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Fiscal Policy and Investment as Determinants of Regional Economic Resilience In Indonesia

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Abstract: Economic resilience has been a major concern in economic development studies, especially when there are recurrent macroeconomic shocks and structural vulnerabilities. Although fiscal and investment policies are widely recognized as drivers of economic growth, empirical evidence linking fiscal and investment policies to regional economic resilience from an aggregate demand perspective is limited. This study examines the impact of these two variables on economic resilience in 34 provinces in Indonesia during the period 2012-2024. Regional resilience is measured using real aggregate consumption relative to counterfactual long-term trends, thereby capturing the capacity of regions to withstand shocks and recover over time. The analysis used a Fixed Effects panel model, selected based on the Chow and Hausman tests. The findings show that disaster-related spending through contingency significantly increases the region's economic resilience in the short term, while capital expenditure also has a positive short-term effect, albeit on a smaller scale. In addition, foreign direct investment and domestic investment show statistically significant and consistent positive effects on economic resilience. These results extend Keynesian aggregate demand theory by showing that fiscal and investment policy instruments not only stabilize output but also strengthen adaptive regional resilience, offering important policy insights for disaster-prone developing countries.

Keywords: regional economic resilience, fiscal policy, aggregate demand, foreign investment, domestic investment, panel data.

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INTRODUCTION

The global financial crisis, natural disasters, geopolitical instability, and the COVID-19 pandemic have caused the world economy to experience major shocks in the last twenty years. These shocks changed the perspective of development, from a focus on economic growth to a broader emphasis on economic resilience. (Briguglio et al., 2009; Martin & Sunley, 2015; Rose, 2004).(Briguglio et al., 2009; Martin & Sunley, 2015; Rose, 2004) Economic resilience is defined as the ability of an economic system to absorb shocks, maintain basic economic functions, and recover sustainably over time. (Rose, 2004). In contrast to traditional growth indicators,

resilience emphasizes performance relative to the counterfactual path and reflects a dynamic adjustment process after a disruption. (Cerra & Saxena, 2008). Extreme weather events and disasters cause prolonged output loss, infrastructure damage, and decreased well-being, especially in developing countries. (Cavallo & Noy, 2011; Hallegatte et al., 2018). As a result, economic resilience is currently a key pillar in sustainable development and macroeconomic stability.

Indonesia, as a country made up of many islands and located along the Pacific Ring of Fire, often faces natural disasters, including earthquakes, tsunamis, floods, and volcanic eruptions. These disasters cause significant economic and social losses, disrupt production and distribution systems, and damage consumption patterns in various regions (Mukherjee & Hastak, 2018; Noy & Yonson, 2018; Suppasri et al., 2021). In addition to disaster risks, the COVID-19 pandemic has also severely damaged national economic stability. In 2020, Indonesia's economic growth slowed by −2.07%, and was then followed by a recovery that took place gradually in the following years. However, this recovery process is uneven in various regions and economic sectors. On the one hand, the agricultural sector showed better resilience, while the manufacturing and tourism sectors experienced a sharp decline (Arifah & Kim, 2022). As revealed by Suparman (2023) disaster economics not only calculates the amount of losses caused by disasters, but also highlights the importance of strengthening the recovery capacity and resilience of the regional economic system to return to a stable and sustainable state

Regional economic inequality over time, as evidenced by Gini coefficients ranging from 0.38 to 0.40 and significant regional differences in gross domestic product per capita, further reinforces structural sensitivity. (Yusuf et al., 2021). This study shows that regional economic resilience varies significantly between regions and is influenced by fiscal capacity, investment dynamics, and overall demand stability. An empirical study in Donggala, Indonesia, using the Post-Disaster Recovery Index (Ina-PDRI) approach showed that the recovery index only reached 87.02%, meaning that the socioeconomic state has not fully recovered to the point before the disaster. (Tope et al., 2022). Indonesia's decentralized fiscal framework gives local governments considerable power in determining the allocation of spending. Fiscal decentralization has led to disparities in disaster relief spending, capital investment, and investor attraction between provinces. Therefore, it is important to analyze how fiscal and investment policies contribute to regional resilience, both in theory and in practice. Based on Keynesian macroeconomic theory, the function of fiscal policy is to maintain the economic stability of a country. Keynes (2018) argued that output and employment in the short term are largely determined by aggregate demand and that government intervention through public spending is essential during economic recessions.

