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Aggregate Impacts of Natural and Man-made Disasters: A quantitative comparison*

by

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Abstract

In recent decades, the world has faced an increasing number of natural and man-made disasters. Such disasters include tsunamis, earthquakes, the current ongoing financial crisis, terrorism, riots, and wars. These disasters generate tremendous social and economic costs, especially for the poor in low income economies. This paper assesses and compares the impacts of various natural and man-made disasters quantitatively. We carefully construct cross-country panel data of 189 countries within the range between 1968 to 2001 on a wide variety of natural disasters such as hydro-meteorological, geophysical, climatological, technological and biological disasters as well as man-made disasters such as economic crises, civil conflicts and wars. The paper employs this unique panel dataset to estimate econometric models which enable us to quantify and compare the impacts of different natural and man-made disasters on welfare as captured by per capita consumption. According to our estimation results, in the short term, natural disasters generate the largest negative welfare impacts which are followed by wars and economic disasters. Intriguingly, in the long term, natural disasters and wars have positive impacts on per capita GDP growth. Wars affect large economies more than small economies while natural disasters affect small economies disproportionately.

Keywords: risks, natural disasters, and man-made disasters.
JEL classification: O1; Q54

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1. Introduction

People around the world face a wide variety of risks arising from health, weather, and policy related shocks (Fafchamps, 2001; Dercon, 2006). However, natural disasters, i.e., hydro-meteorological , geophysical, and biological disasters, can generate the most serious consequences ever known. Compounding these issues, disasters such as floods, hurricanes, tornadoes, and wildfires can disable the head of a household or even an entire family. To make matters worse, according to the number of natural disasters registered in the OFDA/CRED International Disaster Database for 1900-2004, there is an apparent increasing trend of natural disasters (Figure 1). There also exists technology related disasters such as chemical spills and transportation accidents. Furthermore, in addition to the negative costs of disasters generated by natural or technological events, the economic and social costs of man-made disasters including financial crises, credit crunch, civil conflicts, and wars have occurred continuously as per Figure 1, which also shows the frequency of man-made disasters over time. We can notice that for civil wars there is some volatility in the trend line, reflecting the frequent occurrence of such type of wars. With regards to big wars such as World War I and World War II, the frequency appears constant over time, probably owing to the rare occurrence of large scale conflict. Finally, with regards to economic crises, the frequency appears to goes up over time and it peaks around 1980-2000 which coincides with the timing of the Latin American crisis and the Asian financial crisis.

Recently, a number of high-profile natural and man-made disasters have hit both developed and developing countries alike. We remember vividly that, in 2010, the Eyjafjallajökull volcanic eruption in Iceland gravely disturbed the European airline industry and the recent 2010 oil spill in the Gulf coast cost about 6.1 billion in the short term (Reuters, 2010). Hundreds of thousands of lives were lost in the Indian Ocean tsunami, Hurricane Katrina, and the earthquakes in central Chile, Haiti, Sichuan province of China, northern Pakistan, and the Hanshin area of Japan. The ongoing global financial and economic crisis has caused a worldwide problem with far-reaching effects similar to the Great Depression of the 1930s. The crisis has sharply slowed global economic growth. As such, man-made disasters can also generate serious negative impacts not only on lives, but on the survivors' livelihoods (Barro, 2009).

While there have been a number of macroeconomic and microeconomic studies undertaken on the causes and consequences of different natural and man-made disasters (Sawada, 2007; Miguel and Roland, 2011), to our best knowledge, there is no unified study to compare the welfare costs of different disasters barring Barro (2009) who quantified aggregate welfare impacts of different disasters. This paper aims at bridging this gap in the existing literature by carefully comparing the relative impacts of damages arising from a wide variety of disasters, ranging from hydro-metereological disasters to civil conflicts. Our approach is to employ cross-country panel data to quantify the degrees of negative welfare effects by these disasters over time and across countries.

The rest of this paper is organized as follows. Section 2 of this paper presents our definitions of natural and man-made disasters and a review of the related literature. In Section 3, we set up the econometric framework to estimate relative welfare impacts of different natural and man-made disasters. Section 4 outlines the data sources, variables, and descriptive statistics in our study. In Section 5, we present and interpret the empirical findings and discuss the relative magnitude of welfare impacts of different disasters. The last section provides concluding remarks together with related policy implications.

2. Definitions of Disasters and a Literature Review

According to the Centre for Research on the Epidemiology of Disasters (2006), generally, a disaster is defined as an unforeseen event that causes great damage, destruction and human suffering, which overwhelms local capacity, necessitating a national or international level assistance (CRED, 2010). Augmenting the classification system of CRED (2010), these disasters can be classified into three broad categories: natural disasters, technological disasters, and man-made disasters. Firstly, natural disasters can be divided into three subgroups: 1) hydro-meteorological disasters including floods, storms, and droughts; 2) geophysical disasters including earthquakes, tsunamis and volcanic eruptions; and 3) biological disasters such as epidemics and insect infestations. Secondly, technological disasters are mainly composed of two subgroups: 1) industrial accidents such as chemical spills, collapses of industrial infrastructures, fires, and radiation; and 2) transport accidents by air, rail, road or water. Finally, man-made disasters are also composed of two subcategories; 1) economic crises

including growth collapse, hyperinflation, financial, and currency crises; 2) violence such as terrorism, civil strifes, riots, and wars.

There have been empirical studies on the causes and consequences of different natural and man-made disasters (Sawada, 2007). As to the economic costs of natural disasters, Stromberg (2007) notes that from 1980 to 2004, around two million people worldwide were estimated to be killed and around five billion people overall were affected by approximately 7,000 natural disasters. The estimated economic cost from natural disasters during this period was around $1 trillion. Hallegatte and Przyluski (2010) distinguish natural disaster impacts between direct and indirect losses. Direct losses are defined as the immediate consequences of the disaster or the physical phenomenon itself. Indirect losses defined as damages "that are not provoked by the disaster itself, but by its consequences" such as the reduction in economic output and the long term consequences of costs to infrastructure as a result of the disaster. On the direct costs, by analyzing cross country data from seventy three countries from 1970 to 2002 on annual deaths from natural disasters, Kahn (2005) finds that while richer nations do not suffer fewer shocks compared to poorer ones, the number of deaths, the number of people injured and homeless decreases significantly as income rises. This finding is also confirmed by Skidmore and Toya (2007) and Noy (2009) who find that in addition to income being a factor, countries with higher educational attainment, greater openness, more complete financial systems, more domestic credit and foreign exchange reserves, and smaller governments have fewer direct fatalities from natural disasters.

On the indirect costs of natural disasters, Skidmore and Toya (2002) employ cross-country empirical analyses to examine the long run determinants of growth rate of real per capital GDP between 1960 and 1990. Intriguingly, they find that higher frequencies of climatic disasters are associated with higher rates of human capital accumulation, increases in total factor productivity and long-run economic growth. Furthermore, disasters affect growth by leading to improvements in total factor productivity.

As to man-made disasters, the number of complex economic crisis also seems to be increasing. A seminal work by Kaminsky and Reinhart (1999) reveals that the number of currency crises per year did not increase much during the 1980's and 1990's, while the number of banking crises and of simultaneous banking-and-currency crises, i.e., "twin crises", increased sharply during the 1980's and 1990's.

Broadly speaking, there are three channels through which a twin crisis is transmitted to impact household welfare. First, large currency depreciation leads to a sharp increase in prices of imports and tradables even under incomplete exchange rate pass-through. This will generate an inflationary pressure and thus cause real income to decline. Second, a sharp depreciation of a currency immediately increases the burden of debt repayments in foreign currency-denominated instruments in corporate and banking sectors which are heavily dependent on external finances (Fallon and Lucas, 2002, p.25). Corporate performance deteriorates instantaneously by such a reinforced burden, necessitating adjustments in the labor market either through increased unemployment or decreased wage rates.[1] Third, a credit crunch arising from a financial crisis is likely to damage small firms disproportionately because unlike large listed firms, the only source of their external funding for investments are bank loans.[2] As a result, many owners of small firms or businesses went bankrupt.[3] Such negative welfare impacts will also appear with increased unemployment, decreased wage rates, and stagnant consumption (Sawada et. al, 2010).

With regards to violence related man-made disasters such as terrorisms, riots, civil conflicts, and wars, it should be noted that the number of conflicts is not necessarily declining over time according to information from the Uppsala Conflict Data Program.[4] Blomberg et al. (2004) use a rich panel data set of 177 countries from 1968 to 2000 to perform an empirical investigation of the macroeconomic consequences of international terrorism and interactions with other forms of collective violence. The paper finds that, on average, the incidence of terrorism may have an economically significant negative

[1] Before the crisis in 1997 and 98, most East Asian countries adopted de fact fixed exchange rate system. Under such circumstance, firms and banks underestimated exchange risks and financed their investments through rapidly arising offshore markets in the region before the crisis because loan regulations are less severe in these markets by nature.

[2] Looking at the liability structures of East Asian corporations, firms in the region have relied heavily on external financing, primarily from the banking system (Claessens et al., 2002, p.26). These firms were directly hit by the credit crunch, which appeared as a form of a rise in interest rates and/or reinforced borrowing constraints.

[3] For instance, sole proprietor's number of bankruptcies in South Korea will jump up to indeed as many as 46 times in 1 years from 1997 through 1998 (Kang and Sawada, 2008).

[4] The data is downloaded from the website: www.ucdp.uu.se/database.

effect on growth, albeit one that is considerably smaller and less persistent than that associated with either external wars or internal conflict. They also find that there are heterogeneities in the incidence and the economic consequences of terrorism. Hess (2003) combines the framework of Lucas' (1987) welfare cost estimates with cross-country data sets for1960 and 1992 to attain the economic welfare costs of conflict. He finds that the welfare cost of conflicts and wars amounts to approximately 8 percent of people's current level of consumption.

