Management Risk: Mitigating The Loss of Natural Disaster

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Abstraksi

Bencana alam bukanlah hal yang baru, namun cara untuk mengurangi dampaknya masih berkembang. Hal ini karena bencana alam saat ini menjadi lebih ganas, dan juga karena tanah yang orang klaim dan kembangkan kini telah mengarah ke daerah yang memiliki resiko tinggi akan bencana alam yang membuat para ahli terus mengembangkan cara untuk meminimalkan kerugiannya. Ketika bencana alam terjadi di sebuah negara, itu akan berdampak pada perekonomian negara tersebut. Tulisan ini akan menjelaskan apa dampak langsung dan tidak langsung yang bencana alam lakukan kepada suatu negara sambil menyajikan beberapa metode tentang bagaimana cara untuk mengurangi dampak dari bencana alam yang disediakan oleh IMF.

Kata Kunci: Manajemen Resiko, Ekonomi, Pencegahan, Bencana Alam.

Abstract

Natural disasters are by no means new, yet the way to mitigate the impact of it still evolving. It is because nowadays natural disasters become more and more violent, and it is also because the land that people claim and develop now been pushed to area that has higher risk of occurrence of natural disaster that the expert keep evolving the way to minimize loss. When natural disaster occurred in a country, it will have impact on the country economy. This paper will explain what is the direct and indirect impact that natural disaster done to the country while also including some method on how to mitigate the impact of natural disaster that provided by IMF.

Key Word's: Management Risk, Economy, Mitigation, Natural Disaster.

A. Introduction

It is generally understood that as country develops, it devotes greater resource to safety, including implementing precautionary measures designed to reduce the impacts of natural disasters. But as time flow, the loss that caused by natural disaster became more and more expensive. Thirty years ago, large-scale natural disasters were considered to be low-probability, high-consequence events. Between 1970 and the mid-1980s, annual insured losses from natural disasters worldwide (including forest fires) were only in the $3 billion to $4 billion range. The insured losses from Hurricane Hugo, which made landfall in Charleston, South Carolina, on September 22, 1989, was the first natural disaster in the United States to inflict more than $1 billion of insured losses (Kunreuther and Kerjan, 2012).

Since that time, interest among economists in disaster impacts is heightened, whether in direct or indirect impact. As for the direct impact, Swiss Re (2011) stated that Economic and insured losses from great natural catastrophes such as earthquakes, hurricanes and floods have increased significantly in recent years. According to Munich Re (2011), economic losses from natural catastrophes increased from $528 billion (1981-1990), $1,197 billion (1991-2000) to $1,213 billion over the period 2001-2010.

While indirect impact that Cavallo and Noy (2010) explain as the economic activity, in particular the production of goods and services, that will not take place following the disaster and because of it. These indirect damages may be caused by the direct damages to physical infrastructure, or because reconstruction pulls resources away from production[1].

Whether the effect of disaster propensity on mortality carries over to economic damage is not clear a priori. For example, early warning systems, which can dramatically reduce fatality for some disaster types if people are moved out of harm's way in time, are less effective for preventing economic loss as buildings and infrastructure cannot be entirely moved out of harm's way before hazards strike. One consequence is that there are many more disaster events with recorded economic loss than with recorded loss of life. While previous studies had to rely on publicly available datasets, which do not report damage estimates for most events, we can

[1] Cavallo and Noy also stated that these indirect damages also include the additional costs that are incurred because of the need to use alternative and potentially inferior means of production and/or distribution for the provision of normal goods and services.

employ data from a comprehensive database assembled by Munich Re, the biggest re-insurance company in the world.

Second, the paper extend the analysis to other types of natural disasters, demonstrating that the systematic impact of disaster propensity is not restricted to earthquakes, but carries over to the other two major disaster types, tropical cyclones and floods. Together with earthquakes, they account for roughly 70% of total worldwide economic damage from natural disasters (Cavallo and Noy, 2010).

In the next section, this paper will give a brief explanation from various papers in the same field about direct and indirect impact of natural disaster, what happen in short-term run and long term-run economy on the country. In the section 3 in the paper will show how to mitigate the loss from natural disaster that been gathered from several source. Section 4 concludes.

