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Foreign Direct Investment and Institutional Quality in Indonesia: Evidence from Provincial Panel Data

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ABSTRACT

This study examines the relationship between Foreign Direct Investment (FDI) and institutional quality in Indonesia using provincial panel data for 2010–2020. District-level FDI realization data are aggregated to the provincial level and analyzed using Fixed-Effects (FE) and Random-Effects (RE) estimators with heteroskedasticity-robust corrections. Institutional quality is measured using the fiscal autonomy ratio and the local democracy index. The findings provide mixed evidence regarding the proposed institutional development hypothesis. In models without a lagged FDI variable, most FDI coefficients are positive but statistically insignificant under both FE and RE specifications. Similar results are observed when lagged FDI is incorporated. However, when the local democracy index is used as the measure of institutional quality, the RE specifications with lagged FDI produce positive and statistically significant coefficients in several model specifications. These effects, however, are not robust to the FE specifications as additional control variables are introduced. Overall, the findings provide limited evidence that FDI systematically improves institutional quality at the provincial level in Indonesia. The results suggest that attracting FDI alone cannot be assumed to automatically strengthen regional institutional quality and that institutional improvement may need to be pursued alongside investment promotion.

ABSTRAK

Penelitian ini menguji hubungan antara penanaman modal asing (Foreign Direct Investment/FDI) dan kualitas institusi di Indonesia menggunakan data panel tingkat provinsi periode 2010–2020. Data realisasi FDI tingkat kabupaten/kota diagregasikan ke tingkat provinsi dan dianalisis menggunakan estimasi Fixed-Effects (FE) dan Random-

KEYWORDS

Fiscal autonomy, FDI, institutional quality, local democracy index, panel data

KATA KUNCI:

Data panel, FDI, indeks demokrasi, kualitas institusi, otonomi fiskal



Effects (RE) dengan koreksi heteroskedasticity-robust. Kualitas institusi diukur menggunakan rasio otonomi fiskal dan indeks demokrasi Indonesia tingkat provinsi. Temuan penelitian menunjukkan bukti yang bervariasi (mixed evidence) terkait hipotesis pengembangan institusi yang diajukan. Pada model tanpa variabel lagged FDI, sebagian besar koefisien FDI bernilai positif tetapi tidak signifikan secara statistik, baik pada spesifikasi FE maupun RE. Hasil serupa juga ditemukan ketika variabel lagged FDI dimasukkan ke dalam model. Namun, ketika indeks demokrasi digunakan sebagai pengukur kualitas institusi, spesifikasi RE dengan lagged FDI menghasilkan koefisien yang positif dan signifikan secara statistik pada beberapa spesifikasi model. Meski demikian, pengaruh tersebut tidak konsisten (robust) pada spesifikasi FE saat variabel kontrol tambahan dimasukkan. Secara keseluruhan, temuan ini memberikan bukti yang terbatas bahwa FDI secara sistematis meningkatkan kualitas institusi di tingkat provinsi di Indonesia. Hasil penelitian mengindikasikan bahwa menarik arus masuk FDI saja tidak dapat diasumsikan secara otomatis memperkuat kualitas institusi daerah, sehingga perbaikan institusi perlu diupayakan beriringan dengan promosi investasi.

INTRODUCTION

Foreign direct investment (FDI) is widely regarded as an important mechanism through which host economies can acquire capital, technology, managerial expertise, and access to international production networks. Beyond these conventional economic effects, FDI may also influence the quality of domestic institutions. The presence of multinational enterprises can increase demand for transparent regulations, predictable administrative procedures, secure property rights, and more effective public governance, particularly where foreign investors possess substantial bargaining power or operate in sectors that require close interaction with public institutions.

In this sense, FDI may generate institutional spillovers by encouraging governments to improve the credibility and efficiency of the investment climate. Empirical evidence from subnational contexts supports this possibility. Dang (2013), for example, finds that foreign investment contributed to improvements in provincial economic institutions in Viet Nam and promoted institutional convergence across regions. Similarly, Antonietti and Mondolo (2023) show that inward FDI, particularly greenfield investment, can affect several dimensions of governance, including regulatory quality, the rule of law, control of corruption, and voice and accountability.

