

The Post-Crises Output Growth Effects in a Globalized Economy [☆]

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Abstract

This paper investigates the persistent impact of financial crises on economic growth in different regimes of globalization. Relying on a nonlinear dynamic panel representation, this paper explains why the effects of globalization on growth weave into a tale of two opposite narratives. On average, a country experiences higher growth, the more open and integrated it is into the world. However, countries can also experience persistently lower medium-term output growth after a financial crisis, once globalization reaches a certain threshold. The benefits, as well as vulnerabilities, accrue earlier in the globalization process for low-income countries.

Keywords: Globalization, Financial crises, Output growth

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1. Introduction

Ten years after the global financial crisis, as noted by Blanchard (2018), "the level of output appears to have permanently been affected by the crisis".¹ The world economy's growth rate is projected to be 3.9 percent in 2018, more than 1 percent lower than it was during the upswing prior to the global financial crisis. Moreover, currently, the 5-year average of the real global GDP growth rate, at 3.5 percent, is 0.75 percent lower than the average of all similar upswing periods since 1980 and more than 1.5 percent lower compared to the average global growth rate from 2003-2007. The negative impact of financial crises on output growth seems to be, if not permanent, persistent and lasting more than a regular cyclical recovery. This low growth medium-range regime is usually labeled as the "new normal", as suggested by Eggerson et al. (2016) and Candelon et al. (2016)², "secular stagnation", as suggested by Eggerson et al. (2017) or "hysteresis", as suggested by Summers (2014), Coeuré (2017) and Blanchard (2018).

Abundant academic research has theoretically and empirically defined the short-run real impact of financial shocks as well as the impact of the last crises (Martin and Rey, 2006; Jermann and Quadrini, 2012; Romer and Romer, 2017; Blanchard, 2018, to name but a few) but rarely analyzes the persistent impact of the financial crises on real activity in the medium run. The presumption in macroeconomics regarding industrialized economies is that when one takes a reasonably long time frame (i.e., avoids business cycle effects), a constant growth rate is to be expected (e.g., steady-state growth). For emerging

¹The same feature has been reported in the World Economic Outlook (2017): "the global recovery is continuing, but it is still incomplete".

²The "new normal" term was first coined by McKinsey (Ian Davis) and PIMCO (Mohamed El-Erian), in March and May 2009, respectively, to reflect the notion that lower output growth was expected to be the new norm, mostly in advanced economies, where consumers (especially, but not exclusively) needed to deleverage extensively, over a long period of time.

markets, things are more challenging given that they are on a development path and are often subject to highly persistent shocks. See Agular and Gopinath (2005) or Chen and Crucini (2016) for evidence that the dividing line between growth and cycle becomes less clear-cut in these cases.

Cerra and Saxena (2008) wrote the seminal empirical paper in this field. Using an unbalanced panel of data from 190 countries from 1960-2001, these scholars regress output growth on its lags and various crisis dummies. They report that output losses following financial crises and some political crises are highly persistent, definitively longer than a cycle, thereby documenting, in a way, the existence of a new normal. Using a balanced panel with data until 2010, Candelon et al. (2016) reproduce this study including the 2008 crisis. They also enhance the empirical framework by allowing individual countries' growth rates to be affected by common factors as well. Including one such factor in the specification increases short- and medium-term output growth for all countries over the sample, and the negative impact of a crisis on growth. Since this common growth factor is highly and negatively correlated with financial crisis measures (banking, external debt default and restructuring, and inflation), and since some of these crisis dummies are correlated across countries, Candelon et al. (2016) labeled this factor "globalization". However, this is an ex-post characterization of a statistical extract obtained from the common movements in the short- and medium-term output growth rate series. This effect of globalization on output growth is supported by theoretical studies, which are distinguishing trade and financial shocks. Trade openness increases economic growth by increasing the market size of a country's production and introducing competition among firms. Trade integration boosts growth by enabling a more efficient allocation of capital, by facilitating the transfer of technology and know-how, and by increasing opportunities for higher returns and for risk diversification. It is usually found that trade openness contributes

positively to growth. On the contrary, the benefits of financial openness are mixed. International financial flows help boost trade, which, in turn, increase production. However, financial globalization also makes the economy more vulnerable to crises and could impact growth negatively.³ Besides, all papers emphasize that the benefits of globalization (trade and financial) on growth are not instantaneous, as, for example, borrowing to invest takes time to make those investments profitable. When this borrowing comes from abroad, it may also come with more know-how and a re-orientation towards selling these goods in the global markets. Opening up the economy to foreign competition also takes time for production to become more efficient or for entrepreneurship to flourish. At the same time, we look to see if short- and medium-term output growth suffers more in the countries that are more integrated in the global economy and experience a financial crisis.

This paper proposes to evaluate how globalization affects the new normal, i.e. the persistent relationship between output growth and crises. To this aim, we estimate a panel Vector AutoRegressive (PVAR) model, where output growth depends on its own lags and may be affected by crises, for 92 countries over the period 1970 – 2014. But contrary to the existing studies as Cerra and Saxena (2008) or Candelon et al. (2016), globalization (and all its components) is introduced as a transition variable driving regimes.⁴ If, in the estimations, the constant term is larger in the higher-globalization regimes (when the KOF Globalization Index is higher than a certain estimated threshold), it means that on average, countries grow more when they open up and integrate into the global economy, through the channels described above. At the same time, if this index is higher than this globalization threshold, the coefficient of a crisis impact on output growth is significant and negative (or

³See Martin and Rey (2006) for a theoretical analysis of the destabilizing impact of financial shocks compared to trade ones.

⁴The globalization threshold is endogenously and recursively estimated.

more negative), while it is non significant or lower when it is below the same globalization threshold; then, we must infer that higher globalization is associated with a lower GDP growth rate once a financial crisis occurs. However, this negative impact on short-term growth is not necessarily a permanent effect, as the economy eventually returns to the higher-growth equilibrium in a higher-globalization regime. The return may be very slow though, as the autoregressive term may be smaller in a higher-globalization regime (cleaning up financial crises and reestablishing trade linkages may be costlier and take more time in more developed and integrated economies).

Anticipating on our results, We find that in a higher-globalization regime (when the KOF Globalization Index or its subcomponents are higher than a certain estimated threshold), short- and medium-term output growth is higher on average, and output growth also contracts more, when a financial crisis occurs. This, coupled with a lower autoregressive growth coefficient for the same high-globalization regime causes a new normal and persistent (yet not permanent) lower output growth. The results are not driven by the tail end of the sample, nor by the 2007-08 crisis. Over the sample, all groups of countries have higher growth on average, as they open up and integrate into the world. In high-income countries, a stock market crisis has a negative impact on short-term growth regardless of the globalization level; once globalization reaches a certain threshold, this effect is stronger, and a banking crisis also has a negative impact. In low- and middle-income countries, a currency and stock market crisis has a negative effect on growth in a higher-globalization regime. The benefits, and vulnerabilities accrue earlier in the globalization process for low- and middle-income countries, which is consistent with Broner and Ventura (2016). These results are robust to various KOF Globalization subindices, and other empirical specifications, including one allowing for endogeneity, and imply that overall, globalization is beneficial for short-term growth,

as long as it is accompanied by sound financial regulation and supervision and macroeconomic policies.

The paper is structured as follows: Section 2 presents the econometric methodology and describes how the new normal hypothesis can be tested within a nonlinear framework. Sections 3 and 4 present the data and results, respectively. Section 5 extends the analysis to different groups of countries, according to income level, and Section 6 provides several robustness checks. Section 7 concludes and elaborates on policy implications.

2. Testing for the new normal while controlling for the transition variable

Recently, Cerra and Saxena (2008) and Candelon et al. (2016) documented the presence of new growth regimes after crises. The underlying idea behind these studies consists of testing whether the short-term output growth rate is lower after the occurrence of a crisis and whether it is significantly so and occurs for a long period.

The original model by Cerra and Saxena (2008) has the following form:

$$g_{i,t} = a + \sum_{j=1}^p (\beta_j g_{i,t-j} + \delta_j D_{i,t-j}) + \eta_i + u_{i,t}, \quad (1)$$

where a is a constant, representing the average short-term real GDP growth rate over the sample and $g_{i,t}$ is the real GDP growth rate in country i at time t .⁵ p is an optimal lag order, $D_{i,t}$ is a vector composed of 3 financial crisis dummies, η_i is a country fixed effect that accounts for unobserved heterogeneity, and $u_{i,t}$ is a zero mean idiosyncratic random disturbance.

Let us also note that regressors are lagged in order to avoid potential endogeneity bias.

Prevailing low short-term growth rates post-crises associated with small coefficients on lagged output growth imply that

⁵We are not interested in long-term or convergence dynamics. Therefore, we use the growth rate of GDP rather than GDP growth per capita.

the recovery is slower⁶ and that the actual output growth will remain below its precrisis level for a long period. The new normal hypothesis is supported when the coefficients associated with the crisis dummies are significant and negative and the coefficients of the autoregressive lags are low, which implies persistently lower but not permanently lower growth since these autoregressive coefficients are not zero.

To investigate the role of globalization in transitioning to a new growth regime, this paper builds a threshold panel VAR, where an exogenous transition variable determines the unobserved prevalent regime.

Model (1) is rewritten as follows:

$$g_{i,t} = \mathbb{1}_{(q_{i,t-1} \leq \gamma)} [a_1 + \sum_{j=1}^p \beta_j^{(1)} g_{i,t-j} + \delta_j^{(1)} D_{i,t-j}] + \mathbb{1}_{(q_{i,t-1} > \gamma)} [a_2 + \sum_{j=1}^p \beta_j^{(2)} g_{i,t-j} + \delta_j^{(2)} D_{i,t-j}] + \eta_i + u_{i,t}, \quad (2)$$

where $q_{i,t-1}$ is a weakly exogenous transition variable⁷, γ is an endogenously estimated threshold value, and $\mathbb{1}(\cdot)$ is an indicator variable that takes the value of 1 if the condition $(q_{i,t-1} > \gamma)$ is respected and 0, otherwise. The constant, the autoregressive coefficients, and the real impact of the crisis vary according to the regime (denoted as ⁽¹⁾ and ⁽²⁾), which is driven by the variable $q_{i,t}$. We assume that $u_{i,t}$ is a martingale difference sequence $E(u_{i,t}|F_{t-1})$.