3. The Econometric Framework

Since our purpose is to quantify and compare the impacts of a variety of natural and man-made disasters on welfare, we need to set the criteria for welfare evaluation. We simply follow the tradition in macroeconomics and use per capita consumption change rates as an outcome variable to capture welfare effects. Hence, to quantify the impacts of natural and human made disasters on the aggregate level of welfare, we employ the following econometric model:

$$\Delta \log c_{it} = a_0 + a_1 \Delta \log y_{it} + \alpha_i + \alpha_t + u_{it}, \quad (1)$$

where Δ is a first-difference operator, c represents the welfare outcome quantified by per capita consumption level where i and t denote country and year, respectively, and y is per capita GDP, α_i is the country fixed effect, α_t is the time effect, and u is an error term. Note that this equation (1) can be seen as the consumption Euler equation under the assumption of the constant relative risk aversion (CRRA) utility function with a variable addition formula of per capita GDP growth rate, $\Delta \log y_{it}$.

In equation (1), we are interested in estimating the sensitivity parameter a_1, i.e., the parameter summarizing welfare impact of income change on consumption change. Yet, our main concern with this approach is the endogeneity bias arising from the correlation between unobserved consumption growth factor in the error term and per capita GDP growth rate. Since this correlation is likely to be positive, an OLS estimate of equation (1) will generate an upward bias in the estimated level of the sensitivity parameter a_1. To handle this endogeneity problem and also to capture the impacts of disasters, our basic idea is to use natural and man-made disaster information as

identifying instrumental variables for income change, Δ log y, in equation (1). While natural and man-made disasters will affect income level significantly, by nature, disasters are not necessarily manipulated by human beings. Hence, we believe that our identification approach will mitigate the endogeneity bias effectively.

Accordingly, we postulate the following first stage regression equation:

$$\Delta \log y_{it} = N_{it}\,\beta_N + W_{it}\,\beta_W + E_{it}\,\beta_E + \gamma_i + \gamma_t + \varepsilon_{it}, \quad (2)$$

where N, W, and E represent a set of variables related to natural disasters, wars and conflicts, and economic crises, respectively. We also include country fixed effects, γ_i, and time effect, γ_t. Our econometric model is a standard instrumental variable estimation with fixed effects based on equations (1) and (2).

In equation (2), we can utilize the estimated coefficients, b_N, b_W , and b_E, respectively, for β_N , β_W, and β_E to decompose per capita GDP change rate into three subcomponents: per capita GDP change rate driven by natural disasters, $N_{it}\,b_N$; wars and conflicts, $W_{it}b_W$; and economic crises, $E_{it}b_E$. By comparing these values, we can formally compare which disaster has the greatest impact on welfare: by combining equations (1) and (2), the total welfare impact of each disaster can be quantified by $\hat{a}_1 N_{it} b_N$, $\hat{a}_1 W_{it} b_W$, and $\hat{a}_1 E_{it} b_E$ for natural disasters, conflict & wars, and economic crises, respectively, where $\hat{a}_1$ is the estimated coefficient in equation (1).

4. Data Sources, Variables, and Descriptive Statistics

For the empirical analysis, we focus primarily on three broad categories: natural and technological disasters, economic disasters, and war and conflicts. The list of variables used, their definitions, and their data sources is shown in Table 1. We use these variables on natural and man-made disasters as instrumental variables in equation (2). The Appendix table presents the list of country names covered in our analysis. First, with regards to the macroeconomic data such as per capita consumption and GDP, we use the Penn World Table (PWT) Version 6.3 and World Development Indicators (WDI) covering the 189 nations in our study.

Second, our data on natural disasters and technological disasters come from the publicly available Emergency Events Database (EM-DAT) maintained by the Center for

Research on the Epidemiology of Disasters (CRED). The CRED classifies natural disasters based on the following criterion: ten or more people were killed; 100 or more people were affected, injured, or homeless; significant damage was incurred; a declaration of a state of emergency and/or an appeal for international assistance was made. We use six variables related to natural disasters 1) geological disasters including earthquakes and volcanic eruptions; 2) meteorological disasters including storms; 3) hydrological disasters such as floods, 4) climatological disasters such as droughts; 5) biological disasters such as epidemics and insect infestations; and 6) technological disasters including industrial accidents and transport accidents.

Finally, data on man-made disasters is classified into two subcategories: first, we use economic crises variables including growth collapse, hyperinflation, and financial, and/or currency crisis. Data are extracted from the Carmen Reinhart's Crisis Database (Reinhart, 2010). As for violence related disasters relating to wars and conflicts, we extract available information from multiple data sources, i.e., Correlates of War (COW) database (Correlates of War, 2010); UPPSALA database (UPPSALA Conflict Database, 2010); and Carmen Reinhart Crisis database (Reinhart, 2010).

Descriptive statistics of the variables used are summarized in Table 2. According to Table 2, on average, a country encounters 3.75 natural disasters per year; one war every five years; and one economic crisis, i.e., banking, debt, currency or inflation crisis, every other year.

5. Empirical Findings

In actual estimation, we use six different lags, i.e., one year, three years, ten years, 15 years, 20 years, and 25 years. By investigating short run and long run impacts separately, we believe we can consider the direct immediate costs and indirect long term losses from disasters as addressed in Hallegatte and Przyluski (2010) and Skidmore and Toya (2007). In all specifications reported in the following tables, we have also included the country fixed effects and the year dummies.

Short Term Impacts

Table 3 shows the basic results of equation (2), i.e., the first stage regression with one year lagged log per capita consumption, c, and log per capita GDP variables, y. We can verify that overall disasters have a significant negative impact on GDP per capita. In particular, climatological disasters, wars and banking crises have significant negative impacts. Table 4 presents the results of the second stage regression, in reference to Equation (1), which allows us to observe the relationship between consumption growth and income growth rates. The estimated coefficients of income growth rate are consistently positive and statistically significant. Moreover, the point estimates for the income variable using OLS are consistently larger than those based on instrumental variable method. This indicates upward bias arising from positive correlation between income and unobserved heterogeneities in the error term in equation (1). These results in Table 3 and 4 together indicate that natural and man-made disasters negatively affect per capita GDP which translate into negative per capita consumption level. According to the third specification in Table 3, natural disasters decrease per capita GDP growth rate by 0.012% points because the average number of natural disasters in log is 0.012 per year (Table 2). Considering that income growth sensitivity of consumption growth is around 0.8 in Table 4, natural disasters decrease annual per capita consumption growth rate by 0.01% points every year. Also note that the F statistics from the first stage regression and the Hansen's J statistics for the over identification tests support the validity of our econometric model.

We also run regressions by changing the lag period from one year to three years. Table 5 reports the estimation results of Equation (2). It is straightforward to see that the total number of disasters has a significant impact on GDP per capita akin to the first lag results. Also, even in these medium term results, the negative impact of war and banking crises still remains. With regards to economic crises, we notice the emergence of the impact of the debt external variable on GDP per capita.

To capture the overall impacts of each disaster category, we decompose the predicted average income growth rates into components of natural disasters, wars and economic disasters evaluated at mean values. The decomposition results are shown in Table 6 and 7. First, we can see that natural disasters, wars, and economic disasters generate statistically significant negative welfare impacts jointly. Second, we can verify that natural disasters generate the largest negative welfare effects in short term which is followed by wars and economic disasters.

Long Term Impacts

So far, our analyses are based on one-year and three year lagged variables, implying that the results reflect the very short term impact of disasters. In order to examine long term impacts of disasters on consumption growth rate, we employ 15 years, 20 years, and 25 years lags. In estimating these models, we follow Skidmore and Toya (2002) and add initial log income per capita in the first stage regression equation (2). This is a version of the estimable transition equation of the Solow model. Table 8 shows that the results based on 15 years lag. Intriguingly, natural disaster variables, i.e., numbers of natural disasters in total, hydrological disasters, and climatological disasters have positive and statistically significant coefficients. The same pattern can be found in the case of 20 years lag (Table 9). In contrast, with regards to economic disasters, the results reveal negative effects over 20 years (Table 9) and 25 years (Table 10). To quantify the overall welfare impacts, Table 11, 12, and 13, respectively, represent the cases of 15 years, 20 years, and 25 years lags. As we can see, natural disasters have the largest *positive* impact on per capita GDP growth in the long term. In fact, these results are consistent with Skidmore and Toya (2002) who find that climatic disasters are associated with higher rates of long-run economic growth. We also find that wars have a similar positive effect on per capita GDP growth in the long term. In the 25 years lag specifications, the positive effect of wars exceeds the effects of natural disasters. In contrast, economic disasters continuously generate negative impacts on per capita growth and welfare.

High Income versus Low Income Countries

To investigate the differentiated impacts of natural disasters depending on the varying size of economies, we follow Noy (2009) to divide the countries in our sample into rich and poor countries on the basis of their GDP. We use GDP data in 1960 or 2006 to split countries into two groups: "small" countries with below-median GDP and "large" countries with above-median GDP. Table 14 and 15 show the results for large countries and small countries, respectively, based on the threshold of GDP data in 1960. Based on these results, overall decomposition figures are summarized in Table 16 and 17

for small and large countries, respectively. While wars indicate the largest negative welfare effect in the case of large economies, impacts of natural disasters are biggest in small economies. Table 18 and 19 represent the regression results for large and small economies, respectively, based on the threshold of the median level of GDP in 2006.

The decomposition numbers in Table 20 and 21 reveal a similar qualitative result as before: wars and natural disasters generate large welfare losses in large and small countries, respectively. These results are perhaps in line with our expectation. Moreover, in the 1960 GDP split, natural disasters have a smaller impact in large economies than in small economies, as natural disasters are, in general, geographically concentrated by nature. Hence, smaller economies, which occupy smaller area size on average, are more detrimentally impacted by the effects of wars or natural calamities. In contrast, wars can affect a whole nation regardless of the size of the economy. Yet, natural disasters facilitate long-run economic growth.