However, the relationship between FDI and institutional quality is neither automatic nor unidirectional. A substantial body of literature emphasizes that institutional quality is itself a key determinant of foreign investment, because effective governance, political stability, regulatory predictability, and strong property-rights protection reduce uncertainty and transaction costs for multinational firms (Daude & Stein, 2007; Buchanan et al., 2012). Consequently, larger FDI inflows should not be presumed to generate institutional upgrading in all settings. Indeed, evidence from subnational studies suggests that foreign investment may improve certain aspects of governance while simultaneously creating opportunities for rent-seeking, regulatory capture, or other institutional distortions when accountability

mechanisms remain weak (Kim, 2019).

Empirical studies of the impact of institutional quality as a key determinant for foreign direct investment (FDI) activities have been extensively investigated and documented in some papers (e.g. Buchanan et al., 2012; Meyer & Sinani, 2009). The generally accepted hypothesis is that the better the institutions in the targeted country for investment, the less risky to send permanent capital to the focused country, and thus, the more likely it is to flow FDI into that country (Ali et al. (2010); Gani (2007); Long et al. (2015); Lucke & Eichler (2016); Peres et al. (2018)). What makes interesting to study is the opposite effect, namely whether FDI determines institutional quality in the concerned country. An interesting question to explore is to what extent FDI originating from multinational companies shapes the level of institutional development in host countries.

There are very few empirical studies examining the impact of FDI on the quality of institutions in the host country. We find a small number studies concerning about this context, for example Dang (2013) in Viet Nam, and a study by Fon et al. (2021) which analyzed the case in the Africa. Conceptually, Fon et al. (2021) find from a political economy point of view, negotiation and lobbying of firms undertaking FDI are likely to have a bearing on policy quality in investment in destination countries.

On how FDI matters for institutional quality in host country was explained by several channels. First, through the non-market effect, where multinational enterprises (MNEs) from developed countries provide information related to standard of rules and regulations applied in other countries where the investment was already settled. Assuming that the host country is able to make institutional adjustments in adaptin changes required or requested, along with the flexibility to accept standards to its domestic institutions, there will be transfer of knowledge and best practices which improve institutional quality in the host country (Dang (2013); Malesky et al. (2015); Prakash & Potoski (2007)).

The second path is that foreign investors are likely to pressure the host country to do some institutional reforms as a cost of allocating their capital in the host country (generally in developing and poor countries) (Dang, 2013). Because of the risk factors where investments channeled to countries with weak institutional quality might raise the transaction costs faced by multinational companies, the pre-investment stage enables internal negotiations, which, in turn, lead the host country to make adjustments within their institutional governance, thereby flowing the capital to their country. On the contrary, foreign companies can threaten to move their capital to other countries with a better institutional environment if negotiation results end without agreement.

Empirically, Demir (2016) has tested the host country's institutional development hypothesis of FDI inflow using country-level data during the 1990-2009 period. His research does not support the hypothesis and instead finds a negative effect of FDI on the quality of country institutions. Chiyaba & Singleton (2023) also find that the effects of FDI inflows on institutional quality tend to be insignificant and are mixed in terms of various proxies used. For example, effects of FDI on government effectiveness and political stability, respectively, are negative but insignificant, while on regulatory quality is positive and significant. Yeboua's study (2020) for example found that countries with institutional quality below threshold (regarding government stability score) tend to have negative effect of FDI on institutional

development. Cooray et al. (2025) recently have also found that the relationship between FDI and institutional quality can be negative due to rent-seeking behaviour and weak of law enforcement environments.

Another study from Fon, Filippaios, Stoian & Lee (2021) confirms the hypothesis where FDI improves institutional quality for the case of African countries using the Fixed-Effect approach and the lag variable from FDI. Previously, Long (2015), with the scope of research in 12,400 companies located in 120 cities in China, utilizing company survey from the World Bank, exposed that domestic firms in China with higher levels of FDI tended to enjoy lower levels of tax burden and fees, including better legal protection.

With the increasing need for FDI to support development progress in developing countries, while on the other hand, the dominance of foreign companies which generally come from developed countries (including those MNEs from developing countries, which aim to expand their position in developing nations for seeking new markets and the interests of the manufacturing industry), the inflow of FDI from these multinational companies may require special treatment from the host country. There are indications that foreign firms from developing countries are more motivated to invest in countries which generally have weak institutional qualities (Cuervo-Cazurra & Genc, 2008; Morck et al., 2008). Meanwhile, Henisz & Zelner (2005) argue that institutions in developing countries are more receptive to change than institutions formed in developed countries.

