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Guest Editors: Prof. Irwan Trinugroho, Prof. Putra Pamungkas and Assoc. Prof. Dr. Evan Lau

Introduction

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News

New Editor for The Botulinum Journal

9 September, 2022

Dr. Fabrizio Anniballi from Istituto Superiore di Sanità in Italy has been appointed to take over editorship of the The Botulinum Journal.

New Editor for International Journal of Services, Economics and Management

7 September, 2022

Prof. Natalia Kryvinska from Comenius University in Bratislava has been appointed to take over editorship of the International Journal of Services, Economics and Management.

International Journal of Manufacturing Research indexed by Clarivate Analytics' Emerging Sources Citation Index

31 August, 2022

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Inderscience is pleased to announce that the International Journal of Manufacturing Research has been indexed by Clarivate Analytics' Emerging Sources Citation Index.

Prof. Lihui Wang, Editor in Chief of the journal, says, "The International Journal of Manufacturing Research, launched in 2006, is dedicated to disseminating the latest advances in manufacturing research at the levels of devices, machines, processes and systems. The journal is sponsored by the Swedish Production Academy, and after more than sixteen years of valuable contributions from authors, the editorial board, the publisher and the research community, IJMR has established itself as a high-quality publishing venue for researchers worldwide. As Editor in Chief, I am delighted that the journal is now indexed by Clarivate Analytics' Emerging Sources Citation Index, as part of the Web of Science Core Collection. Going forward, IJMR aims to further advance the state of the art in manufacturing research, in order to contribute to a sustainable and resilient environment for all."

New issue alerts

New Editors for International Journal of Information and Operations Management Education

26 August, 2022

Dr. Luna Leoni from the University of Rome "Tor Vergata" in Italy has been appointed to take over editorship of the International Journal of Information and Operations Management Education. She will be joined by Dr. Matteo Cristofaro, who will take on the role of Executive Editor.

New Editor for International Journal of Computational Intelligence Studies

25 August, 2022

Prof. Paolo Crippa from the Università Politecnica delle Marche in Italy has been appointed to take over editorship of the International Journal of Computational Intelligence Studies.

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Financial development and regional human development: does capital expenditure matter?

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Abstract: This paper examines the impact of financing decision (FD) and financial inclusion (FI) on the human development index (HDI). Capital expenditure (CE) as a contingency factor that can improve the impact of financing decisions on HDI. Small and medium-size enterprises financing (SMEs F) and income equality (IE), both are used as control variables. Panel data is consist of all province in Indonesia for seven years since issued government's regulation regarding sustainable development. Data were analysed by moderated regression analysis. The result of this study stated that the impact of FD and FI on HDI is statistically significant. Capital expenditures can be strengthening the impact of financing decisions on HDI.

Keywords: HDI; human development index; financing decision; capital expenditures; financial inclusion; SME financing; income equality.

Reference to this paper should be made as follows: Chandrarin, G., Sanusi, A., Roikhah, E., Yuniawan, D. and Cahyaningsih, D.S. (2022) 'Financial development and regional human development: does capital expenditure matter?', *Int. J. Trade and Global Markets*, Vol. 15, No. 3, pp.294–312.

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This paper is a revised and expanded version of a paper entitled 'The ımpact of financing decision and financial ınclusion on human development ındex (case study in Indonesia)' presented at *SMICBES The 5thSebelasMaret International Conference on Business, Economics and Social Sciences*, The Anvaya Beach Resort, Bali, Indonesia, 17–19 July, 2018.

1 Introduction

Raplay (2007) stated that following the Second World War, the main goal of development is to generate income, establish community access to various products and services leading toward advanced society. In the outset, progress was measured with GDP, which was not progressing well. Afterward, experts developed a new measurement called HDI. The HDI model stressed on the people's daily experience, including socio-political-economic and environment processes (Khodabhaksi, 2011). Although many countries had made progress in gross domestic product (GDP) and human development index (HDI), nevertheless global development records still encountered many difficulties including the emergence of development disparity. Poverty and hunger continued to devastate many countries, including social and environmental structures, bringing a negative impact on development. Previous research analysed economic growth as the main goal of development, not followed by improvement in the quality of human life. (Todaro and dan Smith, 2009). FD was the administration's decision in financing development. The option was to use internal capital (income/revenue) or to combine it with external capital (debt/loan). Reinhard and Li (2008) stated that companies with better access to external capital will be able to adjust their financial structures faster outperform rather than the other companies. In reality, a number of regional administrations were reluctant to use debt, despite its huge financial capacity. On the other side, budget allocation for capital expenditure was relatively small.

