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Municipal budget communication on social media: Seasonality, electoral cycles, and development-oriented framing in Poland

Waldemar Rydzak

*Department of Information Economics,
Poznań University of Economics and Business,
Poland*

waldemar.rydzak@ue.poznan.pl
ORCID 0000-0001-5771-933X

Małgorzata Magdalena Hybka

*Department of Public Finance,
Poznań University of Economics and Business,
Poland*

malgorzata.hybka@ue.poznan.pl
ORCID 0000-0002-3524-3489

Jacek Trębecki

*Department of Information Economics,
Poznań University of Economics and Business,
Poland*

jacek.trebecki@ue.poznan.pl
ORCID 0000-0001-9775-173X

Krzysztof Hwaszcz

*Department of English and Comparative Linguistics,
Institute of English Studies, Faculty of Neophilology,
University of Wrocław, Poland*

krzysztof.hwaszcz@umw.edu.pl
ORCID 0000-0003-2136-5001

Tomasz Walkowiak

*Department of Artificial Intelligence, Faculty of Information and
Communication Technology,
Wrocław University of Science and Technology,
Poland*

tomasz.walkowiak@pwr.edu.pl
ORCID 0000-0002-7749-4251

Abstract. The municipal budget is an important instrument of public management, accountability, and the legitimacy of local government actions. The aim of the article is to examine the intensity, seasonality, and framing of budget content

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communication by municipalities in social media, taking into account variation by municipality type and region, as well as the distinct role of the electoral cycle. The analysis focuses on Poland and is based on a corpus of 1,131,615 posts published on the official Facebook profiles of 766 municipalities from six Polish voivodeships between January 2, 2011, and April 19, 2024. Budget posts were identified using a lexical method exclusively among entries containing text. Descriptive analyses, logistic regression (logit) for the probability of publishing a budget post, linear regression (OLS) for the share of fiscal vocabulary at the municipality $\times$ month level, sensitivity analysis, and comparisons of peri-election windows were applied. The results indicate a clear seasonality of budget communication and a significant impact of the electoral cycle: during campaign periods, the share of budget posts increases, and framing shifts toward an investment-project narrative. The most stable result is the seasonal reframing of the budget toward developmental content, while differences between municipality types in the level of message fiscality turn out to be sensitive to the adopted lexical classification. The article shows that the budget in social media functions not only as financial information but also as a narrative resource used to inform residents, legitimize local authorities' actions, and communicate development effects.

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1. INTRODUCTION

The municipal budget is a fundamental instrument of public management at the local level. As a formal financial plan, it defines the revenue and expenditure priorities of a local government unit, and at the same time constitutes an important point of reference for the accountability of local government actions. In conditions of growing expectations regarding the transparency of public administration and citizen participation, the manner of making budget information available takes on special significance. Communicating content related to the budget carries not only a cognitive significance associated with informing residents, but also a normative one, reinforcing trust, accountability, and the legitimacy of local government actions (Twizeyimana & Andersson, 2019; Bertot, Jaeger, & Grimes, 2010).

The development of social media has significantly altered the practices of communication by public institutions. Platforms such as Facebook have become not only a channel for transmitting information but also a space for interaction, negotiating meanings, and building the legitimacy of local authorities' actions. Social media increase the accessibility of messages, accelerate their circulation, and enable audience reactions (Waters & Williams, 2011; Coutinho et al., 2023; Mishchuk et al., 2026). At the same time, research results show that the activity of local governments in social media varies, and the level of audience response depends not only on the frequency of publication but also on the type of content and its local utility (Bonsón et al., 2015).

Against this background, communicating budget issues represents a particular challenge. Financial content is often relatively complex and less intuitively attractive to a wide audience than messages of a symbolic, daily, or event-driven nature. At the same time, it can be presented in a way that is closer to the experience of residents - by referring to investments, projects, funds, tasks, and local effects of actions. The budget can therefore function not only as a financial document but also as a narrative resource that allows local authorities to demonstrate activity, agency, and development priorities.

Previous analyses of communication by municipalities in social media have more frequently focused on general indicators of activity and engagement rather than on the detailed linguistic structure of financial communication. This article attempts to fill this gap by analyzing the communication of budget content by Polish municipalities, using a large corpus of Facebook posts, a corpus approach, and lexical analysis. Three

interrelated axes of analysis are at the center of attention: the intensity and seasonality of budget communication, structural variation by municipality type and region, and the lexical framing of budget content, understood as the relationship between a fiscal and development-investment approach. The mechanism of the electoral cycle is also considered separately as a factor influencing the visibility and presentation of budget content.

2. LITERATURE REVIEW IN THE AREA OF BUDGET CONTENT COMMUNICATION

2.1. Promotional function of the budget, transparency, and public accountability in local management

Key content communication remains linked to one of the functions of a local government unit's budget, described in the public finance literature as a promotional function associated with the relations of a given entity with its environment (Sierak, 2011, p. 104). Its origins can also be sought in the regulations concerning the own tasks of municipalities, which also include promotional activities. In this view, the budget is not solely a financial planning tool but also an instrument influencing the image of the municipality and the evaluation of its authorities' actions. How a municipality is perceived by its residents is determined to a significant extent by the way the expenditure side of the budget is managed and the ability to justify financial choices in accordance with needs and available resources (Kobylińska et al., 2016, p. 64).

In the literature on public management and e-government, transparency and public accountability are treated as fundamental elements of governance quality and trust in public institutions. The theoretical foundations of budget content communication can be linked primarily with agency theory, legitimacy theory, and approaches relating to fiscal illusion. According to agency theory, politicians and public institutions are responsible not only for the execution of public tasks but also for informing citizens about planned and realized revenues and expenditures. Budget transparency strengthens social control, improves the relationship between authorities and citizens, and can foster better economic outcomes (Rukavina, 2023, p. 16).

