

Are Economic Crises and Government Changes Related? A Descriptive Statistic Analysis

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Abstract—The main purpose of this study is to provide a detailed statistical overview of the time and regional distribution, relative timing occurrence of economic crises and government changes in 51 economies over the 1990–2007 periods. At the same time, the predictive power of the economic crises on set government changes will be examined using “signal approach”.

The result showed that the percentage of government changes is highest in transition economies (86 percent of observations) and lowest in Latin American economies (39 percent of observations). The percentages of government changes are same in both developed and developing countries (43 percent of observations). However, average crises per year (frequency of crises) are higher (lower) in developing (developed) countries than developed (developing) countries. Also, the predictive power of economic crises about the onset of a government change is highest in Transition economies (81 percent) and lowest in Latin American countries (30 percent). The predictive power of economic crises in developing countries (43 percent) is lower than developed countries (55 percent).

Keywords—Economic crises, Government Changes, Political Economy, Signal Approach.

I. INTRODUCTION

THERE is a vast theoretical and empirical literature investigating the relationship between economic growth and political instability. Previous studies cannot reach a general conclusion about direction of causality between economic growth and political instability. Most empirical studies argue that political instability would affect economic growth such as Campos and Nugent [4], De Haan and Sierman [6], Olson [18]. Also, there are some studies that consider the inverse causality such as Alesina, Ozler, Roubini and Swagel [2], Zablotsky [20]. Some other empirical studies claim that causality runs both ways such as Londregan and Poole [17], Kirmanoglu [15]. Although there are a lot of theoretical and empirical studies related to economic growth and political instability, the relationship between economic crises and government changes have not received a significant attention even if both seems to occur at the same time or appeared closely timed. Gasiorowski [10, 11] and Leigh [16] look at the effect of economic growth on regime change and government change. Pei and Adesnik [19] look at the

relationship between economic crises, government changes and regime changes. Study covers only 22 developing countries from Asia and Latin America for 1945-1998 periods and has no descriptive or empirical analysis.

This study is different than previous studies in two aspects. First, we use newly data from 1990 to 2007 periods which includes transition economies. Second, the main purpose of this study is to examine effect of economic crises on government changes using descriptive statistics analysis known as “signal approach”. Therefore, study will provide a detailed statistical overview of the time and regional distribution, relative timing occurrence of economic crises and government changes. At the same time, the predictive power of the economic crises on set government changes will be examined.

The organization of this paper is as follows: Section II reviews the links between economic crises and government changes. Section III defines the economic crises, government changes and data sample. Sections IV provide a detailed statistical overview of time distribution, regional distribution and relative timing occurrence of economic crises and government changes by using descriptive statistic analysis. The final section concludes the study.

II. THE LINK BETWEEN ECONOMIC CRISES AND GOVERNMENT CHANGES

It is obvious that good economic conditions supposed to positively affect voter and re-election of incumbent government. However, economists do not have an agreement that why and how political instability could lower economic growth. There are several explanations to show the effect of political instability on economic growth.

Alesina, Ozler, Roubini and Swagel [2] claimed that political instability may lead to uncertainty about government policies and discourages the existing and potential investors to invest. Their empirical results from sample of 113 countries for the period of 1950-1982 showed that high propensity of governmental collapse has significant effect on slower economic growth.

In his theoretical study, Chang [5] indicated that financial crises and political crises determine simultaneously. When foreign lenders are pessimistic about the country's economic and politic conditions, they will demand higher interest rates on the debt or hesitate to lend and more probably lead to economic and politic crises.

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According to De Haan and Sierman [6], political instability causes capital outflow and worsening economic conditions. Empirical result showed that political instability significantly affect economic growth only African countries.

Brender and Drazen [3] claimed that positive economic growth decreases unemployment and improves government services through increase in government revenue. Therefore, re-election probability of incumbent government may increase. Their empirical study investigates the effect of macroeconomic variables on re-election of incumbent government for a sample of 74 countries over the period of 1960–2003 using discrete choice model. The result showed that real per capita GDP increases the probability of re-election only less developed countries and new democracies.

Kirmanoglu [15] investigated the relationship between per capita GDP and political instability for 19 countries by using Granger-causality test. The result showed that there is no causality between two variables in 14 out of 19 cases.

Hazem [13] test causality between political instability and economic growth using data from 1985 to 2002 for 25 countries in 5 different regions. The study showed that there is a significant relationship between political instability and economic growth.