B. Natural disaster impact

There are several methodologies to quantify the cost of disasters, but there is no standard measure to determine a global figure for economic impact[2]. Typically, the effects are measured in the literature as direct and indirect. Direct costs arise from the immediate loss of physical and human capital and crops, and the near-term loss of income from the disruption of economic activity in both the private and public sectors. Indirect losses are those not provoked by the disaster itself, but by its consequences. For example, a factory not damaged by an earthquake may suffer “business interruptions” from extensive power outages in the months following. Indirect costs spread throughout the economy over time and affect investment, output, the fiscal and external accounts, debt, and poverty.

The direct damages caused by natural disasters are also heterogeneous across countries, with a smaller effect in advanced economies, but a big variance in outcomes within regional country groupings.

[2]Various cost definitions include direct costs, indirect costs, market and nonmarket (intangible) losses, output losses, and welfare losses (Hallegatte and Przyluski, 2010).

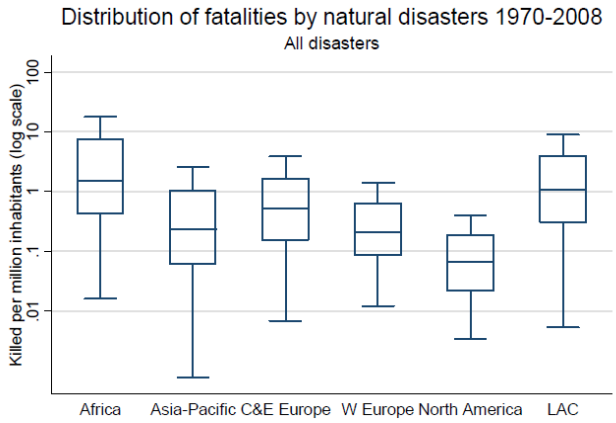

Figure 1. Distribution of Fatalities by Regions, 1970-2008

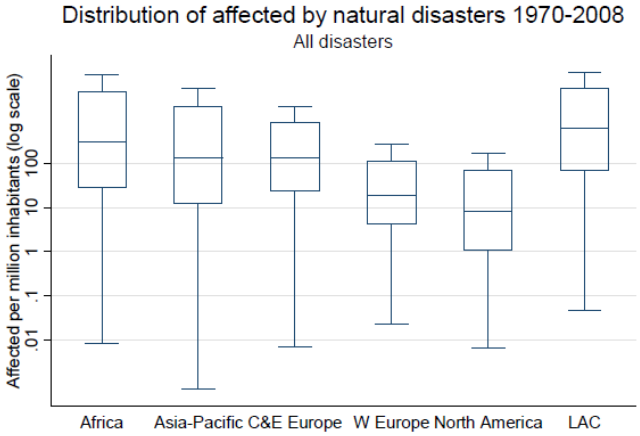

Figure 1. Distribution of Affected by Regions, 1970-2008

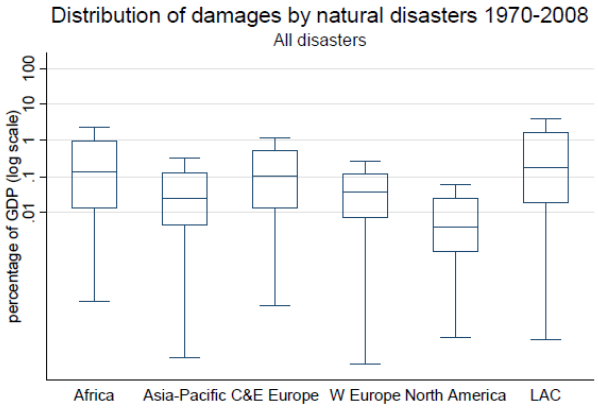

Figure 2. Distribution of Direct Economic Damages by Region, 1970-2008

Figures 1-2[3] plot the distributions of fatalities (as a share of population), people affected (also as a share of the population) and direct economic damages (as a share of GDP) of natural events over the period 1970-2008 for six different regional groupings. Within each box, the center line corresponds to the median impact in the region, while the edges of the box are the p(75) and p(25) percentiles of the distribution and the lines outside the box correspond to the upper and lower adjacent values, respectively.

In 2010 there were a number of severe natural disasters. The Haiti earthquake in January, the third most deadly natural disaster since 1900, continues to claim lives with the cholera epidemic in the autumn of 2010. Other events have been no less significant. However, there have been large variations in their societal impact, particularly on developing countries. Much work needs to be done at local, regional, national and international level to improve preparation and response through enhanced resiliency and risk mitigation.

Source: CBC News

During the last 30 years, fewer people, as a percentage of the total affected, are losing their lives. However, the number of people affected has doubled.(Figure 4)

[3] Researcher sees natural disaster impact mainly into the people and economy.

