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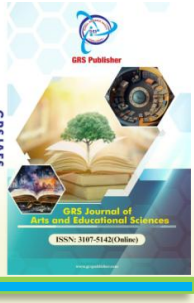

Determinants of Public Education Expenditure in Nepal: A National-Level Time-Series Analysis

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Abstract: This study examines the primary factors influencing public education spending in Nepal across various stages of schooling and expenditure categories in recent decades. Drawing on a multidimensional theoretical framework that integrates economic-demographic theory and Wagner's Law, Keynesian counter-cyclical theory, decision-making (incrementalism) theory, and public-choice perspectives such as fiscal illusion and the political business cycle, the analysis employs ordinary least squares (OLS) multiple regression on national-level time-series data spanning twenty-two years (2000–2021). Six expenditure categories—total, current, capital, basic, higher, and vocational education expenditure—are estimated as functions of economic, demographic, decision-making, and political variables. The findings indicate that the lagged (incremental) expenditure variable is the single most consistent and powerful determinant across all six equations, confirming that budgetary decisions in Nepal are overwhelmingly shaped by the previous year's allocation. Among economic variables, industrialization exerts a positive influence on total and higher-education spending consistent with Wagner's Law, while inflation and unemployment display limited and largely pro-cyclical effects that contradict Keynesian expectations. Demographic and educational indicators are broadly neglected, with the number of teachers being the only variable exerting a significant influence, reflecting the dominance of salary obligations in recurrent spending. Among political variables, only the indirect-tax ratio is significant, and its consistently negative sign contradicts the fiscal illusion theory. The results portray Nepal's education-financing process as predominantly incremental, supply-driven, and weakly responsive to demographic need.

Keywords: *Public education expenditure; Nepal; incrementalism; Wagner's Law; fiscal illusion; time-series analysis; determinants of public spending.*

Cite this Article

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Introduction

Policymakers and policy analysts are persistently concerned with identifying the determinants of public policy, since such determinants are central to any meaningful policy analysis aimed at achieving desired outcomes. Public expenditure, as one of the most important instruments of public policy, has become a crucial component of government activity worldwide and offers a window into how governments operate in practice (Tanzi & Schuknecht, 2000). Within this broad field, education spending occupies a distinctive position because it simultaneously serves the goals of human capital formation, equity, and long-run economic growth (Sen, 1999; Mincer, 1984).

In Nepal, public education expenditure has expanded substantially in absolute terms, yet its relative share of the national budget has fluctuated considerably. Between fiscal years 2007/08 and 2025/26, government spending on education increased more than sevenfold, from just over NPR 28 billion to approximately NPR 211 billion. However, education's share of the total budget fell from a peak of nearly twenty percent in 2007/08 to a low of about five percent in 2017/18, before stabilizing around ten to eleven percent in recent years (MoEST, 2021). This pattern indicates that while education funding has grown in line with overall fiscal expansion, its share of overall spending has plateaued, raising questions about the factors that actually drive allocation decisions.

Much of the earlier scholarship in this field has relied on cross-country comparisons. While theoretically attractive, such comparative work has been criticized for failing to illuminate the country-specific drivers of policy, because governments are constrained in different ways depending on their particular socioeconomic and political environments (Busemeyer, 2007; Akanbi & Schoeman, 2010). This limitation creates a pressing need for in-depth, single-country analysis. The present study responds to this need by focusing on Nepal and addressing the first objective of the broader research programme: to describe and evaluate the primary factors that influence public education

spending in Nepal at various stages of schooling and with respect to various forms of expenditure nationwide over recent decades. Using national-level time-series data, the study estimates the determinants of six distinct categories of educational expenditure and interprets the results in light of established theories of public spending.

Literature Review and Theoretical Framework

Analyzing public education spending requires a multifaceted strategy, because economics, politics, and social considerations are inextricably linked in real-world budgetary decisions (Mullard, 1993; Dye, 2013). No single theory fully explains how much governments choose to spend on education; consequently, a multidimensional approach drawing on economic, demographic, decision-making, and political theories is necessary to construct an adequate analytical framework (Sagarik, 2013; Yun & Yusoff, 2019). The following sub-sections review the principal theories that inform the choice of variables in this study.

Economic-Demographic Theory and Wagner's Law

Economic-demographic theory emphasizes the role of the socioeconomic environment in shaping public policy. Drawing on systems theory, Easton (1957, 1975) conceived the political system as a set of institutions that convert societal demands and support into authoritative decisions, implying that public expenditure must remain responsive to its environment (Dye, 1978). Building on this logic, Wagner (1958) advanced the proposition—widely known as Wagner's Law—that public spending rises as a proportion of national income with industrialization and economic development. As industrialization advances and the division of labor deepens, demand for public services, regulation, and education increases, driving up government expenditure (Henrekson, 1992; Mann, 1980). Wagner specifically identified education as a sector in which public provision tends to be more effective than private provision, implying that educational spending is sensitive to the state of the economy. A related formulation, the displacement effect of Peacock and Wiseman (1967), holds that public spending tends to rise in steps following major social disruptions, after which higher levels of taxation and expenditure persist (Bird, 1972; Musgrave, 1969).

