The Mediating Role of Investment: Analyzing the Causal Impact of Inflation on Economic Growth and the Influence of Capital Expenditure

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: This paper aims to test the impact of inflation and capital expenditure on regional growth of economy employing the investment as a mediating variable in Central Java from 2017 to 2022.
Study Design: The population of this research is 35 districts or cities in Central Java Province for 2017–2022 period. This paper uses secondary data or quantitative approach taken from the Statistics Central Bureau.
Methodology: The method used to collect data is purposive sampling with data analysis using the Structural Equation Modeling model. Data is processed through the Smart PLS 4.0 program applying Structural Model analysis (Inner Model) as an analysis technique of data.
Results: The findings of this paper suggest that: (1) Inflation had no effect significantly on growth of economy. (2) Investment level had an effect positively on growth of economy. (3) Inflation had an effect negatively on the investment. (4) Investment had an effect significantly in mediating the

causality of the inflation to growth of economy. (5) The capital expenditure had an effect positively on growth of economy.

1. INTRODUCTION

Economic growth is an economy condition in a country or in a regional experiencing a process of change continuously in achieving an increasing trend over a specified period. One indicator of the success in growth of economy is the achievement of regional development. By paying attention to economic growth, an overview can be obtained whether development policies in a region have been oriented toward sustainable economic growth to increase people's welfare [1].

According to Table 1, the Statistics Central Bureau (BPS) informs that there is a gap in economic growth. DKI Jakarta Province is recorded as still being most dominant in contributing to national economic growth figures. During the 2020-2022 period, the Province of Central Java occupies the lowest position in the Java Island compared with the other provinces. This is a problem that needs to be studied considering that this province is strategically located in the middle of Java Island and has relatively the same resources with the others. In addition, regional income growth in Central Java Province tends to fluctuate from 2020-2022. The existence of these fluctuations is a phenomenon that needs to be examined, in relation to regional economic growth. Therefore, further investigation is needed regarding the determinants that affect economic growth in the province of Central Java.

A number of studies examined several variables influencing the economic growth including the variables of investment, exports, labor and government spending [2]. In addition, Simanungkalit [3] stated that one of the references used to indicate the stability of a country's economy is the inflation. Hence, it one of the variables that potentially influences growth of economic. This paper decides the inflation and adds a second independent variable, namely capital expenditure. The reason for choosing capital expenditure is that this factor is the most capable of describing the government abilities in financing its governance, progress, and service for the public.

Inflation is a monetary phenomenon in a country where fluctuations in inflation tend to result in economic turmoil. High and unstable inflation has a negative impact on growth of economy thereby it can cause economic instability. In addition, inflation also greatly affects investment. This is because the increased inflation rate would reduce the amount of output produced by companies. Hence, investors will reduce the amount of investment [4]. Several studies related to inflation have been carried out, including studies by Salim and Fadilla [5]; Simanungkalit [3]. They examine the effect of inflation on Indonesia's economic growth where the result suggests that inflation had a negative impact on growth of economy for 2016-2020. In contrast, several studies argue that inflation does not have a negative impact on growth of economy [6,7].

To solve the research gap, this study proposes investment as a mediating variable. The reason for choosing Investment as a mediating variable is that it is a causal factor for economic growth and has a role as dependent variable for the inflation. The Harrod-Domar Theory states that there was an effect positively from investment activity toward the economic growth process for a country. Because, in its condition, investment is included in the national income which will then affect the country's economic growth. In this theory, investment activity is considered as an important variable to influence the growth economy. Based on the background described above and the research gap, we chose the investment as the mediation factor for the association between the inflation and growth of economy and add capital expenditure as independent variable studied in entire cities of Central Java Province.

2. LITERATURE REVIEW

The theory of Keynesian consists of a curve relating an aggregate demand to an aggregate supply that can describe the relationship between the inflation rate and the economic growth. The short-term curve shows the association positively for both factors and the long-term curve shows the association negatively for both factors. Keynesianism believes that market mechanisms are rigid and limit economic activities that should be able to develop more widely. Hence, the rigidity of the market

mechanism will directly affect the country's economy and population.