In turn, legitimacy theory suggests that the sustainability and acceptance of public organizations' actions depend on the alignment between social expectations and the actual actions of institutions. Openness and transparency of the decision-making process can therefore reinforce the credibility of authorities and increase citizens' willingness to accept their policies (Ríos, Guillamón, & Benito, 2024, p. 420). The perspective of fiscal illusion is also relevant, according to which limited access to information can lead to an underestimated perception of costs and an overestimated perception of benefits associated with public spending. Reliable dispersion of budget content can mitigate this problem because it provides citizens with information about the scale of the authorities' activities, costs, funding sources, and expected effects of public actions (Afonso, 2014; Klun, Benčina, & Umek, 2019). In this sense, budget communication also fits into Ebrahim's accountability theory, which assumes an obligation to explain decisions made, methods of operation, and achieved results to stakeholders (Ebrahim, 2003).

2.2. Social media in the practice of municipal communication

Digital communication channels, including social media, are described as tools that potentially expand citizens' access to information, lower information barriers, and support the monitoring of administrative actions (Bertot, Jaeger, & Grimes, 2010). In this view, social media can serve both to enhance transparency and to build standards of public accountability. This also applies to financial content, which in traditional institutional documents can be difficult to comprehend due to technical language, classification categories, and reporting logic. Therefore, in communication practice, special importance attaches not only to making budget information available itself, but also to the choice of channel, form, and language of its presentation.

Research on municipal communication indicates that social media are a relatively new but rapidly spreading tool of administrative practice (Hybka et al., 2024). The literature emphasizes their basic functions: fostering citizen engagement and stimulating community spirit (Waters & Williams, 2011), enhancing the perceived transparency of authorities' actions (Bonsón et al., 2012), and creating conditions for faster audience response to published content (Bonsón et al., 2015). In the Polish context, the importance of local organizational and resource constraints is additionally emphasized, alongside the uneven development level of social media communication practices (Malkiewicz, 2025; Kornacka-Grzonka, 2023; Romanowski & Szymkowiak, 2018; Szymkowiak & Scheibe, 2016; Pawlicz, 2015).

In this context, budget content poses a particular challenge for the content creator. On one hand, its communication is important for the transparency and accountability of local authorities; on the other hand, strictly informational messages tend to be relatively less interactive than symbolic or engaging content (Bonsón et al., 2015). The framing of budget communications therefore takes on particular importance: presenting public finance not only as fiscal categories but as a narrative about investments, projects, funds, and local effects of actions. Such an approach can combine an informational function with a legitimizing and mobilizing function, while making the message more accessible to residents.

2.3. Structural variation: Municipality type and regional context

The literature and observations of local government practices suggest that digitalization, organizational resources, and financial and developmental conditions are unevenly distributed across municipalities. Differences between urban, urban-rural, and rural municipalities may therefore translate into distinct communication patterns, including the intensity and language used to communicate financial topics. More broadly, cross-country research shows that digital government development does not automatically produce stronger fiscal outcomes, as its effects are strongly conditioned by wider economic and institutional factors (Lyeonov et al., 2026). Although this evidence concerns national fiscal performance rather than municipal communication, it supports considering the broader context in which digital administrative practices operate. At the municipal level, regional context may influence both municipalities' financial and technological capacities and the ways in which budget issues are selected and framed. From this perspective, social media can function not only as channels for providing information but also as instruments through which public topics are selected and ordered, with local organizational and developmental conditions potentially reinforcing specific narrative patterns.

Poland is characterized by persistent regional variation. According to Statistics Poland (2024), GDP per capita in 2022 varied considerably across the voivodeships included in the study, ranging from approximately PLN 55 thousand in Lubelskie and Podkarpackie to nearly PLN 91 thousand in Dolnośląskie, compared with the national average of approximately PLN 81.3 thousand. The voivodeships included in the study therefore represent areas with markedly different socio-economic profiles. Such variation may be reflected in differences in municipalities' own-revenue capacity, investment needs, and reliance on external funding sources, including EU funds. These conditions may, in turn, influence both the frequency with which budget issues are addressed and the balance between fiscal and development-investment framing. Municipality type and regional context are therefore treated in this study as potential dimensions of variation in the visibility and framing of budget content, rather than as uniformly directional determinants of communication.

3. RESEARCH QUESTIONS, HYPOTHESES, AND MODEL IN THE ANALYSIS OF BUDGET CONTENT ON MUNICIPAL SOCIAL MEDIA

The analysis of municipal budget communication in social media was designed to address three complementary problem axes: (A) the volume and seasonality of addressing the budget topic, (B) structural variation (municipality type and region), and (C) the framing of budget content in the fiscal and development-

investment dimensions. Special attention was also paid to the electoral cycle mechanism as a distinct factor influencing changes in the intensity and framing of communications regarding budget matters.

3.1. Research questions

Based on the literature and prior empirical findings, the following research questions were formulated:

RQ1. Is the budget communication of municipalities in social media seasonal, and if so, in which months is its highest intensity observed?

RQ2. Does the intensity of addressing budget content differ between types of municipalities and depending on the regional context?

RQ3. How is budget content framed - do fiscal references dominate, or development-investment ones - and does this framing change over time, especially in months key to the budget cycle?

RQ4. Does the electoral cycle constitute a distinct mechanism that increases the volume and visibility of budget content communication, and is a shift in framing toward an investment-project narrative observed in peri-election periods?

3.2. Research hypotheses

Based on the literature review and prior empirical findings, four hypotheses were adopted:

H1 (seasonality). Budget content communication by municipalities in social media is characterized by clear seasonality, with an increase in months key to the budget cycle.

H2 (structural variation). The intensity of communicating budget content varies depending on the type of municipality and the region.

H3 (seasonality of framing). In periods of increased budget activity, a shift occurs in content framing from a fiscal approach toward a development-investment narrative.

H4 (electoral cycle as a distinct mechanism). The electoral cycle constitutes a distinct mechanism that increases the volume and visibility of budget content communication and favors a shift in framing toward a development-investment narrative.

4. METHODOLOGY OF BUDGET CONTENT RESEARCH IN MUNICIPAL SOCIAL MEDIA

4.1. Research design, data sources, and unit of analysis

The study is a quantitative content analysis with a statistical modeling component. The primary unit of analysis is a single post published on the official Facebook profile of a municipality. The empirical setting of the study is Poland, and the analysis covers municipalities from six voivodeships selected to capture historical and regional variation. The study period covers posts published between January 2, 2011, and April 19, 2024. The baseline structure of the corpus and the scale of budget vocabulary saturation are reported in Section 5.1.