Freedman [9] study showed that 1997-1998 economic crises created huge pressure for political change in Indonesia, South Korea and Malaysia.

Akarca and Tansel [1] empirically investigated 25 election episodes for Turkey and the result showed that economic conditions play an important role of re-election of incumbent government.

Leigh [16] investigated the effect of economic growth on re-election using data for 58 countries over the period of 1978-1999. The study showed that economic growth increased probability of re-election of incumbent government.

Gasiorowski [10, 11] empirically investigated the effect of inflation and economic growth on regime change and government change for 97 countries over the period of 1960-1992. His result showed that economic growth decreases regime change and government change but inflation has no effect on regime change and government change.

Pei and Adesnik [19] study covers 22 developing countries from Asia and Latin America regions over 1945-1998 periods. They identified 93 economic crises and 30 of them end up with government changes and 17 of them end up with regime changes.

III. DEFINITION OF ECONOMIC CRISIS, GOVERNMENT CHANGE AND DATA SAMPLE

First, we need to define economic crises and government changes. There are several different definitions of financial crises in the existing literature¹. However, we need to define economic crises which considered that an economic crisis exists when there is a decline in GDP or growth rate of GDP.

¹ Frankel and Rose [8], Eichengren, Rose and Wyplosz [7], Kaminsky and Reinhart [14].

In our work, an economic crisis is considered to occur when one of the following conditions is met:

Condition 1.

$$\Pr(\text{crisis})_{it} = 1 \quad \text{if } \% \Delta \text{ GDP}_{it} < 0 \quad (\text{negative growth})$$

$$\Pr(\text{crisis})_{it} = 0, \quad \text{otherwise.}$$

Condition 2.

$\Pr(\text{crisis})_{it} = 1$ if Growth rate of GDP decrease two consecutive years and decrease must be more than %50.

$$\Pr(\text{crisis})_{it} = 0, \quad \text{otherwise.}$$

% Δ GDP is percentage change of annual GDP. Condition 1 attempts to capture annual negative growth in country. A negative growth of GDP in the country is considered as an economic crisis. Condition 2 states that if growth rate of GDP decreases two consecutive years and decrease must be more than %50, then it is considered an economic crisis.

Finally, we consider the continuity of the economic crises and impose a one-year window to avoid double counting of the economic crises. After we identify a crisis, we treat any crisis in the next year as a part of the same crisis and skip it before continuing to identify a new crisis.

In this paper, a “government change” is considered to occur when the government in power loses the office by free-election.

The data set in this study covers 51 economies² from different regions and categories, including 8 from Asia, 8 from Latin America, 10 from Transition economies, 19 from developing economies and 19 from developed economies. All countries have free-election. The data consist of annual real GDP and election results from 1990 to 2007. The selection of the sample size and the countries are dictated by the availability of data.

GDP data is from the International Financial Statistics (IFS) web side and election results are provided from different web sources³.

The sample period includes 188 election episodes, 99 government change episodes and 54 economic crisis episodes based on our definitions. Figure 1 shows the number of elections, government changes and economic crises per year during the sample period of 1990-2007. Government changes are relatively more frequent in 1995-1998 and 2001-2002 periods. The first peak is observed in 1995-1998, when the Latin American economies crashed in 1994 which related to Mexican financial crisis of December 1994 and Asian economies crashed in 1997. The second peak is observed in 2001-2002 reflects a global economic crisis around the world.

²Albania, Argentina, Australia, Austria, Belarus, Belgium, Bolivia, Brazil, Bulgaria, Canada, Chile, Colombia, Czech Republic, Denmark, Ecuador, England, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Malaysia, Mexico, The Netherlands, New Zealand, Norway, Pakistan, Peru, The Philippines, Poland, Portugal, Romania, Russia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, USA.