The theory of Harrod-Domar suggests that there was an association positively between activity of investment and growth of economy in a country. In this theory, investment activity is considered as an important factor and has two roles at once in influencing the economy, namely investment has a positive relationship with state income and investment can raise the capacity of the economy production by increasing the stock of capital.

Growth of regional economy was measured by comparing the GRDP (Gross Regional Domestic Product) of a certain year with the last year. In general, economic growth is realized by increasing new economic activities in society so that the greater the value of money spent by a regional government through its expenditure posts [8]. It will directly or indirectly increase new economic activities and provide a multiplier effect that leads to an increase in GRDP [9,10]. Growth of regional economy in this study is calculated to describe the real growth of the economy sector from year to year using GRDP at constant prices.

$$Regional\ Economic\ Growth = \frac{GRDP_t - GRDP_{t-1}}{GRDP_{t-1}} x100$$

Inflation is a condition in which the price of goods in general increases continuously for an unspecified time and is at a high level [11]. Inflation is a monetary phenomenon that must be watched out for because inflation does not only interfere with economic aspects but also inflation can interfere with non-economic aspects such as social, political, and cultural society [4]. The inflation rate in this study is calculated using the GDP (Gross Domestic Product) deflator.

$$Inflation\ Rate = \frac{Nominal\ GDP}{Real\ GDP} x\ 100$$

According to Chen et al. [12], government investment is an action by the government to spend funds in a specified period with the expectation of obtaining benefits for the society in the future period. It can be a project including physical or non-physical in nature. In general, the funds for investment could be come from domestic or foreign investors [13,14]. Hence, the sources of investment funds are the sum both national and global funds. In the long term, investment growth would have large benefit on growth of economy where goods and services used in the present are useful in the future [15].

Capital expenditures in the context of district or city governments are government expenditures as part of the expenditure budget intended for tangible fixed assets that can create future benefits for more than one accounting period [16]. In the accounting standard principles of government (PSAK), it consists of five basic classifications, namely buildings and constructions, equipment and machinery, irrigations and networks, roads, and other physicals capital expenditures.

According to the Keynesian theory, inflation in the long term will have an impact negatively towards growth of economy. This is expressed in the long-term curves of aggregate demand-supply showing an association negatively for the inflation and growth of economy. By referring to the study results by Kusumatrisna et al. [17]; Simanungkalit [3]; Salim and Fadilla [5], it was found that the inflation rate had an effect negatively towards growth of economy.

H₁: Inflation has an influence negatively towards growth of economy.

According to Astuti [18], economic investment for regional government is all activities worked by government to spend the fund from regional expenditure budget to some assets during a specified period. It was expected to realize the economic purposes and society benefits. In the Harrod-Domar theory, it is stated that the magnitude of investment activity had an influence positively towards growth of economy. The previous studies by Prasetyo [19] found that there was an impact positively from investment activity to growth of economy.

H₂: Investment has an influence positively towards growth of economy.

Inflation is very influential on the vicissitudes of production. When inflation occurs, prices would soar, thereby reducing people's interest in purchasing power. In addition, when the power decreases, company profits would decrease which could discourage investors from investing because the results obtained are less than usual. The previous studies by Batubara et al. [20]; Bakti and Alie [21]; and Siregar [4] found that there was an effect negatively on an economic investment.

Table 1. Regional income of the province for 2020-2022

Province	Year		
	2020	**2021**	**2022**
DKI Jakarta	170.089,02	174.941,72	182.908,69
Banten	52.729,40	55.207,80	60.990,14
East Java	39.686,19	40.821,89	42.717,44
West Java	30.180,54	30.907,59	32.182,15
Yogyakarta	27.754,47	28.918,82	30.011,22
Central Java	26.483,68	27.144,18	28.362,24

Source: BPS, data processed

H₃: Inflation has an influence negatively towards investment.

