Economic Depression in the World

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Abstract

We create a dataset of country experience with economic depression around the world. We define a depression episode as a period of cumulative decline in per capita output of 20 percent or more lasting at least four years. We find depressions are surprisingly common. We describe their incidence and onset over decades, regions, and levels of development. We identify economic, political, financial, and cultural variables that are associated with depressions. Probit analysis reveals that the probability of entering or exiting a depression is influenced by domestic and international shocks.

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 sixty years ago. Depressions are not well understood theoretically and present a considerable challenge for policymakers. In this paper, we construct a panel dataset of episodes of economic depression around the world from 1950-2009. We present evidence that economic depression is quite common and use our data to explore their incidence, duration, and depth. We then investigate the factors that are coincident with depression. We find significant and,

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in some cases, large differences in the means of key indicators between depressions and periods of normal growth. These are not causal results. Using probit analysis, we also investigate shocks that precipitate depression or help promote recovery from them.

We define a depression as a period during which per capita output falls cumulatively by at least 20 per cent over at least four years. This definition is severe. Even so, depressions are surprisingly common: 85 countries, over half our sample, had at least one depression. To put our rule in perspective, during the U.S. Great Depression, real GDP per capita fell by 29 per cent from 1929 to 1933. The cumulative decline for many of the countries in our sample is much greater than that.

There have been other studies that have examined declines in output per capita. Barro and Ursua (2008) define "macroeconomic disasters" as peak-to-trough declines in output per capita of 10 percent or greater to use in their study of asset pricing puzzles. Reddy and Minoiu (2009) look at episodes of stagnation – where growth is zero or negative. Kehoe and Prescott (2002) use a decline of 20 percent or more from a 2 percent trend growth in output per capita. 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.

A number of recent papers focus attention on structural breaks in an economy's *growth rate*, not its level of output per capita. Easterly et al. (1993) find that there is low persistence in ten-year growth rates in spite of highly persistent policy. Pritchett (2000) documents a typology of economic growth instability and was among the first to point out systematic patterns of growth within a long-run trend. Jerzmanowski (2006) built on this observation by using Markov switching models to understand growth patterns. One strand of this literature examines factors that are associated with changes in growth rates across periods defined historically (Rodrik, 1999) or identified structurally (Jones and Olken, 2008). Hausmann et al. (2005) identified discrete episodes of "growth acceleration" to find clues to the ability of countries to sustain growth.

There have been few attempts to explain particular depressions in light of theoretical models. Exceptions are the work of Kehoe and Prescott (2002) and Hayashi and Prescott (2002) who use an optimizing, intertemporal neoclassical growth model. This work locates the cause of depression in government policies that reduce productivity and hours worked, usually

through impediments to competition and rewards to inefficient industries. McDermott (2010) constructs a multi-country endogenous growth model that explains depressions as transitions to lower growth paths after shocks that increase misgovernance, which indirectly reduce productivity in both production and human capital generation.

Our method for identifying depressions uses an iterative search procedure to select peaks and troughs in output per capita that meet specific criteria to demarcate episodes of negative growth from episodes of positive growth. This procedure allows us to avoid using decadal averages or arbitrary break dates, either of which may lead us to miss key turning points.

Our paper makes three contributions. First, we propose a definition of economic depression and develop an algorithm to identify them. We then construct a dataset of episodes of economic depression (or negative growth) by country. The intervening episodes, by definition, are classified as episodes of positive growth. Second, we use our data to study correlates of economic depression. We explore standard correlates such as economic policy, institutions, internal conflict, and financial crises. In addition, we examine demography and culture, which are much less widely studied. Third, we look at shocks that have the potential to send a nation into a depression – or help it to escape one.

The paper is organized as follows. In Section 2, we describe our algorithm for constructing our set of economic depressions. We provide a complete list of all depression episodes and their general characteristics. In Section 3, we summarize depressions in recent history, categorizing them by decade, region, and income tier. In Section 4, we examine twenty-one correlates of economic depression and ask whether they are systematically different in episodes of depression compared to episodes of positive growth. In Section 5, we investigate shocks that occur prior to, or coincident with, the onset of a depression to see which most influence the probability that a depression will occur. We undertake a similar exercise focused on depression cessation. Section 6 offers some concluding remarks.

2 The Data on Economic Depression

In this section, we explain how our algorithm works to divide countries' time series data of output per capita into periods of negative growth – depressions – and periods of positive growth. We comment on several salient cases of depression to illustrate the validity of the

algorithm and then provide a list of all depression episodes.

2.1 The Algorithm

Our first task is to define a "depression" or "negative growth episode" *(NGE)*. There is no unambiguous way to do this, and we considered several alternatives. All of them involve peak to trough declines in output per capita using two basic parameters: *depth* and *duration*. Our baseline definition takes *minimum* depth to be 20 percent and *minimum* duration to be 4 years.

Our method is to begin with the entire set of peaks and troughs for each country, and then successively narrow the list of candidate peak-trough pairs by applying various filters. We eliminate shallow intermediate peaks and troughs, and are left with deeper and longer candidates. By the end, we keep those, if any, that satisfy our depth and duration criterion. The procedure below successively examines "peak-trough-peak-trough" quadruples to determine whether the intermediate trough-peak pair can be eliminated. If so, the *peak* at the *quadruple start* and *trough at the quadruple end* form the beginning peak-trough pair for a quadruple on the next sweep of the algorithm. The algorithm stops when all intermediate pairs have been eliminated.

Specifically, we implement the method through the series of filters contained in 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. We exclude countries with populations of less than one million and countries with less than eight years of data. See Appendix A for a complete list of data and sources. Data on y are from *Penn World Tables 7.0, RGDPCH series, 1950-2009.*

2. We then apply a filter to eliminate "intermediate trough-peak pairs" that are too small or too short to constitute an intervening positive growth episode. These are defined by the following criterion: (i) the intermediate trough is *above* the *subsequent* trough *and* (ii) the intermediate peak is *below* the *previous* peak; *or* (iii) the trough and peak occur within two years of each other.[1] This filter is applied repeatedly until the peak-trough

[1]We make an exception to the last rule if the intermediate peak is the highest to date; then it starts a new

candidate dates do not change.

3. We then apply a filter that incorporates some "sudden collapses" into the start of a depression – collapses that are too short to stand on their own. These are intermediate trough-peak pairs where (i) the trough comes within 3 years of the *previous* peak; (ii) the trough is *below* the subsequent trough so it is not eliminated in *Step 2*; but (iii) the *subsequent* trough is 20 percent below the *previous* peak. This ensures that even without the collapse, our depth criterion is satisfied by the entire episode.

4. Of the remaining peak-trough pairs, we keep only those if the ratio of y at the peak to y at the succeeding trough is *at least* as large as 1.2; *and* the peak and trough are separated by *at least* 4 years.[2]

Using data from the *Penn World Table* (PWT) on the log of y , the baseline criterion yields a total of 104 depressions in 85 countries. There are 161 countries, so more than half have experienced at least one depression. Table 1 provides a complete list of episodes with the starting date, duration, and growth rate g_{yk} – computed as the coefficient from a regression of the log of y on trend *during* that episode.

