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ARTICLE

Examining Flypaper Effect in Indonesia

Evidence After Transferring Urban-Rural Land and Building Tax to Locals Government

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Abstract: In order to increase the tax power of local governments, the central government implemented a major reform in 2010 by transferring the Urban-Country Land and Buildings Tax (PBB-P2) to local governments. Although the tax contributes a significant portion of local government revenues, the spending behavior of local governments is questionable, and it is unclear whether public spending has been increased. This study examines the effect of strengthening PBB-P2 policy on increasing local revenue (PAD) and its impact on regional spending patterns, specifically whether there are still flypapers after policy reform. Applying a fixed-effects panel data method to Indonesian local governments from 2005 to 2020, we found that strengthening PBB-P2 policy had a significant positive impact on PAD. The positive effect was found to be significant one year (year +1) after policy implementation in each region, including for the province, district, and city, with the issuance of regional ordinances related to PBB-P2. Interestingly, the significant increase in PAD impacted regional spending patterns. Thus, the flypaper effect phenomenon did not exist from 2005 to 2020. This implies that the central government can selectively empower local governments to levy appropriate local taxes and user fees. This can be done by providing new local tax sources, restructuring tax types, simplifying usage fee types, and harmonizing regional government regulations with the central government.

Keywords: PBB-P2; panel event studies; flypaper effect; local government; spending.

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1. Introduction

The Central-Regional Government Financial Relations (HKPD) Law No. 1 of 2022 was enacted to complete Law No. 33 of 2004 on Financial Balance between Central and Local Governments (CPCD). The HKPD Law aims to promote fiscal decentralization by increasing and strengthening local tax power, managing regional taxes and regional retributions, improving the quality of regional spending, harmonizing spending, managing centralized money transfers to local governments and regional funding policies, and strengthening the course harmonization of tax relations between centers and regions.

Effective decentralization can promote context and is not based on convenience, avoiding dependence on central-to-regional cash transfers, which can encourage over-dependence and thus defeat principles of fiscal autonomy (Panao, 2021). Fiscal decentralization in Indonesia has been implemented since 2001, with the main objective to create regional independence, as demonstrated by the administration of and increase in local revenues (Inayati & Setiawan, 2017). The internalization of benefits and costs to the people and how the government reaches out to its people are the essence of decentralization (Simanjuntak, 2015).

The HKPD Law aims to improve Law No. 28 of 2009 concerning PDRD (Regional Taxes and Levies), which has been in effect since January 1, 2010, the aim of which is to strengthen the tax base and increase local taxing power compliance. The flexibility to strengthen the tax base on the types and rates of PDRD in the regions can improve regional fiscal capacity for community welfare by increasing services to the community in provinces, regencies, and cities in Indonesia.

The PDRD Law gives regions the authority to collect taxes (taxing power) in the form of Rural and Urban Land and Building Taxes (PBB-P2). Previously, PPB-P2 was a type of central tax. However, it was transferred and delegated to provincial/regency/city regional taxes as stipulated in the joint regulation between the Minister of Finance (No. 15/PMK.07/2014) and the Minister of Home Affairs (No. 10 of 2014) concerning the Stages of Preparation and Implementation of the Transfer of Rural and Urban Land and Building Taxes as Local Taxes.

Based on LGF's realization of the local budget of the Directorate General of Fiscal Balance, Ministry of Finance, from 2005 to 2008 PAD in the local budget showed a fairly stable upward trend, from IDR35,095 trillion to IDR64,078 trillion, an increase of 83%. In 2009, local revenue was IDR18,036 trillion, and from 2010 to 2020 there was a significant increase of 229%, from IDR80,150 trillion to IDR264,066 trillion.

Many studies on local revenue have been conducted to improve service provision to the community based on the duty and authority of regions to obtain, collect, and manage tax sources and regional funds, including PAD (local revenue), DAU (general allocation fund), DAK (special allocation fund), DBH (profit-sharing fund), deconcentration, homework assistance, and regional loans. Conceptually, local revenues will have a real and significant impact on regional spending. This is consistent with research showing that local revenues have a significant positive effect on regional spending (Ernayani, 2017; Inayati & Setiawan, 2017; Liando & Hermanto, 2017). However, this study contradicts the findings of Sanusi and Yusuf (2018), who reported that local revenues have an insignificant negative effect on regional spending.

Previous research has proven that it is related to the influence and increase in local revenue. However, no studies have examined the effects of strengthening PBB-P2 policies on local revenue. In addition, the relationship between regional spending patterns and the flypaper effect and its effect on local revenue is an important concern in fiscal management in Indonesia, especially income from PBB-P2, which dominates regional revenues in most regions.

The flypaper effect refers to regional dependence on central government transfer funds rather than utilizing local revenue. If there is a reduction in transfer funds from the center to the regions, the regional government will tend to maintain its budget by increasing taxes to increase local revenues. On the other hand, local governments

can reduce regional spending if there is a reduction in transfer funds from the central government. The objectives of this study are: (1) to measure the effectiveness of strengthening PBB-P2 policies related to increasing local revenue from 2005 to 2020 and (2) to analyze the impact of increased local revenue on regional spending patterns in relation to the flypaper effect for all provinces/regencies/cities in Indonesia from 2005 to 2020.