The basis of the analysis is the content layer comprising the results of linguistic processing of posts published by municipalities on Facebook. For each post, a municipality identifier (mun_ID, TERYT code), publication date, number of tokens (lemma_count), and counts of lemmas linked to budget themes were assigned. Voivodeship and municipality type were reconstructed based on the TERYT code. Data concerning GDP per capita variation were used exclusively as interpretive context and not as direct model variables.

The analysis distinguishes posts containing text from the full stream of publications recorded in the raw layer. Text posts are publications for which content is available that enables lemmatization and lexical analysis. Conversely, the full stream of publications may also include highly visual posts, videos, reels, or other formats in which the textual component is limited, rudimentary, or non-comparable. Consequently, the identification

of budget posts and analyses based on vocabulary refer only to posts for which lexical processing could be reliably applied.

4.2. Lexical identification of budget posts and framing measures

The identification of budget posts was conducted using a lexical method on lemmatized data. A publication was considered a budget post if at least one of the selected lemmas linked to budget themes occurred in it. On this basis, the binary variable *is_budget* was constructed, taking a value of 1 when the sum of occurrences of the selected lemmas in the post is greater than zero, and 0 otherwise.

The analysis utilized a set of 18 lemmas: *budżet* (budget), *dochód* (revenue), *wydatek* (expenditure), *podatek* (tax), *deficyt* (deficit), *subwencja* (subvention), *kwota* (amount), *plan* (plan), *prognoza* (forecast), *inwestycja* (investment), *projekt* (project), *fundusz* (fund), *środki* (resources), *dotacja* (grant/subsidy), *grant* (grant), *zadanie* (task), *dlug* (debt), and *pieniądze* (money) (Bischoff et al., 2026).

To capture the framing of budget content communication, lemmas were divided into three categories. The fiscal category included: *budżet*, *dochód*, *wydatek*, *podatek*, *deficyt*, *subwencja*, *kwota*, *plan*, and *prognoza*. The development-investment category included: *inwestycja*, *projekt*, *fundusz*, *środki*, *dotacja*, *grant*, and *zadanie*. The remaining category consisted of the lemmas *dlug* and *pieniądze*. This classification distinguishes language referring to the accounting-fiscal dimension of public finance from the language of projects, investments, and funding sources.

Beyond the binary classification, the intensity of budget vocabulary in posts was analyzed using thresholds for the number of budget tokens in a post: at least two, five, ten, and twenty tokens. At the municipality $\times$ month aggregation level, the indicator *share_fiscal* was calculated as the quotient of the number of fiscal tokens and the sum of fiscal and development-investment tokens: $\text{share_fiscal} = \text{tokens_fiscal} / (\text{tokens_fiscal} + \text{tokens_development})$. Lower values of this indicator were interpreted as a shift in communication toward a development-investment narrative.

4.3. Explanatory variables and analytical procedure

Three main axes of variation were included in the analyses. The first axis concerns volume and seasonality, operationalized by monthly effects and by identifying the months in which the share of budget posts is highest. The second axis concerns structural variation and includes municipality type (urban, rural, urban-rural) and voivodeship. The third axis concerns content framing and includes the proportions of fiscal and development-investment vocabulary.

Beyond the statistical models, descriptive analyses were conducted for the full 2011-2024 corpus. They included calculations of the number of all posts, number of budget posts, and percentage of budget posts by month; comparisons of seasonality by voivodeship and municipality type; identification of lemmas whose relative share increases or decreases in budget months; and tests of differences in selected lemma shares between municipality types, including the Kruskal-Wallis test.

In Model 1, post length was controlled for using the logarithmically transformed number of lemmas, $\log(1 + \text{lemma_count})$. In robustness analyses limited to the years 2021-2023, annual financial-demographic characteristics of municipalities were also included: log of population size, log of total income per capita, share of own revenue, debt, share of young population, share of elderly population, and unemployment rate. These variables were used exclusively to evaluate the stability of selected relationships in the period for which complete structural data were available.

4.4. Statistical models, robustness checks, and sensitivity analysis

Model 1 estimates how the probability changes that a given post will have a budget character. A logistic regression model was used for the binary variable `is_budget`. Predictors included municipality type, monthly effects, and voivodeship, with concurrent control for post length. The model was estimated on a sample of 250,000 posts randomly drawn with a fixed seed (`seed=42`) from the population of 1,131,615 observations. Standard errors were clustered by municipality (`mun_ID`) to account for dependence of observations within the same local government unit. Coefficients were transformed into odds ratios to facilitate interpretation.

Model 2 focuses on the linguistic structure of budget content communication. It was estimated as a linear regression model in which the dependent variable is `share_fiscal` at the municipality $\times$ month level. Predictors included municipality type, voivodeship, and monthly effects, with January as the reference category. Only observations for which the sum of fiscal and development-investment tokens was positive were included. Model 2 refers to 8,817 municipality $\times$ month observations aggregated in the full 2011-2024 corpus.

Additionally, robustness models limited to the years 2021-2023 were estimated. Model 1R corresponded to the logit model for the probability of a budget post and additionally included financial-demographic characteristics of municipalities. Model 2R corresponded to the OLS model for `share_fiscal` and was estimated at the municipality $\times$ year-month level. These models do not replace the main models for the full 2011-2024 corpus, but serve to evaluate whether conclusions regarding seasonality, municipality type, and region remain stable after accounting for basic structural differences between municipalities.

The stability of conclusions was further evaluated through a sensitivity analysis based on two alternative lexical classifications. In the first variant, the lemma `zadanie` (task) was moved from the development-investment category to the fiscal one. In the second variant, the lemma `budżet` (budget) was separated as an independent thematic category so that it would not mechanically reinforce either of the two main frames. The purpose of this procedure was to establish whether directional conclusions regarding seasonality and framing shifts hold independently of classification details.

4.5. Electoral-cycle analytical module

The electoral cycle was treated as a distinct mechanism that could explain changes in the volume and framing of budget communication. Its operationalization was based on a comparative analysis of publication activity in peri-election windows defined as ± 30 days around the day of local government elections. The electoral component was reconstructed based on data from the full study period, which enabled the inclusion of local government elections from 2014, 2018, and 2024. The 2010 elections remain outside the scope of analysis because they precede the start of the studied corpus.