Keynesian Counter-Cyclical Theory

Keynesian counter-cyclical theory holds that the state of the economy should guide decisions about whether to raise or lower public expenditure (Mankiw, 2019). During downturns—for instance, when unemployment rises and private consumption falls—expansionary fiscal policy recommends increasing government spending to stimulate aggregate demand, whereas spending is restrained during periods of growth (Tanzi & Schuknecht, 2000). Applied to education, the central empirical question is whether educational expenditure behaves counter-cyclically or pro-cyclically (Sagarik, 2013). Because an economic decline does not immediately translate into school closures, the relationship between education spending and the business cycle is more indirect than for other expenditure categories, which complicates its empirical detection (Busemeyer, 2007).

Decision-Making Theory: Incrementalism

Decision-making theory locates the determinants of expenditure in the process by which policymakers actually choose. Building on the concept of bounded rationality (Simon, 1990; Earl, 2001), Lindblom (1959) argued that comprehensive rational choice is rarely feasible because decision-makers cannot know all alternatives, consequences, or preferences. Instead, budgeting typically proceeds incrementally, with policymakers making modest adjustments to the previous year's allocations (Anderson, 1994; Quade, 1975). Incrementalism implies that a one-year lagged expenditure variable should be positively and significantly associated with current spending; a strong relationship would indicate that allocations are driven primarily by prior budgetary experience rather than by current demographic or economic conditions (Shelley & Wright, 2009).

Public-Choice Perspectives: Fiscal Illusion and the Political Business Cycle

Public-choice theory examines how political and institutional incentives shape expenditure. The theory of fiscal illusion posits that governments rely on less-visible revenue sources, such as indirect taxes, to finance higher spending, predicting a positive association between the indirect-tax share and public expenditure (Heyndels & Smolders, 1994; Buchanan, 1975). The budget-maximizing-bureaucrat model and related size-of-government arguments suggest that larger deficits accompany expanding public sectors (Mueller, 1987; Meltzer & Richard, 1983). Finally, political business cycle theory anticipates that incumbents increase visible expenditure in election years to court voters (Alesina & Sachs, 1988; Potrafke, 2012). Globalization-based compensation theory further argues that exposure to trade pressures induces governments to raise social and education spending to compensate displaced workers (Rodrik, 1998; Garrett & Mitchell, 2001; Yoon, 2009).

Empirical Evidence on the Determinants of Education Spending

A substantial empirical literature has tested these theories across diverse settings. Studies of OECD democracies have shown that partisan composition, electoral competition, and demographic structure shape education spending (Busemeyer, 2007; Poterba, 1997; Grob & Wolter, 2007). In developing and middle-income contexts, analyses of Thailand, Kenya, Malaysia, India, and several African economies have identified income levels, industrialization, demographic pressures, and institutional quality as recurrent determinants (Sagarik, 2013; Imana, 2017; Wong & Yusoff, 2018; Chatterji, Mohan, & Dastidar, 2015; Akanbi & Schoeman, 2010). Evidence on demographic effects is mixed, with some studies finding that an ageing population or shifting enrolment alters the political economy of education subsidies (Kemnitz, 1999; Kempkes, 2010). For Nepal specifically, prior work has tended to emphasize the growth-education nexus or provincial governance rather than the determinants of expenditure by type and stage, leaving a clear gap that this study addresses (Dhakal & Khanal, 2024; Bhattarai, 2024).

Data and Methodology

This study employs national-level annual time-series data covering twenty-two observations from 2000 to 2021. The data on education indicators were drawn from the Ministry of Education, Science and Technology and from census and survey data compiled by the National Statistical Office (formerly the Central Bureau of Statistics). Six dependent variables capture different forms and stages of public education expenditure: total expenditure (ToEDU),

current expenditure (CuEDU), capital expenditure (CaEDU), basic education expenditure (BaEDU), higher education expenditure (HiEDU), and vocational education expenditure (VoEDU).

The independent variables are organized into four theoretically grounded groups. Economic variables include industrialization (IND), inflation (IFL), and unemployment (UNEM). Demographic and educational variables include population (POP), number of schools (SCH), number of teachers (TEA), number of students (STU), and the student-teacher ratio (STR). The decision-making variable is the one-year lagged expenditure for each category (LEXP), capturing incremental budgeting. Political variables include the budget deficit (DEF), the ratio of indirect tax to total tax (IDT), and an election-year dummy (ELEC).