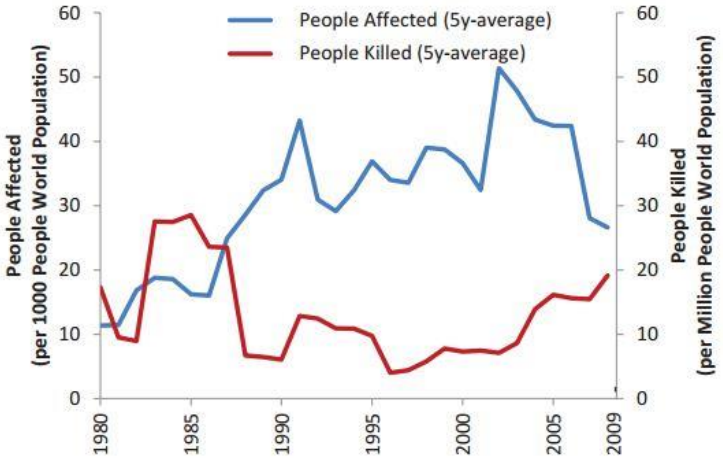

Figure 3. Source: OFDA/CRED International Disasters Database (EM-DAT), UN

The frequency of natural disasters appears to have risen over this period. Figure 5 indicates the number of events reported during the last century. The sharp rise in events might be partly explained by increased observation and reporting (earthquake activity is assumed constant). However, there appears to be an increase in the number of hydrological events.

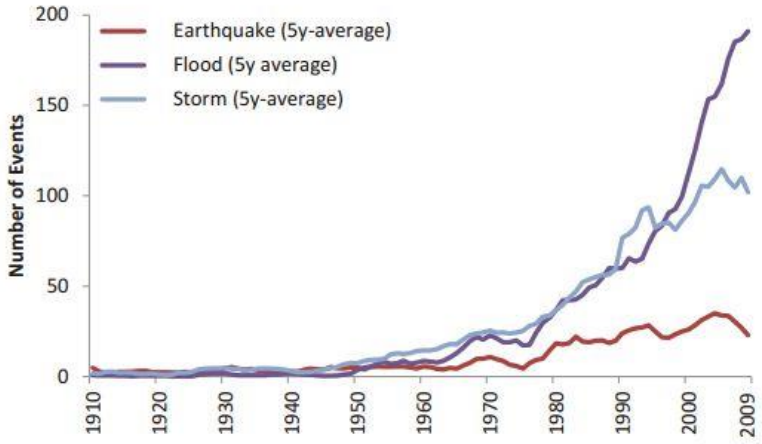

Figure 4. Source: The OFDA/CRED International Disasters Database (EM-DAT)

The overwhelming majority of people affected and killed by natural disasters reside in developing countries, particularly in the Asia-Pacific region. Even some paper that researching the same field stated that developing country is more vulnerable than developed country[4]. This difference is most likely due to the greater amount of resources spent on prevention efforts and

[4] The difference come from the people awareness in natural disaster, as such they build everything within a code conduct where they want it to last from disasters.

legal enforcement of mitigation rules (e.g., building codes). In particular, some of the policy interventions likely to ameliorate disaster impact, including land-use planning, building codes and engineering interventions, are rare in less developed countries.

Larger countries also often have a greater geographical spread of their economic assets relative to the spatial impact of disasters, and can therefore avoid more direct losses while minimizing indirect and downstream losses. Smaller countries like island nations can also face increased disaster risks by not only having a smaller economy, but by also having a larger proportion of their total land exposed to hazard (Kunreuther and Kerjan, 2012). Although Bresch et al. (2011) proposed that the international community should promote capacity building for lesser-developed countries though knowledge, technical skills and funding. Its focus should shift away from disaster response towards pre-disaster resilience measures. Establishing an international response unit with standardized guidelines for disaster risk reduction could reduce adverse impacts on society.

In short-term, the first recent attempt to empirically describe the macroeconomic dynamics of natural disasters was made by Albala-Bertrand (1993), while the more recent literature typically utilizes more robust econometric techniques. Albala-Bertrand develops an analytical model of disaster occurrence and reaction and collects data on a set of disaster events: 28 disasters in 26 countries during 1960-1979. Based on before-after statistical analysis, he finds that GDP increases, inflation does not change, capital formation is higher, agricultural and construction output increase, the fiscal and trade deficits increase (the latter sharply), and reserves increase, but no discernible impact on the exchange rate is observed. Countries with a higher literacy rate, better institutions, higher per capita income, higher degree of openness to trade, higher levels of government spending, more foreign exchange reserves, and higher levels of domestic credit but with less open capital accounts are better able to withstand the initial disaster shock and prevent further spillovers.

