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The Increasing Importance of Intergovernmental Transfer Revenue in Local Finance in Poland and the Flypaper Effect

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Abstract The article explores the growing trend of fiscal recentralization in Polish local finance, evident in the increase of intergovernmental transfers, leading to expanded budgetary expenditures, known as the "Flypaper Effect" (FPE). It aims to identify the causes and extent of the FPE in Polish municipalities and cities with county rights from 2010 to 2020, using descriptive and panel data analyses. Empirical research confirms the presence of the FPE in Polish local governments, more pronounced in rural municipalities than in urban counterparts and cities with county rights. The rise in public budgetary expenditures results from limited fiscal autonomy and the ongoing process of recentralization in public finance, further amplifying the FPE. The strength of the FPE varies depending on the specific types and characteristics of intergovernmental transfers. Additionally, the article highlights significant flaws in Poland's local funding legislation and its consequences, proposing potential paths for local finance reforms. In conclusion, it underscores the increasing trend of fiscal recentralization in Polish local finance driven by the FPE and emphasizes the pressing need for reforms to address these challenges.

Keywords: • local government • intergovernmental transfers • budgetary expenditures • flypaper effect

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1 Introduction

The research problem addressed in this article concerns the systematically progressing trend in the area of Polish local finance, according to which the budgets of local government units are becoming increasingly dependent on intergovernmental transfer revenue from the central government. The analysed trend has negative consequences for both budget revenue and expenditure. The authors of the article focus on expenditure aspects, a subject relatively rarely analysed in Polish literature on the topic. The growing importance of intergovernmental transfer revenue in municipal budgets leads to a reduction in the financial autonomy of local authorities. Unlike their own revenues, which local authorities can freely shape and spend, intergovernmental transfers lack this attribute. This is due to the fact that financial control associated with them lies with the central government, not local authorities.

Therefore, the authors are particularly concerned by the usually greater propensity of local government units to spend additional transfer revenue compared to tax revenue, which in the literature is referred to as the flypaper effect (FPE). Having this in mind, in this article, the following research hypothesis has been scientifically subjected to verification: basing the financing system of local government units on transfer-type revenues stimulates local budget expenditures, leading to the flypaper effect.

The aim of the article is to identify the causes and magnitude of the FPE phenomenon in Polish municipalities and cities with county rights. The analysed units, compared to other local government units in Poland such as counties and provinces, enjoy the highest relative level of financial independence. However, their budgets in recent years have been characterized by the largest dynamics of growth in intergovernmental transfers, which has resulted in the highest advancement of the recentralization process. To study the effect of flypaper on the local budgets of these units from 2010 to 2020, both descriptive analysis and panel data analysis were employed. In this regard, data from the Central Statistical Office (GUS) pertaining to the finances of selected types of local government units were used. We contribute to expanding knowledge about the FPE phenomenon twofold. First, using panel analysis, we prove the existence of FPE in Poland, the strength of which significantly depends on the share of transfer revenues in local government units. Second, this article deepens the understanding of how tendencies towards fiscal recentralization in Polish local finance may intensify the FPE phenomenon.

The remainder of the article is organized as follows. The second section reviews the literature on FPE. The third section discusses the issue of FPE in more detail in the context of local finance. The fourth section describes the general share of

transfer revenues in the budgets of local government units in Poland. Then, in
section five, the data and research methodology are explained, while in section six,
the results of the panel analysis are presented. Finally, the seventh section is
devoted to the conclusions of the conducted research, along with a discussion on
the directions of future research.

## 2   Literature overview on the flypaper effect

The Flypaper Effect (FPE) has become the subject of theoretical and empirical
dispute since the end of the 1960s. This phenomenon was first discussed by
Henderson (1968) and Gramlich (1969). Their empirical analysis revealed
something unexpected. They found that a dollar of intergovernmental fiscal
transfer causes a greater propensity for public spending compared to a dollar of
citizen's income. This means that "money sticks where it hits" which was
described by Arthur Okun as the "flypaper effect" (Courant, Gramlich, &
Rubinfeld, 1978). To put it another way, money to the public sector stays in the
public sector (Inman, 2008).

Based on the literature review, the political factors identified with local economic
governance are undoubtedly responsible for the occurrence of FPE (Becker, 1983;
Barnett, Levaggi, & Smith 1991; Grossman, 1994; Sørensen, 1995; Bae & Feiock,
2004). Bailey and Stephen (1998) stated that interest groups, rather than voters,
seem to be the major players in budgeting. The power of pressure groups differs
from one program to another and this basically affects the size of FPE. The
strength of FPE also depends on a kind of political leadership and the level of
political fragmentation. A strong government has an advantage in keeping debt
and deficits low because of its higher independence when making decisions,
whereas a weak government would be more prone to bargaining and more
reluctant to cut its spending, as it would find it difficult to resist pressures from
local interest groups. Similarly, in municipalities where the councils are
dominated by one political party, the FPE is usually weaker and increases along
with the political fragmentation. Recent studies clearly indicate that local
governments with lower tax collection efficiency and less political strength exhibit
a weaker flypaper effect (Rios, Hortas-Rico, & Pascual, 2022). However, the FPE
is determined by both formal and informal institutions. Among them, the key
values of local communities and the ruling party's ideology are equally important
in this process (Guziejewska, Majdzińska, & Żółtaszek, 2021).

The theoretical explanations of the FPE in the first-generation theories range from
traditional neoclassical ones to those referring to the public choice literature.
Neoclassical economics comprises three mutually independent economic schools,
such as the Anglo-American School founded by Jevons (1879) and Marshall
(1890), the Austrian School with its precursor of Menger (1871) and The

Lausanne School, also known as the Mathematical School, represented by Pareto (1971). The impact of intergovernmental transfers on the consumption of goods can be described on the basis of the main assumptions of the neoclassical theory of consumer behaviour (Wilde, 1968; Kuncoro, 2004). Intergovernmental transfers can be classified into two types: conditional grants and unconditional grants. In the case of conditional grants, the price effect is observed, caused by the transfer which lowers the price of local public goods (Dahlby & Ferede, 2016). The situation regarded is shown in Figure 1.

