
Determinants of the budgetary transparency of public finance in Thailand's educational sector

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Abstract: Public spending on education in Thailand has been beset by a string of corruption charges. This paper examines determinants of budget transparency in public finance in Thailand's education sector, with a focus on four areas specified in the International Monetary Fund's (IMF) fiscal code. Questionnaire data were gathered from officials of the Thai Ministry of Education working on budgeting processes. Results showed that transparency is established through 10 key determinants: efficient use of technology, timely reporting, early commencement of the budgeting process, democratic decision making in budget allocation, objective review of budget performance, quality of revenue resource management, effective anticorruption measures, effective stakeholder engagement in the budgeting process, quality of governance, and accountability. Fiscal transparency in Thailand is below average compared to other nations, though progress has been made on fiscal reporting and fiscal forecasting and management. There are significant differences of the budget transparency determinants among pillars.

Keywords: budgetary/fiscal transparency; budgeting process; public finance; determinants; transparency dimensions; governance.

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1 Introduction

Budget transparency is thought to be a key factor in ensuring that public finance is utilised for the public interest. The effective and efficient use of public finances enables governments to run state affairs and drive national economic growth and development (Suanin, 2015). There is a risk, however, that government agents misuse their powers by serving private rather than public interests. Corruption occurs alongside low transparency and is a common driver of public finances being channelled towards private interests (Maria et al., 2020; Michener, 2019). Increased public spending broadens the scope and responsibilities of governments and makes transparent decision making more difficult (Olavarria et al., 2019).

Education is crucial for the development of human capital and is a substantive enabler of a knowledge economy. Public finance used for education can, therefore, be viewed as long-term investment (Ben and Raies, 2010). The Education 2030 framework, of UNESCO, declared that a country needs to allocate at least 4–6% of gross domestic product (GDP) and 15–20% of total public expenditure on education to ensure high quality education that develops human resources. Over the past five years Thailand has used these benchmarks to allocate its education budget, considering education to be a strategic priority (Wuwongse and Lamphun, 2012). The Thai government allocated 493,822.7 million baht for education in 2020, which accounted for 15.4% of public expenditure. This was a 3.3% reduction from 2019.

The Organization for Economic Cooperation and Development (OECD, 2019) commended Thailand's high budget allocation for education on the grounds that it would help accomplish the country's strategy to achieve high economic growth. However, the level of spending has raised questions over budgetary transparency, particularly when considering educational performance in the key competencies of reading, mathematics, and science. In 2018, Thailand's International School Assessment scores showed that the proportions of low performance achievers in mathematics and reading were significantly higher (53% and 60%, respectively) than that of OECD averages which were 23% and 24%. In light of these findings, corruption charges against Thai politicians and public officials, and particularly those working in the education sector, have increased (Vichit-Vadakan, 2017).

The 2021 Corruption Perception Index, published by Transparency International, ranks Thailand at 110 out of 180 countries. This is a sharp fall from its 96th position in 2017. Thailand's performance on the index has been in consistent decline over the past few years, being placed 99th, 101st, and 104th in 2018, 2019, and 2020, respectively.

Hence, the question can be raised as to whether higher budget allocation creates the context for a higher level of corruption. There is currently a lack of evidence regarding the determinants of budgetary transparency in Thailand. Its citizens do not seem particularly aware of the reasons and root causes of corruption or how it affects their lives, and as such may be easily misled and deceived by politicians. A combination of low levels of transparency, low awareness of corruption, and high conflict of interest appear to prevail (De Oliveira et al., 2019; Michener, 2019).

To address this issue, the present research is conducted to investigate the determinants of budgetary transparency, with reference to transparency dimensions stated in the International Monetary Fund (IMF) fiscal transparency code (2019; hereafter referred to as “the IMF code”). The efforts of the IMF can be seen as major steps to promote budgetary transparency, good governance, accountability, and anti-corruption (IMF, 2021). The IMF issued its first fiscal transparency code in 1998 with revisions in 2007, 2014, and 2019. The aim of the code is to improve the quality of governance and ensure that public interest is preserved over the maximisation of private interests through the use of legitimate powers. The code is widely accepted as an international standard for budgetary transparency.

We focus on the education sector in this research because of its significant budget allocation and its relevance to social and economic development (Alfred, 2018). Those involved in the budgeting process within this sector may be able to offer useful insights into the determinants of budgetary transparency and its relation to educational performance. Successive governments in Thailand have claimed that adequate public money has been spent on education and that tangible outputs are being delivered. These claims have been made without assessment of outcomes or investigation into the negative consequences of corruption and lack of transparency. This lack of critical analysis of the outcomes of public spending and low budgetary transparency have helped to establish the position that high budget allocation for education is in itself an indicator of positive educational development. We argue that the transparency dimensions specified in the IMF code could encourage a higher degree of budgetary transparency, which in turn could provide a platform for citizens to access relevant information about the use of public money (Joyce, 2008), and help to curtail corruption. A high degree of budgetary transparency is an effective tool for balancing any conflicts of interest between agents (the government) and principals (citizens) that exist within Thailand’s Ministry of Education.

