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The December effect in Swedish Public Finances

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Supervisor:

Fredrik N.G. Andersson

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Author

Johannes Dobson

Abstract

This paper examines whether a “December effect” exists in Swedish public finances, defined as a systematic increase in government expenditure at the end of the fiscal year. The analysis is motivated by the literature on “use-it-or-lose-it” incentives, where government agencies may face incentives to exhaust allocated budgets in order to avoid reductions in future appropriations. Using monthly panel data for 291 Swedish government agencies over the period 2006–2025, the paper estimates fixed effects regression models to examine seasonal expenditure patterns and the role of macroeconomic conditions. The empirical analysis provides strong evidence of a substantial and statistically significant increase in spending growth in December relative to other months. The analysis further reveals substantial heterogeneity across agencies and sectors. In particular, higher education and research institutions exhibit especially strong end of year spending patterns, consistent with greater budget flexibility and project-based funding structures. Overall, the results suggest that institutional budgeting rules play an important role in shaping expenditure timing in Swedish public finances. The findings contribute new evidence on end of year expenditure distortions in a European public sector context.

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1. Introduction

Every year, government agencies spend large amounts of public funds during the final weeks of the fiscal year, and expenditures in the public sector tend to increase above average since agencies risk receiving lower future funds when underspending, i.e. not using all allocated financial resources (Eichenauer, 2020, p. 28). This phenomenon is often attributed to so-called ‘use-it-or-lose-it’ incentives, where agencies have incentives to exhaust allocated budgets to avoid reductions in future funding (Hurley et al., 2014, p. 401).

In this paper, the term *December effect* refers to a systematic increase in government expenditure at the end of the fiscal year. The existence of a so-called “December effect” is not only a question of budgeting behavior, but also of broader economic importance. If public agencies systematically increase spending at the end of the fiscal year regardless of actual operational needs, fiscal resources may be allocated less efficiently, reducing the effectiveness of public spending and potentially increasing procurement costs.

Despite the growing literature, relatively little evidence exists for European public sectors, particularly Sweden. This paper addresses this gap by examining whether a December effect exists in Swedish government spending, and its magnitude. This paper also examines heterogeneity across agencies, shedding light on how institutional differences shape spending behavior. Understanding whether such end of year spikes exist in Sweden is important from both an efficiency and a policy perspective, as it may indicate suboptimal allocation of public resources.

Using monthly expenditure data on government agencies over the period 2006–2025, this paper aims to examine the presence and magnitude of a December effect in Swedish public finances. Furthermore, it aims to identify which Government agencies exhibit the strongest end of year spending patterns. More precisely, this paper aims to answer the questions:

Does a December effect exist in Swedish government spending? To what extent can macroeconomic conditions explain this effect? Which types of agencies exhibit the strongest December effect?

There is growing literature that examines the timing and efficiency of public expenditures. Previous research has documented substantial end of year spending spikes across several public sectors and countries. Liebman and Mahoney (2017, pp. 3511-5412) show that U.S. federal procurement spending increases strongly at the end of the fiscal year and that the quality of spending may decline. Similar patterns have been documented in Canadian defense expenditures (Hurley et al., 2014, pp. 407-408) and across OECD fiscal systems more broadly (Eichenauer, 2020, p. 4). Existing research further suggests that end of year spending may reduce procurement efficiency and increase costs due to time pressure and reduced competition (Klymak & Baumann, 2025, pp. 19-20).

The empirical results provide strong evidence of a pronounced December effect in Swedish government spending, consistent with the presence of use-it-or-lose-it incentives. The magnitude of the estimated effect is economically large, with spending growth in December substantially exceeding that of other months. The findings suggest that institutional features of the budgeting process, rather than macroeconomic conditions, influence public expenditure dynamics. This paper contributes new evidence of how institutional budgeting rules influence expenditure timing and fiscal behavior in Swedish public finances.

The remainder of the paper is organized as follows. The subsequent section presents previous literature on end of year government spending, institutional budgeting incentives and public expenditure behavior. It also presents the theoretical framework, focusing on soft budget constraints and principal-agent theory as explanations for end of year spending patterns. Thereafter, the data and methodology are described, including the construction of variables and the empirical strategy used to identify the December effect. The following section presents the empirical results, including both the baseline and extended estimates and the analysis of heterogeneity across agencies. The paper then discusses the findings, their implications, and the limitations of the analysis. Finally, the paper concludes by summarizing the main findings and potential future research.

2. Background

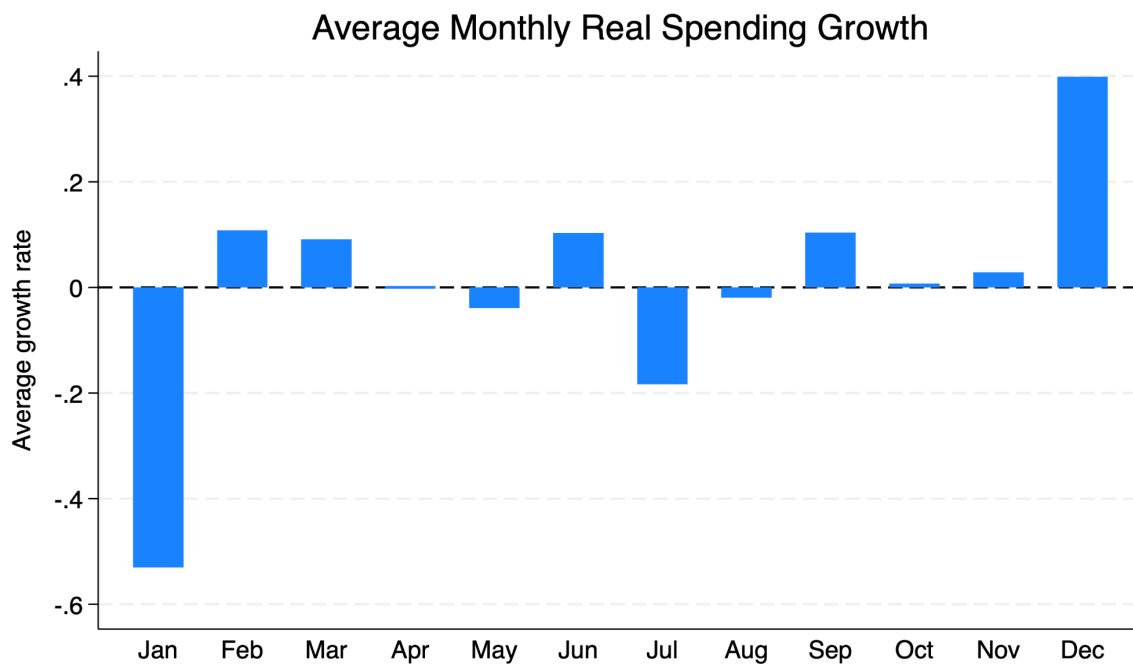
President Donald Trump's office spent approximately \$21.8 million during the final week of the 2017 fiscal year (Andrzejewski, 2017). Fichtner and Greene (2014, p. 12) find that between 2003 and 2013, executive branch departments in the United States spent, on average, 16.9 percent of annual contract expenditures during the final month of the fiscal year. Which is approximately twice the level expected under an even monthly distribution of spending. Such examples illustrate a broader phenomenon in public finance where government agencies appear to increase expenditures toward the end of the fiscal year. Though very little evidence exists on spending patterns in the final month of the Swedish fiscal year.