Independent financial management is necessary when implementing fiscal decentralization in Indonesia, and the potential for local governments to manage effective and efficient planning systems must be optimized because of the challenges experienced by all provinces/regencies/cities. Increasing the capacity of regional financial management is particularly important in the era of decentralization (Sunaryo & Cicellia, 2014). Local governments, along with the community, play an important role in initiatives to advance the region, and all potential sources of financing must be explored for each region to meet their governance and development needs.

The main element of this type of decentralization is fiscal decentralization. The functions and decision-making policies regarding spending in the public sector carried out by local governments require support and approval from the central government, including subsidy facilities and the use of potential finance sources sourced from both PAD and profit sharing (tax and non-tax). This decision-making function is in line with research showing that the authority of the central government is delegated to local governments through statutory regulation, and the party receiving the authority can then perform the functions of administration and delegation (Kharisma, 2013).

Local governments provide services to the community. The duties and authorities of the region include, among others, withdrawing, collecting, and managing tax sources and regional funds, which include PAD, DAU, DAK, DBH, deconcentration, assistance tasks, and regional loans. The implementation of the PBB-P2 policy, which the regional government enacted in 2014, encourages an increase in PAD in each region, so PAD has a significant impact on regional spending.

Since the implementation of decentralization in Indonesia, much progress has been made in managing local government finances. This decentralization involves the delegation of authority from the central government to local governments to manage expenditures, explore potential sources of independent regional income, and optimally allocate budget transfers to local governments and other managers (Kharisma, 2013). According to Wibowo and Oktivalerina (2022), the division of authority between the central and local governments regarding the provision of services to the community and the delegation of authority in allocating various financial resources must be based on the principle of effective and optimal decentralization. This research indirectly corrects a study claiming that local governments are still dependent on the transfer budget from the central government, which results in a lack of local tax revenues (Green, 2005), as well as research reporting that local budgets are required to finance decentralization, which does not give local authorities the authority to collect significant taxes (Aritenang, 2008).

Research on the flypaper effect demonstrated that unconditional transfers in the form of internal revenue allotments (IRAs) could reduce local revenues and create fiscal dependence among local government units (Panao, 2021). Sub-optimal local government units rely on IRAs and tend to be more active in increasing their sources of income and allocating more for the community's welfare. Similarly, research has found that the value of the DAU coefficient on the local budget is greater than the PAD coefficient value, indicating the dependence of the region on the central government (Melo, 2002). Further, research has shown that transfers have a positive and significant effect on local government spending, suggesting a flypaper effect. Local governments will increase their spending in response to an increase in the unconditional transfer of funds on a lump-sum basis, indicating the occurrence of symmetric information, and local government spending behavior is observed, or there is a pattern of spatial dependence on local government spending (Acosta, 2010). Likewise, the flypaper effect has been defined as a pattern of regions depending on the central government

to transfer funds rather than maximizing PAD, which some parties benefit from (Hamilton, 1983). The results of this study show that the transfer of funds from the central government to regions has a negative impact on PAD and is highly dependent on the central government's budget (Cárdenas & Sharma, 2011; Hines & Thaler, 1995; Karnik & Lalvani, 2008; Liu & Zhao, 2011; Sour, 2013). Decentralization, which has been going on for two decades, is resulting in excessive financial dependence on the central government (Haryanto, 2017; Temenggung et al., 2020). The central government has recognized regional independence through self-managed sources of income and by reducing the transfer of funds aiming to address local revenue shortages (Khairi, 2021).

Local governments have a significant level of administrative control over their PAD. As regional expenditures financed by DBH and DAU increase or decrease, local governments need to consider increasing or decreasing their PAD efforts in relation to financing regional expenditures (beyond those funded by DAK). The area changes annually during the fiscal year. The central government largely determines the DAU allocation. The distribution is a positive function of regional expenditure needs, and it is negatively related to fiscal capacity. Therefore, regional expenditures in one period can affect the distribution of DAU in the following periods. The central government allocates DAK to local governments in several stages during the fiscal year. The distribution of the next stage will depend on the extent to which the regional government has spent the previously allocated funds. Thus, the total DAK allocation in one fiscal year is an explicit function of regional expenditures during that year (Lewis, 2013).

2. Methods

The ratification of the PDRD Law made PBB-P2 a new regional tax administered by regional governments in provinces, regencies, and cities in Indonesia. This included the preparation and issuance of regional regulations in each province/regency/city in Indonesia no later than January 1, 2014. Based on Figure 1, the implementation of PBB-P2 policies by the provincial/regency/city governments can significantly increase regional original income. As a control variable, the number of residents has a significant impact on increase in regional original income. Increasing local revenue and central government transfers, including DBH, DAU, and DAK, can reduce the negative impacts of the flypaper effect.

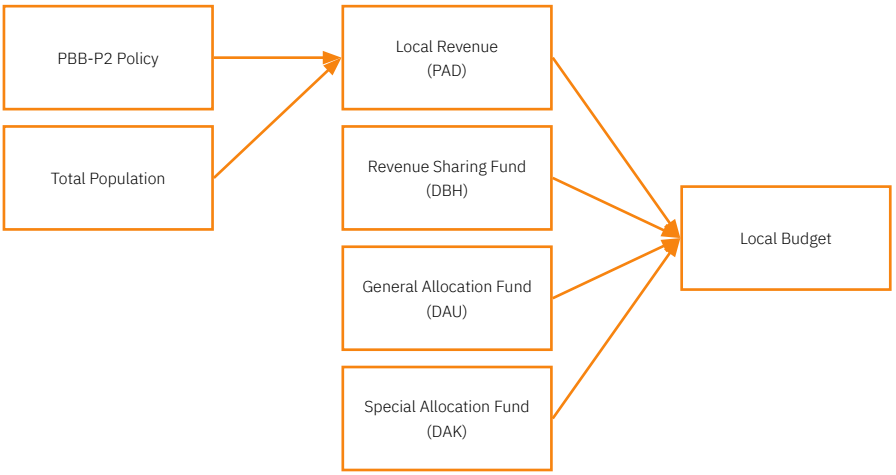

Figure 1. Conceptual Framework for PBB-P2 Policy

Source: *Author (2022)*

This research was conducted using a quantitative research approach employing the panel event study model, a two-way development of the fixed effect difference-in-differences (FE-DID) model, to measure the effect of strengthening PBB-P2 policies on PAD in the period 2005–2020. The panel event study method is used to