³<http://www.imf.org/external/data.htm>,
<http://www.binghamton.edu/cdp/era/countries/>,
http://en.wikipedia.org/wiki/List_of_election_results,
<http://electionresources.org/>

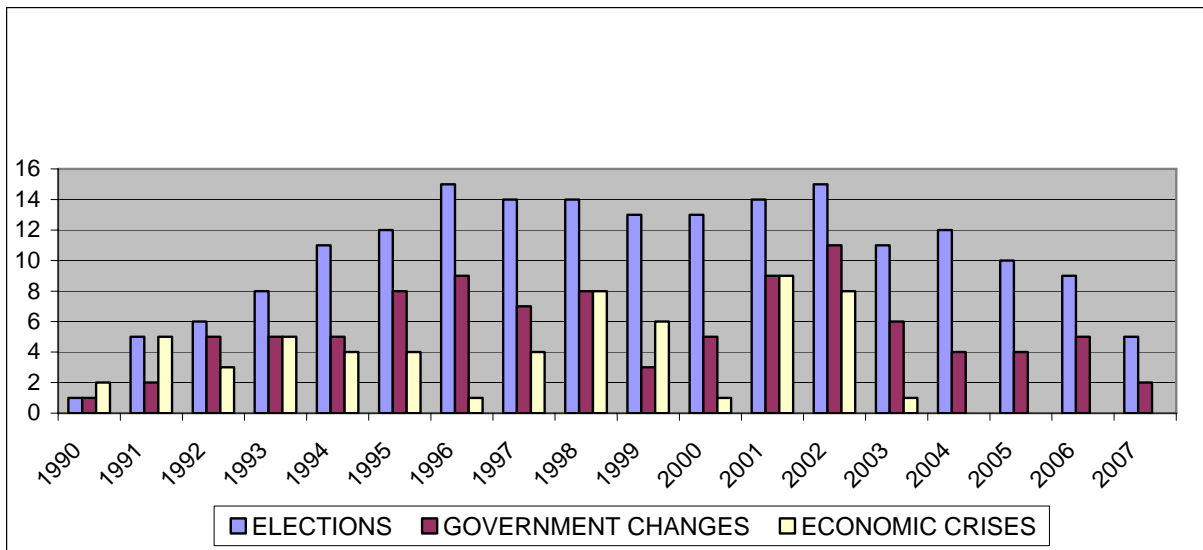


Fig. 1. Number of Elections, Government Changes and Economic Crises Per Year

IV. DESCRIPTIVE STATISTICS ANALYSIS

In this section, we examine occurrence of economic crises and government changes by providing some summary statistics. Descriptive statistics gives some information about time distribution, regional distribution and performance of economic crises as a predictor of government changes.

A. Time Distribution of Government Change and Economic Crises

Table I provides a quick overview of the time distribution of government changes and economic crises. A total of 188 elections, 99 government changes (53 percent of observations) and 54 economic crises are identified in the sample period of 1990-2007.

We can reach the following conclusions from Table I. First, the number of election and number of government changes have reached to peak in 1996-2001 periods when 1997 Asian and 2001 global economic crises appeared. However, percentage of government changes is lowest level (49 percent of observations) at this period. Second, the number of economic crises prior election and average crises per year⁴ (frequency of crises)⁵ are highest (lowest) in 1996-2001 period. Third, 37 of 54 economic crises accompanied by government changes⁶ in whole our sample period (economic crises correctly predicted % 68 of government changes). Economic crises had highest prediction of government

changes in 2002-2007 periods (economic crises correctly predicted % 100 of government changes) where voters severely punished incumbent government in transition economies. Finally, Economic crises had lowest prediction of government changes in 1996-2001 period (economic crises correctly predicted % 50 of government changes) which showed that voter did not punish the incumbent government as much as other periods. Economic crises were less likely to produce government change during the 1996-2001 periods than in previous 1990-1995 period for several reasons. Voters' 1990-1995 experiences showed that government changes may not be a permanent solution for economic problems. Also, 2001 economic crisis is a global economic crisis and some of the blame went to worsening world economic condition rather than incumbent government.

TABLE I
TIME DISTRIBUTION OF GOVERNMENT CHANGE AND ECONOMIC CRISES

| | 1990-2007 | 1990-1995 | 1996-2001 | 2002-2007 |
|---|-----------|-----------|-----------|-----------|
| Government Change | | | | |
| Number of Election | 188 | 43 | 83 | 62 |
| Number of Government Changes | 99 | 26 | 41 | 32 |
| Percentage of Government Changes | 0.53 | 0.60 | 0.49 | 0.51 |
| Economic Crises | | | | |
| Number of Economic Crises Prior Election | 54 | 19 | 26 | 9 |
| Number of Economic Crises (not Accompanied by | | | | |

⁴ Average crises per year is calculated as the number of crises multiplied by number of countries in sample and the result divided by total sum of country-years.