In Sweden, approximately 367 government agencies operate under the authority of the central government, although the number varies over time depending on political decisions (Regeringskansliet, 2026). These agencies are responsible for implementing decisions made by the parliament and government, and constitute a central component of the Swedish administrative model. Government agencies differ substantially in size and responsibilities, ranging from courts and universities to administrative authorities such as the Swedish Tax Agency, the Swedish Migration Agency, and the Public Employment Service. Together, Swedish government agencies employ approximately 250,000 individuals and administer a large share of public sector activities (Regeringskansliet, 2026).

A key feature of the Swedish administrative model is that government agencies operate independently from direct ministerial control. Instead, governance is exercised through formal instruments such as agency instructions, annual appropriation directions, and performance reporting requirements (Regeringskansliet, 2026). Agencies submit annual reports to the government, allowing for evaluation of both financial outcomes and operational performance (Regeringskansliet, 2026). In 2024, Swedish central government spending amounted to approximately 1377 billion SEK and spending was divided into 27 areas of expenditure (Regeringen, 2026). The vast majority of central government spending is administered by government agencies (Regeringen, 2026), implying that any systematic seasonal patterns, such as a December effect, can have important implications for aggregate public finances.

In Sweden, government agencies operate within a framework of annual appropriations, which may create incentives to increase spending toward the end of the fiscal year. Agencies are allowed to transfer up to three percent of the allocated funds to the next period, and these funds have to be used within two budget years (Riksdagen, 2026). If underspending is perceived as a signal of lower future funding needs, agencies may face incentives to exhaust remaining appropriations before the end of the year, potentially contributing to a concentration of expenditures in December. (Eichenauer, 2020, p. 3).

Figure 1: Average monthly real spending growth across Swedish government agencies, 2006–2025.



Notes: The figure displays average growth rates by calendar month.

As illustrated in Figure 1, government expenditure growth appears substantially higher in December than during the rest of the year, suggesting the presence of systematic end of year spending behavior.

3. Previous Research and Theoretical Framework

A growing literature examines how institutional budgeting rules influence the timing and efficiency of public expenditures. A recurring finding in this literature is that government agencies tend to increase spending toward the end of the fiscal year. Under annual budgeting systems, agencies may face incentives to exhaust allocated resources before the fiscal year ends in order to avoid reductions in future appropriations (Eichenauer, 2020, p. 3). This phenomenon is commonly referred to as “use-it-or-lose-it” incentives and has been documented across several public sector contexts.

Previous research shows that end of year spending spikes are particularly pronounced in public procurement. Using detailed procurement data from the United States federal government, expenditures in the final week of the fiscal year have been shown to increase to almost five times the average spending level observed during the rest of the year (Liebman & Mahoney, 2017, pp. 3511–3512). Importantly, the literature also suggests that such spending patterns may reduce expenditure efficiency (Liebman & Mahoney, 2017, pp. 3511–3512). End of year spending has been associated with lower project quality and higher procurement costs, indicating that agencies may prioritize exhausting remaining budgets over efficient allocation of resources (Liebman & Mahoney, 2017, p. 3512).

Similar expenditure patterns have been documented in other institutional contexts. Research on Canadian military spending finds substantial increases in expenditures toward the end of the fiscal year, which are interpreted as responses to annual budgeting incentives (Hurley et al., 2014, pp. 401, 407–408). Likewise, evidence from OECD countries suggests that fiscal activity systematically increases toward the end of budget cycles, indicating that seasonal expenditure spikes are not unique to a single country or sector but instead appear to reflect broader features of public financial management systems (Eichenauer, 2020, p. 12).

Furthermore, Hooker and Knetter (1994, p. 3) show that reductions in military procurement spending were associated with higher unemployment in U.S. states that were heavily dependent on defense related activity, highlighting how changes in public expenditure can

have important labor market consequences. They further argue that unemployment deviations may arise from various economic shocks and that unemployment dynamics are shaped by both structural characteristics and cyclical fluctuations (Hooker & Knetter, 1994, pp. 3-4).

Inflation increases nominal tax bases, while also raising the cost of government spending, particularly for items that are indexed to inflation. However, expenditures tend to adjust more slowly in nominal terms in the short run due to institutional rigidities such as annual budget constraints. In addition, inflation affects broader macroeconomic conditions, including nominal GDP and government borrowing costs, which are relevant for fiscal outcomes. (Garcia-Macia, 2023, p. 3)

The literature further identifies several mechanisms through which end of year spending may generate inefficiencies. Increased procurement activity toward the end of the fiscal year may reduce competition between suppliers, increase negotiated prices, and create capacity constraints that raise procurement costs (Klymak & Baumann, 2025, pp. 19–20). Together, these findings suggest that institutional budgeting incentives may influence not only the timing of expenditures but also the efficiency of public spending.

Theoretical explanations for these patterns are primarily rooted in the literature on soft budget constraints and principal-agent theory. The soft budget constraint theory, associated with Kornai, suggests that organizations expecting continued financial support may face weakened incentives for strict financial discipline (Vahabi, 2025, p. 87). In public budgeting systems, agencies may therefore have incentives to exhaust remaining appropriations before the fiscal year ends if underspending is perceived to reduce future funding allocations. From this perspective, end of year expenditure spikes can be interpreted as rational responses to institutional budgeting rules rather than changes in underlying economic conditions.