Inflation has a strong influence on the development of investment in regional area. With an increase in inflation, the amount of investment in an area will decrease. In contrast, when it is lower, then the amount of investment will increase. It is because investors will prefer to invest in areas with low inflation rates. Hence, the lower investment will affect the decline in the economic level of a region.

H₄: Investment mediates the causality effect from the inflation on growth of economy.

The fifth hypothesis consists of investigation on the impact of capital expenditure. With the increase in capital expenditure, it means that social overhead capital (SOC) is increasing, including increasing and good infrastructure carried out by the local government will spur economic growth in the region [22,23]. Based on research conducted by Yunus and Amirullah [16]; Saputra et al. [24]; Waryanto [25] found that there was an effect positively from capital expenditure on growth of economy.

H₅: Capital expenditure has influence positively towards growth of economy.

Based on the explanation of the theory and the various identified factors, the research model of this study is described at Fig. 1.

3. METHODOLOGY

This study utilized a quantitative approach method that assesses the influence of inflation and capital expenditure on regional economic growth where the investment has a potential role as a mediating variable. The technique used to collect the data of this study was a purposive sampling. The source of all secondary data was obtained from regional income and expenditure budget (RIEB/APBD) realization reports issued by the BPS and the Ministry of Finance (Directorate General of Financial Balance). The population in the data consisted of 35 city or district governments located in Province of Central Java. The sample periods were during 2017-2022 in the form of inflation, investment data, and reports on the realization APBD and GRDP data.

This study applies quantitative technique and has ratio scale data to measure the research variables. The quantitative technique is a research technique where we can calculate and analyze the data collected to create the values of average, maximum, minimum, standard deviation, and others. In addition, ratio scale data is a type of quantitative data scale that makes it easier for statistics to find out the differences between variables and provide a sequence of data. This type of data makes it possible to carry out all kinds of calculations and draw definite conclusions.

This study uses three types of variables including: the independent variables are inflation and capital expenditure. Meanwhile, the dependent variable used is economic growth, and the mediating variable used is investment. The statistical approach and software used to analyze the data are PLS-SEM and SmartPLS 4. This approach is adopted from researches by Rosid et al. [26]; Suzana et al. [27]; Triayuni et al. [28]. The structural equation model to describe the relationship among variables of this study was expressed as follows:

$$EG = \alpha + \beta_1 IR + \beta_2 CE + \beta_3 MI + \varepsilon$$

$$MI = \alpha + \beta_1 IR + \varepsilon$$

Where:

EG = Economic Growth;
α = Constant;

β = Regression Coefficients;
IR = Inflation;
CE = Capital Expenditures;
MI = Investment;
ε = Error

4. RESULTS AND DISCUSSION

The value of R^2 that more than 0 means that there is a predictive relevance in the model. On the contrary, when the value of R^2 is less than or similar to 0, there is less predictive relevance in the model. The inner model generated from partial least square approach was presented at Table 2.

Table 2. The value of R^2

Variables	R-Square
Investment	0.053
Economic Growth	0.142

Source: Output from Smart-PLS

The value of R^2 for the investment variable appears 0.053. It means that investment could be explained by the inflation variable of 5.3%, while 94.7% was explained by the other independent variables not included in the model. Meanwhile, the value of R^2 for the economic growth variable is 0.142, which suggests that economic growth could be explained by inflation, investment, and capital expenditure variables of 14.2%. Meanwhile, the remaining of 85.8% was explained by the other independent variables not included in the model.

The evaluation for the construct model is then worked by computing the predictive relevance of Q^2 value as follows:

$$Q^2 = 1 - (1 - R_{TKM.}^2)(1 - R_{UHH.}^2)$$

$$Q^2 = 1 - (1 - 0.053)(1 - 0.142)$$

$$Q^2 = 1 - (0.947)(0.858)$$

$$Q^2 = 0.188$$

Based on this calculation, the Q^2 value obtained is 0.188 which indicates that the model formed is good enough ($0 < Q^2 < 1$).