A phenomenon in Indonesia indicates that allocation for capital expenditure (CE) is still low, below 25% in the average. Regional administration argued that their budget was insufficient to make a higher allocation in CE as most were allocated for routine and operational expenditures. In fact, capital expenditure besides encouraging economic growth also plays a role in reducing income disparity and community welfare (Jhingan, 2012). CE also affects consumption levels through a direct impact on technology and indirect impacts on investment incentives through financing (Irmen and dan Kuehnel, 2008). Thus, it should be suspected that CE also has an impact on HDI, both in improving purchasing power, the quality of education and health. Previous researches, one of them conducted by Qureshi (2009) revealed that in Pakistan, public expenditures could elevate indicators of HDI and economic growth. Public expenditure is the government's expenditures used to meet community needs. Included under public expenditures are a subsidy for education, health, work training, capital expenditure or infrastructure, such as the adoption of Information Systems or information technologies into business and government organisations (Fahrianta et al., 2018) and so forth. CE is more specific government expenditure, namely capital expenditures or infrastructure. The present phenomena seen in Indonesia is that the government has been trying to boost infrastructure development by using offshore loans. As such, the researchers also examined whether CE could strengthen the impact of FD toward HDI.

This research focuses on HDI which is influenced by FI and FD, because the authors want to prove the role of FI and FD supported by CE as moderating. In human resource development, large funding will be able to have/give an impact if human resources, as economic actors, have good abilities. The results of the study are expected to be used as a basis for the government is considering offshore loans to finance development, especially in allocating capital expenditure. Based on the results of this study we can see whether debt-financed CE would have a significant impact on development, both macro (measured with economic growth) and micro (measured with HDI).

2 Literature review

HDI is a tool to measure the success of development which illustrates the capability of the community to access resources to have a healthy and long life, enjoy education and meet their daily (Noorbakhsh, 1998). HDI aspects used in Indonesia are life expectancy, level of participation in Elementary School and Purchasing Power Index. In several countries, it is evident that expenses related to human development are influenced by poverty eradication (Ranis et al., 2000). UNDP's report on Human Development in 2016 revealed that the global level of poverty of $ 1.90 per day was estimated at less than 11% in 2013, while in 1990 it was 35%. A drastic reduction, particularly in East Asia and the Asia Pacific in which the proportion of people living with less than $ 1.90, dropped from 60.2 in 1990 to 3.5% in 2013, and South Asia, dropped from 44.6% to 15%. Therefore, in order to elevate HDI, the government has to improve economic growth as well as household consumption and income. In this issue, the government is obligated to generate income equality. On the other hand, by increasing their income, households will have the opportunity to save. The increase in community savings will influence economic growth.

Based on previous studies, for example, done by Irmen and dan Kuehnel (2008), it showed that the connection between CE and EG was good proof or evidence. This indicates that the increased utilisation of resources for unproductive expenditures holds a

close relation with slow economic growth. CE will stabilise consumption stability through direct influence toward technology and indirect influence toward investment incentive through (Irmen and dan Kuehnel, 2008). Infrastructure spending particularly financed through loans was proven as instrumental to stimulate the economy to work in maximal capacity (Bivens, 2014). Regression among countries indicates that EG impacted HDI in two aspects: firstly, EG impacted HDI through CE, namely infrastructure, and secondly, through income distribution (Ranis et al., 2000). Meanwhile, Kendall (2009) stated that community growth did not have a linear relation with the financial level. The lack of growth was in the financial sector, regional banks in particular. In Thailand, Malaysia, and the Philippines the banking industry has dominated the financial sector for a long time. Commercial banks were launched in these countries before capital markets and it has become the first option for funds for many households and firms (Wongpiyabovorn, 2016).

Qureshi (2009) developed a model using the dynamic system approach, to examine public expenditure (PE) against human development (HD) and economic growth (EG). This dynamic system approach is used to identify and help manage human development and economic growth pattern/development path in Pakistan given alternative policies against HD and EG. The results showed that the current level of public expenditures against HD was very low and the next decrease would have an irreversible negative impact toward HD and EG. A higher impact of public expenditures toward EG, would not bring HD and EG indicators to be better. On the contrary, the higher the impact of public expenditure toward HD, the result would not only improve HD indicators but would serve as a supplement to EG. This is consistent with the result of the previous study and fiscal policies, which indicates that thus far Pakistan has continuously disregarded HD.

This study differs from the study conducted by Qureshi (2009) which examined the impact of public expenditure towards HD, while this study uses CE which is a specific aspect of public expenditure, and CE as moderating variable (not independent), that can strengthen the impact of FD towards HDI in Indonesia. Based on the experience of developing countries, infrastructure plays an important role in improving economic structure and national economic competitiveness, which in turn will improve community welfare. The provision of infrastructure, including goods and services, is the main task of regional administrations (Bird and Slack, 2007), by managed under administration's strategy and financing structure (Slack et al., 2003). Therefore, financing strategy for public spending is key to regional management strategy (World Bank, 2005). In several countries, regional administrations rely on the transfer of funds from the central government to meet their requirements. The previous study recommended regional administrations to use local funds and loans to finance projects available in their areas because relying on transferred funds would lead to regional inequality and distortion in EG. Utilisation of local funds, which means taxes, loans and government spending are components of fiscal policies (Jhingan, 2012).