Public spending, investment, and consumption are the main variables in aggregate demand. (Blanchard, 2017; Mankiw, 2021). Countercyclical fiscal policies during crises can help mitigate economic downturns and support the recovery process through a multiplier effect. However, classical Keynesian economic theory emphasizes the role of fiscal policy in maintaining economic stability rather than dynamic resilience. In other words, this theory only addresses how the economy returns to equilibrium, without clearly defining the resilience, speed of recovery, or adaptation that occurs over time. (Aghion & Howitt, 1990; Cerra & Saxena, 2008). On the other hand, resilience theory places more emphasis on adaptability, structural change, and long-term recovery processes. (Briguglio et al., 2009; Martin & Sunley, 2015). However, research on

economic resilience is often not formally connected to macroeconomic frameworks in the context of total demand mechanisms. Therefore, the integration of Keynesian total demand theory in explaining the dynamics of economic resilience at the regional level remains suboptimal.

Several previous empirical studies have evaluated the performance of regional economies in terms of GDP growth or production levels. (Martin & Sunley, 2015). While this is useful, it does not reflect a deviation from normal patterns or resilience based on well-being. Cerra & Saxena (2008) reveal that post-crisis output losses can persist for a long time, testing assumptions about auto-run recovery. With the same method, studies on disaster economics show that fiscal action has an important role in reducing long-lasting losses. (Cavallo & Noy, 2011; Hallegatte et al., 2018). In Indonesia, empirical research tends to explore the effects of fiscal multipliers or the impact of investment, but no one has clearly measured regional economic resilience using aggregate demand indicators. In addition, several studies have combined disaster-related expenditures, capital expenditures, and foreign and domestic investment in a tentative model for resilience at the provincial level. These limitations are still particularly striking in developing countries that implement fiscal decentralization, where differences in fiscal policies can produce varying resilience outputs.

This study identifies three main gaps: limited integration between Keynesian stabilization theory and economic resilience theory; reliance on GDP growth instead of consumption-based resilience measures; and the lack of provincial-level panel evidence on how fiscal and investment policies shape resilience in disaster-prone developing countries. In response, this study positions regional economic resilience within the intersection of macroeconomic stabilization and resilience economics by defining it as sustained real aggregate consumption relative to its counterfactual trend, thus providing a Keynesian aggregate demand–based measure of resilience.

This research contributes by extending the Keynesian theory of aggregate demand into the framework of regional economic resilience, integrating fiscal and investment policies in an integrated panel model, providing subnational empirical evidence from 34 Indonesian provinces during 2012–2024. Thus, the purpose of this study is to examine the impact of fiscal and investment policies on regional economic resilience in Indonesia using an aggregate demand-based panel data approach.

METHOD

This study applies a quantitative method by utilizing panel data analysis to evaluate the influence of fiscal and investment policies on economic resilience at the regional level in Indonesia. A region's economic resilience is measured through real aggregate consumption expenditure, which reflects demand stability across provinces. The selection of aggregate consumption as an indicator of resilience is based on Keynesian macroeconomic theory, which emphasizes the role of consumption as the dominant and most consistent element of aggregate demand (Blanchard, 2017; Keynes, 2018). In a demand-focused economy, a sustained decline in consumption signals low resilience, while consumption stability describes good economic resilience. The panel structure incorporates inter-sector variation in all provinces as well as all-time variation over time during the period 2012 to 2024, which allows for the identification of dynamics in provinces while controlling for unobserved heterogeneity. (Baltagi, 2021).

Data and Variables

The dataset is a balanced panel of data covering 34 provinces in Indonesia that is monitored annually from 2012 to 2024. All data used is secondary and comes from official statistical publications and government financial reports.

Variable Dependency

Regional Aggregate Demand (ADit) is defined as total real consumption at the provincial level, which serves as an indicator of regional economic resilience. This methodology is in line with the theory of demand-side stabilization (Keynes, 2018) and empirical macroeconomic research that emphasizes the smoothing of consumption patterns during a crisis (Mankiw, 2010).

Regional Unexpected Expenses (RUEit) indicates funds set aside by the government for responding to and recovering from disasters after they occur. The theory of fiscal stimulus suggests that spending during economic downturns can help lessen declines in production (Blanchard & Perotti, 1999).

