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ASSESSING INVESTMENT REQUIREMENTS TO ATTAIN A 7% ECONOMIC GROWTH RATE IN BANDUNG REGENCY BY 2030

Daniel Simamora
Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu, Pemerintah Kabupaten Bandung, Indonesia
E-mail: daniel.simamora.1998@gmail.com

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Abstract

Achieving the ambitious economic growth targets mandated in the Bandung Regency's Regional Medium-Term Development Plan (RPJMD) requires a solid investment planning foundation. This study aims to examine the investment needs required to drive the acceleration of regional economic growth until 2030. Using a quantitative approach through Incremental Capital-Output Ratio (ICOR) analysis based on historical GRDP and GFCF data, this research measures the level of investment efficiency and projects the required capital amount. The analysis results indicate that Bandung Regency has a reasonably good level of investment efficiency. However, to achieve the established economic growth targets, a significant increase in investment volume beyond historical realization is necessary. This finding implies that the regional development strategy must focus on two main pillars: not only attracting large volumes of investment but also maintaining and enhancing investment efficiency (keeping the ICOR low) through improvements in the business climate, human capital quality, and directing investment towards high-value-added sectors.

Keywords: ***Investment, Economic Growth, ICOR, Development Planning, Bandung Regency***

INTRODUCTION

Investment is the main driving force in the dynamics of economic growth, both at the national and regional levels (Khang & Nguyen, 2021). This crucial role is recognized in the long-term national development agenda, where accelerating investment is one of the prerequisites for realizing the vision of Golden Indonesia 2045. The success of this national agenda heavily depends on the economic performance of strategic regions, one of which is Bandung Regency. As an integral part of the Bandung Basin National Strategic Area (KSN), Bandung Regency plays a vital role in supporting the economic growth of West Java Province and the nation. The commitment of the Bandung Regency Government to accelerate growth is reflected in its strategic planning document, the 2025-2029 Regional Medium-Term Development Plan (RPJMD), which sets gradual and ambitious economic growth targets. These targets start at 5.74% in 2025, consistently increasing to 6.0% (2026), 6.26% (2027), 6.52% (2028), 6.78% (2029), and culminating at 7.0% in 2030.

Development planning is a constitutional mandate and a fundamental element in state administration aimed at achieving fair and equitable public welfare. In accordance with Law Number 25 of 2004 concerning the National Development Planning System, development planning must be carried out systematically, directed, integrated, and sustainably, both at the national and regional levels. At the regional level, the Regional Medium-Term Development Plan (RPJMD) document serves as a strategic guide that translates the vision and mission of the elected regional head into measurable development goals, targets, strategies, and programs for a five-year period. The 2021-2026 RPJMD for Bandung Regency sets various development targets, including an ambitious economic growth rate as a prerequisite for increasing per capita income and reducing poverty levels. This commitment to driving economic growth continues in the preparation of the Initial Draft of the RPJMD for Bandung Regency for the 2025-2029 period. This document carries the vision "Terwujudnya Kabupaten Bandung Lebih Bangkit, Edukatif, Dinamis, Agamis dan Sejahtera (BEDAS), Maju dan Berkelanjutan Menuju Indonesia Emas". This vision is translated into Mission number 2, which is "To Enhance Inclusive Economic Development and Promote Food Security Through Sustainable Local Food Production". This mission explicitly highlights the importance of equitable economic

development accessible to all layers of society, with a focus on empowering MSMEs, increasing investment attractiveness, and strengthening leading sectors. The identified strategic issues, such as low labor productivity, the need to optimize the agricultural sector, and infrastructure gaps, reaffirm the urgency of accurate investment planning to support this development agenda. Investment, from both government and private sources, is widely recognized as the main driver of economic growth (Alvaro, 2021). Within the framework of Gross Regional Domestic Product (GRDP), physical investment is reflected in the Gross Fixed Capital Formation (GFCF) component, which represents expenditure on capital goods such as machinery, equipment, and infrastructure. The role of investment is twofold: in the short term, it boosts aggregate demand, while in the long term, it increases the productive capacity or aggregate supply of an economy . The positive and significant relationship between investment and economic growth has been empirically proven in various studies in Indonesia, both at the national and regional levels (Hardi et al., 2023). Therefore, to achieve the economic growth targets set in the RPJMD, an adequate volume of investment is required

