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Globalization and the New Normal

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I N T E R N A T I O N A L M O N E T A R Y F U N D

## IMF Working Paper

Institute for Capacity Development

### Globalization and the New Normal

Prepared by **Bertrand Candelon, Alina Carare, Jean-Baptiste Hasse and Jing Lu<sup>1</sup>**

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### Abstract

This study expands the empirical specification of Cerra and Saxena (2008), and allows short-term output growth regimes to be determined by globalization. Relying on a non-linear dynamic panel representation, it reconciles the earlier results in the literature regarding the two opposite narratives of the effects of globalization on output growth. Countries experience higher growth, on average, the more open and integrated they are into the world. However, once they reach a certain globalization threshold (endogenously estimated), countries may also experience a new normal, persistently lower short-term output growth following a financial crisis. The benefits, as well as vulnerabilities, accrue earlier in the globalization process for low- and middle-income countries. To solely reap the globalization benefits on growth, sound policies should be in place to mitigate the negative effects stemming from increased vulnerabilities brought by globalization.

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Keywords: New Normal, Globalization, Financial crises, Banking crises, Output growth

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## 1. Introduction

Ten years after the global financial crisis, "the global recovery is continuing, but it is still incomplete" (World Economic Outlook, October, 2017). 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  $\frac{3}{4}$  percent smaller than the average of all similar upswing periods since 1980, and more than 1.5 percent lower compared to the average global growth rate during 2003-2007.

The "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. This effect was expected to be, if not permanent, at least more persistent than it would have been during a regular cyclical recovery, as economies would find a new growth paradigm.

While the press easily embraced this term, especially since China has also started a reorientation of its growth model, the literature presenting comprehensive empirical evidence on the topic remains scarce. Cerra and Saxena (2008), using an unbalanced panel of data from 190 countries over 1960-2001, regress output growth on its lags and various crisis dummies. They report that output losses following financial, and some political crises are highly persistent, thereby documenting, in a way, the existence of a new normal. Using a balanced panel with data until 2010, Candelon, Carare, and Miao (2016) enhance this empirical framework by allowing individual countries growth rates to be affected by common factors as well.

Including one such a factor in the specification increases short-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 and others (2016) labeled this factor "globalization".

However, this is an ex-post characterization of a statistical extract obtained from the common movements in the short-term output growth rate series.

Even though these results are obtained using statistical extracts, they are supported by theory. Trade openness and integration increase economic growth by rising the market size of a country's production, and introducing competition among firms. Financial openness and integration boosts growth, by enabling a more efficient allocation of capital, facilitating the transfer of technology and know-how, and by increasing opportunities for higher returns and for risk diversification (for more detailed channels, and extensive review, see Chapter VI of the Bank of International Settlements 2017 Annual Report focused on Globalization).

The empirical literature finds, mostly in partial and linear settings, that trade openness and integration are contributing positively to growth. It also finds that the gains from financial openness and integration are mixed. International financial flows help boost trade, which, in turn increases production. However, financial globalization also makes the economy more vulnerable to crises (Ashenfelter and others, 2017), and could impact growth negatively.

We look to bridge this gap in the literature, and estimate in a panel setting if, once countries open up and integrate into the world, they have on average higher growth. Those benefits of globalization 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 until production is more efficient, or for entrepreneurship to flourish. At the same time, we look to see if short-term output growth suffers more, in the countries that are more integrated in the global economy, and experience a financial crisis.

Whether these financial crises are home brewed, or imported, is not of interest to our analysis. That is because, in the aftermath of a crisis, an open economy needs to restore its trade and financial linkages, disrupted by this financial crisis, regardless if there is also a global trade slowdown, or a financial crisis with international origin. Moreover, the question

of interest is not to compare growth rates of countries in autarky with those of more integrated countries, over the long-term, or, in the short-term following a crisis. We also do not try to identify all channels of higher growth on average, and lower following crises, nor to disentangle these channels. We try to provide empirical evidence that could unify the two different narratives of the impact of globalization on growth, and, to see if they coexist in a higher-globalization regime.

Therefore, we allow globalization (and all its components) to explicitly affect growth simultaneously in both directions. Short-term output growth is determined like in Cerra and Saxena (2008): output growth depends on its own lags, and may be affected by crises. We also allow for fixed effects, and for growth benefits and vulnerabilities to accumulate over time, as countries open up and integrate in the world. Therefore, globalization acts as a transition variable enabling shifts in two independent autoregressive output growth regimes.

The globalization threshold is endogenously and recursively estimated in a dynamic panel using a Generalized Linear Model (GLM) like in Hansen (1996).<sup>1</sup> In our setting, rather than using separately trade and financial openness variables, as previously used in literature, we use the KOF Globalization Index instead. This way, we apply information contained in each country's data on trade and financial flows, and restrictions, and other dimensions of globalization (social, political). Ashenfelter (2017) notes that these latter globalization dimensions are just as important for economic growth.

If, in the estimations, the constant term is larger in the higher- globalization regimes (when the KOF Globalization passes above 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 above this globalization threshold, the

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<sup>1</sup>As in Hansen (1996) or Seo and Shin (2016), the estimated threshold maximizes the log-likelihood of the model. Associated tests for linearity are also performed. Confidence bounds are determined via block bootstrap. We also use GMM. The results are reported in the Robustness Checks section.

coefficient of a crisis impact on output growth is significant, and negative (or more negative), while it is insignificant, or smaller 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, of 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 lengthier in more developed and integrated economies).

We find that in a higher-globalization regime (when the KOF Globalization Index or its subcomponents, are above a certain estimated threshold) short-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 in the same high-globalization regime causes a new normal, a 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 length of 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, and 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 have 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, 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 is accompanied by sound financial regulation and supervision, and macroeconomic policies.

As such, the contribution of this paper to the literature is threefold. We thoroughly document the existence of a new normal, and we expand the crisis dummy databases to

over one hundred countries up to 2016. More importantly, we reconcile the earlier results 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, by incorporating threshold effects of globalization on growth.