We also ran the algorithm using different parameters for minimum depth and minimum duration. We tried two other combinations: (1) increasing the minimum duration to five years keeping the peak-trough ratio of 1.20; and (2) increasing the peak-trough ratio to 1.25 keeping the minimum duration of four years. The first alternative yields 93 episodes spread over 77 countries. The second gives us 88 depressions in 74 countries. The harsher filters exclude around 11 to 16 of the "less severe" depressions.

2.2 Discussion of Depressions

To put our algorithm and data in perspective, it is instructive to begin the discussion by referring to the US Great Depression. In Figure 1 we show the path of the log of y for the United States from 1880 to 1940.[3] Our algorithm picks out the Great Depression that lasted

episode.

[2]There is one last filter: if a new NGE begins within two years of the end of a previous NGE, the two are joined into a single NGE.

[3]We stop the data in 1940 to make the scale comparable to the figures of contemporary episodes later. This figure uses data from Maddison (2010), which goes back to 1870.

Table 1: Country Experience with Depression

Country	Start Year	Duration in years	mean annual $\%\Delta y$	Country	Start Year	Duration in years	mean annual $\%\Delta y$	Country	Start Year	Duration in years	mean annual $\%\Delta y$
Afghanistan	1983	19	-0.07	Ghana	1972	12	-0.03	Niger	1965	9	-0.03
Algeria	1960	7	-0.04	Guatemala	1980	9	-0.03	Niger	1979	15	-0.03
Angola	1974	8	-0.05	Guinea	1962	9	-0.03	Nigeria	1960	9	-0.04
Angola	1988	6	-0.05	Guinea	1976	22	-0.01	Nigeria	1974	14	-0.04
Argentina	1979	12	-0.02	Guin-Bissau	1965	7	-0.04	P.N. Guinea	1976	15	-0.01
Azerbaijan	1993	5	-0.09	Guin-Bissau	1976	13	-0.01	P.N. Guinea	1994	10	-0.02
Bahrain	1977	11	-0.06	Guin-Bissau	1996	9	-0.05	Peru	1975	18	-0.02
Bangladesh	1963	12	-0.02	Guyana	1976	10	-0.07	Philippines	1981	5	-0.04
Belize	1981	5	-0.06	Haiti	1980	25	-0.02	Romania	1988	5	-0.09
Benin	1974	5	-0.05	Honduras	1951	5	-0.05	Russia	1991	8	-0.07
Benin	1982	13	-0.01	Iran	1976	14	-0.05	Rwanda	1962	7	-0.03
Bolivia	1951	8	-0.03	Iraq	1979	25	-0.05	Rwanda	1981	14	-0.03
Bolivia	1977	10	-0.03	Jamaica	1973	13	-0.03	Saudi Arabia	1992	8	-0.02
Brunei	1979	30	-0.02	Jordan	1965	9	-0.03	Senegal	1961	33	-0.01
Bulgaria	1988	10	-0.02	Jordan	1981	11	-0.04	Sierra Leo.	1989	11	-0.08
Burundi	1991	6	-0.07	Kazakhstan	1993	6	-0.04	Somalia	1972	34	-0.03
Cambodia	1970	13	-0.06	Kuwait	1993	10	-0.03	South Africa	1981	12	-0.01
Cameroon	1986	10	-0.06	Lebanon	1974	9	-0.05	Sudan	1977	10	-0.06
CAR	1961	45	-0.02	Lebanon	1987	6	-0.23	Suriname	1985	15	-0.02
Chad	1975	6	-0.10	Lesotho	1978	7	-0.03	Syria	1982	8	-0.03
Chile	1971	5	-0.05	Liberia	1978	22	-0.11	Tajikistan	1993	6	-0.14
Chile	1981	5	-0.04	Libya	1986	9	-0.05	Thailand	1950	6	-0.06
Congo, D. R.	1956	45	-0.03	Libya	1997	6	-0.03	Togo	1979	30	-0.02
Congo, Rep.	1984	24	-0.01	Madagascar	1974	9	-0.03	Trin. & Tob.	1981	13	-0.03
Cote d'Ivoire	1978	31	-0.01	Madagascar	1989	14	-0.01	Uganda	1969	18	-0.03
Cuba	1989	5	-0.11	Malawi	1978	17	-0.03	Ukraine	1993	5	-0.11
Djibouti	1970	29	-0.03	Mali	1960	15	-0.01	Uruguay	1980	5	-0.07
Ecuador	1980	20	-0.03	Mauritania	1976	22	-0.01	Uruguay	1998	5	-0.06
El Salvador	1978	6	-0.06	Mauritius	1951	21	-0.01	Uzbekistan	1990	7	-0.06
Eq. Guinea	1977	14	-0.04	Mexico	1981	8	-0.02	Venezuela	1977	27	-0.01
Estonia	1990	5	-0.09	Moldova	1992	8	-0.05	Zambia	1968	34	-0.04
Ethiopia	1973	20	-0.01	Morocco	1953	5	-0.07	Zimbabwe	1957	12	-0.02
Gabon	1976	12	-0.04	Mozamb.	1976	11	-0.03	Zimbabwe	1974	14	-0.02
Gabon	1997	10	-0.03	Namibia	1974	12	-0.02	Zimbabwe	1997	12	-0.11
Gambia	1982	17	-0.01	Nicaragua	1977	17	-0.04				

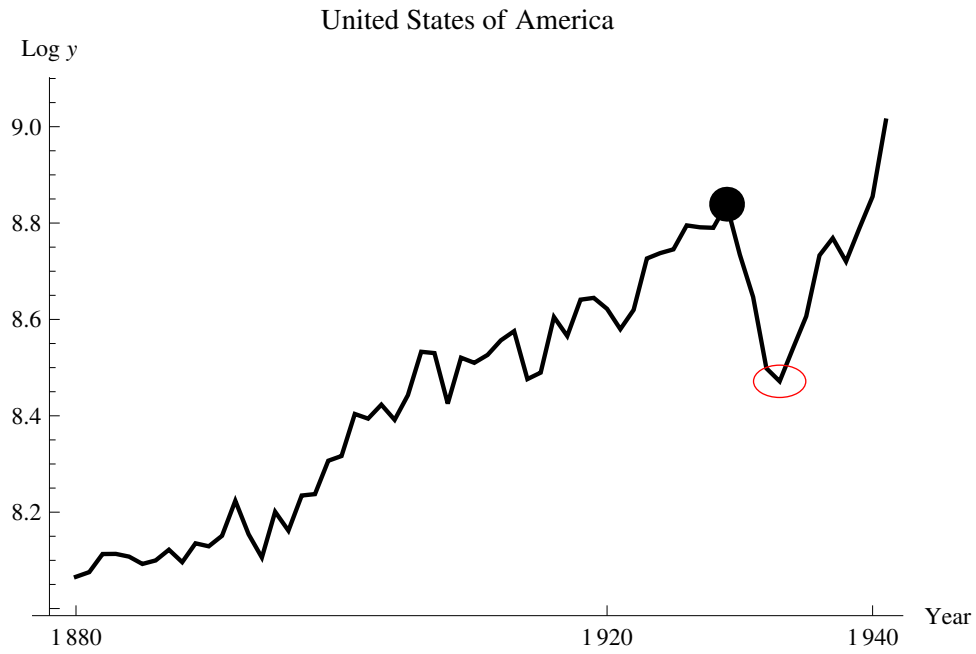

Figure 1: Log of Output of the United States

from 1929 to 1933, but does not capture a number of other downturns because they do not meet the depth or duration criteria. The depression episode – shown by the solid dot and the open oval – lasted five years (we count both the peak year and the trough year as part of the depression) and the ratio of output in 1929 to that in 1933 was 1.44[4], far in excess of our cut-off value of 1.20. By all accounts, this was an extreme event ("Great") and many of our depression episodes are not this severe. On the other hand, several of our episodes are even *more* extreme. Of the 104 episodes of depression that we found, fully 47 exceeded the depth of the Great Depression.

