THE MACROECONOMIC CONSEQUENCES OF NATURAL DISASTERS IN VIETNAM

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THE MACROECONOMIC CONSEQUENCES OF NATURAL DISASTERS IN VIETNAM

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Statement of Originality

The work described in this Final Year Project, entitled

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is to best of the author's knowledge that of the author except where due reference is made.

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ABSTRACT

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By

Kuy Gui Jin

The main purpose of this study is to investigate the macroeconomic consequences of natural disasters in Vietnam for the period from 1983 to 2009. Augmented Dickey-Fuller and Phillip-Perron unit root tests, Johansen and Juselius cointegration test and causality test based on vector error correction model (VECM) are used to examine the model. The empirical results showed that all the time series data are stationary at first difference and cointegrated with single vector. All the explanatory variables have found to contribute to the long run equilibrium relationship. In addition, natural disasters have a statistically adverse impact on the macro-economy. Increase in the total number of victim leads to corresponding decrease in the income level. Furthermore, the Granger causality test results based on vector error correction model reveal that the government consumption and gross capital formation do not have causality relationships with total number of affected in the short-run. This study provides a better understanding to people of the impact of natural disaster on macro-economy in Vietnam.
ABSTRAK

AKIBAT MAKROEKONOMI BENCANA ALAM DI VIETNAM

Oleh

Kuy Gui Jin

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CHAPTER ONE
INTRODUCTION

1.0 Introduction

In the last few years, the local media, especially the press, have been filled with reports of natural disasters in worldwide. There have been many reports of natural disasters such as Japan earthquake, Thailand floods, Philippines storm and so on. With this barrage of media reporting, there is an air of anxiety and fear as to what the future may hold for the society as well as quality of life. Nevertheless, human can do little to deal with natural disasters. Most of the times, human can just pray and hope the natural disasters may not occur.

Due to the tropical monsoon, from the end of October in 2010, large-scale of rain appeared in the central of Vietnam for a period over two months. The persistent rain caused floods, landslides, mudslides and other disasters and it affected over 1.5 million people and caused over 200 reported deaths. The flooding inundated 90 per cent of Quang Binh, Vietnam and about 21,000 hectares of agricultural land of Quang Binh and Ha Tinh were destroyed. Moreover, official figures stated that more than 152,200 houses were flooded or damaged with 2,133 completely destroyed. The flood in Vietnam has forced several industrial parks to be closed, hundreds of business were stopped, number of large factory idled. Besides, the floods caused the tourism industry
to suffer huge losses and it slowed down the economic growth in Vietnam (International Federation of Red Cross and Red Crescent Societies, 2012).

Floods in Vietnam had brought a lot of problems to the local residents. Large areas of rice granary were flooded and caused the supply of rice to decline which in turn led to higher food prices and makes the life of poor people suffering. Besides, floods polluted the drinking water and bought a lot of health diseases to the residents such as cholera and malaria. Besides the economic problems, natural disasters caused social problems. Thus, the effects of natural disasters have attracted worldwide attention.

From 1900 to 2011, natural disasters such as earthquake, tsunamis, cyclones, storms, floods, wildfires, drought and high winds have caused enormous losses of human life and livelihoods, the devastation of economic and social infrastructure, as well as environmental damage. For example, major recent catastrophic events in Indo-China countries such as Vietnam floods in 2008, Laos earthquake in 2007 and Cambodia floods in 2010 had put the life of the people and the economies of the country at stake. These disasters destroyed property, polluted air and water and damaged other natural resources.

Natural disasters by definition is the occurrence of an abnormal or infrequent hazard that affects vulnerable communities or geographic areas, causing substantial damage, disruption and perhaps causalities and leaving the affected communities unable to function normally (Benson & Clay, 2004). Natural disaster can or do have a serious
negative short-run impact to the economic in which the economic activity is influenced by the disaster events. For the long-run economic effect, the growth and development of a country be affected. According to Auffret (2003), catastrophic events may lead to a decline in the growth of output, investment and consumption and worsening the current account in the long-run. In addition, the production, employment and government spending and revenues will be decreased due to natural disasters. These effects will alter development path of a national economy.