In the electoral module, a budget post was identified using the variable `is_budget`, while framing was measured by `share_fiscal`. Differences in the shares of budget posts inside and outside peri-election windows were tested using a proportions test, equivalent to the χ^2 test for 2×2 tables. Differences in mean values of `share_fiscal` were tested using Welch's two-sample independent two-tailed t-test. Budget posts published in the peri-election window were compared with budget posts published outside this window in the same election year. Methodological limitations resulting from lexical identification, text-only analysis, temporal scope, and data availability are discussed in Section 8.

5. RESEARCH RESULTS ON BUDGET CONTENT COMMUNICATION

5.1. Corpus structure, communication intensity, and descriptive seasonality

The structure of the empirical material and the scale of budget vocabulary saturation are presented in Table 1. Budget-related content constitutes a recognizable part of municipal Facebook communication. Moreover, the identification of budget posts does not rely solely on incidental, single references, but in a significant portion of cases concerns communications clearly saturated with budget vocabulary.

Table 1

Corpus structure and budget vocabulary saturation

Indicator	Value
Study period	January 2, 2011 - April 19, 2024
Full corpus	1,131,615 posts
Budget posts	164,647
Share of budget posts	14.55%
Budget tokens in budget-related posts	4,096,238
Municipalities with at least one budget post	766
Posts with at least two budget tokens	13.47%
Posts with at least five budget tokens	9.58%
Posts with at least ten budget tokens	6.44%
Posts with at least twenty budget tokens	3.86%

Source: Authors' results.

Note: Budget posts are posts containing at least one occurrence of one of the 18 budget lemmas.

Descriptive results show that budget communication is seasonal and structurally differentiated by municipality type and region (Table 2). February, September, and October have the highest shares of budget posts and were therefore adopted as budget months. The observed pattern is consistent with the calendar of the budget procedure. According to Art. 238 of the Public Finance Act, the executive board of a local government unit prepares and submits a draft budget resolution to the legislative body and the regional accounting chamber, for its opinion, by November 15 of the year preceding the budget year. September and October correspond to the period of intensification of work on the draft budget for the following year, while February is associated with entering the execution phase of the budget and closing certain procedural obligations.

At the descriptive level, rural and urban-rural municipalities more frequently than urban municipalities include the budget topic in their publication stream. Regional variation is also visible, with the highest shares observed in Podkarpackie and Lubelskie and the lowest share observed in Warmińsko-Mazurskie. Seasonality occurs across municipality types and voivodeships, with the strongest selected increases reported for rural municipalities in Podkarpackie and urban-rural municipalities in Warmińsko-Mazurskie and Podkarpackie.

Table 2

Descriptive seasonality and structural variation in budget post shares

Analytical dimension	Category	Value
Overall corpus	Full corpus	14.55%
Budget month	February	16.17%
Budget month	September	15.33%
Budget month	October	16.99%
Municipality type	Urban municipalities	approx. 13%
Municipality type	Urban-rural municipalities	approx. 15.5%
Municipality type	Rural municipalities	approx. 17.9%
Voivodeship	Podkarpackie	16.22%
Voivodeship	Lubelskie	15.41%
Voivodeship	Zachodniopomorskie	15.08%
Voivodeship	Dolnośląskie	14.35%
Voivodeship	Wielkopolskie	14.19%
Voivodeship	Warmińsko-Mazurskie	13.02%
Selected increase in budget months	Podkarpackie, rural municipalities	+3.4 p.p.; from 17.0% to 20.4%
Selected increase in budget months	Warmińsko-Mazurskie, urban-rural municipalities	+3.3 p.p.
Selected increase in budget months	Podkarpackie, urban-rural municipalities	+3.2 p.p.

Source: Authors' results.

Note: Values marked with approx. are approximate. The table presents descriptive results for overall shares, highest monthly shares, shares by municipality type and voivodeship, and selected strongest increases in budget months.

5.2. Lexical framing and structural variation

A comparison of the lexical composition of budget posts in budget months relative to the remaining months shows that periods of highest budget visibility are associated with a shift in the structure of budget vocabulary. The strongest relative gains are observed for grant (approx. +23% in relative terms), podatek (tax) (approx. +13%), and projekt (project) (approx. +10%). To a lesser extent, fundusz (fund), środki (resources), inwestycja (investment), and plan also gain relative importance. Conversely, the relative share of subwencja (subvention) is roughly half as high in budget months, while wydatek (expenditure), deficyt (deficit), dochód (revenue), and partially dotacja (grant/subsidy), kwota (amount), budżet (budget), and prognoza (forecast) lose relative visibility. Thus, the increase in budget visibility is not only a simple increase in references to finance, but also a change in the lexical structure of the message.

The baseline framing structure confirms that the dominant form of communicating budget content across all municipality types is development-investment vocabulary (Table 3). Urban municipalities retain a relatively more fiscal communication profile, whereas rural and urban-rural municipalities are shifted slightly more toward a development-investment narrative.

Table 3

Fiscal and development-investment vocabulary shares by municipality type

Vocabulary category	Urban municipalities	Rural municipalities	Urban-rural municipalities
Fiscal vocabulary share	31.24%	29.34%	27.91%
Development-investment vocabulary share	68.60%	70.52%	71.94%

Source: Authors' results.

Note: Values are approximate..

Statistically significant differences between municipality types are also observed in selected lemma shares within the pool of budget words (Table 4). Rural and urban-rural municipalities relatively more frequently refer to lemmas such as *fundusz* and *dotacja*, while urban municipalities relatively more frequently use the lemma *plan* and generally have a larger share of fiscal vocabulary. The share of *inwestycja* is similar across municipality types and does not differ significantly. This means that the variation in framing between municipality types does not consist of a simple contrast between “investment” and “non-investment” municipalities, but rather of a distinct distribution of accents between the language of planning, funds, grants, and the general development-budget narrative.