The normative implications of the paper are also important, as systematic and unambiguous evidence of a new normal is important for policy debate, and for the construction of theoretical models. In a new normal, the recommended course would be to implement stabilization policies, accompanied by strong structural reforms, such that the long-run effects of negative short-run developments are mitigated. Adequate financial regulation is also necessary for reaping the greatest rewards of globalization. In turn, theoretical models with a slower convergence to a unique steady state need to be developed.

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 provides some stylized facts, to present the intuition behind these results, and some takeaways, while Section 8 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 and others (2016) have documented the presence of new growth regimes occurring 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, significantly so, and for a long period.

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

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

where  $a$  is a constant, representing the average short-term real GDP growth rate over the sample,  $g_{i,t}$  is the real GDP growth rate in country  $i$  at time  $t$ <sup>2</sup>,  $p$  is an optimal lag order,  $D_{i,t}$  is a vector composed of 3 financial crisis dummies,  $\eta_i$  is a country fixed effect that accounts for unobserved heterogeneity, and  $u_{i,t}$  is a zero mean idiosyncratic random disturbance.

Prevailing low short-term growth rates post-crises, associated with small coefficients on lagged output growth, imply that the recovery is slower<sup>3</sup>, and that the actual output growth will remain below its pre-crisis 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 coefficient of the autoregressive lags are low. This 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:

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

where  $q_{i,t-1}$  is a weakly exogenous transition variable,  $\gamma$  is an endogenously estimated threshold value,  $\mathbb{1}(\cdot)$  is an indicator variable that takes a value of 1 if the condition ( $q_{i,t-1} > \gamma$ ) is respected, and 0 otherwise. The constant, the autoregressive coefficients, and the real

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<sup>2</sup>We are not interested in long-term or convergence dynamics. Therefore, we use the growth rate of GDP, not GDP growth per capita.

<sup>3</sup>The delay of recovery for output growth after a crisis can be calculated as  $\frac{1}{1-\beta}$ , where  $\beta$  is the autoregressive coefficient. It is obvious that if  $\beta$  gets closer to 0, the adjustment lag goes to infinity.



impact of the crisis vary according to the regime (denoted as <sup>(1)</sup> and <sup>(2)</sup>), which is driven by the variable  $q_{it}$ . We assume that  $u_{i,t}$  is a martingale difference sequence  $E(u_{i,t}|F_{t-1})$ .

This model (2) differs from Hansen (2000), as it allows for dynamics via the autoregressive parameters. We follow Hansen (2006), and instead of splitting the model (1) into a regime below the estimated threshold and one above said threshold, we estimate a model (1) for the whole sample, and one above this threshold. This allows us a more precise estimation because more observations are available to estimate the first part of the model. The model can be rewritten as follows for  $p = 1$ <sup>4</sup>:

$$g_{i,t} = a_1 + \beta_j^{(1)} g_{i,t-1} + \delta_i^{(1)} D_{i,t-1} + \mathbb{1}_{(q_{it-1} > \gamma)} [a_2 + \beta_j^{(2)} g_{i,t-1} + \delta_i^{(2)} D_{i,t-1}] + \eta_i + u_{i,t}. \quad (3)$$

The interpretation of the  $\delta_i$ ' is now different from that 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 if, above a certain level of globalization, a crisis has a higher effect on real activity. The value of the constant  $a_2$  is also important, as a significant and positive value would indicate that, above a certain level of globalization ( $\gamma$ ), 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) rising 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

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<sup>4</sup>This lag order has been found by Candelon and others (2016), and has been confirmed by the different information criteria in the current paper.

know-how, and by (iic) increasing opportunities for higher returns and for risk diversification (see Chapter VI of the Bank of International Settlements 2017 Annual Report focused on Globalization). However, these benefits are not instantaneous. It takes time to open up and be competitive in larger markets, as well as more efficient in domestic production, due to competition, or imported funds and know-how

In addition, financial globalization makes the economy more vulnerable to crises (Ashenfelter and others, 2017), and once these crises occur they have a negative impact on growth. In a higher-globalization regime, the impact of 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, the higher the disruption, and the slower the recovery.

Compared to Seo and Shin (2016), model (3) does not suffer from potential endogeneity bias. 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 GMM is not required<sup>5</sup>, 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  $\gamma$  at its historical minimum value, then the second part of the equation (when  $q_{it} > \gamma$ ) would include only one observation, making it impossible to estimate. Hence, the common practice suggests to use a 15 percent trimming value.<sup>6</sup>

We first test to see if the coefficients associated with the crisis dummy variables and output growth rates depend on globalization level, and hence the model is nonlinear. 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

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<sup>5</sup>GMM estimation results are, nevertheless, presented in the Robustness Section.

<sup>6</sup>Robustness checks with alternative trimming values are available upon request from the authors.

the constant is significant and positive, and whether the coefficients associated with the crisis dummies are significant, and negative. If so, one may conclude that while over the long-term globalization helps increasing growth rates, it also leads to a higher sensitivity of output growth response to a crisis. This implies a new normal when a crisis occurs, in a higher globalization regime. Following the literature, we estimate only one variable as the transition for the growth regime at a time. In other words, we first estimate the system with the KOF Globalization Index, and afterwards with each of its subindices as a transition variable, one by one.

### 3. Data

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 ([http : //www.reinhartandrogoff.com/data/](http://www.reinhartandrogoff.com/data/)). We use three out of their seven dummies, namely the ones that date and track the banking, currency, and stock market crashes, as the core of our database.<sup>7</sup> To expand the sample to more countries, and up to 2016, we use data from the Harvard Business School (HBS) database.<sup>8</sup> We also calculate the dummies using the crisis definitions of Reinhart and Rogoff, data from the WEO (exchange rates), stock indices,

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<sup>7</sup>We exclude the domestic or external debt default and restructuring crisis dummies, the inflation crisis dummy, and the year a country received its independence. We exclude the former because they were consistently insignificant in Candelon and others (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 during 1970-1975.