Principal-agent theory provides a related explanation for why such incentives may arise. In public finance, governments and parliaments function as principals, while government agencies act as agents responsible for implementing public policy and managing allocated

resources. Because principals cannot perfectly monitor agency behavior, information asymmetries may create incentives for agencies to behave in ways that differ from the objective of efficient resource allocation (Eisenhardt, 1989, pp. 58–61). Within annual budgeting systems, agencies may therefore perceive persistent underspending as a signal that future appropriations can be reduced, creating incentives to concentrate expenditures toward the end of the fiscal year.

Together, the existing literature suggests that annual budgeting systems may systematically distort the timing of public expenditures. The combination of annual appropriations, limited budget flexibility, and imperfect monitoring may generate incentives for agencies to exhaust remaining budgets before the end of the fiscal year, contributing to end of year spending spikes.

Although the literature on end of year spending has expanded in recent years, the existing evidence is heavily concentrated on the United States and a limited number of other countries. Relatively little research has examined whether similar expenditure patterns exist within European public sectors, and evidence on Sweden remains particularly limited. Moreover, previous studies have primarily focused on procurement spending or specific sectors rather than broader agency expenditure behavior across the public sector. This paper therefore contributes to the literature by examining whether a December effect exists in Swedish government spending and by analyzing how expenditure patterns vary across government agencies.

4. Data

The empirical analysis uses monthly expenditure data for Swedish government agencies obtained from Statskontoret, the Swedish Agency for Public Management (Statskontoret, 2026). The data contain agency-level expenditures distributed across expenditure areas and appropriation items. The monthly frequency of the data is particularly important for identifying end of year expenditure spikes. Annual expenditure data would conceal

short-term reallocations of spending within the fiscal year, while monthly observations make it possible to isolate whether spending systematically increases in December relative to surrounding months.

The Swedish state budget operates on a calendar-year basis. Expenditure outcomes are based on accounting data reported by government agencies to the government information system Hermes (Statskontoret, 2026). Government agencies also make accounting adjustments in connection with annual closing procedures and annual reports. As a result, preliminary December outcomes are revised in subsequent monthly reports before final outcomes are established (Statskontoret, 2026).

The dataset covers the period from January 2006 to December 2025 and includes reports from 303 government agencies. In total, the raw dataset contains 307,894 expenditure observations across agencies, appropriation items, and months (Statskontoret, 2026). Since not all agencies report expenditures in every month over the full sample period, the panel is unbalanced. Expenditures are aggregated to the agency and month level, resulting in one observation per agency and month. After data cleaning and variable construction, the final estimation sample consists of 48,699 observations across 291 agencies.

Macroeconomic data on inflation and unemployment are obtained from Statistics Sweden (SCB, 2026). Inflation is measured as the year-on-year percentage change in the consumer price index with fixed interest rates (CPIF), while unemployment is measured as the seasonally adjusted monthly unemployment rate among individuals aged 15–74.

Before estimating the empirical models, several data preparation steps were undertaken to ensure consistency across datasets and to construct the variables used in the analysis. The expenditure data, obtained from Statskontoret, were initially provided in a format where observations were structured across agencies and time, but required cleaning and restructuring before analysis.

The raw data was cleaned, reshaped from a wide format into a long format, such that each row corresponds to a unique agency and month observation. This transformation ensured that the dataset could be aligned with macroeconomic variables and imported into statistical software for panel regression analysis. During this process, variables were standardized and formatted consistently across datasets, including ensuring that dates were expressed in a uniform monthly format. The dataset was then merged with external data on inflation and unemployment, which were similarly transformed into long format and aligned at the monthly frequency.

The heterogeneity analysis is based on estimated agency level December spending growth and descriptive comparisons across categories. This approach allows the analysis to assess whether agencies operating under different budgeting structures and expenditure flexibility exhibit systematically different end of year spending patterns.

Table 1: Descriptive statistics

	count	mean	sd	min	max
RealSpending	49470	724 million sek	9.85e+08	1.021868	5.61e+09
logRealSpending	49470	18.19003	3.900655	.0216323	22.4481
dlog_realspending	48699	.0087611	1.35286	-4.698143	4.731597
Inflation	49470	.0209645	.0186512	-.0035263	.1017382
Unemployment	49470	7.663586	.9168601	5.7	9.8

Table 1 presents descriptive statistics for the main variables used in the analysis. Average monthly real spending growth is relatively close to zero, but exhibits variation across agencies and over time. Inflation and unemployment display moderate variation during the sample period. The dataset contains 48,699 monthly observations across 291 government agencies.

5. Method

5.1 Empirical Strategy

To examine whether a December effect exists in Swedish government spending, the analysis estimates fixed effects panel regression models using monthly data across agencies and time over the period 2006–2025. The empirical strategy identifies whether expenditure growth is systematically higher in December relative to other months within the same agency.

A key challenge is to distinguish the December effect from broader seasonal variation in expenditures. To address this, the model includes a full set of monthly dummy variables, excluding November as the reference category. This specification allows the December coefficient to capture the increase in spending growth relative to the immediately preceding month.

Agency fixed effects are included to control for unobserved agency-specific characteristics, such as organizational structure, expenditure composition, and budget flexibility, that remain relatively constant over time. The analysis therefore relies on within agency variation in spending growth over time rather than differences across agencies. Standard errors are clustered at the agency level to account for serial correlation within agencies.

5.2 Variable Construction

Nominal expenditure data are deflated using the consumer price index with fixed interest rates (CPIF), allowing expenditures to be expressed in real terms. This ensures that the analysis captures changes in real purchasing power rather than nominal fluctuations driven by inflation. Observations with zero or negative expenditure values are excluded to allow for logarithmic transformation. The dependent variable is defined as the first difference of the logarithm of real spending, $\Delta \log(\text{RealSpending}_{i,t})$, which approximates the monthly growth rate in expenditures. This transformation serves two purposes. First, it approximates the monthly growth rate in spending, allowing for a more interpretable measure of changes over

time. Second, it helps address potential non-stationarity in the level of spending and reduces heteroskedasticity across agencies. To reduce the influence of extreme observations, the dependent variable is winsorized at the 1st and 99th percentiles prior to estimation.

