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Abstract

This paper analyzes the behavior of a long list of economic variables during episodes of recovery from an economic collapse. A set of stylized facts is proposed so as to depict what in this work is called "growth recoveries". Through different estimation techniques, it is inferred under which conditions and policies the likelihood of experiencing a growth recovery increases. The results of the paper indicate that collapses tend to occur in countries with high dependence on natural resource rents, macroeconomic mismanagement, low levels of democratic accountability and rule of law and high levels of conflict. Recoveries, on the other hand, tend to be longer than collapses and are more likely to occur in contexts of: improved external conditions, less natural resource rents, balanced fiscal accounts, where the exchange rate corrects but within a more fixed exchange rate regime and a more restricted financial account, and where there are: rebounds in private consumption, increases in international trade and improvements on property rights.

Keywords: Economic Growth, Growth Recoveries, Growth Collapses, Institutions, Event Analysis.

JEL classification: F43, O43, 047, O50.

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1 Introduction and Motivation

Before the COVID-19 pandemic, the economic situation of Venezuela had become critical. Gross Domestic Product (GDP) contracted for sixth consecutive years, accumulating a drop greater than 60% in this period. According to OPEC, oil production contracted 70%, reaching a production around 700.000 barrels per day from 2.300.000 b/d in 2013. According to the country's Central Bank, until the first quarter of 2019, sectors such as construction (-93%), commerce (-79%) and manufacturing (-76%), led this fall. Similarly, although to a lesser extent, sectors associated with the State, such as electricity-water and government services, have contracted 30% and 16%, respectively.

A lack of external resources due to the fall in oil production and overindebtness has generated an abrupt fall in imports, with imports in 2018 being 15% of imports in 2012.[1] This significantly affected the provision of goods and services, as the dependence on imports substantially increased during the 2004-2014 oil price boom.[2] This situation, together with the closing of external financing sources (due to, at least three factors: (i) the increase in public debt; (ii) high financing needs; and (iii) economic sanctions,[3]) led to the loss of international reserves. Moreover, part of the diminished exports are destined to amortize external debt with bilateral creditors. In this external context, starting on 2019, the government relaxed the exchange rate regime, allowing the adjustment of the exchange rate and with it, the increase in private foreign currency transactions, although no substantial improvements on GDP have been observed until the first half of 2021.

As macroeconomic adjustments were postponed and international financing closed (the country started defaulting on its foreign creditors since 2016), the government monetized a large fiscal deficit, which peaked in 2017 and triggered the hyperinflationary process that affects the country since that year. As is common during hyperinflations, both, the purchasing power of tax revenues and the inflation tax, have lost its purchasing power, inevitably reducing government spending and thereby collapsing public services. Since 2019, the government tried to capture more seignorage by increasing bank reserve requirements at the Central Bank, at the cost of reducing bank credit and reaping no substantial benefits in terms of inflation and output.[4]

This serious picture of economic depression occurs in a context where, over the last 20 years, there has been an increased participation of the State in the economy, negatively impacting on the institutions and in turn on the incentives to invest and produce in the country. The government increased its influence in the economy through control policies on both, prices and the FX market, as well as with a long list of expropriations of companies

[1] According to the latest mirror figures (i. e. reported by business partners) from UN, Comtrade.

[2] Public imports grew from around 20% of GDP in 1997 to 50% in 2012.

[3] Between 2017 and 2019, following the social and political consequences of the economic crisis, some members of the international community, especially the United States, have implemented economic sanctions on the Venezuelan government and the state oil company, making access to external financing even more complicated.

[4] Over the last three years, the country has registered multiple national blackouts, the water and sanitation service has collapsed in different regions of the country and health and education services are increasingly under-provided.

and productive assets. It leveraged on oil income and public debt to mitigate the impact of these measures, in detriment of saving the oil windfall for hard times and/or investing it for future generations.

The social impact of these collapse has been unprecedented in Latin America. According to ENCOVI[5], by 2019-2020, the population in condition of poverty reached 96%, inequality soared to the highest in the region, and health, education, employment and basic infrastructure indicators show a sharp deterioration.[6] Moreover, by June 2021, at least 5.6 million people were confirmed to have migrated from Venezuela.[7]

Given these excruciating circumstances, a natural question to ask is when such a collapse is going to stop? However, this type of question is fraught with uncertainty. Perhaps a more diligent way to raise the question is to ask when and how to stop the collapse? Put another way, such question is also saying: when and how to start the recovery? Moreover, countries can start to recover from a collapse, but —as our research suggest— they might take too long to achieve the levels they had before the collapse started. Thus, a more thorough research agenda is one that seeks to understand when and how a complete economic recovery occurs, to then try to answer what can be done to get a country to recover, but also to understand why some countries struggle so much to get back to pre-collapse income levels. These are the central questions of this research project.

This way, we wanted to be exhaustive in observing the behavior of a long list of economic variables (62, to be exact) when an economy recovers from a collapse. With that, a set of stylized facts was developed to depict what in this work we call a "representative recovery episode". Then, using linear probability models, we tried to infer under which conditions and policies the likelihood of experiencing such an episode increases.

The results of this study indicate that growth collapses and subsequent recoveries seem to be a phenomenon that have occurred mostly in African and former Soviet Union countries and that around 2/3 of the countries that experienced such an episode depend in a non-despicable way on natural resource rents. We also found that recoveries tend to take longer than collapses, which implies that *what it's easily lost, it's arduous to recover*, even with countries experiencing higher growth rates during the recovery than during the collapse.

In terms of macroeconomic policy, for the representative country that recovers from a collapse, we find that there is an improvement of the fiscal position of the government (i. e. balanced fiscal account and lower debt levels), something that implies that the government uses less resources from the rest of the economy (i. e. less crowding out), which also suggests, through the role of expectations, that the private sector is able to invest, produce and consume more during this phase. See, for instance, Giavazzi & Pagano (1990), Bertola & Drazen (1993), Alesina & Perotti (1997) and Perotti (1999).

[5]Is the spanish acronym for Life Conditions Survey, a national survey that has been carried out since 2014 (when the National Statistics Institute stopped publishing data in a timely and reliable way) by the 3 largest universities in the country.

[6]See https://www.proyectoencovi.com/ for details.

[7]https://data2.unhcr.org/en/situations/platform.

Growth recoveries are episodes in which home currencies depreciate in real terms at the beginning (perhaps so as to correct some overvaluation) to then start to appreciate, in line with previous evidence on economic stabilization and recovery [see Calvo & Végh (1993, 1994) for two studies on the role of the exchange rate in a process of stabilization and recovery]. Moreover, during a representative recovery episode, the exchange rate regime is more flexible than in normal years, although less flexible than during the collapse years. This result suggests that capacity and credibility losses in the management of exchange rate policy during the collapse years translate into a necessity to (i) anchor domestic consumers' expectations and (ii) provide some predictability to foreign (and domestic) investors by the means of a less volatile exchange rate.

Regarding external factors, it appears that during growth recoveries there's a combination of good policy and good luck. Lower foreign interest rates during a representative recovery episode could be an important factor not only because it reduces borrowing costs but because lower interest rates in safer markets increases risk appetite from investors, and this seem to induce FDI flows during recoveries. Also, recoveries have occurred in periods of higher capital market volatility [for an account on the impact of capital market volatility on growth and other macro variables, see Calvo *et al.* (2004)] and when there is a slight improvement in the terms of trade [see Kose (2002) and Mendoza (1995) for the impact of terms of trade changes on economic growth]. There is also an improvement on FDI inflows and remittances, even when comparing to regular growth years [for the linkages of these two variables on economic growth, see Alfaro & Johnson (1997) and De Haas (2005)].

All aggregate demand components increase during recoveries, in particular private investment, as it increases its share over GDP. Exports and imports also grow importantly, with imports recovering more, perhaps as investment increases. The financial sector recovery is subdued, which suggests that the economic recovery of is "credit-less", see Calvo *et al.* (2006) for this possibility.

In the case of microeconomic indicators, as measured by an economic freedom index and its components, it is observed that, when comparing to the collapse phase, the median value of the aggregate index is higher during recoveries. To see how changes in economic freedoms have an impact on the performance of the economy, see De Haam & Sturm (2000) and Bengoa & Sanchez-Robles (2003). On the institutional and political fronts, growth recoveries are associated with a reduction on external and internal conflicts. Also, in countries that successfully recovered, indicators associated to the rule of law improved. For accounts on the role of the rule of law and other institutional factors on growth, see the works of Acemoglu *et al.* (2005), Barro (1996), Barro (2000) and Haggard & Tiede (2011).

From all the variables examined, linear probability models suggest that recoveries are more likely to occur in contexts of balanced fiscal accounts, lower natural resource rents, favorable external conditions, higher private consumption and international trade, and where property rights —measured through improvements in law and order as well as in countries' investment profile indices— allow agents to produce and exchange with more confidence.

The document is organized in five sections including this introduction. Section II presents the identification of the episodes and the dynamics of the selected variables five years before

and after the recovery. Section III explores the statistical significance in the median difference of the selected variables during the recovery episodes against other periods. Section IV shows how these variables correlate with the probability of experiencing an economic recovery. Section V presents our concluding remarks.

2 Stylized facts of growth recoveries

2.1 Episode identification: What is a recovery?

A growth recovery is defined as the period during which an economy recovers the level of income lost during a contraction equal or greater than 20% (measured as real GDP), allowing for two-year "gaps". To account for business-cycle-related fluctuations[8], our criteria allows for up to 2-year positive (negative) growth deviations or, as we call them, "gaps", during the collapse (recovery) phase. We gathered real GDP data for 171 countries over the 1960-2017 period from the World Bank, World Development Indicators database [9].

In contrast with other event studies that analyze turning points in macroeconomic variables —such as Pritchett (2000) and Hausmann *et al.* (2005) on growth, Montiel (2000) on consumption, Rodrik (2000) on saving, Freund & Pierola (2012) on exports and Libman *et al.* (2019) on investment — this study focuses on growth episodes that follow a growth collapse. To the best of our knowledge, there is only one study that does a similar exercise, Barrios & Santos (2017), although Ben-David & Papell (1997) do something similar as well. In their study, based on several sub-sets of growth experiences, Barrios & Santos try to estimate the probability of recovery of Venezuela (until 2016) under a different set of assumptions and constraints. In their most similar exercise to ours, the authors identify growth disasters according to a criteria similar to the one used by Barro (2006) (a fall in per capita production of at least 5% in compounded annual growth rate, CAGR, for a minimum period of three years), to then try to precise the frequency these countries managed to regain their pre-disaster level in the following decade.

Our study goes one step further, rather than restricting the duration of the recovery and considering only the behavior of one variable, to understand what underlies a representative recovery episode —no matter how long it took to get to its pre-collapse levels— we observe the behavior of a series of economic and institutional variables to (i) see if they are statistically different, not only in recoveries vs. collapses but also in recoveries vs. other growth years, and then try to (ii) estimate which of these variables —if any— correlate positively (or negatively) with the probability of experiencing a recovery. This way, we complement the existing literature on the matter with an attempt to depict what happens during a growth recovery and which variables could precipitate it.

[8]Periods in which GDP recovers sporadically and without a significant change on its trend.

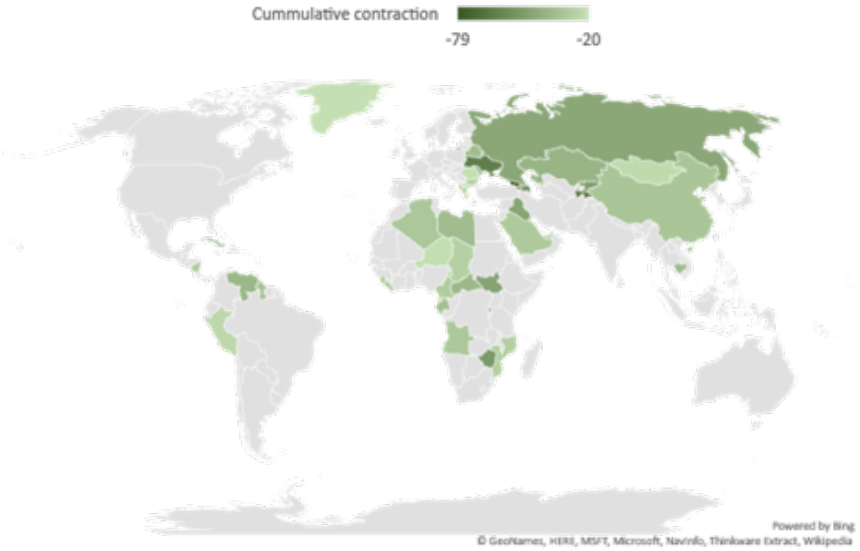
[9]We tried the exercise with Real GDP per capita, and results were pretty similar. We preferred Real GDP since this variable had more observations.

2.2 Sample characteristics

Following our proposed method and from this dataset and time period, we found 57 episodes in 54 countries (56 considering San Marino and Greenland). Of these, 6 (Equatorial Guinea, Greece, Libya, South Sudan, Yemen and Venezuela) are still in the contraction phase and another 3 (Central African Republic, Georgia, and San Marino), that although having started to recover, have not reached their pre-collapse levels by 2017 (the end of the sample period). Thus, there are 48 complete episodes. Interestingly, Iraq is the only country that, from this dataset and under this methodology, registers 2 growth collapses with their corresponding 2 growth recoveries.

Geographically, of 56 countries, 15 are located in Sub-Saharan Africa, 10 in the Commonwealth of Independent States, 10 in the Middle East and North Africa, 9 in Latin America and The Caribbean, 7 in Europe (including Greenland and San Marino), and 6 in Asia.

Figure 1: Growth recoveries: Geographical distribution of episodes

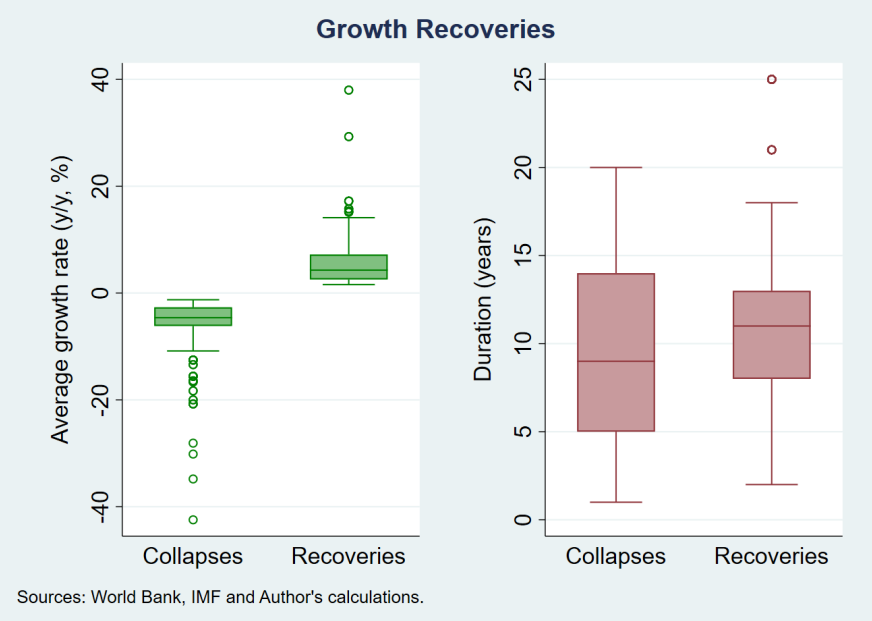


The (sample) median cumulative contraction rate is -33.1% (average is -36%). The largest registered contraction takes place in Georgia (-78.6%), followed by Tajikistan (-70.6%), and Iraq (-64%); of these three, only Georgia has not fully recovered. At the upper limit, it is observed that the Marshall Islands (-20.4%), followed down by Greenland and Romania (-20.5% and -20.6%, respectively) lead the smallest contraction episodes; at the end-year of the sample, all of these countries fully recovered their GDP to their pre-collapse levels.

These cumulative growth rates imply a median CAGR of -5% (average -5.6%) during the contraction and of 6.5% (7.6% average) during the recovery. The country with the largest CAGR during the contraction being Iraq (-64%), followed by Lebanon (-42.5%) and Central African Republic (-36.7%); these three collapses happened suddenly in a period of just one year. On longer periods, the largest compounded rates occurred in Georgia (-15.8%), Tajikistan (-14.2%), and Azerbaijan (-16%), with periods of 9, 8, and 5 years, respectively.

The smallest CAGRs were found in Guyana (-2.8%), Trinidad and Tobago (-2.9%), and Nicaragua (-3%), and Guyana (-2.8%) in considerably long collapse episodes that lasted more than 10 years; Greece, on its incomplete collapse episode has shown a rate of 2.9%. The country with the largest CAGR on the recovery was Lebanon (37.5%), followed by the second and first episodes of Iraq (26.9% and 16.3%, respectively), while the countries with the shortest recovery rates were: San Marino (1.4%, Brunei Darussalam (1.6%) and Niger (2.2%).