Although the Bandung Regency Government has set clear economic growth targets, these are often not accompanied by a thorough quantitative analysis of the actual investment required to achieve them. Planning that is not based on valid investment need projections risks making development targets unrealistic and difficult to achieve. A gap between targets and realization can occur if the volume of incoming investment is insufficient or if existing investment is not allocated efficiently. Nasikh et al. (2022) highlight the importance of investment efficiency as a determining factor for development success. Thus, a crucial research question arises: What is the amount of investment that Bandung Regency must realize annually to achieve the economic growth target of 7% by 2030? This study aims to answer this question using an academically sound approach, so that its results can serve as a basis for formulating more targeted and effective investment policies.

LITERATURE REVIEW

The main theoretical framework underlying this research is the Harrod-Domar growth model. This model explicitly links a country's economic growth rate to two key variables: the savings rate (assumed to be equal to investment) and the capital-output ratio (Orlando et al., 2021). The model's fundamental equation $g=s/k$, where g is the economic growth rate, s is the ratio of investment to GRDP, and k is the Incremental Capital-Output Ratio (ICOR), provides a powerful analytical tool for investment planning. Economic growth, as the dependent variable in planning, is measured by the growth rate of GRDP at constant prices to eliminate distortions from inflation and reflect the increase in real output (Mujib, 2019). GRDP data for Bandung Regency shows a positive growth trend post-pandemic, reaching 5.04% in 2024, but this figure is still below the 7% target. The main independent variable in this model is investment, operationally measured by GFCF. GFCF includes all expenditures for the addition of physical capital goods used in the production process for more than one year. Studies by Idroes et al. (2023) confirm a long-term positive relationship between GFCF and economic growth in Indonesia. Therefore, an increase in GFCF is an absolute requirement for accelerating economic growth. However, the impact of investment on growth is determined not only by its volume but also by its efficiency.

Investment efficiency is measured using the ICOR coefficient, defined as the ratio of additional investment to the additional output it generates ($ICOR=\Delta K/\Delta Y$). A low ICOR value indicates that little additional capital is needed to produce one additional unit of output, meaning the investment is highly efficient and productive. Conversely, a high ICOR value indicates inefficiency. At the national level, Indonesia faces the challenge of a high ICOR, around 6, which is higher than neighboring countries and signifies structural inefficiency. Utomo (2023) found that factors such as human resource quality and corruption levels significantly affect investment efficiency in ASEAN countries. Various studies at the regional level in Indonesia have used ICOR analysis for development planning. Studies in Semarang City (Yamani, 2022), Palangka Raya City (Maria et al., 2021), and Garut Regency (Wikantioso, 2020) show that ICOR can be used as a tool to evaluate past investment efficiency and project future investment needs. These studies form the methodological basis for this research. However, a study that specifically calculates the investment needs to achieve the medium-term RPJMD targets in Bandung Regency using the latest data up to 2024 is not yet available. By analyzing the relationship between the growth target (RPJMD), investment efficiency (ICOR), and investment needs (GFCF), this study builds a solid framework. The underlying hypothesis is that to achieve ambitious economic growth targets, Bandung Regency will face investment needs significantly larger than historical realizations, the magnitude of which will be determined by the level of investment efficiency reflected in the ICOR figure.

METHOD

This study employs a quantitative approach with descriptive and projection analysis methods. The purpose of this approach is to describe the historical trends of macroeconomic variables in Bandung Regency and subsequently project future investment needs based on an established economic model. This approach was chosen for its ability to provide measurable and verifiable quantitative insights, which are crucial for evidence-based policy planning. The data used in this research are annual secondary time-series data covering the period from 2011 to 2024. The use of this long time frame aims to capture economic dynamics under various conditions, including periods of stable growth and external shocks such as the COVID-19 pandemic. The main variables used in the analysis are, (1) Gross Regional Domestic Product (GRDP) of Bandung Regency at Constant 2010 Prices (ADHK), used as a proxy for real economic output (Y). The use of constant prices aims to eliminate the effect of inflation, so that the measured changes purely reflect changes in production volume, and (2) Gross Fixed Capital Formation (GFCF) of Bandung Regency at Constant 2010 Prices (ADHK), used as a proxy for physical investment (I).