Prior to estimation, multicollinearity was assessed using Pearson correlation coefficients together with Variance Inflation Factors (VIF) and tolerance values. Variables exhibiting correlations above 0.80, tolerance below 0.10, or VIF values of ten or above were judged problematic. On this basis, gross capital formation (GCAP) was found to be highly correlated with several variables and was excluded from all equations, as were a number of other strongly inter-correlated indicators. The retained variables—including IFL, IND, POP, UNEM, STU, SCH, STR, TEA, DEF, ELEC, and IDT—displayed acceptable tolerance and VIF values and were therefore included in all six equations.

Each expenditure category was then estimated using ordinary least squares (OLS) multiple regression, a method appropriate for the data's time-series structure and the diversity of explanatory variables. Reported diagnostics include R-squared and adjusted R-squared, the F-statistic, and the Durbin-Watson statistic to detect autocorrelation. Coefficients significant at the ninety-five percent confidence level are interpreted as meaningful determinants.

Empirical Findings

Descriptive statistics confirm the scale and priority of education spending in Nepal: total education expenditure peaked at approximately twenty-one percent of total government expenditure, with current expenditure alone reaching about eighteen percent—a share surpassing allocations to many other ministries. The regression results for each of the six categories are summarized below; variables discussed as significant are those reaching the ninety-five percent confidence level.

Total Education Expenditure (ToEDU)

The total expenditure equation is highly explanatory, with an adjusted R-squared of 0.988 and a significant F-statistic, while the Durbin-Watson value of 2.35 indicates no autocorrelation. Industrialization (IND) carries a positive coefficient consistent with Wagner's Law, indicating that an expanding industrial sector raises demand for an educated workforce. Inflation (IFL) is negative and significant, suggesting that total education spending either declines or grows more slowly than the price level. Among demographic variables, only the number of teachers (TEA) is positive and significant, reflecting the weight of salary obligations. The lagged expenditure variable (LEXP) is strongly positive and significant, with a coefficient of 0.765, providing clear support for incrementalism. Among political variables, the indirect-tax ratio (IDT) is significant and negative, contradicting the fiscal illusion hypothesis, while the budget deficit and election-year variables are insignificant.

Current Education Expenditure (CuEDU)

The current-expenditure model has the highest explanatory power of all six equations (adjusted R-squared of 0.994). None of the economic variables—industrialization, inflation, or unemployment—is statistically significant, contradicting both Wagner's Law and Keynesian expectations for this category. The number of teachers (TEA) is again positive and highly significant, consistent with the observation that recurrent spending is dominated by wages and salaries. The lagged expenditure variable (LEXP) is the strongest determinant, with a coefficient of 0.876, reaffirming incrementalist budgeting. The indirect-tax ratio (IDT) is significant and negative, while the remaining political variables are insignificant.

Capital Education Expenditure (CaEDU)

The capital-expenditure equation explains about eighty-five percent of the variation (adjusted R-squared of 0.854). None of the economic or demographic variables is statistically significant, suggesting that capital allocation is unresponsive to industrial growth, inflation, unemployment, or educational need, plausibly because capital spending constitutes a small share of the education budget. The lagged expenditure variable (LEXP) is positive and significant (coefficient of 0.412), though weaker than in other equations, indicating that even infrastructure investment is driven substantially by prior allocations rather than current needs. The indirect-tax ratio (IDT) is again the only significant political variable, with a negative sign.

Basic Education Expenditure (BaEDU)

The basic-education equation is highly explanatory (adjusted R-squared of 0.988). Unemployment (UNEM) is negative and significant, implying that the government reduces basic-education spending as unemployment rises. This pro-cyclical pattern is consistent with a demand-responsive reading of Wagner's Law but contradicts Keynesian counter-cyclical theory, which would predict increased spending during downturns. No demographic or educational variable is significant. The lagged expenditure variable (LEXP) is the dominant determinant, with a coefficient of 0.91—the highest among all equations—underscoring a "muddling-through" approach to budgeting. The indirect-tax ratio (IDT) is significant and negative, while the deficit and election variables are insignificant.

Higher Education Expenditure (HiEDU)

The higher-education equation explains about ninety-seven percent of the variation (adjusted R-squared of 0.97). Industrialization (IND) is positive and significant, consistent with Wagner's Law: a larger industrial labor force raises demand for skilled graduates and prompts greater investment in higher education. The number of teachers (TEA) is also positive and significant. Inflation and unemployment are insignificant, and demographic and enrolment variables exert no measurable influence. The lagged expenditure variable (LEXP) is strongly positive and significant (coefficient of 0.745), again confirming incrementalism. Among political variables, only the indirect-tax ratio (IDT) is significant and negative, suggesting that public-choice dynamics apply weakly to higher education, which is comparatively detached from local political agendas.