Regional Capital Expenditure (RCEit) is an expenditure on infrastructure and capital formation. Public investment contributes to increasing productive capacity in the long term (Abdulrazaq et al., 2024).

Foreign Direct Investment (FDIit) is the inflow of foreign investment that is carried out. FDI plays a role in creating productivity overflow as well as structural improvements (Aghion & Howitt, 1990). Domestic Direct Investment (DDIit) represents the implementation of internal investment inflows, which indicates internal capital development and enhances domestic consumption.

Shock Variables. The COVID-19 Dummy (D2020) serves as a dummy variable that represents widespread economic disruptions that began in 2020. Research in macroeconomic shocks indicates that pandemics lead to a decrease in overall demand (Guerrieri et al., 2022).

Table 1. Variable Types, Operational Definitions, and Data Sources

Variabel	Operational Definition	Units	Data Source
Aggregate Demand (AD)	Regional aggregate expenditure value as an indicator of regional aggregate demand based on constant prices, 2010	Billion Rupiah	Central Statistics Agency (BPS)
Regional Unexpected Expenses (RUE)	Realization of local government expenditure for handling emergencies or disasters	Billion Rupiah	Ministry of Finance
Regional Capital Expenditure (RCE)	Realization of local government expenditure for the establishment of fixed assets/infrastructure	Billion Rupiah	Ministry of Finance
Foreign Investment (FDI)	Realization of foreign direct investment at the provincial level	Billion Rupiah	BKPM / Ministry of Investment
Domestic Direct Investment (DDI)	Realization of domestic investment at the provincial level	Billion Rupiah	BKPM / Ministry of Investment
COVID-19 Dummy	Covid-19 Pandemic in 2020 =1 and other years =0	Scale	-

Econometric Model Specifications:

The basic model of panel regression is defined as:

$AD_{it} = \alpha_i + \beta_1 RUE_{it} + \beta_2 RCE_{it} + \beta_3 FDI_{it} + \beta_4 DDI_{it} + \varepsilon_{it}$ … (eq. 1)

Econometric model after including COVID-19 shocks:

$AD_{it} = \alpha_i + \beta_1 RUE_{it} + \beta_2 RCE_{it} + \beta_3 FDI_{it} + \beta_4 DDI_{it} + \beta_5 D2020_t + \varepsilon_{it}$ … (eq. 2)

Where i is indicates province, t is indicates year, α_i is capturing province-specific fixed effects, ε_{it} is a term of error. Fixed effects are used in models to control the structural heterogeneity of time invariants. (Wooldridge, 2010).

Model selection is carried out to determine the most appropriate estimator to use. Three alternative panel models are estimated:

a) Pooled Ordinary Least Squares (PLS)
b) Fixed Effect Model (FE)
c) Random Effects Model (RE)

Panel model selection through standard econometric procedure stages (Baltagi, 2021).

a) Chow Test

The Chow test tests the comparison between the PLS model and the Fixed Effect model that has been collected. The rejection of the null hypothesis shows a significant heterogeneity in cross-sectional data and provides support for the application of the Fixed Effect model.

b) Hausman Test

The Hausman specification test evaluates the consistency of the Random Effects estimator, leading to the rejection of the Random Effects assumption. This confirms the correlation between the unobserved provincial effect and the explanatory variable.

3) Estimation Technique and Inference

All models are estimated by using a fixed effect approach with cross-sectional dummy variables. For potential heteroscedasticity and serial correlation, strong standard errors are corrected to ensure reliable statistical inference (Arellano & Bond, 1991). Validity of models is evaluated using R-squared to measure the tightness of relationships, F-statistics to measure the significance of model significance simultaneously, t-statistical test to measure partial secra significance, and Durbin-Watson statistical Model robustness is assessed through comparison between Collected and Fixed Effect OLS, Hausman specification tests, inclusion of shock and interaction models, and robust standard error correction. It ensures consistency of the estimator and internal validity of empirical results. (Baltagi, 2021; Wooldridge, 2010).