Most of the economic structure of developing countries is generally characterized by a large primary sector (agriculture, mining), and a small secondary sector (construction, manufacture) and a small services sector (tourism, finance) (Crowards, 2000). Natural disasters not only can cause causalities, but also destroy the capital land. Natural disasters decrease agricultural products and reduce the income of farmers. This situation worsens the problem of poverty and leads the country into economic crisis. Natural disasters pose a significant challenge on development and it is likely to impact the whole country. This is supported by several researchers who found that natural disasters caused negative impact on economic growth (Auffret, 2003; Hochrainer, 2009; Strobl, 2009; Raddatz, 2009; Berghott & Lujala, 2010; Cavollo et al., 2010). However, some studies indicated that natural disasters decreases human development and increases the poverty level (Noy & Nualsri, 2007; Oreggia et al., 2008).
In addition, many research support that the low incomes countries are most suffer disaster losses the most (Toya & Skidmore, 2005; Noy, 2009; Loayza et al., 2009). Disasters often affect the poorest in a community as they have relatively higher sensitivity to disaster events. Collins (2009) revealed in his study that disasters have a significant impact in terms of mortality rates in the low human development index category while high human development category has a greater economic impact.

Almost all researchers focus on the topic of disaster ex-ante, such a risk management literature that aims to prevent and prepare the onset of disasters from human and economic losses. To continue the industrialization and modernization the nation, a sustainable development should be focused. The purpose of the present study is to examine the impact of natural disasters on macro-economy of Vietnam over the sample period between 1983 and 2009. This study provides an understanding to Vietnam on the preparation and prevention of the large natural disasters.

1.1 Background of the Study

1.1.1 Vietnam

Vietnam is a country located at South-East Asia, bounded by China, Laos, and Cambodia. The capital city is Hanoi and the largest city is Ho Chi Minh City. Vietnam

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1 See for further information, Central Intelligence Agency, https://www.cia.gov/
has around 90 million people, who live on Vietnam’s territory of 32,956.7 km². Vietnamese language is the official language and Buddhism is the most popular region. The major ethnic group is Kinh.

The GDP in 2011 was at US$299.2 billion and the growth rate was 5.8%. Despite its high growth rate, but there are still 14.5% of the population which were below poverty line and their GDP per capita was US$3,100. In Vietnam, the industrial sector contributed about 40% of the GDP and services sector and agriculture sector represent nearly 38% and 22% of the GDP respectively in year of 2011. However, the agriculture sector still remains a main sector in their economy. There are 48% of the labor force involve in the agriculture sector. The main Vietnam’s economy activity is rice production and is the second exporter of rice worldwide. Vietnam also provides other agricultural products such as coffee, rubber, peanuts, cotton and sugar canes. Vietnam’s coastline and inline waterways encourage fishing and aquaculture industries in Vietnam. The main industries in Vietnam are garment, food, processing and mining.

Vietnam is located in the tropical monsoon area and is one of the most hazard-prone areas in the Asia Pacific Region. It is because of the geographical position whereby it always faces the storm and floods. The storm season is from May to December, with the storm hitting the northern part of the country in May through June and moving gradually to southern part from July to December. Every year, natural disasters caused a lot of human and economic losses. Because massive concentration of its population is along the coastline and low-lying river basins, disasters take a toll of
hundred thousand lives and damage livelihoods. For example, tropical storm “Ondoy”
Mindulle in 2009 caused 182 causalities, 2477315 affected and the estimated damage
cost was US$ 785 million (EM-DAT, 2009).

In a nutshell, Vietnam is a country that is exposed to high risk of natural
disasters. To continue the industrialization and modernization for nation, a sustainable
development should be focused. A policy such as a good environment policy, a well
organized security management and a proper drainage system should be encouraged. It
is because most of the disaster events were caused by the human’s mistake.

1.2 The Trend of Natural Disaster Events in Vietnam

Figure 1: The Trend of Natural Disaster Events in Vietnam, 1983 to 2009

Source: International disaster database, EM-DAT, 2009
As illustrated in Figure 1, the main natural events are drought, flood, storm and epidemic between the 1983 and 2009. As stated by Paldi (2008), drought is an extended period of time characterized by a deficiency in a region’s water supply that is the result of constantly below average precipitation. A drought can lead to losses to agriculture, affect inland navigation and hydropower plant, and cause a lack of drinking water and famine. Epidemic is the cases of an infectious disease, which already exist or previously absent in the region or population concerned. Floods are significant rise of water level in the stream, lake, reservoir and coastal region. Storm is atmospheric phenomena which are typical cyclone.

In the case of Vietnam, the data showed that there are 5 cases of drought, 9 cases of epidemic, 55 cases of floods and 73 cases of storm from the period of 1983 to 2009. This country only experienced small occurrences of disaster events, but every event brought huge impact to the country. The higher statistics for flood and storm indicated that Vietnam is exposed to a higher risk of flood and storm. For example, in 2011, the flood caused 85 deaths, 60,000 affected and the estimated damage cost is US$175 million (EM-DAT, 2009).

1.3 Problem Statement

Catastrophic events have always been one of the main concerns of the world community. Over the last few years, natural disasters have posed a dangerous effect on
the economy in the world. The occurrence of catastrophic events is not expected to decrease, and the destruction they caused in developing countries is still ongoing.