FD is reflected in the State Budget/Revenue and Spending (APBN). Financial Resources, which enable the government to increase government revenue, among others, offshore loans, domestic loans, print banknotes and fiscal (Burgess and Stern, 1993). According to Burgess and Stern, financing through loans and money printing as financing resources has been proven as unsustainable in an extended period. There are no substitutions for tax as sources of funding. Burges and Stern concluded that fiscal policies affected aggregate demands through consumer reports toward government spending

financed by taxes. The increase in public spending and the use of taxes to close budget deficit would increase output and employment (Sawyer, 2012). Skott (2015) also stated that fiscal policies are important in managing short and long term demands. Scott stated that if EG is slow, the government must increase investment level (saving rate); the government should also provide compensation to close gaps in policies requiring external financing (loans). On the contrary, Jhingan (2012) argued that a loan from the community is a better capital formation source instead of a tax. Loans to the community can divert non-productive public investment and stimulate productivity. This FD concept cannot only be implemented in government but also in profit-oriented companies, as stated by Reinhard and Li (2008). The companies with better access to external capital will be able to adjust their financial structures faster outperform rather than the others. The result of their study also stated that it appeared that it was an important issue to increase the efficiency of monetary policy measures in Indonesia and Malaysia.

A loan is one funding source if the government is in deficit. Deficit funding is the balance between budget and spending (a budget deficit), purposely made to increase national spending through loans or external funding (using loans). Deficit financing is used to fund public-funded government expenses/spending. The deficit may occur in terms of revenue and capital (capital account) that will be closed to reduce the balance of planned withdrawal of cash balance through the balance sheet, debt or issuance of a new currency. In reference to Jhingan (2012), deficit financing can be used to build an economy and social overhead such as transportation infrastructure, energy, schools, etc. By providing capital for the public, deficit financing is expected to improve productivity, income, and EG.

In addition, the deficit has an impact on income growth. Deficit financing will be followed by the possibility of inflation through increasing investment mechanism, an increase in income per capita and an increase in aggregate demand that cannot be directly followed by an increase in output. Inflation is put into consideration to have a negative impact by inhibiting the progress of savings, investment, foreign trade, and lower efficiency. According to Jhingan (2012), deficit financing will only work to accumulate capital without being contra-productive toward economy if the following conditions are met:

- rate of economic growth together with an increase in money supply
- growth of money supply
- an increase in government debt to society and taxes
- control of wages, prices of consumer goods and credit
- creation of a surplus of imports through import of capital goods and industrial raw materials
- increase in production and supply of goods
- increase in share capital, retained earnings and surplus budgets
- public's cooperation to price controlling.

Based on the above clarification, any financing policy that covers alternative sources of funding has positive and negative sides. This is concluded that funding policies will influence aggregate through government loan leading to an increase in consumption

rather than savings. In Indonesia, deficit financing and alternative financing is determined through risk limitation consideration and not to disturb fiscal sustainability. Fiscal sustainability index can be seen from deficit ratio against GDP and debt ratio against GDP (Finance Ministry of Indonesia, 2009).

Greiner and Semmler (2000) concluded that in a less stringent economic regime, additional debt/loan to finance public investment will have a positive impact on EG. Christie and Rioja (2012) also concluded that an increase in CE (public investment) toward EG depends on the method of financing funded by the government and debt and tax level by the time the policy is taken. They also proved that when the tax rate is low, financing using tax will promote EG in a longer period. On the other hand, the use of debt/ loan as a source of funding will also inflict financial loss due to the expense of interest from new loans and other costs from debt filing. This conclusion confirmed that the result of the previous study conducted by Easterly et al. (2007), which concluded that economic impact from infrastructure development for community interest not only depends on how they financed such infrastructure but also on the debt and tax level.

The following discussion is on CE. Capital is the provision of production factors so that investment in the form of capital goods can be used to improve production and work opportunity. The availability of capital goods will improve production capacity and productivity and drive EG. In low-income countries, the level of savings and investment is also low. This leads to insufficiency of capital accumulation and slows down capital investment. Under this condition, Jhingan (2012) argued that economic development can only be done through the state. In addition, government spending drives EG, government spending in the form of EG or investment spending also plays a role in reducing income disparities and social welfare (Jhingan, 2012).

The government's spending is government expenses to finance programs, capital to elevate community or social welfare. Under economic classification based on Law Number 17 the Year 2003 on state finance, government spending consists of employees, goods, capital, interest, subsidy, grants, social aid, and other expenses.

Under Government Accounting Standards Statement in Indonesia, CE is defined as the expenses budget to purchase fixed assets and other assets having benefits of more than one accountancy period (Accountancy Standard Committee, 2006). Under budget terminology, CE is defined as expenses made within the context of capital accumulation in the form of fixed assets, such as land, buildings, network, types of machinery and other forms of physical shape.