We can now further look at the impact of disasters on high income and low income countries after 3 years (Tables 23-29), i.e. in the medium term.[5] Our findings indicate that for smaller economies, the impact of natural disasters is still the biggest. However unlike the first year results, after three years lag, the coefficient of wars turns out to be positive. This implies that less developed economies can recover quickly from the impact of wars in the medium term.

With regards to advanced economies, in the first year, i.e. the short term, we observed that the impact of wars is the largest. In contrast, with three year lag, the impact of natural disasters becomes larger. However, in the three year lag case, it is worth noticing that the coefficient of wars is still negative for the relatively large economies. This suggests that in contrast to smaller economies that can achieve quick recovery for wars in the medium term, larger income economies are not able to recover as quickly from the impact of wars.

The Nexus between Natural and Man-made Disasters

While our study as well as Barro (2009) analyses both natural and man-made disasters, the existing studies including ours treat natural and man-made disasters as

[5] We also examined the regression results for the long term, i.e., 10 years, however, the results did not satisfy the Hansen and the F test, so we did not include these results

independent incidents. Yet, there may be an interrelationship between them. For example, in the case of Japan 1923 earthquake, one of the most devastating earthquakes in the country's history, the impact of the earthquake was followed by a sharp decline in the country's GDP. Japan's earthquake can be considered an example of an exogenous economic shock, whose effects are temporary-as a result of the earthquake, |there was a slowdown in output growth, and higher current account deficits in 1923 and 1924 (Obstfeld, Rogoff, p76). In our study we tried to examine if there existed any systemic relationship between natural disasters and economic disaster. Table 30 shows pairwise correlations between different natural and man-made disasters. As per our findings we conclude that natural disasters are not systematically related to man-made disasters. In contrast, Miguel et al. (2004) used data from 41 African countries during 1981–99 to identify the causal impact of negative economic growth on civil conflict. Intriguingly, they also find that the impact of negative growth shocks on conflict is not significantly different in richer, more democratic, or more ethnically diverse countries. Further investigations on the inter-relationships among natural disasters, wars, and economic disasters should be undertaken for future research.

6. Concluding Remarks

In this paper, we compare the impacts of various man-made and natural disasters quantitatively. We carefully construct cross-country panel data of 189 countries within the range of 1968-2001 on a wide variety of natural disasters such as hydrological, geophysical, and biological disasters as well as man-made disasters such as economic crises, civil conflicts and wars.

There are three main empirical findings that have emerged from our analysis. First, in the short term, natural disasters, wars, and economic disasters involve statistically significant negative welfare impacts, i.e., declines in per capita GDP and consumption growth rates. Furthermore, natural disasters generate the largest negative welfare effects which are followed by wars and economic disasters. Second, in the long term, natural disasters and wars have *positive* impacts on per capita GDP growth and welfare. Our results here are consistent with existing literature that account for the positive growth effects of natural disasters (Skidmore and Toya, 2002). A rationale for this counterintuitive positive growth effect of natural disasters was given by Skidmore

and Toya (2002) who reasoned that disasters maybe accelerating the "Schumpeterian" creative destruction process, through for instance, the inflow of foreign aid or innovations in research and development after a natural disaster (Cavallo and Noy, 2009). In contrast, economic disasters continuously generate negative impacts. Third, wars affect large economies more than small economies; while natural disasters affect small economies disproportionately. Thus, in terms of policy implications, our empirical results suggest that stronger emphasis should be placed on short-term post-disaster rehabilitations for natural disasters, conflicts and warfare and on long-term continuous interventions against economic crises.

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Figure 1

Frequency of Natural and Man-made Disasters, 1960s-2006

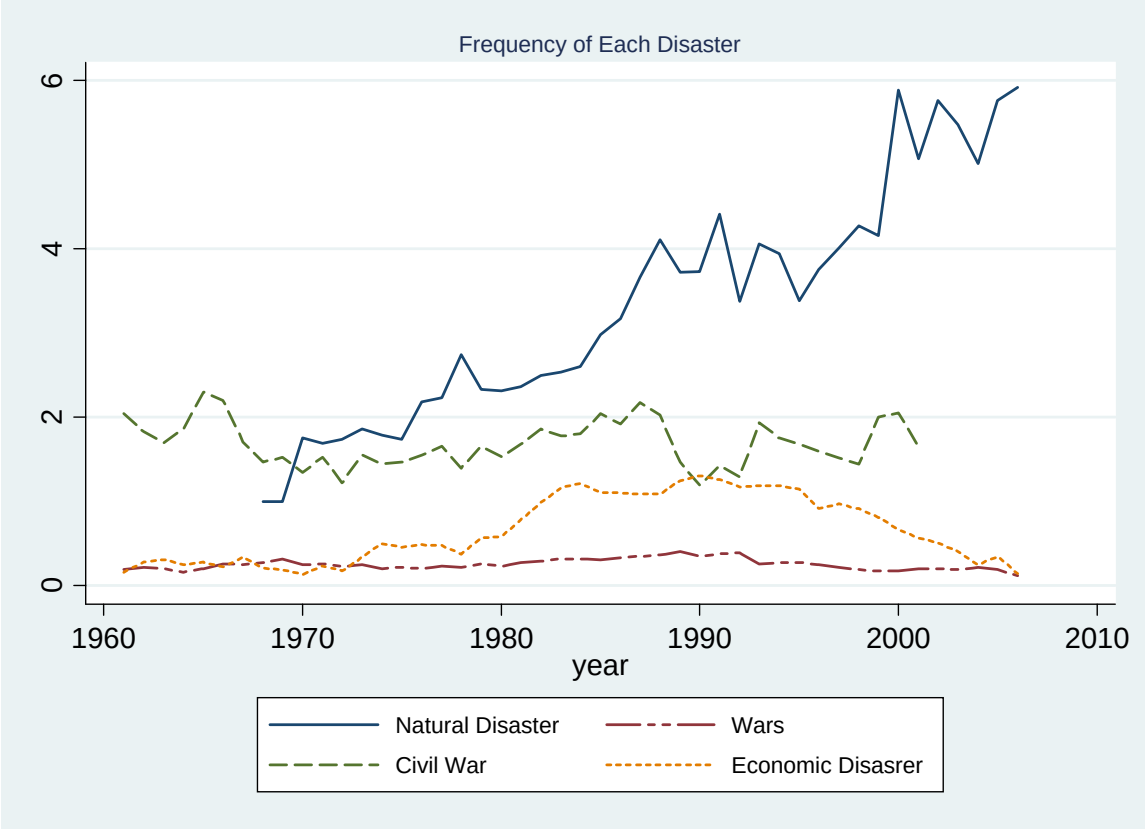

Table 1 Definition and Sources of Variable

Variables	Definition	Source
Per capita consumption growth rate (in log)	Logarithm of per capita consumption rate	PWT
Per Capita GDP growth rate (in log)	Logarithm of percentage change in per capita GDP	PWT
Geophysical Disasters	Geophysical disasters (originating from solid earth Earthquake, Volcano, Mass Movement)	EMDAT
Meteorological Disasters	Events caused by short-lived/small to meso scale atmospheric processes (in the spectrum from minutes to days) such as storms	EMDAT
Hydrological Disasters	Hydrological disasters (caused by deviations in the normal water cycle and/or overflow of bodies of water caused by wind set-up) such as floods	EMDAT
Climatological Disasters	Climatic disaster events caused by long-lived/meso to macro scale processes (in the spectrum from intra-seasonal to multi-decadal climate variability) such as extreme temperature, droughts, wildfire	EMDAT
Technological Disasters	Industrial accidents such as chemical spills, collapses of industrial infrastructures, fires, and radiation; or transport accidents by air, rail, road or water means of transport	EMDAT
Biological Disasters	Biological disaster events caused by the exposure of living organisms to germs and toxic substances such as Epidemics, Insect infestations, Animal Stampedes	EMDAT
Number of Civil Wars	Number of militarized interstate disputes, i.e., disputes that are united historical cases of conflict in which the threat, display or use of military force short of war by one member state is explicitly directed towards the government, official representatives, official forces, property, or territory of another state. Disputes are composed of incidents that range in intensity from threats to use force to actual combat short of war.	COW
Big Wars	Wars that occurred over the years (1800-2008)	REINHART
Currency Crises	An annual depreciation versus the US dollar of 15 percent or more	REINHART
Inflation Crises	An annual inflation rate 20 percent or higher (Hyperinflation)	REINHART
Banking Crises	Two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institutions (or group of institutions), that marks the start of a string of similar outcomes for other financial institutions	REINHART
Debt Crises domestic	Default or rescheduling on domestic debt (includes deposit freezes)	REINHART
Debt Crises External	Default or rescheduling on foreign debt	REINHART

Data Sources:

COW: Correlates of War (2010), COW Militarized Interstate Disputes (v.3.10), http://www.correlatesofwar.org/

EMDAT:"EM-DAT: The OFDA/CRED International Disaster Database www.em-dat.net

PWT: Penn World Tables (2010), Penn World Tables Version 6.3, http://pwt.econ.upenn.edu/

WDI: World Development Indicators (2010)

UPPSALA: UPPSALA Conflict Database (UCDP)

REINHART: Reinhart and Rogoff Database "Financial Crash to Debt Crisis," NBER WP 15795, March 2010. Forthcoming in American Economic Review.

