Economic Depression in the World*

Janice Boucher Breuer† and John McDermott‡

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Abstract

We create a new dataset of country experience with economic depression around the world. Our algorithm defines a depression as a cumulative decline of 20 per cent or more in output per capita lasting at least three years. Depression episodes are very common in recent history and tend to follow periods of high growth. We find several variables to be strongly associated with depression. These include not only economic, political, and institutional variables, but variables that measure cultural and demographic characteristics as well.

1 Introduction

Economic depression is a tragedy. Dramatic, long-lasting declines in living standards have beset many countries around the world. Haiti, Nigeria, and Zimbabwe stand out as familiar cases, but the past six decades are full of similar instances. Recovery from depression is arduous and not all countries succeed. Fifteen countries are worse off today than they were over fifty years ago. Depressions are not symmetric with positive growth episodes and so defy conventional policy

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†Economics Department, University of South Carolina, Columbia, SC 29208

‡Economics Department, University of South Carolina, Columbia, SC 29208

and frustrate theoretical understanding. In this paper, we construct a panel dataset of episodes of economic depression around the world since 1950. We present evidence that economic depression is much more common than usually thought, and use our data to begin an investigation of the incidence, duration, and principal correlates of these episodes.

We define a depression as a period during which per capita output falls cumulatively by at least 20 per cent over at least three years. We regard our criteria as conservative: a decline in output per capita of this length and depth is likely to be symptomatic of conditions that severely restrain a country's ability to grow. To put our rule in perspective, during the U.S. Great Depression, real GDP per capita fell by 29% from 1929 to 1933. The cumulative decline for many of the countries in our sample is much greater than that. Our definition of economic depression is severe and one might think relatively few instances of depression of this magnitude have occurred. Unfortunately, this is not the case: in all, 88 countries have experienced 121 depressions by our definition.

Among the first to focus attention on the cross-country experience with different patterns of growth rates – and not just the long-run average – were Easterly et al. (1993) and Pritchett (2000). Jerzmanowski (2006) built on this idea in the context of Markov switching models. Rodrik (1999) studied factors that contributed to the decline in growth rates post-1975. Jones and Olken (2008) examined correlates of growth episodes before and after structural breaks, including episodes of negative growth. Hausmann et al. (2005) identified discrete episodes of "growth acceleration" to find clues to the ability of countries to sustain growth. In general, this literature concentrates on growth rates, not levels of output per person, and identifies breaks in the data in different ways.

Our approach is similar to Hausmann et al. (2005), but we look at episodes in which *output per capita* is declining. Few papers focus on episodes of severely declining output and none define an episode of decline the same way that we do. Barro and Ursua (2008) define "macroeconomic disasters" as peak-to-trough declines in output per capita of 10% or greater in their study of asset pricing puzzles. Reddy and Minoiu (2009) look at episodes of stagnation that can include periods of zero growth. Pritchett (2000)'s typology of growth episodes identifies "mountains"

as episodes where growth rates exceed 1.5 percent before a break and are negative afterwards. Hausmann et al. (2006) analyze the duration of episodes of output collapse, but define them so that they end when output per worker is restored to its original level. Our definition is more stringent: depression episodes deal strictly with declines in output per capita. They are larger and longer-lasting than business cycle downturns and recovery is potentially more difficult.

Our method for identifying depressions uses an iterative search procedure to identify peaks and troughs in output per capita that meet specific criteria. This approach has several advantages. First, our method is concrete in terms of defining negative growth. Unlike other work, it excludes episodes of stagnation or slowdowns in positive growth. It also avoids identifying the end of a depression with *any* rise in output per capita by permitting short-lasting increases to be part of an overall episode of decline. Our method also allows us to avoid arbitrary choices of break dates, either to satisfy sample size conditions or to pre-determine events that might produce breaks. Last, it does not require the data to be stationary.

The present paper makes two contributions. First, we propose a definition of economic depression and construct a dataset of countries and episodes of negative and positive growth. Second, we use our data to study correlates of economic depression. We explore standard correlates such as economic policy, institutions, and internal conflict. Additionally, we examine demography and culture, which are much less widely studied.

The paper is organized as follows. In Section 2, we propose an algorithm for identifying an economic depression. We provide a complete list of all 121 episodes of depression and their summary characteristics. In Section 3, we describe the incidence of depressions in recent history categorizing them by decade, region, and income tier. We also look at growth rates during depressions and their relationship to prior periods of positive growth. In Section 4, we undertake a probit analysis of the incidence of depression. Section 5 concludes.

2 The Data on Economic Depression

Episodic negative growth interrupts positive growth periods and may have long

lasting negative effects on an economy's growth potential. Employment, human capital, investment, savings, and real estate may suffer so much that recovery is impaired for many years, and standards of living may never catch up to where they would have been absent the decline (Blyde et al. (2010)).

There has been very little work to date investigating negative growth. Most treatments deal with it in the context of a business cycle downturn or recession and the standard policy prescriptions borrow from the large literature on fostering recovery from a recession. Depressions, however, are different in magnitude and duration from business cycle downturns, and their causes may also be different.

Our first task is to define a "depression" or "negative growth episode" *(NGE*). There is no unambiguous way to define this, but we settled on the following algorithm:

1. We identify all turning points of per capita output y – the local maxima and minima – for each country over all available dates.[1]

2. To be an *NGE* the ratio of y at the local peak to y at the subsequent trough must be *at least* as large as 1.2 ; *and* the peak and trough must be separated by *more than* 2 years.

3. Transient "blips" – small upward movements in y within an *NGE* – are ignored if they last two years or less.[2]

4. A new *NGE* must be separated from an existing one by at least 1 year.[3]

5. The growth rate within any single episode $g_{y,t}$ is computed as the coefficient from a regression of the log of y on $trend$.

In Figure 1 we show eight countries' time series of log y. The peak that begins an *NGE* is indicated by a black dot, and the trough at the end by an oval. Afghanistan

[1] See Appendix A for a complete list of data and sources.

[2] By "small" we mean that the intermediate peak of y must be below the initial peak.

