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Flypaper Effect: The Shifting Unconditional Transfer and Private Income in Indonesia

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ABSTRACT

This study aims to analyze the behavioral pattern of local government as seen from their spending regarding unconditional transfer and private income. Flypaper effect has been a major phenomenon in academic research. Nevertheless, in Indonesia, such research, especially the one focusing on the shift of unconditional transfer and private income, never been caried out. Over 22 years, Indonesia has been implementing decentralization which makes it more intriguing to see local governments' budget and spending decisions' motives. This paper uses a panel data from 476 districts and cities in Indonesia for 11 years. Classical assumption tests, endogeneity test as well as instrumental validation test were caried out before doing the regression. The result from two-stage least square regression shows that flypaper effect does not present in total spending yet appears in four other kinds of spending. Asymmetric response of those five are quite varied. Total expenditure and capital expenditure have symmetrical response. Meanwhile, operational spending and transfer spending have a fiscal replacement type of asymmetry. On the other hand, unexpected spending shows a fiscal restraint asymmetry. The direction of private income's influence to spending also seen to be different from one another.

Keywords: Flypaper Effect, Local Government, Private Income, Spending Behavior, Unconditional Transfer.

INTRODUCTION

Flypaper effect was initially studied by James Henderson and Edward M. Gramlich in 1960s by using a function of social welfare to understand key drivers of local government's spending and taxation decision. The idea of flypaper effect was found as it against median voter theory. Supposedly, elected leaders and public officials only act towards their voters' welfare. Such purpose can only be achieved when economic development in the jurisdiction becoming a priority. Pangestuti and Prasetyia (2021) described economic development as generally pictured when there is an increase of job and wealth creation as well as quality of life in the jurisdiction. It also indicates how development progresses (Runtunuwu & Kotib, 2021). Local government has the responsibility to provide public goods and services which cannot be fulfilled by private companies; thus, an efficient allocation of public resources is necessary. Public officials have the power to stabilize economy through fiscal policies. Government's ability in managing resources and key elements of economic development will strongly contribute to the economic growth (Khusaini, 2019). Local government assumed to have the capability to represent local needs as reflected in their policies.

Median voter theory also categories local government resources to execute their budget into two, i.e., from public and private sector. Hence, an increase in unconditional transfer as a resource from public sector and private income as a resource from private sector will have an equal impact in magnitude and size of spending decisions of local government. Allocative and distributive effect of the government appear to influence such point of view. Unconditional transfer from the central government strengthens the possibility to overcome fiscal gap among municipalities. Utama, Khusaini, and Wahyudi (2017) mentioned that unsuitable tax collection to local citizen's condition will be disincentive and stall economic growth in the long run. Tax redistribution can also reduce capital out migration's efficacy. Therefore, local government then use unconditional transfer as a tax reduction. However, prior studies found the opposite (Dahlby & Ferede, 2015; Gennari & Messina, 2013; Gramlich, 1969; Henderson, 1968**).** The term "money sticks where it hits" has been the symbol affiliated to flypaper effect. Unconditional transfer only circulates in public sector, residents of the jurisdiction do not receive their transfer's share in the form of tax reduction. It is in favor to Niskanen's model of bureaucratic behavior which assumes that bureaucrats are only interested in maximizing their own welfare not that of the community for which they provide services (Bailey & Connolly, 1998). Local government sees unconditional transfer as a free money which they can easily use without putting much effort to earn it. In contrary, Bradford and Wallace (1971) found the presence of intergovernmental transfer help local government to optimize the efficiency of their public services since an additional transfer funds stimulates local spending on public services.

Inman (2009) mentioned characteristics of local government's spending patten can be seen through private income as local tax base. Hence cost of collecting tax and the size of tax base are influential in encouraging the possibility of flypaper effect. The higher the cost and wider the size, the stronger the effect will be. Technically, flypaper effect happens due to problematic data, econometric problem, and exclusion of political characteristics (Bailey & Connolly, 1998). Using incompatible variable to describe grants by combining unconditional and matching transfers is not correct and can be the cause of a problematic data. Unconditional transfer has an income effect only, meanwhile matching transfer has both price and income effect which make the output of such analysis will be bias. The nature of intergovernmental transfer is not exogenous which makes it paramount to address it by using the right analytical tool. Inman (2008) mentioned the necessity to include political characteristics as part of the model. Political

negotiation is an influential stage in deciding the amount of unconditional transfer that the local government will receive. It should be kept in mind to include related variable.