Figure 2: Growth recoveries: Distribution of duration and average growth rate during episodes



The median duration of the contraction is 5 years (average is 5.7 years). The largest duration of a collapse comes from Kuwait (16 years; -38.3% contraction), followed by Guyana (14 years; 32.3% contraction), the Democratic Republic of the Congo and Kuwait (both with 13 years and 49.2% and 35.9% contraction, respectively). The shortest are Iraq, Lebanon, Central African Republic, Cambodia, Liberia and Guinea-Bissau (1 year), followed by the second episode of Iraq, Gabon, China, Algeria, Brunei Darussalam and Romania, (2 years) and Armenia, Albania, and Chad (3 years).

The median duration of the recovery is 8.5 years (average is 8.8 years). The shortest recovery takes place in Lebanon, the second episode of Iraq, and the United Arab Emirates (2 years), followed by China and Sierra Leone (3 years), and Bahamas and Peru (4 years). The largest duration of a recovery is 25 years, in Gabon, followed by Brunei Darussalam (21 years) and Tajikistan (18 years). also notable the duration of the recoveries in Georgia (23 years) and Ukraine (18 years) that by the final year of the sample (2017) had not fully recovered.

Of the 57 episodes registered through this methodology, 31 of them had either ongoing wars or a low score on the external or internal conflict indexes (i. e. a score less or equal

than 50%)[10], and 37 out of the 56 countries had average rents from natural resources equal or greater than 5% of their GDP during the episode.[11] As we will see in the rest of the study, these two features, high dependence on natural resource rents and high conflict are key to understand not only growth collapses but also growth recoveries. Table 1 below shows a summary of these findings.

[10]The countries are: Algeria, Angola, Armenia, Azerbaijan, Belarus, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, El Salvador, Guinea-Bissau, Guyana, Iran, Iraq (on both episodes), Kazakhstan, Kuwait, Lebanon, Liberia, Mozambique, Nicaragua, Niger, Peru, Rwanda, Saudi Arabia, Sierra Leone, South Sudan, Tajikistan, Ukraine and the United Arab Emirates.

[11]The countries are: Algeria, Angola, Azerbaijan, Brunei Darussalam, Cambodia, Cameroon, Central African Republic, Chad, China, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Guinea-Bissau, Guyana, Iran, Iraq, Jamaica, Kazakhstan, Kuwait, Liberia, Libya, Moldova, Mongolia, Mozambique, Niger, Peru, Russia, Rwanda, Saudi Arabia, Sierra Leone, Solomon Islands, South Sudan, Trinidad and Tobago, the United Arab Emirates, Venezuela, Yemen and Zimbabwe.

Table 1: Summary of episodes

	Collapse					Recovery			
Country	Total Fall (%)	Start	End	Duration (years)	CAGR Fall (%)	Start	End	Duration (years)	CAGR Rise (%)
Georgia	78.6	1986	1994	9	15.8	1995	-	-	5.5
Tajikistan	70.6	1989	1996	8	14.2	1997	2014	18	7.2
Iraq	64.0	1991	1991	1	64.0	1992	1998	7	8.3
Ukraine	61.6	1990	1999	10	9.1	2000	-	-	2.3
Azerbaijan	58.1	1991	1995	5	16.0	1996	2005	10	10.2
Rwanda	54.3	1993	1994	2	32.4	1995	2000	6	12.7
Armenia	53.1	1991	1993	3	22.3	1994	2004	11	7.7
Zimbabwe	49.8	1999	2008	10	6.7	2009	2017	9	8.0
Kyrgyz Republic	49.3	1991	1995	5	12.7	1996	2009	14	5.0
Dem. Rep. of the Congo	49.2	1989	2001	13	5.1	2002	2013	12	6.0
South Sudan	45.5	2012	-	-	11.4	-	-	-	-
Russia	44.2	1990	1998	9	6.3	1999	2007	9	7.1
Iran	44.2	1977	1988	12	4.7	1989	2003	15	4.5
Lebanon	42.5	1989	1989	1	42.5	1990	1991	2	37.5
Moldova	41.9	1993	1999	7	7.5	2000	2011	12	5.4
Albania	40.9	1990	1992	3	16.1	1993	1999	7	7.0
Kazakhstan	38.4	1991	1998	8	5.9	1999	2004	6	9.1
Nicaragua	38.3	1978	1993	16	3.0	1994	2005	12	4.2
Iraq (2nd episode)	37.7	2002	2003	2	21.1	2004	2005	2	26.9
Libya	37.6	2009	-	-	6.5	-	-	-	-
Venezuela[1]	36.9	2014	-	-	10.9	-	-	-	-
Central African Republic	36.7	2013	2013	1	36.7	2014	-	-	3.7
Yemen	36.7	2011	-	-	6.3	-	-	-	-
Kuwait	35.9	1980	1992	13	3.4	1993	1997	5	9.5
Cambodia	34.8	1994	1994	1	34.8	1995	2000	6	7.9
Cuba	34.8	1990	1993	4	10.1	1994	2005	12	4.2
Belarus	34.7	1991	1995	5	8.2	1996	2003	8	6.0
Gabon	33.6	1977	1978	2	18.5	1979	2003	25	2.4
San Marino	33.1	2009	2014	6	6.5	2015	-	-	1.4
Guyana	32.3	1977	1990	14	2.8	1991	1996	6	7.2
China	31.3	1961	1962	2	17.1	1963	1965	3	15.1
Algeria	30.6	1961	1962	2	16.7	1963	1967	5	14.7
Angola	30.2	1990	1993	4	8.6	1994	1998	5	8.2
Liberia	30.1	2003	2003	1	30.1	2004	2009	6	6.3
Saudi Arabia	29.6	1982	1989	4	13.0	1990	1998	9	6.7
Bahamas	29.4	1970	1975	6	5.6	1976	1979	4	13.4
Sierra Leone	29.3	1992	2001	10	3.4	2002	2004	3	13.8
El Salvador	29.1	1979	1982	4	8.2	1983	1995	13	2.9
Cameroon	28.6	1987	1993	7	4.7	1994	2002	9	4.0

Table 1: Continued...

	Collapse					Recovery			
Country	Total Fall (%)	Start	End	Duration (years)	CAGR Fall (%)	Start	End	Duration (years)	CAGR Rise (%)
Guinea-Bissau	28.1	1998	1998	1	28.1	1999	2011	13	3.1
Trinidad & Tobago	28.0	1983	1993	11	2.9	1994	1998	5	6.5
Mozambique	27.6	1982	1986	5	6.3	1987	1993	7	7.0
Chad	26.5	1978	1980	3	9.8	1981	1985	5	8.9
Bulgaria	26.5	1989	1993	5	6.0	1994	2005	12	2.9
Brunei Darussalam	25.4	1980	1981	2	13.6	1982	2002	21	1.6
Greece	25.4	2008	-	-	2.9	-	-	-	-
Equatorial Guinea	23.9	2013	-	-	6.6	-	-	-	-
United Arab Emirates	23.7	1982	1988	7	3.8	1989	1990	2	15.3
Solomon Islands	23.7	1999	2002	4	6.5	2003	2007	5	6.2
Jamaica	23.5	1973	1980	8	3.3	1981	1991	11	2.9
Peru	23.3	1988	1992	5	5.2	1993	1996	4	6.9
Mongolia	22.3	1990	1993	4	6.1	1994	2002	9	3.3
Macedonia	21.2	1991	1995	5	4.7	1996	2005	10	2.5
Niger	20.8	1980	1984	5	4.6	1985	1995	11	2.2
Romania	20.6	1991	1992	2	10.9	1993	2003	11	6.9
Greenland	20.5	1990	1993	4	5.6	1994	2000	7	4.1
Marshall Islands	20.4	1996	1999	4	5.6	2000	2010	11	2.3
Average	36.0	1990	1992	5.7	12.3	1993	2001	8.8	7.6
Median	33.1	1990	1993	5	7.5	1994	2002	8.5	6.5
Min	20.4	1961	1962	1	2.8	1963	1965	2.0	1.4
Max	78.6	2014	2017	16	64.0	2015	2017	25.0	37.5

1: In April 2021 WEO, the IMF estimates a GDP collapse of 74.4% for Venezuela from 2013 to 2020.

2.3 Sample dynamics

In this subsection, to observe the economic dynamic of these episodes in a "representative country", the distribution of a series of variables (62 to be exact) related to (i) macroeconomic policies; (ii) external factors; (iii) aggregate demand components and the financial sector; and (iv) micro-economic policies and institutional factors is analyzed five years before and five years after the economic recovery. We consider the median value of each variable as a proxy of the "representative country" but also consider the 10th and 90th percentile to consider more "extreme" cases. Appendix D contains a short description of the variables, as well as their sources. We discuss the results of this exercise in what follows.

2.3.1 Macroeconomic Policy variables

The first group of variables analyzed are those related to the main instruments that countries' macroeconomic policymakers have at hand to propitiate an economic recovery: fiscal policy (measured trough the fiscal balance, tax revenues and debt levels), monetary policy (evaluated through the increase on money growth and the inflation rate) and exchange rate policy (by seeing the behavior of the nominal exchange rate and indices on the type of ex-

change rate regime and financial account openness). Figure 3 at the end of this subsection shows a panel with these variables.

Regarding fiscal variables, for the median country, the value of the fiscal balance improves the year before the recovery, then slightly deteriorates the year the recovery starts, to then consistently improve towards a balanced position by the fifth year. At the same time, the 10th and 90th percentiles shrink towards each other, suggesting a move towards deficit reduction and fiscal consolidation from one phase to the other. Tax revenues of the median country show a similar behavior, with a total increase from around 10% to 15% of GDP during the last three years of the collapse, then declining the year before to then start increasing again the first year after the recovery and reaching 15% of GDP in year five. As with the fiscal balance, the 10th and 90th percentiles start converging in the phase of the recovery. On the government's debt side, the median country shows a debt reduction from more than 100% of GDP to roughly 50% before the recovery starts and then decreases slightly during the recovery. The 90th percentile presents a more dramatic, yet volatile, overall drop this whole period, getting closer to the median by the fifth year of the recovery. The 10th percentile sees a reduction from 50% of GDP to around 20%. The overall fiscal picture is one of increasing revenues, lower debt and balanced fiscal accounts.

Inflation in the representative country showed an increasing trend towards the end of the collapse, peaking at over 20% in the last year to then decrease at the start of the recovery. The percentage change of base money was between 10% and 20% yearly on the last years of the collapse followed by an increase during the first years of the recovery (between 20% and 30% yearly from year 1 to year 5). At the 90th percentile, both variables were much higher, with inflation ranging from under 500% to over a 1,000% (base money from under 200% to over 800%) before the end of the collapse, with both variables converging towards the median from start to end of the recovery. At the 10th percentile, inflation rates hoovered around zero with some years showing deflation, while money base rates behaved similarly but with larger variations. Thus, the monetary dynamic during the recovery seems to be one of inflation stabilization and a stable demand-driven money growth.

The median country's exchange rate regime index (based on Itzenski *et al.* (2017) index) moved towards free floating from a de facto crawling band of less than +/-1% during the last 5 years of the collapse, to then move back to crawling band territory after the recovery started. The regime was unchanged at both the 10th and 90th percentile during the whole period, showing the presence of extreme regimes: hard pegs and free floats[12]. This is in line with behavior of the nominal exchange rate, which fluctuated from zero to 15% depreciation every year for the median country. At the 10th percentile the variable was mostly negative, showing nominal appreciations as well. The 90th percentile shows high depreciation rates during the collapse and then converges towards the median by the fifth year of the recovery. On financial account openness, we used the Chinn & Ito (2006) index, which says that the median country maintained an index of zero (which means not too tight not too loose) up

[12]See statistical Appendix D for a detailed explanation of the index. To see in depth, review Itzenski *et al.* (2017).

until year 1 of the recovery, to then move towards greater restrictions[13]. These indices will be explained further in the document.

Overall, the exchange rate picture is one that goes from stability to free fall (with not so many restrictions in the financial account) during the collapse, to one that goes back to stability (under a more restricted financial account) during the recovery.

[13]See statistical Appendix D for a detailed explanation of the index. To see in depth, review Chinn & Ito (2006).

Figure 3: Growth recoveries: Macroeconomic policy variables – Sample Dynamics

2.3.2 External factors

External factors matter. Especially when we want to try to answer the famous question: bad policy or bad luck? [Easterly *et al.* (1993)]. On several occasions, external factors have been attributed part of the responsibility for the advent of recessions (the bad luck

hypothesis) while most of the other occasions they are attributed to domestic factors such as agents' behavior, particularly the government (the bad policy hypothesis). But what about growth recoveries?

External factors can manifest themselves in several ways, among which we can find: (i) terms of trade shocks, which are particularly relevant for developing economies since they are vulnerable to the international price of their exports; see Kose (2002) and Mendoza (1995); (ii) volatility in the international capital markets (such as stock market crashes or bank runs) and barriers to external financing (such as higher foreign interest rates) can translate into domestic macroeconomic volatility, reduce access to financing, limit capital inflows, etc., all of which have an impact on investment and growth; see Calvo *et al.* (2004); (iv) restrictions to foreign trade (imposition of tariffs, controls on current account transactions, etc., can affect economic growth through several channels, some of them being price distortions and lack of access to foreign knowledge; see, for instance, Rodriguez & Rodrik (2000) and Madsen (2009)).

To understand the role of the terms of trade during growth recoveries, a country export price relative to the United States of America (U. S.) index has been used as a proxy variable for changes in the terms of trade. Regarding the role of market volatility, the U. S. federal funds rate (corrected using the U. S. GDP deflator) and the standard deviation of the VIX index[14] were used. For variables that affect international trade and finance, a real effective exchange rate was considered along with tariffs applied to tradable products. Finally, to observe the outcomes of these sources of external disturbance, the current and financial accounts, and some of their components, such as remittances and external debt payments were observed.

Figure 4 shows the behavior of external factors for the median country and the 10th and 90th percentiles. The real interest rate in the U. S. shows a drop of more than 2 pp in the years leading to the recovery and stays around the same level after the start, these lower interest rates in developed markets could have attracted capital flows into the median recovering country. This is accompanied by an increase in the volatility of the U. S. stock market during the recovery years, as captured by the VIX index, attracting foreign investment the same way as lower foreign interest rates —this hypothesis will be tested further in document. For the median country, export prices relative to those in the U. S. increase two years before the recovery, then remain stable until the third year. Import prices relative to those in the U. S. show stability during the last five years of the collapse and then start to pick up during the first three years of the recovery. Altogether, the overall picture seems to be one of favorable external conditions during recoveries.

The current and financial accounts of the median country behaved similarly, showing an increasing deficit from the last years of the collapse to the first years of the recovery (from close to zero to around 5% of the GDP). For both accounts, it seems that the tails of the distribution don't follow a clear pattern during the period, a reason to check its components.

Regarding the current account, the trade component will be discussed in the next section, but two components of the primary and secondary income accounts will be discussed next.

[14]The Chicago Board Options Exchange's CBOE Volatility Index.