The objectives of this research and specific research questions were developed based on the argument that a high degree of budget transparency, assessed through education officials’ perception of relevant determinants, leads to improved quality, accountability, and governance, and effective use of public money. The key research questions pertain to why Thailand has not been able to deliver better educational performance despite its high education spending, whether this is due to lack of budgetary transparency, and, if so, what determines the level of transparency. The dimensions of the IMF code will be used to assess determinants of budgetary transparency. We suggest that low transparency allows politicians and public officials to maximise their private interests at the expense of the public.

Based on the background and arguments detailed above, the research objectives for this study are as follows:

- 1 To examine what determines budgetary transparency in education sector in Thailand.
- 2 To assess the level of budgetary transparency based on determinants outlined in the IMF code.
- 3 To examine whether there are differences in perceptions on the determinants of budgetary transparency among different demographic groups.

To examine whether there are differences in perceptions on the determinants of budgetary transparency when transparency dimensions are divided into different groups, or ‘pillars’.

2 Literature review

Agency theory (Jensen and Meckling, 1976) proposes the existence of principal-agent relationships, when principals appoint agents to carry out tasks on their behalf. For example, citizens elect a government to act in the public interest when ruling a country, give the mandate to use public money through budget allocation to deliver services for the populace (Bleyen et al., 2017). A high degree of transparency should be maintained to ensure the continued consent of citizens (Porumbescu et al., 2017). Agency theory then justifies actions taken by a government to allocate funds for the development of education of citizen.

Relatedly, legitimacy theory outlines that budgetary transparency is important for governments to maintain their legitimacy while ruling the country and utilising resources bestowed on them to act in the best interest of public (Ruth and Thomas, 2019). Issues with budget allocation and the level of transparency maintained may test the legitimacy of a government. An absence of transparency creates information asymmetry between principals and agents and limits the public’s access to information (Nicholls et al., 2016; Salehi et al., 2018). Signalling theory specifies that when information asymmetry exists, parties that have access to information (i.e., governments) should pass credible and quality information to other parties (citizens; Castilla and Rissing, 2018). Some degree of information asymmetry between government and citizens is always likely to exist. Governments should therefore promote transparency to maintain good governance (Rhodes, 1996). Free access to transparent information on financial and physical progress of budget allocation is indicative of a government’s performance, which the public assesses in relation to whether public interests have been served.

Consent of various stakeholders is a crucial factor for agents (Government) to carry out their tasks (Moon, 2020). Proponents of stakeholder theory argue that transparency can increase with support from relevant stakeholders. Lack of budgetary transparency has been identified as a major cause for corruption, bad governance, and resource wastage (Nicholls et al., 2016). It could be argued, then, that if budgetary transparency is well maintained, better performance in education may result (Denhardt, 2017). Transparency can also promote effective stakeholder engagement that could positively contribute towards needs analysis, budget planning, facilitate optimal resource allocation, budget execution, monitoring, and monitoring budgets (Choi and Hashimoto, 2018).

On the other hand, budgetary transparency leads to improve governance, performance and accountability (Bisogno and Cuadrado-Ballesteros, 2021; IMF, 2019). Hence, it is a good leverage to mitigate the impact of principal agents conflicts (Cucciniello and Grimmelikhuisen, 2017; Jensen and Meckling, 1976) between citizen and a government.

This is particularly the case where operations are conducted in a not-for-profit way, such as public education (Nicholls et al., 2016). Use of public finance creates opportunities for agents (governments), to misuse wealth that belongs to public for personal benefits. Government is likely to exploit such opportunities and as a result, public trust of citizen will be consequently lost thus creating scepticism among stakeholders (Baume and Papadopoulos, 2015).

In Thailand's budget strategy of 2020, the government highlighted its major policies and His Majesty's strategy of "understanding the people's needs", focus on the relevance of education and its connection to have a resilient economy. Thailand has also expressed its commitment to promote the UN's Sustainable Development Goals (SDGs; Sunthonkanokpong and Murphy, 2019), of which goal number 4 is "to ensure inclusive and equitable quality education and to promote lifelong learning opportunities for all". Corruption in the education sector may arise in a range of areas, including resource allocation, budget administration, provision of school services, examinations, accreditation, teacher management, and classroom conduct (Ludpa, 2016; Rita and Alfred, 2022).