⁵ Frequency of crises is calculated as the total sum of country-years divided by number of crises.

⁶ There is an economic crisis at the time of election year or one year prior to election.

| | | | | |
|---|---------|--------|---------|-------|
| Government Changes | 37 (17) | 15 (4) | 13 (13) | 9 (0) |
| Percentage of Economic Crises Correctly Predict Government Change | 0.68 | 0.79 | 0.50 | 1.00 |
| Average Crises Per Year | 3 | 3.2 | 4.3 | 1.5 |
| Frequency of Crises | 17 | 16.1 | 11.8 | 34 |

Table II. First, the percentage of government changes is highest in transition economies (86 percent of observations) and lowest Latin American economies (39 percent of observations) and the percentage of government changes are same in both developed and developing countries. Second, average crises per year (frequency of crises) is highest (lowest) in Transition (Asian) countries and lowest (highest) in Asian (Transition) countries. Finally, however, average crises per year (frequency of crises) are higher (lower) in developing (developed) countries than developed (developing) countries.

B. Regional Distribution of Government Change and Economic Crises

Table II shows the distribution of crises by regions and categories. We can reach the following conclusions from

TABLE II
REGIONAL DISTRIBUTION OF GOVERNMENT CHANGES AND ECONOMIC CRISES

| | Developing | Developed | Latin America | Asia | Transition |
|--|------------|-----------|---------------|------|------------|
| Government Change | | | | | |
| Number of Election | 77 | 74 | 31 | 27 | 35 |
| Number of Government Changes | 33 | 32 | 12 | 13 | 30 |
| Percentage of Government Changes | 0.43 | 0.43 | 0.39 | 0.48 | 0.86 |
| Economic Crises | | | | | |
| Number of Economic Crises Prior Election | 23 | 18 | 10 | 8 | 16 |
| Average Crises Per Year | 1.27 | 1 | 0.55 | 0.44 | 1.22 |
| Frequency of Crises | 14.8 | 19 | 14.4 | 18 | 8.2 |

C. Performance of Economic Crises as a Predictor of Government Changes

Kaminsky and Reinhart [14] and Glick and Hutckinson [12] used the signal approach to link banking crises and currency crises. In this section, the similar procedure is adopted to discuss the link between economic crises and government changes, the method of Kaminsky and Reinhart [14] is followed. The following matrix is used to measure the performance of economic crises on government changes as a predictor.

| | | |
|----------------------|-----------------|--------------------|
| | Economic Crisis | No Economic Crisis |
| Government Change | A | B |
| No Government Change | C | D |

A is the number of instances in which an economic crisis issues a signal in a particular year t and a government change occurred in year (t) or (t + 1) (i.e. A is the number of years the economic crisis provides “good signal” about the occurrence of government change). B is the number of instances in which an economic crisis did not issue a signal in a particular year t

when there was a government change in year (t) or (t + 1) (i.e. B is the number of years economic crisis did not provide a good signal about the occurrence of government change). C is the number of instances in which an economic crisis issues a signal in a particular year t and a government change did not occur in year (t) or (t + 1) (i.e. C is the number of years economic crisis provide “bad signal” or “noise” about the occurrence of government change). D is the number of instances in which an economic crisis did not issue a signal in a particular year t when there was no a government change in year (t) or (t + 1) (i.e. D is the number of years in which neither an economic crisis or government change occurred). It is obvious from the above matrix that the perfect predictor will produce only observations A and D.

The first column in Table III shows the number of economic crises. The second column shows whether the economic crisis in year t was accompanied by a government change contemporaneously or one year ahead. The last column shows the predictive power of economic crises on government change⁷.

⁷ Number of economic crises was accompanied by a government change at time t or (t+1).

Based on the Table III, we can reach several conclusions. First, the second column shows that 37 out of 54 economic crises for all countries, 10 out of 23 economic crises for developing countries, 10 out of 18 economic crises for developed countries, 3 out of 10 economic crises for Latin American countries, 3 out of 8 economic crises for Asian countries and 13 out of 16 economic crises for Transition countries correctly predicted government changes. Second, the last columns show that the predictive power of economic crises about the onset of a government change is highest in Transition economies (81 percent) and lowest in Latin American countries (30 percent). In transition economies

(New liberalized economies), expectation about economic development is too high and voters severely punished incumbent government in case of economic failure. Asian and Latin American voters are more experienced and past experienced showed that government changes may not solve economic problems. Finally, the predictive power of economic crises in developing countries (43 percent) is lower than developed countries (55 percent). Non-economic factors such as political ideology, culture, ethnicity, religion etc play more important role in developing countries than developed countries.