This model (2) differs from that in Hansen (1999), as it allows for dynamics via the autoregressive parameters. We follow Hansen (2000), and instead of splitting the model (1) into a regime below the estimated threshold and the threshold discussed above, we estimate a model (1) for the whole sample and for one above this threshold. This process allows for a

⁶The delay of the recovery of output growth after a crisis can be calculated as $\frac{1}{1-\beta}$, where β is the autoregressive coefficient. It is obvious that as β nears 0, the adjustment lag goes to infinity. This calculation also stresses that the degree of persistence does not depend on the number of lags included but rather on the value of the autoregressive coefficients.

⁷The property is guaranteed by taking the lag of the globalization variable.

more precise estimation because more observations are available to estimate the first part of the model. The model can be

rewritten as follows for $p = 1$:⁸

$$g_{i,t} = a + \beta g_{i,t-1} + \delta D_{i,t-1} + \mathbb{1}_{(q_{i,t-1} > \gamma)}[a' + \beta' g_{i,t-1} + \delta' D_{i,t-1}] + \eta_i + u_{i,t}. \quad (3)$$

The interpretation of the δ' is now different from the $\delta_j^{(2)}$ in model (2). A significant coefficient for the crisis dummy in the second regime, i.e., when the transition variable exceeds the estimated threshold, indicates an excess (negative) impact of the crisis on output growth in a higher-globalization regime. In other words, it is possible to see whether, above a certain level of globalization, a crisis has a greater effect on real activity. The value of the constant a' is also important, as a significant and positive value would indicate that, above a certain level of globalization (γ), output growth would be higher on average, indicating that the benefits of globalization have accrued over time.

What is the intuition behind this model? Globalization supports growth over the long-term through the following channels: (i) trade openness and integration increase economic growth by (ia) increasing the market size of a country's production, and (ib) introducing competition among firms, while (ii) financial openness and integration boosts growth by (iia) enabling a more efficient allocation of capital, (iib) facilitating the transfer of technology and know-how, and by (iic) increasing opportunities for higher returns and for risk diversification. However, these benefits are not instantaneous. It takes time to open up and be competitive in larger markets, as well as to become more efficient in domestic production due to competition or imported funds and know-how.

⁸This lag order was first proposed by Candelon et al. (2016) and has been confirmed by the different information criteria in the current paper.

In addition, globalization makes the economy more vulnerable to crises (Ashenfelter et al. 2018), and once these crises occur, they have a negative impact on growth. In a higher-globalization regime, the impact of a crisis is also longer lasting, especially as crises tend to be correlated across countries and therefore disrupt trade and financial flows. The deeper the crisis is, the higher the disruption and the slower the recovery.

Compared to the model in Seo and Shin (2016), model (3) does not suffer from potential endogeneity bias. Indeed, it is likely that a banking, currency, or stock market crisis takes at least a year to transmit fully to real economic growth. The impact of a large downturn will also be felt after a year. This feature also simplifies the estimation technique, as Generalized Method of Moments (GMM) is not required,⁹ and a recursive generalized linear estimator provides a convergent and efficient estimate of (3).

As indicated by Hansen (1996), or by Andrews (1993, 1998), a trimming value is necessary for the implementation of the recursive GLM. If model (3) is estimated with γ at its historical minimum value, then the second part of the equation (when $q_{i,t-1} > \gamma$) would include only one observation, making it impossible to estimate. Hence, the common practice suggests using a 15 percent trimming value.¹⁰

We first test to see if the coefficients associated with the crisis dummy variables and output growth rates depend on the globalization level, and hence, the model is nonlinear. This is done via a block-bootstrap-based log likelihood ratio test, similar to that in Hansen (1996). The idea of the test is to consider different values of the threshold and to retain the one

⁹GMM estimation results are, nevertheless, presented in Section 6.

¹⁰The robustness checks with alternative trimming values are available upon request from the authors.

that maximises the likelihood. The linearity test evaluates if the difference between this likelihood and the one obtained for the linear model (i.e. without threshold) is significantly different from 0). Appendix 3 provides a formal description of this test. The rejection of the linearity hypothesis would support our hypothesis that globalization impacts the growth regime. In our second step, we check whether in the high-globalization regime, the constant is significant and positive and whether the coefficients associated with the crisis dummies are significant and negative. If this is so, one may conclude that while over the time globalization helps to increase growth rates, it also leads to a higher sensitivity of output growth response to a crisis. This idea implies that a new normal (also called hysteresis or secular stagnation) occurs when a crisis happens in a higher globalization regime. We estimate model (3) considering several globalization variables. We first estimate the system with the composite KOF Globalization Index and afterwards, with each of its subindices as a transition variable, one by one.

3. Data

Our database is based on three main data sources.¹¹ For real GDP growth, we use the IMF's World Economic Outlook (WEO) database, which includes data up to 2016.

To have the largest sample of crisis dummies, we construct a database using three available databases and our own calculations as follows: Reinhart and Rogoff's database includes data available for 70 countries from 1970 until 2010 on their website.¹² We use three of their seven dummies, namely, the ones that date and track the banking, currency, and stock market crashes, as the core of our database.¹³ To expand the sample to more countries and up to 2016, we use data from

¹¹Appendix 1 and 2 provide details on the dataset.

¹²<http://www.reinhartandrogoff.com/data/>

¹³We exclude the domestic or external debt default and restructuring crisis dummies, the inflation crisis dummy, and the year a country received

the Harvard Business School (HBS) database.¹⁴ We also calculate the dummies using the crisis definitions of Reinhart and Rogoff. For the remaining missing observations we download the corresponding data from the WEO (exchange rates and stock market indices) to build the currency and stock market dummy. For the banking crises dummies, we are completing using the systemic banking crises database of Laeven and Valencia (2012, 2018).¹⁵ This way, we manage to obtain crisis dummies for 102 countries from 1970 up to 2016 at a yearly frequency; Appendix 1 details the definition of the dummies and the country data across these databases.

As a globalization proxy, we consider the KOF Globalization Index (Dreher, 2006 and updated by Dreher et al., 2008) which is a composite indicator published by the Swiss Federal Institute of Technology Zurich. This index is the most inclusive measure of globalization, as it can be decomposed into 3 subindices on economic, social and political globalization (Potrafke, 2015). The economic globalization subindex aggregates data on the trade of goods and financial flows, as well as trade and capital account restrictions. The social globalization subindex includes data on personal contacts (such as international tourism and a foreign population), information flows, and cultural proximity, and the political globalization subindex includes data on country representation in international structures, as well as treaties.¹⁶ The (composite) KOF Globalization Index is the closest measure, consistent with the broader definition of globalization (Ashenfelter et al., 2017). It corresponds

its independence. We exclude the former because they were consistently insignificant in Candelon et al. (2016) and the latter since it is not very informative; the independence dummy takes the value of 1 for all countries in our sample, except for Angola from 1970-1975.

¹⁴<http://www.hbs.edu/faculty/initiatives/behavioral-finance-and-financial-stability/Pages/global.aspx>

¹⁵<https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Systemic-Banking-Crises-Database-An-Update-26015>. Data were transformed to be consistent with Reinhart and Rogoff, as the latter uses a more generic crisis definition than the former.

¹⁶The description and the weight for all components in the subindices can be found on the website <http://globalization.kof.ethz.ch/>.

to the process of creating connections between countries and is mediated through a variety of flows (not only capital and goods but also people, information, and ideas). The other advantage of the KOF Globalization Index is that it covers 192 countries. However, only 92 of those countries have the longest span of data, from 1970 up to 2014, and match the selection of countries in the expanded crisis dummy database. Our sample consists of a balanced panel of data for various indicators for 92 countries at a yearly frequency from 1970 to 2014. These countries represent all levels of income, as described later.

The evolution of the KOF Globalization Index and of the subcomponents over the sample is displayed in the graphs in Appendix 2. The charts show that globalization increases steadily over time, including the yearly average of the index, as well as the values for the index for the least or the most integrated country in a year (which vary each year). After a brief slowdown in the mid-eighties, countries on average sped up their globalization until 2007. However, there were no sudden stops nor strong accelerations. Economic globalization has increased at a faster pace since the mid-nineties, especially for the least open country. Looking again at the components of the index, this pattern is not counterintuitive. Many trade agreements have been negotiated and implemented at the time and are applicable to countries in our sample. The most important agreements were NAFTA and EU enlargements. Trade and financial flows increased, and restrictions (trade, or capital account) decreased. The increase in social globalization is slightly less pronounced, while political globalization saw a period of faster increase in the early nineties.

4. Results

The block-bootstrapped linearity test is performed and the dynamic panel model (3) is estimated via GLM, considering the overall KOF Globalization Index, as well the four subindices (economic and within that, the actual flows subindices for

social and political), sequentially as the transition variables. This process allows us to differentiate the impact of various globalization aspects on the new normal. The threshold estimate corresponds to the value that maximizes the log likelihood ratio. Confidence bounds are obtained via block bootstrap (with 10.000 replications), as described in Appendix 3.

4.1. Overall KOF Globalization Index as a transition variable

The results of the estimation using the overall KOF Globalization Index for globalization as a transition variable are reported in Table 1.

Table 1: Growth, Crises and Globalization - Overall KOF Globalization Index as a Transition Variable

	Full Sample	
	<i>Coeff.</i>	<i>sê.</i>
Intercept	2.806***	0.689
$g_{i,t-1}$	0.226***	0.017
$Banking_{i,t-1}$	-0.432	0.295
$Currency_{i,t-1}$	-0.630***	0.229
$Stock_{i,t-1}$	-1.900***	0.330
	Sample	
γ	> 64 [57 : 95]	
Intercept	0.480	0.335
$g_{i,t-1}$	-0.162***	0.039
$Banking_{i,t-1}$	-1.303***	0.509
$Currency_{i,t-1}$	0.443	0.571
$Stock_{i,t-1}$	-1.676***	0.531
Linearity test p-value < 1%		

Notes: This table reports the results of the estimations of model (3) including country fixed effects and using recursive GLM estimation methods. The trimming value is set to 15%, and the threshold confidence bound is obtained via block-bootstrap with 10.000 replications.