The government's spending in the form of capital expenses or investment spending also plays a role in lowering/reducing income disparities and social welfare (Jhingan, 2012). CE for education infrastructure, for instance, in addition, to absorb workforce (labour) also serves as an investment in human resources. Improvement of education and training levels will increase the wage level and reduce disparities. Through CE, the government can allocate resources for less interesting areas for the private sector. As such, development disparities among regions can also be reduced.

FI is an effort taken by the government to eliminate obstacles faced by the people in accessing financial services. FI is also the government's strategy to elevate EG through income distribution, poverty eradication and stabilisation of financial (Finance Ministry of Indonesia, 2014) indicated by the number of banks in certain areas/regions divided by the population (Chandrarin et al., 2018).

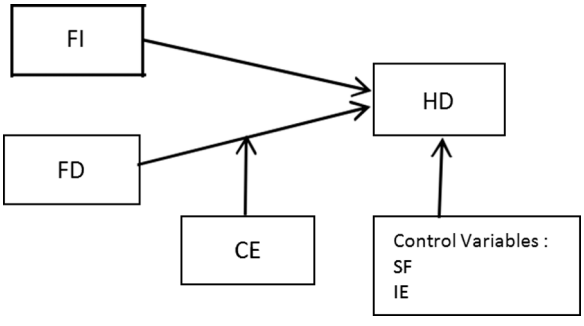
Babajide et al. (2015) concluded that FI had an impact on EG in Nigeria by improving labour productivity, capital Gross Domestic Bruto (GDP). On the other hand, Oluseye (2013) proved that EG in Nigeria was influenced by banking credits allocated for SMEs. Bank's loan proved to be able to increase SMEs' productivity and drive the national economy. This argument is parallel with Beck et al. (2000) opinion which stated that SMEs are more productive compared to big corporations due to their ability to absorb manpower.

Chandrarin et al. (2018) stated that the effect of FI statistically is significant both on EG and IE. Moderated by SMEs Financing, FI has the ability to evenly distribute national income. The conclusion is that the increase in income indicated by EG can evenly distribute through banks as a financial intermediary institution. The impact will be more significant if a credit (loan) is more allocated for SMEs, in fitting with SME's characteristics, which involves low-income communities. Bank loans to SMEs are key to significant contributions both in urban and rural areas (Trinugroho et al., 2014). According to Trinugroho et al. (2015), "poor local governance significantly impedes financial deepening, in the socioeconomically less developed regions; the level of financial deepening is lower than that of more developed regions". Indonesia as an archipelago has geographical characteristics that need to be considered in measuring the affordability of financial institutions. Microfinance institutions can bridge MSMEs to get financial assistance, microfinance institutions usually mobilise funds and collect risk, but this can no doubt be done on a large scale like traditional and formal financial institutions do (Sohag et al., 2015).

3 Research method

Data used in this study is panel data, which is a combination of cross-sectional data of 33 provinces in Indonesia with a data time series period of seven years, from 2010 to 2016, and 231 observations were collected. The use of the 2010–2016 data range put into consideration Presidential Instruction Number 3 the Year 2010 on Just/Impartial Development Program. Such Presidential Instruction became the basis for the applications of the sustainable development program in Indonesia with HD indicators are involved therein. FD and FI are two dependents which influence is tested against HDI, while CE is a contingency factor tested to supplement as controlling variables in order to minimise measurement errors in the model designed for this study. The research model is shown in the following Figure 1.

Figure 1 Research model



The regression equation can be formulated as follows:

$$\mathrm{HD}_{it} = \beta_0 + \beta_1 \mathrm{FD}_{it} + \beta_2 \mathrm{FI}_{it} + \beta_3 \mathrm{CE}_{it} + \beta_4 \mathrm{FD}_{it} * \mathrm{CE}_{it} + \beta_5 \mathrm{SF}_{it} + \beta_6 \mathrm{IE}_{it} + \varepsilon \tag{1}$$

where

HD = HDI

FD = Financing Decision

FI = Financial Inclusion

CE = Capital Expenditure

SF = SMEs Financing

IE = Income Equality.

HDI is measured by the average of life expectancy index formula, level of elementary school participation and purchasing power index, formulated as follows:

$$\mathrm{HDI} = \frac{(\text{life expectancy index} + \text{level of elementary school participation} + \text{purchasing power})}{3} \tag{2}$$

FD is measured by a number of loans divided by the total funding × 100%, formulated as follows:

$$\mathrm{FD} = \left(\frac{\text{number of loans}}{\text{total funding}} \right) \times 100\% \tag{3}$$

FI is measured by a number of bank offices, branch offices, and bank cash offices in each province, formulated as follows:

$$\mathrm{FI} = \text{number of bank offices, branch offices, and bank cash offices in each province} \tag{4}$$

CE is measured by the capital expenditure divided by the total of expenditure × 100%, formulated as follows:

$$\mathrm{CE} = \left(\frac{\text{The capital expenditure}}{\text{total of expenditure}} \right) \times 100\% \tag{5}$$

SMEs F and IE are added as a control variable with the purpose to minimise the measurement error of the developed model. SMEs F is measured by the total of loans allocated for SME sectors in each province. IE is measured by a Gini ratio proxy that is formulated as follows:

$$G = 1 - \sum_{k=1}^{n} (X_k - X_{k-1})(Y_k - Y_{k-1}) \tag{6}$$

The data in this study are secondary data from several sources including the Ministry of Finance of the Republic of Indonesia, BI (central bank of the Republic of Indonesia) and BPS (Central Bureau of Statistics). FD and CE data are processed and collected from sources from the Ministry of Finance of the Republic of Indonesia. FI data and SF data are processed from the BI. While for HDI and IE data collected from the BPS.