[3] There are 4 instances where there is a single year separating two *NGEs* – Iran (1982), Iraq (1992), Peru (1986), and Zambia (1987).

and Haiti each had a single, very long episode. The others had multiple, shorter episodes. These profiles are typical, although the majority of countries that experienced an *NGE*, had just one.[4] The years that are not part of a depression are considered part of a "positive growth episode" or *"PGE."* For most of these episodes, growth is positive, but given our algorithm, there are a few exceptions. Many industrial countries have experienced just one, long *PGE.*

Of the 121 episodes of depression, the average *annual* decline was 6.0%, the mean duration was 10 years, and the average *cumulative* peak-to-trough decline was 45%.[5] There were 88 countries with at least one depression and 73 countries that never suffered a depression. Only one-third of the countries avoiding a depressive episode are industrialized. In our data, 62 of the *NGE* countries had only one episode, and one country, Zimbabwe, had four.

A full list of the countries and episodes of depression is given in Table 1. For each, we show the average annual growth rate over the episode and the duration of the episode. Haiti had the longest *NGE* at 27 years. With an average annual decline in y of 2.0%, Haiti's standard of living would have been almost cut in half over the period. There are 18 countries with an *NGE* lasting just 4 years. Of these countries, Iraq suffered the biggest average *annual* output loss over 1988-91, a staggering 36.0%.

3 The Topography of World Depressions

We stratify depressions by decade, region, and income level to reveal patterns in the data across time and space. Table 2 reports the number of episodes, mean

[4] We experimented with three other filters which differed by cumulative depth and duration. The least strict required that the peak to trough ratio had to be at least 1.1; and the duration had to last at least 2 years. The most strict required a ratio of 1.2 and a duration of 5 years or more. The most stringent of our other filters identified 71 *NGEs*, and the slackest of the filters identified 175 *NGEs*.

[5] Barro and Ursua (2011) find183 economic disasters with an average cumulative decline of 20.8%. Their criteria is less stringent than ours and their dataset consists of 40 countries dating back to the mid-1800s.