We observe first that the linearity hypothesis is rejected at usual significance levels. In addition, the coefficients for the banking and stock market crises are significant in a higher globalization regime. On the contrary, currency crises do not present a extra negative impact in high globalization regime. This difference of effect between currency and financial (banking and stock markets) crises has already been highlighted in Candelon et al. (2016). They show that advanced economies are more exposed to financial crises whereas currency crises harm growth in emerging and low incomes countries.¹⁷ Such a result

¹⁷This finding will be tested in Section 5.

is mainly due to low financial maturity in these latter countries. Still, the impact of a financial crisis on output growth thus depends on the degree of globalization.¹⁸

Second, the average threshold estimate for the overall KOF Globalization Index is 64. It is important to note that countries enter a new growth regime at different times. Table 1 also reports the estimated interval in which this threshold lies with a high probability, and Table 2 reports the years when countries cross this threshold of 64 for the overall KOF Globalization Index. Most of the countries cross this globalization threshold in the 1990s or early 2000s. We also note that the countries that are higher than the globalization threshold across the sample or from a much earlier stage are high-income countries. In the early 2000s, some middle- or low-income countries also cross this globalization threshold, but some pass this threshold later or never. This result helps us to develop clear and granular implications. Besides, it also indicates that our results are driven by the recent 2007-2008 financial crisis.

¹⁸The presence of 3 regimes is also tested and rejected.

Table 2: Dates and Countries Crossing the Overall KOF Globalization Index Estimated Threshold

	KOF	Overall			
			Kuwait	1992	over
				1993	under
				1994	over
Algeria	-	(under)	Lesotho	-	(under)
Argentina	1998	over	Luxembourg	-	(over)
	2001	under	Madagascar	-	(under)
Australia	1975	over	Malawi	-	(under)
Austria	1977	over	Malaysia	1996	over
Barbados	-	(under)	Mali	-	(under)
Belgium	-	(over)	Mauritania	-	(under)
Benin	-	(under)	Mauritius	2007	over
Bolivia	-	(under)		2009	under
Botswana	-	(under)		2010	over
Brazil	-	(under)			(under)
Burkina Faso	-	(under)	Mexico	-	(under)
Burundi	-	(under)	Morocco	2011	over
Cameroon	-	(under)	Nepal	-	(under)
Canada	-	(over)	Netherlands	-	(over)
Central African Republic	-	(under)	New Zealand	1988	over
Chad	-	(under)	Nicaragua	-	(under)
Chile	1999	over	Niger	-	(under)
Colombia	-	(under)	Norway	1975	over
Congo Democratic Republic	-	(under)	Pakistan	-	(under)
Costa Rica	-	(under)	Panama	2006	over
Cote d'Ivoire	-	(under)	Paraguay	-	(under)
Denmark	-	(over)	Peru	2007	over
Dominican Republic	2013	over	Philippines	-	(under)
Ecuador	-	(under)	Poland	1995	over
Egypt	-	(under)	Portugal	1992	over
El Salvador	2008	over	Republic of Korea	2007	over
	2009	under	Republic of the Congo	-	(under)
	2014	over	Romania	2004	over
Fiji	-	(under)	Rwanda	-	(under)
Finland	1984	over	Senegal	-	(under)
	1989	under	Seychelles	-	(under)
	1990	over	Sierra Leone	-	(under)
France	1979	over	Singapore	1978	over
Gabon	-	(under)	South Africa	2007	over
Germany	1985	over		2009	under
	1989	under		2010	over
	1991	under	Spain	1989	over
Ghana	-	(under)	Sudan	-	(under)
Greece	1993	over	Sweden	1973	over
Guatemala	-	(under)	Switzerland	1973	over
Guyana	-	(under)	Thailand	2009	over
Honduras	-	(under)	Togo	-	(under)
Hungary	1992	over	Trinidad and Tobago	-	(under)
Iceland	1994	over	Tunisia	-	(under)
India	-	(under)	Turkey	2004	over
Indonesia	-	(under)	United Kingdom	1972	over
Ireland	1977	over	United States	1978	over
Israel	1998	over	Uruguay	2000	over
Italy	1989	over		2001	under
Japan	2003	over		2004	over
Kenya	-	(under)	Venezuela	-	(under)
			Zambia	-	(under)

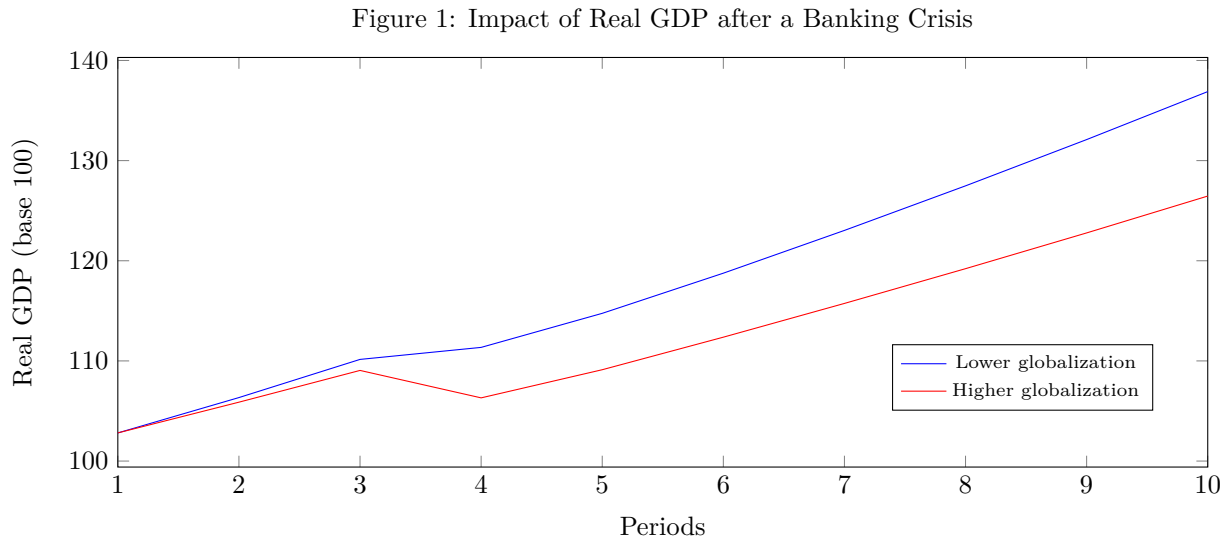
Third, when the economy is in a high-globalization regime, i.e., when the overall KOF Globalization Index is higher than 64, countries have about 0.48 percent higher output growth rates because the benefits from opening up and integrating have accrued over time. Even if this term is marginally significant, it nevertheless highlights the fact that globalization is beneficial for growth. Higher globalization brings not only higher short-term growth but also greater exposure to crises, in particular for banking and the stock market. In a higher-globalization regime, the occurrence of a banking and stock market crisis leads to a decline in growth by 1.3 and 1.7 percent, respectively. However, this effect is not permanent.

In a higher-globalization regime, the recovery is slower, as the autoregressive coefficient is lower. The coefficient needs to be added to the one for the whole sample, and in this case, the coefficient is therefore 0.064 (0.226-0.162). Albeit small, the coefficient on the autoregressive lag is different than zero, implying that a recovery for the higher output growth in this

regime will eventually occur, although very slowly. Currency crises do not negatively impact growth in a high-globalization regime. These findings are in line with Candelon et al. (2016) and Martin and Rey (2006). The latter notes the destabilizing effect of financial globalization on growth, whereas trade globalization remains beneficial.

Fourth, we observe that the autoregressive coefficients are significantly negative in the high-globalization regime, leading to an increase of the persistence of the crisis dummy. Such a finding is interesting as it highlights that crises shocks have higher duration when globalization is high.

Fifth, we simulate the output gdp in level from model (3) after the occurrence of a crisis. Figure 1 reports the paths obtained in a high (in red) and low (in blue) globalization regime. It remarkably mimics Blanchard’s (2018) Figure 1 (p.99), supporting the idea of the real long lasting effects of a financial crisis. It also illustrates that after a crisis output growth rate is much lower when globalization is high than when it is low.



Notes: This figure reports the impact of a banking crisis on real GDP. Crisis occurs at time 3 on the x-axis. This figure remarkably mimics Blanchard’s (2018) Figure 1 (p.99), supporting the idea of the real persistent effects of a financial crisis.

Our results are also consistent with the stylized facts reported in the 2017 Annual Report of the Bank of International Settlements. Globalization leads first to higher growth driven by larger trade gains but also to higher financial exposure,

which comes with negative consequences. A high level of globalization is thus associated with a new normal period during which financial crises (banking and stock market) threaten world growth. As shown in Table 2 and Figure 1, only about half the countries pass this estimated threshold at least one.¹⁹ The other countries can still benefit from higher short-term growth by opening up and integrating in the global economy.

4.2. The KOF subcomponents as transition variables

The estimation can now be repeated with the subcomponents of the KOF Globalization Index as the transition variable. The results reported in Table 3 are similar to the ones obtained using the overall KOF Globalization Index. Looking at the subindex of economic globalization and the actual flows subindex, we observe that in a higher-globalization regime, average growth is higher by about 1.5 percent, and banking and stock market crises also have a much stronger negative impact on growth, by an extra 2 percent. This is in line with other papers, i.e. Candelon et al. (2016) and Martin and Rey (2006) (based on partial linear models), which show that trade globalization contributes positively and significantly to higher growth. In a nonlinear setting, Calderón et al. (2004) find that trade and financial openness also have a positive effect on growth.

We also observe that in the case of economic and actual flows, the estimated thresholds are higher, 73 and 76, respectively, and the confidence interval is much tighter. Looking at our data, we note that only one-third of the countries exceed these thresholds by 2014. These are the high-income countries that tended to exceed these thresholds in the mid-nineties or earlier. These and the earlier results stress the importance of the link between the new normal and globalization as a recent phenomenon, even if it is not driven by the most recent global financial crisis.

¹⁹The crossing process is not continuous and at time date some countries can cross upward or downward the threshold.

