

A Cross-Country Analysis of the Economic and Institutional Causes of Natural Disasters

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Abstract: This study aims to reveal the relationship between damage arise from disasters and economic and institutional determinants. A cross-sectional analysis was conducted for selected low- and middle-income countries (see Appendix) utilizing average annual data for 2000-2024. Total disaster damage, the number of people affected by disasters, and the share of disaster damage in GDP were selected as dependent variables; per capita income, urbanization rate, human capital level, corruption, and political stability were selected as independent variables. The findings revealed that the level of economic development reduced disaster damage to some extent, but increasing prosperity transforms this relationship into a non-linear structure. It also demonstrated that reducing corruption and enhancing political stability are crucial to mitigating disaster-related losses. This study aims to fill a gap in the literature by comprehensively addressing the determinants of disaster damage from both institutional and economic perspectives, which has remained under-researched.

Keywords: Disaster Damage, Economic Development, Governance, Institutional Quality, Cross-Country Analysis

Öz: Bu çalışmanın amacı afetlerin yol açtığı hasarlar ile ekonomik ve kurumsal belirleyenler arasındaki ilişki ortaya koymaktır. Bu amaçla çalışmada 2000-2024 dönemine ait ortalama yıllık veriler kullanılarak seçilmiş düşük ve orta gelirli ülkeler (Bkz. Ek) için yatay kesit analizinden yararlanılmıştır. Bağımlı değişkenler olarak toplam afet hasarı, afetlerden etkilenen kişi sayısı ve afet hasarlarının GSYH içindeki payı seçilmiş; bağımsız değişkenler olarak ise kişi başına gelir, kentleşme oranı, beşeri sermaye düzeyi, yolsuzluk ve politik istikrar değişkenleri seçilmiştir. Bulgular, ekonomik kalkınma düzeyinin afet hasarlarını belirli bir düzeye kadar azalttığını, ancak artan refahın bu ilişkiyi doğrusal olmayan bir yapıya dönüştürdüğünü ortaya koymaktadır. Ayrıca yolsuzluğun azalması ve politik istikrarın artmasının afet kaynaklı kayıpların azalmasında önemli bir rol oynadığını göstermektedir. Çalışma afet hasarlarının belirleyicilerini hem kurumsal hem de ekonomik boyutlarıyla bütüncül bir şekilde ele alarak literatürdeki boşluğu doldurmayı amaçlamaktadır.

Anahtar Kelimeler: Afet Hasarları, Ekonomik Kalkınma, Yönetişim, Kurumsal Kalite, Ülkeler Arası Analiz

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Introduction

The economy and society of a nation are significantly affected by natural disasters resulting in loss of property and human life. The increasing frequency of disasters and the devastation they cause in recent years have underscored the necessity of investigating the reasons for the disparities in their repercussions across nations. Some countries are capable of managing a calamity of the same magnitude with minimal losses, while others experience long-term economic and social repercussions. This demonstrates that the consequences of calamities cannot be adequately captured by their physical force. Variations in the economic development, institutional capability, and catastrophe management strategies of nations may influence this distinction. Although the majority of individuals perceive disasters as natural occurrences, individuals and institutions are responsible for a significant amount of the damage that occurs in the aftermath of a disaster. As a result, the economic and social consequences of catastrophes must be evaluated in the context of the institutional and administrative framework in which they occur, in addition to the calamity itself.

Quantitative methods are increasingly being employed in empirical studies that investigate the economic and political factors that influence disaster damage, as evidenced by the current literature. Additionally, there are additional studies that primarily address disaster management and governance from a conceptual perspective. Empirical research typically examines the impact of income level, demographic structure, political stability, and governance factors on disaster damage. (Escaleras et al., 2007; Noy, 2009; Cavallo & Noy, 2010; Özerdem & Barakat, 2011; Yamamura, 2014), while the conceptual literature emphasizes the social aspects of disasters, institutional accountability, and the importance of managerial competency. (McLoughlin, 1985; Perry, 2006; Kadioğlu, 2008; Carter, 2008). Nevertheless, only a small number of studies have combined these two methodologies within a unified analytical framework.