RESULTS AND DISCUSSION

Research Result

The use of panel data allows researchers to capture data variations across regions and time simultaneously, as well as control for unobserved heterogeneity that has the potential to affect relationships between variables (Baltagi, 2021; Wooldridge, 2010). Before interpreting the estimation results, the initial stage is to select the most appropriate panel model specifications, considering the potential for structural heterogeneity between provinces that cannot be observed directly

Uji Chow (Pooled OLS vs Fixed Effects)

The Chow test was performed to determine whether the Pooled OLS or Fixed Effects model was more appropriate in the panel data estimation. This test tested the null hypothesis that the difference in intercept between provinces is not significant, so the Pooled OLS model is adequate (Baltagi, 2021). If the null hypothesis is rejected, then there is cross-provincial heterogeneity that needs to be modeled through Fixed Effects.

Table 2. Results of the Redundant Fixed Effects Test (Chow Test) of Provincial Data Panel Models in Indonesia

Effects Test	Statistic	d.f.	Prob.
Cross-section F	384.289313	(33,404)	0.0000
Cross-section Chi-square	1537.209154	33	0.0000

Source: Data from the Indonesian provincial panel for 2012–2024, processed using EViews 13.

The results of the Redundant Fixed Effects Test in Table 2 show a Cross-section F value of 384.29 with a probability of 0.0000 and a Chi-square value of 1,537.21 with a probability of 0.0000. Since the probability value is much smaller than the 5 percent significance level, the null hypothesis is rejected. Thus, it can be concluded that there is significant structural heterogeneity between provinces, so the Fixed Effects model is more appropriate to use than Pooled OLS. These findings suggest that interprovincial fixed characteristics through fiscal capacity, economic structure, and institutional quality influence regional aggregate demand and need to be explicitly controlled in estimation models.

Uji Hausman (Fixed Effects vs Random Effects)

The Hausman test is performed to decide whether the Settled Impacts (FE) or the Arbitrary Impacts (RE) are more suitable. The null hypothesis states that the Random Effects estimator is consistent and efficient, while the alternative hypothesis states that the Random Effects become biased so that the Fixed Effects are more consistent (Wooldridge, 2010).

Table 3. Results of the Hausman Test (Selection of Fixed Effects vs Random Effects Models) on Provincial Panel Data in Indonesia

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	117.216829	4	0.0000

Source: Data from the Indonesian provincial panel for 2012–2024, processed using EViews 13.

The results of the Hausman test in Table 3 show a Chi-square value of 117.22 with a probability of 0.0000, so the null hypothesis is rejected. Thus, the Fixed Effects model is chosen as the main specification. These results show that individual effects between provinces are correlated with independent variables, so the Random Effects approach does not meet the basic assumptions of the panel model.

Base Model Estimation (Baseline Fixed Effects)

Baseline model estimation that relates regional aggregate demand to local government spending and investment. Estimation was carried out using *the Fixed Effects* method with *robust standard errors* to anticipate potential heteroscedasticity and correlation in *error terms*.

Table 4. Estimation of the Fixed Effect (FE) Model on the Influence of Regional Fiscal Policy and Investment on Regional Aggregate Demand in Indonesia

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	17.03710	0.164783	103.3911	0.0000
RUE	0.009277	0.004118	2.252498	0.0438
RCE	0.018124	0.011433	1.585222	0.1389
FDI	0.097359	0.018503	5.261768	0.0002
DDI	0.055803	0.006043	9.234348	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.989395	Mean dependent var		18.80889
Adjusted R-squared	0.988424	S.D. dependent var		1.157815
S.E. of regression	0.124571	Akaike info criterion		-1.245834
Sum squared resid	6.269227	Schwarz criterion		-0.894093
Log likelihood	313.3293	Hannan-Quinn criterion.		-1.107097
F-statistic	1018.714	Durbin-Watson stat		0.819028
Prob(F-statistic)	0.000000			

Source: Data from the Indonesian provincial panel for 2012–2024, processed using EViews 13.

The results of the basic model estimation in table 4 show that simultaneously the variables of local government expenditure and investment have a significant effect on regional aggregate demand, as shown by the significant statistical value of F. Partially, disaster-related spending and investment, especially domestic investment, showed a positive and significant influence on aggregate demand, while regional capital expenditure showed a positive but not statistically significant influence. These findings indicate that fiscal instruments that are responsive in nature and investments that are directly oriented to economic activity have a stronger role in driving short-term aggregate demand. The model of the equation is as follows:

AD = 17.03710 + 0.009277*RUE + 0.018124*RCE + 0.097359*FDI + 0.055803*DDI

Shock Model Estimate: The Impact of Economic Shocks in 2020

The estimation of the impact of national economic shocks due to the COVID-19 pandemic is carried out by expanding the basic model by including the dummy shock variable in 2020. This model aims to capture shifts in aggregate demand levels that occur due to external shocks, after controlling the influence of regional fiscal policies, investment, and interprovincial heterogeneity.