We also notice that that growth is higher in a regime of high social and political globalization. The estimated threshold are even significantly lower than the ones obtained for the economic and actual flows subindices. The positive effect of political globalization confirms the results of Rodrik (1999), which show that weak institutions (in particular in conflict management) leads to lower growth. It is noticeable that political dimension of globalization does not amplify the transmission of banking and currency shocks. Such a finding is not surprising as higher political integration signifies higher coordinated actions (as loans from institutional organisations or bilateral financial support) aiming at smoothing the potential effects of crises. Even if the effects of such strategies are debatable, the transmission of crises on output growth is not exacerbated in high political globalization regimes. The impact of social globalization on growth is positive²⁰ but not significantly different from 0. It highlights the importance of labor mobility as well as technology in the structural change process (in particular for natural resource rich countries and low income countries), but also indicates that economic globalization is more important in the transmission of financial crises to growth. Finally, whatever the KOF subindex, it turns out that the autoregressive coefficient becomes negative in high globalization regime, indicating an higher persistence of the crisis shock.

In early 2018, the KOF index was decomposed into a "de facto" part and a "de jure" part (see Gygli et al., 2019). The first subindex includes variables that represent flows and activities and thus refers to a "de facto" measure, whereas de jure measures include variables that represent policies which, in principle, enable flows and activities. Table (4) reports the outcomes of the estimation of equation (3) for these two subindices.

²⁰See McMillan and Rodrik (2011) and McMillan, Rodrik and Sepulveda (2017).

Table 3: Growth, Crises and Globalization - KOF Globalization subindices as Transition Variables

	KOF Economics		KOF Actual Flows		KOF Social		KOF Political	
	$\hat{Coef}f.$	$\hat{s}e.$	$\hat{Coef}f.$	$\hat{s}e.$	$\hat{Coef}f.$	$\hat{s}e.$	$\hat{Coef}f.$	$\hat{s}e.$
Full Sample								
Intercept	2.725***	0.682	2.747***	0.685	2.804***	0.689	2.602***	0.700
$g_{i,t-1}$	0.239***	0.016	0.234***	0.016	0.228***	0.017	0.262***	0.020
$Banking_{i,t-1}$	-0.526**	0.265	-0.599**	0.257	-0.444	0.283	-0.518	0.582
$Currency_{i,t-1}$	-0.478**	0.218	-0.482**	0.217	-0.605***	0.223	-0.912**	0.356
$Stock_{i,t-1}$	-2.132***	0.292	-2.155***	0.283	-2.166***	0.307	-1.236	0.824
Sample	$\gamma > 73$ [54 – 76]		$\gamma > 76$ [60 – 77]		$\gamma > 65$ [49 – 69]		$\gamma > 56$ [43 – 56]	
Intercept	1.992***	0.345	1.717***	0.351	0.391	0.337	0.950***	0.269
$g_{i,t-1}$	-0.551***	0.056	-0.404***	0.051	-0.174***	0.039	-0.153***	0.031
$Banking_{i,t-1}$	-2.474***	0.589	-2.008***	0.671	-1.417***	0.531	-0.579	0.638
$Currency_{i,t-1}$	-0.266	0.692	-0.167	0.721	0.713	0.650	0.502	0.434
$Stock_{i,t-1}$	-1.917***	0.604	-2.170***	0.677	-1.393**	0.570	-1.443*	0.861
L. test $P - value$	< 1%		< 1%		< 1%		< 1%	

Notes: This table reports the results of the estimations of model (3) including country fixed effects and using recursive GLM estimation methods. Coefficient estimators are reported as $\hat{Coef}f.$ and the estimated standard errors as $\hat{s}e.$. ***, ** and * indicate significance at 1, 5 and 10% confidence level. The trimming value is set to 15%, and the threshold confidence bound is obtained via block-bootstrap.

Table 4: Growth, Crises and Globalization - KOF Globalization Indices "de facto" and "de jure" as Transition Variables

Full Sample				
	de facto		de jure	
	$\hat{Coef}f.$	$\hat{s}e.$	$\hat{Coef}f.$	$\hat{s}e.$
Intercept	2.730***	0.688	2.453***	0.715
$g_{i,t-1}$	0.244***	0.017	0.086***	0.026
$Banking_{i,t-1}$	-0.509*	0.289	0.125	0.707
$Currency_{i,t-1}$	-0.528**	0.229	-1.087**	0.451
$Stock_{i,t-1}$	-2.072***	0.328	1.376	1.198
Sample				
	> 64 [52 : 67]		> 39 [38 : 40]	
Intercept	0.707**	0.349	0.270	0.306
$g_{i,t-1}$	-0.253***	0.038	0.168***	0.032
$Banking_{i,t-1}$	-1.302**	0.515	-0.953	0.750
$Currency_{i,t-1}$	0.053	0.561	0.812	0.505
$Stock_{i,t-1}$	-1.327**	0.521	-4.082***	1.220
L. test $P - value$	< 1%		< 1%	

Notes: This table reports the results of the estimations of model (3) including country fixed effects and using recursive GLM estimation methods. Coefficient estimators are reported as $\hat{Coef}f.$ and the estimated standard errors as $\hat{s}e.$. ***, ** and * indicate significance at 1, 5 and 10% confidence level. The trimming value is set to 15%, and the threshold confidence bound is obtained via block-bootstrap.

It turns out that the results obtained with the "de facto" subindex look similar to those reported in Table (1) with the overall KOF globalization Index. In contrast, the "de jure" subindex provides a different finding, as it only considers the policies in place and not the flows they are conveying.

5. Results for Income-per-capita Groups of Countries

Even if the fixed effect terms are specified to address the potential unobserved heterogeneity among the countries in models (1) through (3), it is obvious that the impacts of crises on output growth might differ over some country clusters. Candelon et al. (2016) consider the income per capita classification of the World Bank and create homogeneous groups of countries. They observe that banking crises negatively impact output growth in high-income countries, whereas currency crises deteriorate growth in middle-income countries. In this study, using similar clusters (high/middle/low-income countries) is not feasible due to a lack of data that are needed to estimate the threshold and the confidence bounds. Hence, we estimate equation (3) for two groups of countries that we can cluster: the high-income countries (OECD and non-OECD) in one group and the middle-and low-income countries in the second group. The results are reported in Tables 5 and 6.

Table 5: Growth, Crises and Globalization - High-income Countries

	KOF Overall		KOF Economics		KOF Actual Flows		KOF Social		KOF Political	
	$\hat{Coeff.}$	$s\hat{e.}$	$\hat{Coeff.}$	$s\hat{e.}$	$\hat{Coeff.}$	$s\hat{e.}$	$\hat{Coeff.}$	$s\hat{e.}$	$\hat{Coeff.}$	$s\hat{e.}$
Full Sample										
Intercept	2.410***	0.738	2.322***	0.651	2.345***	0.643	2.309***	0.699	1.570*	0.857
$g_{i,t-1}$	0.375***	0.038	0.368***	0.027	0.364***	0.027	0.392***	0.039	0.413***	0.034
$Banking_{i,t-1}$	0.184	0.642	-0.233	0.418	-0.400	0.365	0.161	0.538	2.622	1.72
$Currency_{i,t-1}$	-0.271	0.483	-0.128	0.391	-0.050	0.363	-0.239	0.428	0.935	0.972
$Stock_{i,t-1}$	-2.025***	0.539	-2.015***	0.396	-2.122***	0.361	-2.349***	0.454	-2.610*	1.425
Sample	$\gamma > 64$ [63 : 65]		$\gamma > 48$ [48 : 64]		$\gamma > 73$ [58 : 76]		$\gamma > 65$ [65 : 67]		$\gamma > 50$ [50 : 53]	
Intercept	1.156***	0.395	2.534***	0.334	2.668***	0.359	1.091***	0.354	2.735***	0.609
$g_{i,t-1}$	-0.315***	0.050	-0.737***	0.056	-0.736***	-0.057	-0.332***	0.050	-0.438***	0.048
$Banking_{i,t-1}$	-1.883**	0.750	-2.913***	0.625	-2.886***	0.692	-2.022***	0.676	-4.418**	1.750
$Currency_{i,t-1}$	-0.002	0.689	-0.578	0.692	-1.333*	0.794	0.269	0.701	-1.624	1.024
$Stock_{i,t-1}$	-1.226*	0.667	-2.073***	0.613	-2.237***	0.671	-0.967	0.633	-0.195	1.457
L. test $P - value$	< 1%		< 1%		< 1%		< 1%		< 1%	

Notes: This table reports the results of the estimations of model (3) including country fixed effects and using recursive GLM estimation methods. Coefficient estimators are reported as $\hat{Coeff.}$ and the estimated standard errors as $s\hat{e.}$. ***, ** and * indicate significance at 1, 5 and 10% confidence level. The trimming value is set to 15%.

The results are consistent with Candelon et al. (2016), regardless of whether we are using the KOF Overall Globalization

Table 6: Growth, Crises and Globalization - Middle- and Low-income Countries

	KOF Overall		KOF Economics		KOF Actual Flows		KOF Social		KOF Political	
	$\hat{Coeff.}$	$\hat{s.e.}$	$\hat{Coeff.}$	$\hat{s.e.}$	$\hat{Coeff.}$	$\hat{s.e.}$	$\hat{Coeff.}$	$\hat{s.e.}$	$\hat{Coeff.}$	$\hat{s.e.}$
Full Sample										
Intercept	0.983	0.834	1.799**	0.822	2.122***	0.824	2.632***	0.762	0.669	0.849
$g_{i,t-1}$	0.166***	0.039	0.083*	0.044	0.176**	0.040	0.075***	0.032	0.303***	0.044
$Banking_{i,t-1}$	-0.251	1.067	-0.470	1.006	-0.685	0.899	-0.310	1.022	-0.123	0.950
$Currency_{i,t-1}$	0.394	0.650	1.876***	0.714	0.595	0.606	-0.972*	0.527	-0.195	0.634
$Stock_{i,t-1}$	5.346	3.412	2.158	1.994	0.436	1.250	0.174	1.440	2.474	1.757
Sample	$\gamma > 27$ [27 : 28]		$\gamma > 24$ [24 : 27]		$\gamma > 29$ [25 : 30]		$\gamma > 16$ [15 : 16]		$\gamma > 39$ [34 : 43]	
Intercept	1.997***	0.439	1.202***	0.418	0.907**	0.421	-0.020	0.351	2.358***	0.464
$g_{i,t-1}$	0.025	0.045	0.128***	0.049	0.022	0.046	0.188***	0.041	-0.143***	0.050
$Banking_{i,t-1}$	-0.313	1.126	-0.110	1.058	0.055	0.961	-0.191	1.082	-0.521	1.008
$Currency_{i,t-1}$	-1.148	0.710	-2.786***	0.759	-1.469**	0.663	0.632	0.607	-0.448	0.695
$Stock_{i,t-1}$	-7.692**	3.429	-4.574**	2.024	-2.982**	1.311	-2.583*	1.489	-4.971***	1.793
L. test $P - value$	< 1%		< 1%		< 1%		< 1%		< 1%	

Notes: This table reports the results of the estimations of model (3) including country fixed effects and using recursive GLM estimation methods. Coefficient estimators are reported as $\hat{Coeff.}$ and the estimated standard errors as $\hat{s.e.}$. ***, ** and * indicate significance at 1, 5 and 10% confidence level. The trimming value is set to 15%, and the threshold confidence bound is obtained via block-bootstrap.