To address the aforementioned gap, this investigation examines the economic and social repercussions of natural disasters by combining numerical data with discussions regarding corporate accountability and disaster governance. This study employed data from 2000 to 2024 to conduct econometric studies that concentrate on the total amount of disaster damage, the number of individuals affected by disasters, and the proportion of disaster damage in relation to GDP.

The subsequent section of this study is structured as follows. The second section provides an overview of the connections between business ethics, corpora-

te responsibility, and calamities. The empirical literature that concentrates on the economic and political determinants of catastrophes is the subject of the third chapter. The data set, the procedure employed, and the results are illustrated in the fourth chapter, while the results are discussed in relation to the literature in the fifth chapter. The sixth and final section presents the results and offers policy recommendations.

Conceptual Framework: Business Ethics, Corporate Responsibility, and Disasters

The concept of disaster encompasses the occurrence of a natural or man-made event and the disruption of social life, the economic and social losses that result, and the community's incapacity to address the situation using its own resources. A catastrophe is a social reality that is more defined by the repercussions it generates than by the event itself. The destruction wrought by disasters has a direct impact on administrative structures, cities, communities, and individuals, underscoring the importance of administrative responsibility and institutional capacity. The concept of vulnerability is brought to the forefront by the social destruction dimension of disasters, which also broadens the extent of the responsibility of all institutional actors, including the state (Büyükbaş & Ormanoğlu, 2013; Perry, 2006).

Interventions during and following disasters are not the sole focus of disaster management. The contemporary method is founded on an integrated management concept that also includes the pre-disaster risk reduction and preparedness phases. Disaster management is a continuous cycle that encompasses the stages of prevention, mitigation, preparedness, response, and recovery, according to this comprehension. The effectiveness of the other phases is weakened by a deficiency in any link of the chain, as each stage of this cycle is interconnected. Consequently, success in the face of disasters is achievable not only through response capacity but also through the establishment of institutional structures before disasters, the implementation of preventive measures, and the development of administrative reflexes (AFAD, 2024).

Disasters have far-reaching economic and social consequences that extend beyond their immediate effects. They also have long-term repercussions on human capital, income distribution, social welfare, and economic growth. Supply chains can be disrupted by major disasters that occur on a global scale, resulting in regional and global effects that extend beyond local economies. This situation illustrates that calamities are not merely natural occurrences; they also represent an economic and institutional issue. The depletion of savings, increased destitution,

the disruption of economic development processes, and a decline in human capital are among the secondary effects of disasters.

167.2 million individuals were impacted by 393 calamities associated with natural hazards in 2024, which resulted in the deaths of 16,753 individuals. The economic cost of disasters has exceeded USD 242 billion. The year 2024 was characterized by extreme heat events that resulted in the deaths of thousands of individuals in Asia, severe droughts that affected over 25 million people in Africa, and destructive tropical cyclones in the United States (U.S.) that caused a total damage exceeding USD 100 billion (CRED, 2025). The profound socioeconomic repercussions of disasters are underscored by the scope of economic damage and loss of life.

In this context, corporate responsibility is instrumental in mitigating the financial losses that result from disasters. The level of social resilience is directly influenced by the ability of institutions to anticipate risks before disasters, respond promptly and effectively during disasters, and conduct recovery processes fairly and transparently. Institutional responsibility is not restricted to public institutions; rather, it applies to a multi-actor framework that encompasses civil society organizations and the private sector. The state's substantial role in disaster management is crucial; however, the lack of participation by other stakeholders in the process results in governance and accountability concerns (Kadioğlu, 2008).

In the disaster management process, business ethics are a particularly critical dimension. Public resources, aid, and investment are rapidly mobilized during disasters, which are exceptional periods. This circumstance elevates the likelihood of corruption and may facilitate unethical conduct (Yamamura, 2014).

The impacts of disasters are exacerbated by human-induced risks, including the inefficient and unfair use of public resources, failure to comply with building standards during post-disaster reconstruction, and ineffective oversight mechanisms. The literature has compelling evidence that countries with high levels of corruption experience a higher incidence of property and life loss from disasters (Escaleras et al., 2007; Özerdem & Barakat, 2011; Ambraseys & Bilham, 2011; Yamamura, 2014).