<sup>8</sup>[http : //www.hbs.edu/faculty/initiatives/behavioral - finance - and - financial - stability/Pages/global.aspx](http://www.hbs.edu/faculty/initiatives/behavioral%20finance%20and%20financial%20stability/Pages/global.aspx)

and for banking crises, Laeven and Valencia (2012).<sup>9</sup> 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 number of countries data across these databases.

The KOF Globalization Index (Dreher and others, 2006) is a composite indicator published by the Swiss Federal Institute of Technology Zurich. It is widely available, and the most inclusive measure of globalization, as it incorporates data on economic, social and political globalization. The economic subindex uses data of trade of goods and financial flows, as well as trade and capital account restrictions. The social globalization subindex includes data on personal contact (like international tourism and foreign population), information flows, and cultural proximity, and the political globalization subindex includes data on country representation in international structures, as well as treaties.<sup>10</sup> This Index is the closest measure consistent with the broader definition of globalization (Ashenfelter and others, 2017); that globalization is the process creating connections between countries, mediated through a variety of flows (not only capital, and goods, but also people, information, and ideas).

The KOF Globalization Index has data available for 192 countries. However, only 92 of those countries have the longest span of data, and match the selection of countries in the expanded crisis dummy database. Our sample therefore 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 level of income, as described later.

The evolution of the KOF Globalization Index, and of the subcomponents over the sample,

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<sup>9</sup><https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Systemic-Banking-Crises-Database-An-Update-26015>. Data was transformed to be consistent with Reinhart and Rogoff, as the latter uses a more generic crisis definition than the former.

<sup>10</sup>The description, and the weight of all components can be found on the website, <http://globalization.kof.ethz.ch/>, and in Appendix 2.

is displayed in the graphs in Appendix 2. The charts show that globalization increases steadily over time; 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 speed up their globalization, until 2007. However, there are no sudden stops, nor strong accelerations. Economic globalization increases 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. A lot of trade agreements have been negotiated and implemented at the time, and are applicable to countries in our sample. The largest were NAFTA, and EU enlargements. Trade and financial flows increased, and restrictions (trade, or capital account) decreased. The social globalization increase is slightly less pronounced, while the political globalization sees a period of faster increase in the early nineties.

#### **4. Results**

In a preliminary step, a block-bootstrap-based Log Likelihood Ratio test like in Hansen (1996) is performed for the dynamic panel model to check whether the null of linearity is rejected or not. If the null hypothesis of linearity is rejected, the dynamic panel model (3) is then estimated via GLM, considering the overall KOF Globalization Index, as well the four subindices (economic, and within that the actual flows subindex, social and political), sequentially as the transition variables. This 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 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:** New Normal and Globalization - Overall KOF Globalization Index as transition variable

Full Sample		
	$\widehat{Coeff.}$	$s\hat{e.}$
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		
	$\gamma$	$> 64$ [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: the p-value of the linearity test is < 1%. Besides, the coefficients for the dummy crises are significant in a higher globalization regime. The impact of a crisis on output growth depends thus on the degree of globalization.

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 a different time. Table 1 reports also 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 above the globalization threshold over 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 helps us to develop clear and granular implications. Figure 3 reports the number of countries that have been crossing the estimated threshold, every year, since 1970.<sup>11</sup>

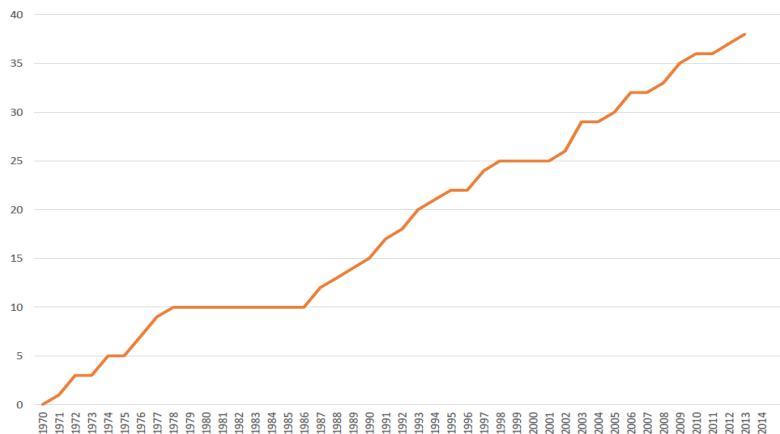
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<sup>11</sup>More results based on different income groups of countries are reported in the next section (5).

**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)		2011	over
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	over		1989	over
Ghana	-	(under)	Spain	-	(under)
Greece	1993	over	Sudan	-	(under)
Guatemala	-	(under)	Sweden	1973	over
Guyana	-	(under)	Switzerland	1973	over
Honduras	-	(under)	Thailand	2009	over
Hungary	1992	over	Togo	-	(under)
Iceland	1994	over	Trinidad and Tobago	-	(under)
India	-	(under)	Tunisia	-	(under)
Indonesia	-	(under)	Turkey	2004	over
Ireland	1977	over	United Kingdom	1972	over
Israel	1998	over	United States	1978	over
Italy	1989	over	Uruguay	2000	over
Japan	2003	over		2001	under
Kenya	-	(under)		2004	over
			Venezuela	-	(under)
			Zambia	-	(under)

Figure 3: Total numbers of countries (cumulative) crossing the estimated threshold of globalization since 1970



Third, when the economy is in a high-globalization regime, i.e. when the overall KOF Globalization Index is above 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 only marginally significant ( $t$ -stat equals 1.45), 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 banking, and 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, a 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 to 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 and others (2016), and Martin and Rey (2006). The latter notes the destabilizing effect of financial globalization



on growth, whereas trade globalization remains beneficial.

Our results are consistent with the stylized facts reported in the 2017 Annual Report of the Bank of International Settlements. Globalization leads first to higher growth potential driven by larger trade gains, but also to higher financial exposure, which comes with potential 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 3, only about half the countries pass this estimated threshold. 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 subsubindex, we observe that in a higher-globalization regime average growth is higher, by about 1¾ percent, and banking and stock market crises also have a much stronger negative impact on growth, an extra 2 percent. This is in line with other papers (based on partial linear models), which show that trade globalization contributes positively and significantly to higher growth. In a nonlinear setting, Calderón, Loayza, and Schmidt-Hebbel (2008) 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 countries pass these thresholds by 2014. Those are high income countries that tend to pass these threshold in 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 not driven by the most recent global financial crisis.