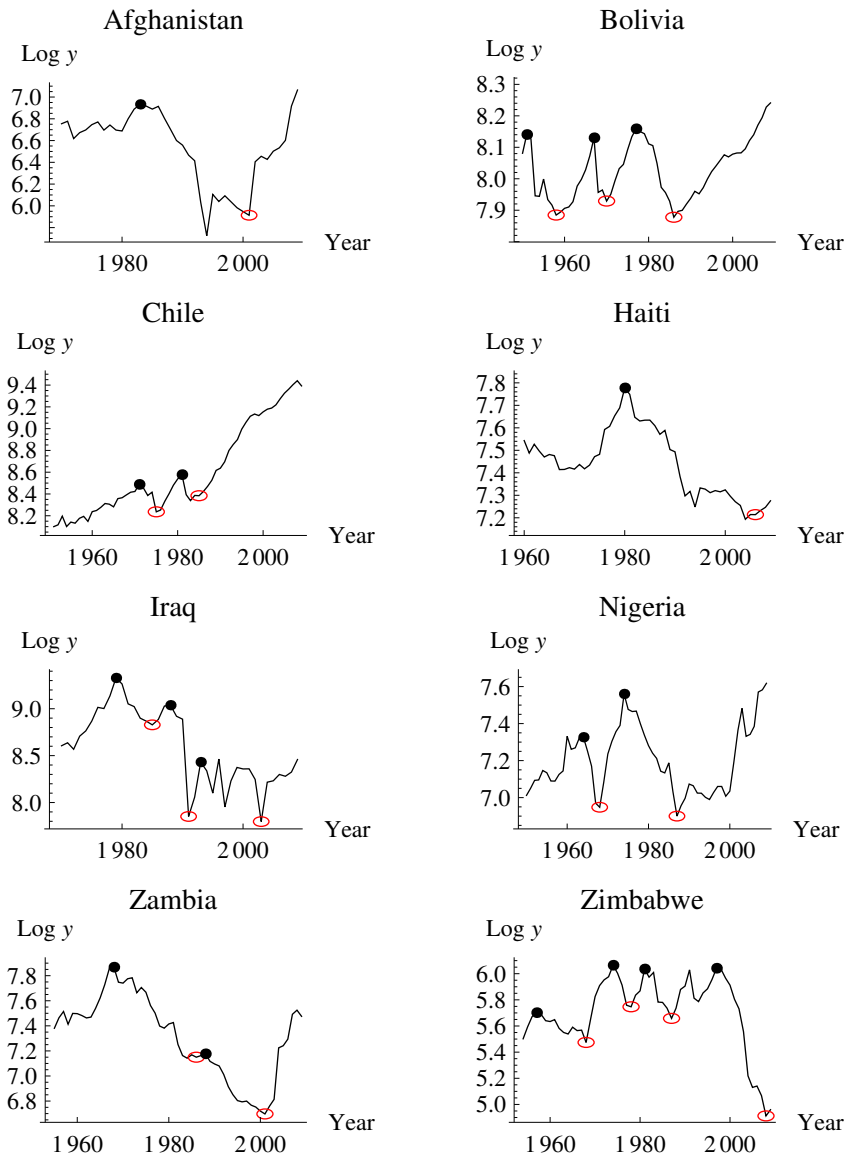

Figure 1: Eight Countries: Episodes of Economic Depression

Table 1: Country Experience with Depression

Country	Start Year	Duration in years	mean annual %Δy	Country	Start Year	Duration in years	mean annual %Δy	Country	Start Year	Duration in years	mean annual %Δy
Afghanistan	1983	19	-0.07	Ghana	1972	5	-0.08	Nigeria	1974	14	-0.04
Albania	1983	9	-0.02	Guatemala	1980	9	-0.03	Oman	1970	4	-0.07
Angola	1974	8	-0.05	Guinea	1962	9	-0.03	P.N. Guinea	1994	10	-0.02
Angola	1988	6	-0.05	Guin-Bissau	1996	9	-0.05	Peru	1981	5	-0.05
Argentina	1979	12	-0.02	Guyana	1976	10	-0.07	Peru	1987	6	-0.07
Azerbaijan	1993	5	-0.09	Haiti	1980	27	-0.02	Poland	1979	4	-0.09
Bahrain	1977	11	-0.06	Iran	1976	6	-0.18	Romania	1988	5	-0.09
Belize	1981	5	-0.06	Iran	1983	4	-0.07	Russia	1991	8	-0.07
Benin	1974	5	-0.05	Iraq	1979	7	-0.09	Rwanda	1960	9	-0.03
Bolivia	1951	8	-0.03	Iraq	1988	4	-0.36	Rwanda	1981	4	-0.08
Bolivia	1967	4	-0.06	Iraq	1993	11	-0.02	Rwanda	1992	6	-0.04
Bolivia	1977	10	-0.03	Jamaica	1973	13	-0.03	Senegal	1961	13	-0.01
Bos. & Herz.	2000	4	-0.10	Jordan	1965	11	-0.03	Sierra Leo.	1989	11	-0.08
Brunei	1979	20	-0.04	Jordan	1981	11	-0.04	Slovakia	1989	4	-0.12
Bulgaria	1988	5	-0.05	Kazakhstan	1993	6	-0.04	Somalia	1972	14	-0.03
Burundi	1991	6	-0.07	Kuwait	1986	5	-0.04	Somalia	1989	19	-0.03
Cambodia	1970	13	-0.06	Kuwait	1993	10	-0.03	Sudan	1977	14	-0.03
Cameroon	1986	10	-0.06	Lebanon	1979	4	-0.15	Sudan	2000	4	-0.11
CAR	1961	23	-0.01	Lebanon	1987	6	-0.23	Suriname	1978	17	-0.01
CAR	1986	11	-0.03	Lesotho	1978	9	-0.02	Syria	1982	8	-0.03
Chad	1975	6	-0.10	Liberia	1978	18	-0.15	Tajikistan	1993	6	-0.14
Chile	1971	5	-0.05	Liberia	2002	4	-0.13	Thailand	1950	6	-0.06
Chile	1981	5	-0.04	Libya	1986	17	-0.02	Togo	1979	9	-0.06
China	1959	4	-0.09	Madagascar	1974	9	-0.03	Togo	1990	4	-0.10
Congo, D. R.	1971	30	-0.06	Madagascar	1989	10	-0.02	Togo	1997	12	-0.02
Congo, Rep.	1974	4	-0.07	Malawi	1961	4	-0.07	Trin. & Tob.	1981	8	-0.06
Congo, Rep.	1990	5	-0.05	Malawi	1978	17	-0.03	Uganda	1969	18	-0.03
Costa Rica	1979	4	-0.07	Mali	1960	15	-0.01	Ukraine	1993	5	-0.11
Cote d'Ivoire	1978	17	-0.01	Mauritania	1976	9	-0.02	Uruguay	1980	5	-0.07
Cote d'Ivoire	1999	10	-0.02	Mauritius	1951	21	-0.01	Uruguay	1998	5	-0.06
Croatia	1990	4	-0.14	Mexico	1981	8	-0.02	Uzbekistan	1990	7	-0.06
Cuba	1989	5	-0.11	Moldova	1992	8	-0.05	Venezuela	1977	9	-0.05
Cyprus	1957	4	-0.05	Mongolia	1990	4	-0.18	Venezuela	1992	12	-0.02
Djibouti	1970	33	-0.03	Morocco	1953	7	-0.03	Zambia	1968	19	-0.04
El Salvador	1978	6	-0.06	Mozamb.	1976	11	-0.03	Zambia	1988	14	-0.04
Eq. Guinea	1977	14	-0.04	Namibia	1981	5	-0.07	Zimbabwe	1957	12	-0.02
Estonia	1990	5	-0.09	Nicaragua	1984	10	-0.08	Zimbabwe	1974	5	-0.09
Ethiopia	1973	20	-0.01	Niger	1963	14	-0.03	Zimbabwe	1981	7	-0.07
Gabon	1976	12	-0.04	Niger	1979	6	-0.07	Zimbabwe	1997	12	-0.11
Gabon	1997	10	-0.03	Niger	1988	13	-0.01				
Gambia	1982	17	-0.01	Nigeria	1964	5	-0.10				

duration of each, and the average annual rate of decline, classified by decade and region of the world. Data are reported for six regions, East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and North Africa ($MENA$), Southeast Asia (SAS), and sub-Saharan Africa ($SBSA$). There are 138 countries across these 6 regions. One region, "the West" – comprising 23 countries including the USA, Canada, Japan, Australia, New Zealand, and countries in Western Europe – is excluded since there were no *NGEs* over any decades.

Table 2 shows that nearly half of the *NGEs* occurred in sub-Saharan Africa (57 out of 121). This may be due, in part, to the sheer number of countries comprising this region – 42 in all. By comparison, the next largest number of countries – 27 – is in the region of Europe and Central Asia. Still, sub-Saharan Africa had the highest episode-to-country ratio at 1.35. The next highest was the Middle East and North Africa at 0.92. No countries had more than one *NGE* in East Asia and the Pacific, Europe and Central Asia, and Southeast Asia. This can be seen by looking at the row showing the count of total episodes and the row showing the number of countries experiencing one or more *NGEs*.

In terms of the magnitude of the decline in output per capita, the region of the Middle East and North Africa had the worst experience, followed by Europe and Central Asia. However, Europe and Central Asia's average *NGE* was the shortest in duration (5.6 years) and Southeast Asia's the longest (19 years). However, only one country in Southeast Asia had an *NGE* and that was Afghanistan whose decline started in 1983. The durations of the remaining regions are more similar.