determine the effects of policies in different years between individuals or entities. In simple terms, the panel event study method can be used when data are available to beneficiaries in different periods of policy implementation. This method produces an estimated impact, which is measured to control for factors that do not change with time (time invariant) but still require time-variant factors to control them. The panel event study method can be described using the following regression equation (Clarke & Tapia-Schythe, 2021):

$$ln\_pad_{st} = \alpha + \sum \beta_j (Lag\ j)_{st} + \sum \gamma_k (Lead\ k) + Province/Regencies/City_s + Province/Regencies/City_t + ln\_\ total\ population_{st} + \varepsilon_{st}$$

where ln_pad_{st} is the dependent variable of local revenue; $Province/Regencies/City_s$ is the group of province/regency/city fixed effects; $Province/Regency/City_t$ is the group of province/regency/city time effects; $ln\_number\ of\ population_{st}$ is a control variable for population, which is time variant in nature between provinces/regencies/cities; α is a constant (intercept); β_j and γ_k are the values of the variable coefficient, is 1,2,3,...,509 (cross-section, province/regencies/cities in Indonesia), is 1,2,3,...,15 (time series, 2005–2020), ε_{st} is the unobserved variable or error component (error term), Lag is a binary variable that shows how late it is in the observation year before the policy is implemented; and Lead is a binary variable that shows how late it is in the observation year after the policy is implemented (policy year). Lag and Lead represent the dynamics/events that occur in the respective periods before and after the policy is implemented.

This research followed a quantitative approach and used the fixed effect panel data model to analyze the increase in PAD related to the relationship between regional spending patterns and the flypaper effect in all provinces, regencies, and cities in Indonesia in the period 2005–2020. The fixed effect panel data method can be described using the following regression equation:

$$ln\_expenditure_{st} = c + \delta_1 ln\_pad_{st} + \delta_2 ln\_dbh_{st} + \delta_3 ln\_dau_{st} + \delta_4 ln\_totaldak_{st} + \varepsilon_{st}$$

where $ln\_localexpenditure_{st}$ is the dependent variable of regional expenditure; ln_pad is the independent variable of regional original revenue, which is time variant between provinces/regencies/cities; ln_dbh is the independent variable of the revenue sharing fund, which is time variant between provinces/regencies/cities; ln_dau is the independent variable of the general allocation fund, which is time variant between provinces/regencies/cities; ln_totaldak is the independent variable of the special allocation fund, which is time variant between provinces/regencies/cities; c is a constant (intercept), δ_1 s.d. δ_4 is the value of the variable coefficient, is 1,2,3,...,542 (cross-section, provinces/regencies/cities in Indonesia), $_t$ is 1,2,3,...,15 (time series, the year 2005–2020); and ε_{st} is an unobserved variable or error term.

This study uses various data sources for the unit of analysis. To measure the effectiveness of strengthening PBB-P2 policies in terms of increasing PAD, the dependent variable in this study was taken from data from the Directorate General of Fiscal Balance of the Ministry of Finance. In contrast, the dummy variable used data on the issuance of regional regulations on the implementation of PBB-P2 policies from the Directorate General of Fiscal Balance of the Ministry of Finance, and the variable control was based on the Population from Indodapoer and Statistics Indonesia.

To analyze the increase in PAD related to the relationship between regional spending patterns and the flypaper effect in all provinces/regencies/cities in Indonesia from 2005 to 2020, the dependent variable uses local budget data from the Directorate General of Fiscal Balance of the Ministry of Finance. The independent variable is based on data on the realization of PAD, DBH, DAU, and DAK from the Directorate General of Fiscal Balance of the Ministry of Finance. The data and sources are shown in Table 1.

The unit of analysis is province/regency/city to measure the impact of strengthening PBB-P2 policies on PAD in the 509 provinces/regencies/cities, and the increase in PAD

Table 1. Data and Sources

No.	Variable	Unit	Source Data
1	Local Budget Realization	Billion Rupiah	Directorate General of Fiscal Balance – Ministry of Finance
2	Implementation of PBB-P2 Policy	Year	Directorate General of Fiscal Balance – Ministry of Finance
3	Realization of Local Revenue	Billion Rupiah	Directorate General of Fiscal Balance – Ministry of Finance
4	Realization of DBH	Billion Rupiah	Directorate General of Fiscal Balance – Ministry of Finance
5	Realization of DAU	Billion Rupiah	Directorate General of Fiscal Balance – Ministry of Finance
6	Realization of DAK	Billion Rupiah	Directorate General of Fiscal Balance – Ministry of Finance
7	Total population	Soul	Indodapoer and Statistics Indonesia

Source: *Author (2022)*

is related to the relationship between regional spending patterns and the flypaper effect in 542 provinces/regencies/cities for the period 2005–2020.