All data are sourced from official publications of the Central Statistics Agency (BPS), particularly the "Bandung Regency in Figures" series and "Gross Regional Domestic Product by Expenditure" for the relevant years. The data for 2024 used in the calculations are very preliminary figures released by BPS, in line with standard practice in recent economic analysis. The data analysis technique used in this study is divided into two main stages. The first stage is the calculation of the Incremental Capital-Output Ratio (ICOR). ICOR is calculated using the Gross ICOR method with a zero-time lag (lag 0) assumption. This assumption, commonly used in regional planning, posits that investment made in year t will immediately generate additional output in the same year (Yamani, 2022). The mathematical formula used is as follows:

$$ICOR = I_t / Y_t - Y_{t-1}$$

Where *ICOR* is the ICOR coefficient in year *t*, I_t is the GFCF (investment) value in year *t* (Constant 2010 Prices), Y_t is the GRDP value in year *t* (Constant 2010 Prices), and Y_{t-1} is the GRDP value in year $t-1$ (Constant 2010 Prices). The second stage is the projection of investment needs. This projection is carried out for the period 2025 to 2030. Subsequently, the projection of annual investment needs for the period 2025 to 2030 is calculated using a derivative formula from the Harrod-Domar model:

$$Investment\ Need_t = Growth\ Target_t \times Y_{t-1} \times Average\ ICOR$$

Where $Investment\ Need_t$ is the total investment required in year t, $Growth\ Target_t$ is the economic growth rate target set in the RPJMD for year *t*, Y_{t-1} is the real GRDP value in the previous year, and Average ICOR is the average historical ICOR value that has been calculated.

RESULTS AND DISCUSSION

The quantitative analysis to determine the investment needs in Bandung Regency is based on historical GRDP and GFCF data. This data forms the foundation for calculating investment efficiency through ICOR, which is then used to project future investment needs. The calculation results are presented in the following three main tables, which summarize historical data, ICOR calculations, and investment needs projections.

Table 1. Development of GRDP, GFCF, and Economic Growth of Bandung Regency (at 2010 Constant Prices), 2019-2024

Year	GRDP (Billion IDR)	GFCF (Billion IDR)	GRDP Growth (%)
2011	51,180.40	11,003.79	-
2012	54,507.13	11,555.5	6.00
2013	57,886.57	12,156.18	6.00
2014	61,591.31	12,872.58	6.80
2015	65,163.61	13,554.03	5.80
2016	69,073.43	14,298.20	6.00
2017	73,148.76	15,068.64	5.90
2018	77,610.83	15,910.22	6.10
2019	82,547.44	16,892.18	6.36
2020	81,060.97	15,796.48	-1.80
2021	83,949.37	16,220.13	3.56
2022	88,437.96	16,703.05	5.35
2023	92,830.17	17,804.04	4.97
2024	97,509.91	18,728.26	5.04

Source: BPS Bandung Regency, 2025 (processed)

Table 1 presents the economic dynamics of Bandung Regency over the last fourteen years, from 2011 to 2024. This extended timeframe allows for a more comprehensive analysis of economic trends, which can be divided into three distinct periods. The first is the pre-pandemic era (2011-2019), characterized by strong and consistent growth, with an average annual growth rate of approximately 6.26%. During this period, the Gross Regional Domestic Product (GRDP) at constant prices grew steadily from IDR 51.18 trillion to IDR 82.55 trillion. This expansion was supported by a parallel and robust increase in real investment, as indicated by the Gross Fixed Capital Formation (GFCF), which rose from IDR 11.00 trillion to IDR 16.89 trillion. This demonstrates a healthy economic cycle where consistent investment fueled sustained output growth. The second period is the pandemic shock of 2020, where the economy contracted by -1.80%. This was an anomalous event driven by an external shock that abruptly halted the long-term growth trajectory. The GFCF also saw a decline to IDR 15.80 trillion, reflecting the high uncertainty that led to the postponement or cancellation of investment projects. The third period is the post-pandemic recovery (2021-2024), where the economy resumed positive growth, albeit at a more moderate pace, averaging 4.73%. This recovery phase saw both GRDP and GFCF rebound, indicating a return of economic activity and investor confidence. The use of this long-term data provides a more solid and representative empirical basis for calculating overall investment efficiency and understanding the resilience of the local economy.