Table 2 also shows that over half of the depression episodes (78 of 121) occurred in the 1970s and 1980s. This result is echoed by Jones and Olken (2008) who find that down breaks in growth dominate these decades. The decade of the 1970s stands out for oil shocks and the breakdown of the Bretton Woods fixed exchange rate arrangement, and the decade of the 1980s for the sovereign debt crisis and the Volcker-induced worldwide credit crunch.[6]

[6] There is only one depression identified during the decade of 2000. However, given the strictness of our criteria for identifying a depression and because our sample period ends in 2009, we may not be capturing some of the *NGEs* that are likely to have materialized during the worldwide financial

Table 2: NGE Descriptive Statistics by Decade and Region

Decade	Statistic	*EAP*	*ECA*	*LAC*	*MENA*	*SAS*	*SBSA*	Total
1950-59	episodes	2	–	1	2	–	4	9
	mean dur	5	–	8	5.5	–	14.3	9.6
	mean $\%\Delta y$	-7.5	–	-3.3	-4.2	–	-1.7	-3.7
1960-69	episodes	1	–	1	3	–	8	13
	mean dur	13	–	4	16	–	13.1	13.1
	mean $\%\Delta y$	-5.9	–	-5.9	-4.3	–	-4.1	-4.4
1970-79	episodes	1	1	12	4	–	22	40
	mean dur	20	4	10.6	7.0	–	11.6	10.9
	mean $\%\Delta y$	-3.9	-8.5	-4.3	-12.1	–	-5.1	-5.6
1980-89	episodes	1	7	8	7	1	14	38
	mean dur	4	5.6	6.5	7.9	19	9.7	8.0
	mean $\%\Delta y$	-18.3	-8.1	-6.2	-11.3	-6.7	-4.9	-7.3
1990-99	episodes	1	8	2	2	–	8	21
	mean dur	10	5.9	8.5	10.5	–	8.6	7.8
	mean $\%\Delta y$	-2.1	-8.5	-3.6	-2.7	–	-5.8	-6.2
2000-09	episodes	–	–	–	–	–	1	1
	mean dur	–	–	–	–	–	4	4
	mean $\%\Delta y$	–	–	–	–	–	-13.2	-13.2
	Total Episodes	6	15	24	18	1	57	121
	Mean duration	9.5	5.6	8.7	9.1	19	11.0	9.5
	Mean $\%\Delta y$	-7.5	-8.4	-4.9	-8.6	-6.7	-4.9	-6.0
	# of countries with ≥ 1 *NGE*	6	15	18	12	1	36	88
	# of countries in region	16	27	26	20	7	42	138

Note: 23 countries from the region 'West' were excluded since they had no NGES.

Table 3: NGE Descriptive Statistics by Decade and Level of Development

Decade	Statistics	*LID*	*LMID*	*UMID*	*HID*	Total
1950-59	episodes	3	4	1	1	9
	mean dur	12	6.3	21	4	9.6
	mean $\%\Delta y$	-1.7	-5.4	-1.4	5.1	-3.7
1960-69	episodes	9	3	1	–	13
	mean dur	13.1	16	4	–	13.1
	mean $\%\Delta y$	-4.4	-4.0	-6.9	–	-4.4
1970-79	episodes	18	11	9	2	40
	mean dur	13.1	9.0	7.7	15.5	10.9
	mean $\%\Delta y$	-5.1	-5.8	-6.5	-5.1	-5.6
1980-89	episodes	13	14	10	1	38
	mean dur	10.8	6.6	6.7	5	8.0
	mean $\%\Delta y$	-6.0	-7.9	-8.6	-4.3	-7.4
1990-99	episodes	9	7	4	1	21
	mean dur	8.3	6.3	8.8	10	7.8
	mean $\%\Delta y$	-6.6	-7.0	-4.4	-3.2	-6.2
2000-09	episodes	1	–	–	–	1
	mean dur	4	–	–	–	4
	mean $\%\Delta y$	-13.2	–	–	–	-13.2
	Total Episodes	53	38	25	5	121
	Mean duration	11.5	7.9	7.8	10	9.5
	Mean $\%\Delta y$	-5.4	-6.6	-6.8	-4.5	-6.0
	# of countries with ≥ 1 *NGE*	35	29	20	4	88
	# of countries in level of development	47	47	30	37	161

We next categorize *NGEs* by decade and income category. We use the World Bank's income classification system: low income *(LID),* lower middle income *(LMID)*, upper middle income *(UMID*), and high income *(HID).* The income development classification was determined in 2010 and does not re-categorize by year or decade. These results are reported in Table 3.

The results presented in Table 3 show that there is a preponderance of depression episodes up through the third tier of economic development. Three-fourths of low-income countries have experienced an *NGE.* But economic depressions are by no means exclusive to *LID* countries: two-thirds of lower-middle and upper-middle income countries have also experienced an *NGE*. Only the high-income countries, for the most part, have avoided *NGEs.* However, the low income countries are associated with the longest mean duration, nearly four more years than the lower middle and upper middle income groups. The middle income group of countries, on the other hand, have the biggest declines in y. The negative growth experiences of these two groups of countries is 1.3 to 2.2 percentage points worse than the income groups at the extremes. This might reflect the fact that low income countries are already close to subsistence, so the decline in y is limited.

Growth for most countries is highly variable. Figure 2 shows the highest and lowest episodic growth rates for each country ranked by the log of initial per capita income. We see that almost all countries have considerable variability in their growth experience.[7] The mean difference between the highest positive episode growth rate and the lowest negative episode growth rate across countries is 12.2%.

We also document a boom-bust nature to growth cycles. Easterly et al. (1993) and Hausmann et al. (2005) found that periods of high growth were often followed by periods of low growth. Our data reveal that the magnitude of the growth during a depression is inversely related to the magnitude of the growth during the prior period of positive growth. It seems that depressions may be initiated, at least partly,

crisis.

[7]Episode length over which we calculated the growth rates varies greatly, since depressions do not have a uniform length. Moreover, this figure only contains countries that had at least one depression. Jones and Olken (2008) perform a similar exercise, but compare the highest 10-year growth rates to the lowest 10-year growth rates for each country.