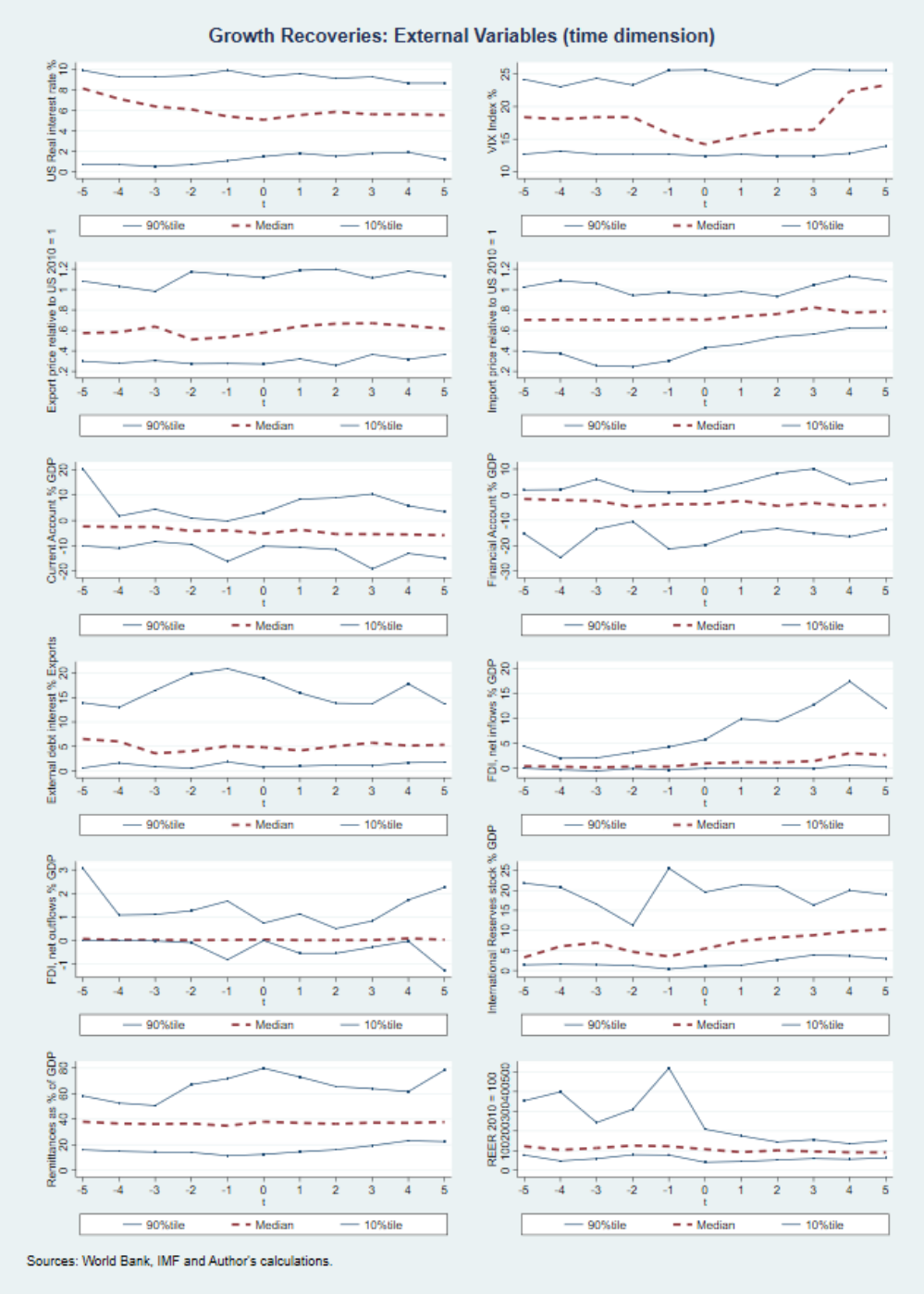
The first is foreign debt interest payments (as share of exports) which for the median country increase *slightly* before the recovery and then decrease during first two years to then increase and stabilize around 5% of GDP, while for the 90th percentile increase *sharply* the 3 years before the recovery to then go back to pre-recovery levels again. Overall, external debt interest payments seem to be important for some countries but at the median they seem manageable. The second variable is remittances —a variable that tends to represent an important share of GDP in economies in crisis— was roughly 40% of GDP for the median country throughout the end of the collapse and the beginning of the recovery. At the 10th percentile, the number was 20% with a trend similar to the median, while the 90th percentile increased from around 50% of GDP two years before the recovery, reaching 80% the year the recovery starts to then steadily go back to around 50% again in the fourth year of recovery. These patterns show (i) remittances are of great magnitude for episode countries and (ii) they tend to increase during recoveries.

Checking one key component of the financial account, foreign direct investment (FDI, from now on), we observe that FDI net inflows (i. e. non-resident flows) of the median country steadily increase during the analyzed period, reaching around 4% of GDP by the fourth year of the recovery (from close to zero five years before the recovery). Median net FDI outflows (i. e. resident flows) were zero or very close to zero over the period. Net inflows at the 10th percentile showed a very similar trend to the median country, while the 90th percentile sharply increased, going from less than 5% of GDP to more than 15%. Net outflows tails show a volatile pattern during the whole period. Overall, it seems that countries received important inflows of FDI during the recovery. Although unreported, portfolio investment flows for the median country remained mostly flat around zero for the whole period.

For the median country, after falling in years three and two before the recovery, the stock of international reserves (as share of GDP) start a steady recovery that lasts for the following 7 years, reaching 10% of the GDP at the end of the period. A similar patter can be seen at the 10th percentile in contrast to a more volatile behavior at the 90th percentile. All in all, countries seem to accumulate reserves during the recovery years.

Finally, in line with the inflation pattern, for the median country the real exchange rate seems to appreciate the years before the recovery then slightly depreciates the years before, during and after the recovery to then remain mostly flat. The tails converge towards the median in the years of the recovery, suggesting real exchange correction for the whole sample during the recovery years.

Figure 4: Growth recoveries: External Factors – Sample Dynamics



2.3.3 Aggregate demand components and the financial sector

Aggregate demand and financial sector variables for the median country, 10th and 90th percentiles, are shown on figure 5. Starting with real consumption variables, the median country shows contractions on the rate of change of total real consumption until year two

before the recovery to then show a constant positive change every year after, a pattern that is shared by its public and private components. The tails of the three variables also show a similar trend: steady above and below zero during the collapse and then with an upward trend during the recovery. Real gross fixed capital formation (GFKF) variables showed a similar trend to the one showed by real consumption.

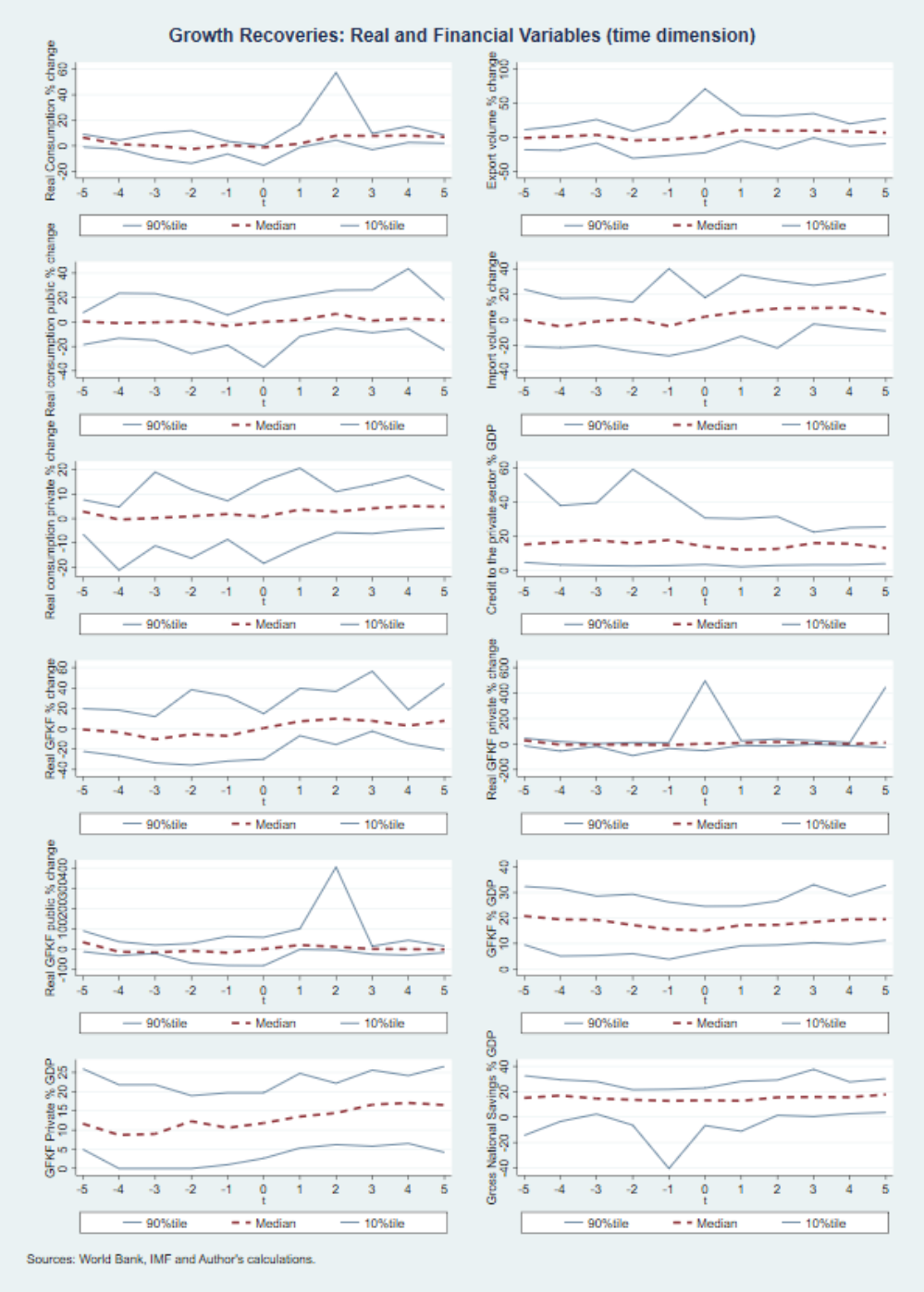
As a percentage of the GDP, GFKF was around 20% overall for the median country, showing an increase on its private investment component since the start of the recovery that took it from 10% before the end of the collapse to more than 15% at the fifth year. At the 90th percentile, the overall level was around 30% and at the 10th percentile it was around 10%. Both percentiles show the same pattern of the median.

Regarding external trade components, for the median country, export volume growth turns to negative rates two years before the recovery to then turn to positive from the first to the fifth of the recovery. As with consumption, the tails of the variables show a similar trend: steady above and below zero during the collapse and then with an upward trend during the recovery.

Finally, gross national savings for the median country remained almost unchanged during the time shown at roughly 20% of the GDP. The 90th percentile levels were slightly higher during the last years of the collapse before starting an increase during the recovery, while the 10th percentile saw a large drop a year before the end of the collapse but went back to pre-recovery levels after that.

Regarding the financial sector we observe that, for the median country, credit to the private sector (as share of GDP) decreases slightly during the first years of recovery to then go back to pre-recovery levels (20% of GDP). Interestingly, the 90th percentile shrinks toward the median. These dynamic suggests that the financial sector shrinks for some countries.

Figure 5: Growth recoveries: Real and financial sector – Sample Dynamics



2.3.4 Microeconomic policies and institutional variables

There are other economic policies, such as development policies (via changes or reforms that affect the structure and functioning of the economy) as well as institutional and social factors that determine the conditions under which economic activities take place.

Two sets of variables have been included: (i) Heritage Foundation's Economic Freedom Index,[15] understanding that changes in economic freedoms have an impact on the performance of the economy [see, De Haam & Sturm (2000) and Bengoa & Sanchez-Robles (2003)] and (ii) country risk indicators from the International Country Risk Guide (ICRG),[16] which measures socioeconomic, institutional, and political conditions, understanding that growth recoveries can affect (and be affected by) the behavior of these variables. For accounts on this topic, see the works of Acemoglu *et al.* (2005), Barro (1996), Barro (2000) and Haggard & Tiede (2011).

The following two figures show the variables used to capture the institutional and micro aspects of the episodes. Figure 6 collects the variables from the Heritage Foundation's Economic Freedom Index (all with a maximum score of 100), and it shows how, for the median country, indices regarding macroeconomic variables such as fiscal freedom, government spending, monetary freedom, all show a tendency to improve during the recovery years. This goes in line with the description of the macroeconomic policy variables section.

Indices regarding microeconomic variables, on the other hand, show mixed dynamics. First, indices regarding business, investment and financial freedoms do not show any substantial changes during the recovery years. If any, we observe that at the tails, financial freedom improves the year before the collapse but then it comes back to pre-recovery levels, while the 10th percentile of the investment freedom index converges towards the median, suggesting an improvement of investment freedoms for a typical sample country.

The property rights index for the median country deteriorates before the start of the recovery but immediately recovers its trend when the recovery starts. The tails keep a +/- 20 point difference from the median. Trade freedom index (which covers the presence of trade barriers) recovers one year before the recovery and continues this trend until the end of the analyzed period with tails converging toward the median. Taken together, these results could suggest improvements on the incentives to produce and exchange during the recovery years.

Finally, the labor freedom index deteriorates substantially after the start of the recovery with tails converging toward a lower median at the end of the period. The labor freedom index encompasses seven different sub-factors (see Appendix D) which, taken as whole, suggest a tighter labor market during the recovery years.

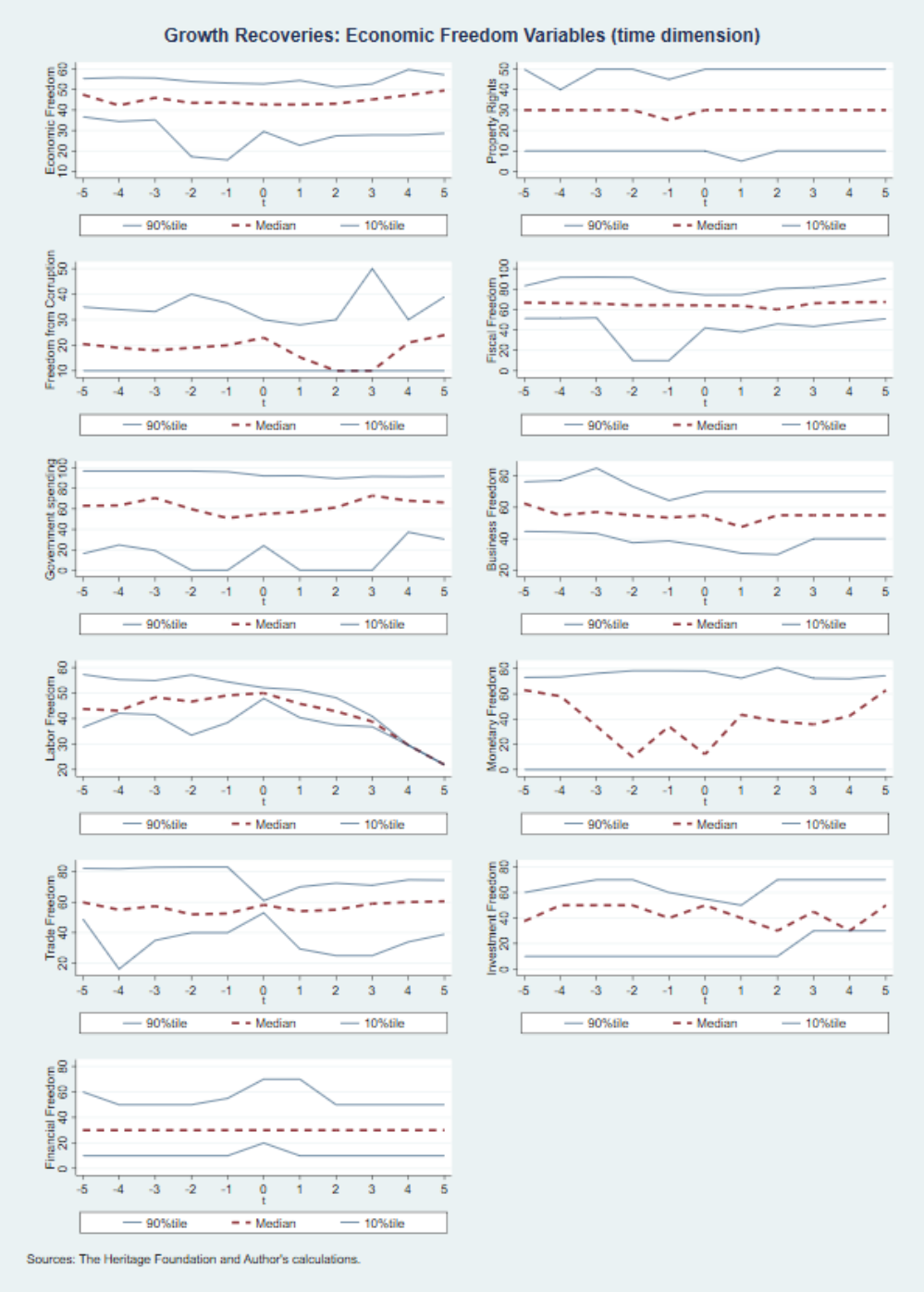
The freedom from corruption index for the median country shows improvements three years before the recovery to then collapse towards very low levels during the first years before finally improving after the third year of the recovery.

All in all, excluding the indices related to macro variables, the picture seems to be one of better investment and international trade freedoms, a drop on labor freedom, no changes in the indices of business freedom, financial freedom, and property rights, and volatility in the freedom from corruption index.