Indonesia, on the one hand, is one of the largest emerging market countries, particularly in Southeast Asia. The role of FDI from foreign investors has its potential to affect formation of the quality of existing institutions in Indonesia, especially with the regional decentralization system that divides Indonesia into sub-national regions (provinces and districts/cities). We find none studies that empirically test the institutional development impact from FDI inflows using the district-level data case in Indonesia or using the most recent analysis period. The majority of empirical studies, not within-Indonesia, has treated FDI as a result of institutional quality (Farla et al. (2016); Fukumi & Nishijima (2010); Hong et al. (2016); Malesky et al. (2015); McCulloch et al. (2013)). The lack of research on this particular issue in a within-country setting especially in Indonesia is surprising, given the importance of the quality of a country's institutions for long-term economic development (Acemoglu, 2012).

The conceptual contribution of this research lies in the urgency of institutional quality which should not only be a determinant of FDI but can also be influenced by the flow of capital transfers. Multinational corporations shape the institutional environment by changing the “game” and directly influencing the rules of the game (Dang, 2013; Demir, 2016; Fon et al., 2021). The empirical contribution of this research stands in testing the hypothesis of institutional development formed by FDI using a sample of FDI investment realization at the provincial level (as an aggregation of districts/cities) in Indonesia during 2010-2020. The decision to focus on empirical testing is based on several reasons. First, very few studies have analyzed the role of FDI on institutional quality, and the estimation results of past studies have also found mixed results. Second, there has been no previous empirical research investigating this hypothesis at the regional level in Indonesia. Third, Indonesia is a developing country that requires FDI flows to support development. Testing the hypothesis

that puts FDI as an institutional determinant at the local government level is therefore worth investigating.

This article aims to empirically examine whether foreign direct investment (FDI) inflows affect institutional quality using province-level data from Indonesia. The next section will discuss the research method used in this study, followed by providing results and discussions in section 3. The last section then concludes.

METHOD

This study limits its scope using provincial level in Indonesia during the period 2010-2020, the situation before Covid-19 pandemic was largely widespread. As we combined North Kalimantan Province back to East Kalimantan Province, which initially was the parent province before the division, we observe 33 provinces over a 10-years period, making the sample of 363 observations under panel data form.

To conduct empirical analysis, this study uses dependent and independent variables as empirically investigated by Fon, Filippaios, Stoian & Lee (2021), Demir (2016) and Long et al. (2015). The reduced form is expressed as below:

$$Inst_{it} = \alpha_1 + \beta_1 FDI_{it} + \beta_2 lperincome_{it} + \beta_3 TELE_{it} + \beta_4 GOVEXP_{it} + \beta_5 POPSHARE_{it} + \varphi_i + \varepsilon_{it} \dots \quad (1)$$

Here $Inst_{it}$ is the level of institutional quality in province i in year t measured using two indicators: (1) a government effectiveness (*GovEffect*) indicator, by getting the ratio of the contribution of local-owned sourced revenue (henceforth PAD), from regional taxes and levies, in total regional income; and (2) the Indonesian Democracy Index (IDI). The latter index measures aspects linked to civil liberties, political rights and democratic institutions. These three dimensions follows elements dictated in the Worldwide Governance Indicator (WGI), which has been the standard of institutional quality measurement at country level, such as voice and accountability and political stability and absence of violence.

The IDI conceptually monitors degree of repression of government officials for freedom of sharing opinion, community political rights, public complaint services, government information on budget, equality in gender and legal aspects. The higher the value of the IDI the better institutional quality in the province. The IDI has some unique characteristics which are relatively connected with the study as found in Fon, Filippaios, Stoian & Lee (2021), which measured level of institutional development based on six categories (e.g. voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption). Moreover, our main independent variable will be represented by FDI_{it} , which is the aggregate FDI inflows realization to districts located in province i in year t . This measure becomes the main parameter in this study. Parameter β_1 , indicates the impact of FDI on the level of institutional quality in host province. We finally transform FDI values across years into natural logarithms to smooth data distribution and to acquire the percentage effect.

Next, we also include control variables in the model. $LnGDPpercap$ is the logarithm of GRDP per capita. $TELE_{it}$ is the proportion of households owning/controlling computers. $GOVEXP_{it}$ stands for the share of direct government spending. $POPGR_{it}$ represents the

percentage of annual population growth. All is referred for province i at year t . We also apply dummy fixed effects (φ) to control for unobserved province effects included in the model.