Table 2: Descriptive Statistics

Variable	Description	Date Source	Obs	Mean	Std. Dev	Min	Max
Log Consumption Growth	Consumption growth (in log)	PWT	6568	0.053	0.169	-7.487	1.447
Log Income Growth	Income growth (in log)	PWT	6568	0.056	0.113	-4.078	0.985
Natural Disasters							
Numtotal	Number of Total Disasters	EMDAT	3910	3.765	6.476	1	100
Log Total Natural Disasters	Total Number of Natural Disasters (in log)	EMDAT	3780	0.012	0.007	0.007	0.046
Log Geophysical Disasters	Total Number of Natural Disasters that are Geophysical (in log)	EMDAT	3780	0.002	0.004	0	0.026
Log Meteorological Disasters	Total Number of Natural Disasters, that are Meteorological (in log)	EMDAT	3780	0.003	0.005	0	0.033
Log Hydrological Disasters	Total Number of Natural Disasters that are Hydrological (in log)	EMDAT	3780	0.004	0.005	0	0.030
Log Climatological Disasters	Total Number of Disasters that are Climatological (in log)	EMDAT	3780	0.002	0.004	0	0.023
Log Biological Disasters	Total Number of Disasters that are Biological (in log)	EMDAT	3780	0.002	0.004	0	0.025
Log Technological Disasters	Total Number of Disasters that are Technological (in log)	EMDAT	3780	0.005	0.007	0	0.043
Conflicts and Wars							
Wars	Dummy Variable on wars that occurred over the years (1800-2008)	REINHART	3933	0.243	0.429	0	1.000
Occurrence	Number of Civil War	COW	2250	1.760	1.553	0	26
Log of Number of Civil Wars	Number of militarized interstate dispute (in log)	COW	2240	0.925	0.384	0	3.296
Economic Disasters							
Banking Crises	Banking Crisis (dummy)	Reinhart	2640	0.148	0.356	0	1.000
Debt Crisis Ext	Debt Crisis External (dummy)	Reinhart	3535	0.155	0.394	0	1.000
Currency Crisis	Total Number of Currency Crises (in log)	Reinhart	3744	0.093	0.394	-2.765	9.484
Inflation Crisis	Total Number of Inflation Crisis (in log)	Reinhart	3737	0.132	0.330	-0.415	4.884
Currency Crisis (Dummy)	Dummy Variable for Currency Crisis	Reinhart	3613	0.177	0.396	0	1.000
Inflation Crisis (Dummy)	Dummy Variable for Inflation Crisis	Reinhart	3794	0.155	0.362	0	1.000

Table 3: Results of the First Stage Regression
Dependent Variable: Per capita GDP growth rate (one year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)	IV(7)	IV(8)	IV(9)	IV(10)
Total Number of Natural Disasters (in log)	-0.598 [0.490]		-1.019** [0.436]		-0.842* [0.443]		-0.641 [0.495]		-0.434 [0.502]	
Log Geophysical Disasters		-0.457 [0.524]		-0.572 [0.501]		-0.553 [0.537]		-0.464 [0.502]		-0.469 [0.534]
Log Meteorological Disasters		0.058 [0.429]		0.017 [0.418]		0.029 [0.427]		0.068 [0.418]		0.075 [0.425]
Log Hydrological Disasters		-0.241 [0.403]		0.102 [0.424]		0.167 [0.424]		-0.252 [0.407]		-0.182 [0.401]
Log Climatological Disasters		-1.425*** [0.537]		-1.778*** [0.563]		-1.721*** [0.569]		-1.463*** [0.525]		-1.373** [0.542]
Log Biological Disasters		1.741 [1.066]		1.773* [1.010]		2.078* [1.069]		1.69 [1.040]		2.046* [1.096]
Log Technological Disasters		-0.321 [0.350]		-0.714** [0.334]		-0.709** [0.331]		-0.328 [0.362]		-0.31 [0.361]
Wars	-0.017*** [0.006]	-0.018*** [0.006]	-0.017*** [0.006]	-0.017*** [0.006]	-0.019*** [0.006]	-0.018*** [0.006]	-0.017*** [0.006]	-0.017*** [0.006]	-0.019*** [0.006]	-0.020*** [0.006]
Log of Number of Civil Wars	0.002 [0.006]	0.003 [0.006]	0.002 [0.006]	0.002 [0.006]	0.001 [0.006]	0.002 [0.006]	0.002 [0.006]	0.003 [0.006]	0.002 [0.006]	0.003 [0.006]
Banking Crisis	-0.016*** [0.005]	-0.014*** [0.005]					-0.016*** [0.005]	-0.014*** [0.005]	-0.016*** [0.005]	-0.014*** [0.005]
Debt Crisis Ext	-0.012 [0.011]	-0.014 [0.011]	-0.012 [0.010]	-0.012 [0.011]	-0.014 [0.011]	-0.014 [0.012]	-0.011 [0.010]	-0.013 [0.011]	-0.016 [0.011]	-0.018 [0.011]
Currency Crisis			-0.004 [0.013]	-0.005 [0.012]			-0.001 [0.014]	-0.001 [0.013]		
Inflation Crisis			-0.006 [0.024]	-0.003 [0.023]			-0.006 [0.026]	-0.004 [0.025]		
Currency Crisis (Dummy)					-0.008 [0.009]	-0.011 [0.008]			-0.002 [0.009]	-0.005 [0.008]
Inflation Crisis (Dummy)					0.013 [0.012]	0.017 [0.011]			0.018 [0.011]	0.021* [0.011]
Observations	498	498	542	542	530	530	497	497	488	488
Number of country	47	47	49	49	48	48	47	47	46	46
R-squared	0.05	0.07	0.04	0.07	0.04	0.07	0.05	0.08	0.06	0.09
F test: coeff. of IV = 0	5.61	3.75	3.27	3.85	2.96	3.6	4.11	3.24	4.89	3.61
Prob > F	0	0	0	0	0.01	0	0	0	0	0

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Results of the Second Stage Regression
Dependent Variable: Per Capita Consumption Growth rate (one year lag)

	OLS	**IV(1)**	**IV(2)**	**IV(3)**	**IV(4)**	**IV(5)**	**IV(6)**	**IV(7)**	**IV(8)**	**IV(9)**	**IV(10)**
Log income Growth	1.044*** [0.152]	0.756*** [0.149]	0.809*** [0.128]	0.767*** [0.204]	0.866*** [0.127]	0.810*** [0.199]	0.826*** [0.129]	0.790*** [0.146]	0.857*** [0.126]	0.713*** [0.148]	0.811*** [0.126]
Constant	-0.005 [0.008]										
Observations	8269	498	498	542	542	530	530	497	497	488	488
Number of country	190	47	47	49	49	48	48	47	47	46	46
R-squared	0.53	0.11	0.08	0.21	0.17	0.19	0.19	0.09	0.05	0.12	0.07
Hansen J statistic		0.19	5.87	5.69	9.66	2.84	6.68	6.12	9.67	2.46	6.88
Chi-sq(3) P-val		1	0.75	0.34	0.47	0.73	0.76	0.41	0.56	0.87	0.81

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Results of the First Stage Regression
Dependent Variable: Per capita GDP growth rate (3 years lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)	IV(7)	IV(8)	IV(9)	IV(10)
Total Number of Natural Disasters (in log)	-2.270** [1.015]			-2.713*** [0.990]		-3.355*** [1.010]	-3.101*** [1.019]		-2.348** [1.002]	
Log Geophysical Disasters		-1.898* [1.092]	-2.333** [1.066]		-2.410** [1.118]			-2.368** [1.122]		-1.945* [1.116]
Log Meteorological Disasters		-1.3 [0.953]	-1.365 [0.926]		-1.389 [0.944]			-1.251 [0.975]		-1.334 [0.958]
Log Hydrological Disasters		-0.182 [0.849]	-0.564 [0.833]		-0.498 [0.845]			0.314 [0.858]		-0.156 [0.858]
Log Climatological Disasters		-3.098*** [1.049]	-3.150*** [1.046]		-3.064*** [1.061]			-3.974*** [1.147]		-3.057*** [1.067]
Log Biological Disasters		4.931** [1.927]	4.275** [1.858]		4.152** [1.955]			4.221** [1.978]		4.517** [1.970]
Log Technological Disasters		-1.353* [0.726]	-1.255* [0.735]		-1.221* [0.737]			-1.851** [0.768]		-1.251* [0.732]
Wars	-0.029** [0.014]	-0.030** [0.013]	-0.011 [0.015]	-0.013 [0.015]	-0.013 [0.015]	-0.023 [0.014]	-0.024* [0.014]	-0.022 [0.014]	-0.031** [0.014]	-0.031** [0.014]
Log of Number of Civil Wars	-0.016 [0.013]	-0.012 [0.013]	-0.012 [0.013]	-0.013 [0.013]	-0.011 [0.013]	-0.021 [0.013]	-0.019 [0.013]	-0.017 [0.013]	-0.015 [0.013]	-0.012 [0.013]
Banking Crisis	-0.021* [0.011]	-0.014 [0.011]	-0.020* [0.011]	-0.025** [0.011]	-0.020* [0.011]				-0.020* [0.011]	-0.014 [0.011]
Debt Crisis Ext	-0.033 [0.020]	-0.039** [0.020]				-0.041** [0.019]	-0.031 [0.020]	-0.032 [0.020]	-0.03 [0.023]	-0.036* [0.022]
Log Currency Crisis			0.005 [0.024]			0.007 [0.024]				
Log Inflation Crisis			-0.031 [0.054]			-0.043 [0.056]				
Currency Crisis (Dummy)				-0.001 [0.017]	-0.007 [0.016]		-0.011 [0.017]	-0.017 [0.016]	0.007 [0.016]	0.002 [0.015]
Inflation Crisis (Dummy)				-0.018 [0.021]	-0.011 [0.020]		-0.012 [0.024]	-0.004 [0.023]	-0.016 [0.022]	-0.008 [0.021]
Observations	498	498	528	519	519	542	530	530	488	488
Number of country	47	47	49	48	48	49	48	48	46	46
R-squared	0.05	0.09	0.08	0.04	0.07	0.07	0.05	0.09	0.05	0.09
F test: coeff. of IV = 0	5.87	5.77	5.14	3.97	4.86	5.62	4.56	5.72	4.37	4.64
Prob > F	0	0	0	0	0	0	0	0	0	0