[15] For the detail of the calculation methodology of these indices, visit: https://www.heritage.org/index/pdf/2018/book/methodology.pdf

[16] For the detail of the calculation methodology of these indices, visit: https://www.prsgroup.com/wp-content/uploads/2012/11/icrgmethodology.pdf

Figure 6: Growth recoveries: Economic freedom components – Sample Dynamics

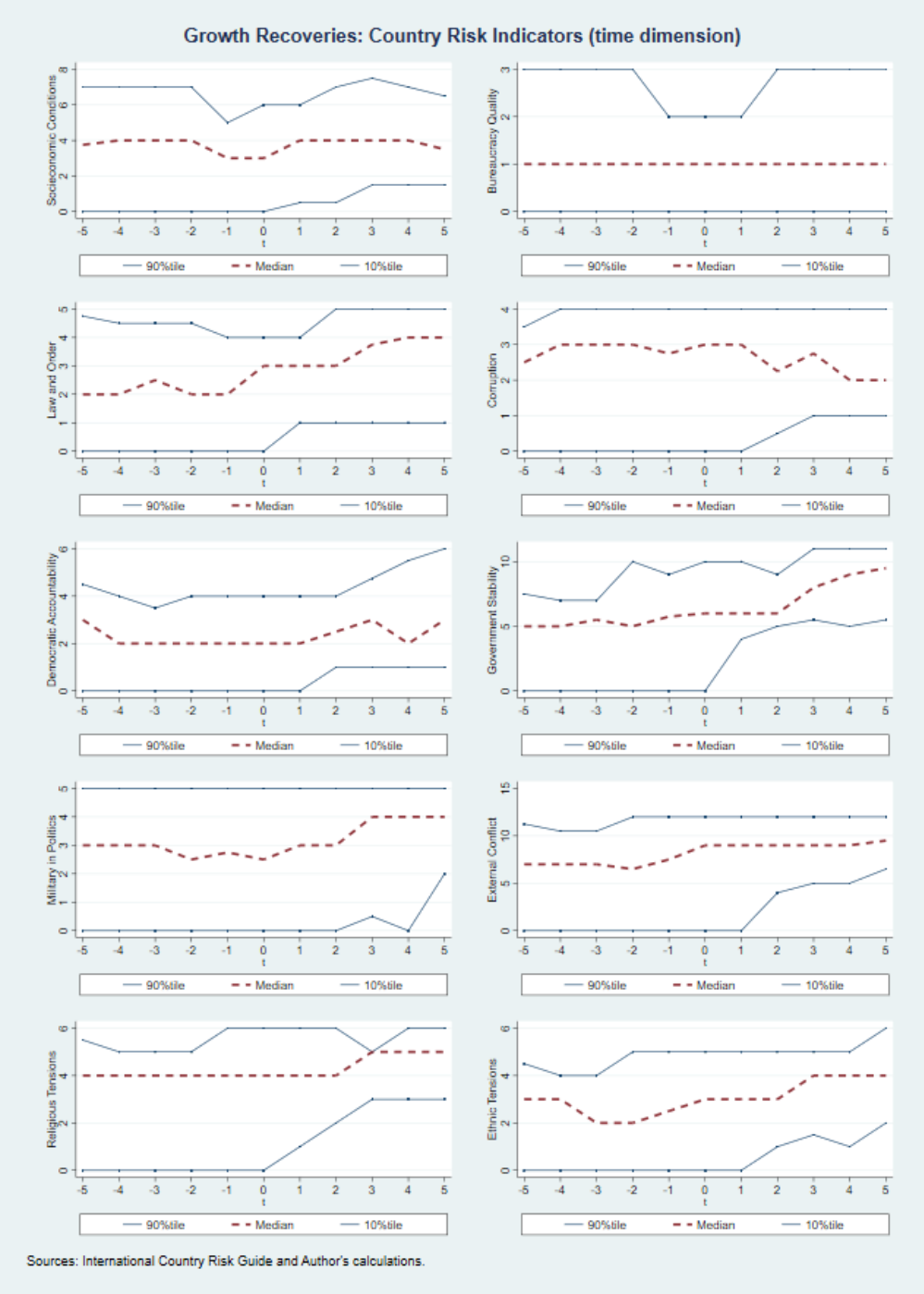


The International Country Risk Guide indicators are shown in figure 7, with the median country improving the score (i. e. the higher the score, the lesser the risk) for most indicators with the start of the recovery, particularly those related to law and order, government stability and military in politics.

We observe virtually no variations on the bureaucracy quality and the socioeconomic conditions indices, although the later deteriorates one year before and recovers one year after the start year. A deterioration in the corruption index is also observed.

Indices of democratic accountability and those regarding tensions and conflicts tend to improve either the year before or a couple of years after the recovery starts. For the 10th and 90th percentiles, the behavior is similar: indicators tend to show an improvement during the first recovery years.

Figure 7: Growth recoveries: Country risk indicators – Sample Dynamics



3 Drivers of recoveries

After having observed the dynamics, the next step is to determine which variables underlie the recovery process. In this sense, to observe what distinguishes these episodes in a

representative country, the median of the same variables was estimated to make two types of comparisons.

The first comparison involves a sample with 47 "complete" episodes (i. e. excluding those that are still collapsing and those who are not fully recovered) during the contraction phase, while the comparison sample involves the same 47 episodes during the recovery phase; this, with the aim to understand what are the main changes during a recovery, conditional on being collapsing, for the (median) representative recovering country.

The second comparison involves the same 47 episodes but only during the recovery phase, and the comparison sample comprises the rest of other non-recovery, positive growth episodes within the same countries; this, with the aim to see which variables (if any) distinguish during growth recoveries, compared to more "normal" times.

Subsequently, a statistical test is performed to determine if the difference between the medians of the two samples is significant at standard confidence levels. The method used for this is the confidence interval test for the Hodges & Lehmann (1963) medians difference, which is a special case of the average slope of Theil (1950), discussed by Sen (1968). Confidence intervals are used to identify equivalent values at a level of significance of 1, 5, and 10 percent. These intervals are calculated with robust variances, since they consider the grouping of observations by countries.[17]

As we saw in the previous section, collapses are (i) a rare phenomenon (even less frequent over the last two decades) and (ii) have occurred in countries with narrow/basic statistical coverage of economic data. Such combination (a higher frequency of episodes back-loaded in time and low national statistical capabilities), brings as a consequence that not all variables are available for all the countries and years with episodes, reducing the sample size significantly. Tables 9 to 13 of Appendix A show summary statistics of the variables for the whole sample and Appendix D contains a short description of them, as well as their sources. We discuss the results of this exercise next.

3.1 Macroeconomic policies

The first group of variables analyzed are those related to the main instruments that countries' macroeconomic policymakers have at hand to propitiate an economic recovery: fiscal policy (measured trough the fiscal balance and debt levels), monetary policy (evaluated through the increase on money growth and the inflation rate) and exchange rate policy (by seeing the behavior of the nominal exchange rate and indices on the type of exchange rate regime and financial account openness). For the role of macroeconomic factors on growth, see Fischer (1993).

Table 2 below shows the result and figure 8 in Appendix B, shows the Whisker plots of the compared samples.

The table reads the following way: the first column – first row cell says that, during growth recoveries, the median value of the government's fiscal balance (as a percentage of GDP) is

[17] For details of this methodology see, Newson (2000) and Newson (2002).

Table 2: Macroeconomic policy variables. Hodges-Lehman median differences 1/

Variable	Recoveries vs. Collapses	Full Sample	Recoveries vs. Other growth	Full Sample
Fiscal balance (% GDP)	1.8	2.4	0.3	0.3
Tax revenues (% GDP)	4.6**	3.3	-2.3*	-2.0
Central Government debt (% GDP)	-57.7*	-43.2	1.6	3.3
Base money (y/y, %)	3.9	4.7	8.1***	7.8***
Inflation (year average, y/y, %)	-7.4**	-6.1**	2.9**	2.3**
Exchange rate regime (from 1 to 15)	-1.0	-1.0	2.0	2.0
Nominal official exchange rate (y/y, % change)	-0.8	-0.8	2.1***	1.8***
Financial account openness (Index, from -2 to 2)	0.0	0.0	0.0	0.0

Sources: World Bank, IMF, and Author's calculations.
1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

around 1.8 percentage points (pp) higher than during a collapse. The second column —which increases the sample size by including countries that are still collapsing and countries that have not fully recovered by the end of the sample period— says that this difference rises to 2.4 pp. The third column says that, for the same sample of column 1, a representative growth recovery case experiences a fiscal result that is 0.3 GDP pp higher than other growth years for the same countries. The fourth column —which adds to the sample in column three the countries that have not fully recovered by the end of the sample period— produces the same result. None of these differences are statistically significant, a fact that suggest that, during growth recoveries, although there seems to be improvements in the fiscal balance (e. g. surplus positions), nothing is written in stone regarding fiscal policy and one should look at each of the countries' conditions.

By the same logic, results for the second row variable, tax revenues (as a share of GDP), say that, during growth recoveries, tax revenues increase by 4.6 GDP pp (column 1), a difference that is statistically significant at the 5% level. On the other hand, when comparing with other non-recovery growth episodes, growth recoveries experience less tax revenues by 2.3 GDP pp (column 3), a difference that possess statistical relevance at the 10% level. Results from the Central Government debt variable suggest a significant reduction of the debt to GDP ratio (-57.7 GDP pp and statistically significant at the 10% level), not only as a consequence of economic growth but perhaps also as some sort of debt relief or debt restructuring program that allowed for such recovery. This claim certainly needs to be investigated further.

Putting together these results, it could be inferred that, during growth recoveries, there is an improvement of the fiscal position of the government (i. e. . improved fiscal stance and lower debt), something that implies that the government uses less resources from the rest of the economy (i. e. . less crowding out), which also suggests, through the role of expectations, that the private sector is able to invest and consume more during this phase. See, for instance, Giavazzi & Pagano (1990), Bertola & Drazen (1993), Alesina & Perotti (1997) and Perotti (1999).

Compared to the collapse phase (columns 1 and 2), the monetary set of variables show an inflation reduction of around 6-7 pp, a difference that is significant at the 5% level. This, despite money growth being actually larger during growth recoveries, although the difference is not statistically significant. Moreover, when comparing with other non-recovery episodes (columns 3 and 4), inflation and money growth are higher during growth recoveries, at high levels of statistical relevance, although inflation is just about 2-4 pp higher. Such results suggest that inflation and monetary growth are higher during recoveries than in more tranquil times. This is an interesting result and worth to be investigated in depth.

An hypothesis that could be investigated about the result above is the following: during the collapse, as tax revenues and debt issuance are constrained, a bulk of government expenditures has to be financed via seignorage, increasing inflation to high rates [see Cagan (1956), Sargent & Wallace (1981) and Fischer *et al.* (2002)]; whereas during the recovery, together with economic policy changes and reforms, tax collection and private consumption improve [Sargent (1982)], reducing (or eliminating) seignorage and therefore leaving the source of money growth to the increased demand for real money balances that accommodates the recovery of private consumption expenditures. Below we will see that real private consumption increases correlate positively with the likelihood of a recovery taking place.

Regarding exchange rate policy, three variables have been included: (i) the type of exchange rate regime (based on Itzenski *et al.* (2017) index), understanding that changes in the exchange regime have repercussions on other policy variables as well as on the economy; (ii) an index of restrictions and controls to the financial account (using the Chinn & Ito (2006) index), understanding that the level of regulation of international financial transactions impacts the flow of capital and, therefore, economic growth; (iii) the depreciation of the nominal exchange rate, understanding —based on the extensive literature on the role of the nominal exchange rate as an economic policy variable— that country authorities intervene in the foreign exchange market for different reasons such as to smooth out fluctuations, stabilization, promote export competitiveness, etc., and that, in turn, large nominal exchange rate depreciations have an impact on prices, the fiscal, monetary and external accounts, and the financial sector (through balance sheet effects). See Levy-Yeyati & Sturzenegger (2003), Heathcote & Perri (2016), Calvo & Végh (1994), Rodrik (1986), and Allen *et al.* (2003) for an account on these issues.

Regarding the role of the exchange rate regime, it is necessary to explain first that the Itzenski *et al.* Index moves on a scale of 1 to 15, with the first levels being "more pegged" regimes while the highest levels reflect regimes that float freely, depreciate in free fall or in which a dual exchange rate system with parallel markets exists.[18] That is, as the index increases, the exchange rate fluctuates more.

In this sense, it is observed that, when comparing to the collapse phase (columns 1 and 2), the median value of the index is just 1 level lower during the recovery, but this difference is not statistically significant. The median exchange rate regime during a collapse is 7, a "de jure" crawling peg, which means that the median country jumps towards a "de facto" crawling band, a less volatile exchange rate regime. When comparing to other growth episodes, it is

[18] See statistical Appendix for a detailed explanation of the index. To see in depth, review Itzenski *et al.* (2017).

observed that the index during recoveries is 2 levels higher, which means that the exchange rate is more volatile, although this difference is not statistically significant (the median exchange rate regime in other growth episodes is 4, a "de facto" crawling peg).

In other words, during growth recoveries, the median exchange rate regime is more flexible than in normal years, although slightly less flexible than during the collapse years. This result suggests that capacity and credibility losses in the management of exchange rate policy during the collapse (perhaps as a consequence of the application of controls to foreign currency transactions, the designing of an unrealistic exchange rate policy, delaying adjustments, etc.) translate into a necessity to (i) anchor expectations to domestic consumers and (ii) provide predictability to foreign and domestic investors during the recovery by the means of a less volatile exchange rate.

The previous results go hand in hand with the dynamics of the nominal exchange rate. Comparing to the collapse phase (columns 1 and 2), the median depreciation rate of the official nominal exchange rate is around 1 pp lower during recoveries, this difference not being statistically significant. Comparing with other growth episodes, the depreciation rate is 2 pp higher during growth recoveries, with both differences showing 1% statistical significance (the median value of the depreciation rate of the nominal exchange rate in the entire sample is 0).

Finally, the median value of the Chinn & Ito's capital control index (ranging from -2 to 2, where a negative value reflects greater restrictions) does not change during growth recoveries when compared to growth collapses (columns 1 and 2), but this is not statistically significant. Moreover, when comparing to other growth episodes there is also no difference, also without statistical relevance. However, while the median value during collapses and other growth episodes is around 0, this value during recoveries is around -1, which suggests that, during recoveries, countries have opted for a stricter stance towards capital flows, while in normal times, things "return to normal". The impact of these results on actual capital flows will be discussed in the next section.

So far, the results of the exchange rate policy set of variables are consistent with the results of other policy variables mentioned up to this point, they show that the exchange rate regime is rather looking to anchor expectations and provide predictability to investors. Nevertheless, the non-statistical relevance of the median difference across the comparisons on the openness of the financial account suggest that nothing is written in stone regarding exchange rate policy during growth recoveries.

3.2 External factors

Table 3 below presents the results of the median difference tests for the external sector variables and figure 9 in Appendix B, shows the Whisker plots of the compared samples.

Table 3: External factors. Hodges-Lehman median differences 1/

Variable	Recoveries vs. Collapses	Full Sample	Recoveries vs. Other growth	Full Sample
United States real interest rate (%)	-2.3***	-1.9***	0.2	0.0
VIX Index (std. deviation of daily volatility)	1.5**	1.3**	0.8	0.4
Export prices - relative to U. S. (Index, 2010 = 100)	0.1*	0.1	-0.1**	-0.1**
Import prices - relative to U. S. (Index, 2010 = 100)	0.2***	0.1**	-0.1***	-0.1***
Products subject to tariff (% total tradable products)	-0.7	-1.1	0.0	0.1
Average applied tariff (%)	-0.2	0.6	-0.2	-0.4
Current account (% GDP)	-0.6	-1.1	-1.2	-1.9
Financial account (% GDP)	0.7	0.0	0.3	-0.3
External debt interest payments (% Exports)	-1.1	-1.0	1.0*	1.0*
FDI, net inflows (% GDP)	1.8***	2.0***	0.2	0.4
FDI, net outflows (% GDP)	0.0	0.0	-0.1*	-0.1
Portfolio investment, net (% GDP)	0.0	0.0	0.0	0.0
International reserves, stock (% GDP)	3.1*	3.0**	-2.4*	-2.5**
Remittances (% GDP)	6.2**	5.9**	5.0*	5.7**
Real effective exchange rate (2010 = 100, + appreciation)	-36.9*	-28.2**	-2.4	-2.6

Sources: World Bank, IMF, and Author's calculations.
1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

The real interest rate in the U. S. is up to 2 percentage points lower during growth recoveries, at 1% statistical significance while, when comparing with other growth episodes, the difference is not statistically different from zero, indicating the lower borrowing costs could be an important factor during recoveries. Moreover, since lower interest rates in safer markets (such as the U. S.) increases risk appetite from investors, a lower interest rate in the U. S. induces capital flows towards emerging markets.

In terms of market volatility, the median value in the standard deviation of the VIX index is higher during growth recoveries, at the 5% level. However, comparing with other growth episodes (column 3), capital market volatility is not statistically different. This result could be suggesting, among other things, that growth recoveries may surge despite greater instability in capital markets.

Although the difference in the median value of the price of exports is statistically significant at the 10% level, it is only slightly higher than during a collapse (columns 1 and 2) while being exactly the opposite in the comparison with other growth episodes (columns 3 and 4). Thus, although the role of external prices is significant, its impact seems marginal.

Regarding restrictions to international trade, although median differences suggest lower tariff barriers during recoveries, none of them are statistically significant. Regarding outcome variables, the balance of the current and financial accounts (as a percentage of GDP) was used. For these variables, it stands out that —at least at the traditional levels of confidence—

no difference in medians is statistically significant. Nevertheless, the signs of the coefficient suggest that, compared against the collapse phase, growth recoveries show a balanced current account and a financial account surplus, that is, less resources put out outside the domestic economy and more external assets. Nevertheless, the lack of statistical relevance suggests looking more deeply into each country.