Table 5. Estimated Results of the Fixed Effect (FE) Model on the Influence of Regional Fiscal Policy, Investment, and the Impact of Economic Shocks on Regional Aggregate Demand in Indonesia

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.03318	0.161016	105.7859	0.0000
RUE	0.011217	0.003906	2.871576	0.0140
RCE	0.018069	0.011232	1.608682	0.1337
FDI	0.097331	0.018338	5.307636	0.0002
DDI	0.055986	0.005996	9.336835	0.0000
D2020	-0.038873	0.013815	-2.813760	0.0156
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.989458	Mean dependent var		18.80889
Adjusted R-squared	0.988464	S.D. dependent var		1.157815
S.E. of regression	0.124357	Akaike info criterion		-1.247231
Sum squared resid	6.232214	Schwarz criterion		-0.886233
Log likelihood	314.6380	Hannan-Quinn criterion.		-1.104843
F-statistic	995.3894	Durbin-Watson stat		0.791968
Prob(F-statistic)	0.000000			

Source: Data from the Indonesian provincial panel in 2012–2024, processed using EViews 13

The results of the shock model estimation shown in Table 5 show that the dummy coefficient in 2020 was negative and significant, indicating that there was a significant decrease in regional aggregate demand in 2020. These findings confirm that the COVID-19 pandemic is a negative shock that has a wide impact on the regional economy in Indonesia, even after considering the fiscal and investment policy responses. The model of the equation is as follows:

AD = 17.03318 + 0.011217*RUE + 0.018069*RCE + 0.097331*FDI + 0.055986*DDI + -0.038873 *D2020

Statistical Test and Model Validity (Based on Estimation Results)

Statistical testing and evaluation of model validity in this study were carried out to ensure that the estimated regional economic resilience model has strong explainability, consistent estimators, and accountable statistical inference. The evaluation is carried out in stages through parameter significance tests, model feasibility tests, panel specification selection tests, and statistical inference robustness testing.

Partial Significance Test (t-test)

The results of the *Fixed Effects model estimation* show that several main variables have a statistically significant influence on aggregate consumption expenditure as an indicator of

regional economic resilience. The variable of disaster-related expenditure (BTD) showed a positive coefficient with a significant t-statistical value at a confidence level of 99 percent (Prob.<0.01), indicating that an increase in disaster expenditure was associated with an increase in regional aggregate consumption. Economically, these findings confirm the role of disaster spending as an effective short-term stabilization instrument in maintaining people's purchasing power. In contrast, regional capital expenditure (BMD) shows a positive coefficient but with a weaker level of significance, even not significant in some model specifications. This indicates that the impact of capital expenditure on aggregate consumption is indirect and tends to be delayed (time lag), making it less effective as an instrument for stabilizing consumption in the short term.

On the investment side, which is based on domestic investment (PMDN), it shows a positive and very significant influence with a relatively large t-statistic value and Prob. close to zero. These findings indicate that domestic investment is the main determinant of regional aggregate consumption. Meanwhile, foreign direct investment (FDI) also showed a positive and significant coefficient, although the magnitude of the influence was relatively smaller than that of PMDN, reflecting the limited direct linkage of FDI to local household consumption.

Simultaneous Significance Test (F Test)

The results of the simultaneous significance test showed that all the estimated models had very strong statistical feasibility. In the *Pooled Least Squares* (PLS) model, an F-statistic value of 208.81 with a Prob(F-statistic) of 0.0000 was obtained, which shows that simultaneously fiscal and investment policy variables have a significant effect on aggregate consumption.

In the *Fixed Effects* (FE) model, the F-statistic value increased significantly to 1,018.71 with the Prob (F-statistic) equal to 0.0000, which indicates that after controlling for interprovincial heterogeneity, the model has a much stronger explanatory power. This is also reflected in the *R-squared* value of 0.9894 and *the Adjusted R-squared* of 0.9884, which shows that about 98.84 percent of the variation in aggregate consumption expenditure can be explained by variables in the model and the provincial fixed effect. In comparison, the *Random Effects* (RE) model yields an F-statistic of 137.32 with a Prob(F-statistic) equal to 0.0000, and an R-squared value of 0.5569. This value is much lower than that of the FE model, which indicates that *the Random Effects assumption is* less able to adequately capture the structural variation in consumption between provinces.