In Figures 2 and 3, we show sixteen countries' time series of log y.[5] The peak that begins an *NGE* is indicated by a solid dot, and the trough at the end by an open oval. Guinea-Bissau's depression in 1976 is a good example of *Step 2* of the algorithm – several minor intermediate trough-peak pairs are eliminated as candidate depressions within two of its three depressions. Lebanon's depression starting in 1974 is a good illustration of *Step 3*

[4]This corresponds to a 29 percent decline in y in the sense that $\frac{y_{1933}-y_{1929}}{y_{1929}} = -0.29$. We reported this number in the Introduction, and it is the figure commonly associated with the depth of the Great Depression.

[5]The scales in Figures (2) and (3) differ by country. Because of this, it may seem that some episodes are too mild to be depressions. For example, Argentina, Bangladesh, and Bulgaria do not appear to have suffered large declines in y. Since these are logarithmic scales, however, all we need is a peak-trough difference of about 0.2. Although these countries do satisfy the criteria, they are among the least disastrous of the episodes in our data.

– without that filter, we would not include the major output collapse in 1974 as part of an overall depression, since it was too short to be captured in our main filter.

We found 85 countries with at least one depression and 76 countries that never suffered a depression. Of the 85 countries experiencing a depression, 68 of them had one episode; 15 countries had two episodes; and two countries, Guinea-Bissau and Zimbabwe, had three episodes. One-third of the countries avoiding a depression altogether are industrialized while the remainder are developing countries.

Of the 104 episodes of depression, the average *cumulative* peak-to-trough ratio was 1.61, much greater than the 1.44 of the Great Depression.[6] This number, however, does not take into account the time it took to fall that far. The mean duration of the episodes was 13.17 years, nearly three times as long as the Great Depression, and the mean growth rate within any single episode k, g_{yk} was -4.24 percent per year.

Table 1 shows the longest *NGE's* were 45 years – an unbelievable record shared by the Central African Republic and the Democratic Republic of the Congo. With an average annual exponential decline in y of 1.57 percent and 3.41 percent, respectively, these two countries' living standards at their troughs would have been only 49 percent and 22 percent of their original peak magnitudes. That is not as severe, however, as the 22-year decline in Liberia of 11.17 percent per year that left the economy's per capita output at a mere 8.56 percent of its original level. The largest average annualized episodic decline was for Lebanon over the six-year depression beginning in 1987. The annual rate of decline was 23.42 percent, leaving it at 24.53 percent of its per capita income before the event.

3 Depression Topography

In this section, we summarize our data in order to appreciate the historical and worldwide

[6]Barro and Ursua (2011) find 183 economic disasters with an average cumulative decline of 20.8 percent. Their criteria is less stringent than ours and their dataset consists of 40 countries dating back to the mid-1800s.