In the long-term, the impact of natural disaster reflected, although not always, on the country GDP. Potentially negative long-term economic effects after a disaster include the increase of the public deficit and the worsening of the trade balance (demand for imports increase and exports decrease). For example, after Hurricane Mitch in 1998, Honduras experienced total direct and indirect losses that were 80 percent of its GDP (Kunreuther and Kerjan, 2012).

Natural disasters can also have a significant negative impact over the long term on poverty and social welfare. The poor have limited savings and access to credit, so are not able to supplement their incomes following a crisis. This can drive households into "poverty traps"[5] with negative health and social effects (Hallegatte and Przyluski, 2010). Indeed, disasters have been found to have long-lasting consequences on psychological health and cognitive development (Norris, 2005; Santos, 2007). To prevent this thing happen and in certain case get worse the IMF has implemented a solution which called the macroeconomic policy.

When compared to the short-run research, the literature on the long-run effects of natural disasters is scant and its results inconclusive. Part of the reason for the scarcity of research in this area is the difficulty of constructing appropriate counterfactuals: what would have happened to the path of GDP growth in the absence of natural disasters?

C. Mitigate loss from natural disaster

Modern science has identified the causes of natural hazards and how to prevent or mitigate their consequences. Hazards are events triggered by natural forces, but they only turn into disasters if people are exposed to the hazard and are not resilient to fully absorbing the impact without damage to life or property (Schwab et al., 2007; Paul, 2011). Of course, the likely geographic location of disasters is more easily predictable for some disaster types (e.g., volcanoes) than others (e.g., earthquakes) and for some hardly at all (e.g., hail storm).

An important development in disaster risk management approaches over the past decade has been the recognition of their cyclical nature. Although the response phase captures most of the attention, much of the hard work on disaster risk management is carried out before disasters occur, in the form of risk assessment, prevention, mitigation, and establishing early warning systems. Disaster mitigation includes those activities designed to prevent or reduce losses from disaster. It is usually considered the initial phase of emergency management, although it may be a component in the other phases. Examples include land-use planning, to limit or prevent development in floodplains, building codes to reduce losses from earthquakes and fires, dam and levees to prevent flooding (Laframboise and Loko, 2012).

[5] a mechanism which makes it very difficult for people to escape poverty.

Disaster mitigation is concerned with policies and programs to prevent the recurrence of natural disasters and covers the long-term aspect of such disasters. The small price to pay for any method of prevention and protection pays off in the long run.

The IMF working paper[6] gave an example of simple explanation and also several methods on mitigation. The term "**mitigation**" describes actions which can help reduce or eliminate your long-term risk from natural disasters. With mitigation, you can avoid losses and reduce your risk of becoming a disaster victim.

There are many *low-cost* mitigation measures you can take to protect yourself, your home, or your business from losses. For example:

1. **Earthquake**

a) ***Bolt or strap cupboards and bookcases to the wall,*** and keep heavy objects on the lower shelves. This will reduce both damages and the possibility of injury to those in your home or business.

b) ***Strap your water heater*** to a nearby wall using bands of perforated steel (commonly known as "plumber's tape"). If a gas water heater falls during an earthquake, it could break the gas line and start a fire.

c) ***Install bolts to connect your home to its foundation.*** Anchor bolts cost as little as $2 a piece, but can prevent thousands of dollars of damage. Have them installed every six feet around the perimeter of your home.

2. **Flooding**

a) ***Move valuables and appliances out of the basement*** of your home or business if it is prone to flooding. This will increase the chance that your belongings will remain dry when a flood occurs.

b) ***Have the main breaker or fuse box and the utility meters elevated*** above the anticipated flood level in your home or business, so that flood water won't damage your utilities.

c) ***Buy flood insurance*** to cover the value of your home and its contents. Not only will it give you greater peace of mind, but it will also greatly speed your recovery if a flood

[6] IMF Working Paper, Laframboise and Loko, published in 2012, explaining about a lot of things that IMF work in for mitigating the loss from natural disaster economically.

occurs. To learn more about flood insurance, contact your insurance company or agent, or call 1-800-427-4661.