The way disasters are managed is directly influenced by the relationship between corporate responsibility and business ethics. Disaster management is not solely a technical matter; it is also a domain in which social trust is established through transparency, accountability, the rule of law, and adherence to ethical principles. Disasters may result in significant administrative and institutional crises in additi-

on to natural devastation if an ethical management approach is not implemented during the preparation and response phases. Consequently, disaster management should be viewed as a multifaceted policy domain in which technical capacity is not the sole determining factor, but rather institutional ethics and a sense of responsibility (Wisner & Walker, 2005).

Empirical Studies and Literature Review

The literature generally acknowledges that disasters cannot be solely assessed as natural occurrences; rather, they must be assessed in conjunction with their social, economic, and institutional repercussions. Disasters are social realities that challenge the capacity of existing institutional structures and disrupt societal order by causing the loss of life and property (Perry, 2006; Büyükbaş & Ormanoğlu, 2013). In this context, disaster management is considered a multifaceted policy area that transcends a solely technical intervention process and must be addressed within the framework of institutional responsibility, governance, and ethical principles (Kadioğlu, 2008).

The distinction between the classical disaster management approach and the integrated disaster management model is a key theme in the disaster management literature. The classical approach predominantly addresses disasters through response activities during and after the event, positioning the state as the primary actor. Conversely, the integrated disaster management approach emphasizes a multi-actor governance structure and regards the pre-disaster risk reduction, preparedness, response, and recovery phases as components of an interconnected cycle (Carter, 2008; McLoughlin, 1985). According to research conducted in Turkey, the integrated disaster management approach has been incorporated into legislation and policy documents; however, its implementation is still restricted (Kadioğlu, 2011).

The literature's studies on the relationship between governance and disaster management underscore the necessity of involving not only public institutions but also the private sector and civil society organizations to effectively mitigate the effects of disasters. The governance approach aims to manage disaster risks by implementing the principles of transparency, accountability, coordination, and participation (Meuleman, 2008). Nevertheless, the efficacy of disaster governance is significantly diminished in countries where a centralized management approach is the norm, as weak institutional capacity within civil society and limited private sector participation are significant factors (Aydiner & Özgür, 2014).

Another dimension that has become increasingly significant in the disaster management literature is the concept of corporate responsibility. Corporate responsibility encompasses not only the fulfillment of legal obligations by organizations, but also the implementation of a management approach that is ethical, transparent, and accountable, and that considers social welfare. Corporate responsibility is directly correlated with the anticipation and mitigation of pre-disaster risks, the establishment of a rapid and effective response capacity during disasters, and the implementation of fair and inclusive recovery processes in the post-disaster period (Kadioğlu, 2008). The social and economic costs of disasters are exacerbated by ethical violations, weak oversight mechanisms, and accountability failings that occur during these processes.

The empirical literature on disaster damage is heavily reliant on cross-country panel data and cross-sectional analyses. These studies underscore the fact that disaster-related damage cannot be entirely attributed to natural factors and that the extent of such damage is significantly influenced by variables related to governance and institutional capacity (Toya & Skidmore, 2007; Noy, 2009; Yamamura, 2014). In particular, a plethora of studies have investigated the correlation between disaster damage and governance indicators, including political stability, government efficacy, regulatory quality, and the rule of law.

In countries with high levels of corruption, investments in pre-disaster risk mitigation are insufficient, and post-disaster resource allocation is ineffective, according to studies that investigate the relationship between corruption and disaster damage (Özerdem & Barakat, 2011; Yamamura, 2014). This situation results in an increase in the number of individuals affected by disasters and the total economic losses. In the same vein, empirical evidence indicates that disaster management processes are implemented more coherently in countries with high political stability, resulting in lower disaster-related losses.

The literature demonstrates a non-linear pattern in the relationship between income level and disaster damage (Raschky, 2008; Padli & Habibullah, 2009). Findings indicate that per capita income reduces disaster damage up to a certain threshold; however, as the level of prosperity increases, the absolute value of economic losses also rises. These results suggest that not only the level of economic development but also the nature of development and the institutional structure are decisive in explaining disaster damage (Toya & Skidmore, 2007; Noy, 2009).