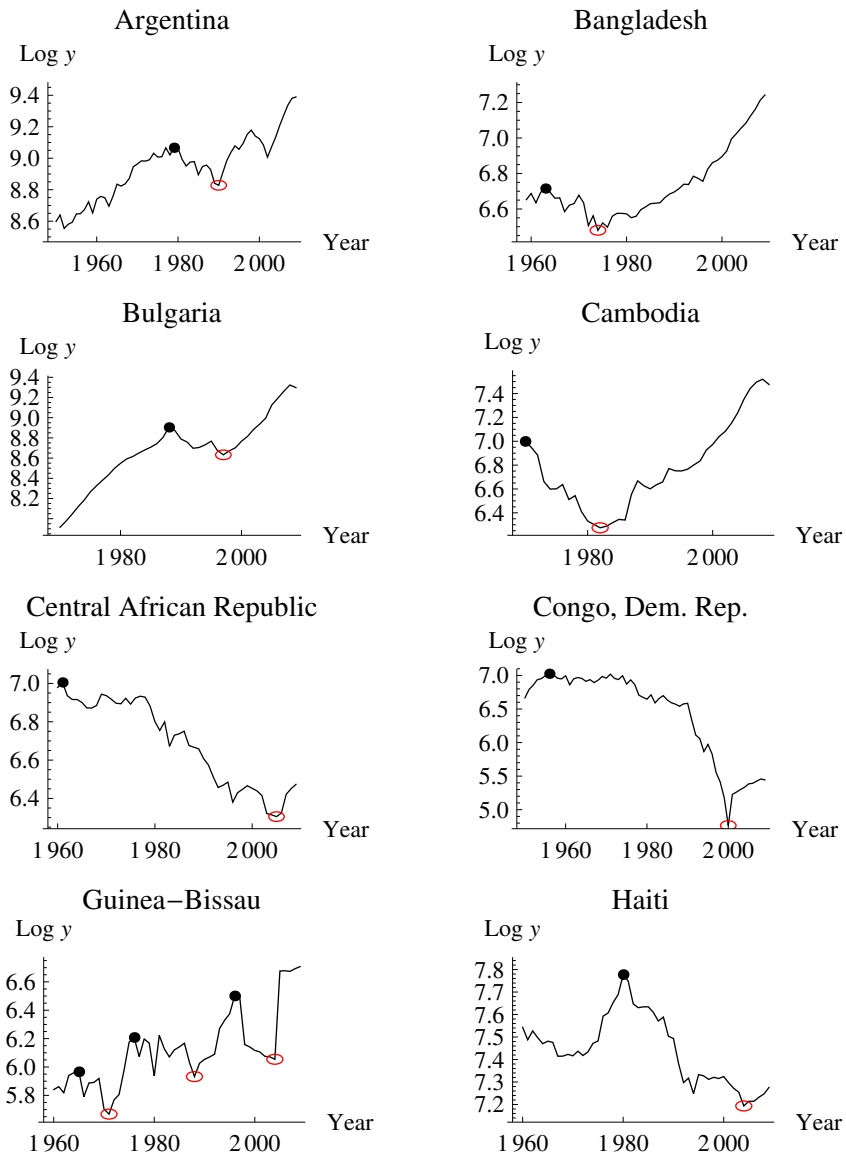

Figure 2: Eight Countries

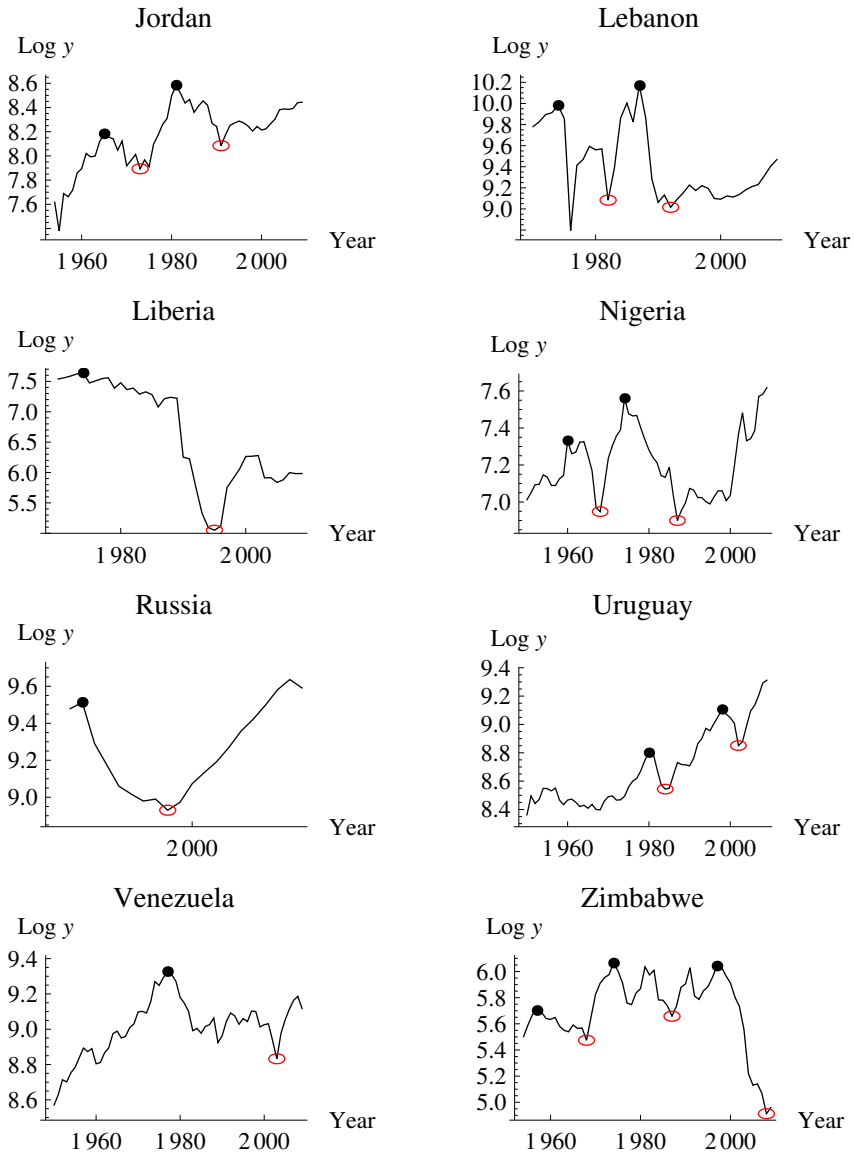

Figure 3: Eight More Countries

experience with economic depression.

3.1 Depression Incidence

Depressions have not been uniformly distributed over the 60 or so years for which we have data. As a first look at our data, Table 2 breaks down all of our depressions by decade, both for country-years and by country. In Column 2, we show the number of *country-years* that were spent in a depression by decade. We then report the sum of all country-years in Column 3. For example, in the 1950s, there were 40 country-years spent in depression out of a total of 645 country-years.[7] The share – 6.2 percent in the 1950's – is shown in Column 4.

Another way to consider the data is by the number of *countries* that spent at least one year in depression during a decade. Country information is reported in Columns 5 and 6. For example, Zambia's depression started in 1968 but persisted through 2001. Zambia would be counted as having a depression in every decade in Table 2 except the first. Column 5 shows that in the 1950s, 7 countries were in a depression at some point over the decade and that by the 1980s, this number had increased to 67.

We see that the 1970's, 1980s, and 1990's stand out by both measures. During the 1970s, known for oil price shocks and the breakdown of the Bretton Woods Agreement, 30 percent of the world (49 countries) and 18.4 percent of country-years were spent in depression. As bad as this was, it got worse during the 1980's, the decade of the sovereign debt crisis and the Volcker-induced world wide credit crunch. In this decade, 41.6 percent of countries (67 countries) and 36.2 percent of the country-year observations are classified as $NGEs$. There was improvement in the 1990's, yet depression was still surprisingly common.

After 2000, the incidence of depression falls considerably. Our filter, however, does not allow us to capture declines that may have started after 2007. This is because we require a minimum of four years of downturn to qualify as a depression. All of the country-years spent in NGE during the decade of the 2000s reported in Table 2 *started* in prior decades.[8]

[7] By referencing Table 1, we can identify the countries that had a portion or all of their NGE during the 1950s: Bolivia (8 years), Congo, D.R. (4 years), Honduras (5 years), Mauritius (9 years), Morocco (5 years), Thailand (6 years), and Zimbabwe (3 years).

[8] For example, Afghanistan's depression began in 1983 but was still ongoing by 2000. Central Africa Republic's began in 1961 but did not conclude until 2005. (See Table 1 and Figure 2).

Table 2: World Share of Depression

Decade	*Country-Years spent in NGE*	*Total Country-Years*	*Share (%)*	*# of countries in NGE*	*Share of World (%)*
1950-59	40	645	6.2	7	4.3
1960-69	113	1056	10.7	16	9.9
1970-79	248	1350	18.4	49	30.0
1980-89	497	1374	36.2	67	41.6
1990-99	390	1576	24.7	57	35.4
2000-09	102	1606	6.4	20	12.4
Total	1370	7607	18.0	–	–

Notes: Total country years are based on available data. The country-years spent in NGE during the 2000s are continuations of $NGEs$ that began prior to 2000. The world consists of 161 countries.

3.2 Depression Onset

We now turn our attention to a summary discussion of depression onset by region and decade, using the year that depressions *begin*. (Tables for this discussion are available upon request.) We looked at six regions of the world: 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 – had no $NGEs$ in our sample.

Most of the depression starts – 67 in all – occurred in the 1970's and 1980's.[9] Relatively few began in the 1990's and none in the 2000's. This suggests that the relatively heavy incidence in the 1990's noted earlier came from ongoing depressions that began in prior decades. The "Great Moderation" experienced in the United States appears to have been a world-wide phenomenon.

Nearly half of the NGE starts occurred in sub-Saharan Africa (49 out of 104). Even

[9] This result is echoed by Jones and Olken (2008) who find that down breaks in growth dominate these decades.

though there are more countries in this region – 42 in all – it also had the highest episode-to-country ratio at 1.17. In terms of the magnitude of the average annualized decline in output per capita, the region of Europe and Central Asia had the worst experience (7.6 percent) but the shortest duration (5.6 years). Sub-saharan Africa and Southeast Asia had the longest duration (16.0 and 15.5 years).

To categorize NGE starts by 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. There is a preponderance of depression episode onsets occurring at the lowest two tiers of economic development. Three-fourths of low-income countries have experienced a depression. 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.* The low income countries are also associated with the longest mean duration, nearly six more years than the lower middle and upper middle income groups. The middle income group of countries, on the other hand, has the biggest declines in y.

4 What is Associated with Economic Depression?

In this section, we use our data to examine whether there are systematic differences in the economic, political, financial, and cultural climate during economic depression compared to periods of normal growth. 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), Acemoglu et al. (2008), and Céspedes and Velasco (2012), among many others, has shown that certain events, policies, and institutional arrangements are linked to fast growth and high per capita output.

There has been much work that identifies financial crises as coincident with episodes of contracting or slower growth. In these studies, a measure of the output losses and their

duration is calculated over the financial crisis episode. In general, studies find that output losses are larger and more protracted during crisis episodes. (See, for example, Reinhart and Rogoff, 2009, Shimpalee and Breuer, 2006**,** Breuer and Shimpalee, 2007, Bordo and Haubrich, 2010 and Bordo et al., 2010). We follow the recent literature and categorize financial crises according to four types: currency crisis, banking crisis, domestic debt default crisis, and sovereign debt default crisis.