Data is analysed using moderated regression analysis (MRA) to test the impact of FD and FI toward HDI and CE as a contingency factor, which tested the impact of FD against HDI. MRA or interaction test is a multiple linear regression application in a regression equation that contains elements of interaction, namely multiplication of two or more independent variables (Liana, 2009; Chandrarin, 2017; Chandrarin et al., 2018). Data is estimated using panel least square (E-views) method. A fixed cross-section accuracy test uses F test and probability value, and the determination coefficient test (R^2). The testing significance level of the hypothesis determined is alpha of 5%, with hypothesis acceptance criteria if the value of p is ≤0.05 and hypothesis rejection if p is >0.05. Acceptance criteria if the value of p is ≤0.05 and hypothesis rejection if p is >0.05.

4 Result and discussion

Based on data analysis estimated using panel least square, the following results were obtained.

4.1 The result of descriptive statistics analysis results

Descriptive Statistics Analysis was conducted to clarify the characteristics of the study sample tested under this study. Table 1 describes the results of descriptive statistical analysis consisting of mean value, SD, maximum and minimum before the conducted transformation of data (raw data).

Table 1 The result of descriptive statistics analysis

Variables	*Mean*	*Std. deviation*	*Minimum*	*Maximum*
HDI	67.39	4.27	54.45	79.49
Financing decision	0.09	0.06	0.01	0.35
Financial inclusion	105.96	125.54	12	574
Capital expenditures	0.23	0.07	0.07	0.45
Income equality	0.37	0.03	0.28	0.46
SMEs financing	19.70	39.32	1.08	266.15

Table 1 describes that the average HDI variable which is 67.39 with a minimum value of 54.45 and a maximum of 79.49. This means that there is a still human development disparity among regions in Indonesia. The lowest HDI occurs in Papua Province, while Jakarta exclusive district (DKI) relatively succeeds in human development as indicated by the highest HDI achievement in Indonesia.

The average FD is 0.09 with a minimum value of 0.01 and a maximum value of 0.35. This means that there is still a province that has a pure internal financing policy or uses only 1% of debt in its budget, namely the West Papua Province. Another province in which budget structure utilises 35% of debt/loan is West Sumatra Province.

The average of FI is 105.96 with a minimum value of 12 and a maximum value of 574. This means that the level of accessibility to banking services of Indonesian people is still low and there is still a disparity in the availability of financial service institutions among regions. For an example, in Southeast Sulawesi province, the level of people's

accessibility to financial services is only 12 (far off compared to the number of people to be serviced), while DKI Jakarta reaches 574. There is a wide disparity among provinces in Indonesia.

Based on the above table, it can also be seen that CE allocation is still low, which is around 7% to 45% with an average of 23%. If it is traced further, it can be seen that regions, which are not using debt or credit in their budget structure, have lower CE allocation compared to regions that are using debt or loan. For example, Central Java with a debt percentage of around 6–7% turns out to only allocates 7.1% annually for CE. While DKI Jakarta, with a debt financing around 11% allocates 45% annually for CE.

The average of IE in Indonesia is 0.37, which means that national income has not been well distributed. The highest disparity occurs in Gorontalo Province with a Gini index of 0.46 while the lowest reaches 0.28 in North Maluku. This means that income distribution is better in North Maluku than in Gorotalo Province.

The disparity in distribution also occurs in the financial sector which is indicated by SMEs Financing allocation value with an average of 19.70. The lowest SMEs funding allocation occurs in West Sulawesi that is 1.08, while the highest SMEs Financing allocation occurs in DKI Jakarta which reaches 266.15.

4.2 The result of matrix correlation among variables

Based on Table 2, results of matrix correlation analysis shows a positive correlation between FD and FI as independent variables, CE as moderation variable, and SMEs Financing and IE as controlling variables against HDI. Rule of thumb is using correlation value criteria which are less than 0.8. Meanwhile, we can ignore correlation value which is more than 0.8, because of heteroscedasticity produced by the multiplication of variables in the model (moderating variable). For the results of the multicollinearity test, it can be seen in Table 3.