Similarly, political stability is a decisive factor in ensuring institutional continuity and coordination in disaster management. The literature emphasizes that

in countries where political instability prevails, the sustainability of disaster management policies weakens, inter-agency cooperation falters, and delays occur in response processes (Ide, 2023; Omelicheva, 2011). It is also noted that indicators, such as government effectiveness and regulatory quality, play an important role in disaster risk management and the success of post-disaster recovery processes (Noy, 2009).

Studies based on World Bank governance indicators reveal that weakness in areas, such as freedom of expression and accountability, the rule of law, and control of corruption deepen the economic and social impacts of disasters (World Bank, 2025). Studies focusing on Turkey similarly indicate that declines in governance indicators increase institutional fragility in disaster management and amplify coordination problems during large-scale disasters.

In conclusion, the literature indicates that success in disaster management depends not only on technical capacity but also on institutional accountability, business ethics, and the quality of governance. Empirical studies examining the relationship between disaster damage and governance indicators underscore the importance of quantitative analysis in this field and provide a strong theoretical and empirical foundation for research focusing on the institutional dimension of disaster management.

Data Set and Method

The theoretical and empirical literature summarized above demonstrates that disaster damage is closely related not only to the physical characteristics of natural hazards but also to the socioeconomic, political, and institutional structures of countries. In this context, this section introduces the dataset used to empirically analyze the economic, social, and political factors affecting natural disaster damage. It provides a detailed explanation of the econometric method employed.

In this study, a dataset enabling cross-country comparisons was created to examine the economic and governance-related determinants of natural disasters. The analysis uses averages of annual data from 2000 to 2024. This approach aims to capture long-term trends that reflect countries' structural vulnerabilities to natural disasters, institutional capacity levels, and governance characteristics, rather than short-term, temporary shocks. Due to irregular observations in disaster data over time and the concentration of zero values in certain years across many countries, the cross-sectional data method was preferred over the panel data approach. This method enables a more robust analysis of structural differences across countries.

However, using annual averages excludes short-term fluctuations within countries, and the findings should be interpreted accordingly.

Data on natural disasters were obtained from the EM-DAT International Disaster Database. In this study, disasters are examined under the category of total disasters, which includes earthquakes, floods, storms, droughts, extreme temperatures, landslides, and forest fires. Data on economic and institutional variables were compiled from the World Bank's World Development Indicators (WDI), the Penn World Table (PWT), and international governance indicators.

The dependent variables used in the analysis are total disaster damage, the number of people affected by disasters, and the share of disaster damage in GDP (Altunç & Öztekin, 2025). In this study, the effects of natural disasters are not assessed using a single indicator; instead, the economic magnitude of disasters, their social repercussions, and their relative macroeconomic effects are analyzed separately. For this purpose, three different dependent variables were used. Total disaster damage reflects the absolute economic burden of disasters on countries and the damage inflicted on capital stock, while the number of people affected by disasters captures the human dimension of disasters and the level of social vulnerability. The share of disaster damage in GDP reveals the relative shocks from disasters relative to the overall size of the economy and its macroeconomic resilience. These three indicators represent different yet interrelated impact channels of disasters, enabling a more comprehensive analysis of their multidimensional effects that cannot be captured by a single dependent variable. This approach is consistent with the multidimensional assessment framework widely adopted in the disaster economics literature. The explanatory variables include per capita income, the square of per capita income, the urbanization rate, human capital indicators, and measures of control of corruption and political stability. Definitions of the variables and their data sources are presented in Table 1.

Table 1

Variable Definitions and Data Sources

Variables	Period	Definition	Source
Total disaster damage	2000-2024 (avg.)	Natural disaster-related costs	EM-DAT
Total number of people affected	2000-2024 (avg.)	Number of people affected by natural disasters	EM-DAT
Per capita income	2000-2024 (avg.)	GDP per capita (constant 2015US Dollars)	World Bank
Urbanization	2000-20224 (avg.)	Urban population (%of total population)	World Bank
Political stability	2000-2024 (avg.)	Political Stability and Absence of Violence/Terrorism	World Bank
Corruption	2024	Control of Corruption	Worldwide Governance Indicators (WGI)

The descriptive statistics for the variables used in the study reveal significant cross-country differences in terms of natural disaster damage and the affected population. The high standard deviations observed in the disaster-related variables indicate that disasters exhibit spatial and structural heterogeneity across countries. To reduce the influence of extreme values on the estimation results and obtain more stable estimates of the relationships between variables, most variables with continuous and positive values were transformed using logarithms.