Index or the economic and actual flows subindices. Over the length of the sample, all groups of countries have a higher output growth rate once globalization increases. Moreover, in a higher-globalization regime, banking crises negatively affect growth in high-income countries, and as in Martin and Rey (2006), currency crises negatively affect growth in low- and middle-income countries.

The globalization threshold estimates are much lower for middle- and low-income countries (approximately 27) than those of high-income countries (approximately 64). This result is not counterintuitive. The KOF data show that low-income countries pass on average this threshold in the mid-nineties, while middle-income countries have a higher overall KOF Globalization Index than this estimated threshold since the 1970s. Currency crises happen in at least one country of this subsample each year, with the majority of the countries being in at least one currency crisis after 1980. It therefore indicates that the findings obtained are not exclusively driven by the recent 2007 – 2008 global crisis. In addition, albeit precisely identified, this threshold represents information from many series: output growth, the globalization index, and the financial crisis dummies. This means that the estimated threshold is indicative of when the benefits of globalization on growth accrue over time and also of when vulnerabilities stemming from openness and integration may lead to lower growth following a

crisis. This group of countries benefits sooner from opening up, but they also become more vulnerable to a financial crisis.

Such a finding reinforces the results of Martin and Rey (2006) in a highly globalized environment.

On average, low-income countries have higher GDP growth by approximately 1–2 percent once they reach this threshold, suggesting that there are considerable rewards to be enjoyed due to trade and financial integration. Most importantly, across the sample, financial openness and integration do not have a long-lasting effect on growth as the autoregressive coefficient are positive or not significantly different from 0 for middle/low income countries. It implies that crises are less persistent for these countries than in the high-incomes ones (for which autoregressive coefficients are negative and significant). The reasons for such a result are not straightforward and should be the topic of further studies. Still, we can think about convergence effect, i.e. the poorest countries tend to grow faster than the richest ones, or the insulation from the banking sector. However, in a higher-globalization regime, only currency and stock market crises affect growth more negatively in middle/low income countries. Interestingly, the impact of stock market crises on growth is at least as important as in the group of high-income countries. This result is not surprising, as many of these countries have insulated banking systems but shallow and highly illiquid markets. Hence, once a currency or stock market crisis occurs in a middle or low-income country that opens up, output growth will be negatively impacted. These consequences would be limited for a high-income country benefiting from mature and large financial markets. In this respect, Broner and Ventura (2016) emphasize that a careful plan of economic development and financial globalization could lead to higher growth and investment, while avoiding low growth equilibrium, including for the lowest-income countries.

It also appears that in the case of the middle/low income countries, extra growth and higher exposure to currency and

stock market crises is significant in a regime of high economics integration. On the contrary, when looking at the regime of high social integration, it turns out that output growth remains unchanged as well as the effect of the banking and currency crises. Only the autoregressive parameter is significantly and positive. It thus indicates that social globalization mitigates the effect of crises in middle/low income countries but at the cost of growth. Such a result is different in high income countries, for which all types globalization (including social one) reinforce output growth and exposure to banking crises rise.

6. Robustness Check

Two types of robustness checks are performed to enhance our results. In the first step, we estimate the dynamic panel model (3) considering now contemporaneous regressors and therefore using GMM estimators.²¹ So far, we have assumed that banking, currency, or stock market crisis takes at least a year to transmit fully to real economic growth. This assumption is now released, but to avoid potential endogeneity biases, we perform GMM estimation with up to four lagged endogenous variables as instruments. Overall, the results of the GMM estimation (reported in Table 7) are consistent with the ones obtained in the previous section, where we used the GLM estimation (reported in Tables 1 and 3). The GMM estimated threshold is lying in the block-bootstrapped confidence bound previously estimated. Moreover, in the high-globalization regimes, we also observe higher GDP growth (positive constant) and negative and significant autoregressive coefficients, indicating model (1) persistently lower growth once a financial crisis occurs. Indeed, the coefficients of the banking and stock market crises dummies are significant and negative when looking at the overall and economic subindices. These findings highlight the benefits (higher growth), and drawbacks (higher exposure to financial crises) of globalization.

²¹The regressors considered here are the contemporaneous observations of the exogenous variables.

Table 7: Growth, Crises and Globalization - KoF Subcomponents as Transition Variables; Robustness Check: Contemporaneous Regressors

	KoF Overall		KoF Economics		KoF Actual Flows		KoF Social		KoF Political	
	<i>Coëff.</i>	<i>sê.</i>	<i>Coëff.</i>	<i>sê.</i>	<i>Coëff.</i>	<i>sê.</i>	<i>Coëff.</i>	<i>sê.</i>	<i>Coëff.</i>	<i>sê.</i>
Full Sample										
Intercept	2.209***	0.857	2.182**	0.858	2.211**	0.860	1.871**	0.754	1.865**	0.923
$g_{i,t-1}$	0.402***	0.026	0.406***	0.025	0.402***	0.026	0.491***	0.027	0.500***	0.042
$Banking_{i,t}$	-0.170	0.241	-0.344*	0.205	-0.368*	0.199	-0.037	0.230	-0.220	0.549
$Currency_{i,t}$	-0.182	0.238	-0.081	0.219	-0.127	0.220	0.056	0.228	-0.311	0.439
$Stock_{i,t}$	-1.967***	0.259	-2.187***	0.232	-2.127***	0.223	-2.121***	0.250	-1.003*	0.583
	$\gamma > 64$		$\gamma > 78$		$\gamma > 79$		$\gamma > 51$		$\gamma > 69$	
Intercept	0.693**	0.309	0.534**	0.234	0.339	0.308	1.314***	0.351	1.528***	0.357
$g_{i,t-1}$	-0.129**	0.052	-0.168***	0.060	-0.122**	0.062	-0.300***	0.067	-0.268***	0.057
$Banking_{i,t}$	-1.184***	0.333	-1.017**	0.396	-0.730	0.473	-1.619***	0.397	-0.624	0.591
$Currency_{i,t}$	0.164	0.384	-0.403	0.486	0.162	0.556	-0.187	0.400	0.062	0.483
$Stock_{i,t}$	-1.517***	0.422	-1.467***	0.455	-2.039***	0.526	-1.302***	0.423	-1.638***	0.618
<i>L - test P - value</i>	< 1%		< 1%		< 1%		< 1%		< 1%	

Notes: This table reports the results of the estimations of model (3) including country fixed effects and using recursive GMM estimation methods. Coefficient estimators are reported as *Coëff.* and the estimated standard errors as *sê.* * *, * and * indicate significance at 1, 5 and 10% confidence level. The trimming value is set to 15%.

We perform a second robustness check to see if the regime shifts could be driven by other variables instead of the KOF Globalization Index. In other words, a more negative impact of a financial crisis on output growth could be driven by factors other than globalization, such as oil prices. Since oil prices are important drivers of trade and contribute 22 percent to the KOF economic subindex,²² one could question whether our findings are not driven by oil price movements instead of globalization. Indeed, oil price variations impact countries current account (for exporters as well as importers) affecting hence growth but also the probability of a financial crisis. We estimate model (3) and for the transition variable, instead of using the KOF Globalization Index, we use the price of the Brent from the Federal Reserve Bank of Saint Louis (<https://fred.stlouisfed.org/series/DCOILBRENTU>). Table (8) reports the outcomes of the estimation.

In this case, the null hypothesis is that there is only one growth regime, independent of the level of the oil price. Since the LR-test p-value is below the usual confidence level, and since the coefficients of the crises dummies are significant in the growth regime above the estimated threshold, the linearity hypothesis is rejected. Three major differences can be observed

²²See noted in the "Indices and variables" description document related to the KOF Globalization Index.

Table 8: Growth, Crises and Globalization - Oil Price as the Transition Variable

	<i>Coëff.</i>	<i>sê.</i>
Full Sample		
Intercept	3.241***	0.692
$g_{i,t-1}$	0.110***	0.020
$Banking_{i,t}$	-1.001***	0.333
$Currency_{i,t}$	-0.875***	0.299
$Stock_{i,t}$	-1.861***	0.382
Sample $\gamma > 38$		
Intercept	-1.206***	0.206
$g-1$	0.208***	0.031
$Banking_{i,t}$	0.397	0.467
$Currency_{i,t}$	0.820**	0.389
$Stock_{i,t}$	-1.172**	0.498
L-test P-value < 1%		

Notes: This table reports the results of the estimations of model (3) including country fixed effects and using recursive GLM estimation methods. Coefficient estimators are reported as *Coëff.* and the estimated standard errors as *sê.* * * *, ** and * indicate significance at 1, 5 and 10% confidence level. The trimming value is set to 15%, and the price of Brent is used as the transition variable

compared to the results in Table 1. First, the banking crisis dummy is not significant when the Brent price exceeds the threshold of 38 US dollars per barrel. Hence, a regime driven by oil prices does not have greater exposure to banking crises, whereas in the previous estimations, globalization does.

7. Conclusions and Policy Implications

The academic literature has shown that trade openness and integration increase economic growth. Financial openness and integration boost growth, but they also make the economy more vulnerable to crises and could impact growth negatively. By expanding Cerra and Saxena (2008) to a model with two growth regimes depending on the level of globalization we are able to weave a tale with these two opposite narratives. Globalization (especially economic one) increases the growth rate of output significantly over the sample for all groups of countries, and it also exposes a country to a larger negative impact on short-term growth from a financial crisis. In particular, high-income countries in a high-globalization regime face larger negative effects on growth from banking and stock market crises. Middle/Low-income countries in a high globalization regime face larger negative effects on growth from currency and stock market crises. For middle/low income countries the benefits and vulnerabilities accrue earlier in the globalization process (the globalization threshold of switching from one

growth regime to the other is lower than for income countries). The results are robust to various specifications, and are not driven by the recent crisis.