3. Results and Discussion

This study aimed to determine and measure the impact of strengthening PBB-P2 policies on PAD using the panel event study method and analyzing PAD increases related to the relationship between regional spending patterns and the flypaper effect in the period 2005–2020.

The HKPD Law represents a refinement of the PKPD Law and PDRD Law. One of the objectives of improving this regulation is to strengthen local taxing power, specifically by strengthening the application of PBB-P2. The HKPD Law covers the management and administration of regional taxes and regional retributions, which was previously regulated by the PDRD Law. Based on the PDRD Law, PBB-P2 was transferred from the central government to the regional government. The PBB-P2 policy has become a regional tax based on the idea that PBB-P2 is in the territory of the regional government (local taxing power). This delegation and transition of PBB-P2 has affected the structure of local budgets.

3.1. Overview of Local Revenue and Local Transfers

Indonesia consists of 542 local governments, divided into 34 provinces, 93 cities, and 415 regencies. Regional fiscal decentralization was first implemented in Indonesia in 1999. Each region has the power and authority to regulate and manage its regional finances, which can be seen from the increase in PAD realization from 2005 to 2022.

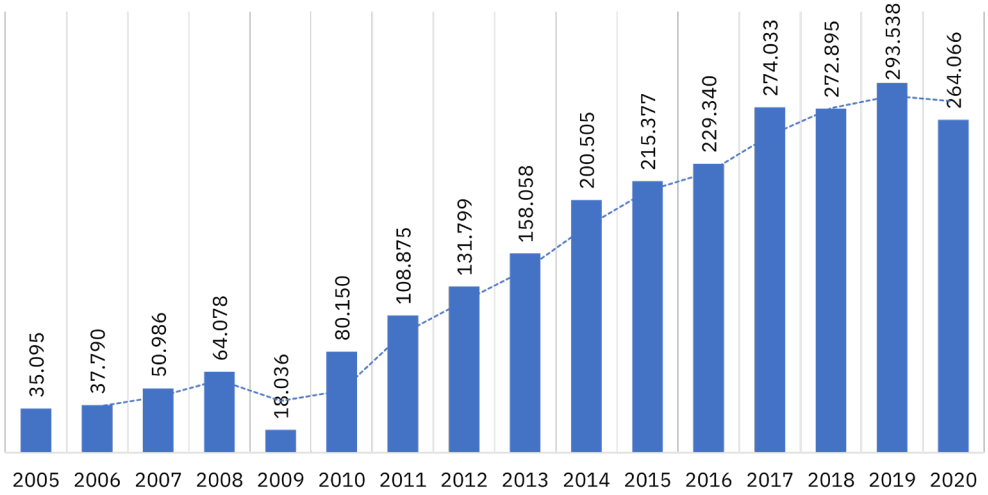

Figure 2. Realization of PAD From 2005 to 2020 (Billion Rupiah)

Source: *LGF Realization of the DJPK Regional Expenditures of the Ministry of Finance (2005 to 2020), processed*

According to Figure 2, local revenue in regional expenditures from 2005 to 2008 showed a fairly stable upward trend, from IDR35,095 trillion to IDR64,078 trillion,

an increase of 83%. In 2009, PAD amounted to IDR18,036 trillion, and then from 2010 to 2020 there was a significant increase of 229%, from IDR80,150 trillion to IDR264,066 trillion. Local revenue, both before and after the PDRD Law was issued, was increasing nationally from 2005 to 2020.

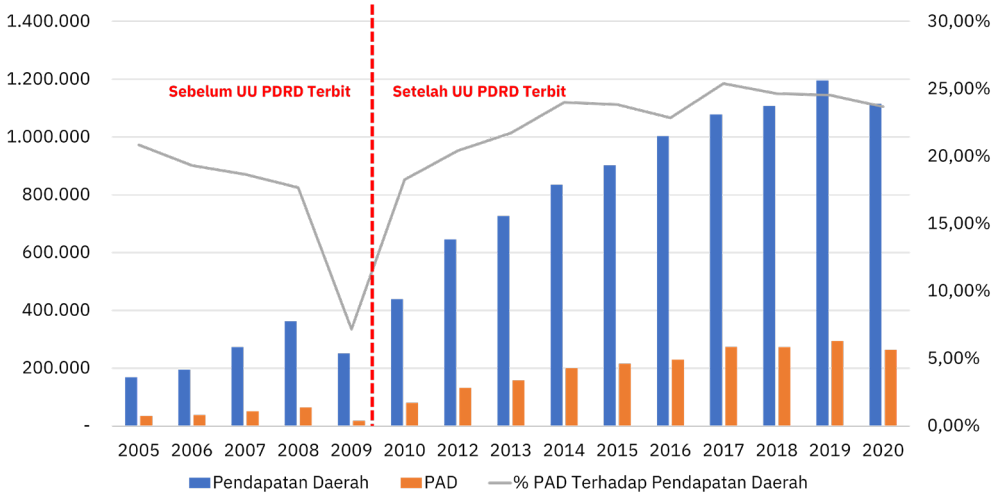

Figure 3. Proportion of PAD on Local Expenditure 2005–2020 (Billion Rupiah)

Source: *LGF Realization of Local Budget DJPK Ministry of Finance (2005 to 2020), processed*

Based on Figure 3, the value of PAD from 2005 to 2008 experienced an upward trend, from IDR35.095 billion to IDR64.078 billion, and it decreased in 2009 to IDR18.036 billion. PAD increased again by IDR80.150 billion in 2010 and tripled in 2020. The proportion of PAD in regional expenditures from 2005 to 2009 experienced a downward trend, from 20.85% to 7.18%. From 2010 to 2020, the proportion of PAD to regional expenditures increased significantly, from 18.27% to 23.67%.