**Table 3:** New Normal and Globalization - KOF Globalization sub-indices as transition variable

	KOF Economics		KOF Actual Flows		KOF Social		KOF Political	
	$\hat{Coeff.}$	$\hat{s.e.}$	$\hat{Coeff.}$	$\hat{s.e.}$	$\hat{Coeff.}$	$\hat{s.e.}$	$\hat{Coeff.}$	$\hat{s.e.}$
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 fixed country effects and using Recursive GLM estimation methods. The trimming Value is set to 15% and the threshold confidence bound is obtained via block-bootstrap.

## 5. Results for income-per-capita groups of countries

Even if fixed effect terms are specified to tackle the potential unobserved heterogeneity among the countries in models (1) through (3), it is obvious that the impacts of crises on the output growth might differ over some country clusters. Candelon and others (2016) consider the income per capita classification of the World Bank, and create homogeneous groups of countries. They observe that banking crises impact negatively output growth in high-income countries, whereas currency crises deteriorate growth in middle-income countries. In this study, a similar cluster of (high/ middle/low-income countries) is not feasible due to a lack of data required 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. Results are reported in Tables 4 and 5.

The results are consistent with Candelon and others (2106). Whether we are using the KOF Overall Globalization 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 rises. Moreover, in a higher-globalization regime, banking crises affect negatively

**Table 4:** New Normal and Globalization - High income countries

	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	2.410***	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	$\gamma > 64$		$\gamma > 39$		$\gamma > 73$		$\gamma > 65$		$\gamma > 76$	
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 fixed country effects and using Recursive Maximum Likelihood methods. Trimming Value 15%.

**Table 5:** New Normal and Globalization - Middle- and Low-income countries

	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	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	$\gamma > 27$		$\gamma > 24$		$\gamma > 29$		$\gamma > 16$		$\gamma > 39$	
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 fixed country effects and using Recursive Maximum Likelihood methods. Trimming Value 15%.

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 (around 27), than those of high-income countries (around 64). This is not counterintuitive. The KOF data shows that low-income countries pass on average this threshold in the mid-nineties, while middle-income countries have 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. In addition, albeit precisely identified, this threshold represents information from many series: output growth, globalization index, and 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.

On average low-income countries have higher GDP growth by about 1–2 percent, once they reach this threshold, suggesting that there are high rewards to be enjoyed due to trade and financial openness and integration. Most importantly, over the sample financial rises do not have a long-lasting effect on growth. However, in a higher-globalization regime, only currency and stock market crises affect more negatively growth. 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 low-income country that opens up, output growth will be negatively impacted. 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 lowest-income countries.

**Table 6:** New Normal and Globalization - KoF subcomponents as transition variables; Robustness check: contemporaneous regressors

	KoF Overall		KoF Economics		KoF Actual Flows		KoF Social		KoF Political	
	$\hat{Coef.}$	$\hat{s.e.}$	$\hat{Coef.}$	$\hat{s.e.}$	$\hat{Coef.}$	$\hat{s.e.}$	$\hat{Coef.}$	$\hat{s.e.}$	$\hat{Coef.}$	$\hat{s.e.}$
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
$L - test P - value$	< 1%		< 1%		< 1%		< 1%		< 1%	

**Notes:** This table reports the results of the GMM estimations of model (3) including fixed country effects. A trimming Value of 15% is implemented.

## 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.<sup>12</sup> Overall, the results of the GMM estimation (reported in Table 6) 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), negative and significant autoregressive coefficients, indicating, persistently lower growth once a financial crisis occurs. Indeed, the coefficients of 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.

We perform a second robustness check to see if regime shifts could be driven by other

<sup>12</sup>The regressors considered here are the contemporaneous observations of the exogenous variables.

**Table 7:** New Normal and Globalization - Overall KoF Globalization Index as transition variable

	$\widehat{Coef.}$	$s\hat{e.}$
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 fixed country effects and using Recursive Maximum Likelihood methods. Trimming Value 15% and the price of brent as transition variable

variables, instead of the KOF Globalization Index. In other words, the higher negative impact of a financial crisis on output growth could be driven by other factors than globalization; such as oil prices. Since oil prices are important drivers of trade, which contributes 22 percent to the KOF economic subindex, as noted in Appendix 3, one could question whether our findings are not driven by oil price movements instead of globalization. We estimate model (3), and for the transition variable, instead of using the KOF Globalization Index, we use the price of the brent. Table (7) 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 L-test p-value < 1%, 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 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 lead to a greater exposure to banking crises, whereas in the previous estimations the globalization does. Second, the constant is significant, and highly negative in the regime with higher oil prices. This result is consistent with the intuition, and other empirical evidence for oil importing

countries. Third, in a high-oil price regime, the estimate of the currency crisis dummy coefficient is positive, meaning that it would foster growth. That is also not surprising. In oil exporting countries, higher oil prices lead to output growth, but also to a large appreciation, and big overvaluations of their currency. A large depreciation, would therefore return the real exchange rate towards its equilibrium level, fostering output growth.

## 7. Results, Stylized Facts, and Takeaways

In this section we summarize our results, put them into perspective, present some stylized facts about the data, and emphasize some takeaways.

The robust results show that in a high-globalization regime a banking and stock market crisis have larger negative growth effects. The intuition, coming from different models, is as follows. During a banking crisis, a credit crunch ensues, caused by capital losses on non-performing loans or a tightening of the regulatory environment. The more severe the banking crisis, the larger the credit crunch. The effects are most likely longer lasting, the more globally interconnected banks and economies are. In addition, a financial crisis leading to capital flight affects the funding of financial institutions, which, in turn cannot longer support international trade and growth.