Last, 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, 2012; and Gorodnichenko and Roland, 2011). It seems plausible, given this literature, that certain traits would help a country mitigate or avoid shocks that might otherwise cause depression.

In what follows, we classify twenty-one variables into one of three categories: economic and political; financial; and cultural. Then, we test for differences in the means of the variables across negative growth episodes and positive growth episodes. We make no claim about causality: we wish to investigate whether our variables are associated with the incidence of economic depression.

4.1 The Method

We use the following equation as the basis of a test for the difference in means over negative growth episodes and positive growth episodes:

$$Z_{it} = \alpha_0 + \alpha_1 Dep_{it} + \varepsilon_{it} \tag{1}$$

where Z_{it} stands for one of the twenty-one variables of interest in Country i in year t. Dep_{it} is an indicator variable taking the value 1 if Country i was in depression in year t and 0 otherwise. If, for example, Z_{it} is inflation, then the coefficient estimate α_1 gives the difference between the unconditional mean of the inflation rate during episodes of depression and episodes of positive growth. If $\alpha_1 = .10$, we can say that in depression episodes, the inflation rate is, on average, 10 percentage points greater than when not in depression. The p-value associated with α_1 allows us to test for the significance of this difference. Jones and Olken (2008)

performed a similar exercise for episodes before and after a structural break in the growth rate to see if the means of certain variables differed depending on whether the country was growing fast or slowly.

We also estimate (1) with a complete set of year dummies YD_t and with or without a control variable, X_{it} as:

$$Z_{it} = \alpha_0 + \alpha_1 Dep_{it} + \alpha_2 YD_t + \alpha_3 X_{it} + \varepsilon_{it} \tag{2}$$

We use two controls for the level of development – *the log of per capita income* $ln\, y$ and *Latitude*. Now, α_1 measures the difference in the mean of Z_{it} during a depression episode compared to its mean during a positive growth episode, conditional on X_{it} and YD_t. For example, if Z_{it} is inflation and $\alpha_1 = .05$, we can say that in depression episodes, after controlling for, e.g. the level of development and any year-specific shocks, the inflation rate is, on average, 5 percentage points greater than when not in depression. This is a stricter test of the difference in means in each Z_{it} than from (1).

We estimated (2) with country fixed-effects regression as well. In the case of the economic and political variables, the results are very similar, but we do not report them for two reasons. First, under this specification, *Latitude* drops out of the regression, and we are reluctant to ignore this control in favor of the undefined country effect. Second, with fixed-effects we cannot run the regressions for the cultural variables, since in these cases Z_{it} varies over countries, but not over time. For any cultural variable, the time-demeaned dependent variable is effectively zero for each country.

Our dataset is an unbalanced panel of countries with annual data from 1950 to 2009 with 7,607 observations at maximum. In the estimation of (1) and (2), we allow the errors to be independent across countries, but clustered within countries. [10]

[10] We also estimate (1) and (2) excluding outlier episodes of negative growth. We consider three criteria for outliers: negative growth episodes lasting more than 44 years; episodes lasting more than 24 years; and episodes lasting more than 10 years. Our results are robust to these treatments. More of the culture variables achieve statistical significance when we exclude outliers.

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 later, our economic and political variables are time-varying. Our use of year dummies will control for any events that are common across the world in any year.

Our results are presented in Table 3.[11] The first column of both panels shows the results of running (1). Column (1) reports α_1 – the difference between the unconditional average of Z for depressions versus positive growth episodes. The next three columns report estimates of α_1 from (2) with the inclusion of year dummies only and then supplemented with one of our two controls. We report p-values in brackets for α_1 beneath the coefficient. The last column shows the number of observations.

In *Panel A* we present our results for each of the economic variables. To capture aspects of the *Economy,* we use ln y itself (also used as a control), the *consumer price index inflation rate*, a measure of *economic and trade liberalization,* and *population.*

Output per capita, $ln\, y$, is expected to be inversely related to the incidence of depression. Shocks that increase the frequency of economic depression in poor countries may be neutralized in developed, diversified economies. Our results support this intuition: α_1 is negative and highly significant. Episodes of economic depression are associated with output per capita that is on average less than half that in times of normal growth.

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 higher during episodes of depression. The coefficient is positive and highly significant. When we compare *unconditional* average inflation rates over positive and negative growth episodes – see Columns (1) – we find that inflation rates are 15 percentage points higher in NGEs. Though not reported in the table, the inflation rate during economic depression averages 25 percent and slightly less than 10 percent during other years. With controls, the inflation rate is about 11-12 percentage points higher during depressions compared to periods of normal

[11] The results in Table 3 differ very little when we use the two other algorithms for determining *NGEs* mentioned in Section 2.2.

Table 3: Test of Mean Differences between NGEs and PGEs

$$Z_{it} = \alpha_0 + \alpha_1 Dep_{it} + \alpha_2 X_{it} + \alpha_3 YD_t + \epsilon_{it}$$

A: Economic Factors					
	α_1	α_1	α_1	α_1	N
$Z \downarrow$ *Control* $\rightarrow$	–	–	*ln y*	*Latitude*	
Year Dummies	No	Yes	Yes	Yes	
ln y	-0.825** [0.00]	-0.901** [0.00]	–	–	7607
Inflation	0.153** [0.002]	0.119* [0.015]	0.106* [0.023]	0.115* [0.018]	5705
Liberalization	-0.302** [0.00]	-0.308** [0.00]	-0.203** [0.00]	-0.211** [0.00]	7122
Population	-25.305* [0.028]	-27.303* [0.03]	-35.884† [0.058]	-25.85*]0.034]	7596

B: Political Factors					
	α_1	α_1	α_1	α_1	N
$Z \downarrow$ *Control* $\rightarrow$	–	–	*ln y*	*Latitude*	
Year Dummies	No	Yes	Yes	Yes	
Civil Liberties	-1.393** [0.00]	-1.366** [0.00]	-0.677** [0.001]	-0.821** [0.00]	4750
Democracy	-3.017** [0.00]	-2.841** [0.00]	-1.2** [0.001]	-1.602** [0.00]	6765
Cons. Exec.	-1.84** [0.00]	-1.743** [0.00]	-0.895** [0.00]	-1.096** [0.00]	6765
Civil War	0.094** [0.00]	0.074** [0.002]	0.046* [0.043]	0.06* [0.016]	7607

Notes: Robust p values in brackets. *Dep* is equal to 1 for depression episodes.

** significant 1%; * at 5%; and † at 10%.

growth.

Scale measures, like *economic liberalization* and *population,* show mixed results in cross-country growth studies. For economic liberalization, we use the trade liberalization measure from Wacziarg and Welch (2008) which is a 0-1 indicator variable. As noted by several authors, this measure includes not just free trade, but also monetary and fiscal reform and less reliance on the state. Economic and trade liberalization have been linked to good economic outcomes in some studies (Wacziarg and Welch, 2008 and Andersen and Dalgaard (2011)), but others find little evidence that it promotes growth (Barro and Sala-i Martin (2004) and Schularick and Solomou (2011)). Liberalization, in our data, is far less in evidence during depression. The estimates of α_1 suggest that mean liberalization is 0.20 - 0.31 points lower during depression periods. The average levels of liberalization during depression compared to positive growth episodes (not reported) are more revealing: only about 13 percent of country-years in depression were open in this sense compared to 43 percent for country-years in normal growth.