Equation (1) above is estimated using the Fixed Effects (FE) approach and we always compare it with the Random Effects (RE) approach. The Hausmann test is carried out to statistically elect which estimator that is suitable. Furthermore, due to the possibility that the estimated coefficients generated using equation (1) are potentially biased, due to the inverse causality effect (institutional quality that actually affects FDI), we use the reduced form as expressed in equation (2):

$$Inst_{it} = \gamma_1 + \delta_1 FDI_{it-1} + \delta_2 LnGDPpercap_{it} + \delta_3 TELE_{it} + \delta_4 GOVEXP_{it} + \delta_5 POPGRT_{it} + \varepsilon_{it} \quad \dots \quad (2)$$

The difference between Equations (1) and (2) is that we use FDI_{it-1} to anticipate the risk of reverse causality of FDI inflows on the level of institutional quality in the host province. This strategy follows estimation used by Demir (2016) and Fon et al. (2021). Data on the quality of institutions at the provincial level are sourced from the publication of Provincial Government Financial Statistics related to local-owned sourced revenue information, and Political, Legal and Security Statistics related to the Indonesian Democracy Index. The data for the control variables use the information provided by National Statistics Agency of the Republic of Indonesia (BPS).

RESULTS AND DISCUSSION

Table 1 presents summary statistics for the variables included in the panel regression model. The average value of institutional quality (measured based on the Provincial Democracy Index (Inst_Democ)) is concentrated at 4.251 with a standard deviation of 0.101 and the highest score is 4.5. This value reflects a moderate democracy quality across provinces in Indonesia between the period investigated. The ratio of PAD to total province income (goveffect, here is used to measure fiscal autonomy) has an average proportion at 0.382, which is quite low compared to its maximum value which stands at 0.774. This indicates that regional fiscal independence tends to contribute less than 40 percent.

Table 1. Summary of Statistics

VARIABLES	N	mean	sd	min	max
Inst_Democ (log)	363	4.251	0.101	3.963	4.500
goveffect	363	0.382	0.178	0.033	0.774
PopShare	363	0.030	0.042	0.003	0.184
GovExp	363	0.030	0.044	0.004	0.324
Tele	330	17.640	6.707	5.340	36.950
Log FDI	363	12.420	1.831	5.432	15.780
lperincome	363	10.320	0.558	9.140	12.070

Source: author's calculation

Turning to Table 2 (see Appendix 1), it shows regression results of FDI on institutional quality. We first compared the RE and FE findings, all in the form of robust standard errors. The dependent variable in Table 2 is institutional quality based on fiscal independence, with FDI (in logs) as key independent variable. The estimation results using the RE approach (columns (1)-(5)) show mixed evidence where in general most coefficients

identified are negative, contrary to our proposed hypothesis. In all specifications as in columns (1)-(5), only column (1) shows a significant effect of FDI (at the 10% level), but this model only incorporates FDI as a control, excluding other important covariates. Therefore we cannot find any evidence to support our hypothesis under RE-based specifications.

We then move to our FE approach (see columns (6)-(10)) which presents estimated coefficients that are also indifferent with the RE approach. Again, the effect of FDI in column (6), for example, is negative and significant at the 5% level. These results are quite surprising because it does not confirm the proposed hypothesis where FDI is able to build the quality of institutions in the host country. However, the negative and statistically significant effect of FDI vanishes when control variables included, with the direction of coefficient also varies across columns (see columns (7)-(10)).

We then compare with the model that applies the lag of FDI (see columns (1')-(5')), using the RE approach. We find the direction of the FDI coefficients is negative in some specifications (columns (1'), (2'), (4'), (5')), although, again, only column (1') shows the effect that is statistically different from zero at the 5% level. The same results are also consistent in direction when it comes to FE-based results, where the majority of the predicted signs of FDI coefficient is negative, though not significant for almost all models tested except for column (6').