Unconditional transfer in Indonesia has been the main source of local revenue which accounts for 65% in average. Regardless the aggregate amount of transfer fund increases over the years, the change is quite fluctuated, as pictured in Figure 1.

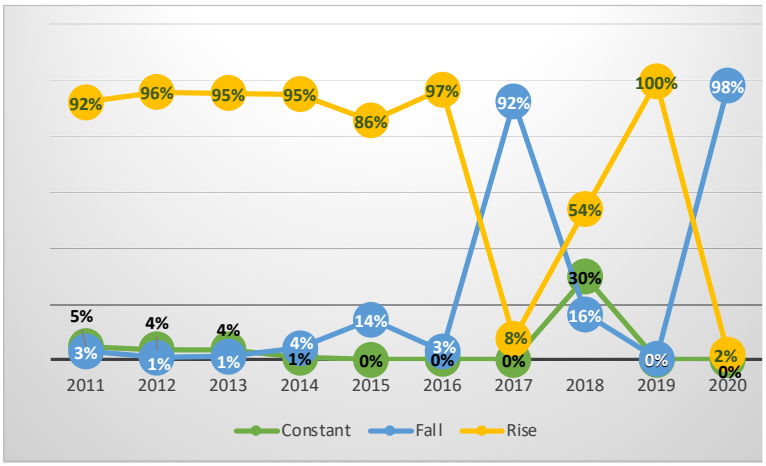

Figure 1. Shift of Unconditional Transfer's Municipalities Trend
Source: Bureau Statistics of Indonesia

Empirically, there are four paths and magnitudes that can be described from the shift of intergovernmental transfer to local spending, namely full substitution, half substitution, no substitution, and stimulation (Boyne, 1990; King, 1984; Haskell, 1964; Wilde, 1971). Full substitution happens when the change of transfer does not influence spending. Half substitution appears when the fall/increase in transfer fund strengthens/decreases spending even though the amount will be very small. No substitution means the shift of unconditional grants will be allocated fully in spending. Lastly, stimulation is a condition when the magnitude of change in transfer bring a stronger influence in spending, i.e., the amount of spending's increases/decreases is higher than the additional/cut of transfer.

In 2022, Indonesia renewed their regulation on unconditional transfer and local spending as issued in the Law No. 1 Year 2022. Prior to the issuance of the Law, unconditional transfer was capped 26% of country's revenue but it is not the case anymore. There is a reformulation of unconditional transfer calculation which accounts for local revenue's potency as a subtrahend. In terms of local spending, a constraint of personnel expenditure, which excluding teachers' allowance, maximum 30% from intergovernmental transfer. Infrastructure spending as one of the mandatory spending of local government shall be at least 40% of total spending. The number increases as regulated in 2017 with minimum 25% cap.

The present study contributes to the public economy literature in several ways: First, many studies have analyzed the influence of unconditional transfer on local government spending across the globe by considering the endogeneity of such transfer and including political characteristics. However, prior studies in the case of Indonesia do not seem to be aware of such concern (Amalia, 2017; Hapsoro & Yoduke, 2019; Iskandar, 2015; Murniasih & Mulyadi, 2011; Solikin, 2016). Second, the empirical response of local government expenditure to shift in transfer give a supplementary insight to existing studies of flypaper effect. Third, analysis on the relevance of recent regulation in spending constraint will be beneficial for economists and policymakers. Prior research in

Indonesia which use own source revenue instead of private income will only evaluate local government's dependence to central ones, yet the motives of such spending can't be seen.

The structure of this study is organized as follows: the second section explains the review of literature and the third section describes the data and economic methodology which are employed in this study. The fourth section presents the empirical results and analysis. The fifth section presents the summary and conclusions.

LITERATURE REVIEW

Median voter theory was brought by Anthony Downs in 1957 through his book entitled 'an economic theory of democracy'. Voters will choose public officials. Hence, it would be called median voter who elect public leaders. Such voter will have a collective preference. And due to the nature of the elected officials to maintain their image, especially for themselves as well as their parties, to maintain their electability, thus in making spending and taxation decision as well as public policy, they will always consider their citizen's welfare.