As some countries might deal with important external debt payments that crowd out resources for other, more beneficial activities, in order to identify the role of this variable during growth recoveries, the behavior of an index that measures interest payments on foreign debt (as a percentage of total exports of goods, services and net factor payments) was observed. While the variable shows less resources devoted to foreign debt payments as a share of exports during a recovery, the magnitude is rather small and not statistically significant. On the other hand, when comparing with growth recoveries with other growth years, a positive but small difference arises (and statistically significant at the 10% level), suggesting that external debt payments are marginally larger during recoveries.

The role of remittances was also examined. It is known that it takes a catastrophe to make people move from their home, see Nakamura *et al.* (2016). Such migrants then send money to their relatives that stayed at the home country. Given the collapse, such hard currency flows are quite substantial (in terms of GDP) and could become an important source of foreign currency and development for the receiving —and for the sending— country [see, De Haas (2005)]. In this sense, it is observed that remittance flows as a share of GDP are around 6 GDP points higher when the economy recovers from a collapse (at the 5% level) and more than 5 GDP points higher than during other growth years (at the 10% and 5% levels for columns 3 and 4, respectively).

Inquiring through the components of the financial account, we observe that FDI inflows are around 2 pp higher during recoveries, at the 1% level. These higher FDI inflows during growth recoveries highlights the role of foreign investment during recoveries [for studies on the impact of FDI on growth, see, among a wide literature: Haddad & Harrison (1993), Borensztein *et al.* (1998) and Alfaro & Johnson (1997)]. The median value of portfolio investment is not significantly different from zero in each of the four columns. The remaining explanatory sources of financial account performance during the episode comes from the other investment account and variations in international reserves: the median value of international reserves as a proportion of GDP is higher by around 3 pp, at the 10% level (5% level when using the whole sample, column 2). Unfortunately, data for the other investment account was only available for a few countries.

Last, but certainly not least, is the performance of the real effective exchange rate. As can be seen from the table, the real effective exchange rate depreciates importantly (between 28-37 pp, at the 5% level) when the economies recover, which could be a sign of exchange rate realignment, but also more domestic price stability, as discussed in the previous section.

In sum, from the analysis of external factors, it can be inferred that exogenous external factors (such as shocks in the terms of trade, borrowing costs and volatility in international financial markets) seem to play a role during growth recoveries. In particular, there are lower borrowing costs and a "good luck" terms of trade of shock seems to be playing as well. It is

also interesting to note that growth recoveries occur despite greater capital market volatility. There is also an improvement on FDI inflows and remittances, even when comparing to regular growth years.

3.3 Aggregate demand components and the financial sector

Table 4 below presents the results of the median difference tests for aggregate demand components and financial sector variables and figure 10 in Appendix B, shows the Whisker plots of the compared samples.

All aggregate demand components increase their growth rates with respect to the collapse phase at statistically significant levels above 5%, except for public sector investment which is not statistically significant. The most pronounced increase is on investment, particularly that from the private sector, followed by imports and exports. Interestingly, for the median country, investment growth during recoveries is also higher when compared with other positive growth episodes (by 2.7 pp) while investment coming from the private sector is even higher (by 3.4 pp). Also, growth rates for public consumption are 2 pp lower than other growth episodes, suggesting lackluster growth of current public expenditures (but also capital expenditures, although at not statistically significant levels).

It is also important to highlight the behavior of import growth when compared to other growth episodes, as they are 2.3 pp higher during recoveries, perhaps as a corollary of the higher investment growth. However, investment (as a share of GDP) is around 4.0 GDP pp lower during recoveries when comparing with other growth years, suggesting that capital is hard to recover, although, comparing with the collapse phase, *private* investment recovers 4 GDP pp during the recovery. In line with investment, a similar pattern is shown for national saving.

Table 4: Real and financial sectors. Hodges-Lehman median differences 1/

Variable	Recoveries vs. Collapses	Full Sample	Recoveries vs. Other growth	Full Sample
Real consumption (y/y, % change)	6.3***	5.7**	1.3	1.3
-Private sector	5.3***	4.6***	0.5	-0.2
-Public sector	2.4**	2.7**	-1.9***	-1.8***
Real gross fixed capital investment (y/y, % change)	11.3***	11.5***	2.7**	1.6
-Private sector	11.2***	13.9***	3.4**	2.7
-Public sector	5.7	20.8**	-1.9	-1.5
Gross fixed capital investment (% GDP)	0.3	1.2	-4.0***	-3.8***
-Private sector (% GDP)	2.3	3.7**	-0.6	-0.4
Gross national saving (% GDP)	2.1	2.9	-5.0**	-5.5**
Exports volume (y/y, % change)	8.1***	8.6***	1.2	0.7
Imports volume (y/y, % change)	9.7***	9.9***	2.3**	1.6
Bank credit to the private sector (% GDP)	-1.7	-2.1	-5.3**	-5.1**
Bank deposits (% GDP)	-3.7	-4.3	-5.3**	-5.6**

Sources: World Bank, IMF, and Author's calculations.
1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

Financial sector indicators show important contractions at both comparisons, with the comparison against other growth episodes being statistically significant at the 5% level. This is in line with other studies that find the financial sector tends to shrink during times of economic stress, such as Reinhart & Savastano (2003) and Calvo *et al.* (2006).

3.4 Microeconomic policies and institutional variables

Table 5 below presents the results of the median difference tests for micro variables and figure 11 in Appendix B, shows the Whisker plots of the compared samples.

In the case of economic freedoms (measured by the index of economic freedom, which ranges from 0 to 100 and where the higher the index, the greater the freedom) it is observed that, when comparing to the collapse phase, the median value of the aggregate index is 6 points higher during recoveries, at 10% confidence. Inquiring through the components of the index, it is observed that indices of fiscal, monetary, and trade freedoms increase significantly, at the 1, 5, and 10% levels. The change on the fiscal freedom index[19] could be related to improvements on the fiscal balance and public debt discussed at the beginning of this section. Regarding monetary freedom, the improvement is associated to the reduction of inflation, but also to the reduction or elimination of price controls. The improvement of the trade freedom index is associated to tariff reductions seen in Section 3.2 as well as to other non-tariff barriers.

It is also interesting to see that there are no major changes regarding property rights for the median country. Also, the increase in the freedom from corruption index is high (9

[19]See the statistical Appendix D to see the components of these and all other indices.

points) but not statistically significant. Government spending also reduces importantly (9 points), which suggest a decrease on government spending for the median country, but this is not statistically significant. When comparing to collapses (columns 1 and 2), there are no significant differences on business, investment, and financial freedoms.

When comparing with other growth episodes (columns 3 and 4), it is noted that during recoveries, the representative country is substantially below their median level on almost all the indices comprised by the overall freedom index. The most notorious differences are in the monetary, business, financial and labor freedoms. No statistically significant difference were found for the indices of property rights. And for government spending, investment and financial freedoms, the median during recoveries is still below in all cases.

Table 5: Economic Freedom Indicators. Hodges-Lehman median differences 1/

Variable	Recoveries vs. Collapses	Full Sample	Recoveries vs. Other growth	Full Sample
Economic Freedom (Index, from 0 to 100)	6.1*	3.8	-8.8***	-8.2***
Property rights (Index, from 0 to 100)	0.0	0.0	0.0	0.0
Freedom from corruption (Index, from 0 to 100)	9.0	0.0	-8.3**	-8.0**
Fiscal freedom (Index, from 0 to 100)	10.9*	5.7	-9.4***	-7.7*
Government spending (Index, from 0 to 100)	-9.3	4.0	-4.5	-3.3
Business freedom (Index, from 0 to 100)	0.0	0.0	-9.4**	-8.8*
Labor freedom (Index, from 0 to 100)	-	6.2	-8.8**	-7.1
Monetary freedom (Index, from 0 to 100)	46.5**	6.9	-11.2***	-10.4***
Trade freedom (Index, from 0 to 100)	11.0***	4.2	-5.8*	-5.0
Investment freedom (Index, from 0 to 100)	0.0	0.0	-5.0	-5.0
Financial freedom (Index, from 0 to 100)	0.0	0.0	-10.0	-10.0

Sources: Heritage Foundation and Author's calculations.
1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

Table 6 below presents the results of the median difference tests for institutional variables and figure 12 in Appendix B, shows the Whisker plots of the compared samples.

Indicators of political and social risk show that when comparing with the collapse phase (columns 1 and 2), growth recoveries show statistically significant improvements on the law and order index, government stability, the presence of the military on political affairs, external and internal conflicts and ethnic tensions. No important changes are seen for the indices of socioeconomic conditions (which considers variables of unemployment, consumer confidence, and poverty). No changes on bureaucratic quality nor corruption are observed.

When comparing to other growth episodes (columns 3 and 4) it is observed that it appears to be space for further improvement on these indices after the recovery. Although there are no statistically significant differences, it seems there is room for improvement on the indices related to socioeconomic conditions and democratic accountability. The difference on the external conflict index suggests that, during recoveries, the median country could still be under an oversee/sanctions regime by some foreign power or the international community.

Finally, it is important to highlight that most of these countries are still in the low ranks of these indices.

Table 6: International Country Risk Guide Indicators. Hodges-Lehman median differences 1/

Variable	Recoveries vs. Collapses	Full Sample	Recoveries vs. Other growth	Full Sample
Socioeconomic conditions (Index, from 0 to 12)	1.0	1.0	-1.0	-1.0
Bureaucratic quality (Index, from 0 to 4)	0.0	0.0	0.0	0.0
Rule of law (Index, from 0 to 6)	1.0*	1.0	0.0	0.0
Corruption (Index, from 0 to 6)	0.0	0.0	0.0	0.0
Democratic accountability (Index, from 0 to 6)	1.0	1.0	-0.5	-0.5
Government stability (Index, from 0 to 12)	3.0***	3.0***	0.0	0.0
Military in politics (Index, from 0 to 6)	1.0*	1.0	0.0	0.0
External conflict (Index, from 0 to 12)	3.0***	2.0***	-0.5	-0.5
Internal conflict (Index, from 0 to 12)	3.0***	3.0***	0.0	0.0
Religious tensions (Index, from 0 to 6)	1.0	1.0	0.0	0.0
Ethnic tensions (Index, from 0 to 6)	2.0***	1.0	0.0	0.0

Sources: International Country Risk Guide and Author's calculations.
1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

4 Empirical analysis: What variables affect the probability of recovering?

The purpose of this section of the study is to build upon the information gathered during the previous section and try to identify which variables could increase the probability of experiencing a growth recovery. The strategy was to use a linear probability model.

A linear probability model of the form:[20]

$$P(y_{it} = 1|x_{it}) = y = \beta_1 x_{it1} + \beta_2 x_{it2} + ... + \beta_k x_{itk} \quad (1)$$

where:

y is the predicted probability of having $y = 1$ (i. e. . experiencing a recovery) for the given values of $x_1...x_k$

$x_{1...k}$ are the explanatory variables.

i is the country subscript.

t is the year subscript.

[20]See Wooldridge (2010), Ch 15.

was estimated to see which variables could increase or decrease the probability of experiencing a recovery.

Since there could be uncertainty around the precise starting date of an episode, for our baseline specification, we created a dummy variable that takes the value of one the first year of recovery, one the immediate year after, and zero otherwise. The years an episode cannot take place (i. e. the years before the start of the collapse and years 3 to $n < 26$ after the start of a recovery) are excluded. This reduces the sample size significantly.

Moreover, as we explained in the previous section, not all variables are available for all the countries and years of an episode, reducing an already small sample into a smaller one for the regressions. As a consequence of this lack of data, the model does not control for fixed effects. Also, while coefficient estimates seem to hold to large sample properties, they should be taken with caution. The flip side of this, however, considering the lack of data, is that these results could be as good as one gets without going deeply into each country in search for an old statistics book that most likely does not exist. All in all, the purpose of this study is to have an educated guess on the variables that could precipitate a recovery.

Due to the lack of data, variable selection considered a mix of the following two conditions: (i) the number of available observations and (ii) how representative was the variable in each block of variables. For instance, for variables related to the fiscal accounts, fiscal balance was the one that, besides complying with the first criteria (has more number of observations), it also contains information related to the rest of the variables that explain the performance of the fiscal accounts (e. g. tax revenues and debt levels); thus, fiscal balance is a representative variable of the set of variables pertaining to the fiscal accounts. The same criteria was applied for each of the 4 groups of variables.

Moreover, since around 2/3 of the countries in the sample have an important share of rents derived from natural resources, a variable that controls for this is included. To control for endogeneity our baseline model uses 3 year moving averages of the covariates. Table 7 below shows the selected model variables and presents their summary statistics for the sample period, as well as their expected effect on the probability of an episode taking place.

Table 7: Summary Statistics - Model Sample

	Obs.	Mean	Standard Deviation	Min	Max	Expected Sign
Fiscal Balance as a % of GDP	120	-4.11	22.92	-204	61.7	(+/-)
Base Money, % change	285	242	1,119	-58.17	12,513	(-)
Rents as a % of GDP	391	11.7	12.6	0	64.3	(+/-)
Real consumption private, % change	267	1.34	13.22	-51.51	80.96	(+)
Real GFKF, % change	276	4.55	35.78	-78.88	283	(+)
Export volume, % change	281	5.25	29.87	-91.55	316	(+)
Import volume, % change	281	3.6	25.86	-64.68	265	(+/-)
U. S. Real interest rate, %	421	6.65	3.41	0.33	16.82	(-)
Financial Account Openness	393	-0.37	1.25	-1.9	2.37	(+)
Remittances as % of GDP	361	40.59	26.7	0.06	223	(+/-)
Law and Order	258	2.36	1.58	0	6	(+)
Democratic Accountability	258	2.06	1.34	0	6	(+)
Bureaucracy Quality	258	1.15	0.96	0	3.5	(+)
Investment Profile	258	3.99	2.49	0	11	(+)

Observations: 435

Our baseline model results can be seen in Table 8 at the end of this section. As we did in the previous section, we will comment on the variables by block:

4.1 Macroeconomic policy variables

For macroeconomic policies (starting on column 1 of Table 8), our baseline model suggests that increases in the fiscal balance correlate negatively with the likelihood of an episode taking place, that is, spending beyond revenue seems to increase the probability of a recovery. This supports the Keynesian approach of fiscal policy during recessions[21]. Although the sign of this variable is consistent in all specifications (columns 2 to 4 of Table 8), it is only statistically significant in a couple of them, suggesting, as we saw in the previous section, that nothing is written in stone regarding fiscal policy during recoveries.

Regarding monetary policy, our model suggests that increases in the money supply correlate negatively with likelihood of starting a growth recovery. While the sign is consistent in all the specifications it is also statistically significant at the 1% in most of them. The magnitude of the coefficient however, is rather small.

[21] An approach that was actually inspired in lieu of the depression of 1929.

A rather structural variable: natural resources (as a share of GDP) does not have a clear sign nor is statistically significant in our baseline model. However, in some of the models that we estimated for robustness (see Tables 14, 15, 16 and 17 in Appendix C), this variable shows a statistically significant negative correlation with the likelihood of a recovery. To us, the global result is evidence that natural resource rents are neither good or bad for generating a recovery. What might happen, however, since some specifications actually report a negative correlation, is that, due to the different implications of the "natural resource course" (e. g. dutch disease, rent seeking, rent appropriability, political patronage, etc.), recoveries might be delayed [see the works of Lane & Tornell (1998) and Lederman & Maloney (2007)].

4.2 Aggregate demand components

Regarding aggregate demand components (starting on column 2 of Table 8), real private consumption correlates positively with the likelihood of a recovery taking place. A one percent increase in real consumption increases the probability of a recovery by between 1.1-1.6 percent, depending on the specification. These results are almost always statistically significant. A similar result is obtained for exports and imports, which are also statistically significant. From these results and the fiscal result of the previous subsection, it could be inferred that increases in consumption expenditures as well as an international trade reactivation propitiate an economic recovery.

Although investment shows an unexpected sign in our baseline model it is not statistically significant. This contradicts what we showed in the previous sections, where the median growth rate of fixed capital formation was more than 11 pp higher during recoveries and, as figure 5 shows, this variable picks up before the recovery. To try to incorporate this trend, in some of our robustness checks (see tables 14, 15 and 16 in Appendix C) we changed the start of our dummy variable to up to a couple of years before the start of the recovery but the models yielded the same results. This persistent flipped sign and the lack of significance our models show, make a call for analyzing the behavior of this variable in depth and case by case. However, this is something that goes beyond the scope of this work.

4.3 External variables

As can be seen in Table 8 (starting on column 3), of the external variables considered (U. S. real interest rate, financial Account Openness and remittances), none of them report neither a consistent sign nor statistical significance. However, other models estimated for robustness purposes show that increases in the U. S. real interest rate correlate negatively with the probability of a recovery taking place, an expected result, considering the negative relationship between foreign-domestic interest rate differentials and capital movements as traditionally explained in the Mundell-Fleming model.