Vocational Education Expenditure (VoEDU)

The vocational-education equation has the lowest explanatory power (adjusted R-squared of 0.68), reflecting the small and volatile share of this category within the total education budget.

None of the economic, demographic, or political variables are significant. The lagged expenditure variable (LEXP) is the sole significant determinant, with a coefficient of 0.8, indicating that vocational spending is allocated almost entirely based on the previous year's budget and is largely unresponsive to societal demand.

Comparative Summary across the Six Models

Table 1 summarizes the significant determinants identified for each expenditure category. The comparison highlights the pervasive influence of the incremental (lagged) variable and the narrow set of economic and political factors that reach significance.

Table 1. Significant national-level determinants of public education expenditure in Nepal by type and stage (OLS, 2000–2021)

Expenditure Category	Significant Determinants	Direction of Effect
Total (ToEDU)	Industrialization, Inflation, Teachers, Lagged expenditure, Indirect tax	+, −, +, +, −
Current (CuEDU)	Teachers, Lagged expenditure, Indirect tax	+, +, −
Capital (CaEDU)	Lagged expenditure, Indirect tax	+, −
Basic (BaEDU)	Unemployment, Lagged expenditure, Indirect tax	−, +, −
Higher (HiEDU)	Industrialization, Teachers, Lagged expenditure, Indirect tax	+, +, +, −
Vocational (VoEDU)	Lagged expenditure	+

Discussion

Taken together, the six equations reveal that the incremental (lagged) expenditure variable is the single most consistent and powerful determinant of public education spending in Nepal. Its significance and large coefficients across every category demonstrate that decision-makers rely heavily on the preceding year's allocation when formulating policy, in line with Lindblom's (1959) account of incrementalism and bounded rationality. While the overall trajectory of education spending is incremental, the structural and institutional shifts described in the broader policy record manifest as occasional spikes rather than as smooth, demand-driven adjustment.

Economic variables matter selectively. Industrialization positively influences total and higher-education spending, consistent with Wagner's Law and the intuition that a developing, industrializing economy requires a more skilled workforce (Wagner, 1958; Henrekson, 1992). Inflation depresses total spending in real terms, while unemployment exerts a puzzling negative effect on basic education. The latter pattern is pro-cyclical and contradicts Keynesian counter-cyclical theory, which would predict higher spending during downturns to stimulate recovery (Mankiw, 2019). This divergence highlights a distinctive feature of Nepal's education-financing behavior and suggests that basic education is not used as a counter-cyclical instrument, even though students at this level are not financially self-sufficient.

Demographic and educational indicators are largely neglected. With the notable exception of the number of teachers—whose significance reflects rising salary obligations rather than responsiveness to enrolment demand—variables such as population, number of students, number of schools, and the student-teacher ratio fail to influence allocations. This suggests that policymakers attach minimal weight to sectoral need when setting budgets, raising concerns about allocative efficiency (Hanushek & Rivkin, 1997; Imana, 2017).

Among political variables, only the indirect-tax ratio is significant, and its consistently negative sign across categories contradicts the fiscal illusion hypothesis, which predicts that less-visible indirect taxes finance higher spending (Heyndels & Smolders, 1994). A plausible interpretation is that additional indirect-tax revenue is channeled toward non-education expenditure, or that increases in direct taxation accompany higher education spending. The insignificance of the budget deficit and the election-year dummy indicates that neither the budget-maximizing-bureaucrat model nor the political business cycle theory accounts for Nepal's education-spending patterns (Mueller, 1987; Potrafke, 2012).

Conclusions and Way Forward

This study set out to describe and evaluate the primary factors influencing public education spending in Nepal across different stages of schooling and forms of expenditure, using national-level time-series data for 2000–2021. The analysis demonstrates that Nepal's education-financing process is predominantly incremental: the previous year's allocation is the strongest predictor of current spending across all categories. Economic forces operate selectively—industrialization raises total and higher-education spending in line with Wagner's Law—while demographic and educational needs are largely overlooked, save for the salary-driven influence of teacher numbers. Political variables are largely inert, and the lone significant political factor, the indirect-tax ratio, runs counter to the fiscal illusion theory.

These findings carry clear implications. A budgeting process anchored to past allocations risks perpetuating misalignment between spending and sectoral need, particularly in basic education, where pro-cyclical reductions during periods of rising unemployment may harm vulnerable households. Strengthening the responsiveness of allocations to demographic and educational indicators and reconsidering the treatment of capital and vocational expenditure—both of which respond almost exclusively to inertia—would enhance the efficiency and equity of Nepal's education financing. Future research could extend this national-level analysis using sub-national panel data to capture provincial

dynamics that a time-series design cannot fully capture. The upcoming article will cover the analysis and findings in detail.

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