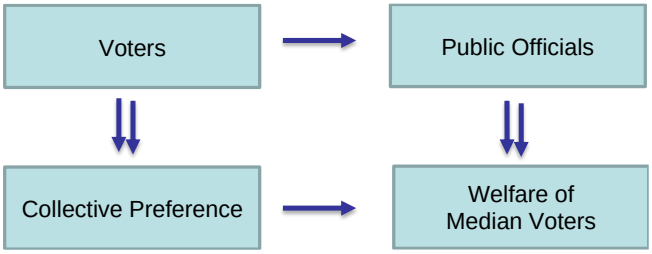

Figure 2. Median Voter Theory

RESEARCH METHOD

This study uses a panel data of 476 regencies and cities in Indonesia from the year 2010 to 2020. The study excluded new autonomous regions emerged around the year of observation and non-autonomous municipality, i.e., DKI Jakarta province. The data used in the study is a secondary data from Directorate General of Fiscal Balance, the Audit Board of Indonesia, and the Central Bureau of Statistics. The quantitative study will be run by Stata v.14. To test the hypothesis, a straightforward model of Gamkhar & Oates (1996) will be used.

$$DAU_{it} = \pi_0 + \pi_1 D\_Area_{it} + \pi_2 PDPR_{it} + \upsilon_{it} \quad (1)$$

$$D_{it}[DAU_t - DAU_{t-1}]_{it} = \pi_0 + \pi_1 D\_Area_{it} + \pi_2 PDPR_{it} + \upsilon_{it} \quad (2)$$

$$B_{it} = \alpha + \beta_1 DAU_{it} + \beta_2 D_{it}[DAU_t - DAU_{t-1}] + \beta_3 P_{it} + \beta_4 Peng_{it} + \beta_5 KP_{it} + \beta_6 Pen_{it} + e_{it} \quad (3)$$

Where B_{it} is local expenditure per capita in rupiah, P_{it} is per capita private income in rupiah, DAU_{it} is unconditional transfer from the central government per capita in rupiah, $D_{it}[DAU_t - DAU_{t-1}]_{it}$ is a dummy variable with a unity value of unconditional transfer declined in rupiah from the preceding year and zero otherwise. Table 1 describes the variables. Due to the presence of endogeneity from unconditional transfer and its change, this study will use two-least stage regressions. Since there is a high possibility of heteroscedasticity and serial correlation problem, this study will correct the standard error to cluster robust standard error (Hoechle, 2007; Millo, 2017; Stock & Watson, 2008). Before running the regression, several tests were conducted, e.g., endogeneity and instrument validity tests. Endogeneity test examines whether the variables are truly not exogenous. By using Durbin and Wu Hausman Test, the endogeneity of

unconditional transfer the shift of such transfer will be checked (Durbin, 1954; Wu, 1974; Hausman, 1978). Instrument validity test will investigate the relevance of appointed instruments, the relevance to endogenous variables, yet unrelated to dependent variables. Weakness of instrument variables will be exercised by comparing Cragg and Donald (1993) eigenvalue F statistics to critical values table created by Stock and Yogo (2005). Model selection of the analysis will use Breusch-Pagan Lagrangian Multiplier (1980) and cluster – robust Hausman tests.