Robust Standard Errors and Resilience of Statistical Inference

To ensure that statistical inference is not affected by potential heteroscedasticity and residual correlation, the *Fixed Effects* model estimation is complemented using *robust standard errors* (White diagonal). The estimated results showed that despite adjustments to *the standard value of errors*, the direction and significance of the main variables remained consistent. This suggests that the research's empirical findings are not sensitive to violations of certain classical assumptions and have good inference resistance.

Synthesis of the Validity of the Regional Economic Resilience Model

Based on all statistical tests conducted, it can be concluded that the regional economic resilience model used in this study has very strong econometric validity. The high F-statistical value (1,018.71), *the Adjusted R-squared* close to one (0.9884), and the consistently significant results of the Chow and Hausman tests show that *the Fixed Effects* model with *robust standard errors* is the most appropriate specification.

Discussion

The results of the estimates show that regional economic resilience in Indonesia, which is proxied through regional aggregate demand stability, is shaped by two main mechanisms, namely short-term fiscal stabilization and structural capacity strengthening through investment. These findings make it clear that economic resilience is not just a function of growth, but rather the result of the interaction between fiscal policy responses and long-term investment foundations.

Disaster Management Expenditure as a Short-Term Stabilization Instrument

Regional disaster management expenditure (BTD) has been proven to have a positive and significant effect on all model specifications. Conceptually, these results reinforce the Keynesian

perspective that government spending that is responsive to crises serves as an effective demand stabilizer (Blanchard, 2017; Keynes, 2018). When shocks occur and household consumption declines due to income contraction and increased uncertainty, government spending becomes a component of aggregate demand that can withstand the decline.

Interestingly, the effectiveness of BTD remained stable even when the pandemic shock variable was included. This shows that the role of regional disaster management spending through unexpected spending is not only situational, but inherent as a structural stabilization mechanism in the regional fiscal system. In other words, BTD functions as a regional automatic stabilizer, not just an ad hoc policy during a crisis.

These findings expand the literature on fiscal multipliers that generally focus on the national level.(Auerbach & Gorodnichenko, 2011) by providing empirical evidence at the provincial level in developing countries. Its main contribution is to show that the effectiveness of fiscal stabilization is also applicable in the context of fiscal decentralization, where regional capacity plays a crucial role in maintaining aggregate demand.

Capital Expenditure: A Structural Role with Delayed Effects

In contrast to BTD, regional capital expenditure (BMD) does not show statistical significance in the short term. Although the coefficient is positive, the impact on aggregate demand is not immediately visible in the same period. This is consistent with the literature that states that infrastructure investment has a time lag effect and affects long-term production capacity more than short-term consumption. (Aschauer, 1989).

From the perspective of regional economic resilience, these results confirm the difference between the stabilization function and the development function. If BTD increases resistance capacity (the ability to withstand initial shocks), then BMD is more related to recovery capacity (the ability to strengthen the economic foundation for the next period) (Martin & Sunley, 2015).

Thus, capital expenditure is not unimportant, but its contribution to resilience is indirect and more structural. These results provide empirical clarification that long-term development policies are not always an effective stabilization instrument in the early phases of the crisis.

Investment as a Fundamental Factor of Resilience

Both Foreign Direct Investment (FDI) and Domestic Investment (PMDN) consistently demonstrated a strong and positive impact across all models, even when accounting for pandemic-related shocks. The reliability of this coefficient indicates that investment plays a crucial role as a structural element in the resilience of regional economies.

Within the Keynesian model, investment is a key factor of total demand that generates a ripple effect on both income and consumption. However, the findings of this research extend beyond merely the immediate multiplier effects. Investment also enhances production capabilities, boosts productivity, and promotes economic diversity, which in turn fortifies the region against major economic disturbances. (Alfaro et al., 2004; Borensztein et al., 1998).

Curiously, even though the PMA coefficient is greater, the impact of PMDN is not only more significant but also more consistent. This shows that domestic investment serves as the main support of regional internal demand, while foreign investment plays a role in increasing productive capacity and external integration. Thus, the combination of the two creates a more comprehensive foundation of resilience.