Table 4

Selected lemma shares and Kruskal-Wallis tests by municipality type

Lemma	Urban municipalities	Rural municipalities	Urban-rural municipalities	H	p
<i>fundusz</i>	0.082	0.111	0.096	≈33.9	≈4.3×10 ⁻⁸
<i>dotacja</i>	0.035	0.050	0.052	≈21.0	≈2.7×10 ⁻⁵
<i>plan</i>	0.074	0.048	0.056	≈65.4	≈6.4×10 ⁻¹⁵
<i>inwestycja</i>	0.137	0.142	0.134	≈0.87	≈0.65

Source: Authors' results.

Note: H denotes the Kruskal-Wallis test statistic. Mean shares are approximate.

5.3. Model 1: Budget post frequency

Model 1 confirms that the probability of publishing a budget post is associated with municipality type, month of publication, and regional context (Table 5). Relative to urban municipalities, rural and urban-rural municipalities have significantly higher odds of publishing budget posts. Monthly effects indicate seasonality, with the strongest statistically significant manifestation in October. February yields a weaker but still significant effect, while September has a positive coefficient but does not achieve statistical significance after controlling for the remaining variables.

Regional effects are weaker than the effects of municipality type and month. Relative to Podkarpackie, only Warmińsko-Mazurskie retains statistical significance at conventional thresholds.

Table 5

Model 1: logistic regression for budget post frequency

Predictor/effect	β	OR	p
Rural municipalities	0.3914	1.4790	<0.001
Urban-rural municipalities	0.2304	1.2592	<0.001
February	0.0833	1.0869	0.013
September	0.0224	1.0227	0.504
October	0.1691	1.1842	<0.001
Dolnośląskie	-0.0668	0.9354	0.212
Lubelskie	0.0242	1.0245	0.649
Warmińsko-Mazurskie	-0.1466	0.8637	0.032
Wielkopolskie	-0.0578	0.9438	0.262
Zachodniopomorskie	-0.0729	0.9297	0.228

Source: Authors' results.

Note: Reference categories are urban municipalities, January, and Podkarpackie Voivodeship. OR = $\exp(\beta)$.

The robustness model limited to 2021–2023 confirms the stability of the seasonal pattern, but refines the interpretation of structural effects (Table 6). October remains positive and significant, February remains positive but weaker, and September does not reinforce the probability of publishing a budget post. The effects of municipality type do not achieve statistical significance, while the negative effect of Warmińsko-Mazurskie remains significant. These results do not undermine the conclusions from the main model, but indicate that a portion of typological and regional differences may be shared with the financial-demographic characteristics of municipalities.

Table 6

Robustness model 1R for budget post frequency

Predictor/effect	OR	p
October	1.175	<0.001
February	1.067	0.042
September	0.919	0.020
Rural municipalities	1.157	0.089
Urban-rural municipalities	1.056	0.434
Warmińsko-Mazurskie Voivodeship	0.809	0.005

Source: Authors' results.

Note: The model is limited to 2021–2023 and includes the financial-demographic controls listed in Section 4.3.

5.4. Model 2 and sensitivity analysis: Share of fiscal vocabulary

Model 2 captures differences in the structure of budget language at the municipality $\times$ month level (Table 7). The results indicate that the share of fiscal vocabulary is significantly lower in rural and urban-rural municipalities than in urban municipalities, after controlling for voivodeship and monthly effects. Monthly effects confirm seasonal variation in framing: because share_fiscal is a relational indicator, a decrease in the fiscal component simultaneously implies a relative increase in development-investment vocabulary.

Voivodeship effects serve primarily a control function in Model 2. Positive and significant effects are observed for Dolnośląskie and Wielkopolskie relative to Podkarpackie, while the effects for Lubelskie, Warmińsko-Mazurskie, and Zachodniopomorskie are not significant. The robustness model limited to 2021–2023 confirms the baseline conclusion regarding framing seasonality, especially for September and October. Typological differences also persist, whereas voivodeship effects do not achieve statistical significance.

Table 7

Model 2: OLS regression for share_fiscal and robustness model 2R

Model	Predictor/effect	Coefficient	p
Main model	Rural municipalities	$\alpha = -0.0291$	0.004
Main model	Urban-rural municipalities	$\alpha = -0.0297$	0.007
Main model	February	$\alpha = -0.0582$	<0.001
Main model	September	$\alpha = -0.1391$	<0.001
Main model	October	$\alpha = -0.1511$	<0.001
Main model	Dolnośląskie Voivodeship	$\alpha = 0.0402$	<0.001
Main model	Wielkopolskie Voivodeship	$\alpha = 0.0650$	<0.001
Robustness model 2R	September	$b = -0.130$	<0.001
Robustness model 2R	October	$b = -0.160$	<0.001
Robustness model 2R	February	$b = -0.043$	0.070
Robustness model 2R	Rural municipalities	$b = -0.084$	0.039
Robustness model 2R	Urban-rural municipalities	$b = -0.070$	0.012

Source: Authors' results.

Note: Reference categories in the main model are urban municipalities, January, and Podkarpackie Voivodeship. Effects for Lubelskie, Warmińsko-Mazurskie, and Zachodniopomorskie are not statistically significant. The robustness model is limited to 2021-2023 and includes the financial-demographic controls listed in Section 4.3.

The sensitivity analysis verifies whether the main conclusions hold under alternative lexical classifications (Table 8). In variant 1, assigning *zadanie* to the fiscal category increases the share of fiscal vocabulary in all municipality types to around 44-45%, but the dominance of development-investment vocabulary still persists. In both sensitivity variants, the effect of municipality type weakens and loses statistical significance, while seasonal effects remain strong and negative. These results indicate that the seasonal shift toward a development-investment narrative is stable independent of classification details, whereas differences between municipality types in the lexical profile require a more cautious interpretation.

Table 8

Sensitivity analysis of lexical classification

Variant	Predictor/effect	α	p
V1	Rural municipalities	-0.0040	0.690
V1	Urban-rural municipalities	-0.0059	0.587
V1	February	-0.0376	<0.001
V1	September	-0.1140	<0.001
V1	October	-0.1149	<0.001
V2	Rural municipalities	0.0054	0.611
V2	Urban-rural municipalities	-0.0046	0.686
V2	February	-0.0592	<0.001
V2	September	-0.1571	<0.001
V2	October	-0.1662	<0.001

Source: Authors' results.