Table 1. Definition of Operational Variables

Category	Variable	Definition	Measurement	Reference
Dependent	Total Expenditure	Local government's total expenditure per capita in rupiah	$\frac{\text{Total Expenditure}}{\text{Local Population}}$	Samal (2018)
	Capital Expenditure	Local government's capital expenditure per capita in rupiah	$\frac{\text{Capital Expenditure}}{\text{Local Population}}$	
	Operational Expenditure	Local government's operational expenditure per capita in rupiah	$\frac{\text{Operational Expenditure}}{\text{Local Population}}$	
	Unexpected Expenditure	Local government's unexpected expenditure per capita in rupiah	$\frac{\text{Unexpected Expenditure}}{\text{Local Population}}$	
	Transfer Expenditure	Local government's transfer expenditure per capita in rupiah	$\frac{\text{Transfer Expenditure}}{\text{Local Population}}$	
Independent	Unconditional Transfer	Local government's unconditional transfer (*Dana Alokasi Umum*) per capita in rupiah	$\frac{\text{Unconditional Transfer}}{\text{Local Population}}$	Levaggi & Zanola (2003) Karnik & Lalvani (2005)
	Change in Unconditional Transfer	Dummy variable of the shift in unconditional transfer of current year less the year prior	D = 1 If $[DAU_t - DAU_{t-1}] < 0$, or D = 0 If $[DAU_t - DAU_{t-1}] \geq 0$	
	Private Income	Gross Domestic Regional Product (GDRP) by the constant price of the year 2010	$\frac{\text{GDRP Constant Price 2010}}{\text{Local Population}}$	
Control	Unemployment	Percentage of open unemployment	%	Mehiriz & Marceau (2014) Gennari & Messina (2013) Bastida, Benito & Guillamón (2009) Lago-Peñas (2008) Heyndels (2001) Gamkhar & Oates (1996) Henderson (1968) Gramlich E. (1969)
	Density	Local density	Person/KM^2	
	Population	Local population	Person	
Instrument	Fraction of Leaders' Parties in the House	Share of president and its vice's parties in the house of representatives	$\frac{President\ and\ VP\acute{}s\ Partie}{Number\ of\ All\ Parties\acute{}}$	Gamkhar & Oates (1996)

Category	Variable	Definition	Measurement	Reference
	Area Dummy Variable	Dummy variable for municipalities in the west or east region	D=1 If Municipality's Located in Java, Sumatra, & Kalimantan Province, or D = 0 for others	Islam & Choudhury (1989)

RESULTS

All variables are pretested by using classical assumption, endogeneity, and instrument validity test.

Table 2. Multicollinearity Test

Variable	VIF	1/VIF
Population	1.57	0.635652
Private Income	1.54	0.650257
Density	1.39	0.719036
Change in Transfer	1.36	0.735613
Unconditional Transfer	1.35	0.739480
Unemployment	1.21	0.826162
Mean VIF	1.40	

Table 2 above describes that there is no multicollinearity problem since the number of all variables' variance inflation factors are less than 2 as well as its mean value. Since the data has been proven to be BLUE, the next step will be to do a model selection. Breusch-Pagan Lagrangian Multiplier test shows that all four dependent variables show the present of random effect. Moreover, Cluster-Robust Hausman test also find that two-stage least square with a random effect to be the most suitable analytical tool as the majority accept H_0. Model selection is tabulated in Table 3.

Table 3. Model Selection

Test	Hypothesis	Dependent Variable	Probability	Conclusion
Breusch-Pagan Lagrangian Multiplier	H_0: CE, H_a: RE	Total Expenditure	0.0000	Reject H_0
		Capital Expenditure	0.0000	Reject H_0
		Operational Expenditure	0.0000	Reject H_0
		Unexpected Expenditure	0.0435	Reject H_0
		Transfer Expenditure	0.0000	Reject H_0
Cluster-Robust Hausman	H_0: RE, H_a: FE	Total Expenditure	0.1136	Accept H_0
		Capital Expenditure	0.2151	Accept H_0
		Operational Expenditure	0.4121	Accept H_0
		Unexpected Expenditure	0.0000	Reject H_0
		Transfer Expenditure	0.0000	Reject H_0

Prior to examining the regression, endogeneity test and instrument validity check are conducted, as pictured in table 4. The outcome shows that two appointed variables as endogenous, i.e., unconditional transfer and the shift of it, are indeed not exogenous. Two proposed instruments seem to be valid and representable.

Table 4. Endogeneity and Instrument Validity Tests

Category	Test	Hypothesis	Dependent Variable	Prob>chi2	Conclusion
Endogeneity	Durbin	H_0: Exogenous H_a: Not Exogenous	Total Expenditure	0.0002	Reject H_0
			Capital Expenditure	0.0000	Reject H_0
			Operational Expenditure	0.0096	Reject H_0
			Unexpected Expenditure	0.0000	Reject H_0
			Transfer Expenditure	0.0000	Reject H_0
	Wu-Hausman		Total Expenditure	0.0002	Reject H_0
			Capital Expenditure	0.0000	Reject H_0
			Operational Expenditure	0.0097	Reject H_0
			Unexpected Expenditure	0.0000	Reject H_0
			Transfer Expenditure	0.0000	Reject H_0
Instrument Validity	Stock & Yogo	H_0: Weak H_a: Not Weak	Total Expenditure	9.8645 > 7.03	Reject H_0
			Capital Expenditure	9.8645 > 7.03	Reject H_0
			Operational Expenditure	9.8645 > 7.03	Reject H_0
			Unexpected Expenditure	9.8645 > 7.03	Reject H_0
			Transfer Expenditure	9.8645 > 7.03	Reject H_0