From the perspective of regional resilience, investment strengthens absorptive capacity and adaptive regional capacity (Martin & Sunley, 2015; Rose, 2007). Regions that attract significant investments tend to have more complex and varied economic frameworks, which allow them to sustain spending and economic operations during times of disruption

The Effect of Pandemic Shock and Regional Differences

The COVID-19 outbreak has shown a notable decrease in overall demand across regions. These findings align with the literature on macroeconomic downturns that indicate major shocks leading to reductions in production and spending. (Cerra & Saxena, 2008). Still, the effects are not the same across all provinces. Variations in financial resources and investment abilities resulted in differing levels of decline and recovery rates. Thus, economic resilience is spatial and contextual, not nationally homogeneous. These findings make an important contribution by

showing that external shocks do not fully determine regional economic outcomes; The impact is mediated by local fiscal and investment structures.

Overall, the results show that regional economic resilience is shaped by a combination of responsive fiscal policies and structural investment capacity. Without short-term stabilization, the shock will cause sharp contractions; Without long-term investment, the recovery is not sustainable. Therefore, the strategy to strengthen regional economic resilience requires a balance between stabilizing spending and strengthening the structural foundation of the economy.

CONCLUSIONS

The results of the estimation concluded that there were three main findings. First, Regional Unexpected Expenses spending has a positive and significant effect on regional economic resilience. These findings confirm that fiscal spending that is responsive to crises serves as a stabilizer of aggregate demand and can withstand economic contractions in periods of shock. Thus, Unexpected Expenses acts as a short-term resistance mechanism. Second, regional capital expenditure shows a positive but not significant influence in the short term. This indicates that infrastructure spending has a structural character and a time lag effect, so that its contribution to economic resilience is more medium- and long-term (recovery capacity) than direct stabilization. Third, investment, both Foreign Investment and Domestic Investment, consistently has a positive and significant effect on all model specifications, including during the pandemic period. The stability of this coefficient shows that investment is the main structural determinant of regional economic resilience. Investment not only drives growth but also strengthens the region's absorptive and adaptive capacity in the face of macroeconomic shocks.

In addition, the COVID-19 pandemic has proven to have significantly reduced regional aggregate demand. However, the impact differs between provinces, showing that the heterogeneity of fiscal and investment capacity determines the level of regional economic resilience. This research highlights that the robust nature of regional economies is influenced by two interrelated processes: immediate financial stabilization and enhancing structural capacity via investment. The combination of the Keynesian model of overall demand with the concept of regional economic resilience represents a significant advancement. of this research in the regional development literature.

REFERENCES

Aghion, P., & Howitt, P. (1990). A Model of Growth Through Creative Destruction. *NBER Working Paper*, *3223*.

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of International Economics*, *64*(1), 89–112. https://doi.org/10.1016/S0022-1996(03)00081-3

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Carlo Application to Data : Evidence and an Employment Equations. *The Review of Economic Studies*, *58*(2), 277–297.

Arifah, K. F., & Kim, J. (2022). The Importance of Agricultural Export Performance on the Economic Growth of Indonesia: The Impact of the COVID-19 Pandemic. *Sustainability*, *14*(24), 16534. https://doi.org/10.3390/su142416534

Aschauer, D. A. (1989). Is public expenditure productive? *Journal of Monetary Economics*, *23*(2), 177–200. https://doi.org/10.1016/0304-3932(89)90047-0

Auerbach, A. J., & Gorodnichenko, Y. (2011). Fiscal Multipliers in Recession and Expansion. In the *NBER Working Paper Series. National Bureau of Economic Research. Working Paper 17447*.

Baltagi, B. H. (2021). *Econometric Analysis of Panel Data* (6th ed.). Springer Nature.

Blanchard, O. (2017). Macroeconomics (7th ed.). Pearson. 2017. In *Macroeconomics (7th ed.).*

Pearson.