The estimation results in Table 2 contradict the hypothesis implying institutional quality is likely to be influenced as the FDI inflows raise. Our econometrics testing shows that FDI has negative effect on the quality of province's fiscal independence, though the results are less stable when other variables are added in the model. Some empirical studies have explained this situation. Study by Henisz & Zelner (2005) argue that institutions in developing countries are more receptive to change than institutions formed in developed countries, meaning that FDI inflows may have insignificant impact in its association with institutional development in Indonesia's case. Chiyaba & Singleton (2023) have also found the effects of FDI vary on institutional factors, similar with our study for Indonesia. Yeboua's study (2020), moreover, finds that FDI in countries that had score of institutional quality below threshold score shows negative relationship with institutional development. Our finding in Indonesia's district case can also be supported by the explanation of Cooray et al. (2025) study where they found that rent-seeking behaviour and weak of law enforcement environments can limit the effect of FDI, thereby making the impact becomes negative.

This can happen, for instance, in the case of FDI channeled in natural resource-based sectors. The ease of capital in the host provinces can weaken fiscal autonomy performance, simply because of the blessing effect of foreign capital on short and medium term. The massive flows of foreign capital reduce the effectiveness of local government performance, hampering domestic capital (crowding out effect) and lowering the quality of their domestic institutions. This finding supports the investigation of the cross-country data sample conducted by Demir (2016), though not for the regional-level analysis, and conducted by Dang (2013) in Viet Nam.

To ensure whether these results are consistent, we test it using alternative measure of institutional quality by incorporating democracy index as a proxy of regional institutional quality. Our findings, as shown in Table 3 (see Appendix 2), find different results, for example

under the RE approach (see columns (1)-(5)), both with and without lag, we find positive direction in our estimated coefficients, and some specifications had shown significant influence of FDI on institutional quality variable. Without lag, as shown in column (1) FDI variable finds positive and statistically significant effect on institutional quality at 1 percent, while when using lag of FDI, the effect consistently shows positive direction across all specifications and significant as found in columns (1'), (2'), and (3'). For example in column (3'), an increase of one percent in FDI (with lag) increases institutional quality (local democratic climate) by about 0.012 points, *ceteris paribus*. We also find the positive impact of FDI in the estimations using the FE approach, although the direction of the coefficients shows some mixed evidences as specified in columns (6) and (10) as well as columns (6') and (10').

The other control variables as presented in Table 3 show positive sign in results, for example, income per capita (in a log form) had positive and significant effects both in the FE and RE models. In our FE strategy, in column (10), for example, a one percent increase in per capita income raises quality of democracy by 0.250 points. The proportion of households that has access to a computer also has influence as expected on the quality of the institution (statistically significant at the 5 percent level), though the magnitude is small (0.005). On the other hand, based on RE estimator, we find government spending significantly reduces democracy index.

The findings summarized in Table 3 (see Appendix 2) highlight significant FDI effects with sign direction in accordance with the hypothesis proposed especially in RE-based regression, supporting the findings of Dang (2013) and Prakash & Potoski (2007). In the estimation of FE without and with the lag element of FDI, we only found a positive and significant effect (at the 1 percent level) of FDI occurred when the other control variables were excluded. When we add the other control variables, *lperincome*, *GovExp*, *Tele*, and *PopShare*, we find the direction of the coefficients remains positive, but the significant effect vanishes. The results shown in columns (7)-(10) and (7')-(10') are not statistically significant at any level of conventional confidence.

To obtain some visualization, we average all variables from 2010-2020 by province to highlight relationships in a form of scatter diagrams, which can indicate the correlation between FDI and institutional quality on average. Figure 1, for example, shows the possibility of a positive correlation relationship where the predicted line shows a strong linear pattern. By contrast, in Figure 2, the correlation between FDI and the province's democracy index shows pattern where FDI in each province (on average) scattered randomly, making hard to make any prediction line. These results imply that the effect of FDI on the quality of institutions, both using measurements of fiscal independence and the democratic climate, needs to be further confirmed the accuracy of the estimation with a robust regression approach.