As mentioned before, this study examines the impact of flypaper effect on local government's spending pattern. Table 5 shows the descriptive statistics of minimum, maximum, mean, and standard deviation of variables used in the empirical estimations. The sample size is 476 municipalities in Indonesia, excluding DKI Jakarta province as it does not have any autonomous regions and new autonomous regions during the observed year. Each regency/city has eleven years of a strongly balanced data, providing 5,236 observations.

Table 5. Descriptive Statistics Example (*N* = 476)

Variables	Min.	Max.	M	SD
Total Expenditure	331453	9.84e+07	4785024	5522872
Capital Expenditure	599.7414	3.54e+07	1227070	2034467
Operational Expenditure	43771.63	5.28e+07	3113303	3130958
Unexpected Expenditure	0	1632101	17914.17	70138.08
Transfer Expenditure	-19049.21	1.70e+07	427254.4	757832.1
Unconditional Transfer	0	3.83e+07	2549687	3025407
Shift in Unconditional Transfer	0	1	.210657	.4078142
Private Income	3333601	4.52e+08	3.23e+07	3.82e+07
Unemployment	0	763	5.410304	10.9282
Population Density	.07	15643	968.4493	2148.769
Population	12961	5965410	501228.2	601629.6

Note. M = Mean, *SD* = Standard Deviation.

In table 6, we show the findings of the estimation in various forms of equation. We note that all the estimated equations have undergone a correction for autocorrelation and heterogeneity among the disturbance terms. Due to the potential endogeneity problem of transfer variables which pretested to be true in this case. We thus use two-stage least squares (2SLS) and treating both the unconditional transfer and asymmetry variables as endogenous.

Table 6. Local Expenditure Estimates

	-1	-2	(3)	(4)	(5)
	TotalExp	CapExp	OpExp	UnexExp	TransExp
DAU_{it}	1.671***	0.751***	0.827***	0.00975**	0.147***
	(7.88)	(6.15)	(7.86)	(3.22)	-5.36
Dit(DAUt-DAUt-1)	3378309.5	-2800459.4	3198804.0*	-532605.2***	2625729.3***
	(1.09)	(-1.46)	(2.22)	(-7.65)	-5.46
P_{it}	0.0187	0.0147*	0.00900*	0.000474***	-0.00224*
	(1.81)	(2.39)	(2.12)	-3.65	(-2.31)
$Peng_{it}$	-0.227	0.71	-0.623	0.0149*	-0.0507
	(-0.34)	(1.76)	(-1.82)	-2.33	(-0.74)
Pen_{it}	1569.7	-827.0	1684.7	-273.3*	335.1
	(0.89)	(-0.69)	-1.75	(-1.98)	-0.57
KP_{it}	-51.82	5.103	1.133	2.568*	-52.46***
	(-1.85)	(0.26)	(0.06)	(2.49)	(-5.41)
_cons	-634677.3	-930340.0***	341510.3	81509.5***	-352646.9***
	(-1.28)	(-3.46)	-1.35	(7.47)	(-5.94)

t statistics in parentheses

As explained before, that flypaper effect is a condition when local government's spending responds to an increase in unconditional transfer more than private income. In this case, flypaper effect presents when $\beta_1 > \beta_3$. Aggregate value of dependent variable (total expenditure) has shown a bias in determining flypaper effect, thus dividing into smaller elements could see the real impact of flypaper effect in local government's spending. Flypaper effect seems to present in all kinds of spending, but total ones. The results are in line with prior studies by Dahlby and Ferede (2015) who found no flypaper effect in total spending and Samal (2018) showed flypaper effect in operational expenditure. The results are the opposite to prior studies by Heyndels (2001); Karnik and Lalvani (2005); Acosta (2008); Lago-Penas (2008); Gennari and Messina (2013); Mehiriz and Marceau (2014); Hortas-Rico, Rios, and Pascual (2021) who confirm the presence of flypaper effect in total spending as well as Samal (2018) stated no flypaper effect in capital expenditure.