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Predicted Value Tables of Disaster Types (*one year* lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)	IV(7)	IV(8)	IV(9)	IV(10)
natural disaster	-0.011*** [0.000]	-0.005*** [0.000]	-0.015*** [0.000]	-0.006*** [0.000]	-0.013*** [0.000]	-0.005*** [0.000]	-0.011*** [0.000]	-0.005*** [0.000]	-0.008*** [0.000]	-0.004*** [0.000]
War	-0.005*** [0.000]	-0.004*** [0.000]	-0.005*** [0.000]	-0.005*** [0.000]	-0.006*** [0.000]	-0.005*** [0.000]	-0.005*** [0.000]	-0.004*** [0.000]	-0.005*** [0.000]	-0.005*** [0.000]
economic disaster	-0.004*** [0.000]	-0.004*** [0.000]	-0.003*** [0.000]	-0.003*** [0.000]	-0.002*** [0.000]	-0.002*** [0.000]	-0.005*** [0.000]	-0.005*** [0.000]	-0.002*** [0.000]	-0.002*** [0.000]

Table 7: Predicted Value Tables of Disaster Types (*three years* lags)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)	IV(7)	IV(8)	IV(9)	IV(10)
natural disaster	-0.025*** [0.000]	-0.011*** [0.000]	-0.013*** [0.000]	-0.030*** [0.000]	-0.014*** [0.000]	-0.038*** [0.000]	-0.035*** [0.000]	-0.016*** [0.000]	-0.026*** [0.000]	-0.011*** [0.000]
war	-0.022*** [0.000]	-0.020*** [0.000]	-0.013*** [0.000]	-0.014*** [0.000]	-0.013*** [0.000]	-0.022*** [0.000]	-0.021*** [0.000]	-0.019*** [0.000]	-0.022*** [0.001]	-0.020*** [0.000]
economic disaster	-0.009*** [0.000]	-0.009*** [0.000]	-0.004*** [0.000]	-0.007*** [0.000]	-0.006*** [0.000]	-0.008*** [0.000]	-0.009*** [0.000]	-0.008*** [0.000]	-0.009*** [0.000]	-0.006*** [0.000]

Table 8: Results of the First Stage Regression
Dependent Variable: Per capita GDP growth rate (15 years lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)
Initial per capita GDP	0.021 [0.045]	0.031 [0.047]	0.025 [0.045]	0.038 [0.047]	0.032 [0.049]	0.024 [0.046]
Total Number of Natural Disasters (in log)	1.259* [0.698]		1.235* [0.690]			1.218* [0.688]
Log Geophyiscal Disasters		-0.842 [0.818]		-1.095 [0.868]	-0.502 [0.860]	
Log Meteorological Disasters		0.34 [0.642]		0.321 [0.639]	0.023 [0.723]	
Log Hydrological Disasters		1.592** [0.696]		1.632** [0.723]	1.852** [0.769]	
Log Climatological Disasters		1.928** [0.967]		1.862* [0.981]	2.166** [1.015]	
Log Biological Disasters		0.471 [1.304]		0.621 [1.342]	0.617 [1.304]	
Log Technological Disasters		0.169 [0.594]		0.24 [0.613]	-0.028 [0.654]	
Wars	-0.095 [0.071]	-0.061 [0.075]	-0.075 [0.067]	-0.039 [0.074]	-0.059 [0.077]	-0.071 [0.069]
Log of Nuymber of Civil Wars	-0.005 [0.213]	-0.099 [0.246]	0.004 [0.213]	-0.091 [0.238]	-0.055 [0.249]	0.015 [0.214]
Banking Crisis			0.093 [0.082]	0.118 [0.084]		0.11 [0.081]
Debt Crisis Ext					-0.105 [0.118]	-0.059 [0.103]
Logo of Currency Cirsis	-0.016 [0.101]	-0.084 [0.122]	-0.037 [0.100]	-0.117 [0.118]	-0.052 [0.119]	-0.019 [0.103]
Log of Inflation Crisis	0.085 [0.100]	0.114 [0.113]	0.065 [0.101]	0.097 [0.110]	0.128 [0.116]	0.082 [0.102]
Wars (Dummy)	0.142 [0.165]	0.036 [0.173]	0.2 [0.241]	0.068 [0.255]	0.022 [0.170]	0.193 [0.226]
Log of Number of Civil Wars (Dummy)	0.06 [0.171]	0.147 [0.188]	0.06 [0.172]	0.149 [0.182]	0.112 [0.186]	0.056 [0.173]
Banking Crisis (Dummy)			-0.131 [0.207]	-0.122 [0.211]		-0.136 [0.190]
Debt Crisis (Dummy)					-0.171 [0.154]	-0.119 [0.105]
Currency Crisis (Dummy)	0.243*** [0.090]	0.323** [0.154]	0.188* [0.095]	0.276* [0.153]	0.256* [0.152]	0.134 [0.124]
Inflation Crisis (Dummy)	-0.385** [0.170]	-0.349 [0.215]	-0.294* [0.157]	-0.255 [0.200]	-0.098 [0.267]	-0.119 [0.189]
Constant	0.336 [0.338]	0.305 [0.327]	0.313 [0.345]	0.26 [0.331]	0.295 [0.338]	0.321 [0.347]
Observations	99	99	99	99	99	99
R-squared	0.07	0.14	0.08	0.15	0.15	0.09
F test: coeff. of IV = 0	6.25	4.6	5.44	4.48	4.28	5.2
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9: Results of the First Stage Regression
Dependent Variable: Per capita GDP growth rate (20 years lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)	IV(7)
Initial per capita GDP	-0.090* [0.049]	-0.083* [0.049]	-0.084 [0.064]	-0.090* [0.050]	-0.097 [0.067]	-0.086* [0.051]	-0.091* [0.051]
Total Number of Natural Disasters (in log)	1.650** [0.683]	1.808** [0.752]		1.459** [0.650]		1.807** [0.742]	1.483** [0.663]
Log Geophyiscal Disasters			-0.567 [1.177]		-0.265 [1.204]		
Log Meteorological Disasters			0.15 [1.130]		0.075 [1.156]		
Log Hydrological Disasters			0.294 [1.387]		-0.211 [1.438]		
Log Climatological Disasters			1.59 [1.073]		1.153 [1.159]		
Log Biological Disasters			-0.645 [1.721]		-1.075 [1.769]		
Log Technological Disasters			1.696 [1.257]		1.572 [1.236]		
Wars	-0.138 [0.095]	-0.161 [0.112]	-0.223 [0.138]	-0.113 [0.100]	-0.15 [0.121]	-0.172 [0.104]	-0.089 [0.099]
Log of Number of Civil Wars	0.058 [0.073]	0.076 [0.076]	0.142 [0.106]	0.079 [0.071]	0.138 [0.103]	0.059 [0.075]	0.049 [0.075]
Banking Crisis	-0.112 [0.104]	-0.097 [0.115]	-0.106 [0.130]	-0.114 [0.118]	-0.146 [0.146]	-0.092 [0.106]	-0.133 [0.109]
Debt Crisis Ext	-0.191** [0.096]					-0.191 [0.120]	-0.222** [0.101]
Currency Crisis		-0.181** [0.071]	-0.166* [0.085]			-0.036 [0.100]	
Currency Crisis (Dummy)				0.128 [0.132]	0.216 [0.161]		0.258* [0.139]
Inflation Crisis (Dummy)				-0.276** [0.135]	-0.313* [0.158]		-0.243* [0.129]
Wars (Dummy)	0.195 [0.128]	0.227 [0.170]	0.173 [0.197]	0.253 [0.244]	0.161 [0.304]	0.382* [0.213]	0.209 [0.224]
Log of Number of Civil Wars (Dummy)	0.005 [0.133]	0.007 [0.136]	-0.067 [0.170]	0.011 [0.138]	-0.046 [0.171]	0.001 [0.136]	0.015 [0.139]
Banking Crisis (Dummy)	0.261*** [0.068]	0.203*** [0.065]	0.323** [0.128]	0.13 [0.178]	0.237 [0.244]	0.229*** [0.053]	0.158 [0.161]
Debt Crisis Ext (Dummy)	-0.186** [0.082]					-0.145 [0.102]	-0.187** [0.092]
Currency Crisis (Dummy 2)		-0.218* [0.122]	-0.286* [0.167]			-0.204 [0.181]	
Currency Crisis (Dummy 3)				0.121 [0.173]	0.023 [0.188]		-0.029 [0.178]
Inflation Crisis (Dummy 2)				-0.252 [0.228]	-0.19 [0.261]		0.131 [0.246]
Constant	1.153*** [0.350]	1.084*** [0.356]	1.224** [0.478]	1.163*** [0.355]	1.333*** [0.502]	1.111*** [0.362]	1.175*** [0.358]
Observations	91	91	91	91	91	91	91
R-squared	0.17	0.15	0.18	0.17	0.2	0.17	0.19
F test: coeff. of IV = 0	8.73	18.32	11.81	8.67	4.65	8.8	10.02
Prob > F	0	0	0	0	0	0	0