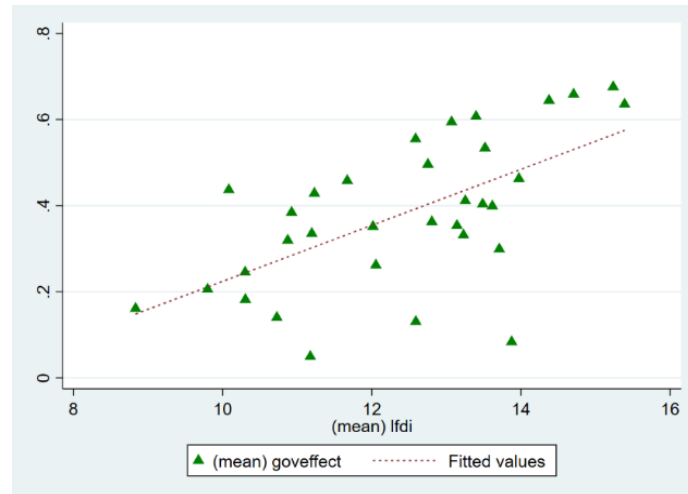


Figure 1. Scatter Plot between FDI and Government Effectiveness

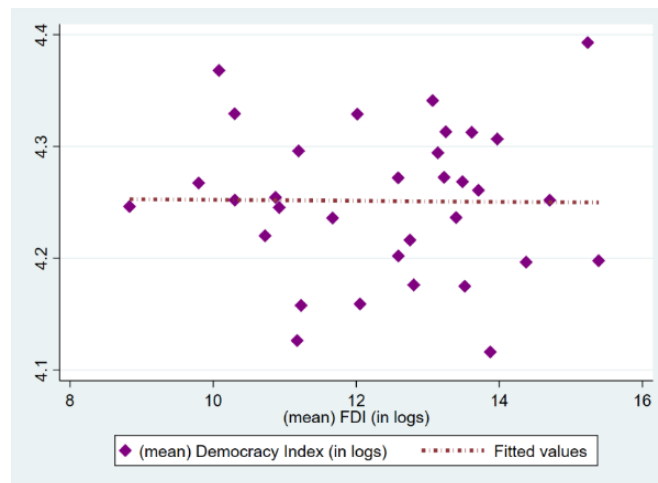


Figure 2. Scatter Plot between FDI and Democracy Index

Taken together, the findings provide mixed evidence regarding whether FDI inflows affect institutional quality at the provincial level in Indonesia. When institutional quality is measured through fiscal autonomy, the results do not support the proposition that higher FDI inflows improve institutional quality. The estimated coefficients are predominantly negative across the RE and FE specifications, although the statistical significance of the relationship is not robust to the inclusion of control variables. The negative association is particularly evident in the parsimonious specifications, but it becomes weaker and changes across specifications once differences in income, government expenditure, telecommunications, and population share are taken into account. This suggests that the observed negative relationship between FDI and fiscal autonomy cannot be interpreted as a stable effect of FDI on institutional quality.

The results become different when institutional quality is measured using the provincial democracy index. In this alternative specification, FDI generally exhibits a positive association with institutional quality, particularly under the RE estimator and in several models incorporating lagged FDI. The positive coefficient on lagged FDI is also consistent with the possibility that institutional changes may not occur immediately following the arrival of

foreign investment. However, the evidence is again sensitive to the estimation strategy. Under the FE specification, the positive and statistically significant relationship is observed primarily in models without the full set of control variables, while the statistical significance disappears after the controls are introduced. Therefore, the positive relationship between FDI and democratic quality should also be interpreted with caution.

The contrasting results obtained from the two measures of institutional quality are important for answering the research objective. They indicate that the relationship between FDI and institutional quality is not uniform across institutional dimensions. FDI is negatively associated with fiscal autonomy but positively associated with the democratic dimension of institutional quality in several specifications. Moreover, neither relationship remains consistently statistically significant across all model specifications. This finding is consistent with the broader literature suggesting that the relationship between FDI and institutional quality can vary according to the institutional dimension examined and the characteristics of the host economy. Chiyaba and Singleton (2024), for example, show that the relationship between FDI and institutional development is sensitive to natural-resource rents, while evidence from Indonesia indicates that the relationship between governance quality and investment varies across provinces with different resource endowments (OECD, 2020).

These findings provide an important qualification to the expectation that FDI necessarily contributes to institutional improvement in host regions. The positive association observed when institutional quality is represented by the democracy index is consistent with previous evidence that the relationship between FDI and institutional development may vary across institutional dimensions and country characteristics. Evidence from developing countries indicates that natural-resource dependence can alter the relationship between FDI and institutional development, while the Indonesian context also shows substantial variation in the relationship between governance quality and investment across provinces (Chiyaba & Singleton, 2024; OECD, 2020). Nevertheless, the absence of a robust effect in the fully controlled FE models indicates that this relationship should not be interpreted as evidence that FDI independently improves institutional quality. Similarly, the negative association between FDI and fiscal autonomy does not necessarily imply that FDI deteriorates institutions. Rather, it may reflect differences in the fiscal structure and economic characteristics of provinces receiving substantial foreign investment.