Asymmetry response present when β_2 is significant. There are two types of asymmetries, namely fiscal replacement, and fiscal restraint/inducement. Fiscal replacement form of asymmetry is a condition when grants grow, spending is stimulated strongly; when grants fall, spending is unaffected, and municipalities compensate the loss through additional taxation. On the other hand, fiscal restraint happens when grants fall, not only expenditure declines but tax revenue also decreases with the decrease in grants. This study finds the presence of fiscal replacement asymmetry in operational and transfer expenditures. Meanwhile, fiscal restraint type of asymmetry occurs in unexpected transfer. The results are in line with prior studies by Karnik and Lalvani (2005); Mehiriz and Marceau (2014); Gennari and Messina (2013), who find no asymmetry in total spending. Samal (2018) believes there is a fiscal replacement asymmetry in operational expenditure. The results are the opposite to prior studies by Heyndels (2001), Lago-

Penas (2008); Hortas-Rico et al. (2021); Samal (2018) that examine asymmetry in total spending as well as study from Samal (2018) who pictures the presence of fiscal replacement asymmetry in capital expenditure.

DISCUSSION

In Indonesia, most local revenue comes from unconditional transfer which in average is 65%. Since they barely can rely on their tax base, local government sees unconditional transfer as a free money that enhances their budget. Public officials react to additional amount of transfer by maximizing their budget rather than strengthening their citizen's welfare (Bailey & Connolly, 1998). Elected leaders supposedly responsible in achieving local economic development by fulfilling their economic goals, such as balancing inflation, creating new jobs, and prioritizing sustainable growth (Pangestuti & Prasetyia, 2021). Moreover, issuing policies and programs related to basic local needs as well as physical development and easiness of health access to the poor are also important to be in discussion. Society's welfare and local capabilities must be over the bridge. As described in median voter theory, voters will create a collective preference hence in making any activities or policies related to the citizens in their jurisdiction, leaders should consider such preference. Prasetyia and Pangestuty (2021) describe the process of public policy creation which initiated by individual problems move to social then public case. When it becomes a public concern, government's intervention is expected in the form of public policy issuance.

Khusaini (2018) stated that flypaper effect is a condition where local government responds to the use of intergovernmental transfer by using it to fund their spending. Local tax base does not seem to react the same way. The main reasoning behind appearance of flypaper effect is high dependence on transfer. The symmetrical response of capital expenditure is plausible due to the nature of such spending which requires a heavy bureaucratic event from planning and execution to evaluation process that must be carried. Unexpected appears when there are unavoidable events or emergencies and unplanned situations which make the finding reasonable to the increase in such spending even though grants fall. Transfer expenditure and operational expenditure seem to decrease as the grant decrease. It is potentially due to the high dependence rate of local government to unconditional transfer which in average about 65% of local revenue.

CONCLUSION

The presence of flypaper effect then strongly supports the idea that local government is very much dependent on transfers as part of their free money which then the circulation of such funds does not appear to be allocated to the private sector as part of tax reduction but as a free resource to spend more. Flypaper effect is detected in all kinds of expenditures, except total spending. It could be due to bias caused by the aggregate value on spending. Symmetrical response of total and capital expenditures, as well as asymmetry in other spendings fit the nature. These results enhance the debate on fiscal decentralization to allocative efficiency and economic growth. There is evidence of significant relationship between all kinds of spending and unconditional transfer as well as private income, regardless the insignificant result of the aggregate value. Median voter theory suggests the needs of elected officials to maintain their image, i.e., for themselves and or their parties, thus in making any decision will always consider their voters' happiness. Yet, findings of this study find the opposite to such motives. Local government tends to maximize their budget as they get additional fund to spend more.

Due to the retrenchment in Indonesia since covid-19 pandemic and based on the world bank's prediction that Indonesia's economy will be back to normal in 2026, future research should analyze specifically flypaper effect during the pandemic. As expected, fluctuation of unconditional transfer and private income will be much higher. Our model provides a foundation for future research into the question of whether flypaper paper effect more responsive to the fall of grants compared to its rise.

LIMITATION

This paper excludes districts and cities of new autonomous regions as some of the data are unavailable and could make the research bias. Exception also made to the year 2021 due to data unavailability.

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DECLARATION OF CONFLICTING INTERESTS

The Authors declare that there is no conflict of interest.

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