The findings are also consistent with other empirical studies. Caballero and others (2016) stress the role of bank linkages in promoting international trade, and hence, growth, by alleviating the risks associated with international trade transactions. Risks are alleviated either through long-term interbank lending on export flows or through letters of credit or documentary collections, as discussed in a series of recent papers (Antras and Foley, 2015). It follows that, when those linkages are broken because of a banking crisis, net exports decline, and, as such output. Should the banks remain unconnected, only a domestic credit crunch would contribute to the decline in output.

The first table below shows the average correlation between the banking crisis dummy

**Table 8:** Average correlation between the real GDP growth and banking crisis dummy by period (summary table)

	1970-1994	1995-2016
Sample	-0.18	-0.28
KOF < 64	-0.18	-0.17
KOF > 64	-0.18	-0.40

and real GDP growth, for different periods.<sup>13</sup> The table also shows the average correlation for different values of the overall KOF Globalization Index: for the entire sample, and for values below and above the estimated threshold of 64. In addition, in this table we also show the correlations pre- and post- 1995. We choose to split the sample in 1995 because post-1995 most countries pass either the threshold estimated with the overall KOF Globalization Index, or with subindices, regardless of the income level. Moreover, 1994/1995 is a consistent date with other studies emphasizing a new stage of globalization (or trade and financial openness and integration).

We observe that for an overall KOF Globalization Index below the estimated threshold, the correlation is almost unchanged over time. However, that is not the case for the countries with an overall KOF Globalization Index above 64, which they see a much more negative correlation in the second part of the sample ( $-0.4$  versus  $-0.18$ ). These results are consistent with the earlier estimated results, showing that for more globalized countries, banking crises tend to subtract more from growth.<sup>14</sup>

One question that most readers tend to ask next is, whether the results are driven by the tail end of the sample, or by the global financial crisis of 2007–2008. To answer this question thoroughly we do not have enough observations to be able to estimate our specification in

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<sup>13</sup>We present the data for various subsamples, and for banking crisis only, to save space. Data for currency or stock market crises, and country-by country data are available upon request from the authors.

<sup>14</sup>These are simple correlations, therefore not proving causation. Nonetheless they are consistent with earlier results, including the ones accounting for endogeneity.



a subsample with data only for the last ten years.<sup>15</sup> Therefore, we will look only at these average correlations between the real GDP growth and the banking crisis dummy, in different periods.

In table (9) we present more granular average correlations: in five different periods (1970-1990, 1991-2000, 2001-2010, and 2011-2014), and for various overall KOF Globalization Index values (for the entire sample, for KoF between 25-40, 40-64, 64-80 and above 80). We split the presentation this way because some countries experience banking crises in some decades, but not in the others, and because we would like to see if those countries have the lowest growth now, hence a new normal, or when they experience most banking crises. While for the overall sample we observe the highest negative correlation during the decade including the global financial crisis ( $-0.43$ ), and in the subsequent period, a look at the more detailed data shows that this is not the case for countries with a lower average overall KOF Globalization Index. As mentioned earlier, they represent three quarters of the countries in the sample (69 out of 92).

Moreover, countries with a relatively low average overall KOF Index (between 25 and 40) do not experience banking crises after 2000. Those tend to be low-income countries, from sub-Saharan Africa. For example, Kenya, faced banking crises earlier, in the eighties, and early nineties, and Cameroon has banking crises in 1987 and 1995 only. As a result, their lower average real GDP growth is recorded during the nineties (see Table 10), not recently. For the moderately globalized countries, with an overall KOF Globalization Index between 40 and 64, the correlation remains almost the same in the first three periods, and, most importantly, those countries do not have banking crises during 2011-2014. Ecuador and Malaysia belong to this group and have banking crises in the eighties and nineties, lasting until the first couple

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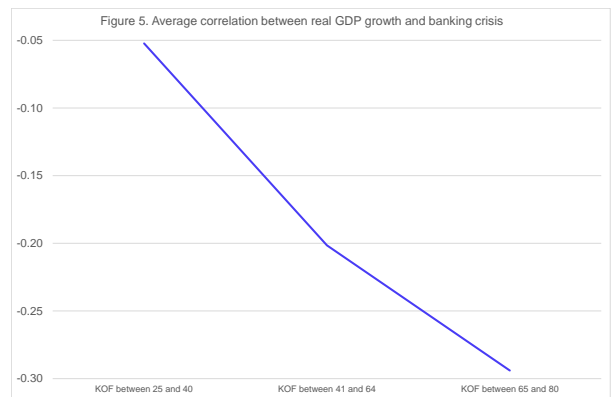
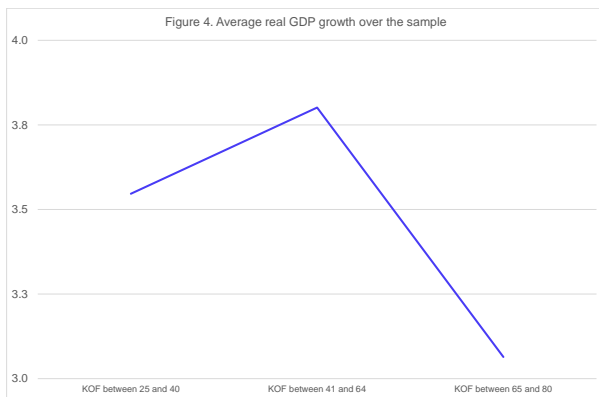
<sup>15</sup>Candelon and others (2016) are able to provide estimates for various rolling samples, as they have a slightly simpler specification (without the endogenously estimated threshold level). Those results are consistent with the results of this paper.

**Table 9:** Average correlation between real GDP growth and banking crisis dummy by period and average overall KOF Index

	1970-1990	1991-2000	2001-2010	2011-2016
All countries	-0.14	-0.28	-0.43	-0.40
Average KOF $\in (25, 40]$	-0.16	0.01	N/A	N/A
Average KOF $\in (40, 64]$	-0.25	-0.27	-0.27	N/A
Average KOF $\in (64, 80]$	-0.12	-0.63	-0.38	-0.76
Average KOF $> 80$	N/A	-0.38	-0.54	-0.37

of years this century (2000s) only. Therefore, they have relatively high GDP growth in the last decade. The most globalized countries have the lowest growth on average, during 2001-2010, but they do not necessarily have a new normal, if they did not experience a banking crisis (e.g. Luxemburg, one of the most open and economically integrated countries).