Figure 1: The impact of conditional grants on the consumption of goods
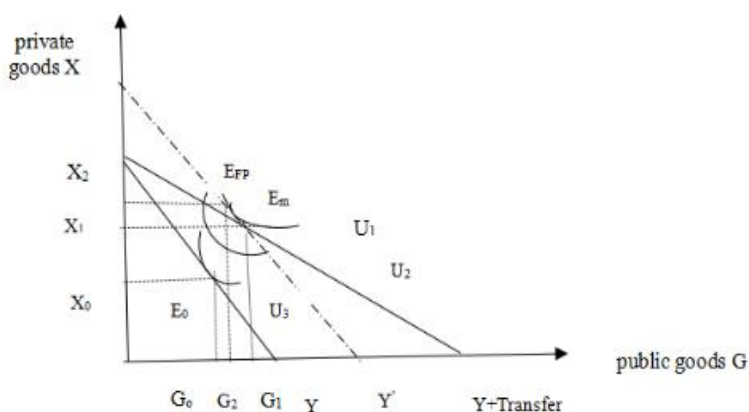
Source: Authors' own elaboration based on Mueller (2009).

Finally, the slope of the budget line shifted from Y to Y plus transfer. The decrease in prices induces the consumption of public goods from Go to G1. How do conditional grants change the consumption of private goods? This depends on the government policy after receiving the transfer. If the local government decrease local taxes, the consumption of private goods will also increase from X1 to X2, as a result of the substitution of the local tax burden with the transfer acceptance from the central government.

The FPE also occurs in the case of unconditional grants, leading to the increase in consumption of both public and private goods (Figure 2).

Figure 2:   The impact of unconditional grants on the consumption of goods
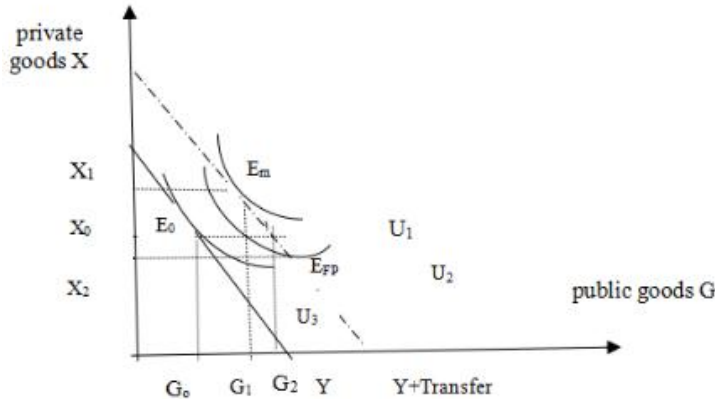
Source: Authors' own elaboration based on Mueller (2009).

Figure 2 shows that the occurrence of transfer caused the income effect, shifting the budget line to the right from Y into Y plus transfer (Fisher, 1982). As a result, we should achieve a new consumer equilibrium Em, but in fact, it doesn't happen. The increasing transfer acceptance rather than a decrease in local taxes due to the increasing consumption of public goods from Go to G1. Finally, consumer equilibrium exists in EFP.

In light of the traditional explanations of intergovernmental transfers, their type can be used to predict the impact of grants on the recipient's fiscal behaviour. Bailey and Connolly (1998) draw the following conclusions:
1) lump-sum grants (both general and specific) cause only income effect on local spending,
2) a stimulatory effect of open-ended matching grants on local spending is greater than that of lump-sum grants (because open-ended matching grants lead to both income and substitution effects),
3) a stimulatory effect of lump-sum grants and personal income on local spending is similar or identical.

From the point of view of public choice theories, the main subject of interest is self-interested politicians, imperfect competition in the political system, and fiscal illusion on the part of citizens about the workings of the public sector. In general, there are at least three kinds of models (Boadway & Shah, 2007):
1) the models which assume that voters (residents) face fiscal illusion, while politicians are self-interested and there is no political competition (fiscal illusion hypothesis),

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2) the models that assume no fiscal illusion in the case of voters (residents) but perceive politicians as self-interested and budget maximizing under the conditions of imperfect competition in the political system (monopolistic government hypothesis),

3) models based on the assumption of harmony of interests between politicians and voters, political competition, and no fiscal illusion (efficient government hypothesis).

Firstly, the causes of different reactions of spending to changes in intergovernmental transfers and private income – treated as anomalies inconsistent with the theoretical framework of the median voter – are associated with voters' irrationality which is sought in the political and economic environment. One should not respect symmetric reactions in government expenditures due to the problem of fiscal illusion (Oates, 1979; Grossman, 1990; Turnbull, 1992; Turnbull, 1998; Dollery & Worthington, 1996). Transfers may induce fiscal illusion by making local public goods look cheaper. Voters are usually poorly informed about outside grants (Filimon, Romer, & Rosenthal, 1982). If local expenditures are funded by a higher level of government, the residents perceive them as costless, but they are not free. Oates (1979) argued that grants contribute to the decline in the average price of public goods, and this price primarily determines voters' allocative decisions, instead of the marginal tax price.

Secondly, the theory of bureaucrats (Niskanen, 1971) explains the FPE due to the behaviour of self-interested budget maximising bureaucrats driven by political greed that have more freedom to spend transfer funds than to raise taxes. They do not inform their communities about the true levels of own and external funding, and residents are not conscious of the real budgetary constraints (McGuire, 2015; Brollo, Nannicini, Perotti, & Tabellini, 2013). The Niskanen model (Niskanen, 1971) shows that in representative democracies, an oversupply of public goods will generate both allocative inefficiency and x-inefficiency as a result of inefficient production of public goods. Many researchers of FPE notice that the intergovernmental transfers expectedly lower the tax burden on the local community due to the fiscal support from the central government. Despite this, the bureaucrats, unfortunately, with their budget authority take advantage to set a higher budget accompanied by an increase in local taxes (Wyckoff, 1988).

Thirdly, the efficient government hypothesis explains the reason for the FPE as the difference in the perception of the source of funding by the local government. Recipient governments typically prefer grants rather than costly and more distortive taxes (Hamilton, 1986; Quigley & Smolensky, 1992; Aragon, 2013; Vegh & Vuletin, 2015). Transfers are perceived as more permanent compared to uncertain revenue sources. According to Hines and Thaler (1995), the grant

money received should have a greater stimulatory effect on local spending, because it does not create deadweight loss for local government. A behavioural explanation for the FPE may be due to one of three behavioural irregularities, such as loss aversion, framing and mental accounting. Loss aversion suggests that taxpayers are "much more sensitive to decreases in their welfare than to increases. This implies that the political cost of explicitly raising a tax is greater than the political benefit of an equivalent tax cut" (Hines & Thaler, 1995, p.223). Framing in the context of FPE means that "the choices to the public are not framed as between spending the money or cutting taxes, but rather how should the money be spent" (Hines & Thaler, 1995, p.223). Finally, mental accounting assumes that one dollar in private funds is treated differently from one dollar in public funds (Becker, Hopp, & Kriebel, 2020).