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10: Results of the First Stage Regression
Dependent Variable: Per capita GDP growth rate (25 years lags)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)
Initial per capita GDP		0.005 [0.068]	-0.044 [0.064]	-0.006 [0.069]	-0.024 [0.062]	-0.032 [0.061]
Total Number of Natural Disasters (in log)	0.807 [1.057]		0.823 [1.144]		1.089 [1.062]	1.04 [1.108]
Log Geophyiscal Disasters		-1.659 [1.925]		-1.177 [2.233]		
Log Meteorological Disasters		0.322 [1.315]		0.419 [1.425]		
Log Hydrological Disasters		2.948** [1.367]		2.589 [1.559]		
Log Climatological Disasters		-0.194 [1.556]		-0.231 [1.557]		
Log Biological Disasters		1.473 [1.898]		2.036 [2.190]		
Log Technological Disasters		-1.392 [1.453]		-1.637 [1.472]		
Wars	-0.205 [0.132]	-0.198 [0.142]	-0.250* [0.135]	-0.225 [0.139]	-0.221* [0.131]	-0.270* [0.139]
Log of Number of Civil Wars	0.212 [0.205]	0.169 [0.304]	0.218 [0.208]	0.228 [0.337]	0.174 [0.215]	0.179 [0.215]
Banking Crisis			0.237 [0.149]	0.197 [0.174]		0.196 [0.177]
Debt Crisis Ext					-0.16 [0.161]	-0.198 [0.176]
Currency Crisis					-0.044 [0.102]	-0.07 [0.103]
Currency Crisis (Dummy)	0.193 [0.198]	0.167 [0.185]	0.149 [0.184]	0.152 [0.178]		
Inflation Crisis (Dummy)	-0.410* [0.208]	-0.466** [0.194]	-0.407** [0.198]	-0.479** [0.200]		
Wars (Dummy)	0.637*** [0.118]	0.398** [0.157]	0.577*** [0.159]	0.409* [0.237]	0.618*** [0.118]	0.439*** [0.155]
Log of Number of Civil Wars (Dummy)	-0.04 [0.211]	0.002 [0.274]	-0.087 [0.200]	-0.098 [0.310]	-0.019 [0.218]	-0.048 [0.207]
Banking Crisis (Dummy)			0.057 [0.129]	0.031 [0.261]		0.182 [0.127]
Currency Crisis (Dummy 2)					0.151 [0.128]	-0.003 [0.206]
Currency Crisis (Dummy 3)	0.047 [0.232]	0.209 [0.256]	0.048 [0.233]	0.17 [0.285]		
Inflation Crisis (Dummy 2)	-0.423* [0.231]	-0.337 [0.236]	-0.423* [0.222]	-0.336 [0.255]		
Constant	1.004** [0.417]	0.764 [0.463]	1.030** [0.412]	0.833* [0.466]	0.885** [0.399]	0.936** [0.395]
Observations	80	80	80	80	80	80
R-squared	0.18	0.23	0.2	0.25	0.18	0.19
F test: coeff. of IV = 0	13.68	11.45	16.96	12.95	14.89	26.8
Prob > F	0	0	0	0	0	0

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 11: Predicted Value Tables of Disaster Types (15 years lags)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)
natural disaster	0.159*** [0.007]	0.102*** [0.011]	0.155*** [0.007]	0.102*** [0.011]	0.107*** [0.011]	0.153*** [0.007]
War	0.047*** [0.005]	0.017*** [0.003]	0.073*** [0.007]	0.034*** [0.003]	0.013*** [0.002]	0.072*** [0.007]
economic disaster	-0.044*** [0.005]	-0.008*** [0.003]	-0.070*** [0.007]	-0.025*** [0.004]	-0.004 [0.003]	-0.068*** [0.007]

Table 12: Predicted Value Tables of Disaster Types (20 years lags)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)	IV(7)
natural disaster	0.211*** [0.012]	0.231*** [0.013]	0.124*** [0.016]	0.187*** [0.010]	0.083*** [0.014]	0.231*** [0.013]	0.190*** [0.010]
War	0.069*** [0.007]	0.084*** [0.008]	0.055*** [0.007]	0.100*** [0.009]	0.064*** [0.007]	0.129*** [0.012]	0.080*** [0.007]
economic disaster	-0.003 [0.006]	-0.016*** [0.005]	0.002 [0.005]	-0.025*** [0.006]	0.001 [0.007]	-0.066*** [0.009]	-0.009 [0.007]

Table 13: Predicted Value Tables of Disaster Types (*t*+25 lags)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)	IV(6)
natural disaster	0.089*** [0.005]	0.042*** [0.014]	0.091*** [0.005]	0.039*** [0.013]	0.120*** [0.007]	0.114*** [0.006]
War	0.233*** [0.022]	0.151*** [0.014]	0.200*** [0.019]	0.143*** [0.014]	0.222*** [0.021]	0.150*** [0.015]
economic disaster	-0.133*** [0.015]	-0.058*** [0.010]	-0.100*** [0.013]	-0.047*** [0.009]	-0.133*** [0.015]	-0.057*** [0.009]

Table 14: Results of the First Stage Regression for Large Economy
Dependent Variable: Per capita GDP growth rate
(Base Year 1960, one year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
Total Number of Natural Disasters (in log)		0.247 [0.207]		0.237 [0.209]	
Log Geophysical Disasters	-4.907 [3.013]		-5.202* [3.030]		-5.065* [3.012]
Log Meteorological Disasters	0.319 [2.098]		0.195 [2.118]		0.112 [2.121]
Log Hydrological Disasters	2.778 [1.759]		2.865 [1.774]		2.83 [1.769]
Log Climatological Disasters	0.237 [0.257]		0.235 [0.258]		0.239 [0.260]
Log Biological Disasters	0.6 [0.474]		0.579 [0.471]		0.588 [0.486]
Log Technological Disasters	-0.035 [0.205]		-0.027 [0.205]		-0.047 [0.207]
Wars	-0.431* [0.253]	-0.531* [0.277]	-0.395 [0.260]	-0.512* [0.282]	-0.439 [0.269]
Log of Number of Civil Wars	-0.042 [0.284]	0.07 [0.272]	-0.017 [0.288]	0.096 [0.278]	0.023 [0.298]
Banking Crisis		0.195 [0.223]		0.221 [0.230]	0.217 [0.237]
Debt Crisis Domestic					
Debt Crisis Ext			0.409 [0.370]	0.328 [0.375]	0.492 [0.376]
Log Currency Crisis	-0.802*** [0.305]	-0.743** [0.309]	-0.961*** [0.344]	-0.880** [0.372]	-1.058*** [0.356]
Log Inflation Crisis	0.307 [0.240]	0.221 [0.228]	0.228 [0.238]	0.163 [0.221]	0.221 [0.231]
Observations	170	170	170	170	170
Number of country	15	15	15	15	15
R-squared	0.1	0.06	0.1	0.06	0.11
F test: coeff. of IV = 0	2.66	2.71	2.67	2.48	2.5
Prob > F	0.01	0.02	0	0.02	

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 15: Results of the First Stage Regression for Small Economies
Dependent Variable: Per capita GDP growth rate
(Base Year 1960, one year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
Total Number of Natural Disasters (in log)		0.006 [0.006]		0.004 [0.007]	
Log Geophysical Disasters	-0.048 [0.104]		-0.091 [0.114]		-0.123 [0.119]
Log Meteorological Disasters	0.087 [0.089]		0.097 [0.108]		0.18 [0.131]
Log Hydrological Disasters	-0.01 [0.075]		0.007 [0.100]		0.019 [0.112]
Log Climatological Disasters	-0.026** [0.010]		-0.024** [0.011]		-0.022* [0.012]
Log Biological Disasters	0.035** [0.015]		0.032** [0.015]		0.033** [0.016]
Log Technological Disasters	-0.009 [0.006]		-0.008 [0.006]		-0.006 [0.006]
Wars	-0.003 [0.012]	-0.002 [0.014]	-0.023* [0.012]	-0.028** [0.013]	-0.026* [0.014]
Log of Number of Civil Wars	0.027** [0.011]	0.035*** [0.012]	0.023* [0.014]	0.032** [0.013]	0.028* [0.015]
Banking Crisis		-0.020** [0.010]		-0.009 [0.012]	-0.001 [0.012]
Debt Crisis Domestic			-0.026 [0.020]	-0.004 [0.023]	-0.014 [0.023]
Debt Crisis Ext	0.015 [0.071]	0.037 [0.075]	0.042 [0.063]	0.068 [0.069]	0.052 [0.062]
Log Currency Crisis	0.05 [0.088]	0.043 [0.098]	0.05 [0.088]	0.013 [0.102]	0.025 [0.103]
Log Inflation Crisis					
Observations	174	145	142	116	116
Number of country	11	11	9	9	9
R-squared	0.09	0.07	0.15	0.12	0.21
F test: coeff. of IV = 0	1.64	1.93	1.63	1.94	1.64
Prob > F	0.1	0.08	0.1	0.07	0.09

Robust Standard Errors in Brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 16: Results for the Countries Below Median GDP
(Base Year 1960, one year lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
natural disaster	-0.012*** [0.001]	-0.028*** [0.000]	-0.017*** [0.001]	-0.012*** [0.000]	-0.009*** [0.000]
War	-0.007*** [0.001]	-0.006*** [0.000]	-0.009*** [0.001]	-0.007*** [0.000]	-0.003*** [0.001]
economic disaster	0.001*** [0.000]	0.0002 [0.000]	0.004*** [0.000]	-0.011*** [0.001]	-0.008*** [0.001]

Table 17: Results for the Countries Above Median GDP
(Base Year 1960, one year lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
natural disaster	-0.007*** [0.000]	-0.006*** [0.000]	-0.004*** [0.000]	-0.005*** [0.000]	-0.004*** [0.000]
war	-0.010*** [0.000]	-0.009*** [0.000]	-0.009*** [0.000]	-0.010*** [0.000]	-0.009*** [0.000]
economic disaster	-0.001*** [0.000]	0.0001 [0.000]	0.0002 [0.000]	-0.0003 [0.000]	-0.0004 [0.000]