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, 2004, Hall and Jones, 1999). However, we find that population is on average higher in positive growth episodes. We could infer that for reasons of scale, large countries are less prone to episodes of economic depression. To see if this result is robust to outliers, we removed countries whose population exceeded 100 million (15 countries). The coefficient was still negative and significant and of similar magnitude. [12]

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.[13] Our results support the observation that high-quality institutions are associated with economic prosperity, as found in several recent studies (Acemoglu et al., 2001, Barro, 1991, Hall and Jones, 1999, Jerzmanowski, 2006, and Rodrik, 1999).

Civil war is more prevalent during negative growth episodes. From column (1), we see the

[12]We also test this idea using the log of total output. We find a statistically significant negative relationship between this measure of economic size and negative growth episodes.

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

unconditional mean of our civil war indicator during economic depression is 9.4 percentage points higher than during positive growth episodes. Indeed, 15.5 percent of depression years (not reported) are spent in civil war, while only 6.1 percent of positive growth episode years (not reported) coincide with civil war. When we control for level of development and time, our estimate of α_1 shows that the share of time spent in civil war is 5-7 percent higher during economic depression. As with all of our results, we cannot infer causality, and it seems likely that either event – a depression or a civil war – could trigger the other.

4.3 Financial Crises

We examine the incidence of four types of financial crises: currency crises, banking crises, and sovereign debt crises – domestic and external. Our sources for this data come from Reinhart and Rogoff (2009),[14] who define a currency crisis (or crash) to be an annual depreciation of the country's currency by 15 percent or more. Banking crises are defined to involve either merger, closure, government takeover, or large-scale assistance to one or more financial institutions. Domestic debt crises are defined by a failure to meet principal or interest payments, rescheduling of debt or other write-down terms to debt obligations to domestic lenders. They also include freezing of bank deposits and conversion of dollar deposits to local currency. External debt crises are similarly defined. The crises variables are indicator variables set equal to 1 for the years the country is in a crisis.[15] The estimates of α_1 from (1) and (2) therefore will give the difference in the share of country-years spent in financial crisis between negative and positive growth episodes.

Our results show that in nearly all cases, countries on average spend a larger share of time in currency, banking, and debt crises during economic depression. There is some evidence that negative growth episodes and positive growth episodes exhibit little difference in terms of the prevalence of domestic debt crises. However, external debt crises are much more ubiquitous during depressions – about three times more than banking crises and two times more than currency crises.

[14] We also use Laeven and Valencia (2012)'s database but for space constraints do not report the results.

[15] There were several instances where the currency crisis variable in the Reinhart and Rogoff (2009) source data was set equal to 2. The '2s' identified a currency crisis plus debasement or conversion to a new currency. We set these to 1 since a currency crisis was present.

Table 4: Test of Mean Differences in Crises Variables between NGEs and PGEs

$$Z_{it} = \alpha_0 + \alpha_1 Dep_{it} + \alpha_2 X_{it} + \alpha_3 YD_t + \epsilon_{it}$$

Financial Crises Variables					
	α_1	α_1	α_1	α_1	N
$Z \downarrow$ *Control* $\rightarrow$	–	–	*ln y*	*Latitude*	
Year Dummies	No	Yes	Yes	Yes	
Currency Crises	0.21** [0.00]	0.17** [0.01]	0.14* [0.04]	0.16** [0.01]	3910
Banking Crises	0.13** [0.00]	0.10* [0.02]	0.08* [0.03]	0.09* [0.02]	3912
Domestic Debt Default	0.05* [0.01]	0.04* [0.05]	0.04 [0.16]	0.03 [0.20]	3912
External Debt Default	0.35** [0.00]	0.32** [0.01]	0.25** [0.00]	0.28** [0.00]	3912

Notes: Robust p values in brackets. *Dep* is equal to 1 for depression episodes.

** significant 1%; * at 5%; and † at 10%.

4.4 Cultural Factors

We measure *Culture* using nine variables. Four of these are fairly common in the literature – *latitude, ethnic fractionalization, religious fractionalization,* and *trust.* We include five more that have received less attention: *ethnic polarization*, *religious polarization*, *individualism, attitudes toward government welfare,* and *confidence in the justice system.* Culture variable descriptions appear in Appendix A. The results are presented in Table 5. As before, we present estimates of α_1 from (1) in Column 1 and from (2) in Columns (2) - (4).

The culture variables are available on a less frequent basis than the economic and political variables used above. For many variables, we have only one observation per country over our whole sample. In some cases, we have up to four observations over the sample period. To proceed, we assume that the true value of each cultural variable is, in fact, constant within a country over time and can be captured by the average of the few observations that we have. Thus, all of the cultural measures we use are time-invariant. This means our estimate of α_1 captures the cross-sectional difference between our measures of culture for countries in a negative growth episode and those not. Because we have an unbalanced panel, α_1 is weighted

by the years spent in depression (NGE).

We expect *Latitude*, which we also include as a control, to be inversely related to economic depression. Latitude may proxy for cultural traditions that established the initial conditions of human capital, institutional quality, and democratic tradition.[16] We find α_1 is negative and significant. On average, the latitude of countries spending time in economic depression are lower by 0.13. To put this in perspective, this would be about 12 degrees (13 percent of 90), equivalent to the distance between Paris and Tunis; or Tijuana and Mexico City.

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 help 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 link between fractionalization and economic growth. Our results complement these findings. There is strong evidence in Table 5 that *ethnic fractionalization* is greater in countries experiencing negative growth, by 0.12-0.22 points (on a scale of 0 - 1). *Religious fractionalization*, however, does not appear to be correlated with negative growth. This may be because greater religious fractionalization is often the result of religious or other freedoms.

Polarization is another way to measure the potential for societal conflict.[17] Unlike fractionalization, which increases with the number of distinct groups, polarization reaches a maximum when there are two groups. Conflict may be worse if power is concentrated between two strong rivals. We find that this argument has some merit. Both greater *ethnic polarization* and *religious polarization* are associated with more time spent in negative growth. However, the inclusion of *Latitude* reduces the statistical significance just below 10 percent.

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 weak evidence that lower trust coincides with country experience with economic depressions. Only

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

[17] The concept of polarization was introduced by Duclos et al. (2004). It has been used by Montalvo and Reynal-Querol (2005) and Esteban et al. (2012) to show that societal composition is an important determinant of economic outcomes. See also Miguel et al. (2004) and Collier and Hoeffler (2004).