As such, the contribution of this paper extends the existing literature threefold. It thoroughly documents the existence of a persistent lower output growth after a financial crisis, labeled as "new normal". These results are consistent with the recent academic literature explaining lower economic output following the most recent global financial crisis (Eggertsson et al., 2016; Eggertsson et al., 2019; Romer and Romer 2017; Blanchard, 2018). It also expands the crisis dummy databases to over one hundred countries up to 2014.

More importantly, it reconciles the earlier findings in the literature regarding the two opposite narratives of the effect of globalization on output growth. We provide empirical evidence that globalization is good for growth, up to a point, unless sound policies are in place to mitigate the negative effects stemming from increased vulnerabilities brought by globalization. To the best of our knowledge, this is the only study that encompasses, and therefore can explain, both sets of results. Our empirical analysis provides support for the recent conjectures made by Cecchetti (2012) and Shin (2017), that stress that globalization is beneficial up to a certain point, unless policies are in place to mitigate the negative effects on growth from financial crises.

This paper points that a globalization reversal would not be optimal, as many countries have room to benefit from opening up and integrating more into the global markets. Highly globalized countries benefit from a higher growth but could face persistently lower growth if they are hit by a financial crisis. Therefore, sound financial regulation and supervision, and macroeconomic policies, are needed to help countries reap the benefits of globalization on output growth over time, and

avoid the long lasting negative growth effects following a financial crisis.

References

- Acemoglu, Daren, Pierre Yared, 2010. "Political Limits to Globalization." *American Economic Review*, 100(2): 83-88.
- Aguiar, Mark and Gita, Gopinath, 2007. "Emerging Market Business Cycles: The Cycle Is the Trend," *Journal of Political Economy*, 115: 69-102.
- Andrews, Donald WK., 1993. "Tests for Parameter Instability and Structural Change with Unknown Change Point." *Econometrica: Journal of the Econometric Society*: 821-856.
- Azariadis, Costas, Allan Drazen, 1990. "Threshold Externalities in Economic Development," *The Quarterly Journal of Economics*. 105(2): 501-526.
- Blanchard, Olivier, 2018. "Should We Reject the Natural Rate Hypothesis?" *Journal of Economic Perspectives*, 32 (1): 97-120.
- Broner, Fernando, and Jaime Ventura, 2016. "Rethinking the Effects of Financial Globalization." *Quarterly Journal of Economics*, 131(3): 1497-1542, August.
- Bank of International Settlements, 87th 2017 Annual Report, chapter VI "Understanding Globalization", pp. 97-124, June 25.
- Calderón, C., N. Loayza, and K. Schmidt-Hebbel, 2004. "External Conditions and Growth Performance," in External Vulnerability and Preventive Policies, edited by R. J. Caballero, C. Calderón, and L. F. Céspedes. Santiago: Central Bank of Chile.
- Candelon, Bertrand, Alina Carare, and Keith Miao, 2016. "Revisiting the New Normal Hypothesis." *Journal of International Money and Finance* 66 : 5-31.
- Cerra, Valerie and Sweta Chaman Saxena, 2008. "Growth Dynamics: the Myth of Economic Recovery." *The American Economic Review* 98: 439-457.
- Cecchetti, Stephen, 2012. "Is Globalization Great?". Bank of International Settlements Papers, 69: 1-6.
- Chen, Kan and Crucini, Mario J., 2016. "Trends and Cycles in Small Open Economies: Making the Case for a General Equilibrium Approach." *Journal of Economic Dynamics and Control*, 72(C): 159-168.
- Christensen, Jens HE, and Glenn D. Rudebusch, 2017. "A new normal for interest rates? Evidence from inflation-indexed debt." *Review of Economics and Statistics* : 1-46.
- Coeuré, Benoit, 2017. "Scars or Scratches? Hysteresis in the Euro Area." Speech given at the International Center for Monetary and Banking Studies, Geneva, May 19.
- Davis, Ian, 2009. "The New Normal", McKinsey Quarterly, March.
- Dreher, Axel, Noel, Gaston, and Pim, Martens, 2008. "Measuring Globalisation: Gauging its Consequences." Springer Science & Business Media.
- Dreher, Axel, 2006. "Does Globalization Affect Growth? Evidence from a New Index of Globalization." *Applied Economics* 38(10): 1091-1110.
- Eggertsson, Gauti B., Neil R. Mehrotra, and Jacob A. Robbins, 2019. "A model of secular stagnation: Theory and quantitative evaluation." *American Economic Journal: Macroeconomics* 11.1 : 1-48.
- Eggertsson, Gauti B., Neil R. Mehrotra, and Lawrence H. Summers, 2016. "Secular Stagnation in the Open Economy." *American Economic Review* 106(5): 503-07.
- El-Erian, Mohamed, 2009. "A New Normal", PIMCO Secular Outlook, May.
- Fischer, Stanley, 2003. "Globalization and Its Challenges." *American Economic Review*, Vol. 93 (2): 1-30.
- Grossman, Gene, Elhanan Helpman. "Globalization and Growth". *American Economic Review*, Vol. 93 (2), (2015): 100-104.
- Gygli, Savina, Florian Haelg, Niklas Potrafke and Jan-Egbert Sturm, 2019. "The KOF Globalisation Index - Revisited", *Review of International Organizations*.

- Hansen, Bruce E., 2000. "Sample splitting and threshold estimation." *Econometrica* 68.3: 575-603.
- Hansen, Bruce E., 1999. "Threshold effects in non-dynamic panels: Estimation, testing, and inference." *Journal of Econometrics* 93.2: 345-368.
- Hansen, Bruce E., 1996. "Inference when a nuisance parameter is not identified under the null hypothesis." *Econometrica: Journal of the econometric society* : 413-430.
- Jermann, Urban, and Vincenzo Quadrini, 2012. "Macroeconomic Effects of Financial Shocks." *American Economic Review*, 102 (1): 238-71.
- Laeven, Luc, and Fabian Valencia, 2018. "Systemic banking crises revisited". International Monetary Fund.
- Laeven, Luc, and Fabian Valencia, 2012. "Systemic Banking Crises Database." *IMF Economic Review* 61(2): 225-270.
- McMillan, Margaret S. & Dani Rodrik, 2011. "Globalization, Structural Change and Productivity Growth," NBER Working Papers 17143.
- McMillan, Margaret S., Dani Rodrik and Claudia Sepulveda, 2017. "Structural Change, Fundamentals and Growth: A Framework and Case Studies," NBER Working Papers 23378.
- Martin, Philippe and Hélène Rey, 2006. "Globalization and Emerging Markets: With or Without Crash?" *American Economic Review*. 96(5): 1631-1651.
- Mendoza, Enrique G., and Vincenzo Quadrini, 2010. "Financial Globalization, Financial Crises and Contagion." *Journal of Monetary Economics* 57(1): 24-39.
- Minier, Jenny. "Nonlinearities and Robustness in Growth Regressions." *American Economic Review* vol. 97 (2), (2007): 388-392.
- Potrafke, Niklas, 2015. "The Evidence on Globalisation." *The World Economy*. 38(3): 509-552.
- Reinhart, Carmen M., and Kenneth S. Rogoff, 2011. "This time is different Chartbook: Country Histories on Debt, Default and Financial Crises?". NBER Working Paper 15815, March (2010). Published also in Decade of Debt (Washington: Peterson International Economics Institute, 2011). Data available at: <http://www.reinhartandrogoff.com/data/> or <http://www.carmenreinhardt.com/data/browse-by-topic/topics/7/>
- Reinhart, Carmen M., and Kenneth S. Rogoff, 2009. "The aftermath of financial crises." *American Economic Review* 99.2 : 466-72.
- Rodrik, Dani, 1999. "Where Did All the Growth Go? External Shocks, Social Conflict, and Growth Collapses," *Journal of Economic Growth*, 4(4): 385-412.
- Romer, Christina D. and David H. Romer, 2017. "New Evidence on the Aftermath of Financial Crises in Advanced Countries", *The American Economic Review*. 107(10): 3072-3118
- Romer, Paul, 2010. "What Parts of Globalization Matter for Catch-up Growth." *The American Economic Review* Vol. 100(2) : 94-98.
- Seo, Myung Hwan, and Yongcheol Shin, 2016. "Dynamic Panels with Threshold Effect and Endogeneity." *Journal of Econometrics* 195(2): 169-186.
- Summers, Lawrence, 2014. "Fiscal Policy and Full Employment." Speech at Center for Budget and Policy Priorities Event on Full Employment, April 2.

Appendix 1: Data

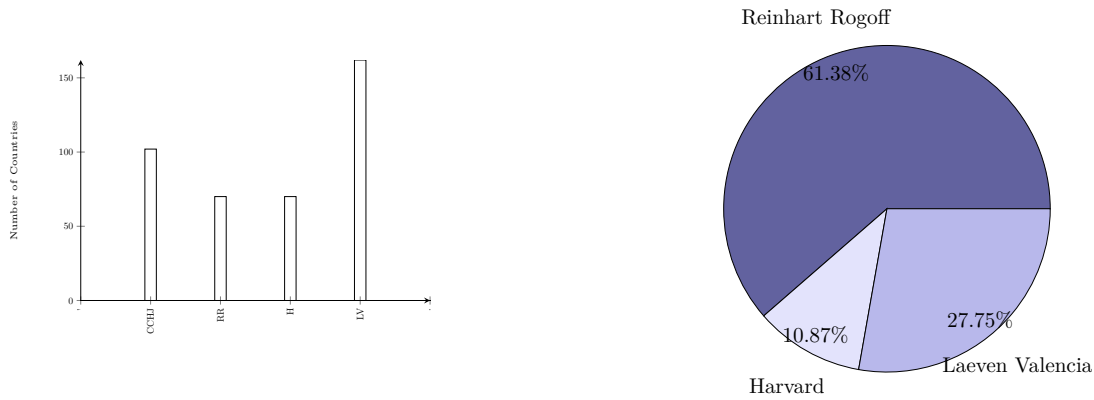
Detailed Definitions of Crises (Reinhart and Rogoff, 2009)

- **Banking:** A bank run that leads to the closure, merger, or takeover, by the public sector, of one or more financial institutions. If there are no runs, a banking crisis is considered when there is a closure, merger, and takeover, or large-scale government assistance of an important financial institution (or group of institutions), which marks the start of a string of similar outcomes for other financial institutions.
- **Currency:** An annual depreciation of 15 percent or more against the US dollar (or the relevant anchor currency -historically, the UK pound, the French franc, or the German DM, and presently, the euro).
- **Stock:** A cumulative decline of 25 percent or more in real equity prices.