Note: V1 = *zadanie* assigned to the fiscal category; V2 = *budżet* separated as an independent category. Variant 1 increases the share of fiscal vocabulary in all municipality types to around 44-45%.

6. BUDGET, ELECTIONS, AND LOCAL COMMUNICATION

Section 6 brings together the results concerning electoral periods. It examines whether budget content becomes more visible in peri-election windows and whether its framing shifts toward an investment-project narrative. In political logic, local government elections increase the pressure of accountability, reinforce the need to legitimize authorities' actions, and intensify electorate mobilization. Consequently, the budget and public investments become a particularly useful argument resource during campaign periods, because they enable communicating agency, priorities, and tangible effects of governance.

6.1. Peri-Election Scope and Empirical Results

The electoral module covers the local government elections of 2014, 2018, and 2024. The 2010 elections are not included because they precede the start of the studied corpus. The analysis includes the first and second rounds of voting in 2014 and 2018, and the first and second rounds in 2024, with the caveat that the data range ends on April 19, 2024, and therefore does not cover the full period after the second round of the 2024 elections.

A comparison of peri-election windows with the remaining part of the same election year indicates a systematic increase in the intensity of budget communication during election periods (Table 9). This pattern is visible for both first-round and second-round windows. In parallel, a shift in framing toward a development-investment narrative is observed, visible in lower values of *share_fiscal* in election windows. The exception is the second round in 2014, where the difference in *share_fiscal* is reported as not significant.

Table 9

Budget communication volume and framing in peri-election windows

Round	Year	Indicator	In peri-election window	Outside peri-election window	p / significance
First round	2014	Budget post share	11.89%	10.24%	0.00035
First round	2014	share_fiscal	0.2353	0.3041	0.00007
First round	2018	Budget post share	15.16%	12.94%	<1×10 ⁻¹²
First round	2018	share_fiscal	0.2202	0.2942	<1×10 ⁻¹⁷
First round	2024	Budget post share	18.79%	17.74%	0.00541
First round	2024	share_fiscal	0.2471	0.3455	<1×10 ⁻²⁷
Second round	2014	Budget post share	11.33%	10.37%	0.0428
Second round	2014	share_fiscal	0.2658	0.2957	p=0.1101; difference not significant
Second round	2018	Budget post share	13.99%	13.20%	0.00902
Second round	2018	share_fiscal	0.2255	0.2915	<1×10 ⁻¹²
Second round	2024	Budget post share	20.00%	17.64%	<1×10 ⁻⁶
Second round	2024	share_fiscal	0.2306	0.3308	<1×10 ⁻²³

Source: Authors' results.

Note: Lower share_fiscal values indicate a shift toward a development-investment narrative. For 2024, the post-election window after the second round is incomplete because the corpus ends on April 19, 2024.

6.2. Interpretation of Peri-election dynamics

The electoral results indicate that during campaign periods the budget enters the local communication agenda more prominently. The scale of increase is not identical in all years, but the direction of relationship remains stable. At the same time, lower values of share_fiscal show that alongside growing budget visibility, communication more frequently accents investments, projects, obtaining resources, and the execution of tasks, and relatively less frequently takes the form of a fiscal account focused on revenues, expenditures, deficit, or subventions.

Juxtaposing the increase in the share of budget posts with the simultaneous decline in share_fiscal indicates that the electoral cycle should be treated as a mechanism dynamizing both the frequency of budget communication and its framing. During election periods, the budget serves as a tool for legitimizing local authorities' actions: it is not communicated solely as a set of financial parameters, but more frequently as a story about projects, investments, and public tasks that can be presented as achievements or credible commitments. This mechanism reinforces, but does not replace, the seasonality stemming from the institutional rhythm of the budget procedure.

7. DISCUSSION

The results of the analysis show that the communication of budget content by municipalities in social media is a clearly structured phenomenon rather than an accidental or exclusively reactive practice. Budget visibility and framing depend primarily on the rhythm of the budget cycle, type of municipality, regional context, and the electoral cycle. At the same time, these effects do not have equal methodological stability. The results

regarding seasonality and the seasonal shift of framing toward a development-investment narrative are the most firmly established, whereas typological and regional effects are important descriptively but require more cautious interpretation.

The most important result concerns seasonality. Budget communication intensifies in months linked to the rhythm of the budget procedure, and this rhythm remains visible in both descriptive analyses and the logit model. Social media therefore do not eliminate the procedural logic of public management, but transfer it into a more visible and accessible informational loop. In this sense, the results are consistent with the conceptualization of social media as tools reinforcing transparency, access to information, and the accountability of public institutions (Bertot, Jaeger, & Grimes, 2010; Twizeyimana & Andersson, 2019).

A second critical finding is that seasonality concerns not only the volume of budget posts, but also the manner of their framing. In budget months, the budget is more often presented through the prism of projects, investments, funds, tasks, and local action results. Such framing increases the explanatory and legitimizing potential of the message: it allows technical financial categories to be linked with the experience of residents and the material results of local policy. This is particularly important in social media, where content competes for attention and must be not only informational, but also understandable and locally useful (Bonsón et al., 2012; Bonsón et al., 2015; Waters & Williams, 2011).

Municipality type differentiates budget communication, although the character of this variation depends on the level of analysis. In the main model, rural and urban-rural municipalities publish budget posts more frequently than urban municipalities, but this effect loses statistical significance in the robustness model with financial-demographic controls. This suggests that a portion of typological differences in communication volume may be shared with structural traits of local government units, such as population size, income level, own revenue structure, or socio-demographic situation.

The issue of framing presents itself differently. In the main model as well as in the robustness model for 2021-2023, rural and urban-rural municipalities are characterized by a lower share of fiscal vocabulary than urban municipalities, which points to a stronger shift toward a development-investment narrative. This indicates that typological differences may be more visible in how the budget is narrated than in the probability of publishing budget posts itself after accounting for fuller structural controls. Less urbanized municipalities more frequently embed the budget in the language of funds, grants, projects, and tasks, while urban municipalities retain a relatively more fiscal message profile.