Lagged inflation and unemployment variables are included to account for broader macroeconomic conditions that may influence expenditure growth independently of institutional budgeting incentives. Inflation can generate temporary changes in nominal expenditure growth (Garcia-Macia, 2023, p. 3). Prior research also emphasizes that governments may adjust expenditure policies in response to employment conditions (Kikuchi, Kuzawa, & Tamai, 2026, p. 88). Both variables are included with a one-period lag to mitigate simultaneity concerns and reflect the timing of information available to agencies.

5.3 Regression models

A key challenge in identifying the December effect is to distinguish it from general seasonal patterns in agency expenditures. To address this, a full set of monthly fixed effects is included. Specifically, dummy variables are included for all months except November, which serves as the reference category. This choice allows the December coefficient to capture the incremental increase in spending relative to the immediately preceding month, thereby isolating the effect from broader seasonal variation. By excluding November as the reference category, the coefficients capture deviations in spending growth relative to this baseline month. This allows for identifying systematic end of year increases that are a product of institutional incentives. To avoid issues related to non-stationarity and spurious regression, the dependent variable is constructed as the first difference of the logarithm of real spending, $\Delta \log(\text{RealSpending}_{i,t})$, which approximates the monthly growth rate in spending.

The baseline specification is therefore:

Equation 1: Baseline model

$$\Delta \log(\text{RealSpending}_{i,t}) = \alpha + \sum_{m \neq \text{Nov}} \beta_m D_{m,t} + \mu_i + \varepsilon_{i,t}$$

where $RealSpending_{i,t}$ denotes monthly deflated nominal expenditures for agency i in month t . The dependent variable is specified in logarithmic form. This allows the coefficient of interest, β_m , to be interpreted as the difference in the percentual change in the expenditures in month m relative to November within the same agency. This helps stabilize variance across agencies of different sizes. The term μ_i represents agency fixed effects, capturing unobserved agency specific heterogeneity across agencies. The term $\varepsilon_{i,t}$ is an idiosyncratic error term.

The inclusion of agency fixed effects is important because government agencies differ substantially in terms of size, expenditure structure, institutional responsibilities, and budget flexibility. These characteristics are likely to influence spending behavior but remain relatively constant over time. Agency fixed effects therefore remove all unobserved agency specific heterogeneity across agencies, ensuring that the estimated December effect is not driven by permanent structural differences between organizations.

As a result, the estimated month coefficients are identified from changes in spending behavior within agencies over time rather than differences between agencies. This strengthens the interpretation that the estimated December effect reflects systematic end of year expenditure behavior rather than variation in agency characteristics. Full calendar time fixed effects are not included, since the objective is to estimate systematic seasonal variation across months rather than isolate common shocks in each specific month in a year.

At the same time, the fixed effects specification does not eliminate all potential sources of omitted variable bias. In particular, time varying factors such as policy reforms, changes in budgeting procedures, accounting adjustments, or other institutional changes may still affect spending behavior. To partly address this concern, the extended specification includes lagged macroeconomic controls for inflation and unemployment. However, unobserved time dependent institutional factors may still influence the estimated coefficients, implying that the results should be interpreted as evidence of a robust association rather than definitive causal effects.

To explore whether the December effect can be explained by macroeconomic conditions, the model is extended by including lagged macroeconomic variables. Inflation and unemployment are included with a one period lag to reflect the timing of information available to agencies when making spending decisions and to mitigate concerns about simultaneity.

The extended specification is given by:

Equation 2: Extended model

$$\Delta \log(\text{RealSpending}_{i,t}) = \alpha + \sum_{m \neq \text{Nov}} \beta_m D_{m,t} + \gamma \text{Inflation}_{t-1} + \delta \text{Unemployment}_{t-1} + \mu_i + \varepsilon_{i,t}$$

Because the model is estimated in differences, common time trends are removed, and the inclusion of an explicit time trend is not necessary. This specification ensures that the estimated December coefficient reflects excess spending growth in December relative to November, conditional on both seasonal patterns and macroeconomic conditions. Standard errors are clustered at the agency level to account for potential serial correlation in spending within agencies over time.

5.4 Heterogeneity Analysis

To examine whether the December effect differs across types of government agencies, the analysis additionally considers heterogeneity in spending behavior across institutional categories. Agencies are grouped according to their primary function, including higher education and research institutions, county administrative boards, and healthcare agencies. The analysis is motivated by the soft budget constraint framework, which suggests that organizations facing more flexible or project based funding structures may exhibit stronger incentives to exhaust remaining appropriations before the end of the fiscal year.

6. Results and discussion

The empirical results on monthly spending patterns across Swedish government agencies, with a particular focus on identifying the presence and magnitude of a December effect will be presented. The analysis begins by presenting the baseline fixed effects estimates of seasonal expenditure patterns. The section then examines whether the estimated December effect remains robust after controlling for macroeconomic conditions through the inclusion of lagged inflation and unemployment variables. Thereafter, the economic magnitude of the estimated effect is evaluated, followed by an analysis of heterogeneity across agencies and institutional categories. Together, the results provide evidence on whether end of year spending behavior in Swedish public finances is primarily driven by institutional budgeting incentives or broader macroeconomic conditions.

6.1 Baseline model results

The baseline fixed effects model indicates substantial seasonal variation and provides strong evidence of a December effect. The coefficient on the December indicator is positive and statistically significant at the 1% level, indicating that expenditure growth in December is substantially higher than in the reference month, November. December exhibits a large and statistically significant increase in spending, with an estimated coefficient of approximately 0.369 ($p < 0.01$). This suggests a pronounced end of year spike in expenditure.

In contrast, January shows a large negative effect in real spending growth (approximately -0.557, $p < 0.01$), indicating a sharp decline in spending following the end of the fiscal year. This pronounced reversal supports the interpretation that spending is shifted toward December rather than reflecting a sustained increase in expenditure levels. Several other months show smaller but statistically significant effects: February, March, June, and September display positive deviations, while May and July show negative effects. In contrast, coefficients for other months are generally smaller and less consistently significant. This pattern indicates that the December increase is not part of a smooth seasonal trend, but rather reflects a distinct spike in spending at the end of the fiscal year.

6.2 Extended model results

To assess whether this pattern can be explained by macroeconomic variables, the model is extended to include lagged inflation and unemployment. The results, reported in Table 2, show that the inclusion of these controls does not materially affect the estimated monthly effects. The December coefficient remains virtually unchanged at approximately 0.369 and retains its high level of statistical significance.