New Database Creation

The objective of this subsection consists in describing the original database we created to harmonize the existing ones, which where covering different sets of countries and different sample sizes.

Figure 1: Source data



Notes: The first figure (on the left side) represents the number of countries covered by each data sources. CCHJ: (anonymous authors of this paper), RR: Reinhart Rogoff, H: Harvard Business School, LV: Laeven Valencia. The second figure (on the right side) represents the sources of the CCHJ (anonymous authors of this paper) database. Reinhart Rogoff (1970-2010), Harvard Business School (1970-2017), Laeven Valencia (1970-2016).

Table 1: Banking crisis

Country	Banking Crisis
Algeria	1990, 1991, 1992, 1993, 1994
Argentina	1980, 1981, 1982, 1989, 1990, 1991, 1995, 2001, 2002, 2003
Australia	
Austria	2008, 2009, 2010, 2011
Barbados	
Belgium	2008, 2009, 2010, 2011, 2012, 2013, 2014
Benin	1988, 1989, 1990, 1991, 1992
Bolivia	1986, 1994
Botswana	
Brazil	1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998
Burkina Faso	1990, 1991, 1992, 1993, 1994
Burundi	1994, 1995, 1996, 1997, 1998
Cameroon	1987, 1988, 1989, 1990, 1991, 1995, 1996, 1997
Canada	
Central African Rep.	1976, 1977, 1978, 1979, 1980, 1981, 1982, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999
Chad	1983, 1992, 1993, 1994, 1995, 1996
Chile	1981, 1982, 1983, 1984, 1985
Colombia	1982, 1998, 1999, 2000
Congo, Dem. Rep.	1983, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998
Congo, Rep.	1992, 1993, 1994
Costa Rica	1987, 1988, 1989, 1990, 1991, 1994, 1995
Cote d'Ivoire	1988, 1989, 1990, 1991, 1992
Denmark	2008, 2009, 2010, 2011, 2012, 2013, 2014
Dominican Republic	2003, 2004
Ecuador	1982, 1983, 1984, 1985, 1986, 1998, 1999, 2000, 2001, 2002
Egypt, Arab Rep.	1980
El Salvador	1989, 1990
Fiji	
Finland	1991, 1992, 1993, 1994, 1995
France	2008, 2009, 2010, 2011, 2012, 2013, 2014
Gabon	
Germany	2008, 2009, 2010, 2011
Ghana	1982, 1983
Greece	2008, 2009, 2010, 2011, 2012, 2013, 2014
Guatemala	
Guyana	1993
Honduras	
Hungary	1991, 1992, 1993, 1994, 1995, 2008, 2009, 2010, 2011, 2012, 2013, 2014
Iceland	2008, 2009, 2010, 2011, 2012, 2013, 2014
India	1993
Indonesia	1997, 1998, 1999, 2000, 2001
Ireland	2008, 2009, 2010, 2011
Israel	
Italy	2008, 2009, 2010, 2011, 2012, 2013, 2014
Japan	1997, 1998, 1999, 2000, 2001
Kenya	1985, 1992, 1993, 1994
Korea, Rep.	1997, 1998
Kuwait	1982, 1983, 1984, 1985
Lesotho	
Luxembourg	2008, 2009, 2010, 2011
Madagascar	1988
Malawi	
Malaysia	1997, 1998, 1999
Mali	1987, 1988, 1989, 1990, 1991
Mauritania	
Mauritius	
Mexico	1981, 1982, 1983, 1984, 1985, 1994, 1995, 1996
Morocco	1980, 1981, 1982, 1983, 1984
Nepal	1988
Netherlands	2008, 2009, 2010, 2011, 2012, 2013, 2014
New Zealand	
Nicaragua	1990, 1991, 1992, 1993, 2000, 2001
Niger	1983, 1984, 1985
Norway	1991, 1992, 1993
Pakistan	
Panama	1988, 1989
Paraguay	1995
Peru	1983
Philippines	1983, 1984, 1985, 1986, 1997, 1998, 1999, 2000, 2001
Poland	1992, 1993, 1994
Portugal	2008, 2009, 2010, 2011, 2012, 2013, 2014
Republic of Korea	1997, 1998
Romania	1990, 1991, 1992
Rwanda	
Senegal	1988, 1989, 1990, 1991
Seychelles	
Sierra Leone	1990, 1991, 1992, 1993, 1994
Singapore	
South Africa	
Spain	1980, 1981, 2008, 2009, 2010, 2011, 2012, 2013, 2014
Sudan	
Sweden	1991, 1992, 1993, 1994, 1995, 2008, 2009, 2010, 2011
Switzerland	2008, 2009, 2010, 2011
Thailand	1983, 1997, 1998, 1999, 2000
Togo	1993, 1994
Trinidad and Tobago	
Tunisia	1991
Turkey	1982, 1983, 1984, 2000, 2001
United Kingdom	2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014
United States	1988, 2007, 2008, 2009, 2010, 2011
Uruguay	1981, 1982, 1983, 1984, 1985, 2002, 2003, 2004, 2005
Venezuela, RB	1994, 1995, 1996, 1997, 1998
Zambia	1995, 1996, 1997, 1998

Table 2: Currency crisis

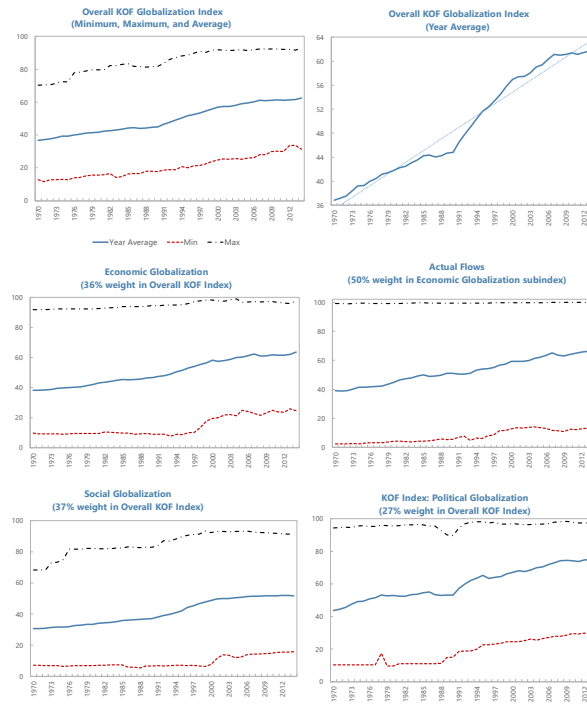
Country	Currency Crisis
Algeria	1988, 1989, 1991, 1992, 1994, 1995
Argentina	1971, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 2002, 2009, 2013, 2014
Australia	1985, 1998
Austria	1981, 1997, 2000
Barbados	
Belgium	1981, 1982, 1997, 2000
Benin	1981, 1982, 1983, 1994, 2000
Bolivia	1973, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1990
Botswana	1976, 1981, 1982, 1984, 1985, 1988, 1996, 1998
Brazil	1971, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1999
	2001, 2002, 2012
Burkina Faso	1981, 1982, 1983, 1994, 2000
Burundi	1984, 1993, 1996, 1997, 1998, 1999, 2000, 2001, 2003
Cameroon	1982, 1983, 1984, 1985, 1994, 1995, 2000
Canada	
Central African Rep.	1981, 1994, 2000
Chad	1981, 1982, 1983, 1994, 2000
Chile	1970, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1982, 1983, 1984, 1985, 1986, 2001, 2014
Colombia	1975, 1979, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1993, 1998, 1999, 2000
Congo, Dem. Rep.	1976, 1983, 1989, 1994, 1999, 2005, 2009
Congo, Rep.	1981, 1982, 1983, 1994, 2000
Costa Rica	1974, 1981, 1982, 1988, 1991, 1996
Cote d'Ivoire	1981, 1982, 1983, 1994, 2000
Denmark	1981, 1982, 2000
Dominican Republic	1991, 2003, 2004
Ecuador	
Egypt, Arab Rep.	1979, 1990, 1991, 1992, 2002, 2003, 2004
El Salvador	
Fiji	1998, 2009
Finland	1975, 1981, 1983, 1993, 2000
France	1981, 1982, 1983, 2000
Gabon	1981, 1982, 1983, 1994, 2000
Germany	1981, 1997, 2000
Ghana	1972, 1978, 1979, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1992, 1993, 1994, 1995, 1996, 1997, 1999, 2000, 2001, 2009, 2012, 2014
Greece	1980, 1981, 1982, 1983, 1984, 1985, 1993, 2000
Guatemala	1986, 1990, 1999
Guyana	1984, 1985, 1987, 1988, 1989, 1990, 1991, 1992
Honduras	1990, 1991, 1993, 1994, 1996
Hungary	1983, 1989, 1991, 1993, 1995, 1996, 1997, 2000, 2009
Iceland	1975, 1976, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1989, 1993, 2001, 2008, 2009
India	1984, 1991, 1993
Indonesia	1979, 1983, 1986, 1987, 1997, 1998, 2001
Ireland	1975, 1980, 1997, 1998, 2008, 2009
Israel	1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1989, 1993
Italy	1976, 1981, 1982, 1984, 1993, 2000
Japan	1996, 2013
Kenya	1981, 1982, 1983, 1989, 1991, 1992, 1993, 1999
Korea, Rep.	
Kuwait	
Lesotho	
Luxembourg	1981, 1982, 1997, 2000
Madagascar	1981, 1982, 1983, 1984, 1987, 1988, 1991, 1994, 1995, 1997, 1999, 2004
Malawi	1982, 1984, 1985, 1987, 1988, 1992, 1993, 1994, 1995, 1998, 1999, 2000, 2001, 2003, 2012, 2013
Malaysia	1998
Mali	1981, 1982, 1983, 1994, 2000
Mauritania	1984, 1985, 1993, 1998
Mauritius	1980, 1981, 1982, 1984, 1997
Mexico	1976, 1977, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1995, 1996, 1998, 2009,
Morocco	1981, 1982, 1983, 1984
Nepal	1985, 1992, 2009
Netherlands	1981, 1997, 2000
New Zealand	1975, 1976, 1982, 1984, 1985, 1998, 2000
Nicaragua	1974, 1975, 1979, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993
Niger	1981, 1982, 1983, 1994, 2000
Norway	1981
Pakistan	1972, 1973, 1983, 1994, 1997, 2009
Panama	
Paraguay	1984, 1985, 1987, 1989, 1990, 1993, 1998, 2001, 2002
Peru	1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1999
Philippines	1970, 1983, 1984, 1998, 2001
Poland	1971, 1979, 1981, 1982, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1992, 1993, 1994, 1997, 2009
Portugal	1976, 1977, 1978, 1981, 1982, 1983, 1984, 1985, 1993, 2000
Republic of Korea	1975, 1980, 1997, 1998, 2008, 2009
Romania	1974, 1975, 1984, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2009
Rwanda	1984, 1991, 1995, 1996, 2000
Senegal	1981, 1982, 1983, 1994, 2000
Seychelles	1976, 2007, 2008, 2009
Sierra Leone	1976, 1983, 1984, 1985, 1986, 1987, 1989, 1990, 1991, 1992, 1995, 1996, 1998, 1999, 2004, 2010
Singapore	
South Africa	1976, 1982, 1984, 1985, 1989, 1996, 1998, 2001, 2002, 2008, 2013
Spain	1976, 1981, 1982, 1983, 1993, 1997, 2000
Sudan	1980, 1981, 1982, 1985, 1988, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2011, 2012, 2013, 2014
Sweden	1981, 1982, 1983, 1993, 2009
Switzerland	1981, 1997
Thailand	1997, 1998
Togo	1981, 1982, 1983, 1994, 2000
Trinidad and Tobago	1986, 1993
Tunisia	1981, 1982, 2000
Turkey	1970, 1971, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999
	2000, 2001, 2002, 2009
United Kingdom	1976, 1982, 1983, 1993, 2009
United States	
Uruguay	1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995
	1996, 1997, 2002, 2003
Venezuela, RB	1984, 1987, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 2002, 2003, 2004, 2009, 2010, 2011, 2012, 2013, 2014
Zambia	1983, 1984, 1985, 1986, 1987, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1998, 1999, 2000, 2001, 2002, 2009