Oates (2005) claimed that in second-generation theories devoted to the FPE, the main focus has moved away from explaining this phenomenon toward a broader concern with the equity and efficiency effects of intergovernmental grants in decentralized federal systems. The researchers started paying attention to the issues such as:
1) the trade-off between accountability and fiscal interdependencies in situations of inter-jurisdictional competition,
2) the soft budget constraint (the problem of decentralized governments "raiding the fiscal common" in a federation and weakening the fiscal restrictions placed on them by a balanced-budget constraint),
3) the moral hazard problem created by the fact that the federal government insures state and local government budgets against negative economic shocks.

At the end of this section, we would like to focus on the results of empirical analysis of the FPE. According to the earliest flypaper empirical research conducted by Gramlich (1969); Gramlich and Galper (1973); Inman (1979) and Fisher (1982) the marginal propensity to spend $ 1 of grant income raged from 0, 25 cents to around unity, while the marginal propensity to spend $ 1 of private income was between 0,05 cents to 0,10 cents (Hines & Thaler, 1995). On the one hand, based on the empirical literature review, it should be claimed that authors such as Case, Hines and Rosen (1993); Aronson and Munley (1996); Melo (2002); Deller and Maher (2006); Dahlby and Ferede (2016); Allers and Vermeulen (2016); Kusuma (2017); Langer and Korzhenevych, 2018 and Guziejewska et al. (2021) proved the stimulative effects of intergovernmental grants and the flypaper effect's existence in various public finance systems. On the other hand, Becker (1996); Worthington and Dollery (1999) and Yu, Wang, and Tian (2016) concluded that its existence could not be confirmed.

Assuming the existence of FPE, second generation studies have also focused on the issue of whether the FPE is asymmetrical, focusing on the effect of grant

reductions or instability in the grant programs. The asymmetry in the context of
FE appears when local government treats grant decreases or increases differently.
Taking this into account, the research conducted by Filimon et al. (1982); Stine
(1994); Heyndels (2001) and Deller and Maher (2006) found an asymmetrical
relationship, while Gamkhar and Oates (1996) achieved a symmetrical
relationship.

It is worth understanding that the FPE empirical analysis is not also free from
methodological problems which are widely discussed by the literature (Hines &
Thaler, 1995; Bailey & Connolly, 1998; Inman, 2008). They refer to issues such
as model specification, omission of relevant variables, failure to distinguish
matching grants from unconditional aid, failure to consider the simultaneous
determination of grants and local spending, measurement errors, or the
endogeneity bias caused by possible reverse-causality relationships.

3 Theoretical background of transfer revenues and the flypaper effect phenomenon in the area of local finance

The FPP is a term used in the theory of economics and public finance to describe
the phenomenon in which money transferred from higher-level governmental units
(central government) to lower-level ones (local government units) is spent to a
greater extent than analogous funds collected from public levies, such as local
taxes and fees. According to the theoretical concept under analysis, transfer
revenues can cause an excessive increase in local budget expenditures, seemingly
"sticking" to them (hence the analogy to flypaper). Symptomatically, local
decision-makers often perceive transfers as "free money" and are more inclined to
spend them. Such behaviours are in contradiction with the assumptions of the
concept of fiscal federalism, in which it is assumed that all budget revenues should
be recognized as substitutes, regardless of the source of their origin. According to
the doctrine, the influence of the categorical type of budget income on the
specificity of the "expenditure behaviour" of local government is treated as an
anomaly. It is assumed that it should be identical, both in relation to the revenues
of local government units and transfer revenues. Money is money, and according
to the principle of fund interchangeability, the source of their origin should not
influence their optimal allocation (Inman, 2008).

According to the previously mentioned concept of fiscal federalism, the FPE
phenomenon contributes to the inefficient allocation of public resources and the
limitation of the fiscal autonomy of local government. Receiving constant
financial aid from LGUs may lead to dependency on external support, and as a
result, discourage what is known as revenue effort, or efforts to increase their own
revenues (Kańduła, 2017). It also results in increased dependence of local

governments on grants from the central government, thereby limiting the fiscal autonomy of the local government units.

The issues described have inspired the authors of this article to undertake research related to the influence of the increase in the significance of transfer revenues in the financing systems of LGUs on the deepening of the FPE problem in Polish local finance. The research problem addressed in this article is the previously signalled increase in the significance of transfer revenues in the budgets of Polish local government units. According to the research hypothesis adopted by the authors, basing the financing system on revenues of a transferable nature favours the mechanism of stimulating budget expenditures, causing the FPE phenomenon.

The literature on the subject indicates various causes and conditions for the growth of transfer incomes, and as a result, the intensification of negative effects related to the FPE phenomenon in the area of Polish local finances. However, the necessity of transferring transfer incomes from the central budget to local government budgets is most often justified by the following premises:

1) Reducing Fiscal Inequalities – In accordance with the principle formulated in the doctrine of respecting the equality of LGUs, and the associated requirement of fiscal equalization, fiscal transfers are treated as an instrument to level out differentiated fiscal capacity, understood as the ability of LGUs to increase own revenue and take into account the context of diversified expenditure needs (Blöchliger & Charbit, 2008);

2) Equalizing Tax or Service Capacity – LGUs are responsible for providing basic public services (e.g., education, healthcare, social assistance, public transport), and fiscal transfers facilitate their provision by LGUs with lower fiscal capacities, enabling their resident's access to a minimum, guaranteed level of services, regardless of the differentiated fiscal abilities of LGUs, without the need for excessive taxing of residents; levelling the level of public services through fiscal transfers is consistent with the postulate of fiscal justice (Boadway & Shah, 2007), assuming a similar level of public services throughout the state, with a similar level of tax burdens on citizens, regardless of their place of residence;

3) Mitigating Fiscal Externalities – Fiscal transfers are used, among other things, to financially support LGUs that provide public services extending beyond their jurisdiction, i.e., not only to their own residents but also to residents of other LGUs. A particular type of external effect is the so-called fiscal externalities, which occur when tax and expenditure decisions made by the authorities of one specific LGU affect the welfare of taxpayers in another territorial unit. An increase in the share of LGUs' tax revenues in total tax revenues typically intensifies the process of external fiscal effects and increases the demand for equalizing transfers (Blöchliger & Petzold, 2009).