Blanchard, O., & Perotti, R. (1999). An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output. In *NBER Working Paper Series* (Issue July). https://doi.org/10.3386/w7269

Borensztein, E., De Gregorio, J., & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, *45*(1), 115–135. https://doi.org/10.1016/S0022-1996(97)00033-0

Briguglio, L., Cordina, G., Farrugia, N., & Vella, S. (2009). Economic Vulnerability and Resilience: Concepts and Measurements. *Oxford Development Studies*, *37*(3), 229–247. https://doi.org/10.1080/13600810903089893

Bruneau, M., Chang, S. E., Eguchi, R. T., Lee, G. C., O'Rourke, T. D., Reinhorn, A. M., Shinozuka, M., Tierney, K., Wallace, W. A., & Von Winterfeldt, D. (2003). A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities. *Earthquake Spectra*, *19*(4), 733–752. https://doi.org/10.1193/1.1623497

Cavallo, E., & Noy, I. (2011). Natural Disasters and the Economy — A Survey. *International Review of Environmental and Resource Economics*, *5*(1), 63–102. https://doi.org/10.1561/101.00000039

Cerra, V., & Saxena, S. C. (2008). Growth Dynamics: The Myth of Economic Recovery. *American Economic Review*, *98*(1), 439–457. https://doi.org/10.1257/aer.98.1.439

Guerrieri, V., Lorenzoni, G., Straub, L., & Werning, I. (2022). Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages? *American Economic Review*, *112*(5), 1437–1474. https://doi.org/10.1257/aer.20201063

Hallegatte, S., Rentschler, J., & Walsh, B. (2018). *"Building back better: Achieving resilience through stronger, faster, and more inclusive post-disaster reconstruction".* (Vol. 27, Issue 6).

Keynes, J. M. (2018). *The General Theory of Employment, Interest, and Money*. Springer International Publishing. https://doi.org/10.1007/978-3-319-70344-2

Mankiw, N. G. (2010). *Macroeconomics* (Seventh Ed). Worth Publishers.

Mankiw, N. G. (2021). Principles Of Economics, Ninth Edition. In *Cengage*.

Martin, R., & Sunley, P. (2015). On the notion of regional economic resilience: conceptualization and explanation. *Journal of Economic Geography*, *15*(1), 1–42. https://doi.org/10.1093/jeg/lbu015

Mukherjee, S., & Hastak, M. (2018). A Novel Methodological Approach to Estimate the Impact of Natural Hazard-Induced Disasters on Country/Region-Level Economic Growth. *International Journal of Disaster Risk Science*, *9*(1), 74–85. https://doi.org/10.1007/s13753-017-0156-3

Noy, I., & Yonson, R. (2018). Economic Vulnerability and Resilience to Natural Hazards: A Survey of Concepts and Measurements. *Sustainability*, *10*(8), 2850. https://doi.org/10.3390/su10082850

Rose, A. (2004). Defining and measuring economic resilience to disasters. *Disaster Prevention and Management: An International Journal*, *13*(4), 307–314. https://doi.org/10.1108/09653560410556528

Rose, A. (2007). Economic resilience to natural and man-made disasters: Multidisciplinary origins and contextual dimensions. *Environmental Hazards*, *7*(4), 383–398. https://doi.org/10.1016/j.envhaz.2007.10.001

Suparman. (2023). *Ekonomi Bencana; Prinsip-prinsip dasar dan Model Pemulihan Ekonomi Dampak Bencana* (A. Febriyanti (ed.)). Edu Publisher.

Suppasri, A., Maly, E., Kitamura, M., Syamsidik, Pescaroli, G., Alexander, D., & Imamura, F. (2021). Cascading disasters triggered by tsunami hazards: A perspective for critical infrastructure resilience and disaster risk reduction. *International Journal of Disaster Risk Reduction*, *66*, 102597. https://doi.org/10.1016/j.ijdrr.2021.102597

Tope, P., Ichwan, M., Tenge, E., & Suparman. (2022). Social Economic Index Analysis of Palu Disaster Recovery. *Environment and Ecology Research*, *10*(6), 728–737. https://doi.org/10.13189/eer.2022.100608

Wooldridge, J. M. (2010). Econometric Analysis of Cross-Section and Panel Data. In *The MIT Press. Cambridge, Massachusetts* (Second Edition). Massachusetts Institute of Technology. https://doi.org/10.2307/j.ctv5rdzwc.1

Yusuf, A. A., Anglingkusumo, R., & Sumner, A. (2021). A direct test of Kuznets in a developing economy: a cross-district analysis of structural transformation and inequality in Indonesia. *Regional Studies, Regional Science*, *8*(1), 184–206. https://doi.org/10.1080/21681376.2021.1924850