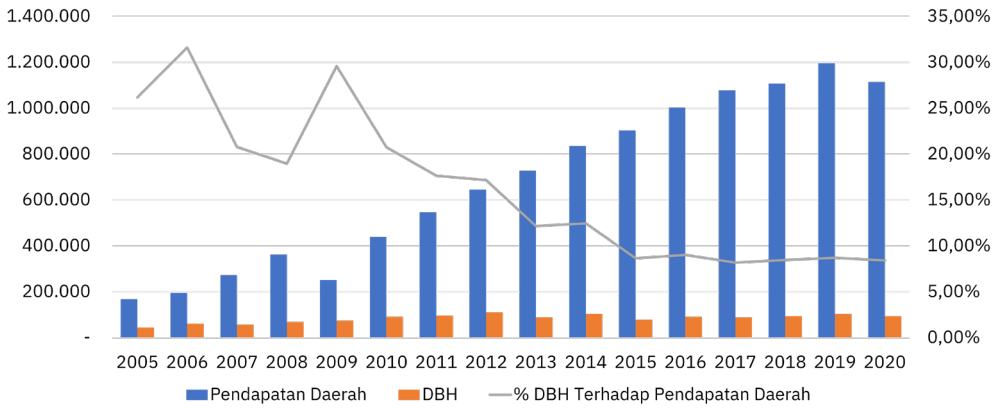

Figure 4. Proportion of DBH to Local Revenue 2005–2020 (Billion Rupiah)

Source: *LGF Realization of Local Budget DJPK Ministry of Finance (2005 to 2020), processed*

Based on Figure 4, the proportion of DBH to local revenue in regional expenditures from 2005 to 2008 experienced a downward trend, from 26.19% to 18.96%, increased again in 2009 by 29.60%, decreased again in 2010 to 2014 from 20.77% to 12.45%, and stabilized again from 2016 to 2020, ranging from 8.42 to 9.04%.

Based on Figure 5, the proportion of DAU to local revenue in APBD from 2005 to 2006 increased from 52.73% to 74.23%, decreased again in 2008 by 49.53%, and increased in 2009 by 74.23%. From 2010 to 2020, there was an insignificant downward trend, with a proportion of 43.91% in 2010 and 34.21% in 2020.

Based on Figure 6, the proportion of DAK to local revenue in APBD increased from 2.38% in 2005 to 9.83% in 2009 and decreased again in 2010 to 4.78%. DAK

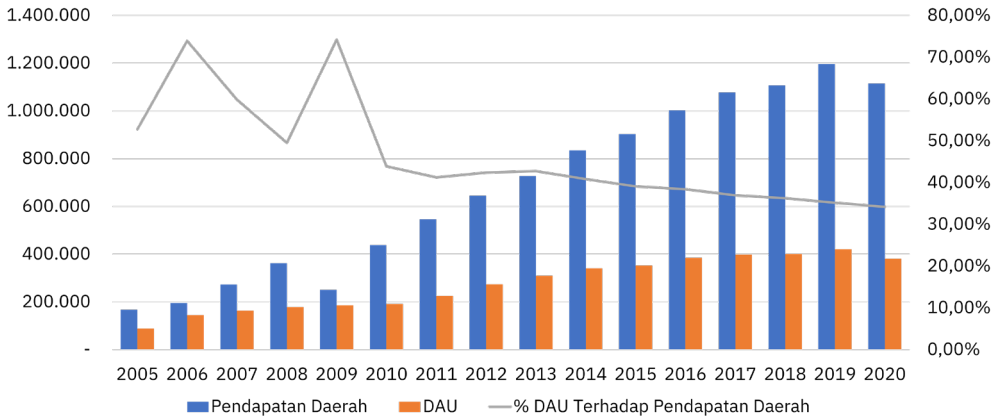

Figure 5. Proportion of DAU to Local Revenue 2005–2020 (Billion Rupiah)

Source: *LGF Realization of Local Budget DJPK Ministry of Finance (2005 to 2020), processed*

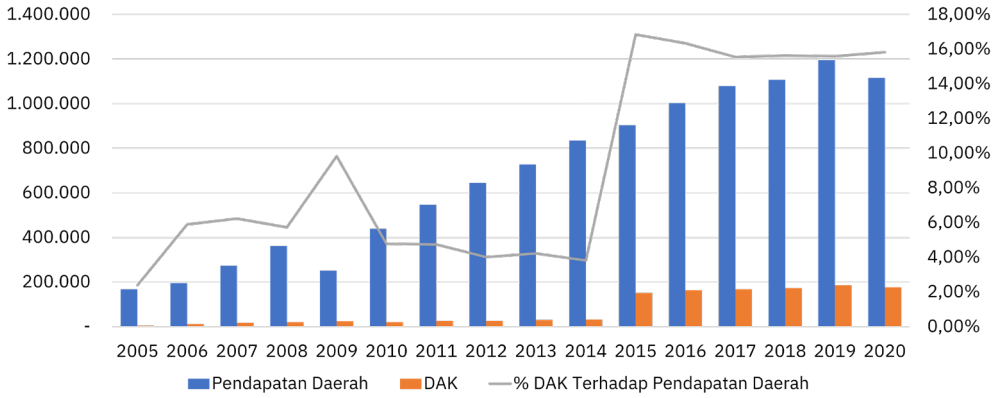

Figure 6. Proportion of DAK to Local Revenue 2005–2020 (Billion Rupiah)