Vietnam is in disaster-prone areas. Every year, the country suffers catastrophic events. Over the past 10 years, Vietnam has suffered economic losses of more than US$5000 million from natural disasters and about 2579 people died in the disaster events (EM-DAT, 2009).

Hence, it can be noted that most governments in developing countries do not have enough experience in coping with the destruction and the consequences of natural disasters. A lower productivity and economic growth caused the economic activity after the natural disasters to be stagnant. In addition, the government does not have a proper financial system to deal with this kind of situation. Although a smaller natural disaster, the country suffers a large economic loss.

Given the problems faced by the country in recent times, it is now a suitable moment to understand the macroeconomic consequences of natural disaster in Vietnam for better future risks management policy.
1.4 Objectives of the Study

1.4.1 General Objective

The primary aim of this study is to examine the impact of natural disasters on macro-economy in Vietnam for the period from 1983 to 2009. It is hoped that this would provide a better understanding of the impact of natural disasters on economic growth in Vietnam.

1.4.2 Specific Objectives

This study seeks to investigate and verify the relationship between disaster measures with the level of income, government consumption and gross capital formation, which are important macroeconomic indicators of a country’s economy. This would be useful in providing information regarding its suitability for adoption as a disaster management tool by government. Specifically, the aims of this study are:

I. To test the relationship between the natural disaster and income level.
II. To test the relationship between the government consumption and income level.
III. To test the relationship between the gross capital formation and income level.
1.5 **Significance of the Study**

The outcome from this study may benefit the government and community to have a better understanding of the macroeconomic consequences of natural disasters in Vietnam. Understand the impacts of natural disasters on macro-economy may for better future risk management policy. This reduces the vulnerability and economic losses from disasters while inducing economic growth during post-disaster reconstruction.

In addition, findings from this study can provide further input to readers about the relationship of natural disasters and economic growth in Vietnam. This would hopefully contribute towards expanding the limited literature regarding this subject for low and middle-income developing countries.

This study can also help the future researchers to conduct further study which is related to this research by showing the relevant effects of natural disasters in Vietnam.

1.6 **Motivation of the Study**

Many researchers have studied the effects of natural disasters on macro economy in different countries, but very limited studies were conducted specific on the effects on natural disasters on income level in Vietnam. This motivates the present study and can
provide more knowledge the relationship between the natural disasters and national income level in Vietnam for the period between 1983 and 2009.

1.7 Scope of the Study

This study is a time series data analysis. The sample data focused on at least twenty years of real GDP per capita, government consumption, gross capital formation and natural disasters measures in Vietnam from 1983 to 2009. A detailed description of the data set to be used in the empirical analysis of this study is discussed in Chapter Three.

The arrangement of the study is introduction of the research will be in the Chapter One. Then, the relevant literatures will be reviewed in Chapter Two. Chapter Three focuses on the methodology and the data collection. Chapter Four will be the results. There will be a conclusion remarks in the final chapter of the study.
CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

The impacts of natural disasters have been argued since the 19th century. This is one of the most researched areas in economics and continues to garner much attention from researchers and academics alike.

In this chapter, some recent related studies regarding the impacts of natural disasters are reviewed. Here, the common reviews for the study are more focus more on the impacts of natural disasters on macro economy. There are different perspectives about the relationship between them.

This chapter divided into five sections: the previous studies of the macroeconomic consequences of natural disasters, the determinants of disasters costs, other economic impacts of natural disasters, case studies of disaster impacts and policy implications and natural disasters.
2.1 Reviews of Macroeconomic Consequences of Natural Disasters

Numerous studies have been conducted on the economic development and natural disasters over the years. However, only the more recent literature is reviewed in order to gain insight into the recent findings of research done regarding the relationship. Hochrainer (2009), Strobl (2009) and Noy and Nualsri (2007) are recent examples of studies which document the relationship between natural disasters and economic growth.

Auffret (2003) carried out a research to investigate the impact of natural disasters on household and aggregate welfare. The empirical analysis used the disasters events on 16 countries for the period 1970 to 1999 to explain high consumption volatility and he deducted that the catastrophic events lead to a decline in the growth of output; decline in the growth of investment; a moderate decline in consumption growth and worsening of the current account. Besides, his research showed that an underdeveloped and ineffective risk-management is the main point that leads to high consumption volatility in these countries.

On the other hand, Jaramillo (2007) conducted a research to examine the relationship between the natural disasters and economic growth. The study used the panel data from 113 countries for the period 1960 to 1996. By using cross-section regression, the author revealed that the countries have a positive relationship between the countries’ per capita GDP and natural disasters, but not all. However, he also