These transfers are partly intended to compensate individual LGUs for the effects of other LGUs' tax policies;

4) Resolving Crisis Situations – Transfer revenue may be granted to LGUs to provide financial support in crisis situations or economic difficulties, requiring compensation for lost budget revenues; fiscal transfers are assigned stimulating and stabilizing functions in such a situation (Rodden, Eskelund & Litvack, 2003);

5) Supporting Development Priorities Set By Central Public Authorities – Fiscal transfers may be used to encourage LGUs to adopt specific policies or implement specific programs, consistent with the central government's priorities; the associated real threat is that economically weaker LGUs, i.e., those most dependent on external transfers, are forced to direct their spending towards priorities set by the central government, thereby distorting their local priorities and expenditures, reducing their freedom of action, and intensifying centralization tendencies (Dafflon & Madiès, 2011);

6) Political Motives (Re-Election) – Central authorities, by appropriately manipulating the amounts of transfers sent to LGUs, may try to achieve specific political goals, influencing social moods and affecting future voter decisions (Oates, 1999).

In the subject literature, emphasis is placed on the great diversity of transfer revenues as sources of LGUs' budgetary revenue. This is illustrated in Table 1.

Table 1: Subnational government's grant categories

Type of grant	Characteristics
Earmarked grants	Transfers that can be used by local government units exclusively for predetermined, strictly defined purposes or projects (no spending freedom).
Non-earmarked grants	Transfers allowing local government units great decision-making freedom and flexibility in their spending, taking into account local needs and priorities (high spending freedom).
Mandatory grants	Transfers legally defined, the rules for granting (e.g., amount and conditions for awarding to local government units) arise from specific legal regulations.
Discretionary grants	Transfers are awarded to local government units at discretion, usually based on applications submitted in a competitive format.
Matching grants	Proportional transfers are aimed at supplementing the contribution of local government units, the amount of which depends proportionally on the expenditure of local government units.
Non-Matching grants	Non-proportional transfers, are not directly related to the size of the own contribution of local government units, the amount of which does not depend on the expenditure of local government units.
Current grants	Transfers that can be allocated by local government units for current or investment expenditure.
Capital grants	Transfers that can be used by local government units exclusively for investment expenditure.

Block grants	Transfers that local government units receive in the form of several smaller, purpose-specific grants consolidated into one "block", usually to address a broader public issue.

Source: Authors' own elaboration based on Blöchliger (2013).

The typology presented here is significant in that the FPE phenomenon may be stronger or weaker depending on the type, specifics, and detailed construction of the transfer revenue. For example, the subject literature emphasizes that matching grants stimulate local budget expenditures to a greater extent than non-matching grants, i.e., those that do not require co-financing by LGUs (Moffitt, 1984; Megdal, 1987; Wyckoff, 1991; Brennan & Pincus, 1996; Baker, Payne, & Smart, 1999). On the other hand, in the case of non-earmarked grants, which LGUs can spend at their discretion, the FPE phenomenon may be less visible, as these funds are treated by local decision-makers similarly to other budgetary revenues.

The situation is different with earmarked grants, which must be spent on specific purposes. The FPE phenomenon is more likely here due to the higher spending propensity of LGUs, resulting, among other things, from the fact that these funds often must be returned if not spent in a given budget year (this principle applies, for example, to targeted subsidies as a source of financing local government in Poland). The FPE phenomenon is also more likely in the case of transfers intended for investment (capital grants) – with prospects for obtaining these funds, LGUs may decide to increase investment expenditures, which may not be as meticulously planned and managed as in the case of expenditures financed from own budgetary revenues. In summary, the type of fiscal transfer can influence the FPE phenomenon in the area of local finance, although the degree of this impact will depend on the specific financial situation and priorities of each local government unit.

After explaining the specifics of revenue transfers as sources of LGUs' budget revenues, it is also justified to analyse the main causes of the FPE phenomenon in the area of local finance. In the subject literature, the most commonly indicated reasons for its occurrence are:

1) Political Pressure – Local authorities, eager to demonstrate their effectiveness, feel a unique expenditure pressure in the context of additional funds received from the central government;

2) Behavioural Conditions – The previously mentioned perception of transfer revenue as 'free money', leads to a greater tendency among LGUs to spend it. This is related to the phenomenon of fiscal illusion, which refers to illusory or erroneous perceptions within the sphere of taxation and public expenditure (Guziejewska, 2009). It means that local taxpayers are not fully aware that the transferred money comes from themselves and has merely been passed on by a higher level of public authority (Bartkowski, 2019);

3) Low Elasticity of Supply of Local Public Services – LGUs, despite having more financial resources, are unable to increase the supply of specific public services quickly. Consequently, the additional transfer revenue often becomes part of the LGUs' budget and is spent on other purposes, possibly leading to improper resource allocation;

4) Legal Regulations – Local authorities are often obligated by legal regulations to allocate funds from subsidies for specific purposes (a problem known as rigid budget expenditures, which LGUs must fulfil based on statutory obligations);

5) LGUs' Cognitive Errors – Local authorities may not be fully aware of the costs associated with spending additional funds obtained through fiscal transfers.

4 Increase in the importance of transfer revenues in the budgets of local government units in Poland

As mentioned earlier, the importance of fiscal transfers in the financial systems of LGUs is increasing. The scale and scope of this trend, taking into account the individual categories of LGUs, are illustrated in Figure 3. The presented data prove that the scope and dynamics of the analysed process differ significantly in various categories of local government units, i.e., in municipalities, cities with county rights, counties, and voivodeships. The highest dynamics of the process of budget dependence on transfer revenues apply to cities with county rights. In these units, the average percentage of transfers in relation to total revenues increased from 63% in 2010 to 71% in 2020 (the average rate for the entire analysed period is approx. 66%).