Table 18: Results of the First Stage Regression for Large Economies
Dependent Variable: Per capita GDP growth rate
(Base Year 2006, one year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
Total Number of Natural Disasters (in log)		0.327 [0.212]	0.068 [0.235]	0.324 [0.213]	
Log Geophysical Disasters	2.83 [2.719]				3.617 [2.920]
Log Meteorological Disasters	2.852 [2.001]				3.298* [1.969]
Log Hydrological Disasters	-0.614 [1.727]				0.608 [1.767]
Log Climatological Disasters	-0.376 [0.228]				-0.306 [0.229]
Log Biological Disasters	-0.161 [0.510]				-0.105 [0.585]
Log Technological Disasters	0.053 [0.186]				0.156 [0.195]
Wars	-0.277 [0.269]	-0.1 [0.271]	-0.221 [0.274]	-0.106 [0.280]	-0.157 [0.291]
Log of Number of Civil Wars	0.371 [0.293]	0.620** [0.291]	0.37 [0.296]	0.622** [0.294]	0.654** [0.295]
Banking Crisis			0.065 [0.239]	0.026 [0.240]	0.034 [0.245]
Debt Crisis Ext					
Log Currency Crisis	-10.128*** [2.722]		-9.880*** [2.770]		
Log Inflation Crisis	-0.251 [1.258]		-0.376 [1.290]		
Currency Crisis (Dummy)		-0.217 [0.412]		-0.218 [0.413]	-0.256 [0.427]
Inflation Crisis (Dummy)		-1.800** [0.858]		-1.805** [0.872]	-1.865** [0.829]
Other Economic					
Observations	191	191	191	191	191
Number of country	15	15	15	15	15
R-squared	0.15	0.08	0.12	0.08	0.1
F test: coeff. of IV = 0	2.73	2.82	3.74	2.32	1.73
Prob > F	0	0.02	0	0.04	0.07

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 19: Results of the First Stage Regression for Small Economies
Dependent Variable: Per capita GDP growth rate
(Base Year 2006, one year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
Total Number of Natural Disasters (in log)		0.014 [0.010]	0.019 [0.012]	0.021* [0.012]	
Log Geophysical Disasters	-0.231* [0.133]				-0.178 [0.139]
Log Meteorological Disasters	0.024 [0.135]				-0.014 [0.161]
Log Hydrological Disasters	0.230** [0.115]				0.202 [0.126]
Log Climatological Disasters	-0.039** [0.019]				-0.025 [0.021]
Log Biological Disasters	0.021 [0.014]				0.018 [0.014]
Log Technological Disasters	0.001 [0.008]				0.011 [0.009]
Wars	-0.034** [0.017]	-0.033** [0.014]	-0.037*** [0.012]	-0.035*** [0.011]	-0.040*** [0.013]
Log of Number of Civil Wars	-0.113 [0.224]	-0.023 [0.208]	0.05 [0.193]	0.041 [0.182]	0.023 [0.209]
Banking Crisis			-0.017 [0.014]	-0.016 [0.013]	-0.012 [0.014]
Debt Crisis Ext					
Log Currency Crisis	0.005 [0.022]		0.017 [0.025]		
Log Inflation Crisis	-0.02 [0.050]		-0.041 [0.056]		
Currency Crisis (Dummy)		-0.013 [0.017]		-0.009 [0.017]	-0.013 [0.016]
Inflation Crisis (Dummy)		0.001 [0.021]		-0.006 [0.022]	-0.003 [0.022]
Observations	113	114	90	91	91
Number of country	10	10	9	9	9
R-squared	0.15	0.05	0.13	0.12	0.19
F test: coeff. of IV = 0	1.7	1.97	2.32	3.43	1.98
Prob > F	0.09	0.09	0.04	0	0.04

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 20: Results for the Countries Below Median GDP (Base Year 2006, one year lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
natural disaster	-0.007*** [0.000]	-0.013*** [0.000]	-0.007*** [0.000]	-0.007*** [0.000]	-0.005*** [0.000]
war	-0.000*** [0.000]	-0.007*** [0.000]	-0.007*** [0.000]	-0.007*** [0.000]	-0.007*** [0.000]
economic disaster	-0.003*** [0.000]	-0.003*** [0.000]	-0.002*** [0.000]	-0.000* [0.000]	-0.003*** [0.000]

Table 21: Results for the Countries Above Median GDP (Base Year 2006, one year lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
natural disaster	-0.009*** [0.000]	-0.014*** [0.000]	-0.008*** [0.000]	-0.008*** [0.000]	-0.008*** [0.000]
war	-0.002*** [0.000]	-0.009*** [0.000]	-0.008*** [0.000]	-0.009*** [0.000]	-0.009*** [0.000]
economic disaster	-0.003*** [0.000]	-0.003*** [0.000]	-0.002*** [0.000]	-0.000** [0.000]	-0.003*** [0.000]

Table 22: Results of the First Stage Regression for Small Economies
Dependent Variable: Per capita GDP growth rate
(Base Year 1960, 3 year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
	-9	-13	-14	-17	-19
	dc	ds	dv	em	eq
Total Number of Natural Disasters (in log)			-1.418 [2.673]		
Log Geophysical Disasters	-5.763 [4.896]	-3.1 [3.985]		-4.639 [5.152]	-4.64 [5.173]
Log Meteorological Disasters	-5.968* [3.363]	-3.502 [2.993]		-5.776 [4.264]	-5.156 [3.967]
Log Hydrological Disasters	0.168 [2.822]	-3.601 [2.419]		4.925 [4.063]	4.633 [3.832]
Log Climatological Disasters	-6.945* [3.954]	-0.552 [2.831]		-7.192 [4.599]	-5.295 [4.133]
Log Biological Disasters	3.369 [3.627]	1.442 [1.636]		2.384 [3.729]	1.193 [3.770]
Log Technological Disasters	-0.439 [3.139]	0.242 [2.056]		-1.23 [4.545]	3.264 [4.794]
Wars	0.039 [0.030]	0.053* [0.029]	0.060** [0.028]	0.006 [0.026]	0.011 [0.026]
Log of Number of Civil Wars	0.014 [0.044]	0.015 [0.045]	0.026 [0.046]	0.02 [0.044]	0.044 [0.042]
Banking Crisis		0.01 [0.029]	0.011 [0.033]		
Debt Crisis Ext				-0.072** [0.036]	-0.037 [0.042]
Log Inflation Crisis		0.091 [0.067]		0.019 [0.084]	
Log Currency Crisis		-0.059** [0.028]		-0.023 [0.033]	
Currency Crisis (Dummy)	-0.122*** [0.039]		-0.077*** [0.029]		-0.092** [0.038]
Inflation Crisis (Dummy)	0.04 [0.061]		0.017 [0.030]		0.04 [0.064]
Observations	114	106	96	95	82
Number of country	15	15	14	14	13
R-squared	0.17	0.17	0.13	0.16	0.2
F test: coeff. of IV = 0	2.16	3.67	2.26	3.24	1.73
Prob > F	0.03	0	0.05	0	0.09

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 23: Results of the First Stage Regression for Large Economies
Dependent Variable: Per capita GDP growth rate
(Base Year 1960, 3 year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
	dv	dw	el	em	ep
Total Number of Natural Disasters (in log)	-2.530** [1.075]		-3.498*** [0.984]		-3.666*** [0.966]
Log Geophysical Disasters		-1.081 [1.048]		-0.9 [1.050]	
Log Meteorological Disasters		-0.954 [1.013]		-0.69 [1.016]	
Log Hydrological Disasters		-0.117 [0.884]		-0.307 [0.869]	
Log Climatological Disasters		-3.773*** [1.080]		-3.865*** [1.107]	
Log Biological Disasters		3.784* [2.293]		4.302* [2.382]	
Log Technological Disasters		-1.524** [0.770]		-2.486*** [0.753]	
Wars	-0.036** [0.016]	-0.037** [0.016]	-0.026 [0.017]	-0.026 [0.017]	-0.025 [0.016]
Log of Number of Civil Wars	-0.023* [0.013]	-0.018 [0.013]	-0.025* [0.013]	-0.02 [0.013]	-0.024* [0.013]
Banking Crisis	-0.025** [0.012]	-0.021* [0.012]			
Debt Crisis Ext			-0.026 [0.025]	-0.025 [0.024]	-0.016 [0.024]
Log Inflation Crisis			0.048 [0.047]	0.06 [0.041]	
Log Currency Crisis			-0.014 [0.056]	-0.024 [0.050]	
Currency Crisis (Dummy)	0.019 [0.018]	0.011 [0.017]			0.009 [0.019]
Inflation Crisis (Dummy)	-0.023 [0.028]	-0.015 [0.026]			-0.03 [0.028]
Observations	389	389	414	414	414
Number of country	29	29	30	30	30
R-squared	0.08	0.11	0.08	0.11	0.08
F test: coeff. of IV = 0	6.15	5.16	5.57	5.38	6.32
Prob > F	0	0	0	0	0

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 24: Results for the Countries Below Median GDP (Base Year 1960, 3 year lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
natural disaster	-0.030*** [0.002]	-0.026*** [0.001]	-0.015*** [0.000]	-0.014*** [0.002]	0.007*** [0.002]
war	0.028*** [0.001]	0.033*** [0.001]	0.046*** [0.002]	0.021*** [0.000]	0.044*** [0.001]
economic disaster	-0.013*** [0.001]	0.010*** [0.001]	-0.011*** [0.001]	-0.014*** [0.001]	-0.017*** [0.001]