On the index of financial account openness some of our robustness models' results (see Appendix C) suggest it correlates negatively with the likelihood of propitiating a recovery, with statistical significance. Among the different reasons of this result, one could be that an

strategy to avoid capital flight turns against its purpose (i. e. acting as a deterrent of capital inflows and as an incentive for capital outflows), affecting economic growth, see Heathcote & Perri (2016) for a discussion on this possibility.

Last but not least, both our baseline and robustness models show that remittances correlate negatively with the probability of a recovery taking place, but just at 10% levels of significance in the best case. Given the characteristics and conditions in which relevant remittance flows take place, particularly in their role as a supporter of basic consumption needs of low income households in low-to-middle income countries, it certainly could be the case remittances have a stabilizing rather than a boosting role for the economy, see Amuedo-Dorantes (2014).

4.4 Institutional variables

Finally, variables related to institutions are added to the model (column 4 of Table 8). Such variables are indexes reflecting the rule of law, democratic accountability, the quality of the bureaucracy and the investment profile of the country. Of these variables, those regarding law and order and investment profile are statistically significant.

The coefficient on law and order is positive, indicating that a 1 pp increase of this index rises the probability of recovery by 32.3%. This index is divided in two components: (i) impartiality of the judicial system and (ii) effective application of the law. Thus, this index has a lot to do with the protection of basic rights (e. g. economic, social and cultural rights) that allow individuals to carry out their most basic economic activities —production and exchange— without being affected either by a predatory government nor a private capture. For a recent account on this literature, see Haggard & Tiede (2011).

Something similar happens with the variable investment profile, which indicates that a 1 pp increase rises the likelihood of recovery by 7.6%. This index is an assessment of 3 factors affecting the risks to investment that are not covered by the other risk components of the country risk index. Such factors are: (i) contract viability/expropriation; (ii) profit repatriation; and (iii) payment delays. As with the law and order index, this result suggests that improvements in a country's capacity to allow individuals and firms the ownership of resources for production and exchange, to appropriately reaping the profits of such activities, and to do so in a timely and efficient way, could propitiate an economic recovery with a high likelihood. Taken together, these results support the previous works of La Porta *et al.* (1998), Rodrik *et al.* (2004) and Acemoglu *et al.* (2005).

The coefficients on democratic accountability and bureaucracy quality are negative but insignificant. However, other models do show statistical significance of the negative relationships (see Table 16 of Appendix C). The democratic accountability index measures how responsive is a government to its people on the basis of the type of governance enjoyed by the country in question (e. g. whether it is an alternating democracy or a de jure one party state). The bureaucracy quality index measures the capacity of the bureaucracy to govern without drastic changes in policy or interruptions in government services, how au-

tonomous from political pressure it is, and if it has an established mechanism of recruitment and training.

Taken either together or separately, these results suggest that recoveries are independent of improvements in the type of government and the quality of its bureaucracy (several countries that enjoyed decades of high economic growth did it without being an alternating democracy or having a high quality bureaucracy, consider Singapore and South Korea in the 1960s or China in the 1980s). Moreover, if they matter, a more democratic form of governance and a more competent bureaucracy could delay a turning point on economic growth. While more research is required to verify this result, one of the reasons this can happen could be tied to political economy problems (e. g. distributional implications leading to wars of attrition between key actors) that are perhaps typical in more democratic societies —which, in turn, typically have more sophisticated bureaucracies— that can delay processes of stabilization and recovery, see, again, Alesina & Drazen (1991) and Acemoglu & Robinson (2000) for an account on the matter.

All in all, the possibility of these results is contained in two facts: (i) this sample is biased toward countries that score low in the country risk index, and (ii) that this is consistent with the literature on growth miracles and growth disasters: rapid changes on institutions are more common under strong dictators and more difficult in democracies [Jones & Olken (2005)]. Nevertheless, it is important to highlight that by no means this implies an endorsement to non-democratic forms of governance on our part.

Table 8: Baseline Model - Dependent variable: dummy takes the value of 1 the first two years of recovery - Results 1/

	(1)	(2)	(3)	(4)
Fiscal Balance as a % of GDP	-0.0001	-0.0215***	-0.0129	-0.0153
	(0.0016)	(0.0063)	(0.0123)	(0.0114)
Base Money, % change	-0.0001***	-0.0002***	-0.0001***	-0.0001
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Rents as a % of GDP	-0.0046	0.0047	0.0049	0.0099
	(0.0039)	(0.0091)	(0.0102)	(0.0093)
Real consumption private, % change		0.0165***	0.0155**	0.0112*
		(0.0061)	(0.0065)	(0.0062)
Real GFKF, % change		-0.0027	-0.0040	-0.0037
		(0.0040)	(0.0051)	(0.0038)
Export volume, % change		0.0131*	0.0125*	0.0108*
		(0.0066)	(0.0071)	(0.0058)
Import volume % change		-0.0005	-0.0012	0.0116*
		(0.0065)	(0.0069)	(0.0060)
U. S. Real interest rate %			-0.0163	0.0226
			(0.0485)	(0.0587)
Financial Account Openness			0.0890	-0.0024
			(0.0950)	(0.0864)
Remittances as a % of GDP			0.0004	-0.0033
			(0.0045)	(0.0050)
Law and Order				0.3231***
				(0.0786)
Democratic Accountability				-0.1388
				(0.0862)
Bureaucracy Quality				-0.3387
				(0.2045)
Investment Profile				0.0760*
				(0.0410)
Observations	97	50	50	46
RSquared	0.068	0.368	0.387	0.679

Robust standard errors in parentheses

1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

5 Concluding remarks and further steps

The results of the paper indicate that growth collapses and subsequent recoveries seem to be a phenomenon that has occurred mostly in the African and former Soviet Union countries. Moreover around 2/3 of the countries in the sample rely importantly in the rent from their natural resources, something that suggests that, beyond the endowment, outcomes (such as the obtained rent from its exploitation) matter. Therefore, the management of this wealth seems important to (un)fortunately determine both: collapses and recoveries.

We also found that recoveries tend to take longer than collapses, which implies that *what it's easily lost, it's arduous to recover*, even with countries experiencing higher growth rates during the recovery than during the collapse.

In terms of macroeconomic policy, growth recoveries are episodes in which home currencies depreciated at the beginning (perhaps to correct some overvaluation) but then started to appreciate, in line with previous evidence on general economic recoveries. Public finances generally improve, as the economy starts to grow and tax revenues rise but also as a reduction of public debt, although there is no strong evidence of tighter fiscal policy. Finally, inflation decreases.

Regarding external factors, it appears that during growth recoveries there is a combination of good policy and good luck. Lower foreign borrowing costs could be an important factor and since lower interest rates in safer markets increases risk appetite from investors, capital, particularly FDI, seems to flow towards recovering countries. Also, while capital markets volatility was registered, growth recoveries occurred. Growth recoveries have occurred when there is a slight improvement in the terms of trade. Thus, during growth recoveries, there is a relaxation of external conditions in a context of a stable local currency.

All aggregate demand components increase during recoveries, in particular private consumption. Exports and imports also grow importantly. Even though GFKF increases, particularly that of the private sector, who gets an increasing share of GDP during recoveries, the likelihood of a recovery seems to correlate negatively with GFKF increases, a result that deserves further research. The financial sector recovery is subdued, which suggest that the recovery of the economy is somehow "creditless".

Although the overall index of economic freedom improves, the picture is mixed. Improvements on the fiscal freedom index could be related to improvements on the fiscal balance and public debt. Regarding monetary freedom, the improvement is associated to the reduction of inflation, but also to the potential reduction or elimination of price controls. The improvement of trade freedom could be associated to tariff reductions in some countries as well as to other non-tariff barriers. There are no substantial improvements in the freedoms to do business, investment and finance, which suggest a timid structural reform agenda. Moreover, measured by the labor freedom index, the labor market seems to tighten during recoveries. Although the improvements of these indices during other growth years suggests countries do improve these freedoms.

On the institutional front, growth recoveries are associated to a reduction on external and internal conflicts, but also to reductions in religious and ethnic tensions. Also, countries

that successfully recovered became more democratically accountable and their rule of law improved. Governments during a growth recovery enjoyed more stability.

From all the variables examined through different types of econometric specifications, the likelihood that a country would experience a growth recovery increases with greater foreign direct investment inflows, increased private consumption and international trade and where there are improvements in the rule of law and the country's investment profile. Conversely, the probability of a recovery taking place decreases with increases on natural resource rents, higher real foreign interest rates and more financial account openness. Although fiscal accounts seem to be more balanced during recoveries, in some models, spending more seems to propitiate recoveries. Although remittances are quite important for a representative recovering country, their role on propitiating a recovery is not consistent across specifications.

This project is still ongoing. For the next stages, further testing of the validity of the probability models has to be done. And more has to be done on disentangling reverse causality issues among variables, such as that between economic growth and democratic accountability. Also, for robustness checks, but also for improvement of the database, it will be good to try identifying said episodes using another source, such as the Penn World Tables. Another interesting analysis could be to predict the duration of a recovery episode. It will also be interesting to better understand the relationship between the tightening of the financial account and higher FDI inflows.

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A Summary Statistics

Table 9: Macroeconomic policy variables – Summary statistics - Full sample

	Observations	Mean	Standard Deviation	Minimum	Maximum
Fiscal Balance (% GDP)	2,847	-1.48	10.69	-204	236
Tax Revenues (% GDP)	3,155	16.82	8.63	0.04	144
Central Government Debt (% GDP)	1,099	58.46	87.22	1.89	2,008
Base Money (% change)	6,347	269.76	18,826	-99.98	1,499,712
Inflation (%)	6,524	37.93	512	-35.84	24,411
Nominal official exchange rate (% change)	8,130	8,630	769,740	-99.99	69,403,824
Financial Account Openness	6,808	-0.05	1.38	-1.90	2.37

Observations: 9,259

Table 10: External variables – Summary statistics - Full sample

	Observations	Mean	Standard Deviation	Minimum	Maximum
U. S. Real interest rate (%)	9,240	5.93	3.74	0.33	16.82
VIX Index (%)	4,704	19.37	5.88	11.09	32.69
Export price relative to U. S. (2010 = 1)	5,590	0.84	0.65	0.03	9.15
Import price relative to U. S. (2010 = 1)	6,034	0.9	0.52	0.05	9.43
Share of products subject to tariffs (% of total)	2,585	3.24	6.55	0	95.12
Average applied tariff (% of total)	2,585	7.25	7.92	0	255
Current Account (% GDP)	5,015	-3.36	14.03	-241	307
Financial Account (% GDP)	4,915	-2.32	14.53	-341	308
External debt interest (% Exports)	3,712	6.34	6.57	0	69.81
FDI net inflows (% GDP)	5,910	3.68	12.76	-82.89	452
FDI net outflows (% GDP)	4,431	1.47	10.89	-202.82	220
Portfolio Investment Net (% GDP)	4,657	0.15	18.75	-592.43	304
International Reserves stock (% GDP)	6,083	13.8	15	-1.02	172
Remittances as (% of GDP)	7,044	39.81	24.13	0	236
Real Effective Exchange Rate (2010 = 100)	2,683	114	99.81	18.68	2,830

Observations: 9,584

Table 11: Real and financial sector – Summary statistics - Full sample

	Observations	Mean	Standard Deviation	Minimum	Maximum
Real Consumption (% change)	1,314	4	4.75	-20.99	57.41
Real consumption private (% change)	4,651	4.32	14.51	-74.6	463
Real consumption public (% change)	4,790	4.58	18.79	-91.33	697
Real GFKF (% change)	4,770	6.56	35.26	-85.16	1,465.85
Real Private GFKF (% change)	2,228	13.07	99.64	-91.55	3,027.74
Real Public GFKF (% change)	2,211	9.03	41.23	173.13	861.59
Gross National Savings (% GDP)	4,421	20.5	16.96	-233.95	356
Export volume (% change)	4,944	7.27	26.88	-91.55	932
Import volume (% change)	4,905	7.01	25.07	-73.85	1,066
Credit to the private sector (% GDP)	6,045	51.52	1,331	0	103,470
Bank Deposits (% GDP)	6,580	37.47	39.52	0	480

Observations: 7,658

Table 12: Economic freedom components – Summary statistics - Full sample

	Observations	Mean	Standard Deviation	Minimum	Maximum
Economic Freedom	2,784	59.48	10.83	15.6	90.5
Property Rights	2,792	47.46	23.28	5	95
Freedom from Corruption	2,808	39.68	22	0	100
Fiscal Freedom	2,794	72.96	14.78	10	99.9
Government spending	2,798	65.96	23.53	0	99.3
Business Freedom	2,804	64.01	15.12	10	100
Labor Freedom	1,637	61.74	15.36	20	100
Trade Freedom	2,789	67.68	15.61	0	95
Investment Freedom	2,799	52.99	20.24	0	95
Financial Freedom	2,789	50.56	19.52	10	90

Observations: 2,808

Table 13: Country risk indicators – Summary statistics - Full sample

	Observations	Mean	Standard Deviation	Minimum	Maximum
Socieconomic Conditions	3,910	5.3	2.5	0	11
Bureaucracy Quality	3,910	2	1.19	0	4
Law and Order	3,910	3.38	1.55	0	6
Democratic Accountability	3,910	3.57	1.78	0	6
Government Stability	3,910	7.19	2.6	0	12
Military in Politics	3,910	3.51	1.89	0	6
Internal Conflict	3,910	8.28	2.95	0	12
Religious Tensions	3,910	4.27	1.62	0	6
Ethnic Tensions	3,910	3.69	1.58	0	6

Observations: 3,910

B Whisker plot panels

Figure 8: Growth recoveries: Macroeconomic policy variables – distribution comparison