Figure 3:   Transfer revenue in Local Government Units (LGUs) in Poland, 2010
to 2020
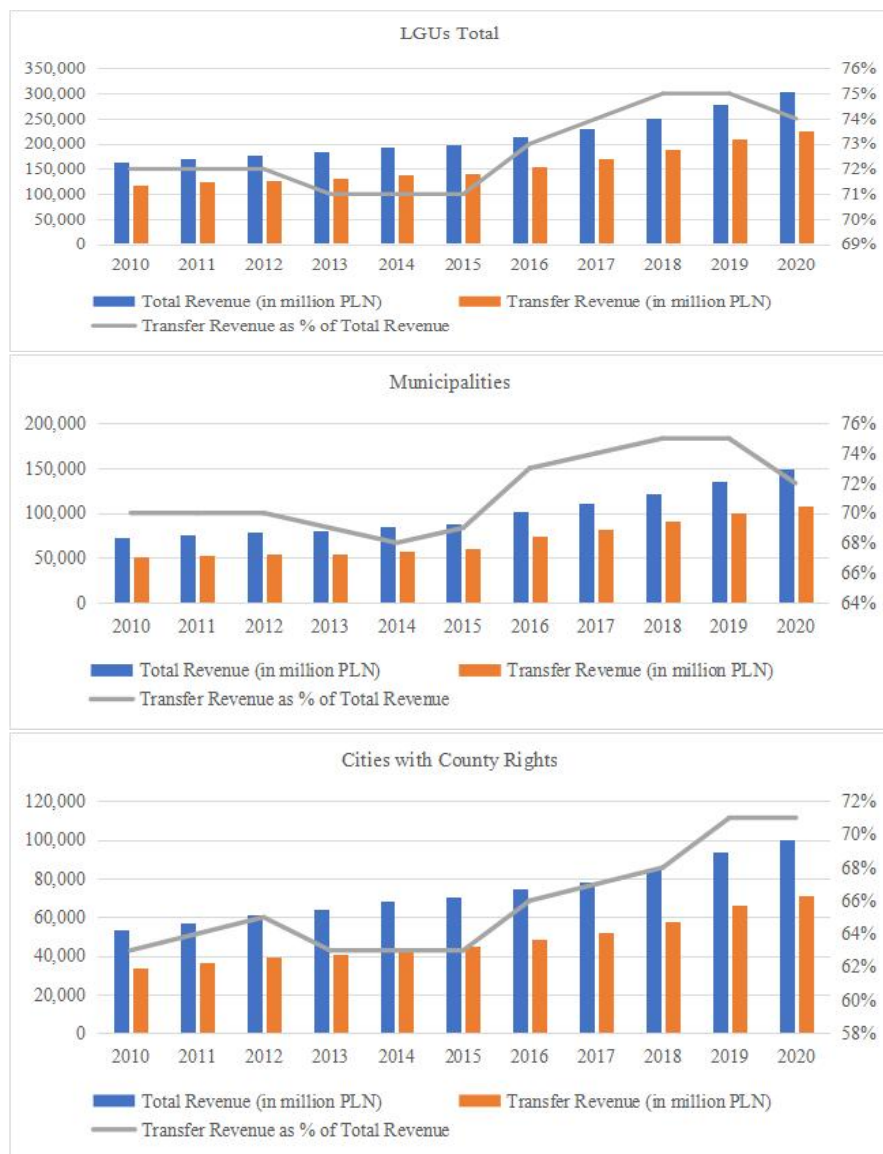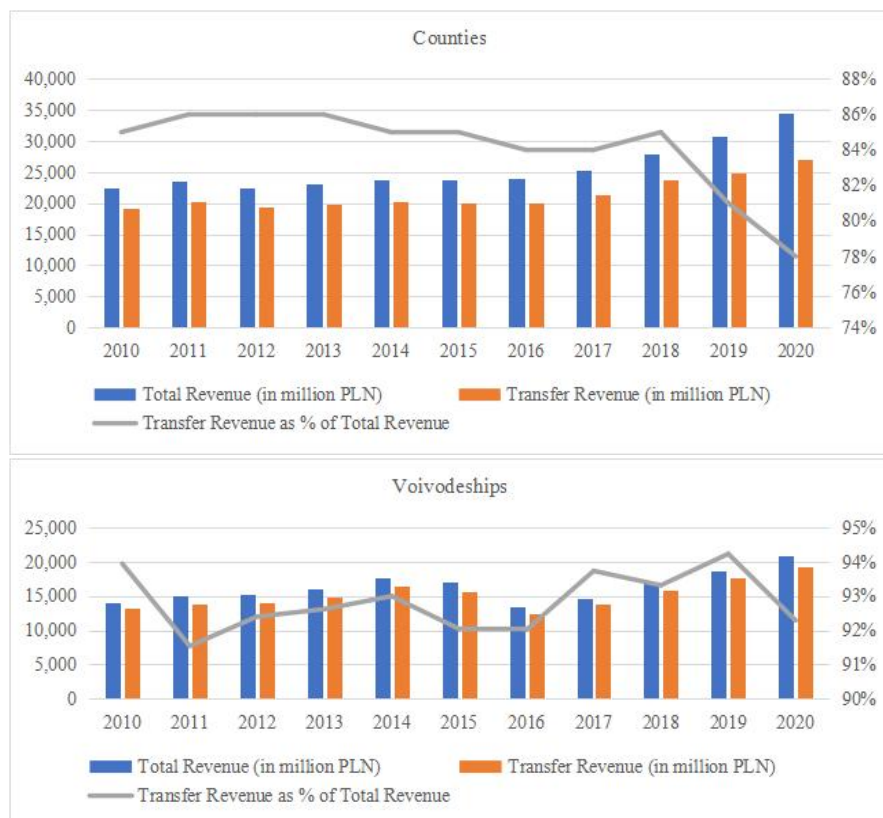
Source: Authors' own elaboration based on statistical data from the Central Statistical Office (GUS) in Poland.

In municipalities, the average percentage of transfers in relation to total revenues was respectively 71%. However, in counties and voivodeships, there was a decrease in the share of transfer revenues (respectively: from 85% to 78% and from 94% to 92%). Regardless of this fact, the average share of intergovernmental transfers in these entities was still very high (84% and 93%). It should be emphasized that since the establishment of these local government units in 1999 (previously, Poland had a single-level organizational structure of local government), counties and voivodeships have always been characterized by a low level of own revenues and, in principle, a symbolic scope of financial independence.

5   Data and research methodology

Panel data modelling has been recently highly utilized in the empirical analysis of
FPE due to some of its advantages over cross-sectional and time-series data. Some
of these advantages have been broadly emphasized by the literature (Prior, 2019).
First, panel data models can help in better explaining unobserved heterogeneity
among the analysed units. Second, panel data allow for the identification and
measurement of effects that cannot be captured in cross-section or time-series data.
Thirdly, the econometric literature shows that panel data estimation allows for the
reduction of collinearity among covariates, simultaneously improving the
efficiency, reliability and stability of econometrics estimates (Hsiao, 2007). Many
authors simultaneously warn against the inappropriate use of panel techniques
which may lead to model misspecification and errors resulting in biased estimates
and unreliable diagnostic statistics (Min, 2019).

In order to test the FPE, our panel analysis is conducted on the case of local data
coming from the Central Statistical Office in Poland. All variables are expressed
in Polish zlotys (PLN) at constant prices of 2015. The database refers to the local
government units' finances from the years 2010-2020. As of January 1, 2021, the
total number of municipalities (gminas) is estimated at 4209 which corresponds to
NUTS 5 (or LAU 2) regions according to the European Nomenclature of
Territorial Units for Statistics. Among them we can distinguish:

  –66 cities with county rights,
  –236 urban municipalities,
  –1523 rural municipalities,
  –652 urban-rural municipalities.