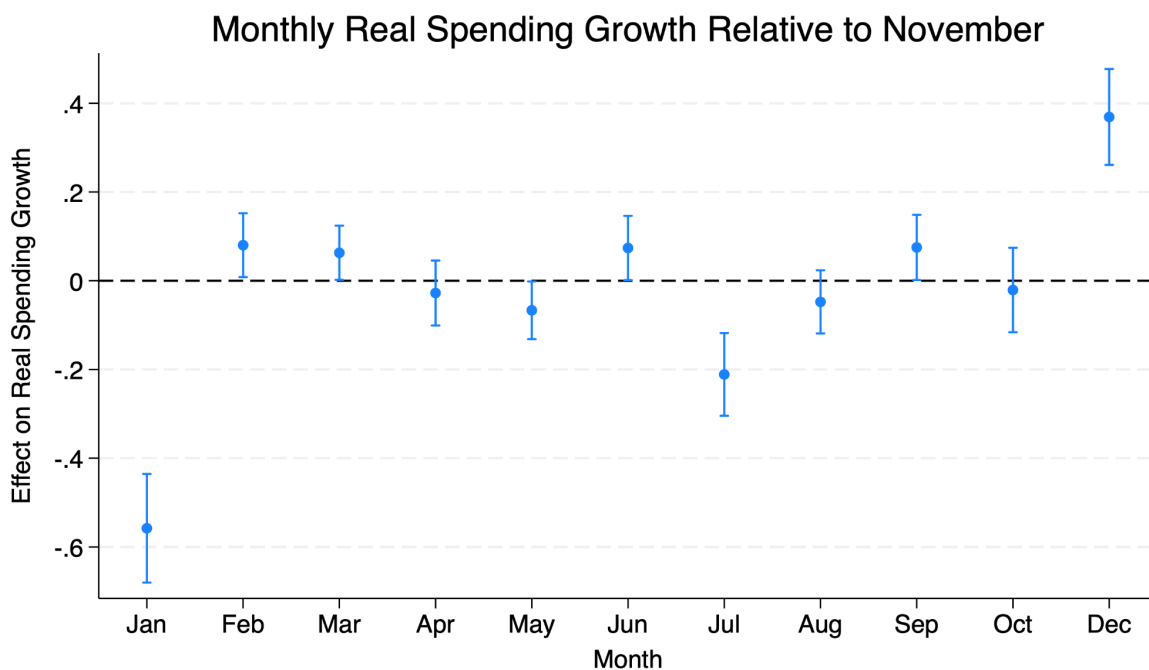
Table 2: Extended regression results

Dependent variable: $\Delta \log(\text{Real Spending})$	(1) Baseline	(2) Extended
January	-0.558*** (0.0622)	-0.558*** (0.0622)
February	0.0801** (0.0366)	0.0801** (0.0366)
March	0.0629** (0.0310)	0.0630** (0.0310)
April	-0.0277 (0.0372)	-0.0276 (0.0372)
May	-0.0667** (0.0331)	-0.0666** (0.0331)
June	0.0738** (0.0368)	0.0738** (0.0368)
July	-0.211*** (0.0474)	-0.211*** (0.0474)
August	-0.0477 (0.0361)	-0.0476 (0.0361)
September	0.0751** (0.0374)	0.0751** (0.0374)
October	-0.0209 (0.0484)	-0.0209 (0.0484)
December	0.369*** (0.0549)	0.369*** (0.0549)
Lagged Inflation		-0.0514 (0.0822)
Lagged Unemployment		0.00121 (0.00250)
Agency fixed effects	Yes	Yes
Clustered standard errors	Yes	Yes
Year fixed effects	No	No
Reference month	November	November
Constant	0.0283 (0.0252)	0.0201 (0.0320)
Observations	48699	48699
Standard errors in parentheses		
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$		

Notes: Standard errors clustered at the agency level are reported in parentheses. November is the omitted reference category. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 2 presents the fixed effects estimates including lagged macroeconomic controls. The coefficient on December remains positive and statistically significant at the 1% level, with a magnitude of approximately 0.369. Importantly, the estimate is virtually unchanged compared to the baseline specification, indicating that the December effect is robust to the inclusion of inflation and unemployment. Neither lagged inflation nor lagged unemployment are statistically significant, suggesting that short-term economic conditions do not play a major role in explaining monthly expenditure growth.

Figure 2: Estimated monthly effects from the fixed effects model.



Notes: Coefficients are relative to November, with 95% confidence intervals.

While Figure 2 presents estimated regression coefficients conditional on agency fixed effects, where December exhibits a large and statistically significant positive effect. Figure 1 shows the raw average monthly spending growth across agencies. The similarity between the two figures is important because it indicates that the December spike is not driven solely by the econometric specification, but is also clearly visible in the underlying data.

The results are consistent with principal-agent frameworks in public economics, where imperfect monitoring and future budget expectations can distort agents' spending decisions (Eisenhardt, 1989, p. 58). Under annual appropriations, agencies may face implicit or explicit penalties for underspending, such as reduced future allocations (Eichenauer, 2020, p. 3). This creates an incentive to exhaust remaining budgets before the fiscal year ends, leading to a concentration of expenditures in December.

This interpretation aligns with existing literature, where Liebman and Mahoney (2017, pp. 3511-3512) document similar end of year spending spikes in procurement in the U.S., while Hurley et al. (2014, pp. 407-408) find comparable patterns in defense spending. The results are also consistent with Eichenauer (2020, p. 12), who shows that fiscal activity tends to increase toward the end of budget cycles across OECD countries. The present study extends these findings to the Swedish context, suggesting that such behavior may be a general feature of public financial management systems.

More generally, the entire set of monthly coefficients is strikingly stable across the baseline and extended specifications. For example, the large negative effect in January and the smaller positive and negative effects in other months remain nearly identical across columns. This stability suggests that the seasonal spending pattern is not driven by omitted macroeconomic variables. Instead, it appears to reflect underlying institutional features of the budgeting process.

The sharp decline observed in January further supports this interpretation, suggesting that the increase in December reflects a shift of spending rather than underlying demand. This interpretation is consistent with the observed variation within agencies, since the analysis controls for agency fixed effects, the estimated December effect reflects changes in spending behavior over time rather than differences across agencies. The fact that the effect is identified relative to November, immediately preceding December, further strengthens the interpretation as a short-term, end of year phenomenon rather than a broader seasonal trend.