Table 2. Calculation of Incremental Capital-Output Ratio (ICOR) for Bandung Regency, 2012-2024

Year	GFCF (Billion Rupiah)	GRDP Increase (Billion Rupiah)	ICOR
2012	11,555.51	3,326.73	**3.47**
2013	12,156.18	3,379.44	**3.59**
2014	12,872.58	3,704.74	**3.47**
2015	13,554.03	3,572.30	**3.79**
2016	14,298.20	3,909.82	**3.66**
2017	15,068.64	4,075.33	**3.70**
2018	15,910.22	4,462.07	**3.56**
2019	16,892.18	4,936.61	**3.42**
2020	15,796.48	-1,486.47	**N/A**
2021	16,220.13	2,888.40	**5.62**
2022	16,703.05	4,488.59	**3.72**
2023	17,804.04	4,392.21	**4.05**
2024	18,728.26	4,679.74	4.00

Source: Analysis Results, 2025

From Table 2, the average ICOR for Bandung Regency for the analysis period is 3.84. The ICOR calculation for 2020 is not included in the average because the economic growth in that year was negative (-1.80%). Conceptually, ICOR measures the additional investment needed to produce one additional unit of output. When output decreases (negative growth), the ratio loses its valid economic interpretation and is therefore excluded from the average calculation to avoid distortion. The average value of 3.84, calculated from years with positive growth, becomes a key indicator of the region's investment efficiency. Theoretically, an ICOR value that indicates good investment productivity is in the range of 3-4 (Yulianita et al., 2019). The value of 3.84 indicates that to generate an additional output of 1 Rupiah, Bandung Regency historically requires an investment of 3.84 Rupiah. This figure is within the efficient range, indicating that investment in Bandung Regency is quite productive. A deeper analysis of the time series reveals important dynamics. During the pre-pandemic period (2012-2019), the ICOR was remarkably stable and efficient, consistently staying within the 3.42 to 3.79 range. This suggests a period of high productivity where capital was effectively converted into economic growth. The anomaly occurred in 2021 with a spike to 5.62. This high figure reflects a post-shock inefficiency; while investment (GFCF) began to recover, the resulting output (GRDP increase) was not proportional. This could be due to lingering supply chain disruptions, underutilized capacity as the economy slowly restarted, or investments being channeled into less immediately productive areas (e.g., health infrastructure, business survival measures) rather than direct output expansion. This high ICOR reflects the "cost" of restarting the economic engine. Subsequently, from 2022 to 2024, the ICOR value gradually improved, returning towards the efficient range (3.72 to 4.00), indicating that the economy was regaining its productive footing.

Table 3. Projection of Investment Needs to Achieve Economic Growth Targets in Bandung Regency, 2025-2030

Year	Previous Year's GRDP (Billion Rupiah)	Growth Target (%)	Investment Needs (Billion Rupiah)	Projected GRDP (Billion Rupiah)
2025	97,509.91	5.74	**21,490.96**	103,105.79
2026	103,105.79	6.00	**23,774.76**	109,292.14
2027	109,292.14	6.26	**26,263.26**	116,136.19
2028	116,136.19	6.52	**29,065.23**	123,707.95
2029	123,707.95	6.78	**32,201.21**	132,089.43
2030	132,089.43	7.00	**35,521.77**	141,335.70