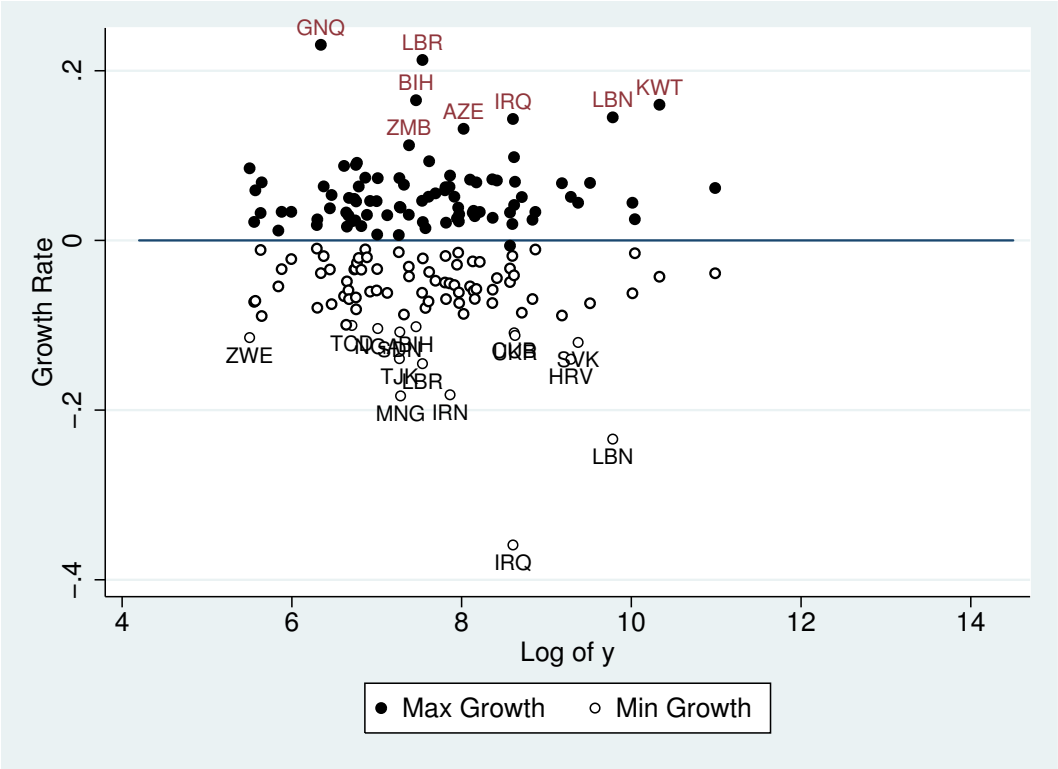

Figure 2: Extreme Growth

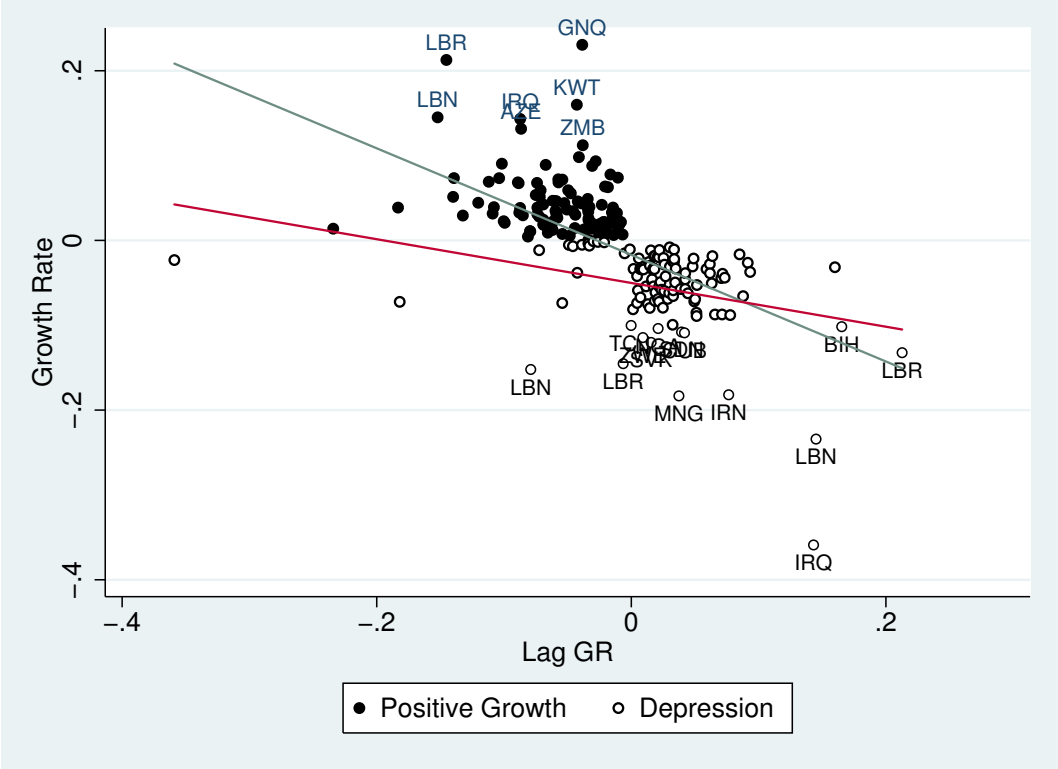

Figure 3: Episodic Growth Rates

by periods of above-average prior growth.

To show this, we first arranged our data into an unbalanced panel of growth rates by country and episode. Then we ran a regression of the following form:

$$g_{jk} = \tau_0 + \tau_1 g_{jk-1} + \eta_j + \varepsilon_{jk} \tag{1}$$

where g_{jk} is the annual average growth rate of country j in episode k and η_j is a country fixed effect. When we ran this regression for the full sample we obtained a coefficient of $\tau_1 = -.76$ with a $p = 0.000$. This is the steeper line in Figure 3. If we restrict the sample to episodes of negative growth – so the lagged growth rate is positive by construction — we obtain a smaller coefficient of $\tau_1 = -.36$, but it still has a $p = 0.000$. This is the flatter line in Figure 3.

The data show that the higher is the growth rate during an episode of positive growth, the lower is the growth rate in the following depression. We find the same

result when we run pooled OLS, whether or not we take the growth rates relative to the mean of world episodic growth rates. Pooled OLS also works if we add region dummies or income dummies, or if we run a simple cross-section regression using country-wide *averages* of negative and positive growth rates.

4 What is Associated with Economic Depression?

4.1 The Method

The empirical literature on economic growth has identified a set of variables that is associated with good economic performance. The early work of Kormendi and Meguire (1985) and Barro (1991), and subsequent studies by Temple and Johnson (1998), Hall and Jones (1999), Acemoglu et al. (2001), and Acemoglu et al. (2008), among many others, has shown that certain policies and institutional arrangements are superior to others in promoting fast growth and high per capita output. In this section, we use our data to examine whether some of these economic and political variables are associated with the incidence of depression.

