announced a decrease in the fiscal deficit target. Yet, this announcement failed to convince market participants as rising interest payments had not been taken into account when estimating fiscal needs.

External assistance and moderating pressures

On May 8th, president Macri announced having started discussing a financial arrangement with the Fund. If this didn't halt the depreciating trend of the peso, the information was welcomed by financial markets and pressures on the currency waned. On May 16th, the government was even able to roll over maturing short-term central bank papers, confirming the moderation of exchange rate pressures. On June 7th, the country was granted an exceptionnally large Stand-By Arrangement with the IMF (sovereign crisis), which helped a regain in confidence. The program was notably backed by several austerity measures. Over July, spreads fell and market indices started rising again.

Unanticipated developments and the erosion of confidence

In August, the country faced several perturbations. Emerging markets worldwide were confronted with increased volatility on financial markets, which reduced available external financing for Argentina. Several corruption scandals irrupted over the summer as well, further fragilizing social cohesion. Moreover, the government's communication on the new program was insufficient to gain the trust of market participants. As the central bank intervened on forex markets inconsistenly with newly established rules, this further fueled the erosion of confidence as risk premia and currency pressures rose once again.

Missed announcements, volatility spikes, and monetary tight-

ENING

At the end of August, president Macri announced having reached an agreement with the IMF to draw program resources in advance to fund government's fiscal needs for 2018-19. Yet, the uncertainty surrounding the announcement amplified exchange rate volatility and further augmented spreads. On September 3rd, the president announced a cabinet reshuffling and a new tightening of fiscal policy targets, with little effects on forex markets.

By the middle of the month, the central bank started implementing new measures to counter disordely market conditions and tightened the monetary stance.

Recession deepening and the taste of recovery

Contractionary monetary policy helped strenghten the peso, the stability of which helped reduce inflation. Nevertheless, driven by the negative weather shock and tight financial conditions, the recession had deepened greatly by September. Private consumption and investment contracted strongly, labor market conditions worsened and poverty rose. Alongside the peso depreciation, the recession helped reverse existing external imbalances as the trade deficit lowered. Yet, as 2018 ended, the economic environment seemed to ameliorate. In January and February 2019, capital started flowing back into the country. This was driven by positive global financial conditions, a stable currency and high interest rates. In turn this caused a fall in the benchmark rate and appreciation pressures.

The return of political uncertainty

Yet, over 2019q1, inflation and inflation expectations rose again. Combined with worsening financial conditions, flows into peso assets reversed in March. With elections ahead, political uncertainty started increasing as well, which intensified the dynamics. This lead to a sharp sell-off of Argentine assets in late April. Over May and June, financial markets calmed down as, notably, changes were made to increase the consistency of the monetary policy and FX intervention framework.

Confidence shock and macroeconomic instability

On August 12th, at the open primary elections, opposition candidate Alberto Fernandez dominated the results against Mauricio Macri. During the campaign, Fernandez had taken a strong stance against the IMF's program which increased concerns and uncertainty. As a result, capital flight accelerated and the exchange rate kept depreciating as balance of payments pressures accumulated. On August 17th, after a week of extreme volatility on forex market, the ministry of finance resigned. As market access became severely curtailed, in September the government announced several measures including the postponement of payments on short-term local notes, the reintroduction of capital flow measures and the intention to extend the maturity of existing debt. The measures were not enough to reverse the dire economic situation the country was in.

Political alternation, social challenges and debt sustainability

On October 27th, as expected, Alberto Fernandez got elected president. His economic program aimed mainly at alleviating the costs on the population of the recession and austerity measures. Yet the government faced an unsustainable debt situation and, in February 2020, legislation was adopted so that the executive has the power to negociate a debt restructuring.

T.5.3 C. Main sources

The latest publicly available country report detailing economic and financial developments is dated July 3rd 2019. A Staff technical note on public debt sustainability, published in March 2020, provides incomplete information on recent events. Hence the narration stops at the beginning of 2020. 0n August 4th, 2020, a debt restructuring agreement was reached which ensured the country would not, once again, be cut from world financial markets.

- IMF (Dec. 1, 2017) *"Argentina: Staff Report for the 2017 Article IV Consultation"*. CR/17/409
- IMF (Jun. 13, 2018) *"Argentina: Request for Stand-By Arrangement"*. CR/18/219
- IMF (Jul. 30, 2018) *"Argentina: Stand-By Arrangement - Review under the Emergency Financing Mechanism"*. CR/18/298
- IMF (Oct. 17, 2018) *"Argentina: First Review under the Stand-By Arrangement"*. CR/18/297
- IMF (Dec. 11, 2018) *"Argentina: Second Review under the Stand-By Arrangement"*. CR/18/374
- IMF (Mar. 26, 2019) *"Argentina: Third Review under the Stand-By Arrangement"*. CR/19/99
- IMF (Jul. 3, 2019) *"Argentina: Fourth Review under the Stand-By Arrangement"*. CR/19/232
- IMF (Dec. 12, 2019) *Transcript of IMF Press Briefing* https://www.imf.org/en/News/Articles/2019/12/12/tr12122 transcript-of-imf-press-briefing
- IMF (Mar. 19, 2020) *"Argentina: Technical Assistance Report – Staff Technical Note on Public Debt Sustainability"*. CR/20/83