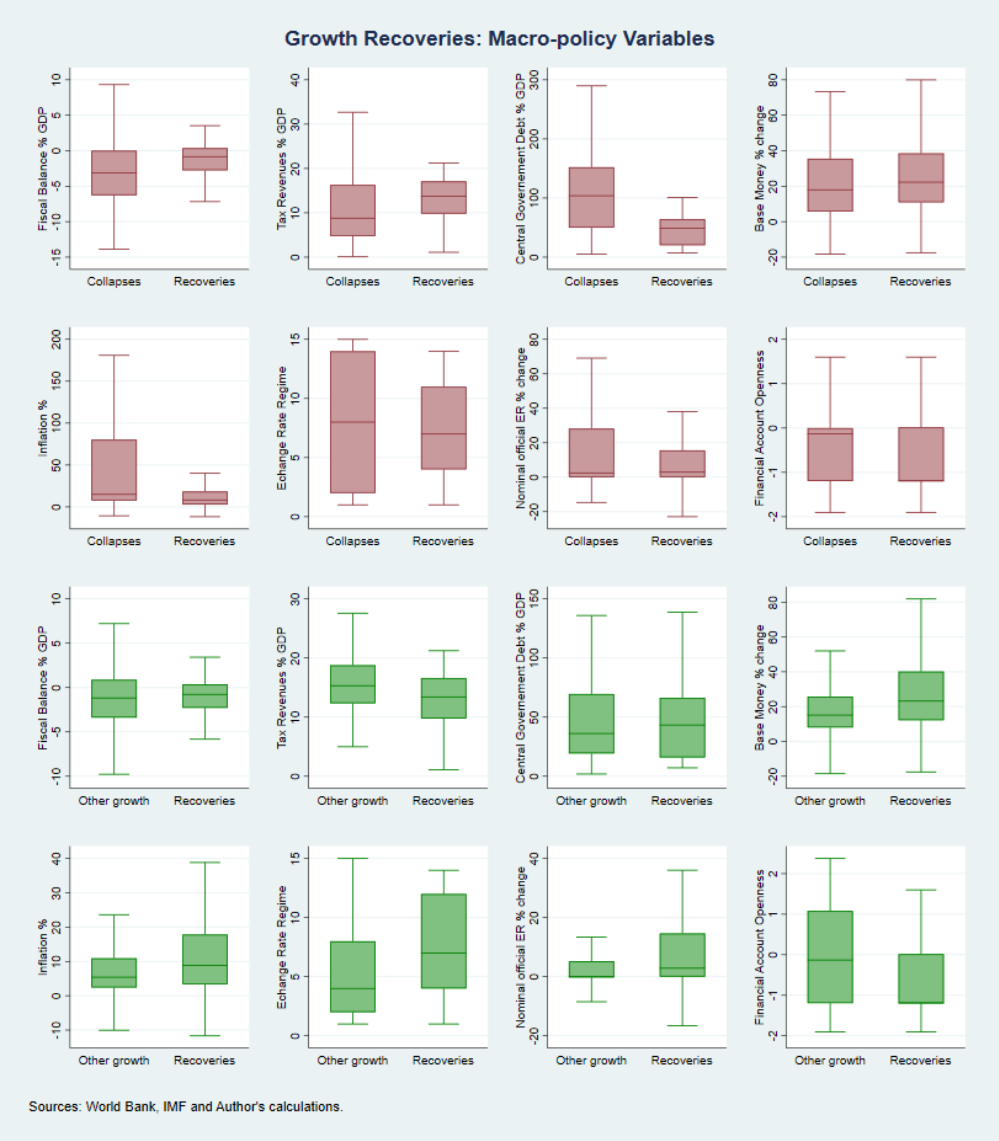

Figure 9: Growth recoveries: External variables – distribution comparison

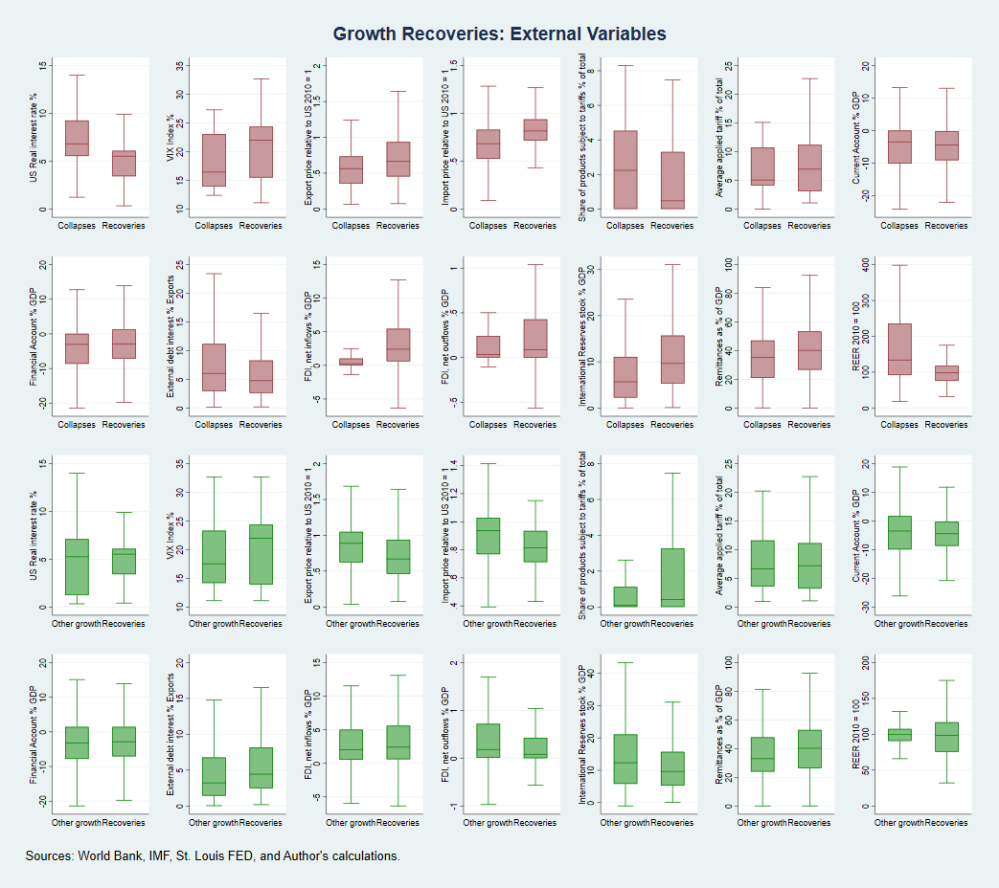

Figure 10: Growth recoveries: Real and financial sector – distribution comparison

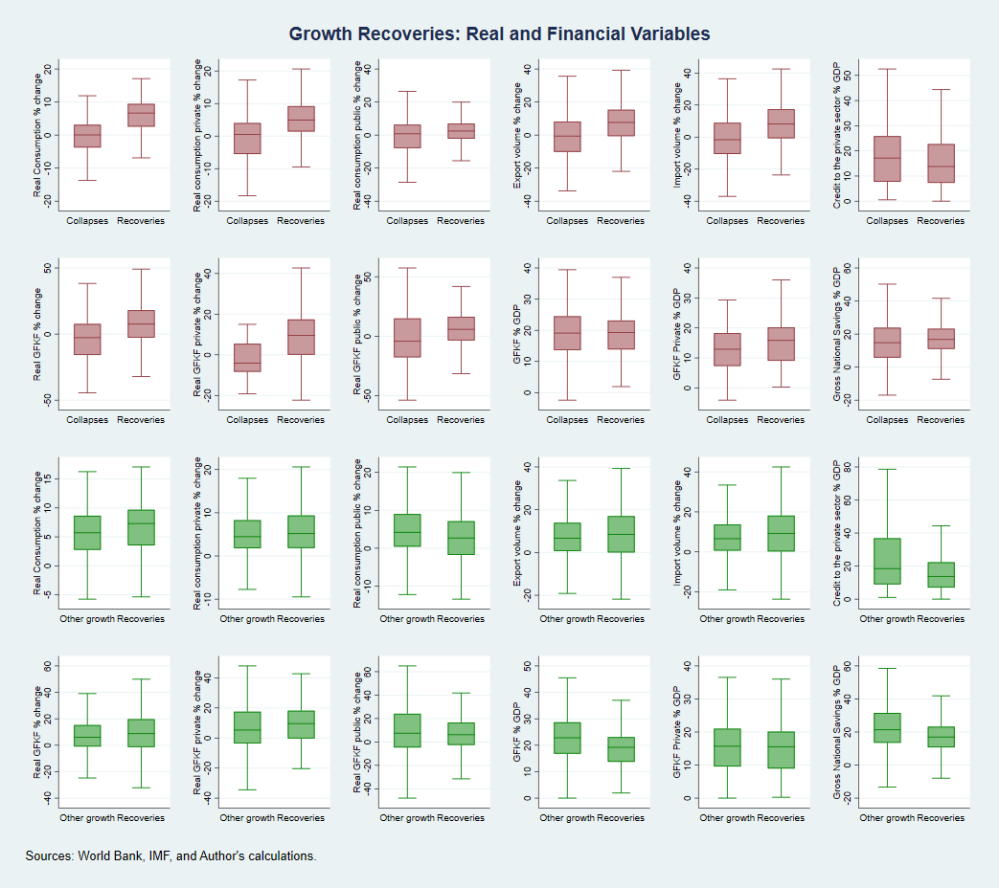

Figure 11: Growth recoveries: Economic freedom components – distribution comparison

Figure 12: Growth recoveries: Country risk indicators – distribution comparison

C Robustness checks

For robustness purposes, in this section we present a set of modifications. We change the dependent dummy variable with two purposes: (i) control for the uncertainty around the recovery date and (ii) assess the sensitivity of changing the sample size. Results will be commented shortly below.

To test the sensitivity of the results to the timing of the recovery we tried 4 different versions of the dependent dummy variable: (i) we modified the dummy variable to take the value of one when the recovery starts and zero otherwise (table 14); (ii) the dummy variable takes the value of one the year of the recovery, one year before the recovery and zero otherwise (table 15); (iii) same as before but including the second lags and leads to the start of the recovery (table 16); and (iv) the dummy variable takes the value of one for all the years of the recovery and zero otherwise (table 17). Only statistically significant results will be commented.

The first modification yields statistically significant results for the variables: natural resource rents (with negative sign), exports and imports growth (positive sign), financial account openness (negative sign), remittances (negative sign) and law and order (positive

sign). The second modification shows two statistically significant results: natural resource rents (negative sign) and the real interest rate in the U. S. (negative sign). The third shows these same results and adds the statistical relevance of democratic accountability (with a negative sign). These results are consistent with those of our baseline specification and suggest that as we fiddle with the start of the recovery including some of the developments that occurred in the near past, the main story holds.

The last modification, which includes all the recovery years, yields different results. It shows that improvements in the fiscal balance correlate negatively with the probability a recovery taking place. The same happens with further increases in the money supply and with increases in the foreign real interest rate. Interestingly, increases in investment also correlate negatively. As before, international trade variables correlate positively with the likelihood of a recovery taking place and the same happens with the institutional variables of law and order and investment profile. Interestingly enough, the remittances variable changed sign, suggesting that in the long run, increases in remittances (as a share of GDP) have positive effect in the likelihood of recovery taking place. This could be related to different reasons, one of them being that remittances stimulate aggregate demand.

Overall, these different modifications give support to the main plot: recoveries are more likely to occur in contexts of fiscal consolidation, prudent monetary policy, higher private consumption and international trade, low foreign interest rates and where property rights allow agents to produce and exchange with some degree of confidence.

Table 14: Robustness check - Dependent variable: dummy takes the value of 1 at the start of the recovery - Results 1/

	(1)	(2)	(3)	(4)
Fiscal Balance as a % of GDP	-0.0013	0.0108	0.0157	-0.0052
	(0.0022)	(0.0117)	(0.0169)	(0.0182)
Base Money, % change	-0.0001***	-0.0001*	-0.0001	-0.0001
	(0.0000)	(0.0001)	(0.0001)	(0.0001)
Rents as a % of GDP	-0.0088**	-0.0085	-0.0104	-0.0274**
	(0.0034)	(0.0078)	(0.0097)	(0.0115)
Real consumption private, % change		0.0047	0.0045	0.0200
		(0.0089)	(0.0096)	(0.0130)
Real GFKF, % change		-0.0083***	-0.0083***	-0.0049
		(0.0028)	(0.0027)	(0.0030)
Export volume, % change		0.0222***	0.0203***	0.0376***
		(0.0033)	(0.0055)	(0.0080)
Import volume, % change		-0.0009	-0.0013	0.0171*
		(0.0071)	(0.0078)	(0.0093)
U. S. Real interest rate, %			-0.0342	-0.0826
			(0.0566)	(0.0874)
Financial Account Openness			0.0556	-0.4403**
			(0.1191)	(0.1737)
Remittances as a % of GDP			-0.0010	-0.0209**
			(0.0057)	(0.0087)
Law and Order				0.5207**
				(0.2203)
Democratic Accountability				-0.2028
				(0.1603)
Bureaucracy Quality				-0.3246
				(0.2812)
Investment Profile				0.0221
				(0.0761)
Observations	74	32	32	29
RSquared	0.130	0.414	0.432	0.780

Robust standard errors in parentheses

1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

Table 15: Robustness check - Dependent variable: dummy takes the value of 1 at the start of the recovery +/- 1 year - Results 1/

	(1)	(2)	(3)	(4)
Fiscal Balance as a % of GDP	-0.0030	-0.0038	0.0061	-0.0068
	(0.0020)	(0.0073)	(0.0106)	(0.0087)
Base Money, % change	-0.0001***	-0.0002***	-0.0001	-0.0001
	(0.0000)	(0.0000)	(0.0001)	(0.0001)
Rents as a % of gdp	-0.0173***	-0.0132*	-0.0136**	-0.0162**
	(0.0038)	(0.0073)	(0.0060)	(0.0061)
Real consumption private, % change		0.0059	0.0012	-0.0046
		(0.0085)	(0.0072)	(0.0076)
Real GFKF, % change		-0.0057	-0.0058	-0.0055
		(0.0043)	(0.0035)	(0.0035)
Export volume, % change		0.0128*	0.0067	0.0082
		(0.0068)	(0.0062)	(0.0073)
Import volume, % change		-0.0121*	-0.0082	0.0007
		(0.0070)	(0.0069)	(0.0077)
U. S. Real interest rate, %			-0.1513***	-0.2443***
			(0.0509)	(0.0647)
Financial Account Openness			0.0475	-0.1052
			(0.0775)	(0.0752)
Remittances as a % of GDP			0.0035	0.0003
			(0.0035)	(0.0046)
Law and Order				0.0116
				(0.0785)
Democratic Accountability				-0.0413
				(0.0971)
Bureaucracy Quality				0.0261
				(0.1848)
Investment Profile				0.0448
				(0.0494)
Observations	87	41	41	38
RSquared	0.293	0.468	0.646	0.781

Robust standard errors in parentheses

1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

Table 16: Robustness check - Dependent variable: dummy takes the value of 1 at the start of the recovery +/- 2 years - Results 1/

	(1)	(2)	(3)	(4)
Fiscal Balance as a % of GDP	-0.0048***	-0.0025	0.0045	0.0002
	(0.0009)	(0.0058)	(0.0077)	(0.0086)
Base Money, % change	-0.0001***	-0.0002***	-0.0001	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0001)
Rents as a % of gdp	-0.0201***	-0.0166***	-0.0186***	-0.0227***
	(0.0030)	(0.0056)	(0.0043)	(0.0043)
Real consumption private, % change		0.0022	-0.0003	-0.0023
		(0.0034)	(0.0032)	(0.0038)
Real GFKF, % change		-0.0013	-0.0013	-0.0001
		(0.0025)	(0.0023)	(0.0022)
Export volume, % change		-0.0002	-0.0042	-0.0070*
		(0.0044)	(0.0035)	(0.0041)
Import volume, % change		-0.0038	-0.0020	-0.0020
		(0.0029)	(0.0026)	(0.0035)
U. S. Real interest rate, %			-0.1071***	-0.1270***
			(0.0381)	(0.0319)
Financial Account Openness			0.0391	0.0175
			(0.0481)	(0.0620)
Remittances as a % of GDP			0.0040	0.0023
			(0.0029)	(0.0036)
Law and Order				0.0335
				(0.0703)
Democratic Accountability				-0.1242*
				(0.0639)
Bureaucracy Quality				0.0189
				(0.1262)
Investment Profile				0.0220
				(0.0263)
Observations	102	52	52	48
RSquared	0.406	0.498	0.643	0.716

Robust standard errors in parentheses

1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

Table 17: Robustness check - Dependent variable: dummy takes the value of 1 for all recovery years - Results 1/

	(1)	(2)	(3)	(4)
Fiscal Balance as a % of GDP	-0.0007	-0.0078**	-0.0066*	-0.0088**
	(0.0027)	(0.0037)	(0.0037)	(0.0038)
Base Money, % change	-0.0002***	-0.0002***	-0.0002***	-0.0002***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Rents as a % of GDP	-0.0088***	0.0040	0.0058**	0.0048
	(0.0025)	(0.0026)	(0.0025)	(0.0032)
Real consumption private, % change		0.0088***	0.0097***	0.0018
		(0.0030)	(0.0027)	(0.0031)
Real GFKF, % change		-0.0064**	-0.0066**	-0.0071***
		(0.0028)	(0.0026)	(0.0023)
Export volume, % change		0.0143***	0.0127***	0.0120***
		(0.0035)	(0.0029)	(0.0024)
Import volume, % change		-0.0017	0.0006	0.0060*
		(0.0042)	(0.0038)	(0.0031)
U. S. Real interest rate, %			-0.0327**	-0.0253*
			(0.0126)	(0.0139)
Financial Account Openness			0.0463***	0.0031
			(0.0150)	(0.0187)
Remittances as a % of GDP			0.0047**	0.0037*
			(0.0019)	(0.0019)
Law and Order				0.0616**
				(0.0302)
Democratic Accountability				-0.0043
				(0.0162)
Bureaucracy Quality				-0.0832
				(0.0653)
Investment Profile				0.0515***
				(0.0176)
Observations	210	143	143	119
RSquared	0.207	0.447	0.555	0.680

Robust standard errors in parentheses

1/ The significance at the levels of 10, 5, and 1 percent is represented as *, **, ***, respectively.

D Description of Variables

Table 18: Fiscal and monetary variables

Variable	Source	Description
Inflation (%)	World Bank	The inflation measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that can be fixed or changed at specific intervals, such as annually. The Laspeyres formula is generally used.
Fiscal Balance (% GDP)	World Bank	The net lending (+) / net borrowing (-) is equal to the government's income less the expenses, minus net investment in non-financial assets. It is also equal to the net result of transactions in financial assets and liabilities. Net lending / net borrowing is a summary measure that indicates the extent to which the government makes financial resources available to other sectors of the economy or abroad, or uses the financial resources generated by other sectors of the economy or abroad.
Base Money (% change)	IMF	Annual percentage change in the monetary base or base money, which is defined in general terms as the currency in circulation outside the central bank, the net holdings of deposits of other deposit societies in the central bank and the rest of the sectors of the economy that are also included in money in a broad sense.
Tax Revenue (% GDP)	World Bank	Tax revenues refer to compulsory transfers to the central government for public purposes divided by GDP. Certain mandatory transfers are excluded, such as fines, penalties and most social security contributions. Reimbursements and corrections of tax revenues wrongly collected are treated as negative income.
Central Government Debt (% GDP)	World Bank	The debt is the entire stock of direct contractual obligations of the government to others at a given date. It includes domestic and foreign obligations such as deposits of money and cash, securities other than shares and loans. It is the gross amount of government liabilities reduced by the amount of capital and financial derivatives that the government owns. Because debt is a stock rather than a flow, it is measured from a certain date, usually the last day of the fiscal year.
Nominal official exchange rate (% change)	World Bank	The official exchange rate refers to the exchange rate determined by the national authorities or to the rate determined in the exchange market legally sanctioned. It is calculated as an annual average based on the monthly averages (units of local currency in relation to the U. S. dollar).