Table 3: Stock market crisis

Country	Stock Market Crisis
Algeria	
Argentina	1970, 1972, 1973, 1975, 1977, 1980, 1984, 1986, 1990, 1992, 1994, 1998, 2000, 2008, 2011
Australia	1970, 1973, 1974, 1981, 1982, 1990, 2008
Austria	1987, 2008, 2011
Barbados	
Belgium	1974, 1980, 1990, 2002, 2008
Benin	
Bolivia	
Botswana	
Brazil	1972, 1978, 1980, 1986, 1987, 1990, 1994, 1995, 1998, 2002, 2008, 2011, 2013
Burkina Faso	
Burundi	
Cameroon	
Canada	1974, 1981, 1990, 2008
Central African Rep.	
Chad	
Chile	1970, 1972, 1981, 1982, 1983, 1996, 1998, 2008
Colombia	1971, 1974, 1980, 1982, 1983, 1984, 1988, 1995, 1998, 2000, 2008, 2011
Congo, Dem. Rep.	
Congo, Rep.	
Costa Rica	1994, 2004, 2009
Cote d'Ivoire	
Denmark	1974, 1984, 1992, 2002, 2008
Dominican Republic	
Ecuador	1988, 1989, 1990, 1991, 1995, 1998, 2000
Egypt, Arab Rep.	1998, 2000, 2001, 2008, 2011
El Salvador	2003, 2008
Fiji	
Finland	1974, 1976, 1977, 1989, 1990, 1991, 2001, 2002, 2008, 2011
France	1974, 1976, 1981, 1987, 1990, 2001, 2002, 2008
Gabon	
Germany	1970, 1973, 1987, 2001, 2002, 2008
Ghana	1991, 1995, 1996, 1999, 2005, 2009
Greece	1979, 1980, 1981, 1983, 1991, 1992, 2000, 2001, 2002, 2008, 2010, 2011, 2014
Guatemala	
Guyana	
Honduras	
Hungary	1998, 2000, 2008, 2011
Iceland	1992, 2008, 2009
India	1974, 1987, 1995, 1998, 2000, 2001, 2008, 2011
Indonesia	1977, 1979, 1980, 1984, 1991, 1994, 1997, 1998, 2000, 2008
Ireland	1973, 1974, 1976, 1979, 1981, 1982, 1990, 2002, 2007, 2008,
Israel	
Italy	1970, 1974, 1976, 1977, 1982, 1987, 1990, 2001, 2002, 2008, 2011
Japan	1970, 1973, 1974, 1990, 1992, 1997, 2000, 2001, 2008
Kenya	1974, 1979, 1995, 1999, 2000, 2001, 2008, 2011
Kuwait	
Lesotho	
Luxembourg	2008
Madagascar	
Malawi	
Malaysia	1973, 1974, 1982, 1984, 1985, 1994, 1997, 2008
Mali	
Mauritania	
Mauritius	1989, 1991, 1995, 2008
Mexico	1981, 1982, 1995, 1998, 2000, 2008
Morocco	1979
Nepal	
Netherlands	1973, 1974, 1987, 2001, 2002, 2008
New Zealand	1974, 1982, 1987, 1990, 2008
Nicaragua	
Niger	
Norway	1971, 1974, 1975, 1977, 1982, 1998, 2002, 2008
Pakistan	
Panama	1992, 2000, 2008
Paraguay	
Peru	1976, 1981, 1982, 1987, 1991, 1995, 1998, 2000, 2008, 2013
Philippines	1970, 1971, 1974, 1975, 1979, 1980, 1981, 1984, 1990, 1994, 1997, 2000, 2001, 2008
Poland	1997, 1998, 2001, 2008, 2011
Portugal	1974, 1978, 1981, 1983, 1988, 1990, 2001, 2002, 2008, 2011, 2014
Republic of Korea	1974, 1979, 1980, 1990, 1996, 1997, 2000, 2008
Romania	1998, 2008, 2011
Rwanda	
Senegal	
Seychelles	
Sierra Leone	
Singapore	1973, 1974, 1984, 1985, 1990, 1997, 2000, 2008, 2011
South Africa	1970, 1975, 1976, 1987, 1990, 2008
Spain	1974, 1976, 1977, 1978, 1979, 1982, 1990, 2002, 2008, 2010
Sudan	
Sweden	1970, 1977, 1990, 2002, 2008
Switzerland	1973, 1974, 1981, 1987, 1990, 2001, 2002, 2008
Thailand	1975, 1979, 1980, 1981, 1990, 1994, 1996, 1997, 2000, 2008
Togo	
Trinidad and Tobago	
Tunisia	1990, 1997, 2001, 2002
Turkey	1988, 1990, 1992, 1994, 1995, 1998, 2000, 2002, 2008, 2011
United Kingdom	1973, 1974, 1990, 2002, 2008
United States	1973, 1974, 2002, 2008
Uruguay	1971, 1972, 1973, 1974, 1975, 1980, 1981, 1983, 1984, 1988
Venezuela, RB	1978, 1979, 1981, 1988, 1989, 1992, 1993, 1998, 2005, 2007, 2008
Zambia	1998, 2000

Appendix 2: KOF composition

These figures represent the composition of the KOF composite index and the weight scheme of each sub-composites.



Appendix 3: Block-Bootstrapped-Based Likelihood Ratio Test for Linearity

An LR test for linearity is easily extendable from equation (3) and consists of comparing the log-likelihood of the linear model (LL_0), i.e., without a threshold (under the null hypothesis of linearity $[H_0]$) and the log-likelihood of equation (3) (LL_1), with a threshold (under the alternative of no linearity $[H_1]$). The statistics of the LR test (ST) is, as always, computed as $-2(LL_0 - LL_1)$. Still, as noted by Hansen (1996), the asymptotic distribution of the test statistic of this linearity is not obvious, as it depends on the threshold's estimate, and therefore, a block-bootstrapped-based test is recommended. This method follows several steps:

- (1) Estimate (3) considering the regressors and the threshold as fixed. Save historical residuals $(u_{i,1}, \dots, u_{i,n})$ and create a multivariate empirical distribution function, $EF_i(t)$.
- (B1) Draw bootstrapped residuals $(u_{i,1}^*, \dots, u_{i,n}^*)$ in $EF_i(t)$. Note that we do not perform wild bootstrap calculations but instead draw blocks (in both dimensions: cross-knit and time) to preserve the cross-sectional dependence of the panel as well as its dynamic properties. With respect to this last dimension, we consider a block of 2 periods.
- (B2) Build a bootstrapped pseudovariable $(g_{i,1}^*, \dots, g_{i,n}^*)$ under the null of linearity (H_0) with the bootstrapped residuals.
- (B3) Under the bootstrapped pseudovariable, estimate the null (linear) and the alternative (with threshold) model. Calculate the LR statistics.
- (B4) Repeat the last (B1-B3) steps a large number of times using *Boo* and building the bootstrapped distribution of LR statistics, from which you can calculate the critical values $\alpha\%$ (CV_α) as $\alpha\%.Boo$. The null of linearity is not rejected if the test statistic (ST) is below (CV_α).

Similarly, the bootstrapped confidence bounds around the threshold estimate can be obtained using the following steps:

- (1) Estimate equation (3) considering the regressors and the threshold as fixed. Save the historical residuals $(u_{i,1}, \dots, u_{i,n})$ and create a multivariate empirical distribution function $EF_i(t)$.
- (B1) Draw the bootstrapped residuals $(u_{i,1}^*, \dots, u_{i,n}^*)$ in $EF_i(t)$. Note that we draw vertical blocks to preserve the cross-sectional dependence of the panel.
- (B2) Build a bootstrapped pseudo variable $(g_{i,1}^*, \dots, g_{i,n}^*)$ using equation (3).
- (B3) Estimate a threshold ($\hat{\gamma}^*$) using the bootstrapped variable $(g_{i,1}^*, \dots, g_{i,n}^*)$.
- (B4) Repeat the last (B1-B3) steps a large number of times, such as *Boo*, and build the bootstrapped distribution of thresholds, from which you can calculate the confidence bound around ($\hat{\gamma}$).