In contrast, percentage values and ratio variables- specifically, the share of disaster damage in GDP and the urbanization rate- were not subjected to logarithmic transformation, as they have limited ranges and a scale- independent structure. The per capita income variable, however, was included in the analysis in logarithmic form, in line with common practice in the literature (Table 2).

Table 2

Descriptive Variables

Variables	N	Average	Std.Dev.
Total damage	40	1239925	4546386.
Total number of people affected	40	3746498	17096391
Total damage/GDP	40	2.87E-04	7.88E-06
Per capita income	40	3766.411	5450.834
Political stability	40	-0.587	0.679
Corruption	40	-0.648	0.546
Urbanization	40	54.93978	21.03551

Correlation analysis was conducted to investigate the fundamental linear relationships between the variables. The correlation matrix indicates significant relationships between disaster damage and economic and institutional indicators (Table 3).

Table 3

Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Total damage	1.000						
(2) Total number of people affected	0.374	1.000					
(3) Total damage /GDP	0.889	0.234	1.000				
(4) Per capita income	0.611	-0.276	0.360	1.000			
(5) Urbanization	0.329	-0.310	0.116	0.826	1.000		
(6) Political stability	0.227	-0.376	0.251	0.616	0.485	1.000	
(7) Corruption	0.414	-0.187	0.265	0.657	0.476	0.706	1.000

Econometric methods

Cross-sectional regression models were estimated to analyze the factors determining natural disaster damage and the number of people affected by disasters. To test the non-linear relationship between economic development and disaster damage, the square of per capita income was also included in the model.

The dependent variables, in order, were total disaster damage, the number of people affected by disasters, and the share of disaster damage in GDP. The expla-

natory variables included per capita income, the urbanization rate, human capital, and indicators of corruption and political stability. The models were estimated using the Ordinary Least Squares (OLS) method.

Empirical Results

Following Padli and Habibullah (2009) and Skidmore and Toya (2008), the following equations were estimated to analyze the factors affecting disaster damage, the number of people affected by disasters, and the share of disaster damage in GDP. It is hypothesized that increases in per capita income and political stability reduce disaster damage and the number of people affected, whereas increases in urbanization and corruption increase disaster damage and the number of people affected (Altunç & Öztekin, 2025).

Model 1:

$$\text{Total disaster damage}_{it} = \beta_0 + \beta_1(X_1) + \beta_2(X_1)^2 + \beta_3(X_2) + \beta_4(X_3) + \beta_5(X_4) + \varepsilon_{it}$$

Model 2:

$$\text{Number of people affected}_{it} = \beta_0 + \beta_1(X_1) + \beta_2(X_1)^2 + \beta_3(X_2) + \beta_4(X_4) + \beta_5(X_5) + \mu_{it}$$

Model 3:

$$\frac{\text{Disaster damage}}{\text{GDP}}_{it} = \beta_0 + \beta_1(X_1) + \beta_2(X_1)^2 + \beta_3(X_2) + \beta_4(X_3) + \theta_{it}$$

In the models, X_1 represents per capita income, $(X_1)^2$ represents the square of per capita income, X_2 represents urbanization, X_3 represents human capital, X_4 represents corruption, and X_5 represents political stability. In this context, the estimation results for the dependent variables- total disaster damage, the number of people affected by disasters, and the share of disaster damage in GDP- are presented in Table 4.

Within this scope, the estimation results for total disaster damage, the number of people affected by disasters, and the share of disaster damage in GDP as dependent variables are presented in Table 4.