Therefore, in direct response to the research objective, the empirical evidence does not provide conclusive support for a systematic effect of FDI inflows on institutional quality across Indonesian provinces. Instead, the results indicate that the relationship is conditional on the dimension used to measure institutional quality and the econometric specification employed. FDI is negatively associated with fiscal autonomy but shows a positive association with democratic quality in several specifications, while these effects become less robust when provincial fixed effects and additional control variables are considered. The central implication is therefore not that FDI uniformly improves or worsens institutional quality, but that its institutional relationship varies across dimensions of governance and model specifications

CONCLUSION

This study examined the relationship between Foreign Direct Investment (FDI) and institutional quality in Indonesia using provincial panel data for 2010–2020. The analysis compared Fixed-Effects (FE) and Random-Effects (RE) specifications and considered both contemporaneous and lagged FDI to examine whether FDI is associated with improvements in regional institutional quality. The findings provide mixed evidence regarding the proposed institutional development hypothesis. When the fiscal autonomy ratio is used as a measure of institutional quality, most FDI coefficients are positive but statistically insignificant in both the non-lagged and lagged specifications. Using the local democracy index, the RE models with lagged FDI produce positive and statistically significant coefficients in several specifications. However, these effects are not robust to the FE specifications, particularly when additional control variables are included. Overall, the findings provide limited evidence that FDI systematically improves institutional quality at the provincial level in Indonesia. This study has several limitations. First, the measurement of institutional quality is constrained by the availability of province-level data in Indonesia. Indicators such as the Corruption Perceptions Index and the Economic Freedom Index are not available at the provincial level and therefore could not be incorporated into the analysis. Second, the study covers the period 2010–2020 and does not capture subsequent developments in FDI and institutional quality. The availability and consistency of comparable institutional data at the subnational level also limit the extension of the observation period. Third, the analysis does not employ a dynamic panel specification or an instrumental-variable approach. Therefore, potential endogeneity and reverse causality between FDI and institutional quality cannot be fully addressed. Despite these limitations, the findings provide a basis for further investigation into the relationship between FDI and institutional quality in developing countries, particularly in ASEAN economies. For Indonesia, future research using more disaggregated district-level data could provide further insight into whether and under what conditions FDI contributes to institutional development, subject to the availability of reliable and comparable institutional quality indicators at the district level.

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Appendix 1:

Table 2. Impact of FDI on the Level of Institutional Quality (measured by GovtEff)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	RE					FE				
FDI (in log)	-0.008*	0.001	0.001	-0.000	-0.000	-	0.001	0.001	-0.003	-0.003
	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	0.011**	(0.004)	(0.003)	(0.003)	(0.003)
lperincome		-	-	-	-		-	-	-	-
		0.140**	0.144**	0.127**	0.116**		0.174**	0.172**	0.204**	0.205**
		*	*				*	*	*	*
GovExp		(0.047)	(0.046)	(0.054)	(0.053)		(0.043)	(0.043)	(0.059)	(0.059)
			0.352	0.271	0.322			-0.269	-	-
									0.519**	0.522**
									*	*
Tele			(0.313)	(0.320)	(0.342)			(0.204)	(0.187)	(0.185)
				0.000	-0.000				0.002	0.002
				(0.001)	(0.001)				(0.001)	(0.001)
PopShare					0.446					-0.354
					(0.495)					(0.521)
Constant	0.478**	1.806**	1.839**	1.690**	1.563**	0.513**	2.167**	2.152**	2.500**	2.528**
	*	*	*	*	*	*	*	*	*	*
	(0.070)	(0.477)	(0.468)	(0.534)	(0.533)	(0.051)	(0.431)	(0.433)	(0.582)	(0.589)
Observations	363	363	363	330	330	363	363	363	330	330
Number of id	33	33	33	33	33	33	33	33	33	33
R-squared	0.0377	0.212	0.202	0.187	0.161	0.038	0.212	0.213	0.214	0.218
	(1')	(2')	(3')	(4')	(5')	(6')	(7')	(8')	(9')	(10')
Lag FDI (in log)	-	-0.000	0.000	-0.001	-0.001	-	-0.000	-0.000	-0.003	-0.004
	0.008**					0.011**				
						*				
lperincome	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)
		-	-	-0.090*	-0.082		-	-	-	-
		0.128**	0.135**				0.173**	0.173**	0.165**	0.167**
		*	*				*	*	*	*
GovExp		(0.049)	(0.049)	(0.054)	(0.054)		(0.044)	(0.045)	(0.055)	(0.055)
			0.502**	0.379	0.431			-0.088	-0.389*	-0.395*
			(0.251)	(0.278)	(0.294)			(0.229)	(0.203)	(0.200)
Tele				-0.001	-0.002				0.000	0.001
				(0.002)	(0.002)				(0.002)	(0.002)
PopShare					0.275					-0.533
					(0.545)					(0.661)
Constant	0.479**	1.700**	1.756**	1.345**	1.252**	0.516**	2.173**	2.168**	2.131**	2.169**
	*	*	*			*	*	*	*	*
	(0.068)	(0.491)	(0.486)	(0.526)	(0.532)	(0.048)	(0.440)	(0.447)	(0.540)	(0.545)
Observations	330	330	330	297	297	330	330	330	297	297
Number of id	33	33	33	33	33	33	33	33	33	33
R-squared	0.0455	0.197	0.182	0.163	0.140	0.045	0.197	0.198	0.194	0.204