Table 5: Test of Mean Differences in Culture between NGEs and PGEs

$$Z_{it} = \alpha_0 + \alpha_1 Dep_{it} + \alpha_2 X_{it} + \alpha_3 YD_t + \epsilon_{it}$$

Cultural Factors					
	α_1	α_1	α_1	α_1	N
$Z \downarrow$ $Control \rightarrow$	–	–	*ln y*	*Latitude*	
Year Dummies	No	Yes	Yes	Yes	
Latitude	-0.13** [0.00]	-0.135** [0.00]	–	–	7607
Ethnic Frac.	0.203** [0.00]	0.219** [0.00]	0.142** [0.00]	0.119** [0.00]	7534
Rel. Frac.	0.036 [0.253]	0.038 [0.26]	0.026 [0.395]	0.007 [0.823]	7555
Ethnic Pol.	0.103** [0.00]	0.114** [0.00]	0.082** [0.001]	0.042 [0.112]	6510
Rel. Pol.	0.221** [0.00]	0.234** [0.00]	0.067† [0.09]	0.071 [0.109]	6510
Trust	-0.073* [0.031]	-0.078* [0.027]	-0.027 [0.451]	-0.027 [0.388]	3817
Justice System	-0.115 [0.12]	-0.128† [0.10]	-0.149* [0.042]	-0.079 [0.242]	3090
Individualism	-19.632** [0.00]	-21.879** [0.00]	-10.399† [0.065]	-3.76 [0.266]	3028
Govt. Welfare	0.753** [0.00]	0.803** [0.00]	0.339* [0.047]	0.568** [0.004]	3817

Notes: Robust p values in brackets. *Dep* is equal to 1 for depression episodes.

** significant 1%; * at 5%; and † at 10%.

when we omit controls do we see a significant coefficient.

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, we therefore investigated whether *trust or confidence in the justice system* is related to episodes of depression. Confidence in the justice system may reflect the true probability that individual property rights and liberties will be protected. We find weak evidence that such confidence is lower in countries that spend more time in economic depression. It achieves significance in two of the four specifications.

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 rewards to conformity and satisfying group preferences.[18] We examine whether countries that experience negative growth score lower on the *individualism* scale (scored $[0-100]$). Consistent with Gorodnichenko and Roland (2011), we find that scores on Hofstede et al. (2010)'s individualism scale are far lower in countries experiencing more time in depression. Our results support this conjecture without a control and with $ln\ y$ as a control. However, *Latitude* reduces its size difference substantially and eliminates its statistical significance.

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* – economic depression would be more prevalent. Indeed, 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. This cultural variable is highly significant across all specifications. The estimate of α_1 is sizable; the mean response to the ranked question (see *Attitudes toward Government Welfare* in Appendix A) is 0.34 - 0.80 points higher during depressions (on a scale of 1 - 10).

[18] 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."

5 Depression Onset and Exit

In this section we look for shocks that are associated with the beginning and end of a depression.

5.1 The Method

For the analysis of depression (NGE) onset, we begin by defining a "start window" variable SWN as an indicator taking the value 1 in the three years surrounding the onset of a depression, and zero otherwise. That is, if the NGE began in year t, SWN takes the value 1 for years $t-1$, t, and $t+1$, and 0 otherwise. For our study of depression end (which is the start of a PGE), we define a start window for positive growth SWP in the same way. The three-year window allows for some uncertainty about the actual dating of the transition to a new regime using our filter.

We follow Hausmann et al. (2005) in the way we restrict the sample. Because the dependent variable is constructed as the window surrounding the first year of an NGE, we confine the probit analysis to a sample that does not include any other year of a depression. That is, it includes data from the SWN three-year window around the start of an NGE, plus all years of PGE. This restriction is necessary because, by construction, the remaining years of any NGE are not eligible to be in the start window. We do likewise in the second case where we study shocks that may influence the probability that a PGE will begin. Since there are many more years of positive growth than years of depression, the sample size for the regressions involving SWN are much larger than those for SWP.

We consider nine exogenous shocks that might influence the probability of precipitating the onset of a depression or exiting from one. Of the nine, four are different types of financial crisis. They are:

- *Inflation shock*: an indicator that takes the value of 1 in any year that a country's inflation rate rises by more than 20 percent. We use data from the IMF's *International Financial Statistics.*

- *Real exchange rate shock:* an indicator that takes the value of 1 in any year that the

real exchange rate devalues by more than 20 percent.[19] The real exchange rate is in local currency per US dollar deflated by the relative (local - US) CPI. We use data from the IMF's *International Financial Statistics.*

- *Liberalization shock:* an indicator that takes the value of 1 at the transition from a closed economy to a liberalized one in the sense of Sachs and Warner (1995) and Wacziarg and Welch (2008).

- *Positive political shock*: an indicator taking the value 1 in the year the political environment shifts toward more democracy. We use *'regtrans'* from the *Polity IV* database when it indicates a major or minor transition toward democracy.

- *Civil war shock:* an indicator that takes the value 1 in the year the civil war started. We use the *Correlates of War* database.

- *Financial crisis shock:* an indicator variable that we set equal to 1 in the year the country *enters* a i) currency crisis; (ii) banking crisis; (iii) domestic debt default crisis; or (iv) external debt default crisis. These variables are constructed using data from Reinhart and Rogoff (2009).[20]

For each shock, we define a four-year *shock window.* For the first four, if the actual shock occurs in year t, we also assign an indicator of 1 to the years $t+1$, $t+2$, $t+3$. This allows for lag effects of the shock on NGE or PGE onset. For the civil war and financial shocks we instead use the years $t-1$, t, $t+1$, and $t+2$, because these disturbances are likely to be widely anticipated.

The probit model is given by:

$$SW_{it} = \beta_0 + \beta_1 Shock_{it} + \beta_2 X_{it} + \beta_3 YD_t + \theta_{ik} \tag{3}$$

where SW_{it} stands for the start window for Country i in year t and applies to either SWN for the onset of a negative growth episode (depression start) or SWP for the transition to positive

[19] We have constructed it so that an increase in the real exchange rate means that the goods of Country i are getting cheaper relative to US goods.

[20] We also use banking crisis and debt crisis variables constructed by Laeven and Valencia (2012) and the results are similar.

growth (depression end). The regressor *Shock* refers to one of the nine shock windows. We estimate (3) three times for each shock – once excluding controls, and two more times using the controls X introduced separately. Time dummies YD_t for each year are always included. In the estimation, we let the error terms be clustered by country.

5.2 Results

The results for SWN are shown in Table 6. The first column of results reports the marginal probabilities for each shock estimated by itself (with the inclusion of year dummies). The second column adds the control $ln\, y$ and the third adds *latitude* instead of $ln\, y$. Since the shocks are also indicator variables, we interpret the coefficients β_1 (γ_j) to be the change in the probability that the country will enter a depression given that the shock occurs.

The results are generally strong. Economic liberalization has the biggest impact on reducing the chance of economic depression. Greater economic freedom and openness reduce the probability of depression onset by about 7.3 percent. Likewise, positive political reforms are good for the economy; they reduce the chance of depression onset by 4 percent. The onset of banking crises or default on foreign-held debt raise the probability of a depression start by 3-6 percent while a real devaluation of more than 20 percent reduces the probability of depression onset by 2-3 percent.[21] Inflation shocks, however, do not appear to initiate a depression, even though we saw earlier that inflation is significantly higher during country-years in depression.

In Table 7, we present the results for SWP, the start of a positive growth episode and cessation of a depression. The results are not symmetric with those for depression onset. We find that a devaluation of the country's currency greater than 20 percent significantly raises the probability of ending a depression, perhaps by spurring exports. The results show that this devaluation shock raises the probability that a depression will end by about 21 percent. Likewise, we find that economic liberalization also raises the chance of exit from depression. Here, the chance of depression end is increased by 17 percent. These two effects are much larger than their impact on depression commencement. For inflation shocks, we also find strong evidence that a shift in the inflation rate exceeding 20 percent *helps* initiate recovery from economic depression. The results for the civil war are modest. In one specification, we

[21] We find the same when we use the banking crisis variable from Laeven and Valencia (2012).