Therefore, the paper presents comprehensive and irrefutable evidence that there are output growth regimes depending on the globalization level. And, as a result, some countries may experience a new normal. The relationship between globalization and growth is a tale of two narratives. On average, over the sample, countries gain from opening up, and integrating into the global economy. However, after a certain threshold, the more globalized the countries are, the more a financial crisis will negatively impact their growth, and the recovery may take longer.



Another question readers tend to ask is what can we say about globalization and new normal? Are, overall, countries better off being more open and integrated, despite hav-

**Table 10:** Average real GDP growth by period and average overall KOF Globalization Index

	sample (1970-2016)	1970-1990	1991-2000	2001-2010	2011-2016
All countries	3.47	6.32	1.76	2.65	3.64
Average KOF $\in (25, 40]$	3.55	5.94	2.44	5.48	2.72
Average KOF $\in (40, 64]$	3.80	6.88	3.44	2.62	4.32
Average KOF $\in (64, 80]$	3.06	5.85	-2.37	1.01	4.75
Average KOF $> 80$	2.24	NA	1.36	2.13	1.29

ing lower growth for longer periods following financial crises? While short-term economic growth is influenced by many factors, including long-term trends (like demographics, or oil discoveries), the next table shows real GDP growth by period, and average overall KOF Globalization Index. The answer is yes. First, when one looks at the average output growth rate for the period 2011-2016, one observes that for all countries their average real output growth is higher than for the entire sample. Since the KOF Globalization Index tends to increase for all countries over time, then, the conclusion is that countries are better off being more open and integrated. Second, looking at all countries data after 1991, we also observe that, on average, countries tend to have higher GDP growth, with each subsequent decade, as they become more open and integrated. In fact, during the current decade all countries, regardless of the globalization level reached, have on average real GDP growth rates similar to, or higher than in the nineties.

## 8. Conclusions and Policy Implications

This paper explores the role played by globalization in the occurrence of a new normal, a persistently (but not permanently) lower real GDP growth regime, following a financial crisis. Although more and more political voices cite the removal of trade barriers, as well as the increase in financial flows, as the main factors contributing to low economic growth post-global financial crisis, especially in high-income countries, what we find does not support these voices.

We find that the effect of globalization on growth is a tale of two narratives, and therefore we bridge the gap in the literature. 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 negative impact on short-term growth of a financial crisis. In a high-globalization regime, in high-income countries, a banking crisis has a negative effect on growth, and a stock market crisis has a stronger negative effect on growth. In low-income countries, currency and stock market crises have a negative effect on growth, and benefits and vulnerabilities accrue earlier in the globalization process. The results are robust to various specifications, and are not driven by the tail end of the sample.

As such, the contribution of this paper to the literature is threefold. We thoroughly document the existence of a new normal, and we expand the crisis dummy databases to over one hundred countries up to 2016. More importantly, we reconcile the earlier results 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, by incorporating threshold effects of globalization on growth.

Albeit precisely identified, the globalization 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 financial crisis. This lower growth is persistent, a new normal, but not permanently lower. Eventually, countries return to the higher growth in the higher-globalization equilibrium.

Our results are consistent with the intuition presented in the latest (2017) BIS Annual Report, published in June 2017<sup>16</sup> and which mentions that we are in the midst of the third wave of globalization, the largest since the end of the 19th century and the industrial revolution. The report describes the channels through which globalization helps economic growth,

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<sup>16</sup><http://www.bis.org/publ/arpdf/ar2017e6.htm>

and how it could also affect negatively economic growth.

Our empirical analysis provides support for these facts, and the recent conjectures made by Cecchetti (2012) and Shin (2017), who 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. The findings of this paper as the BIS report, point to the fact 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.

Therefore, our results stress the importance of appropriate macroeconomic and financial policies in reaping positive rewards from globalization. In particular, countries need appropriate regulation and supervision of banks, and of capital markets, and good international financial policy coordination. Broner and Ventura (2016) suggest ways of making financial globalization effective including for the lower-income countries, and the 2017 BIS Annual Report offers guidelines for reconciling globalization, growth, and financial stability. The report lists three main sources of financial crisis propagation (p. 110). When capital is highly mobile and procyclical, it amplifies the downside risks to growth. Over-exposure to the US dollar increases countries' currency risks and banks funding risks. The strong links between financial institutions are sources of crisis transmission, as well as any unexpected stress. This analysis shows that financial deregulation should not be synchronized with an increase in globalization, as it would undermine its growth impact.

When facing a self-fulfilling financial crisis, financial regulation might be insufficient to freeze the transmission to the real sector of this negative shock. One could ensure that it saves the benefits of higher growth due to increased globalization, such as international reserves, or fiscal surpluses, into a financial stabilization fund. This fund could be used to recapitalize banks or financial institutions facing a systemic crisis. Of course, the practical considerations should be analyzed more deeply and have been left for future research.

In conclusion, following a financial crisis, some countries may have persistently lower growth, a new normal, if they are in a high-globalization regime. 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 mitigate the negative growth effects following a financial crisis.

## References

Asehnfelter, Orly, Robert F. Engle, Daniel McFadden, and Klaus Schmidt-Hebbel. "Globalization: Contents and Discontents." *Contemporary Economic Policy*.

Aizenman, Joshua, Yothin Jinjarak, and Donghyun Park. "Financial development and output growth in developing Asia and Latin America: A comparative sectoral analysis." No. w20917. National Bureau of Economic Research, 2015.

Antras, Pol, C. Fritz Foley. "Poultry in Motion: A Study of International Trade Finance Practices." *Journal of Political Economy*, University of Chicago Press, 123(4) (2015): 853 - 901.

Bai, Jushan. "Panel data models with interactive fixed effects." *Econometrica* 77.4 (2009): 1229-1279.