Importantly, the estimated December effect remains stable when controlling for lagged inflation and unemployment. This is consistent with the fact that short-term macroeconomic conditions included play a limited role in explaining the timing of expenditures. Instead, the persistence of the effect across specifications reinforces the view that institutional factors influence end of year spending behavior. At the same time, the coefficients on inflation and unemployment provide insight into how agencies respond to broader economic conditions. However, these effects appear secondary to the strong seasonal component captured by the month indicators.

An additional insight from Table 2 is the relatively low R^2 , which is approximately 0.023 in both specifications. This indicates that while the model captures systematic seasonal patterns, a large share of variation in monthly spending growth remains unexplained. This might suggest that idiosyncratic or agency specific factors are likely to be important. This motivates a closer examination of heterogeneity across agencies.

6.3 Economic magnitude of the December effect

The magnitude of the December coefficient suggests that the end of year increase is not merely statistically significant, but also economically substantial, indicating a meaningful reallocation of spending within the fiscal year. Since the dependent variable is specified in logarithmic first differences, the estimated December coefficient of 0.369 corresponds to an approximate increase in spending growth of 44.6 percent relative to November. To illustrate the economic magnitude of the effect, if average agency expenditure in November amounted to 10 billion SEK, the estimated coefficient implies an increase of approximately 4.46 billion SEK in December spending.

To further evaluate the economic magnitude of the December effect, the share of annual expenditure occurring in December was calculated for each year in the sample. If government spending were evenly distributed throughout the year, approximately 8.3 percent of annual expenditure would occur in December. However, the raw data show that December accounts

for approximately 14 percent of annual government expenditure on average over the sample period when computing the total spending in December for year t and then dividing that by the total spending in year t . This implies that spending in December is roughly 68 percent higher than what would be expected under a uniform monthly distribution of expenditures.

The concentration of expenditure toward the end of the fiscal year is therefore not only statistically significant, but also economically substantial. In several years, December accounted for more than 15 percent of annual spending, indicating particularly strong end of year expenditure spikes.

6.4 Heterogeneity across agencies

To examine variation across agencies, December growth was calculated at the agency level. The analysis of December growth at the agency level reveals substantial heterogeneity across agencies in the magnitude of the December effect. While the average December effect is positive, the distribution is highly dispersed, with a small number of agencies exhibiting very large increases in spending.

The agency "Avvecklingsmyndigheten för Statens strålskyddsinstitut och kärnkraftinspektion" exhibits an extremely large increase in December spending, however, this extreme value likely reflects irregular or lumpy expenditures. To address this, the dependent variable was winsorized at the 1st and 99th percentiles to reduce the influence of extreme observations.

After winsorizing extreme observations, the agencies with the highest December spending growth are predominantly universities (e.g., Högskolan Kalmar, Södertörns högskola, Högskolan i Gävle), research institutions, and specialized boards. Universities increasingly operate under performance and project based funding systems (Hicks, 2011, pp. 253–254), and may have greater flexibility in the timing of expenditures. This pattern suggests that

organizations with more flexible or project based budgeting structures, such as universities (Hicks, 2011, pp. 253-254), may face stronger incentives to reallocate or exhaust funds at the end of the fiscal year. However, the magnitude of the estimated growth rates for some agencies is very large, which may partly reflect accounting practices or low baseline spending rather than purely economic behavior.

A natural interpretation of these findings is that they reflect “use-it-or-lose-it” incentives embedded in the public budgeting process. This behavior is consistent with models of soft budget constraints in public expenditure, where organizations expect financial support when overspending or performing poorly, weakening incentives for strict financial discipline (Vahabi, 2025, pp. 87, 92-93). In contrast, agencies with relatively low or negative December growth might be more administrative or regulatory in nature, with more stable expenditure patterns and potentially tighter budget constraints. These agencies might have less discretion over the timing of spending, which may limit their ability to shift expenditures toward the end of the year. (Vahabi, 2025, p. 93)

The presence of substantial cross agency heterogeneity provides indirect evidence against purely macroeconomic explanations and instead supports the role of institutional incentives, which vary across organizational structures and budget frameworks. If the pattern primarily were driven by macroeconomic conditions, one would expect a more uniform response across agencies. Instead, the substantial variation suggests that institutional features, such as budget flexibility, funding structure, and the degree of discretion in expenditure decisions, have a greater influence. Moreover, the fact that a relatively small group of agencies accounts for a large share of the December increase indicates that the aggregate effect may be driven by concentrated, rather than uniform, spending behavior.

While the aggregate pattern supports the presence of a December effect, the magnitude of this effect varies significantly, with universities and research institutions driving much of the observed December spike. This finding is consistent with institutional differences in budgeting practices and expenditure flexibility within the public sector. Differences across agencies may reflect variation in the degree of softness of budget constraints (Vahabi, 2025,

p. 93). Agencies operating under project based funding structures may face weaker financial discipline and stronger incentives to exhaust remaining appropriations before the end of the fiscal year (Vahabi, 2025, p. 93).

6.5 Sector classification

Furthermore, to examine differences in spending patterns across sectors, the results of the regression analysis for agencies were split up into the selected categories: Higher education and research institutions, County Administrative boards and Healthcare. Where all relevant agencies in the data set were allocated to their respective categories. For the category Higher education and research institutions, with a number of 35 agencies, the mean of the regression results amounted to 1.3084, the median amounted to 1.2404 with a standard deviation of 1.5171. The category County Administrative boards, with 20 agencies, had a mean of 0.3455, a median of 0.3991 and a standard deviation of 0.6319. Lastly, the category Healthcare, which included 6 agencies, had a mean of 0.4816, a median of 0.3040 and a standard deviation of 0.9164.

All in all, Higher education and research institutions exhibit the strongest average effect, although with substantial variation across agencies. In contrast, County Administrative boards show relatively consistent but more modest effects. Healthcare agencies fall between these groups, displaying moderate average effects. Though the agency “Institutet för psykosocial medicin” is a very strong outlier with an effect of -1.1071, which noticeably decreased the average effect for the category Healthcare. Excluding this outlier increases the mean from 0.4816 to 0.7464, indicating that results are sensitive to extreme observations due to the small sample size.