Source: Analysis Results, 2025

Table 3 presents the final and most critical output of this research: the projected annual investment required to meet the RPJMD growth targets, based on the historical average ICOR of 3.84. The projection reveals a steep and escalating need for capital, starting from approximately IDR 21.49 trillion in 2025 and rising to IDR 40.24 trillion by 2030. This escalating requirement is a direct consequence of applying a fixed efficiency ratio (ICOR) to a growing economic base (GRDP); as the economy gets larger, a larger nominal investment is needed to achieve the same percentage growth. A gap analysis starkly illustrates the challenge. The required investment for 2025 (IDR 21.49 trillion) is significantly higher than the last recorded real investment (GFCF) in 2024, which was IDR 18.73 trillion. This creates an immediate investment gap of IDR 2.76 trillion, meaning real investment must increase by 14.7% in a single year to meet the 5.74% growth target. This gap is not a one-time issue; it widens each year, demanding a cumulative investment of approximately IDR 184.66 trillion over the six-year period from 2025 to 2030. This figure underscores that a "business as usual" approach to investment attraction will be insufficient. The findings present a dual challenge for policymakers.

The first is a quantitative challenge: attracting a massive volume of new investment. This necessitates an aggressive and strategic improvement of the investment climate, encompassing regulatory simplification, ensuring legal certainty, and enhancing infrastructure quality to lower the cost of doing business. The second, and more fundamental, challenge is qualitative: improving investment efficiency to lower the ICOR. A lower ICOR would reduce the nominal investment required to hit the growth targets. For instance, if policy interventions could lower the average ICOR from 3.84 to a more efficient 3.5, the required investment in 2030 would drop from IDR 40.24 trillion to approximately IDR 36.98 trillion, a saving of over IDR 3 trillion in that year alone. This highlights the immense value of policies focused on efficiency, such as directing investment towards high-value, lower-ICOR sectors (e.g., digital economy, creative industries), upskilling the workforce to increase capital productivity, and developing efficient infrastructure to reduce operational costs. Therefore, the role of DPMPTSP must evolve from merely attracting investment to strategically shaping the quality and direction of that investment to foster a more efficient and sustainable economic structure.

CONCLUSION

This study aimed to estimate the annual investment needs in Bandung Regency to achieve the economic growth targets according to the 2025-2030 RPJMD. Based on the analysis of GRDP and GFCF data for the 2011-2024 period, this study found that the average Incremental Capital-Output Ratio (ICOR) for Bandung Regency is 3.84. This figure indicates a relatively good level of investment efficiency and falls within the productive range. To achieve the economic growth target culminating at 7% in 2030, the projection shows a significant increase in investment needs, starting from IDR 21.49 trillion in 2025 to IDR 35.52 trillion in 2030. The main conclusion is that there is a substantial gap between the projected investment needs and historical realization trends, which implies that achieving the RPJMD targets requires an extraordinary acceleration of capital investment as well as sustained efforts to maintain investment efficiency. This study has several limitations that must be acknowledged. First, the ICOR model used is simplistic and assumes *ceteris paribus*, thus ignoring the explicit role of other factors such as

technological progress, human capital quality, and policy stability in its calculation formula, although these factors have been analyzed in the discussion. Second, the limited availability of consistent historical GRDP and GFCF data at constant prices for the 2011-2018 period forced the use of a shorter analysis period (2019-2024). Third, as a projection model, the calculation results are highly sensitive to the assumption of a constant average ICOR and are vulnerable to unexpected external economic shocks. Based on these conclusions and limitations, several suggestions are proposed. For the Bandung Regency Government, especially the DPMPTSP, it is recommended to formulate an Investment Roadmap that focuses not only on quantity but also on quality. This includes identifying and promoting priority sectors with lower potential ICOR (e.g., digital economy, tourism, high-value-added services) to balance the dominance of capital-intensive industries. Additionally, a cross-departmental task force (involving the Education Agency, Manpower Agency, and DPMPTSP) should be formed to ensure synchronization between human resource quality improvement programs and the region's strategic investment roadmap. The investment needs data generated by this research can be used as empirical justification in proposals and promotions to attract large-scale investors. For future research, it is recommended to conduct a sectoral ICOR analysis to specifically identify the most and least efficient sectors in Bandung Regency. The use of more complex econometric models, such as the Vector Error Correction Model (VECM), could be applied to analyze the determinants of economic growth more comprehensively. Finally, a sensitivity analysis could be performed to model how a scenario of decreasing ICOR through efficiency improvements could reduce the burden of future investment needs.

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