Table 2 The result of matrix correlations analysis

Variables	*FD*	*CE*	*FD*CE*	*FI*	*SF*	*IE*
FD	1.000000	0.185552	0.897749	0.221784	0.182121	–0.059223
CE	0.185552	1.000000	0.577423	–0.192243	–0.163462	–0.258936
FD*CE	0.897749	0.577423	1.000000	0.117141	0.093762	–0.147193
FI	0.221784	–0.192243	0.117141	1.000000	0.874196	0.196206
SF	0.182121	–0.163462	0.093762	0.874196	1.000000	0.119959
IE	–0.059223	–0.258936	–0.147193	0.196206	0.119959	1.000000

Table 3 The result of multicollinearity test

Variable	*VIF*
Financing decision	1.792
Financial inclusion	4.627
Capital expenditure	1.172
Income equality	1.156
SMEs financing	4.327

Based on Table 3, it indicates that there is no multicollinearity bias. The rule of thumb of VIF value is less than 10.

4.3 Model estimation selection test for panel data

Model estimation selection test for panel data using Chow test, Hausman test and *Lagrange Multiplier* test was conducted on 231 observations. Tables 4–6 sequentially show results of the three estimation tests.

Table 4 The result of the Chow test

Effect test	*Statistic*	*d.f*	*Prob*
Cross-section *F*	109.230644	(32.192)	0.0000
Cross-section Chi-square	682.645715	32	0.0000

Under the Chow test, it was learned that the proper estimation for such a model is the fixed effect. The fixed-effect model was accepted with a *p*-value of $0 < 0.05$. Table 5 shows the results of the Hausman test.

Table 5 The result of the Hausman test

Test summary	*Chi-sq. statistic*	*Chi-sq. d.f.*	*Probability*
Cross-section random	14.781472	6	0.0220

Under the tabulation of the Hausman test, it was learned that the *p*-value is <0.05, which means that the proper estimation model is the fixed effect model. Table 6 shows the result of the Lagrange multiplier test.

Table 6 The result of Lagrange multiplier test

Description	*Cross-section one sided*	*Period*	*Both*
Breusch-Pagan	507.6484	1.896041	509.5445
	(0.0000)	(0.1685)	(0.0000)
Honda	22.53106	1.376968	16.90553
	(0.0000)	(0.0843)	(0.0000)
King-Wu	22.53106	1.376968	10.21653
	(0.0000)	(0.0843)	(0.0000)
GHM	–	–	509.5445
	–	–	(0.0000)

The Lagrange multiplier test shows a *p*-value of <0.05, meaning that random effect is acceptable. Table 7 shows the summary of the three test results.

Based on the three results of model estimation test for panel data using Chow test, Hausman Test and *Lagrange Multiplier* test, the model selected was the fixed effect (LM test is done to make sure the level of the chosen robust model although it is used to see

the best estimation model between random effect and common effect). Both the Chow test and the Hausman test are robust to choose a fixed effect.

Table 7 Summary of estimation test model

Test	α	*p-value*	*Description*
Chow test	0.05	0	Fixed effect accepted
Hausman test	0.05	0.0143	Fixed effect accepted
Lagrange multiplier test	0.05	0	Random effect accepted

4.4 The results of hypotheses testing (t-test)

Table 8 shows test results using the panel least square method: fixed effect.

Table 8 The result of moderated regression analysis with panel least square

Variable	*Coefficient*	*Std. error*	*t-statistic*	*Prob.*
Financing decision	–0.150936	0.052323	–2.884722	0.0044*
Financial inclusion	0.120406	0.016612	7.248333	0.0000*
Capital expenditure	–0.30200	0.041063	–0.735451	0.4630
CE as moderating	0.008553	0.003663	2.335147	0.0206*
Income equality	0.133311	0.067644	1.970775	0.0502*
SME financing	0.601591	0.304355	1.976608	0.0495*

*Statistically significant at the level of alpha 5%.

Based on model accuracy test results using Cross-section fixed, F test result of 130.447 and probability value of 0.000, and determination coefficient (adjusted test R^2) of 0.95 were obtained. Results of the model accuracy test shows that the model formulated was accurate (p-value of <0.05). The impact strength of all formulated variables in this study against HDI is 95%.

Related to analysis shown on Table 8, it was learned that the impact of FD and FI towards HDI is statistically significant at an alpha level of 5%, with t value (and p-value) of –2.8847 (0.0044) and 7.2483 (0.000) for FD and FI respectively. The extent of FD impact is shown at the negative regression coefficient value which indicates contra movement. FD which only takes into account internal funding and not utilising external funding proportionally will have consequences in HDI development. The extent of FI impact is indicated on the positive regression coefficient value showing co-movement. The higher the people's accessibility to banking indicated by the availability of many banking institutions in each province will have the capability to serve the people better particularly for human development, which in this matter is measured by HDI. CE is a contingency factor that can strengthen the impact of FD toward HDI. FD, included loan give a chance for governments to expand their budget, especially for HDI related programs. On the other side, capital expenditures are able to boost the economy in the area. Improving the economy, finally affected household income through income distribution. Equal income distribution achieved by opening or creating a job field. One of the efforts is supporting SME sectors. In order to develop SMEs, we can support some fields, i.e., financing by financial institutions. This is shown by the occurrence of SMEs

Financing of and IE impacts toward HDI, statistically significant at an alpha level of 5%, with a *t* (and *p*-value) of 1.9766 (0.0495) and 1.9708 (0.0502) for F SMEs and IE respectively. The extent of the second impact of such controlling variables on the positive regression coefficient indicates a co-movement.