Table 25: Results for the Countries Above Median GDP (Base Year 1960, 3 year lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
natural disaster	-0.044*** [0.001]	-0.030*** [0.001]	-0.060*** [0.001]	-0.038*** [0.001]	-0.063*** [0.001]
war	-0.037*** [0.001]	-0.033*** [0.001]	-0.035*** [0.001]	-0.031*** [0.001]	-0.034*** [0.001]
economic disaster	-0.003*** [0.000]	-0.003*** [0.000]	0.002*** [0.000]	0.003*** [0.000]	-0.004*** [0.000]

Table 26: Results of the First Stage Regression for Small Economies
Dependent Variable: Per capita GDP growth rate
(Base Year 2006, 3 year lag)

	IV(1)	IV(2)
	-5	-17
		eq
Total Number of Natural Disasters (in log) Log Geophysical Disasters		
Log Meteorological Disasters	-3.763 [4.800]	-4.114 [4.920]
Log Hydrological Disasters	-5.436 [3.384]	-4.736 [3.280]
Log Climatological Disasters	4.925 [3.156]	4.196 [3.214]
Log Biological Disasters	-7.835* [4.114]	-7.955* [4.240]
Log Technological Disasters	2.714 [3.451]	2.621 [3.603]
Wars	-1.269 [3.585]	-1.083 [3.679]
Log of Number of Civil Wars	0.009 [0.025]	0.009 [0.026]
Banking Crisis	0.005 [0.033]	-0.008 [0.033]
Debt Crisis Ext	-0.073** [0.033]	-0.073** [0.035]
Log Inflation Crisis		-0.053 [0.066]
Log Currency Crisis		0.012 [0.029]
Currency Crisis (Dummy)		
Inflation Crisis (Dummy)		
Observations	113	112
Number of country	18	18
R-squared	0.15	0.16
F test: coeff. of IV = 0	2.1	1.71
Prob > F	0.04	0.08

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 27: Results of the First Stage Regression for Large Economies
Dependent Variable: Per capita GDP growth rate
(Base Year 2006, 3 year lag)

	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
	-14	-15	-16	-17	-18
	dv	dw	el	em	ep
Total Number of Natural Disasters (in log)	-2.539** [0.997]		-3.278*** [0.944]		-3.293*** [0.926]
Log Geophysical Disasters		-2.268** [1.144]		-1.674 [1.062]	
Log Meteorological Disasters		-1.091 [0.995]		-0.903 [1.026]	
Log Hydrological Disasters		-0.399 [0.894]		-0.234 [0.889]	
Log Climatological Disasters		-3.069*** [1.135]		-3.342*** [1.138]	
Log Biological Disasters		5.840** [2.414]		5.385** [2.389]	
Log Technological Disasters		-1.375* [0.769]		-2.208*** [0.749]	
Wars	-0.022 [0.018]	-0.023 [0.018]	-0.032* [0.017]	-0.032* [0.017]	-0.034** [0.016]
Log of Number of Civil Wars	-0.014 [0.013]	-0.012 [0.013]	-0.018 [0.013]	-0.016 [0.013]	-0.019 [0.013]
Banking Crisis	-0.025** [0.012]	-0.02 [0.013]			
Debt Crisis Ext			-0.024 [0.024]	-0.024 [0.023]	-0.026 [0.024]
Log Inflation Crisis			-0.039 [0.069]	-0.027 [0.065]	
Log Currency Crisis			0.004 [0.051]	-0.003 [0.046]	
Currency Crisis (Dummy)	0.007 [0.019]	0.001 [0.018]			0.007 [0.018]
Inflation Crisis (Dummy)	-0.027 [0.027]	-0.018 [0.025]			-0.031 [0.027]
Observations	437	437	433	433	433
Number of country	33	33	32	32	32
R-squared	0.05	0.08	0.07	0.11	0.07
F test: coeff. of IV = 0	4.38	4.89	5.63	5.33	6.46
Prob > F	0	0	0	0	0

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 28: Results for the Countries Below Median (2006 GDP, 3 year lag)

Prediction	IV(1)	IV(2)
natural disaster	-0.016*** [0.002]	0.002* [0.001]
war	0.003*** [0.000]	0.014*** [0.000]
economic disaster	-0.013*** [0.001]	-0.014*** [0.001]

Table 29: Results for the Countries Above Median (2006 GDP, 3 year lag)

Prediction	IV(1)	IV(2)	IV(3)	IV(4)	IV(5)
natural disaster	-0.044*** [0.001]	-0.029*** [0.001]	-0.056*** [0.001]	-0.035*** [0.001]	-0.057*** [0.001]
war	-0.024*** [0.000]	-0.022*** [0.000]	-0.033*** [0.001]	-0.029*** [0.001]	-0.033*** [0.001]
economic disaster	-0.006*** [0.000]	-0.005*** [0.000]	-0.007*** [0.000]	-0.007*** [0.000]	-0.007*** [0.000]

Table 30: Correlation Matrix for Economic Crises and Natural Disasters

	Banking Crisis	Debt Crisis	Currency Crisis	Inflation Crisis	Number of Total Natural Disasters
Banking Crisis	1				
Debt Crisis	0.1653	1			
Currency Crisis	0.0563	0.0548	1		
Inflation Crisis	0.1146	0.1403	0.2374	1	
Number of Total Natural Disasters	0.0511	-0.0819	-0.0143	-0.0201	1

Appendix Table: List of Countries

AFG	Afghanistan	CMR	Cameroon
AGO	Angola	COG	Congo, Republic of
ALB	Albania	COL	Colombia
ANT	Netherlands Antilles	COM	Comoros
ARE	United Arab Emirates	CPV	Cape Verde
ARG	Argentina	CRI	Costa Rica
ARM	Armenia	CUB	Cuba
ATG	Antigua	CYP	Cyprus
AUS	Australia	CZE	Czech Republic
AUT	Austria	DJI	Djibouti
AZE	Azerbaijan	DMA	Dominica
BDI	Burundi	DNK	Denmark
BEL	Belgium	DOM	Dominican Republic
BEN	Benin	DZA	Algeria
BFA	Burkina Faso	ECU	Ecuador
BGD	Bangladesh	EGY	Egypt
BGR	Bulgaria	ERI	Eritrea
BHR	Bahrain	ESP	Spain
BHS	Bahamas	EST	Estonia
BIH	Bosnia and Herzegovina	ETH	Ethiopia
BLR	Belarus	FIN	Finland
BLZ	Belize	FJI	Fiji
BMU	Bermuda	FRA	France
BOL	Bolivia	FSM	Micronesia, Fed. Sts.
BRA	Brazil	GAB	Gabon
BRB	Barbados	GBR	United Kingdom
BRN	Brunei	GEO	Georgia
BTN	Bhutan	GER	Germany
BWA	Botswana	GHA	Ghana
CAF	Central African Republic	GIN	Guinea
CAN	Canada	GMB	Gambia, The
CHE	Switzerland	GNB	Guinea-Bissau
CHL	Chile	GNQ	Equatorial Guinea
CHN	China	GRC	Greece
CIV	Cote d'Ivoire	GRD	Grenada
GTM	Guatemala	MYS	Malaysia
GUY	Guyana	NAM	Namibia
HKG	Hong Kong	NER	Niger
HND	Honduras	NGA	Nigeria
HRV	Croatia	NIC	Nicaragua
HTI	Haiti	NLD	Netherlands
HUN	Hungary	NOR	Norway
IDN	Indonesia	NPL	Nepal
IND	India	NZL	New Zealand
IRL	Ireland	OMN	Oman
IRN	Iran	PAK	Pakistan
IRQ	Iraq	PAN	Panama
ISL	Iceland	PER	Peru

Appendix Table: List of Countries (continued)

ISR	Israel	PHL	Philippines
ITA	Italy	PLW	Palau
JAM	Jamaica	PNG	Papua New Guinea
JOR	Jordan	POL	Poland Puerto
JPN	Japan	PRI	Rico Korea, Dem.
KAZ	Kazakhstan	PRK	Rep. Portugal
KEN	Kenya	PRT	Paraguay
KGZ	Kyrgyzstan	PRY	Qatar
KHM	Cambodia	QAT	Romania
KIR	Kiribati	ROM	Russia
KNA	St. Kitts & Nevis	RUS	Rwanda
KOR	Korea, Republic of	RWA	Saudi Arabia
KWT	Kuwait	SAU	Serbia and Montenegro
LAO	Laos	SCG	Sudan Senegal
LBN	Lebanon	SDN	Singapore
LBR	Liberia	SEN	Solomon Islands
LBY	Libya	SGP	Sierra Leone
LCA	St. Lucia Sri	SLB	El Salvador
LKA	Lanka	SLE	Somalia
LSO	Lesotho	SLV	Sao Tome and Principe
LTU	Lithuania	SOM	Suriname
LUX	Luxembourg	STP	Slovak Republic
LVA	Latvia	SUR	Slovenia
MAC	Macao	SVK	
MAR	Morocco	SVN	
MDA	Moldova	SWE	Sweden
MDG	Madagascar	SWZ	Swaziland
MDV	Maldives	SYC	Seychelles
MEX	Mexico	SYR	Syria
MKD	Macedonia	TCD	Chad
MLI	Mali	TGO	Togo
MLT	Malta	THA	Thailand
MNG	Mongolia	TJK	Tajikistan
MOZ	Mozambique	TKM	Turkmenistan
MRT	Mauritania	TON	Tonga
MUS	Mauritius	TTO	Trinidad &Tobago
MWI	Malawi	TUN	Tunisia
TUR	Turkey	VEN	Venezuela
TWN	Taiwan	VNM	Vietnam
TZA	Tanzania	VUT	Vanuatu
UGA	Uganda	WSM	Samoa
UKR	Ukraine	YEM	Yemen
URY	Uruguay	ZAF	South Africa
USA	United States	ZAR	Congo, Dem. Rep.
UZB	Uzbekistan	ZMB	Zambia
VCT	St.Vincent & Grenadines	ZWE	Zimbabwe