This result should not be equated with full robustness of the typological effect. The classification sensitivity analysis shows that after altering the assignment of selected lemmas, especially *zadanie* and *budżet*, differences between municipality types in the level of message fiscality lose significance. Consequently, municipality type should be treated as an important dimension for describing budget communication variation, but not as an unambiguously independent and fully robust explanatory mechanism. The cautious interpretation is that municipality type differentiates communication patterns in basic models, whereas the strength and stability of this effect depend on the level of analysis, the structural controls, and the lexical classification adopted.

Regional effects have weaker stability than seasonal effects. Differences between voivodeships are visible in the main model, but some of these effects lose distinctness in robustness models. Region should therefore be treated as an important background for communication variation rather than as an independent and clear explanatory mechanism. Regional differences may partially reflect financial-demographic structures of municipalities, local development history, urbanization level, administrative practices, and the specificity of local public agendas.

The electoral component carries a distinct importance. In peri-election periods, the budget becomes particularly useful communicationally: its visibility grows and its framing shifts toward an investment-project narrative. This mechanism is not identical to budget seasonality. Seasonality stems from the institutional rhythm of the budget procedure, whereas the electoral cycle reinforces the political function of the budget as a tool for

accountability, legitimacy, and mobilization. In this context, the budget becomes a narrative resource through which local authorities can exhibit achievements, plans, and material effects of action.

Combined, the results show that budget communication in social media should be analyzed at several levels simultaneously. The mere presence of budget content reveals a seasonal and institutional logic. Framing shows that the budget is transformed from financial language into the language of projects and local development. Typological and regional variation indicates that communication practices are embedded in the structure of local government, although their interpretation requires caution. The electoral component shows that the budget can also serve a political-legitimizing function. The contribution of the article is therefore to show that the budget in social media is not exclusively technical financial information, but a seasonal and contextually framed element of public communication.

8. LIMITATIONS OF THE STUDY

The study has several limitations resulting from data design and the adopted analytical procedure. First, the identification of budget posts was based on a lexical rule. Such an approach reinforces the transparency and replicability of the analysis, but does not allow for capturing all contextual meanings. A portion of posts may contain budget lemmas in contexts weakly related to public finance, and some communications actually concerning the budget may not contain any of the adopted lemmas.

Second, the content analysis encompasses exclusively posts containing a textual component. This means that visual messages, graphics, video materials, or other highly visual formats could remain outside the scope of lexical classification, even if they related to the budget. This is an important limitation in the study of social media, because a portion of financial information may be transmitted through visual elements or text embedded in graphics.

Third, the framing model relies on aggregation to the level of municipality $\times$ calendar month. This solution allows relatively stable framing profiles to be captured, but limits the ability to analyze short-term changes at the individual post level and differences between specific years. In effect, the model describes monthly communication patterns well, but does not exhaust micro-temporal dynamics.

Fourth, the full corpus covers a long period of 2011-2024. This allows long-term patterns of seasonality and the electoral cycle to be analyzed, but this period is not homogeneous in terms of the maturity of municipalities' presence on Facebook. In the early years, the activity of some units could have had a more experimental and less stable character than in later years. For this reason, results regarding differences between municipality types and regions should be interpreted with more caution than results regarding seasonality.

Fifth, the annual financial-demographic characteristics of municipalities were available in full scope only for the years 2021-2023. Therefore, they were used in robustness models and not in main models for the entire corpus. This solution allows the stability of selected conclusions to be verified, but does not substitute a full structural analysis for the entire 2011-2024 period.

Sixth, the electoral part relies on windows of ± 30 days around local government elections. This is a useful operationalization of peri-election intensification, but does not encompass all possible campaign actions. In the case of 2024, an additional limitation is the fact that the corpus ends on April 19, and therefore does not cover the full period after the second round of elections. Conclusions regarding this year should therefore be related primarily to the pre-election and immediately peri-election phase.

Future research should develop the analysis in three directions. First, it is worth combining lexical analysis with qualitative and visual analysis to capture not only the presence of keywords, but also the manner of explaining budget content. Second, analyses encompassing residents' comments and reactions are needed, since the mere publication of budget content does not predetermine its comprehension, acceptance, or contestation. Third, it is worth expanding the analysis with fuller structural data for a longer period, which would allow seasonal, regional, and typological effects to be better separated from the financial-demographic traits of municipalities.

9. CONCLUSIONS

The conducted analysis shows that the communication of budget content by municipalities in social media is a persistent and recognizable element of local public communication. The budget is not an incidental topic, but a regularly present component of municipalities' informational activity on Facebook.

The most strongly confirmed and methodologically robust result of the article is the seasonality of budget communication and the associated framing shift toward a development-investment narrative. The visibility of budget content increases at predictable moments of the year, particularly in months linked to the rhythm of the budget procedure. Seasonality concerns not only the frequency of publication, but also the manner of framing the budget. The budget is thus more frequently presented through the prism of projects, investments, tasks, and funding sources than as a technical description of revenues, expenditures, and financial balance.

Municipality type and region differentiate budget communication, but their significance is less stable than the seasonality effect. Main models point to typological and regional differences, whereas robustness models with financial-demographic characteristics show that a portion of these effects may be shared with the structural traits of municipalities. Therefore, municipality type and voivodeship should be treated as important dimensions for describing budget communication variation, but interpreted with more caution as independent explanatory mechanisms.

The electoral cycle is also important. In peri-election periods, budget communication becomes more visible and shifts toward a development-investment narrative. The budget then serves to exhibit achievements, priorities, and agency, reinforcing the legitimizing function of local authorities' communication without replacing the seasonality stemming from the institutional rhythm.

In a broader perspective, the article shows that the budget in social media does not function exclusively as technical financial information. It is also a narrative resource that at specific moments of the year and in specific political contexts is transformed into the language of local development, investments, and concrete action effects. Therefore, studies on municipal communication should take into account not only the frequency of publication, but also seasonality, framing, structural-regional variation, and the political moment in which the budget becomes particularly useful communicationally.