The stronger December effects observed among Higher education and research institutions are consistent with greater budget flexibility and project based funding structures (Hicks, 2011, pp. 253-254), which allow for discretionary timing of expenditures. In contrast, County Administrative boards exhibit more stable spending patterns, likely reflecting more rigid

budget constraints and less discretion over expenditure timing (Vahabi, 2025, pp. 93). Differences across categories are descriptive and not formally tested. The results suggest that the December effect is not a uniform phenomenon across the public sector, but is driven by specific types of agencies, particularly those with flexible budgeting structures.

Figure 3: Distribution of December spending effects across agency categories

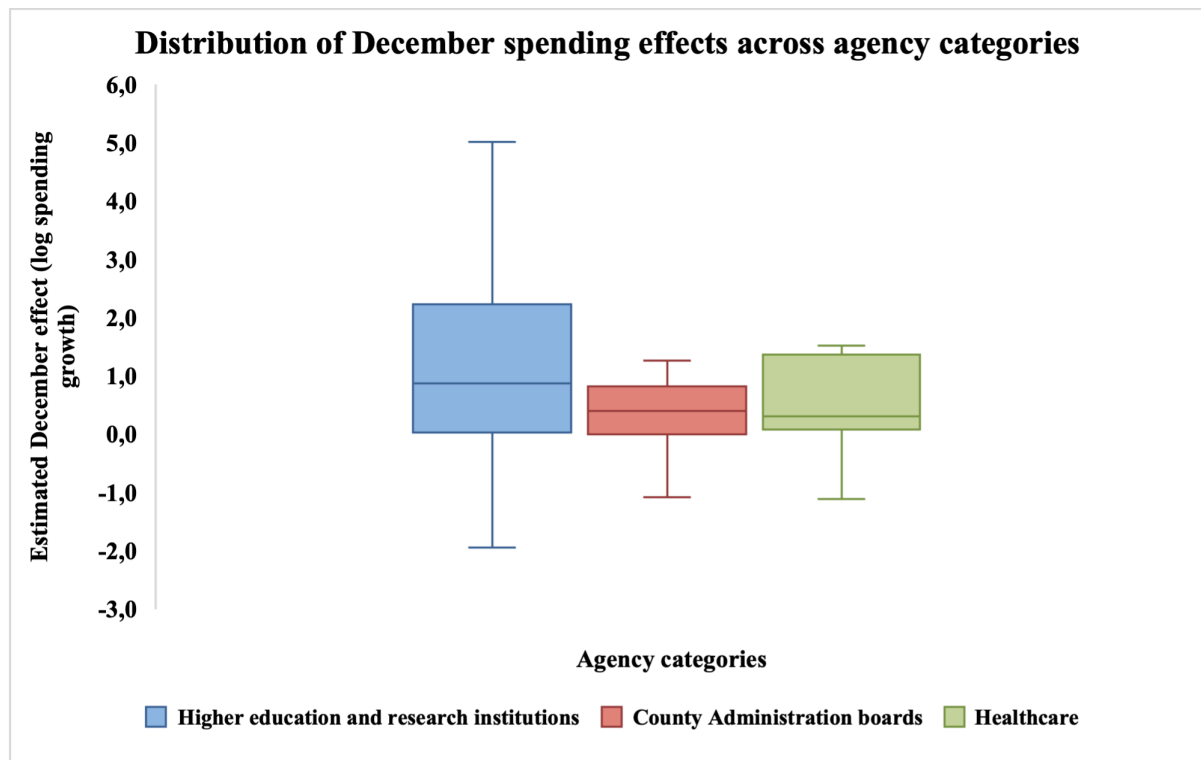


Figure 3 illustrates the distribution of estimated December effects across agency categories. Higher education and research institutions exhibit both higher median effects and substantially greater dispersion, while county administrative boards and healthcare display more concentrated and stable outcomes.

Figure 3 highlights not only differences in average December effects across agency categories, but also differences in dispersion. Higher education and research institutions display substantially wider distributions, indicating that some universities exhibit extremely strong end of year spending spikes while others show more moderate effects. This may reflect differences in project funding cycles, external grants, and discretionary spending

flexibility. In contrast, County Administrative Boards display a narrower interquartile range and fewer extreme observations, suggesting more standardized expenditure patterns and tighter administrative controls.

6.6 Implications

This paper contributes to the existing literature in several ways. First, it provides evidence on seasonal expenditure patterns within a European institutional context. Second, it examines monthly spending behavior across a large number of Swedish government agencies over the period 2006–2025 using panel data methods. Third, the paper investigates heterogeneity across agencies, allowing for an analysis of how institutional differences may shape end of year spending behavior. By focusing on Swedish public finances, the study contributes to a broader understanding of how institutional budgeting rules influence expenditure timing and fiscal behavior.

The findings of this study also have important implications for public financial management and the design of budgeting institutions. The presence of a large and robust December effect suggests that government agencies systematically concentrate expenditures toward the end of the fiscal year. If this pattern is driven by institutional incentives rather than underlying economic needs, it raises concerns about the efficiency of resource allocation in the public sector. Given the scale of Swedish public spending, even relatively small inefficiencies associated with the timing of expenditures may translate into substantial fiscal costs in aggregate.

A key implication is that annual budgeting frameworks may unintentionally encourage suboptimal spending behavior. Agencies face “Use-it-or-lose-it” incentives to exhaust their allocated budgets in order to avoid reductions in future funding. As a result, spending decisions may be influenced more by budget constraints than by actual demand for goods and services. This can lead to a misallocation of resources, where expenditures are rushed or poorly timed, particularly toward the end of the fiscal year. Such behavior may have several efficiency costs. Increased demand for goods and services at the end of the year may place

pressure on suppliers, reducing competition and increasing procurement costs (Klymak & Baumann, 2025, pp. 19-20). In practical terms, this implies that a share of public funds may be allocated under time pressure rather than based on careful evaluation, potentially reducing the overall effectiveness of government programs. Over time, such distortions may accumulate and weaken the link between public spending and policy outcomes.

One potential policy response is to increase the carryover flexibility of unspent funds. Allowing agencies to retain a larger share of unspent funds into the next fiscal year could reduce the incentive to concentrate spending in December. Evidence from other literature suggests that such reforms can meaningfully reduce end of year spending spikes by weakening “use-it-or-lose-it” incentives (Liebman & Mahoney, 2017, pp. 3511-3512). In the Swedish context, where limited carryover is already permitted (Riksdagen, 2026) increasing this ability or the time horizon over which funds can be used may help smooth expenditure patterns (Liebman & Mahoney, 2017, pp. 3511-3512).