Referring to process of bootstrapping, the result shows that the largest value for path coefficients was shown by inflation on investment of 4.233 (Table 3). Then, the smallest value is on the impact from inflation to economic growth of 0.393. In addition, the bootstrapping process could decide the hypothesis testing in this study. The decision criteria to conclude the hypothesis rejection are t-statistic > 1.96 or the level of significance of 0.05 < p-value and the sign of the coefficient. Table 3 presents the t-statistic and p-values for this analysis. Furthermore, Fig. 2 describes the output of research model as the result of data processed.
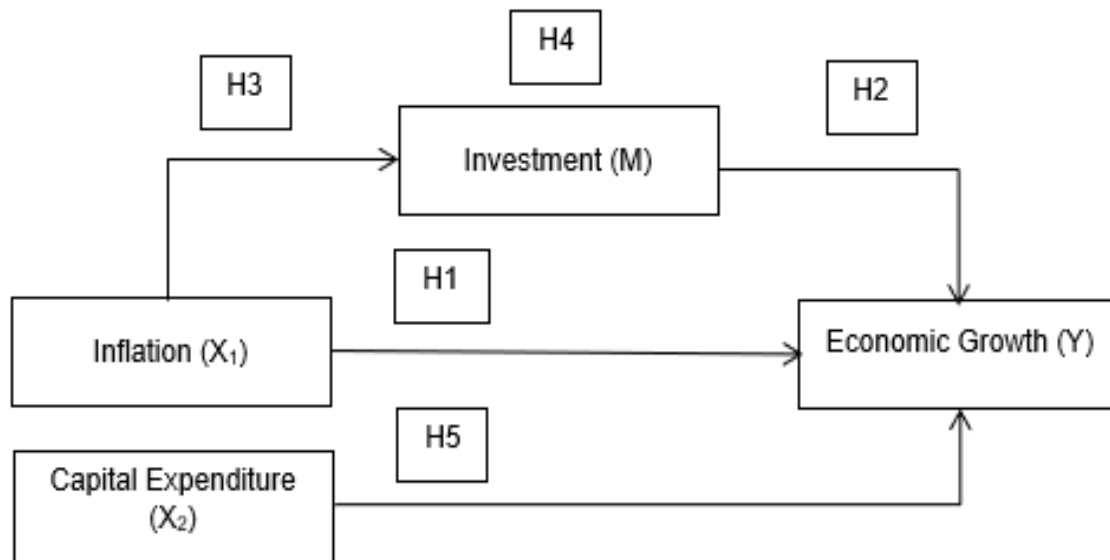