Broner, Fernando, and Jaime Ventura. "Rethinking the Effects of Financial Globalization." *Quarterly Journal of economics*, 131.3 (2016): pp. 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 "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, 2006.

Candelon, Bertrand, Alina Carare, and Keith Miao. "Revisiting the New Normal Hypothesis." *Journal of International Money and Finance* 66 (2016): 5-31.

Cerra, Valerie and Sweta Chaman Saxena. "Growth dynamics: the myth of economic recovery." *The American Economic Review* 98.1 (2008): 439-457.

Cecchetti, Stephen. "Is Globalization Great?". *Bank of International Settlements Papers*, 69 (2012): 1-6.

Davis, Ian. *The New Normal*, McKinsey Quarterly, March (2009).

Dreher, Axel, Noel Gaston, and Pim Martens. *Measuring globalisation: Gauging its consequences*. Springer Science & Business Media, 2008.

Dreher, Axel. "Does globalization affect growth? Evidence from a new index of globalization." *Applied Economics* 38(10) (2006): pp. 1091-1110.

El-Erian, Mohamed. *A New Normal*, PIMCO Secular Outlook, May (2009).

Hansen, Bruce E. "Inference when a nuisance parameter is not identified under the null hypothesis." *Econometrica: Journal of the econometric society* (1996): 413-430.

International Monetary Fund, 2017. *World Economic Outlook: Too Slow for Too Long. Seeking Sustainable Growth: Short-Term Recovery, Long-Term Challenges*, October.

International Monetary Fund, 2009. *World Economic Outlook: Sustaining the Recovery. Chapter 4: What's the Damange? Medium-Term Output Dynamics After Financial Crises*, 121-153.

Laeven, Luc, and Fabian Valencia. "Systemic banking crises database." *IMF Economic Re-*



view 61.2 (2013): 225-270.

Mendoza, Enrique G., and Vincenzo Quadrini. "Financial globalization, financial crises and contagion." *Journal of monetary economics* 57.1 (2010): 24-39.

Obstfeld, Maurice., "Financial flows, financial crises, and global imbalances". Keynote Address to the 15th International Conference on Macroeconomic Analysis and International Finance, University of Crete, Greece, May, also Center for Economic Policy Research Discussion paper series no. 8611. (2011)

Pesaran, M. Hashem. "Estimation and inference in large heterogeneous panels with a multi-factor error structure." *Econometrica* 74.4 (2006): 967-1012.

Reinhart, Carmen M., and Kenneth S. Rogoff. "Recovery from financial crises: Evidence from 100 episodes." *The American Economic Review* 104.5 (2014): 50-55.

Reinhart, Carmen M., and Kenneth S. Rogoff. "From financial crash to debt crisis." *The American Economic Review* 101.5 (2011): 1676-1706.

Reinhart, Carmen M., and Kenneth S. Rogoff. "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.carmenreinhart.com/data-by-topic/topics/7/>

Rousseau, Peter L., and Paul Wachtel. "What is happening to the impact of financial deepening on economic growth?." *Economic Inquiry* 49.1 (2011): 276-288.

Sahay, Ratna, et al. "Rethinking financial deepening: Stability and growth in emerging markets." *Revista de Economía Institucional* 17.33 (2015): 73-107.

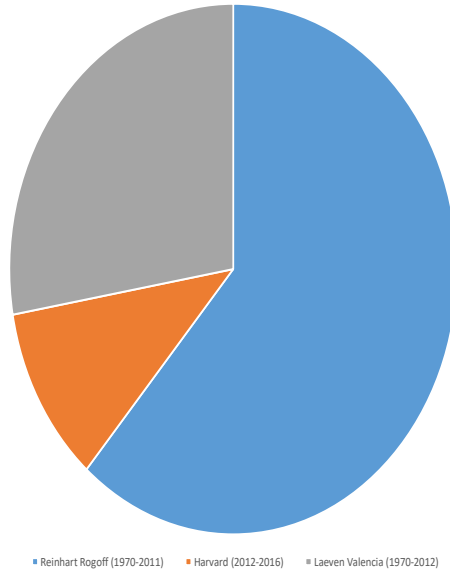
Seo, Myung Hwan, and Yongcheol Shin. "Dynamic panels with threshold effect and endogeneity." *Journal of Econometrics* 195.2 (2016): 169-186.