In the beginning, it is worth emphasizing that referring to econometric literature,
nonstationary does not need to be considered in asymptotic micro panels with
large cross-sections and small time series (Baltagi, 2005). For this reason, panel
data analysis was accepted within the framework of a panel data set with a cross-
section of 4209 local government units and an 11-year time series, and unit root
test was not used in this study regardless of the stationary assumption of the series.
Our research aim is to examine the effects of own and external revenues on
municipalities' expenditures. The general specification of the equation can be
written as follows:

$$EXPEND_{it} = \lambda + \text{\ss}_1 TransRevenue + \text{\ss}_2 OwnRevenue + e_{it}$$

Where: EXPEND – the total amount of expenditure, i – the number of regions
(i=1,…, N depending on the type of municipalities), t – time (t = 1,…T, T=10);
TransRevenue– the total amounts of special purpose grants, general grants and

shared taxes (PIT and CIT), OwnRevenue – the total amount of own revenues collected by municipalities, e_{it} – random error and α, β_1, β_2 –model parameters.

The basic model includes two exogenous variables, such as aggregate intergovernmental transfers (TransRevenue) and own revenue (OwnRevenue). The first category, intergovernmental transfers, encompasses general and specific grants, as well as local governments' shares of Personal Income Tax (PIT) and Corporate Income Tax (CIT). As previously mentioned, in these studies, own revenue is analysed in a narrow sense, i.e., as own revenues sensu stricto, excluding the LGUs' revenues from the shares in state income taxes (PIT and CIT). What is more, in the light of the Law on Local Government Units Revenues only municipalities have their own tax revenue, such as real estate tax, agricultural tax, forestry tax, tax on means of transport, inheritance and donation tax or tax on civil law transaction (TCLT). It means that own revenue of counties (poviats) and regions (voivodeships) in Poland is limited to revenue received by municipal budgetary entities and payments from municipal budgetary entities, income from the municipality's assets, inheritances, legacies, and donations to the municipality, revenue from fines and penalties laid down in separate regulations, 5.0% of revenues obtained for the state budget in connection with the performance of government administration tasks and other tasks commissioned by acts, interest on loans granted by the municipality, interest on late payment of receivables constituting municipal revenue, interest on funds deposited in the municipality's bank accounts, subsidies from the budgets of other local government units and other revenue due to the municipality under separate regulations (Kwiatkowski, Tyszkiewicz, & Wójcik, 2021).

Taking into consideration that counties and voivodeships have always been characterized by a low level of their own revenue, possessing a symbolic scope of financial independence, we decided to examine the phenomenon of FPE, focusing on different types of municipalities (gminas). In addition, cities with county rights (with poviat status) were distinguished as a separate category due to the increasing significance of transfer revenue in their total revenue, rising from 63% in 2010 to 74% in 2020.

The FPE hypothesis testing was carried out by comparing the aggregate intergovernmental transfer revenue regression coefficient (β_1) on local government expenditure (EXPEND) with the aggregate own revenue regression coefficient (β_2) on local government expenditure (EXPEND). We assume that if β_1 is greater than β_2, then a flypaper effect occurs. Otherwise, the FPE does not exist.

To test the hypothesis, we used panel data estimation techniques and the Generalized Least Squared (GLS) method. Considering numerous estimation techniques for the panel model, several statistical analyses were conducted in this study, such as the Welch F-test, Breusch- Pagan test (LM test) and the Hausman-test to get a more suitable model as a probe. Welch F-test was used to determine whether the model is better estimated by using a model of pooled ordinary least square (OLS) or fixed effects (FE). The pooled ordinary least squares (OLS) assume that individual effect ui (cross-sectional or time specific effect) does not exist (ui=0):

$$Yit = \alpha + \beta1 Xit + \varepsilon it$$

Where:
–Yit is the dependent variable (DV), i = entity and t = time,
–Xit represents one independent variable,
–α, ß1 are model parameters,
–εit is the error term.

In fixed effects models (FE) individual effects can be expressed by a fixed number correlated with the values of the exogenous variables (Greene, 2008). The equation for the fixed effects model becomes:

$$Yit = (\alpha + ui) + \beta1 Xit + vit$$

Where:
–Yit is the dependent variable (DV), i = entity and t = time,
–Xit represents one independent variable,
–α, ß1 – are model parameters,
–uit is a fixed effect specific to an individual (group) or time period that is not included in the regression,
–vit: traditional error term.

In turn, the Breusch-Pagan test (LM test) is used to decide if random effects models (RE) are better than pooled least square models (OLS). In a random effects model, unlike a fixed effects model, it is assumed that the variation across entities is random and uncorrelated with the predictor or independent variables which are included in the model: "…the crucial distinction between fixed effect and random effect is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not" (Greene, 2008, pp. 100-210). The random effects model is:

$$Yit = \alpha + \beta1 Xit + (uit + vit)$$

Where:
   –Yit is the dependent variable (DV), i = entity and t = time,
   –Xit represents one independent variable,
   –α, $\beta 1$ are model parameters,
   –uit is a random effect specific to individual (group) or time period that is not included in the regression,
   –vit is the composite error term.

If the null hypothesis of the LM test is rejected, a random effect model is better than the pooled OLS. Similarly, if the null hypothesis of the F-test is rejected, a fixed effect model is favoured over OLS. If both hypotheses are not rejected, fit the pooled OLS. Otherwise, a Hausman test is conducted to choose between random effects and fixed effects models. It is assumed that if the null hypothesis, regarding individual effects which are uncorrelated with the other regressors, is not rejected, a random effect model is favoured over a fixed effect model (Park, 2011).

The data and proposed models can be riddled with issues such as serial correlation and heteroscedasticity. It is assumed that heteroskedasticity and serial correlation can be dealt with with regression methods such as the generalized least square estimations and imposing robust standard errors (HAC) as well. In addition, we checked the results of the regression specification RESET test which informs if models are correctly specified. On the basis of White's test, heteroscedasticity was also examined in all models.

6   Results

The authors present the results of panel data models which were separately built for different types of Polish municipalities, such as urban, rural, urban-rural and cities with county rights. The specification formulated in equation 1 – described in the previous methodological section – was used to assess the impact of different types of financing on the expenditures of four selected sample groups. Descriptive statistics of the logarithmized variables used in the models are provided in Appendix 1. At the first stage of analysis, the diagnostic tests were conducted. The result of diagnostic test F with a value p above 0.05 obtained in all models confirms that the pooled OLS model is more appropriate than the fixed-effects model. Similarly, the LM test statistic with a value p above 0.05 proves that the OLS model is more adequate than the random-effects model. Based on these results, the pooled OLS model was finally accepted.