There is also a new and growing body of literature that finds that the deepest causes of economic development reside in culture (Knack and Keefer, 1997; Guiso et al., 2006; Tabellini, 2008a; Tabellini, 2008b; Breuer and McDermott, 2010; and Gorodnichenko and Roland, 2011). It seems plausible, given this literature, that certain cultural traits would help a country mitigate or avoid shocks that might otherwise cause depression. Our second and more novel use of the data is to test whether cultural variables are systematically associated with the incidence of depression.

It may seem unusual to associate discrete, and relatively rare, events like depressions with the highly persistent variables that we use below. If, however, the immediate and long-run effects of external shocks are conditioned by underlying variables, those variables will be correlated with the frequency and intensity of episodes of falling output. This is similar to the view of Easterly et al. (1993) and Rodrik (1999). Therefore, we proceed with a probit model to measure the strength of the association between the incidence of depression and our variables of interest. Our dataset is an unbalanced panel of countries with annual data from 1970 to

2009.[8] The estimating equation is:

$$NG_{it} = \alpha + \beta Z_{it} + \gamma X_{it} + \delta D_t + \varepsilon_{it} \tag{2}$$

where NG_{it} is an indicator variable taking the value 1 if Country i was in depression in year t and 0 otherwise. The variable Z_{it} stands for the variable of interest in Country i in year t, and X_{it} is a control variable. The variable D_t stands for a complete set of year dummies which are included in all specifications. We assume the errors are independent across countries, but are correlated within countries. We make no claim about causality from Z to NG: we only want to identify characteristics that are associated with the incidence of depression.

Many of our explanatory variables may be correlated with per capita income or latitude – both common proxies for the level of development. Including either as a control should reduce the bias of our estimates. Therefore, we run the probit model three times: without a control, using $\ln y$ as a control, and with *latitude* as a control. The results are presented in Tables 4 and5.

4.2 Economic and Political Factors

We begin by examining nine variables that have been studied in the literature on economic growth. We organize these variables into two categories: the *Economy* and the *Political Environment.* Variable descriptions are contained in Appendix A. In contrast to the cultural variables we consider below, our economic and political variables are time-varying. Our use of time dummies will control for any shocks that are common across the world in any year.

Our results are presented in Table 4.[9] In *Panel A* we present the results of the economic variables. To capture aspects of the *Economy,* we use $\ln y$ itself, the *consumer price index inflation rate*, a measure of *trade openness, population,* and *youth population.* Specification (1) shows the results from the estimating equation

[8] We begin the analysis in 1970 since there is an absence of data for many of our explanatory variables prior to that date.

[9] The results in Table 4 differ very little when we use the three other algorithms for determining *NGEs*. See footnote 4.

without a control. Specifications (2) and (3) present the results controlling for $\ln y$ or $latitude$, respectively.

Output per capita, $\ln y$, is expected to be inversely related to the incidence of depression. Shocks that cause depression in poor countries may be neutralized in developed, diversified economies. Our results support this intuition: the coefficient on $\ln y$ is negative, and highly significant, but not especially large.[10]

High inflation has been linked to low growth, although this relationship may not be monotonic (Lopez-Villavicencio and Mignon, 2011, Barro, 1998). Our results show that inflation is also linked to the to the occurrence of depression. The coefficient is positive and highly significant. When we compare averages over different episode types, we find that, on average, inflation is 19 percentage points higher during years of depression compared to other years. Inflation may indicate the presence of generally poor economic policy.

Scale measures, like *population* and *openness,* show mixed results in cross-country growth studies. In the literature, population appears to have a negative effect on output per capita (Acemoglu and Johnson, 2007), or none at all (Barro and Sala-i Martin, 2003, Hall and Jones, 1999). However, we find that population appears to mitigate the influence of shocks: large countries have fewer episodes of depression. Openness has been linked to good economic outcomes in some studies (Wacziarg and Welch, 2008), but others find no evidence that it promotes growth (Barro and Sala-i Martin, 2003). Openness, in our data, appears to have no relationship at all to the frequency of depressions.

We also investigate whether countries with a higher *youth population* share are more prone to episodes of depression. Positive growth may be harder to maintain when a greater share of the population comprises child-dependents, since child-rearing activities may interfere with work effort and productivity (Kogel, 2005; Madsen, 2010). Negative shocks to production may be more difficult to offset when there are many young, inexperienced, and uneducated workers. Whatever the reason, we find that negative growth episodes are strongly associated with a higher

[10]The rule of thumb is to multiply the coefficient by .4 to obtain the marginal effect. In this case, $m = .4 * .29 = .116$. So, if $\ln y$ increased by .1 – so that y increased by about 10.5% – the probability that a country experienced a depression would fall by about .0116 or 1.16%.

Table 4: Economic and Political Factors

$NG_{it} = \alpha + \beta Z_{it} + \gamma X_{it} + \delta D_t + \varepsilon_{it}$				
	(1)	(2)	(3)	
PANEL A: Economic Factors				
$Z \downarrow$	–	X = *ln y*	X = *latitude*	Obs
ln *y*	-0.29**			5745
	[0.00]			
Inflation	0.64**	0.58**	0.64**	4480
	[0.00]	[0.00]	[0.01]	
Open	0	0	0	5745
	[0.21]	[0.49]	[0.30]	
Population	-0.78**	-0.79*	-0.64*	5735
	[0.01]	[0.02]	[0.03]	
Pop Young	9.10**	4.27+	4.62*	5706
	[0.00]	[0.06]	[0.04]	
PANEL B: Political Factors				
$Z \downarrow$		X = *ln y*	X = *latitude*	Obs
Civil Liberties	-0.27**	-0.23**	-0.24**	4746
	[0.00]	[0.00]	[0.00]	
Democracy	-0.11**	-0.08**	-0.10**	5332
	[0.00]	[0.00]	[0.00]	
Cons. Exec.	-0.19**	-0.15**	-0.16**	5332
	[0.00]	[0.00]	[0.00]	
Civil War	0.50**	0.33*	0.44**	5745
	[0.00]	[0.01]	[0.00]	

Notes: Robust p values in brackets.