The equation of FG least square fixed effect is as follows:

$$\begin{aligned} HDI = {} & 4.6370 - 0.1509FD + 0.1204FI - 0.0301CE + 0.0085FD*CE \\ & + 0.6015SF + 0.1333IE + [CX=F, ESTSMPL="2010\ 2016"] \end{aligned} \quad (7)$$

where [CX = F, ESTSMPL = "2010–2016"] is the effect of the cross-section for each region for seven years.

$$\begin{aligned} HDI = {} & \text{Region Effect during seven years} + 4.6370 - (0.1509 * FD) - (0.0301 * CE) \\ & + (0.0085 * FD * CE) + (0.1204 * FI) + (0.6015 * SF) + (0.1333 * IE) \end{aligned} \quad (8)$$

Differentiation of HDI magnitude in each province shown by the intercept of each region (Table 9).

The slope is a coefficient of the effect of each variable on HDI.

Table 9 The intercept of each region

No.	*Province*	*Effect*
1	West Java	–2.313743
2	Banten	–0.078455
3	DKI Jakarta	1.529271
4	DI Yogyakarta	3.774636
5	Central Java	–2.042245
6	East Java	–2.553152
7	Bengkulu	0.776688
8	Jambi	0.001280
9	Aceh	–0.081075
10	North Sumatera	–1.452762
11	West Sumatera	–0.061876
12	Riau	0.019746
13	Riau Islands	1.308511
14	South Sumatera	0.602031
15	Bangka Belitung	0.355879
16	Lampung	–0.571726
17	South Kalimantan	–0.364999
18	West Kalimantan	–1.163337
19	East Kalimantan	1.011309
20	Central Kalimantan	0.334223
21	Central Sulawesi	–0.013392
22	South Sulawesi	–1.073485
23	North Sulawesi	0.523411
24	Southeast Sulawesi	1.533971

Table 9 The intercept of each region (continued)

No.	*Province*	*Effect*
25	West Sulawesi	2.248707
26	Gorontalo	–0.002205
27	West Nusa Tenggara	–0.685739
28	Bali	1.037853
29	East Nusa Tenggara	–1.015644
30	Maluku	0.473276
31	Papua	–2.439030
32	North Maluku	0.896130
33	West Papua	–0.514058

Source: Central Bureau of Statistics (Indonesia)

4.5 Discussion

Based on previously-defined analysis results, there are several interesting issues to be discussed, among others are as follows.

First, descriptive analysis results on data obtained from the Directorate General Fiscal Balance Department of Finance RI shows that local revenue increased from 2011 to 2017. In 2011, local revenue increased to 5.2% and then increased within a range of 16–19% per year. The expenditure side also increased within a range of 15–19%. Only in 2011, the increase in spending was 2.8%. During the observation period (2010–2016), regional administration tended to implement deficit policy, although the extent of the deficit was not influenced by the increase in revenue or expenditures. This can be observed from the fluctuation of a deficit. In 2011 and 2012, there was a decrease in deficit of 15.5% and 12.7% respectively, while in 2013–2015 the deficit increased to 7–34.5%. Fluctuation in deficit was also followed by fluctuation on the funding side. In 2011 and 2012, regional funding dropped to 18.2% and 11.5%, while from 2013 to 2015 there was an increase of 7–34%.

Based on the above data it can be seen that the region's level of dependency to transfer funds, indicated by ratio among the balance of total revenues is still high. The level of dependency toward transfers fund ranges from 53% to 76%. On the contrary, the level of independence shown by the ratio between government's regions owns source revenue and total revenue, is also low. The level of self-sufficiency varies among regions in Indonesia. In provinces in Java and Bali, the region's autonomy level is higher than provinces on other islands, namely 33.57%. The lowest level of independence is in Nusa Tenggara and Papua-Maluku, namely 5.93%. With a low level of independence, local governments are required to be more creative in finding sources of financing in order to enhance development in their respective areas.

Meanwhile, in expenditure areas, personnel expenditure, spending on goods and services, capital expenditures and other expenditures are also experiencing an increasing trend from 2011 to 2016. Personnel expenditure which is the largest composition of expenditure area continued to increase an average of 12, 6% each year, as well as spending on goods and services increased 18.4% on average each year. Meanwhile, capital expenditures and other expenditures fluctuate (increases and decreases) annually

with an average increase in capital expenditures by 14.5% and other expenditures 28.17%.