Table 2: Results of diagnostic tests

Dependent variable	Wald test		Hausmann test		LM test	
	Model OLS(1) for cities with county rights					
	F	**p-value**	**H**	**p-value**	**LM**	**p-value**
	F(240, 480) = 1.18543	0.06	H = 3.0522	0.217	LM = 2.25455	0.13
	Model OLS(2) for urban municipalities					
	F(94, 947) = 0.716437	0.979347	H = 0.578405	0.74886	LM=3.8613	0.052
EXPEND	**Model OLS(3) for rural municipalities**					
	F(1972,10907) = 0.975221	0.762668	H = 6.06431	0.048	LM=0.4717	0.492
	Model OLS (4) for urban-rural municipalities					
	F(928, 4610) = 0.931757	0.914161	H = 1.47703	0.477824	LM= 1.9778	0.1596

Source: Authors' own calculation.

The achieved results of the RESET test on the chosen specification with a value p above 0.1 in all models mean that we have no grounds to reject the null hypothesis of the correct specification. In turn, as the results of White's test (below 0.05) indicated the problem with heteroscedasticity, all estimations were done under the assumption of heteroscedasticity using the Heteroscedasticity Consistent Covariance Matrix (HCMM).

Tables 3 and 4 show the final model estimations. It turned out that the estimated models were found to be well fitted to the empirical data with R^2 of 99% for cities with county rights; 98.6% for urban municipalities; 95% for rural municipalities and 96.3% for urban-rural municipalities.

Table 3: The impact of the source of financing on the size of expenditures in cities with county rights

Variables	Cities with county rights	
	OLS(1)	
	coefficient	p-value
Const	0.836	<0.0001***
TransRevenue	0.639	<0.0001***
OwnRevenue	0.355	<0.0001***
R2	99.01	
Number of observations	723	

Both dependent variable (Y) – EXPEND and explanatory variables – TransRevenue and OwnRevenue are converted to logarithms; standard errors (robust HAC); There is no country and year fixed-effect; ***, **, * statistical significance at the level of 1%, 5% and 10% threshold, respectively.
Source: Authors' own elaboration.

Both independent variables (TransRevenue and OwnRevenue) are statistically significant. In general, increasing intergovernmental transfers and own revenue contribute to the increase in local spending. These strong and positive relationships are found in all estimated models but the effect of own revenues is less pronounced. In cities with county rights, a one-unit rise in intergovernmental transfers increased local expenditures by 0.64 units and by 0.35 units with a corresponding increase in own revenues. This is in line with the FPE hypothesis.

Table 4: The impact of the source of financing on the size of municipalities' expenditures

Variables	Urban municipalities		Rural municipalities		Urban-rural municipalities	
	OLS(2)		OLS(3)		OLS(4)	
	coefficient	p-value	coefficient	p-value	coefficient	p-value
Const	1.63	<0.0001***	1.122	<0.0001***	1.297	<0.0001***
TransRevenue	0.582	<0.0001***	0.707	<0.0001***	0.663	<0.0001***
OwnRevenue	0.395	<0.0001***	0.266	<0.0001***	0.302	<0.0001***
R2	98.6		95.05		96.3	
Number of observations	1044		12882		5541	

Both dependent variable (Y) – EXPEND and explanatory variables – TransRevenue and OwnRevenue are converted to logarithms; standard errors (robust HAC); There is no country and year fixed-effect; ***, **, * statistical significance at the level of 1%, 5% and 10% threshold, respectively.
Source: Authors' own elaboration.

Based on the results obtained in Table 4, we can notice that the FPE is even greater in the case of rural and urban-ruler municipalities. A one-unit increase in intergovernmental transfers increases local public expenditures of rural municipalities by 0.7 units and by 0.66 units in urban-rural municipalities, respectively. As expected, the total effect of own revenues on public expenditures is less than the overall effect of intergovernmental transfers. Both in rural and urban-rural municipalities, a weaker increase in local expenditures (by 0.266 units and 0.302 units) was proved caused by a one-unit increase in their own revenues compared to the same increase in their intergovernmental transfers.

To sum up, because ß1 is greater than ß2 in the estimated models, it means that the FPE hypothesis can be confirmed. In other words, evidence of flypaper effect is obtained at the level of all types of Polish municipalities during the period of 2010-2020. The size of FPE varies depending on the type of municipality, which can be explained by the different shares of intergovernmental transfers in their total revenues. Generally speaking, the greater significance of intergovernmental transfers in the local budget, the stronger the phenomenon of FPE.

7 Discussion

The research conducted for this study has shown that intergovernmental transfers and local government own revenues are essential elements in financing local government, but they have different effects in the context of their impact on the amount of local budget expenditures. Both of the mentioned categories of budget revenues stimulate the size of budget expenditures of local government units. Nevertheless, the impact of intergovernmental transfers is greater compared to the analogous effect of own revenues. Why is this the case? One explanation proposed in the literature is the fact that intergovernmental transfers are most often earmarked for strictly defined purposes, and territorial self-government units may feel greater pressure to spend them. Meanwhile, own budget revenues may be perceived by local public decision-makers as less "tied" and hence may be spent more cautiously.

It has therefore been determined that basing the financing system on intergovernmental transfers favours the mechanism of stimulating local budget expenditures. This proves the presence of the FPE phenomenon in the area of local finance in Poland between 2010 and 2020. The research findings are thus consistent with theoretical frameworks and previous studies on the flypaper effect, conducted using similar methods or data (Iskandar, 2016; Pettersson, 2020; Guziejewska et al., 2021; Tanjung et al., 2021; Yüksel, 2021).

Understanding the mechanisms of the impact of advancing fiscal recentralization on the local finance system in the context of the intensification of the FPE phenomenon can provide valuable insights into potential directions for decentralization reforms aimed at addressing these challenges. The confirmation of the FPE also carries significant implications for the design of transfer policies. Policymakers must consider this relationship in the process of designing and allocating intergovernmental transfers to achieve the intended goals of public policy while minimizing the FPE.

Our research has shown that in the Polish context, the flypaper effect is stronger in rural and urban-rural municipalities compared to urban municipalities and cities with county rights. This results, among other things, from the relatively higher share of intergovernmental transfers in the overall budget revenues of these units. In fact, this means that these units are dependent on the central government in the context of fulfilling their assigned public tasks, and their financial systems rely primarily on high intergovernmental transfers.