Source: *LGF Realization of Regional Expenditures DJPK Ministry of Finance (2005 to 2020), processed*

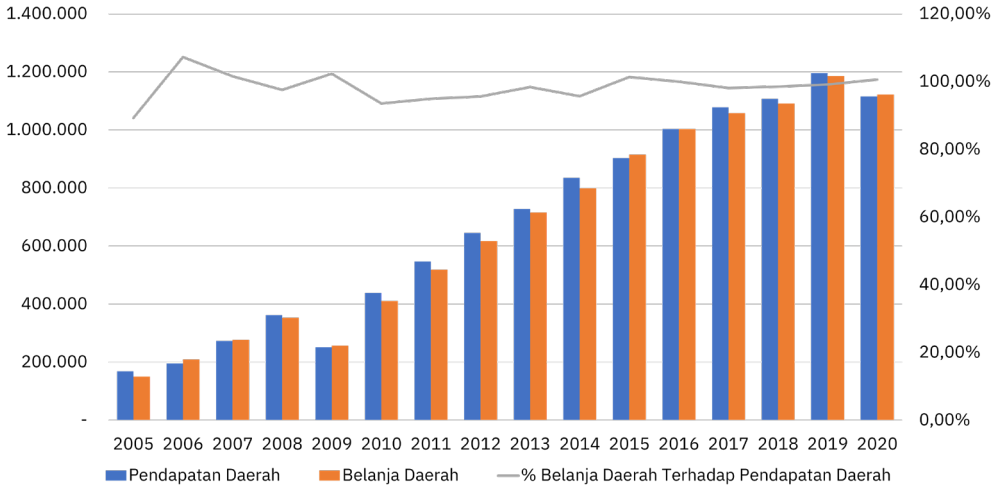

Figure 7. Proportion of Regional Expenditures to Local Revenue 2005–2020 (Billion Rupiah)

Source: *LGF Realization of Local Budget DJPK Ministry of Finance (2005 to 2020), processed*

experienced an increase in regional revenue starting in 2015 by 16.84%, followed by an insignificant downward trend between 2016 and 2020.

Based on Figure 7, the proportion of the realized regional expenditure to regional income from 2005 to 2020 ranged from 89.21–107.27%. The lowest realization occurred in 2005 (89.21%), while the realization of local budgets exceeded regional

revenues in 2006, 2007, 2009, 2015, and 2020 (107.27%, 101.58%, 102.34%, 101.38%, and 100.58%, respectively).

3.2. Analysis of PBB-P2 Policy Description of PAD

The main variables observed are the realization of local revenue (ln_PAD), which is the dependent variable, the year of implementing the PBB-P2 policy for each province/regency/city, which is the dummy variable, and the total population (ln_total population), which is the control variable. This study used a sample of 509 regions (one province and 508 regencies/cities) with a total of 8,144 units of observation.

Table 2. Descriptive Analysis of Dependent, Dummy, and Control Variables

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
ln_pad	7.256	24,664	1,407	14,421	31,453
post_intervention	8.144	0,509	0,500	0	1
ln_ total population	7.855	12,564	1,045	8,723	16,188

Source: *Author (2022)*

Based on Table 2, the average values of the variables range from 0.509 to 24.664. The standard deviation is smaller than each variable's average value, indicating that the sample data are evenly distributed. The minimum and maximum values for each variable are listed in Table 2.

3.3. The Dynamic Impact of PBB-P2 Policy on Local Revenue

This study provides an overview of the dynamic impact of implementing local taxing power policies in provinces/regencies/cities. The results show that PAD has increased since implementing the policy to strengthen PBB-P2 in each region.

Table 3. Estimation Results and Effectiveness of Implementing PBB-P2 Policies on PAD

Variable	ln_pad	
	(1)	(2)
post_intervention	0.259***	0.243***
	(0.0311)	(0.0278)
ln_ total population		0.134**
		(0.0532)
Year -9	-1.535***	-1.534***
	(0.0605)	(0.0589)
Year -8	-1.404***	-1.401***
	(0.0557)	(0.0544)
Year -7	-1.155***	-1.153***
	(0.0457)	(0.0449)
Year -6	-0.965***	-0.963***
	(0.0369)	(0.0360)
Year -5	-0.795***	-0.796***
	(0.0354)	(0.0345)
Year -4	-0.551***	-0.552***
	(0.0337)	(0.0330)
Year -3	-0.377***	-0.380***
	(0.0283)	(0.0275)
Year -2	-0.165***	-0.170***
	(0.0242)	(0.0232)
Year 0	0	0
	(.)	(.)
Year +1	0.237***	0.235***
	(0.0171)	(0.0171)