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REFERENCES

- Afonso, W. B. (2014). Fiscal illusion in state and local finances: A hindrance to transparency. *State and Local Government Review*, 46(3), 219-228. <https://doi.org/10.1177/0160323X14550103>
- Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government Information Quarterly*, 27(3), 264-271. <https://doi.org/10.1016/j.giq.2010.03.001>
- Bischoff, I., Wimberger, A., Hybka, M. M., Banaszewska, M., Rydzak, W., & Trębecki, J. (2026). *Does institutionalization improve citizens' engagement on social media platforms? Evidence from municipalities in Poland* [Manuscript submitted for publication].
- Bonsón, E., Royo, S., & Ratkai, M. (2015). Citizens' engagement on local governments' Facebook sites: An empirical analysis. The impact of different media and content types in Western Europe. *Government Information Quarterly*, 32(1), 52-62. <https://doi.org/10.1016/j.giq.2014.11.001>
- Bonsón, E., Torres, L., Royo, S., & Flores, F. (2012). Local e-government 2.0: Social media and corporate transparency in municipalities. *Government Information Quarterly*, 29(2), 123-132. <https://doi.org/10.1016/j.giq.2011.10.001>

- Coutinho, F., Dias, A., & F. Pereira, L. (2023). Credibility of social media influencers: Impact on purchase intention. *Human Technology*, 19(2), 220–237. <https://doi.org/10.14254/1795-6889.2023.19-2.5>
- Ebrahim, A. (2003). Accountability in practice: Mechanisms for NGOs. *World Development*, 31(5), 813–829. [https://doi.org/10.1016/S0305-750X\(03\)00014-7](https://doi.org/10.1016/S0305-750X(03)00014-7)
- Hybka, M. M., Trębecki, J., & Rydzak, W. (2024). Sztuczna inteligencja w komunikowaniu z wykorzystaniem mediów społecznościowych - czy polskie gminy są na to przygotowane? *Zeszyty Naukowe Akademii Górnośląskiej*, 11/2024 (23), 43–51. <https://doi.org/10.53259/2024.11.05>
- Klun, M., Benčina, J., & Umek, L. (2019). Online budget transparency index and its determinants in Slovenian municipalities. *Public Finance Quarterly*, 3, 393–413. https://doi.org/10.35551/PFQ_2019_3_5
- Kobylińska, U., Liczmańska-Kopcewicz, K., Marzec, M., Owczarczyk, A., & Kożuch, A. J. (2016). *Satysfakcja obywateli i innych interesariuszy a instrumenty zarządzania w JST*. Towarzystwo Naukowe Współczesnego Zarządzania.
- Kornacka-Grzonka, M. (2023). Nowoczesne samorządy potrzebują mediów społecznościowych? O wykorzystywaniu nowych mediów przez jednostki samorządu terytorialnego na przykładzie województwa śląskiego. *Polityka i Społeczeństwo*, 21(2), 66–79. <https://doi.org/10.15584/polispol.2023.2.5>
- Lyeonov, S., Hrytsenko, L., Zámek, D., & Remsei, S. (2026). E-government development, armed conflict, and government revenue: A cross-country panel analysis. *Journal of International Studies*, 19(1), 160–184. <https://doi.org/10.14254/2071-8330.2026/19-1/9>
- Malkiewicz, Ł. (2025). *Wykorzystanie Facebooka w marketingu terytorialnym polskich regionów* [Rozprawa doktorska, Wyższa Szkoła Informatyki i Zarządzania z siedzibą w Rzeszowie, Kolegium Mediów i Komunikacji Społecznej].
- Mishchuk, H., Kuźmicz, K., Krol, V., Nożewski, J., & Imreh-Tóth, M. (2026). Media influence and user behaviour in the news environment: Traditional versus social media. *Human Technology*, 22(1), 219–238. <https://doi.org/10.14254/1795-6889.2026.22-1.11>
- Pawlicz, A. (2015). Wykorzystanie mediów społecznościowych jako narzędzia marketingu turystycznego przez gminy leżące na terenach parków narodowych w Polsce. *Ekonomia i Środowisko*, 4(55).
- Romanowski, R., & Szymkowiak, A. (2018). Obecność samorządów lokalnych w mediach społecznościowych w Polsce. *Zeszyty Naukowe Politechniki Śląskiej. Seria: Organizacja i Zarządzanie*, 129, 447–459. <https://doi.org/10.29119/1641-3466.2018.129.32>
- Ríos, A.-M., Guillamón, M.-D., & Benito, B. (2024). The influence of local government transparency on the implementation of the sustainable development goals in municipalities. *Journal of Public Budgeting, Accounting & Financial Management*, 36(4), 417–444. <https://doi.org/10.1108/JPBAFM-12-2023-0229>
- Rukavina, I. (2023). Effects of media coverage on budget transparency in Croatian local administrative units. *Naše gospodarstvo / Our Economy*, 69(2), 15–28. <https://doi.org/10.2478/ngoe-2023-0008>
- Sierak, J. (2011). Budżet zadaniowy jako narzędzie wzrostu efektywności gospodarowania finansami w jednostkach samorządu terytorialnego. W *Studia i Prace Kolegium Zarządzania i Finansów* (Zeszyt Naukowy 107). SGH.
- Statistics Poland. (2024, September 30). *Gross domestic product and gross value added in regional breakdown in 2022* [News release]. <https://stat.gov.pl/en/topics/national-accounts/regional-accounts/gross-domestic-product-and-gross-value-added-in-regional-breakdown-in-2022%2C2%2C7.html>
- Szymkowiak, A., & Scheibe, A. (2016). Komunikacja samorządu terytorialnego ze społeczeństwem za pośrednictwem mediów społecznościowych. *Collegium of Economic Analysis Annals*, 40, 299–312.
- Twizeyimana, J. D., & Andersson, A. (2019). The public value of e-government: A literature review. *Government Information Quarterly*, 36(2), 167–178. <https://doi.org/10.1016/j.giq.2019.01.001>
- Ustawa z dnia 8 marca 1990 roku o samorządzie gminnym, tj. Dz. U. z 2025 r. poz. 1153, 1436.
- Ustawa z dnia 27 sierpnia 2009 r. o finansach publicznych, Dz. U. z 2017 r. poz. 2077 z późn. zm.
- Waters, R. D., & Williams, J. M. (2011). Squawking, tweeting, cooing, and hooting: Analyzing the communication patterns of government agencies on Twitter. *Journal of Public Affairs*, 11(4), 353–363.