## Appendix 1: Detailed Definitions of Crises (Reinhart and Rogoff, 2009)

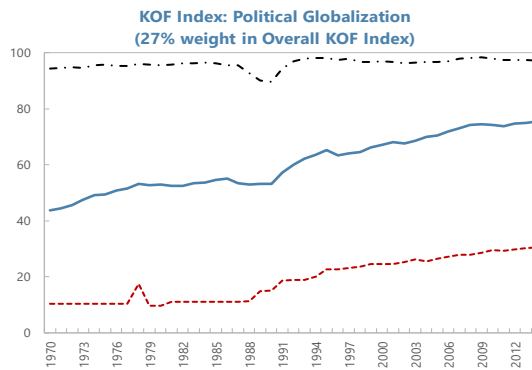
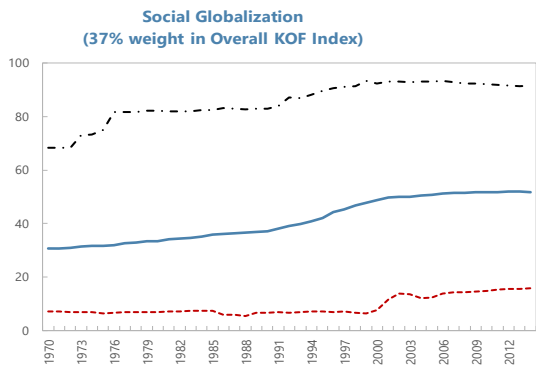
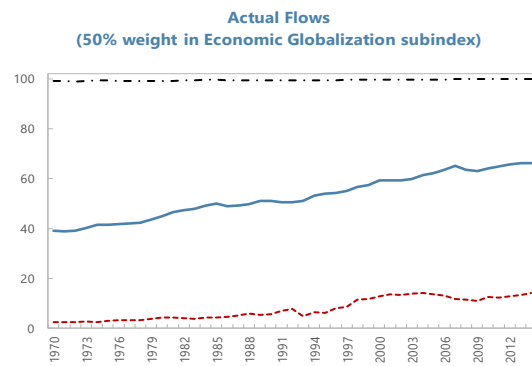
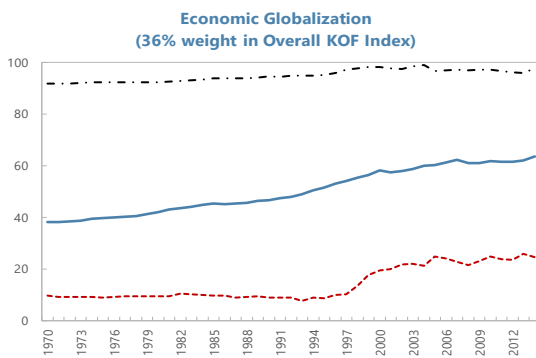
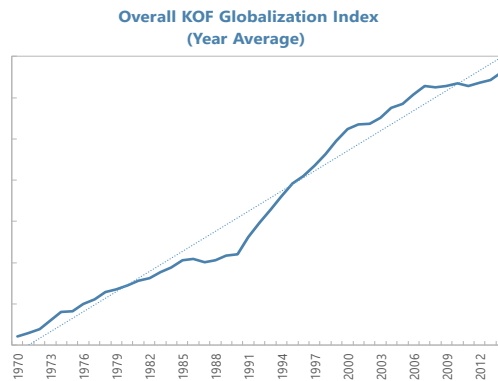
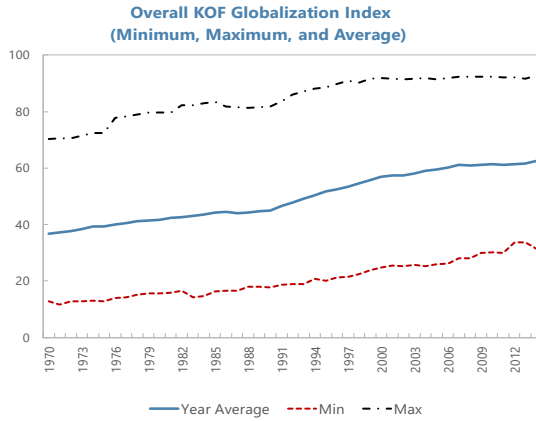
- **Banking:** A bank run that leads to the closure, merger, or takeover, by the public sector, of one or more financial institutions. If there are no runs, a banking crisis is considered when there is a closure, merger, and takeover, or large-scale government assistance of an important financial institution (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.



CCHJ database origin



## Appendix 2: KOF composition



## 2016 KOF Index of Globalization

Indices and Variables	Weights
<b>A. Economic Globalization</b>	<b>[36%]</b>
i) Actual Flows	(50%)
Trade (percent of GDP)	(22%)
Foreign Direct Investment, stocks (percent of GDP)	(27%)
Portfolio Investment (percent of GDP)	(24%)
Income Payments to Foreign Nationals (percent of GDP)	(27%)
ii) Restrictions	(50%)
Hidden Import Barriers	(23%)
Mean Tariff Rate	(28%)
Taxes on International Trade (percent of current revenue)	(26%)
Capital Account Restrictions	(23%)
<b>B. Social Globalization</b>	<b>[37%]</b>
i) Data on Personal Contact	(33%)
Telephone Traffic	(26%)
Transfers (percent of GDP)	(2%)
International Tourism	(26%)
Foreign Population (percent of total population)	(21%)
International letters (per capita)	(25%)
ii) Data on Information Flows	(35%)
Internet Users (per 1000 people)	(36%)
Television (per 1000 people)	(38%)
Trade in Newspapers (percent of GDP)	(26%)
iii) Data on Cultural Proximity	(32%)
Number of McDonald's Restaurants (per capita)	(46%)
Number of Ikea (per capita)	(46%)
Trade in books (percent of GDP)	(7%)
<b>C. Political Globalization</b>	<b>[27%]</b>
Embassies in Country	(25%)
Membership in International Organizations	(27%)
Participation in U.N. Security Council Missions	(22%)
International Treaties	(26%)

Source:

Dreher, Axel, 2006, Does Globalization Affect Growth?  
Empirical Evidence from a new Index, *Applied Economics* 38, 10: 1091-1110.

Updated in:

Dreher, Axel; Noel Gaston and Pim Martens, 2008, *Measuring Globalization - Gauging its Consequence*, New York: Springer.

### Appendix 3: Block-Bootstrapped-Based Likelihood Ratio test for linearity

An LR test for linearity is easily extendable from equation (3). It consists of comparing the loglikelihood 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), 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) in order 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 pseudovariate ( $g_{i,1}^*, \dots, g_{i,n}^*$ ) under the null of linearity ( $H_0$ ) with the bootstrapped residuals.
- (B3) Under the bootstrapped pseudovariate, estimate the null (linear) and the alternative (with threshold) model. Calculate the LR statistics.
- (B4) Repeat the last (B1B3) steps a large number of times, using *Boo* and building the bootstrapped distribution of LR statistics, from which you can calculate the critical values  $\alpha\%$  ( $CV_\alpha$ ) as  $\alpha\%.Boo$ . The null of linearity is not rejected if the test statistics ( $ST$ ) is below ( $CV_\alpha$ ).

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 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 draw vertical blocks to preserve the cross-sectional dependence of the panel.
- (B2) Build bootstrapped pseudo variable  $(g_{i,1}^*, \dots, g_{i,n}^*)$  using equation (3).
- (B3) Estimate a threshold  $(\hat{\gamma}^*)$  using bootstrapped variable  $(g_{i,1}^*, \dots, g_{i,n}^*)$ .
- (B4) Repeat the last (B1B3) steps a large number of times, let say  $Boo$  and build the bootstrapped distribution of thresholds, from which you could calculate the confidence bound around  $(\hat{\gamma})$ .