Variable	ln_pad	
	(1)	(2)
Year +2	0.449***	0.446***
	(0.0239)	(0.0238)
Year +3	0.668***	0.666***
	(0.0305)	(0.0302)
Year +4	0.843***	0.840***
	(0.0375)	(0.0371)
Year +5	1.045***	1.042***
	(0.0474)	(0.0470)
Year +6	1.237***	1.234***
	(0.0588)	(0.0583)
Year +7	1.435***	1.431***
	(0.0713)	(0.0708)
Year+8	1.613***	1.609***
	(0.0831)	(0.0827)
Year +9	1.791***	1.786***
	(0.0962)	(0.0958)
Year +10	1.795***	1.791***
	(0.0823)	(0.0818)
_cons	24.49***	22.81***
	(0.0424)	(0.671)
Number of Observations	7256	7250
Number of Regions	509	509
R-squared	0.8565	0.8629
FE Prov/Regencies/City	Yes	Yes
Linear Trends of Province/Regency/City	Yes	Yes

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

Source: *The results of the author's data processing with Stata 17 (2022)*

Table 3 shows that the PBB-P2 (post_intervention) policy has a significant positive effect on PAD of 0.259, meaning that PBB-P2 policy implementation increased PAD by 0.259%. Table 3 also highlights the impact of implementing the policy of strengthening PBB-P2 on PAD. There was a significant positive effect one year (year +1) after the enactment of the PDRD Law, which was followed by the issuance of regional regulations regarding PBB-P2 in each province/regency/city in Indonesia. However, prior to the issuance of the PDRD Law, it had a significant negative effect on local revenue, which began nine years before the PBB-P2 policy was implemented (years -9 to -2).

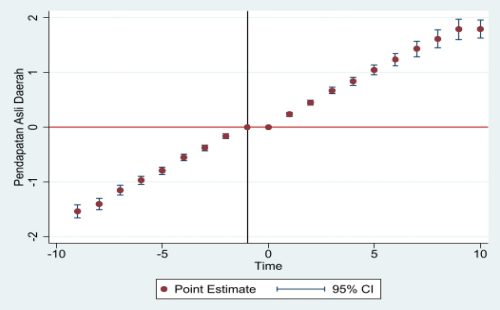

Figure 8. Dynamic Effects of PBB-P2 Policy on PAD

Source: *The results of the author's data processing with Stata 17 (2022)*

Figure 8 illustrates that the dynamic effect of implementing the PBB-P2 strengthening policy on PAD has experienced an increasing trend since the implementation of the local taxing power policy. When PAD is controlled by the population number variable,

the PBB-P2 (post_intervention) policy has a significant positive effect of 0.243 on PAD, meaning that implementation of the PBB-P2 policy leads to an increase in PAD by 0.243%. Meanwhile, the control variable total population has a significant positive effect of 0.134 on PAD. Thus, when all other variables remain constant, a 1% increase in total population increases PAD by 0.134%.

From Table 3, we can also see the effectiveness of the policy strengthening PBB-P2. Population has a significant positive effect on PAD beginning one year (year +1) after the PDRD Law was enacted, followed by the issuance of regional regulations regarding PBB-P2 in provinces/regencies/cities in Indonesia. However, prior to the issuance of the PDRD Law, it had a significant negative effect on local revenue, which began nine years before the PBB-P2 policy was implemented (years -9 to -2).

As shown in Figure 9, the dynamic effect of implementing the policy of strengthening PBB-P2 and population on PAD has increased since the implementation of the local taxing power policy in each province/regency/city.

3.4. Analysis of the Increase in PAD Based on the Relationship Between Regional Spending Patterns and the Flypaper Effect

The dependent variable in this study was regional expenditures (ln_spending), while PAD (ln_pad), DBH (ln_dbh), DAU (ln_dau), and DAK (ln_totaldak) were the independent variables. This study included a sample of 542 regions, with a total observation of 8,672 units.

Table 4. Descriptive Analysis of Dependent and Independent Variables

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
ln_local budget	7.745	27,493	0.845	22,215	31,804
ln_pad	7.746	24,847	1.576	14,422	31,453
ln_dbh	8.171	24,789	1.187	19,823	30,456
ln_dau	8.242	26,837	0.618	21,035	29,017
ln_totaldak	8.078	25,019	1.161	18,787	30,016

Source: *The results of the author's data processing with Stata 17 (2022)*

As shown in Table 4, the average values of the variables range from 24,789 to 27,493. The standard deviation is smaller than each variable's average value, indicating that the sample data are evenly distributed. The minimum and maximum values for each variable are listed in Table 4.

3.5. The Impact of Increased PAD Based on the Relationship Between the Pattern of Regional Expenditures and the Flypaper Effect

According to Hamilton (1983), the pattern of the flypaper effect depends on the region of central government transfer funds rather than maximizing PAD. Certain parties benefit from this dependence. Melo (2002) found that the value of the DAU coefficient on regional expenditures was greater than the PAD coefficient value, indicating the region's dependence on the central government.

The increase in PAD was analyzed based on the relationship between regional spending patterns and the flypaper effect from 2005 to 2020 due to the enactment of the PDRD Law. The fixed effect data panel method was used, and the coefficient estimation results are presented in Table 5.

Table 5. Estimated Results of Independent Variables on Regional Expenditures

Variable	Ln_ Regional Expenditures			
	(1)	(2)	(3)	(4)
ln_pad	0.254***	0.167***	0.160***	0.163***
	(0.00552)	(0.00560)	(0.00546)	(0.00538)
ln_dbh		0.100***	0.101***	0.0918***
		(0.00544)	(0.00529)	(0.00525)

Variable	Ln_ Regional Expenditures			
	(1)	(2)	(3)	(4)
ln_dau			0.175***	0.135***
			(0.0107)	(0.0113)
ln_totaldak				0.0300***
				(0.00365)
_cons	20.36***	19.97***	15.60***	16.08***
	(0.129)	(0.185)	(0.327)	(0.335)
Number of Observations	7739	7700	7668	7500
Number of Regions	542	542	542	542
R-squared	0.923	0.936	0.939	0.940
FE Province/Regency/City	Yes	Yes	Yes	Yes
Description: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Source: *The results of the author's data processing with Stata 17 (2022)*

Table 5 shows that PAD has a significant positive effect on regional expenditures. If there is a 1% increase in PAD while the other variables remain constant, regional expenditure will increase by 0.254% in regression (1), 0.167% in regression (2), 0.160% in regression (3), and 0.163% in regression (4). This is in line with research indicating that PAD has a positive effect on regional spending (Ernayani, 2017; Liando & Hermanto, 2017).