Table 4

Regression Results

	Dependent Variables		
	(1)	(2)	(3)
Independent Variables	Total disaster damage	Total Number of people affected	Total Disaster Damage/GDP
Per capita income	-0.0003** (-2.658)	4.278** (2.061)	-0.0004* (-1.811)
(Per capita income) ²	0.882*** (4.365)	-1.066** (-1.057)	0.866** (2.683)
Urbanization	-4.909*** (-3.087)	-1.572 (-1.446)	-7.37** (-2.877)
Human Capital	0.622 (0.527)		2.86 (1.318)
Corruption	-1.278* (-1.827)	0.710 (1.210)	
Political Stability		-0.652** (-2.300)	
_C	8.541*** (3.084)	-4.355** (-0.641)	-9.12** (-2.681)
N	40	40	40
Model Statistics	Test Statistics		
Heteroscedasticity	1.06[0.44]	1.01[0.43]	0.56[0.45]
J-B	0.91[0.69]	5.80[0.07]	4.01[0.13]
RESET test	0.94[0.35]	0.07[0.95]	2.90[0.08]
VIF values	5.66 11.60 3.59 1.62 2.80	5.98 7.94 4.15 3.16 3.56	4.76 9.57 4.14 4.40

The t-statistic values are shown in parentheses; † $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; values in square brackets represent p-values.

Table 4 presents the regression estimation results for the entire sample, covering the equations for total disaster damage, total number of people affected, and the share of disaster damage in GDP. Diagnostic tests were conducted to ensure the reliability of the OLS estimators for each model. If the assumptions of the estimation method are violated, the results obtained may be unreliable. The Ramsey RESET test was used to assess the functional form, the Breusch-Pagan test to detect heteroskedasticity, the Variance Inflation Factor (VIF) values to check for multicollinearity, and the Jarque-Bera test to evaluate normality. Since the VIF values for the variables were below 5 in all three models, it was concluded that multicollinearity was not a concern. However, including the squared term of per capita income in the model could introduce multicollinearity. However, the VIF results indicate that including these variables in the same model does not pose a problem. The results of tests for functional form, heteroskedasticity, and normality are presented in Table 4. Diagnostic test results show that the assumptions are satisfied at the 5% significance level for each estimation model.

Higher income levels should not always be anticipated to provide superior protection against natural disasters, as per Raschky (2008). He contends that economic development mitigates disaster-related fatalities and economic losses to a certain extent; however, this protective effect diminishes as prosperity levels rise. As a result, high-income countries may experience greater absolute economic losses from large-scale disasters.

Consequently, Raschky investigates the linearity of the correlation between catastrophe losses and economic development and recommends including both the per capita income variable and its square in the model. This study has employed the same methodology to evaluate the non-linear relationship between disaster losses and development levels. The results suggest that the correlation between economic development and disaster damage is, in fact, non-linear.

In the early stages of development, income growth provides a more robust defense against disasters; however, as income levels rise, the marginal contribution of this protective effect declines. Consequently, the findings suggest that the mitigating effect of economic development on disaster damage diminishes as income increases (Raschky, 2008; Padli & Habibullah, 2009; Padli et al., 2010). Our findings unequivocally corroborate Raschky (2008) and Padli and Habibullah (2009)'s assertion that the relationship between disaster fatalities and the level of economic development is non-linear in models (1) and (3). Economic and institutional control variables were progressively integrated into all estimated models. The coefficients'

signs are essentially consistent across models, and the results are robust to the set of variables included. This suggests that the empirical results are consistent.

Discussion

This study analyzes the economic and social impacts of natural disasters using three dependent variables: total disaster damage, the number of people affected by disasters, and the share of disaster damage in Gross Domestic Product (GDP). The findings indicate that the impacts of disasters are multidimensional and that institutional structure, governance quality, and political stability shape disaster outcomes through multiple channels.

The findings related to total disaster damage reveal that institutional quality and governance indicators play a decisive role in the economic costs of disasters. Countries with high levels of corruption and low public administration effectiveness experience greater material losses from disasters. This result can be linked to insufficient pre-disaster risk reduction investments, deficiencies in building inspection processes, and a failure to ensure efficiency in post-disaster resource allocation. These results suggest that disasters should be understood not only as natural events but also as social phenomena that expose the economic consequences of institutional deficiencies.