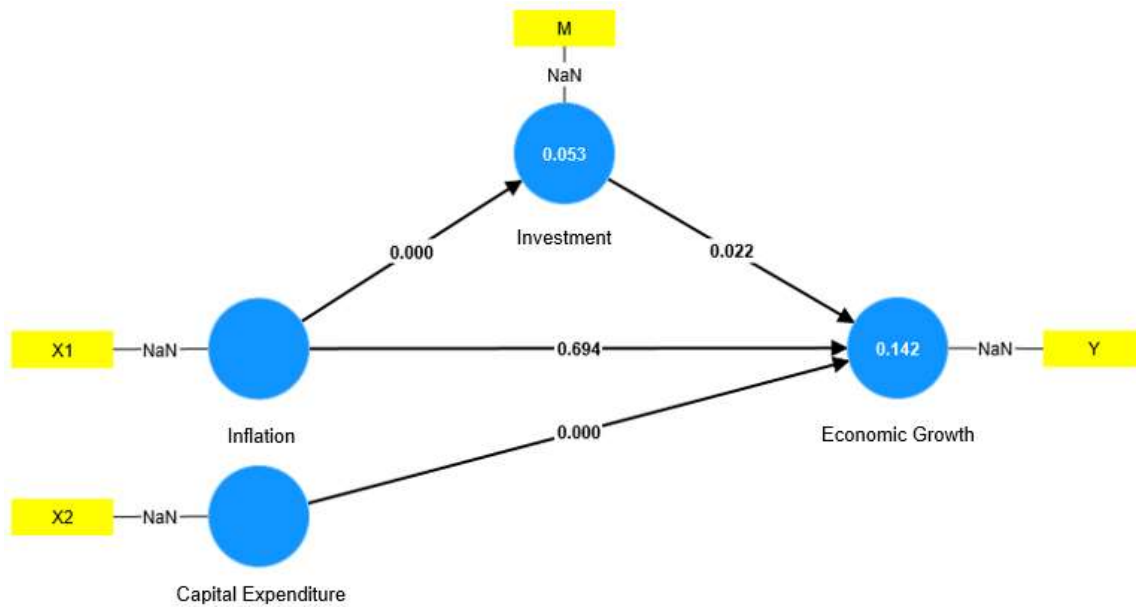**Fig. 1. Research model of economic growth**

Fig. 2. Results of the research model

Table 3. The values of path coefficient

Information	Original sample (O)	Sample average (M)	Standard deviation	T Statistic	P Values
CE → EG	0.286	0.287	0.072	3.963	0.000
IR → MI	-0.231	-0.230	0.054	4.233	0.000
IR → EG	-0.030	-0.033	0.075	0.393	0.694
MI → EG	0.174	0.170	0.076	2.287	0.022
IR → MI → EG	-0.040	-0.039	0.020	1.989	0.047

Source: Output from Smart-PLS

The test of the first hypothesis is whether the inflation rate has an impact negatively on growth of economy. The results statistically indicate that the value of inflation rate coefficient is negative -0.003 with the t-statistic 0.0393. Hence, we could decide that H_1 is rejected where the t-statistic is less than 1.96 or probability-value (0.694) is more than 0.05.

The test of the second hypothesis is whether the investment has an impact positively on growth of economy. The results statistically indicate that the value of investment coefficient is positive 0.174 with the t-statistic 2.287. Hence, we could decide that H_2 is accepted where the t-statistic is more than 1.96 or probability-value is less than 0.05. In addition, with the same procedure, we can decide that the third to the fifth hypotheses are accepted.

Referring to the results of the hypotheses testing, the next sections are the discussion to explain the results as follows.

4.1 The Impact of Inflation on Economic Growth

The first statistical result suggests that the inflation rate did not have an effect on the growth of economy. It was not in accordance with the first hypothesis proposed, which states that inflation rate has an impact negatively on growth of economy. Hence, any change in the inflation in districts located at Central Java Province would not be followed directly by a decrease in growth of economy.

The absence of an effect on the inflation rate means that an increased inflation would cause purchasing power of consumers to decrease because the prices of goods increase, meanwhile the income of consumers remains constant thereby it does not cause a decrease in economic growth [29]. This finding was not in line with studies by Kusumatrisna et al. [17]; Simanungkalit [3]; Salim and Fadilla [5]

suggesting that inflation had a significant negative impact on economic growth.

4.2 The Impact of Investment on Economic Growth

The second statistical result suggests that the investment activity has an effect positively on the growth of economy, which is in accordance with the second hypothesis proposed. Hence, the increase in the fund investment by district or city government would have an impact on improving the economy in a region. The finding of this study is in line with evidence by Prasetyo [19]; Astuti [18]. Likewise, the finding is in line with the Theory of Harrod-Domar suggesting that one of the important factors influencing economic growth is investment funds [30].