As shown in Table 5, the independent variables estimated using the fixed effect data panel method in regression (3) have the following coefficients: PAD=0.160, DBH=0.101, and DAU=0.175. Comparing the coefficients between PAD and DAU, the coefficient for DAU is greater than that for PAD (0.175 > 0.160). Thus, the flypaper effect still occurs in regional spending even though the PDRD Law has been enacted.

Using the fixed effect data panel method in regression (4), the coefficients of each independent variable are as follows: PAD 0.163, DBH 0.0918, DAU 0.135, and DAK 0.030. Again, the DAU coefficient is smaller than the PAD coefficient (0.135 > 0.163), which reflects the relationship between regional spending patterns and the flypaper effect in the period 2005–2020. Hence, there is no flypaper effect with the enactment of the PDRD Law.

The estimation results using the fixed effect data panel show that the DAU coefficient is < the PAD coefficient, and the DBH, DAU, and DAK coefficients are < 1. Thus, for regional expenditures, there is no flypaper effect. The fact that the DBH, DAU, and DAK coefficients are < 1 indicate that if there is an increase (if the coefficient sign is positive) or a decrease (if the coefficient is negative) in regional expenditures, the increase or decrease in regional expenditures will be smaller than the increase in central government transfers. In this case, the PAD, DBH, DAU, and DAK all have a significant positive effect on regional expenditures. PAD has the highest coefficient among the variables, indicating that PAD has the greatest influence on regional expenditures compared to the other variables.

In regression (3), if the PAD value increases by 1% and the other variables remain constant, then the regional expenditure value increases by 0.160%. If DBH increases by 1% and the other variables remain constant, then the value of regional expenditures increases by 0.101%, whereas if the value of DAU increases by 1% and the other variables are held constant, then the value of regional expenditures increases by 0.175%%. As explained, local governments have a significant basis for and level of administrative control over their PAD. As regional expenditures financed from DBH and DAU increase or decrease, local governments need to consider increasing or decreasing their PAD efforts in financing regional expenditures in addition to those funded by DAK, considering that the need for regional expenditures changes in every fiscal year. The central government largely determines the DAU allocation, where the distribution is a positive function of regional expenditure needs and is negatively

related to fiscal capacity. Therefore, regional expenditures in one period can affect the distribution of DAU in the following periods (Lewis, 2013).

In regression (4), if the PAD value increases by 1% and the other variables remain constant, then the regional expenditure value increases by 0.163%. If the value of DBH increases by 1% and the other variables are kept constant, then the value of regional expenditures increases by 0.0918%, whereas if the value of DAU increases by 1% and the other variables remain constant, then the value of regional expenditures increases by 0.135%. If the value of DAK increases by 1% and the other variables are kept constant, then the value of regional expenditures increases by 0.030%. The results of this study are different those of Melo (2002), who found that the value of the DAU coefficient on regional expenditures was greater than the PAD coefficient value, indicating regional dependence on the central government. The central government allocates DAK to local governments in several stages during the fiscal year. The distribution of the next stage will depend on the extent to which the regional government has spent the previously allocated funds. Thus, the total DAK allocation in one fiscal year is an explicit function of regional expenditures during that year. The central government has recognized regional independence through self-managed revenue sources and reduced transfer funds aimed at covering local revenue shortages (Khairi, 2021).

4. Conclusion

Evidence has been presented related to the impact and increase of PAD. However, no study has examined the effectiveness of strengthening PBB-P2 policy in terms of increasing PAD. Importantly, the increase in PAD is related to the relationship between regional spending patterns and the flypaper effect, which is a major concern for the tax administration in Indonesia, especially regarding revenues from PBB-P2, which dominate regional revenues in most of the country's regions. Based on the analysis and discussion, several conclusions can be drawn: (1) Strengthening of the PBB-P2 policy is positively and significantly related to the increase in local revenue since the PDRD law was enacted; (2) The increase in local revenue is caused by the strengthening of PBB-P2 policy, thus reducing the flypaper effect on the spending behavior of local governments in Indonesia; (3) According to the coefficient of fund transfers from the central government to local governments, DAU is smaller than PAD on regional expenditures in Indonesia. Thus, the flypaper effect does not occur in the period 2005–2020. The key policy implication of this research is that the central government can empower local governments to collect taxes and duties by providing new regional tax sources, restructuring tax types, simplifying the types of retaliation, and harmonizing the regulations of the local governments with those of the central government so that the flypaper effect does not occur in the coming year and the regional governments can manage their own regional finances independently. There are some limitations of this study. The published APBD realization data have a lag that results in differences with the audited realization data. In addition, the control variable used in this study is limited to the number of residents, and the regional regulations for enforcing the underlying charges of PBB-P2 do not always reflect the year of PBB-P2 implementation.

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