3. Wildfire

a) ***Move shrubs and other landscaping away from the sides of your home or deck.*** All too often, homes burn when plantings around them catch fire.

b) ***Install tile or flame-retardant shingles on your roof,*** instead of wood shakes or standard shingles. This will reduce the chance that airborne burning debris will end up destroying your home.

c) ***Clear dead brush and grass from your property*** so that it will not provide fuel for a spreading fire.

4. Tornadoes

a) ***Have hurricane straps installed in your home or business t***o better secure the roof to the walls and foundation. This will reduce the risk of losing your roof to high winds.

b) ***Install and maintain storm shutters*** to protect all exposed windows and glass surfaces, and use them when severe weather threatens. Besides protecting against wind, shutters also prevent damage from flying debris.

c) ***Have your home inspected by a building professional*** to ensure that roof and other building components are capable of withstanding wind effects.

With all the recent paper research in this field, it is depend on the country how can they develop a plan, especially for their own country, to prevent bigger lost. Different country had different specific plan which unique for them, for example country like Indonesia which an islands country had different way to build facility in each island, thus became unique and not suitable to be emulated on another country (e.g. Germany). Planning how to distribute their development of precious assets and plan for a code of building to be able to withstand natural disaster and made the country more resilience to the natural disaster.

After all been said and done, when the disaster do struck, IMF as funding organization had been prepared itself as the equalizer for country whom needed fund so they could withstand the impact. IMF financing is a valuable component of the disaster risk financing tool kit for small developing states (Annex X)[7]. The Fund's comparative advantage is fast disbursement of resources to meet urgent balance of payment and fiscal financing needs. For large-scale funding

[7] Source: IMF policy paper, published in December 2016

for rebuilding, development institutions take the lead [8]. While Fund resources are not automatically available following disasters, financing is typically approved within three months across the Fund's instruments and facilities. Disaster financing is available on concessional terms for PRGT-eligible members, among them a number of small islands and micro states with per capita incomes above the normal threshold for PRGT eligibility. Fund financing is expected to play a catalytic role in mobilizing other external financing, with early engagement in assessing the member's post-disaster fiscal and balance of payments financing needs and its macroeconomic policy framework providing a basis for others to step in.

Although many would believe that smaller states will most likely to sought funding, not all small states experiencing disasters have sought Fund financing. Of the 53 natural disasters reported by EM-DAT for small states since 2000, the Fund provided financial assistance in only 16 cases. These cases did not include two disasters with damages of more than 30 percent of GDP and 3 other disasters with damages in the range 20-30 percent of GDP[9]. This likely reflects an ability to meet urgent BOP needs on favorable terms without Fund financing, a situation that will likely continue to apply in some cases in the future.

D. Conclusion

Whether if it's a developed or developing country, a country that can recover fast from natural disaster or the slow one, all of them still need to build a plan to mitigate the risk of bigger economical lost that can cripple their country. While there is a charity organization that helps when a country got struck with natural disaster or by the help of IMF funding, they (the country) can't rely only on that alone. The country itself had to find a way to recover from their lost before the economical lost take effect not only in the impacted area, but also a whole country.

Risk management play important role on mitigating the economical lost, it can gave an option to build an early warning system specifically to the country most usual natural disaster (e.g. Tsunami had tsunami buoy as early warning system) or the country can build up the public

[8] For instance, the World Bank typically concentrates on infrastructure and housing during the reconstruction
(Annex VI); the United Nations Development Program (UNDP) focuses more on the social aspects of recovery.
[9] Belize (2000) and Guyana (2005) for damages exceeding 30 percent of GDP; Belize (2001), Tonga (2001), and
The Bahamas (2004) for damages between 20 and 30 percent of GDP.

awareness and let the public take care of their own, as the public has their own way to deal with mitigating their lost from natural disaster (e.g. insurance).

Building awareness brings recognition of risk and initiates behavioral change. To begin the process one needs to collect appropriate data on risks, which needs to be made publicly available. Communicating the message in a way that informs the affected public of the risks they face is needed to motivate an increase in resilience and preparedness.

Some suggestion to researcher who wants to do related work, they can research on the impact of natural disaster to a country more specifically by looking at the country GDP and economical power and then finds out whether it can cause big difference or not. Also, the next researcher can research about the development of area that fall victim to natural disaster and figure out if the area become more developed, economically, or stay the same, or become more deteriorated after the impact of natural disaster.

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