The results concerning the number of people affected by disasters highlight the importance of political stability and governance. In environments with low political stability and government effectiveness, disasters affect more people. This situation is due to poorly functioning early warning systems, coordination problems in disaster response, and weaknesses in social protection mechanisms.

Findings on the share of disaster damage in GDP focus on the relative macroeconomic shocks that disasters create. These results reveal that disasters have more devastating effects on macroeconomic balances, particularly in economically fragile countries with relatively low income levels, and limited institutional resilience capacity. The increasing share of disaster damage in GDP reflects not only the magnitude of the disaster but also the extent to which the economy can withstand such shocks. In this context, institutional accountability and responsibility mechanisms emerge as important factors in enhancing economic resilience.

The findings obtained in this study underscore the significance of the state's central role in disaster management but also reveal that state-centered approaches alone are insufficient. It has been observed that when the private sector, civil

society organizations, and local actors do not participate effectively in the process, the economic and social costs of disasters increase. This situation emphasizes the importance of institutional structures in disaster management.

Conclusion and Policy Implications

The study's results acknowledge the significance of the state's central role in disaster management but also show that state-centered approaches are insufficient. The economic and social consequences of disasters increase when the private sector, civil society organizations, and local actors are not effectively involved. This emphasizes the necessity of addressing institutional responsibility in disaster management within a multi-actor framework, and that principles, such as accountability, transparency, and corporate ethics play a complementary role in enhancing social resilience to disasters.

The results indicate that the economic and social costs of disasters are substantially more severe in countries with high levels of corruption, weak political stability, and limited public administration effectiveness. These findings suggest that disasters are not merely inevitable natural occurrences; rather, they are significantly exacerbated by institutional weakness and governance deficiencies. In particular, the results on the proportion of calamity damage to GDP underscore the importance of institutional capacity for macroeconomic resilience.

In this context, the primary conclusion for policymakers is that disaster management should not be confined to post-disaster response and recovery. To effectively implement pre-disaster risk reduction policies, it is necessary to fortify a governance approach that is founded on ethical principles, accountability, and transparency. The economic costs of disasters are significantly reduced by the efficient and accountable use of public resources in areas that are designed to reduce disaster risks.

Nevertheless, it is insufficient to entrust institutional responsibility for disaster management exclusively to public authorities. The private sector should be more actively involved in areas, such as infrastructure investment, disaster insurance, and building safety, while civil society organizations should be more effectively involved in raising disaster awareness, strengthening social oversight, and enhancing local-level participation mechanisms. This multi-stakeholder structure will enhance societal resilience to disasters when it is enhanced by the promotion of business ethics and ethical standards.

Lastly, this investigation is subject to certain constraints. The cross-sectional regression method was employed to analyze low- and middle-income countries, utilizing average annual data from 2000 to 2024. Although this method is appropriate for identifying the impact of structural disparities across countries on disaster damage, it is not capable of capturing dynamic changes over time. Additionally, the results may not be explicitly generalizable to countries with varying levels of development, as this study concentrated on a specific income group. Furthermore, the results are indicative of robust associations rather than causal relationships, due to the cross-sectional methodology and data structure employed. Although the possibility of reverse causality and omitted-variable bias cannot be entirely ruled-out, the results have been interpreted in a manner consistent with the current literature.

In the future, it will be feasible to conduct more comprehensive analyses of the relationships among corporate responsibility, governance structures, and disaster-related losses by employing panel data methods with datasets that encompass a broader range of countries, or by conducting comparative studies across high-, middle-, and low-income countries. However, this study provides a distinctive and complementary perspective on the existing literature by investigating the economic and social repercussions of natural disasters in the context of institutional factors, with a particular emphasis on low- and middle-income countries.

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Appendix: List of Countries

Albania, Angola, Argentina, Armenia, Bangladesh, Bolivia, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Republic, Chile, China, Colombia, Democratic Republic of the Congo, Costa Rica, Dominican Republic, Ecuador, Egypt, Gambia, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Iran Islamic Rep., Jamaica, Kazakhstan, Kenya, Kyrgyz Republic, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mexico, Turkiye, Vietnam.