Investment is a main determinant in affecting the regional income level. The district government activity on funds investment leads to a society to achieve greater sustainable economic activities, employment opportunities, and regional income as well as to create a level of prosperity [31,32]. The existence of investment in Central Java Province can encourage and accelerate economic growth. When the amount of investment is high, the available funds for needs of regional development would be larger which would cause an increasingly large multiplier effect. In addition, larger funds investment would have an impact on increasing technology transfer thereby the production becomes more effective and efficient. Furthermore, it would increase production capacity that could create higher economic growth.

4.3 The Impact of Inflation on Investment

The third statistical result suggests that the inflation rate has an effect negatively on the magnitude of investment by district/city governments. This result is in accordance with the third hypothesis proposed. Hence, an increase in the inflation rate will reduce the funds of investment in the district/city area.

The finding of this study is similar to conclusions by Batubara et al. [20]; Bakti & Alie [21]; Siregar [4] suggesting that the amount of funds invested by government was influenced negatively by the inflation rate. The higher inflation could rise the investment project risk thereby the amount of investment quantity might decrease. In addition, higher inflation rate in the long run could reduce the terms of debt maturity [21]. The lower

inflation and prices stability are indicators for investors to take into consideration when investing in a district/city area.

4.4 Mediation of Investment on the Effect of Inflation on Economic Growth

The fourth statistical result indicates that the investment mediates the causality effect from inflation rate towards growth of economy for districts and cities in Central Java Province. This result is the same as the fourth hypothesis proposed. Indirectly, the investment could cause the inflation has an impact negatively on the growth of economy. In fact, it has no impact directly to the growth of economy.

This finding suggests that to increase investment in Central Java Province, the local government needs to reduce the inflation rate so that economic growth can increase. Hence, inflation greatly affects investment where if an area experiences high inflation growth, this will cause investors to be reluctant to invest. Therefore, this will have an impact on decreasing the growth of economy.

4.5 The Impact of Capital Expenditure on Economic Growth

The fifth statistical result indicates that the capital expenditure has an impact positively on growth of economy. This result is similar to the findings by Yunus and Amirullah [16]; Saputra et al. [24]; Waryanto [25]; Zulkarnain et al. [33] which argue that capital expenditure disbursed by the government could able to build facilities and infrastructure that have long-term benefits to increase regional economic growth. In other words, an increase in capital expenditure means an increase in social overhead capital (SOC), including an increase in the infrastructure worked by the local government that would spur economic growth in the region [22,23].

The availability of good infrastructure through regional development can trigger efficiency in various sectors and increase community productivity so that welfare growth can occur [34]. This welfare growth was related to an increased economic growth, in line with what was stated by Halim (2012) in the implementation of autonomy. Seeing the amount of financial resource capacity owned by the region is a picture of the regional government independence that is able to develop its region and to compete

fairly with other regions in achieve true autonomy.

5. CONCLUSION

According to the analysis and discussion that emphasize on the regional economic growth in all district and city of Central Java Province during the 2017-2022 period, we could conclude as follows:

1. There is no influence directly from the regional inflation to growth of regional economy.
2. There is an influence positively from the amount of regional investment to growth of regional economy.
3. There is an influence negatively from the regional inflation to the amount of regional investment.
4. The investment could mediates the causality effect of the inflation on the growth of economy. The reduction in inflation would have an influence on increasing the investment activity where the economic growth in the region would increase.
5. There is an influence positively from the amount of capital expenditure to growth of regional economy.

The implications that can be provided based on the discussion and conclusions above are as follows:

1. Because the investment can mediate the indirect effect of inflation on economic growth, it is possible to increase economic growth by increasing high investment. To increase high investment, the district and city government in Central Java Province needs to reduce the inflation rate by adopting a policy for the public to reduce demand for goods where the inflation will decrease and the investment will increase which creates higher economic growth.
2. Given that capital expenditure is the most influential variable, the regional government should provide policies for capital expenditure budget management to improve regional economic conditions.
3. The outside factors of this study influence the remaining 85.8 percent of the economic growth. Further research is expected to include other determinants of economic growth such as the level of technology and the number of labor.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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