Based on a review of literature dedicated to FPE and my own research, it can be stated that the smaller the scope of autonomy and fiscal independence of local

government units, the stronger the FPE phenomenon. Moreover, the noted increase in intergovernmental transfers at the local government level in Poland in the years 2010-2020 distorts the underlying concept of fiscal federalism, such as aligning the level of autonomy and fiscal responsibility with the scope of implemented public tasks and competencies.

The tendency towards fiscal recentralization, namely, the increasing state control in both the allocation of public funds and the ways of spending them, as well as the associated increase in intergovernmental transfers in the budgets of local government units, appears to be particularly worrisome, as it limits the scope of fiscal autonomy of territorial self-government, thereby weakening the principles of a democratic state. In this regard, additional and in-depth research on the mechanisms and policies driving fiscal recentralization processes would be crucial, especially since this is not only a problem for Poland but also for many other countries.

Increased growth of budget expenditures stimulated by transfer revenues may have both positive and negative effects, depending on the goals and effectiveness of spending these funds. In the authors' opinion, understanding these relationships is key to effective public finance management at the local level.

Our paper adds to the existing literature on the FPE, indicating the most important approaches to this phenomenon, derived from public choice economics and behavioural economics, which can be successfully applied in the area of local finance for the development of the FPE concept. This allows for extending our knowledge of its sources, and thus for a better understanding of human behaviour in the process of public governance. The added value of this article is the results of research proving the existence of FPE in Poland, the strength of which largely depends on the share of transfer revenues in local government units. Additionally, in line with the theory of fiscal federalism, our results also support the need for reform in local finance to improve the system of financing public goods. Overall, this research raises our awareness of the dangers of the growing trend of fiscal recentralization in Polish local finance, along with its potential implications.

It should be added that our study has certain limitations. First, only two independent variables are used in the model. We do not estimate separately the impact of individual categories of transfer income, such as general grants, earmarked grants, or shared taxes (PIT, CIT) on the growth of local expenditures. A similar approach was also taken in relation to revenues from local sources, which were treated collectively in the research conducted for this study. Secondly, control variables, such as income levels or institutional factors, are not taken into account in the estimation. Considering these conditions may constitute potential

directions for future research devoted to the FPE phenomenon in the area of local finance. The authors are simultaneously conscious of certain limits of the estimation method used in the empirical part of the article. First, this method may not adequately address the endogeneity of explanatory variables. Second, its results may also be sensitive to model specification and data sources. Recent empirical research on the FPE phenomenon uses instrumental variables or quasi-experimental methods to deal with endogeneity, which we also intend to take into account in our future research (Lago, Lago-Peñas, & Martinez-Vazquez, 2023).

8   Conclusions

The growing importance of intergovernmental transfer revenue in local finance in Poland encourages conducting a study aimed at capturing the flypaper phenomenon. As part of the theoretical considerations devoted to the FPE, it is argued that the explanation of the FPE phenomenon and its sources can be found mainly in the theory of public choice. Self-interested politicians, imperfect competition in the political system, or the strength of local interest groups are some of the main political factors responsible for the occurrence of the FPE. Similarly, voters' irrationality is also identified with the political environment. Asymmetric reactions in government expenditure, depending on the source of financing, result from fiscal illusion. Voters have incomplete information about inter-government transfers and the economic costs of producing local public goods. They perceive grants as totally costless, unlike local taxes, although they are not free.

A particularly interesting explanation of the FPE is additionally provided by behavioural economists. Loss aversion says that the political cost of raising a tax is always greater than the political benefit of an equivalent tax cut. Moreover, government spending behaviour can be described by the mental accounting approach which assumes that one dollar in private funds is perceived differently from one dollar in public funds. For this reason, politicians usually prefer grants to taxes.

Our empirical analysis also provided expected results consistent with the previous research. Based on the panel data analysis, the FPE phenomenon was confirmed in the area of local finance in Poland between 2010 and 2020. The analysis revealed that the FPE is significantly stronger in rural and urban-rural municipalities compared to urban municipalities and cities with county rights. Overall, our analysis indicates that the FPE phenomenon in Poland coincided with a growing tendency towards fiscal recentralization in public finance.

Theoretical research and empirical analyses, based on the conceptualization of the flypaper effect phenomenon in the Polish local finance system, allow for the formulation of the following final conclusions:

1) The increasing dependence of the Polish local finance system on intergovernmental transfers has exacerbated the phenomenon of the FPE in the realm of local government finances, resulting in a corresponding growth in budget expenditures.

2) Behavioral conditions underlying the FPE phenomenon, such as perceiving revenues from external transfers as 'free money,' contribute to a greater inclination of local authorities to expend these funds compared to their own budgetary revenues.

3) The FPE is more pronounced in rural municipalities in Poland compared to urban units and cities with county status, emphasizing the differentiation of the studied phenomenon depending on the categories of local government units.

4) The strength of the FPE also depends on specific types and characteristics of intergovernmental transfers, suggesting that different categories of transfers have varied effects on the level of local budget expenditures.

5) Deficiencies in Polish legislation related to the local finance system, which has resulted in excessively limited financial autonomy for municipalities and cities with county status, and even illusory autonomy for counties and voivodeships, have also contributed to the intensification of the FPE phenomenon. Urgent reform of the local finance system in Poland aimed at increasing the financial autonomy of local government units is necessary in this regard.

6) In Poland, intergovernmental transfers are used not only as fiscal tools to address fiscal inequalities among local government units but also as political instruments aimed at centralizing power over local government.

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Appendix:

Appendix 1:   Descriptive statistics

Variable	Average	Mean	S.D.	Min	Max
Model OLS(1)					
l_EXPEND	20,4	20,2	0,862	18,8	23,7
l_TransRevenue	19,9	19,7	0,823	18,4	23,2
l_OwnRevenue	19,2	19,0	0,966	17,4	22,6
Model OLS(2)					
l_EXPEND	18,1	18,2	0,901	15,6	19,8
l_TransRevenue	17,5	17,7	0,927	15,2	19,5
l_OwnRevenue	17,0	17,1	0,946	13,8	18,9
Model OLS(3)					
l_EXPEND	17,0	17,0	0,562	15,3	19,5
l_TransRevenue	16,7	16,6	0,570	14,7	19,1
l_OwnRevenue	15,5	15,4	0,727	13,2	19,3
Model OLS(4)					
l_EXPEND	17,6	17,6	0,600	15,7	19,8
l_TransRevenue	17,2	17,2	0,616	14,1	19,4
l_OwnRevenue	16,3	16,3	0,746	14,1	18,9

Variables: EXPEND, TransRevenue and OwnRevenue are converted to logarithms.
Source: authors' own elaboration.