Exchange rate regime	Itzenski, Reinhart and Rogoff	The Itzenski index, et. al moves a scale of 1 to 15, being: 1. There is no legal tender or monetary union. 2. Pre-set peg or conversion box. 3. Pre-announced horizontal band that is narrower or equal to +/- 2%. 4. De facto crawling peg. 5. Crawling peg previously announced; de facto mobile band narrower than or equal to +/- 1%. 6. Crawling band previously announced that is narrower or equal to +/- 2% or de facto horizontal band that is narrower or equal to +/- 2%. 7. Crawling peg. 8. De facto crawling band that is narrower or equal to +/- 2%. 9. Crawling band previously announced that is greater than or equal to +/- 2%. 10. De facto crawling band that is narrower or equal to +/- 5%. 11. Mobile band that is narrower or equal to +/- 2% (that is, it allows both the appreciation and depreciation over time). 12. De facto mobile band +/- 5% / Administered floating. 13. Freely floating. 14. Free falling. 15. Dual market in which parallel market data are lacking.
Financial account openness (Index, from -2 to 2)	Chinn and Ito	Range that goes from -2 to 2, where a negative value reflects greater restrictions to the transactions of the financial account.

Table 19: External variables

Variable	Source	Description
VIX Index (% change)	St. Louis FED	Implied volatility index of the put options market in Chicago, United States.
United States real interest rate (%)	St. Louis FED	It is obtained by deflating the short-term Libor rate (less than 1 year). The U. S. annual GDP deflator is used as the adjustment variable.
Natural resource rent (% GDP)	World Bank	Total rents of natural resources are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents and forest rents, divided by GDP.
Share of products subject to tariffs (%)	World Bank	The proportion of tariff lines with specific rates in the proportion of lines in the tariff list that are established per unit or that combine the ad valorem and per unit rates. It shows the extent to which countries use tariffs based on physical quantities or other non-ad valorem measures.
Applied tariff (% of total tradable products)	World Bank	The weighted average applied rate is the average of the rates applied, weighted by the parts of the imports of products corresponding to each partner country. The data is classified using the Harmonized System of Commerce at the level of six or eight digits. The data of the tariff line was compared with revision 3 codes of the International Classification of International Trade to define the commodity groups and the import weights. As far as possible, the specific rates have been converted to their ad valorem equivalent rates and have been included in the calculation of the weighted averages. The weightings of imports were calculated using the Commodity Trade (Comtrade) database of the United Nations Statistics Division. The tariff rates effectively applied at the six- and eight-digit product level are averaged for the products in each product group. When the rate applied is not available, the most favored nation rate is used instead.
Current account (% GDP)	World Bank	The balance of the current account is the sum of net exports of goods and services, net primary income and net secondary income.
Export volume (% change)	IMF	Annual percentage change in exports of goods and services based on constant local currencies. Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transportation, travel, royalties, license fees and other services, such as communication, construction, financial, information, commercial, personal and governmental services. Exclude employee compensation and investment income (formerly called factor services) and transfer payments.
Import volume (% change)	IMF	Annual percentage change in imports of goods and services based on constant local currencies Imports of goods and services represent the value of all goods and other market services received from the rest of the world. They include the value of merchandise, freight, insurance, transportation, travel, royalties, license fees and other services, such as communication, construction, financial, information, commercial, personal and governmental services. Exclude employee compensation and investment income (formerly called factor services) and transfer payments.
Export price - relative to U. S. (Index, 2010 = 100)	IMF and author's calcs.	Exports price index relative to that of the United States, normalized to 100 in the year 2010.

Import price - relative to U. S. (Index, 2010 = 100)	IMF and author's calcs.	Imports price index relative to that of the United States, normalized to 100 in the year 2010.
External debt interest payments (% Exports)	World Bank	Total payments of interest on exports of goods, services and primary income. The total payment of interest is the sum of the interest paid in cash, goods or services on the long-term debt, interest paid on the short-term debt and charges to the IMF.
Financial account (% GDP)	World Bank	The net financial account shows the acquisition and net disposal of financial assets and liabilities. It measures how the net lending or borrowing of non-residents is financed and is conceptually equal to the sum of the balances of the current and capital accounts. The data is in current U. S. dollars.
FDI, net inflows (% GDP)	World Bank	Direct foreign investment is the net investment flows to acquire a long-term management interest (10% or more of the shares with voting rights) in a company that operates in an economy different from that of the investor. It is the sum of social capital, the reinvestment of profits, other long-term capital and short-term capital, as shown in the balance of payments. This series shows net inflows (new investment flows minus divestment) in the reporting economy of foreign investors and is divided by GDP.
FDI, net outflows (% GDP)	World Bank	Foreign direct investment refers to direct investment capital flows in an economy. It is the sum of social capital, reinvestment of profits and other capital. Direct investment is a category of cross-border investment associated with a resident in an economy that has control or a significant degree of influence in the management of a company that resides in another economy. The ownership of 10 percent or more of the common shares of voting shares is the criterion to determine the existence of a direct investment relationship. This series shows the net outflows of investment from the reporting economy to the rest of the world and is divided by GDP.
Portfolio investment (% GDP)	World Bank	Portfolio investment covers transactions in equity securities and debt securities. The data are in current U. S. dollars, divided by GDP in local currency adjusted by the average exchange rate for the year.
International Reserves, stock (% GDP)	World Bank	Total reserves include holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF and holdings of currencies under the control of the monetary authorities. The gold component of these reserves is valued at the end of London prices (December 31). The data are in current U. S. dollars and are divided by the GDP transformed into U. S. dollars using the average official exchange rate of the corresponding year. For some countries where the official exchange rate does not reflect the rate actually applied to real currency transactions, an alternative conversion factor is used.

Table 20: Real and financial variables

Variable	Source	Description
Real GDP (local currency)	World Bank	Real GDP is the inflation-adjusted sum of the gross added value of all producers' resident in the economy plus any tax on the product and less any subsidy not included in the value of the products. It is calculated without making deductions for the depreciation of manufactured assets or for the depletion and degradation of natural resources. Calculated in local currency using a base year determined by each country.
GDP growth (% change)	World Bank	Annual percentage growth rate of GDP at market prices based on constant local currency.
Real consumption (% change)	IMF	Annual percentage change based on constant local currency. The final consumption expenditure (before total consumption) is the sum of final consumption expenditure of households (private consumption) and final consumption expenditure of general government (general government consumption). This estimate includes any statistical discrepancy in the use of resources in relation to the supply of resources.
Real consumption, public sector (% change)	IMF	Annual percentage change based on constant local currency. The final consumption expenditure of the general government (previously, general government consumption) includes all current government expenditures for purchases of goods and services (including compensation of employees). It also includes the majority of defense and national security expenditures but excludes government military expenditures that are part of the government's capital formation.
Real consumption, private sector (% change)	IMF	Annual percentage change based on constant local currency. Household final consumption expenditure (formerly private consumption) is the market value of all goods and services, including durable products (such as automobiles, washing machines and home computers), acquired by households. It excludes the purchase of houses but includes the imputed rent for the dwellings occupied by their owners. It also includes payments and fees to governments to obtain permits and licenses. Here, household consumption expenditure includes the expenses of non-profit institutions that serve households, even when the country reports separately. This element also includes any statistical discrepancy in the use of resources in relation to the supply of resources.
Gross Fixed Capital Investment (% change)	IMF	Annual percentage change based on constant local currency. Gross fixed capital formation (formerly known as fixed gross domestic investment) includes land improvements (fences, ditches, drains, etc.); purchases of plants, machinery and equipment; and the construction of roads, railways and the like, including schools, offices, hospitals, private homes and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.
Gross Fixed Capital Investment, public sector (% change)	IMF	Annual percentage change based on constant local currency. Public investment covers the gross disbursements of the public sector (including military spending) in additions to its fixed domestic assets.

Gross Fixed Capital Investment, private sector (% change)	IMF	Annual percentage change based on constant local currency. Private investment covers gross disbursements from the private sector (including private non-profit agencies) in additions to their fixed domestic assets.
Real effective exchange rate (Index, 2010 = 100)	World Bank	The real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency versus a weighted average of several foreign currencies) divided by a price deflator or a cost index.
Bank credit to the private sector (% GDP)	World Bank	Domestic credit to the private sector refers to financial resources provided to the private sector by financial corporations, such as loans, purchases of securities other than investment and commercial loans and other accounts receivable, which establish a claim for refund. For some countries these claims include credit to public companies. Financial corporations include monetary authorities and money deposit banks, as well as other financial corporations where data is available (including companies that do not accept transferable deposits but incur liabilities such as savings and time deposits). Examples of other financial corporations are financial and leasing companies, money lenders, insurance companies, pension funds and currency companies.
Bank Deposits (% GDP)	World Bank	It is the sum of sight deposits and term deposits, both in national currency and in foreign currency divided by GDP.
Gross Fixed Capital Investment (% GDP)	World Bank	Gross fixed capital formation (formerly known as fixed gross domestic investment) includes land improvements (fences, ditches, drains, etc.); purchases of plants, machinery and equipment; and the construction of roads, railways and the like, including schools, offices, hospitals, private homes and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.
Gross Fixed Capital Investment, private sector (% GDP)	World Bank	Private investment covers gross disbursements from the private sector (including private non-profit agencies) in additions to their fixed domestic assets.
Gross national saving (% GDP)	World Bank	Gross national savings are calculated as gross national income less total consumption, plus net transfers, divided by GDP.

Table 21: Other economic policy and structural variables

Variable	Source	Description
Economic Freedom (Index, from 0 to 100)	Heritage Foundation	The Economic Freedom Index focuses on four key aspects of the economic environment over which governments typically exercise control of the policy: rule of law, size of government, regulatory efficiency, market opening. The higher the index, the greater the economic freedom.
Property rights (Index, from 0 to 100)	Heritage Foundation	The score for this component is obtained by averaging scores for the following five subfactors, all weighted equally: physical property rights, intellectual property rights, strength of investor protection, risk of expropriation and quality of land administration.

Freedom from corruption (Index, from 0 to 100)	Heritage Foundation	The score of the judicial effectiveness component is obtained by averaging the scores of the following three subfactors, which are weighted equally: judicial independence, quality of the judicial process and probability of obtaining favorable judicial decisions.
Fiscal freedom (Index, from 0 to 100)	Heritage Foundation	The score of this component is derived from quantitative subfactors: the upper marginal tax rate on individual income, the higher marginal tax rate on corporate income, the total tax burden as a percentage of GDP, the fiscal deficit as a percentage of the average GDP of the last 3 years and public debt as a percentage of GDP.
Government expenditure (Index, from 0 to 100)	Heritage Foundation	Total Government expenditure as a percentage of GDP.
Business freedom (Index, from 0 to 100)	Heritage Foundation	Doing Business Report, World Bank.
Labor freedom (Index, from 0 to 100)	Heritage Foundation	Seven quantitative subfactors have the same weighting, each one counted as a seventh of the labor freedom component: ratio between the minimum wage and the average value added per worker, impediment to hire additional workers, rigidity of the hours, difficulty in dismissing redundant employees, mandatory legal notice period, compensation for mandatory dismissal and participation rate in the work force.
Monetary freedom (Index, from 0 to 100)	Heritage Foundation	The score for the monetary freedom component is based on two subfactors: the weighted average inflation rate of the last three years and presence of price controls.
Trade freedom (Index, from 0 to 100)	Heritage Foundation	The free trade score is based on two factors: the trade-weighted average tariff rate and non-tariff barriers.
Investment freedom (Index, from 0 to 100)	Heritage Foundation	It is composed of 7 restrictions: national treatment of foreign investment, foreign investment code, land ownership restrictions, sectoral investment restrictions, sectoral investment restrictions, currency exchange controls, capital controls.
Financial freedom (Index, from 0 to 100)	Heritage Foundation	The Index qualifies the financial freedom of an economy by looking at five broad areas: the degree of government regulation of financial services, the degree of state intervention in banks and other financial firms through direct and indirect ownership, government influence in the allocation of credit, the extension of the development of the financial and capital markets, and openness to foreign competition.
Socioeconomic conditions (Index, from 0 to 12)	International Country Risk Guide	This is an assessment of socio-economic pressures in society that could restrict government action or fuel social dissatisfaction. The assigned risk rating is the sum of three subcomponents: unemployment, consumer confidence and poverty.
Bureaucratic quality (Index, from 0 to 4)	International Country Risk Guide	The institutional strength and quality of the bureaucracy is a buffer that tends to minimize policy revisions when governments change. Therefore, outstanding points are awarded to countries where the bureaucracy has the strength and experience to govern without drastic changes in policy or interruptions in government services. In a low-risk country, the bureaucracy tends to be somewhat autonomous in the face of political pressure and have an established mechanism of recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions.

Rule of law (Index, from 0 to 6)	International Country Risk Guide	"Law and order" form a single component, but its two elements are evaluated separately, and each element is scored from zero to three points. To evaluate the element "Law", the solidity and impartiality of the legal system are considered, while the element "Order" is an evaluation of the popular observance of the law. Therefore, a country can enjoy a high rating -3- in terms of its judicial system, but a low rating -1- if it suffers a very high crime rate or if the law is routinely ignored without an effective sanction (e. g. generalized illegalization of strikes).
Corruption (Index, from 0 to 6)	International Country Risk Guide	This is an evaluation of corruption within the political system. The most common form of corruption that companies directly face is financial corruption in the form of demands for special payments and bribes related to import and export licenses, exchange controls, tax liens, police protection or loans. Such corruption can hinder the effective conduct of business and, in some cases, may force the withdrawal or retention of an investment. Although the measurement considers this corruption, real or potential corruption in the form of excessive patronage, nepotism, work reserves, "favors for favors", funds from secret parties and suspiciously close links between politics is also considered. These insidious types of corruption are potentially much riskier for foreign companies, as they can generate popular discontent and encourage the development of black markets. The greatest risk of such corruption is that at some point it will become so dazzling, or some important scandal will be suddenly revealed, as to provoke a popular reaction, which will result in a fall or overthrow of the government, a major reorganization or restructuring of the government. the political institutions of the country, or, in the worst of cases, a collapse of law and order, making the country ungovernable.
Democratic accountability (Index, from 0 to 6)	International Country Risk Guide	This is a measure of how responsive the government is to its people, on the basis that the less receptive it is, the more likely it is that the government will fall peacefully (in a democratic society), but possibly violently (in an undemocratic one).
Government stability (Index, from 0 to 12)	International Country Risk Guide	This is an assessment of both the ability of the government to carry out its declared program(s) and its ability to remain in office. The assigned risk rating is the sum of three subcomponents: unity in the government, legislative force and popular support.

Military in politics (Index, from 0 to 6)	International Country Risk Guide	The military is not democratically elected. Therefore, their participation in politics, even at a peripheral level, is a diminution of democratic responsibility. However, it also has other significant implications. The military could, for example, become involved in government due to an actual or created internal or external threat. Such a situation would imply the distortion of government policy to deal with this threat, for example, by increasing the defense budget at the expense of other budgetary allocations. In some countries, the threat of military takeover may force an elected government to change the policy or have it replaced by another government more responsive to the wishes of the military. A military takeover or the threat of a takeover can also represent a high risk if it is an indication that the government cannot function effectively and that, therefore, the country has an uncomfortable environment for foreign companies. A large-scale military regime represents the greatest risk. In the short term, a military regime can provide new stability and thus reduce commercial risks. However, in the longer term, the risk will almost certainly increase, partly because the government system will become corrupt and partly because the continuation of that government will likely create an armed opposition. In some cases, military involvement in government can be a symptom rather than a cause of underlying difficulties. In general, a low risk rating indicates more military involvement in politics and therefore a higher level of political risk.
External conflict (Index, from 0 to 12)	International Country Risk Guide	The measure of external conflict is an assessment of the risk to the exercise of foreign action, from non-violent external pressure (diplomatic pressure, withholding of aid, trade restrictions, territorial disputes, sanctions, etc.) to violent external pressure (from border conflicts to total war).
Internal conflict (Index, from 0 to 12)	International Country Risk Guide	This is an assessment of political violence in the country and its actual or potential impact on governance. The highest rating is given to those countries where there is no armed or civil opposition to the government and the government does not allow arbitrary violence, direct or indirect, against its own people. The lowest rating is awarded to a country involved in an ongoing civil war.
Religious tensions (Index, from 0 to 6)	International Country Risk Guide	Religious tensions can derive from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and exclude other religions from the political and/or social processes; the desire of a single religious group to dominate the government, the suppression of religious freedom; the desire of a religious group to express its own identity, separated from the country as a whole. The risk involved in these situations varies from inexperienced people who impose inappropriate policies through civil dissent to civil war.
Ethnic tensions (Index, from 0 to 6)	International Country Risk Guide	This component is an assessment of the degree of tension within a country attributable to racial, nationality or language divisions. Lower grades are awarded to countries where racial and nationality tensions are high because opposition groups are intolerant and unwilling to compromise. Higher ratings are awarded to countries where tensions are minimal, even though such differences still exist.