D. Performance of Economic Crises as a Signal of Government Changes

Table IV is constructed from the previous matrix. Table IV reports calculations of the noise-to-signal ratio associated with performance of economic crises on set government changes. The noise-to-signal ratio for economic crises is calculated by dividing number of bad signals issued by economic crises as a percentage of number of years where bad signals could have been issued, by the number of good signals issued by economic crises as a percentage of the number of years where a good signal could have been issued⁸. An increase in good signals and a decrease in bad signals (noise) lower the above ratio. Therefore we prefer lower noise-to-signal ratio. All numbers are less than 1 implying that when an economic crisis occurs, government change is more likely than not.

TABLE III
ECONOMIC CRISES AS A PREDICTOR OF GOVERNMENT CHANGES

| | Number of Economic Crises Prior Election | Number of Economic Crises Accompanied by Government Changes | Economic Crises Predicting Government Changes (Percentages) |
|---------------|--|---|---|
| All Countries | 54 | 37 | 0.68 |
| Developing | 23 | 10 | 0.43 |

⁸ Noise-to-Signal Ratio is $[B / (B+D)] / [A / (A+C)]$, where B is the number of the local currency-denominated stock market crises not accompanied by a currency crises, (B+D) is the total number of quarters without a currency crises, A is the number of the local currency-dominated stock market crises accompanied by a currency crises and (A+C) is the total number of currency crises.

| | | | |
|---------------|----|----|------|
| Developed | 18 | 10 | 0.55 |
| Latin America | 10 | 3 | 0.30 |
| Asia | 8 | 3 | 0.37 |
| Transition | 16 | 13 | 0.81 |

Table IV shows that the noise-to-signal ratio is 0.72 for the full sample. Developed countries have lower noise-to-signal ratio than developing countries. Asian and Transition economies have higher noise-to-signal ratios. Finally, noise-to-signal ratio is more than 1 for Latin American countries which is not acceptable.

TABLE IV
PERFORMANCE OF ECONOMIC CRISES AS A SIGNAL OF GOVERNMENT CHANGE

| | A | B | C | D | Noise-to-Signal Ratio of Economic Crises |
|---------------|----|----|----|----|--|
| All Countries | 37 | 62 | 17 | 76 | 0.72 |
| Developing | 10 | 21 | 13 | 34 | 0.89 |
| Developed | 10 | 20 | 8 | 36 | 0.65 |
| Latin America | 3 | 6 | 7 | 10 | 1.25 |
| Asia | 3 | 10 | 5 | 20 | 0.9 |
| Transition | 16 | 16 | 3 | 4 | 0.95 |

V. CONCLUSION AND RECOMMENDATIONS

In this study, we provided a detailed statistical overview of the time and regional distribution, relative timing occurrence of economic crises and government changes in 51 economies over the 1990–2007 periods. At the same time, the predictive power of the economic crises on set government changes will be examined using signal approach.

First, the number of election and number of government changes have reached to peak in 1996–2001 periods when Latin American and Asian economic crises appeared. However, percentage of government changes is lowest level (49 percent of observations) at this period.

Second, the number of economic crises prior election and average crises per year (frequency of crises) are highest (lowest) in 1996–2001 period. Economic crises had highest prediction of government changes in 2002–2007 periods. Also, economic crises had lowest prediction of government changes in 1996–2001 periods.

Third, the percentage of government changes is highest in transition economies (86 percent of observations) and lowest Latin American economies (39 percent of observations). The percentages of government changes are same in both developed and developing countries.

Fourth, the predictive power of economic crises about the

onset of a government change is highest in Transition economies (81 percent) and lowest in Latin American countries (30 percent). The predictive power of economic crises in developing countries (43 percent) is lower than developed countries (55 percent).

Finally, Developed countries have lower noise-to-signal ratio than developing countries. Asian and Transition economies have higher noise-to-signal ratio. Finally, all the noise-to-signal ratio is less than 1 (except Latin American countries) which implying that when economic crises occur government changes are more likely than not.

For further research not only economic crises but also other economic, social and cultural factors may be included in signal approach method to predict government changes.

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