However, increasing carryover flexibility may also involve trade-offs. While greater flexibility could reduce incentives for inefficient end of year spending, it may simultaneously weaken fiscal discipline and reduce parliamentary control over appropriations. Policymakers therefore face a balance between improving expenditure efficiency and maintaining strong budget accountability.

Alternative reforms could include budgeting frameworks for several years, stronger expenditure monitoring throughout the fiscal year, or performance-based evaluation systems that place less emphasis on exhausting annual appropriations. More frequent budget evaluations may also help identify inefficient spending patterns before the fiscal year ends.

In addition, the substantial heterogeneity observed across agencies suggests that a one-size-fits-all approach to budget reform may be insufficient. Agencies differ in terms of their expenditure structure, flexibility, and operational needs. As a result, targeted reforms

that account for these differences, such as differentiated carryover rules or tailored budget monitoring, may be more effective than uniform policy changes.

In the Swedish context, reforms aimed at reducing end of year spending incentives may need to be combined with stronger accountability mechanisms and expenditure monitoring. Institutional differences across agencies suggest that reforms may need to be adapted to different organizational structures rather than implemented uniformly across the public sector.

The findings also have implications for fiscal monitoring and accountability. If spending is systematically concentrated at the end of the fiscal year, traditional annual budget evaluations may fail to capture inefficiencies in the timing of expenditures. Policymakers may therefore benefit from incorporating higher frequency monitoring of spending patterns, allowing for earlier identification of potential inefficiencies and better alignment of expenditures with policy objectives.

From a broader societal perspective, inefficient expenditure timing may reduce the productivity of public spending and weaken the connection between government expenditure and policy objectives. Given the scale of Swedish public finances, even relatively small improvements in expenditure efficiency could generate substantial long-run welfare gains and improve the allocation of public resources.

Overall, the findings highlight how institutional incentives embedded in budgeting systems can generate systematic behavioral responses. Addressing these incentives through targeted reforms has the potential to improve both the efficiency and the timing of public spending, leading to better outcomes in the allocation of public resources.

The results should be interpreted in light of certain institutional and data related considerations. In particular, December expenditure data are subject to accounting adjustments associated with annual closing procedures, which may partly influence the

measured magnitude of the December effect. Future research could build on these findings by exploiting institutional reforms or more detailed expenditure data to further examine the mechanisms underlying end of year spending patterns.

6.7 Summary of Results

To summarize, the results provide strong and consistent evidence of a December effect in Swedish public spending. The effect is economically large, statistically significant, and robust across model specifications. Together, these findings point toward institutional explanations rather than macroeconomic drivers of end of year expenditure behavior. The stability of the estimates and the limited role of macroeconomic variables point toward institutional explanations, while the heterogeneity across agencies further supports the interpretation that differences in budgeting practices and expenditure flexibility are key drivers of end of year spending behavior. These findings suggest that the timing of public expenditure is systematically distorted within the fiscal year, rather than evenly distributed and in line with underlying spending needs.

7. Conclusions

This paper has examined whether a systematic December effect exists in Swedish public spending and whether such patterns can be explained by macroeconomic conditions or institutional incentives. Using a set of panel data with agency fixed effects, the analysis provides robust evidence of a substantial increase in expenditure growth at the end of the fiscal year.

The results show that the December effect is both economically large and statistically significant, with December expenditure growth estimated to be 36.9% higher than in November. The estimated effect remains stable across model specifications. These findings are consistent with the presence of “use-it-or-lose-it” incentives, where agencies face pressures to exhaust allocated funds in order to avoid reductions in future budgets

(Eichenauer, 2020, p. 3). As a result, spending decisions toward the end of the fiscal year may be influenced more by budgetary constraints than by underlying economic needs.

The analysis further indicates substantial heterogeneity across agencies and sector classifications, suggesting that the magnitude of the December effect varies depending on institutional characteristics and operational structures. Agencies characterized by flexible budget structures (Hicks, 2011, pp. 253–254) exhibit the strongest December spending patterns. This heterogeneity highlights that institutional incentives do not affect all public organizations equally, and suggests that sector-specific budgeting practices may play an important role in shaping expenditure behavior.

The findings are also consistent with theoretical perspectives emphasizing principal-agent problems and soft budget constraints within public institutions. From a principal-agent perspective, government agencies may have incentives that differ from those of the central government, particularly when future appropriations depend on current spending levels (Eisenhardt, 1989, pp. 58-61). In such settings, agencies may rationally prioritize budget exhaustion over cost efficiency in order to protect future funding. Similarly, the results align with theories of soft budget constraints, where expectations of continued funding reduce incentives for strict expenditure discipline (Vahabi, 2025, p. 93). Taken together, these institutional mechanisms provide a plausible explanation for why end of year spending patterns persist even in the absence of changes in macroeconomic conditions.

Furthermore, the results highlight how formal rules and incentives within public institutions can generate systematic behavioral responses, even in the absence of changes in underlying economic conditions. From a policy perspective, reforms that allow greater flexibility in the use of allocated funds, such as increased ability to carry over unused funds, may help reduce incentives for inefficient end of year spending (Liebman & Mahoney, 2017, pp. 3511-3512).

This paper contributes new evidence on end of year expenditure distortions in a European public sector context and adds to the broader literature on fiscal behavior by documenting a clear seasonal pattern in public expenditure within the Swedish context.

Future research could exploit institutional reforms or variation in carryover rules across agencies to identify the impact of budget constraints on spending behavior. Overall, the findings illustrate how institutional rules, even when designed to ensure fiscal discipline, can generate unintended behavioral responses that shape both the timing and efficiency of public spending. Understanding these behavioral responses is therefore important not only for fiscal management, but also for the efficiency of the public sector and the allocation of taxpayer resources.

8. References

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Statement of AI Usage

Chat GPT was used to help with the formulation of Excel formulas and Stata commands, and troubleshooting when problems occurred in both Excel and Stata. Chat GPT has also been used to check the validity of ideas, such as the Heterogeneity across agencies analysis and Sector classification analysis. Chat GPT has also been used to check grammar and spelling. Generative AI has not been used to interpret any results in this paper.