Table 6: Probit Analysis - Shocks at NGE Start

Panel A: $SWN_{it} = \beta_0 + \beta_1 Shock_{it} + \beta_2 X_{it} + \beta_3 YD_t + \theta_{ik}$				
Control $(X)\rightarrow$	–	*ln y*	*Latitude*	
Shock $\downarrow$	β_1	β_1	β_1	N
Inflation	-0.002 [0.91]	-0.006 [0.71]	-0.007 [0.64]	3102
Real Exchange Rate	-0.023** [0.18]	-0.029† [0.07]	-0.023 [0.13]	2914
Liberalization	-0.077* [0.03]	-0.073* [0.03]	-0.068* [0.03]	4941
Pos. Pol. Change	-0.041† [0.10]	-0.043† [0.07]	-0.041† [0.06]	4941
Civil War	0.027* [0.05]	0.022† [0.09]	0.023* [0.06]	4941
Currency Crisis	0.017 [0.46]	0.006 [0.78]	0.006 [0.72]	2160
Banking Crisis	0.042** [0.01]	0.031* [0.03]	0.031* [0.02]	2160
Domestic Debt Default	0.046 [0.17]	0.024 [0.41]	0.034 [0.22]	2161
External Debt Default	0.061** [0.00]	0.047* [0.03]	0.040** [0.01]	2161
Marginal probabilities reported. Robust p-values in brackets.				
** significant 1%; * at 5%; and † at 10%.				

Table 7: Probit Analysis - Shocks at *PGE* Start

Panel A: $SWP_{it} = \beta_0 + \beta_1 Shock_{it} + \beta_2 X_{it} + \beta_3 YD_t + \theta_{ik}$				
Control $(X)\rightarrow$	–	*ln y*	*Latitude*	
Shock $\downarrow$	β_1	β_1	β_1	N
Inflation	0.142** [0.00]	0.145** [0.00]	0.167** [0.00]	862
Real Exchange Rate	0.211** [0.00]	0.220** [0.00]	0.213** [0.00]	828
Liberalization	0.171** [0.01]	0.171** [0.01]	0.165** [0.01]	1802
Pos. Pol. Change	0.018 [0.79]	0.022 [0.75]	0.037 [0.60]	1817
Civil War	-0.114 [0.11]	0.112 [0.12]	-0.128† [0.07]	1817
Currency Crisis	0.173 [0.23]	0.244† [0.07]	0.0135 [0.32]	536
Banking Crisis	0.126 [0.13]	0.069 [0.44]	0.106 [0.23]	536
Domestic Debt Default	0.121 [0.33]	0.101 [0.42]	0.104 [0.40]	536
External Debt Default	0.007 [0.95]	-0.030 [0.77]	-0.027 [0.80]	536
Marginal probabilities reported. Robust p-values in brackets.				
** significant 1%; * at 5%; and † at 10%.				

find that civil war has a statistically significant effect on reducing the probability of depression end by about 13 percent. In the other two specifications, the p-value is 11 - 12 percent. None of the financial shocks are statistically significant at increasing or decreasing the chance of a depression save the currency crisis variable in one specification.

Last, there is no evidence that a positive political shock helps end a depression, although we saw in Section 4 that political institutions – *civil liberties, democracy,* and *constraint on the executive* are weaker in depressions and stronger in episodes of positive growth. While these differences in institutional quality were statistically significant, we could not use them to comment on causality. Here, our results suggest that a change to better institutions does

not help in recovering from a depression. This may not be surprising. It may take time for good institutions to create conditions that make exit from a depression easier.

6 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 four years. Using our definition, we construct a new dataset for the study of economic depression. In all, we find 104 incidences of depression across 85 countries. Depressions are surprisingly common, afflicting over half of the countries in our sample of 161 countries at least once. World experience has been more severe and longer-lasting than the US Great Depression.

We used our new data in three ways. First, we provided summary statistics on depressions around the world from 1950-2009. 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 ongoing worldwide financial and debt crisis will bring a new wave of economic depression.

Second, we undertook an exploration of the conditions that are coincident with episodes of economic depression. We began by exploring eight economic and political factors. Episodes of negative growth are characterized by lower levels of development, higher inflation, more repression, and smaller scale. Economic depressions also exhibit weaker individual liberties, a lack of democracy, an unconstrained executive, and internal conflict. The share of country-years spent in civil war are higher during depression.

A natural correlate of economic depressions are financial crises. There are variants of crises and we investigate four types – currency crises, banking crises, domestic debt crises, and external (foreign) debt crises. We found that, as expected, financial crises of any type are more prevalent during economic depressions. However, we see that default on foreign-held debt is the most commonplace crisis during episodes of negative growth. There is some evidence that domestic debt crises are no more likely during depressions than during positive

growth episodes.

Cultural factors as correlates of macroeconomic outcomes have been less widely studied. Yet, behavioral economics recognizes that cultural values condition decisions and influence outcomes. So, we undertook a study of nine cultural factors. We find strong associations between cultural characteristics and episodes of depression. Depression occurs at lower latitudes, and in countries with greater fractionalization and polarization. Economic depression is correlated with a stronger belief that the government should be more responsible for the welfare of its citizens, and with a weaker individualistic spirit. We find some evidence that cultures with lower levels of trust (both generally and specifically toward the judicial system) are more likely to experience economic depression.

Lastly, we investigated shocks that might affect the probability of entering into a depression – or getting out of one. We found that a real exchange rate devaluation or a switch to economic liberalization reduced the chance of entering into depression and raised the probability of recovery. The bigger impact was on initiating a recovery. Positive political reforms also reduce the chance of a depression start but have no effect on exit from one. Civil war onset increases the probability of entering depression. There was modest evidence that civil war onset may impede recovery. Banking and sovereign external debt crises also increase the probability of the start of a depression. Inflation shocks do not appear to increase the chance of a depression, but may significantly raise the probability of escape.

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. *Banking Crises.* Indicator variable equal to 1 in the years a country is in a banking crisis as defined by Reinhart and Rogoff (2009) to occur when events lead to bank closure, merger, or takeover by the public sector or large scale government assistance. Source: Reinhart and Rogoff (2009).

3. *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.*

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

5. *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.*

6. *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.*

7. *Currency Crisis.* Indicator variable equal to 1 in the years a country is in a currency crisis as defined by Reinhart and Rogoff (2009) to occur when the currency value drops by more than 20 percent. Source: Reinhart and Rogoff (2009)

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

9. *Domestic Debt Default.* Indicator variable equal to 1 in the years a country is in a domestic debt crisis as defined by Reinhart and Rogoff (2009) to occur when a country fails to meet principal and interest payments to domestic entities, when debt is rescheduled or written down to less favorable terms, or dollar deposits are frozen or forcibly converted local currency. Source: Reinhart and Rogoff (2009).

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

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

12. *External Debt Default.* Indicator variable equal to 1 in the years a country is in a foreign debt crisis as defined by Reinhart and Rogoff (2009) to occur when a country fails to meet principal and interest payments to foreign lenders or when debt is rescheduled or written down to less favorable terms. Source: Reinhart and Rogoff (2009).

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

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

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

16. *Liberalization.* Indicator variable set to 1 after date of liberalization. Source: Wacziarg and Welch (2008).

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

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

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

20. *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.*

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

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