** significant 1%; * at 5%; and $^{+}$ at 10%.

youth population share.[11]

In *Panel B*, we examine four features of the *Political Environment – civil liberties, democracy*, *constraint on the executive*, and a *civil war* indicator. We find that the first three measures of institutional quality are significantly worse during economic depressions.[12] Our results also lend support to the importance of high-quality institutions in securing economic prosperity. (Acemoglu et al., 2001, Barro, 1991, Hall and Jones, 1999, Jerzmanowski, 2006, and Rodrik, 1999).

We also see an extremely strong association between civil war and negative growth. Fully 18% of depression years are spent in civil war, while only 7% of positive growth episode years coincide with civil war. This finding does not allow us to comment on causality, and we would not be surprised to learn that either event – a depression or a civil war – could trigger the other. Moreover, it seems clear to us that something more fundamental, especially ethnic strife born of fractionalization, would go hand-in-hand with weak civil liberties and weak democracies. Societies with such elements must be ripe for economic depression, civil war, or both (Miguel et al., 2004, Collier and Hoeffler, 2004).

In all cases, our results are robust to the inclusion of either control – $ln\,y$ or $latitude$. Our results, suggest that economic and political factors have separate, independent effects on the incidence of depression and are not driven by the level of development or colonial history.

4.3 Cultural Factors

We measure *Culture* using eleven variables. Four of these are fairly common in the literature – *latitude, ethnic fractionalization, religious fractionalization,* and *trust.* We include seven more that have received much less attention: *ethnic polarization*, *religious polarization*, *individualism, attitudes toward government welfare, uncertainty avoidance, confidence in the justice system,* and *attitudes toward honesty.* Culture variable descriptions appear in Appendix A.

The country coverage for about half of our culture variables is much smaller

[11] Using the coefficient reported for the $\ln y$ control (4.27), if the youth share rose by .1, the probability of depression would rise by .1708 or 17.08%.

[12] The variable, *constraint on the executive,* is part of the *democracy* index. See Appendix A.

than for our *Economic* and *Political* variables, reducing our sample size considerably. In addition, the culture variables are time-invariant. This means the probit analysis captures the cross-sectional correlation between our measures of *Culture* and the cross-sectional average of the incidence of depression, NG_{it}. Cultural characteristics are less likely to raise concerns of endogeneity since they have evolved over a very long time and cannot be influenced by depressions, even those lasting several years. The results are presented in Table 5. As before, we present estimates of β with and without controls in Specifications (1), (2), and (3).

We expect *latitude*, which we also include as a control, to be inversely related to the incidence of depression. Latitude may proxy for cultural traditions that established the initial conditions of human capital, institutional quality, and democratic tradition.[13] We find the coefficient is negative and significant.

Rodrik (1999) argues that where latent social conflict is high, shocks cause greater economic disruption than in countries where cooperation is the norm. He finds that income inequality and ethnic fractionalization can explain the global collapse in growth rates post-1975. Work by Alesina et al. (2003), Alesina and Ferrara (2005), Fearon (2003), and Mauro (1995) establishes a causal link between fractionalization and economic growth. Our results complement these findings. There is strong evidence in Table 5 that greater *ethnic fractionalization* is associated with negative growth episodes. *Religious fractionalization*, however, does not appear to be associated with negative growth.

Polarization is another way to measure the potential for societal conflict. Unlike fractionalization, which increases with the number of distinct groups, polarization reaches a maximum when there are two groups (Montalvo and Reynal-Querol, 2005). Conflict may be worse if power is concentrated between two strong rivals. We find that this argument has merit, especially for *religious polarization*.

In recent work, Gorodnichenko and Roland (2011) find that countries with higher *individualism* scores have higher standards of living. Cultures with a bias toward individualism value independence of mind and action and the personal rewards that come with these values. Cultures with low individualism ascribe greater

[13] It is also possible that climate and disease at lower latitudes may make recovery from shocks more difficult (Sachs, 2000).

Table 5: Culture

$NG_{it} = \alpha + \beta Z_{it} + \gamma X_{it} + \delta D_t + \varepsilon_{it}$				
	(1)	(2)	(3)	
$Z \downarrow$		$X = \ln y$	$X =$*Latitude*	Obs
Latitude	-2.08**			5745
	[0.00]			
Ethnic Frac	1.82**	1.45**	1.47**	5676
	[0.00]	[0.00]	[0.00]	
Rel. Frac.	0.42	0.31	0.15	5696
	[0.26]	[0.38]	[0.66]	
Trust	-1.88+	-0.95	-1.35	2736
	[0.08]	[0.38]	[0.24]	
Ethnic Pol.	1.09**	1.02**	0.6	4726
	[0.00]	[0.01]	[0.16]	
Rel. Pol.	1.13**	0.60+	0.66+	4726
	[0.00]	[0.07]	[0.06]	
Individualism	-0.02**	-0.02**	-0.02*	1728
	[0.00]	[0.01]	[0.03]	
Govt. Resp.	0.62**	0.51**	0.60**	2736
	[0.00]	[0.00]	[0.00]	
Uncert. Avoid.	0.01	0.01	0.01	1728
	[0.21]	[0.21]	[0.17]	
Justice	-1.48**	-1.73**	-1.27*	1818
	[0.01]	[0.00]	[0.02]	
Honesty	-2.09	-3.48*	-2.23	2581
	[0.24]	[0.02]	[0.20]	

Notes: Robust p values in brackets.

**significant 1%; * at 5%; and $^{+}$ at 10%.

rewards to conformity and satisfying group preferences.[14] We examine whether countries that are prone to negative growth score lower on the *individualism* scale. Consistent with Gorodnichenko and Roland (2011), we find that scores on Hofstede et al. (2010)'s individualism scale are lower during episodes of depression. If a cultural predisposition toward individualism seems to protect against negative growth, it would follow that in countries where *government welfare* is preferred – the opposite of *individualism* – depression would be more prevalent. Our results strongly support this conjecture, too. Depression-prone countries have a higher score on a scale when its citizens are asked whether they believe the government should take a greater role in providing for them.