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1

Appendix 2:

Table 3. Impact of FDI on the Level of Institutional Quality (measured by Democracy Index)

VARIABLES	(1)	(2)	(3) RE	(4)	(5)	(6)	(7)	(8) FE	(9)	(10)
FDI (in log)	0.018** *	0.007	0.007	0.001	0.000	0.025** *	0.002	0.002	-0.002	-0.002
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)
lperincome		0.133** *	0.156** *	0.001	0.003		0.351** *	0.359** *	0.248** *	0.250** *
		(0.036)	(0.042)	(0.032)	(0.033)		(0.049)	(0.050)	(0.059)	(0.059)
GovExp			- 0.793** *	-0.281*	- 0.313**			- 1.013**	-0.817	-0.812
			(0.200)	(0.161)	(0.159)			(0.458)	(0.508)	(0.510)
Tele				0.011** *	0.011** *				0.006**	0.005**
				(0.002)	(0.002)				(0.003)	(0.003)
PopShare					0.112 (0.220)					0.516 (0.414)
Constant	4.033** *	2.790** *	2.572** *	4.045** *	4.028** *	3.939** *	0.606	0.548	1.638** *	1.598** *
	(0.057)	(0.330)	(0.385)	(0.302)	(0.305)	(0.065)	(0.459)	(0.475)	(0.572)	(0.563)
Observations	363	363	363	330	330	363	363	363	330	330
Number of id	33	33	33	33	33	33	33	33	33	33
R-squared	0.0784	0.319	0.327	0.302	0.304	0.078	0.337	0.346	0.353	0.356
	(1')	(2')	(3')	(4')	(5')	(6')	(7')	(8')	(9')	(10')
Lag FDI (in log)	0.019** *	0.011**	0.012**	0.004	0.003	0.028** *	0.006	0.005	-0.002	-0.002
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
lperincome		0.102** *	0.125** *	-0.018	-0.015		0.349** *	0.360** *	0.233** *	0.235** *
		(0.034)	(0.041)	(0.035)	(0.035)		(0.054)	(0.056)	(0.070)	(0.069)
GovExp			- 0.707** *	- 0.315**	- 0.359**			- 1.115**	- 1.005**	- 0.999**
			(0.209)	(0.158)	(0.161)			(0.436)	(0.439)	(0.442)
Tele				0.012** *	0.012** *				0.008**	0.008**
				(0.002)	(0.002)				(0.003)	(0.003)
PopShare					0.139 (0.210)					0.465 (0.457)
Constant	4.018** *	3.060** *	2.843** *	4.178** *	4.153** *	3.912** *	0.573	0.499	1.745**	1.712**
	(0.057)	(0.314)	(0.384)	(0.326)	(0.331)	(0.064)	(0.521)	(0.542)	(0.660)	(0.648)
Observations	330	330	330	297	297	330	330	330	297	297
Number of id	33	33	33	33	33	33	33	33	33	33
R-squared	0.0974	0.262	0.280	0.284	0.287	0.097	0.304	0.316	0.339	0.342

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1