On average, the composition of personnel expenditures in the period of 2011–2016 amounted to 42.75–24.38% of total expenditures, followed by capital expenditures for goods and services 20.58% and other expenditures of 12.29%. However, if it is viewed more specifically, the ratio of personnel expenditure in 2016 was lower than average. This shows that the ratio of personnel expenses showed a downward trend. In 2011, the ratio of personnel expenses was 43.5% in 2016 down to 38.22%. A high ratio of personnel expenses has an effect on the ratio of capital expenditure. For example, in Sulawesi regions with the highest personnel expenditure ratio in 2016, i.e., 47.52%, also have the lowest capital expenditure ratio that is 22.77%. While in Kalimantan, which its personnel expenditure ratio is lowest at 32.29%, it has the highest ratio of capital expenditure of 35.19%.

Another element relevant to HDI is the surplus/deficit funding policy. Since the implementation of regional autonomy in 2001, regional administrations have been given flexibility in budgeting, including the option to select surplus, deficit or balanced budgeting policy. Since 2012, regional administration with deficit budgeting has the continuity to improve. The average deficit of provincial administration is 4.9%. The highest revenue from deficit ratio is Nanggroe Aceh Darussalam (NAD), which reached 19.3%, while the lowest is Jakarta with a ratio of 0.3%. Data acquired from the Ministry of Finance shows that in 2014 91% of provincial administrations implemented deficit budgeting. Concerning law in Indonesia, regional/local administrations should determine sources of funding to cover the deficit. Sources of funding are governed by regulation domain to cover deficit not absorbed from the previous year (Financing Surplus), Disbursement of Reserve Fund, and Separated Results from Sales of Regional Assets, Acceptance Regional Loan and Municipal Bonds and Acceptance from Regional Receivable.

The highest composition in financing fund acceptance is the utilisation of Financing Surplus from the previous year. For example, data of 2014 budget year shows the utilisation of Financing Surplus from the previous year reached 96.02% from the total financing acceptance also within the province of 2.61%, originating from local loans and municipal bonds. Other sources of funding, involving the disbursement of a reserve fund, is separated from sales of assets and return receivable from the amount of regional receivable, which is relatively small, less than 1%.

Second, FD significantly affects HDI through capital expenditure moderation. This underlines Jhingan (2012) opinion, which states that deficit funding is beneficial to develop social and economy overheads that ultimately will enhance productivity and community income. Enhancement in productivity and community income will directly enhance the Purchasing Power Index which is one of HDI indicators and indirectly also enhances the life expectancy rate through the fulfilment of basic needs and elementary school participation rate.

Third, financial inclusion has a significant effect on HDI, the higher the financial inclusion index, the higher the HDI index. Increasing financial outreach will facilitate access to education and strengthen purchasing power, thereby improving the quality of life. As a developing country, in Indonesia policy makers should encourage the financial sector to expand the scope of services beyond the target of the current market for access to finance for the wider community will have a positive impact on the HDI. CE's impact on HDI depends on the source of funding utilised and the rate of tax and debt then.

Government investment in the form of capital expenditure will create work opportunities as the consequence of rising demand and improved production capacity as the result of increasing tender. In the end, CE will also increase revenue that will implicate HDI enhancement. Fifth, the presence of SMEs Financing and Income Equality as a control variable under this study can ease of types of errors in this study including errors in model specifications.

Finally, the achievement of HDI which is one measure of the success of development with indicators of life expectancy, the level of participation of elementary schools and the people's purchasing power depends on programs carried out by the government. The program will be a success if it is supported by adequate financing capabilities. For example, life expectancy will increase if the government can provide health facilities that can serve the entire community. Likewise, the level of elementary school participation can increase if all primary school age communities can reach educational facilities spread throughout the region. Meanwhile, community the people's purchasing power can be strengthened by providing employment. This means that all three HDI indicators can be achieved with adequate capital expenditure. Government problems are related to limited funding sources; it can be answered in this research that the use of certain limits (debt service coverage ratio) allocated for capital expenditure can increase HDI. The policy of providing capital expenditure through external capital will have a greater impact if accompanied by FI policy through the provision of banking institutions throughout the region to support SMEs so as to increase the productivity of SMEs and their capacity to absorb labour. Thus, people's income will increase and there will be income distribution which will ultimately increase the people's purchasing power.

5 Conclusion

Based on the MRA analysis results estimated by using the Panel Least Square model, it can be concluded that FD and FI have a significant impact on HDI. Improvement in FD using external funding (loans) will enhance HDI if allocated as an investment in the form of CE. Financial inclusion has a positive impact on the effectiveness of monetary policy (Lapukeni, 2015). The results of this study can be used by the government as a basis of considerations in formulating regulations related to the development of budgeting structure and minimal allocation for CE. Under certain preposition, increase in debt may increase the opportunity for the government to allocate CE budget including therein for education, health, and infrastructure in order to elevate community income, which in turn will enhance their purchasing power. Recommendation to the government, as a regulator, is to optimally combine revenue with loans in the budget structure to increase CE allocation in order to generate revenue in the long term and enhance development performance, which among others are measured through HDI, by considering many local governments may have different characteristics and are facing different challenges (Prasetyo and Mulyono, 2018).

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