Trust has long been considered a component of social capital. Work by Knack and Keefer (1997), La Porta et al. (1997), and Zak and Knack (2001) shows that lower trust is associated with slower growth. We extend this idea to episodes of economic depression. We find only weak evidence that lower trust is associated with depression. Only when we omit controls do we see a marginally significant coefficient. As an alternative measure of trust, we also test Hofstede et al.'s (2010) index of *uncertainty avoidance*. We think that countries that are more trusting are less likely to avoid uncertainty. However, we find no empirical support linking depression to *uncertainty avoidance*.

The measure of trust we use has been criticized as being too general*;* it does not reflect trust in specific people or institutions of society. To focus on a particular aspect of society that is critical for economic outcomes, therefore we investigated whether *trust or confidence in the judicial system* is related to episodic depression. We find that such confidence is highly significantly negatively related to these episodes. Confidence in the judicial system may reflect the true probability that individual property rights and liberties will be protected.

Last, we investigated whether *attitudes toward honesty* are more prevalent in countries that have avoided episodes of economic depression. Breuer and McDer-

[14] Hofstede et al. (2010), p. 92 state: "Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him- or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty."

mott (2012) argue that honesty and trustworthiness are necessary for the formation of trust. Here, however, we find very modest support for honesty. Only when we control using lny does honesty appear to protect against depression episodes.

5 Conclusion

We propose a definition of economic depression as a discrete period of negative growth reaching a cumulative decline of 20 percent or more in output per capita lasting at least three years. Using our definition, we construct a new dataset for the study of economic depression that can advance further research on severe downturns. In all, we find 121 incidences of depression across 88 countries. Depressions are surprisingly common.

We used our data in two ways. First, we provided a topography of depressions around the world since 1950. We quantified their incidence, depth, and duration. Further, we stratified by decade, region, and income level and examined patterns in growth episodes. Our results confirm the existence of another kind of Great Moderation: since the end of the Eighties, depressions have become less common. Our data end too soon, however, to permit us to see whether the Great Recession of 2008-2009 has caused a new wave of economic depression.

Second, we undertook an exploration of the conditions surrounding episodes of economic depression. We began by exploring nine economic and political factors. Episodes of negative growth are associated with low income, high inflation, small scale, and a large proportion of young people. They are also associated with poor individual liberties, a lack of democracy, an unconstrained executive, and internal conflict. Years spent in civil war are far higher during depression.

Cultural factors as correlates of macroeconomic outcomes have received much less attention. Yet, it is recognized by behavioral economists that cultural values condition decisions and influence outcomes. So, we undertook a study of eleven cultural factors. We find strong associations between episodes of depression and cultural characteristics. Depression occurs more frequently at lower latitudes, and in countries with greater fractionalization and polarization – both ethnic and religious. In countries where citizens believe the government should be responsible

for their welfare, and in those that lack an individualistic attitude, negative growth occurs with greater frequency. Cultures that have low levels of trust, both generally and specifically toward the judicial system, are more likely to experience economic depression.

Interest in the episodic nature of growth is increasing, but there has been little systematic inquiry into the characteristics or causes of economic depressions. Our data and results are a useful step forward in understanding this important phenomenon.

A Data Appendix

1. *Attitudes toward Government Welfare*. On a scale of 1 – 10, people were asked if they agreed with: "People should take more responsibility to provide for themselves" vs "The government should take more responsibility to ensure that everyone is provided for." A '1' indicates that people should take more responsibility while '10' indicates the government should be more responsible. Responses averaged over individuals in each country over all available waves. Source: *Question E037, World Values Survey*.

2. *Attitudes toward Honesty*. On a scale of 1 – 10, people were asked if "avoiding a fare on public transport" could ever be justified. We inverted so that '1' indicates "always justifiable" (dishonest) while '10' indicates "never justifiable" (honest). Responses averaged over individuals in each country over all available waves. Source: *Question F115, World Values Survey*.

3. *Avoidance of Uncertainty.* Index of Uncertainty Avoidance. Scale 0-100. Higher scores indicate stronger avoidance. Source: *Hofstede et al. (2010).*

4. *Civil Liberties*. Index of Civil Liberties. Inverted scale of 1 – 7, with 7 indicating the most free. Average over each episode for each country. Source: *Freedom House*.

5. *Civil War*. Indicator variable = 1 if the country is in civil war. Source: *Correlates of War Database*.

6. *Confidence in the Justice System.* On a scale of 1 – 4, people were asked how much "confidence in the justice system" they had. We inverted so that '1' indicates "none at all" while '4' indicates "a great deal." Responses averaged over individuals in each country over all available waves. Source: *Question E085, World Values Survey*.

7. *Constraint of the Executive*. Constraint on the Executive index. Scale of 1 – 7, with 7 indicating the most constraint on the power of the executive. Source: *Polity IV*.

8. *Democracy*. Democracy index. Scale of 0 – 10, with 10 indicating the highest institutional democracy. Source: *Polity IV*.

9. *Ethnic Fractionalization*. Measure of concentration of different ethno-linguistic groups within a country. Source: Alesina et al. (2003).

10. *Ethnic Polarization*. Index of concentration of ethno-linguistic groups; reaches a maximum when there are two groups. Source: Montalvo and Reynal-Querol (2005).

11. *Individualism*. Index of individualism. Scale 0-100. Higher scores indicate a more individualistic society. Source: *Hofstede et al. (2010).*

12. *Inflation*. CPI Inflation Rate. Source: *IMF International Financial Statistics*.

13. *Latitude*. Absolute value of latitude. Source: La Porta et al. (1998)

14. *Population*. Population in hundreds of millions. Source: *Penn World Table* v. 7.0.

15. *Religious Fractionalization*. Measure of concentration of different religious groupings within a country. Source: Alesina et al. (2003).

16. *Religious Polarization*. Index of concentration of religious groups; reaches a maximum when there are two groups. Source: Montalvo and Reynal-Querol (2005).

17. *Trade Openness*. Sum of Import and Export value, as a fraction of GDP. Source: *Penn World Table* v. 7.0.

18. *Trust.* Proportion of individuals selecting *"most people can be trusted"* to the question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" Responses averaged over individuals in each country over all available waves. Source: *Question A165, World Values Survey.*

19. *y*. Output per capita; series *RGDPCH*. Source: *Penn World Table* v. 7.0.

20. *Youth population*. Fraction of the population age 10-19 years old. Source: *United Nations*.

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