Budgetary transparency cannot be improved or maintained at a satisfactory level unless the entire budgeting system is fully assessed (Etzioni, 2014; Pekkonen and Melena, 2010). Different actors of course play different roles in the system (Latour, 2005), and there are reciprocal influences between actors and institutional practices embodied in respective fields (DiMaggio and Powell, 1983). A significant budget allocation in one field can reveal government prioritisation of this area. The fact that education receives substantial allocation implies that this budget spending is expected to achieve high economic growth and increased development (Ahunanya et al., 2010; Brun-Martos and Lapsley, 2017; Carlitz, 2013; Hölscher et al., 2009; Renzio and Wehner, 2017; Reviglio, 2001; Ríos et al., 2016).

The IMF has proposed several measures to promote good governance and transparency, with the aim of helping nations to achieve economic stability and growth (Choi and Hashimoto, 2018). IMF measures outlined in its fiscal code focus on public finance and budgetary processes. Implementation of the IMF code requires countries to comply with minimum transparency standards that a country can easily maintain. Maintenance of good practice under the code enables a country to reach an 'intermediary level' of budgetary transparency, if the country has good institutional capacity (IMF, 2019). A rating of 'advanced practice' indicates that an international benchmark has been reached in terms of strong policies and best budgetary practices. IMF has carried out its fiscal transparency evaluations for 28 countries thus far, with results showing that fiscal transparency increases when countries adhere to the code.

Thailand has been a member country of the IMF since 1949 though has not yet requested an official fiscal transparency evaluation. The IMF prepared its report for Thailand in 2009 based on periodic consultation observation and reference to the code of fiscal transparency based on (IMF, 2009). This report revealed that the transparency dimensions of the code had been maintained in certain areas, while in some performance had exceeded the expected level even. It should be noted that performance ratings were produced at the request of the military government and thus may have been biased. Nonetheless, public debt management was praised, and the government was found to have maintained fiscal transparent policies. Further, the report revealed that the Auditor General and National Counter-Corruption Commission carried out their tasks

independently in relation to integrity maintained in public finance. It is noteworthy that a power change took place during this time after the People's Power Party was toppled in 2009.

The budget is the legal document that deals with resource allocation to serve public interest (Choi and Hashimoto, 2018; OECD, 2015). Budgets detail plans and then help to transform these into reality (Levaieva and Kucherenko, 2017). The maintenance of fiscal transparency when dealing with public money can help to legitimise government actions (Paarlberg and Gen, 2009), but the social contract that a government enters into with the public becomes unfeasible and undesirable if the government fails to protect the public interest (Abumere, 2019). Budgetary transparency is a key aspect of good governance along with other factors such as integrity, openness, participation, and accountability, which together can ensure effective budgetary practices (Adler and Borys, 1996; OECD, 2015).

Transparency can be improved further still if budgeting is sensibly integrated with technology (Bodo and Janssen, 2022). A focus on transparency has the goal of making all information readily available and accessible for all citizens (Ben and Raies, 2010). The Thai government has taken some measures to introduce technology in their budget preparations with the aim of improving transparency and accountability in the use of public money, in line with their budget strategies. The budget performance of each agency, assessed through financial progress measures, is communicated through integrated information management systems to the Bureau of Budget using (Chuayprakong, 2019).

In general, budget performance is directly linked to effective fiscal transparency mechanisms (Da Cruz and Marques, 2017). When public finance is used efficiently and in a transparent manner it is less likely that waste and corruption will result, meaning better performance can be delivered (De Oliveira et al., 2019; Ruth and Thomas, 2019).

Public expenditure on education should have substantial impacts on the development of human capital, which can be assessed by a range of outcome indicator (Castilla and Rissing, 2018; Lotko and Zawadzka-Pak, 2016). However, Jaroensathapornkul (2010) has shown that the public money spent on education in Thailand has not increased the quality of education as planned. It has been argued that lack of transparency was the course for this poor performance (Baume and Papadopoulos, 2015). The view that lack of fiscal transparency leads to bad performance implies that the inverse is also true – a high degree of fiscal transparency should improve educational performance.

Budget planning in Thailand is on rolling with five year time frame in line with the National Economic and Social Development Plan (Chuayprakong, 2019) and therefore it focuses on how economic development activities, and other aspects of social development can be facilitated by providing proper infrastructure (Chuayprakong, 2019). Four institutions namely, the finance ministry, Office of the National Economic and Social Development Board, Bank of Thailand, and the budget Bureau are the major agencies engaged with the budgetary process of the country. However, irrespective of what is stated in policies and procedures, ultimately, the Bureau of the Budget is the one that has the practical authority to decide final budget ceilings and allocations. Accordingly, each department under this bureau actively involves it in controlling their budgets.

Guidelines for resource allocation in Thailand comprise of general criteria, detailed criteria, specific criteria, and criteria by objective of expenditure. General criteria comprise upper limits, annual fiscal policies, relevance of programs, activities proposed,

and duties, authority, and responsibilities of agencies (Ríos, 2016), while detailed criteria deal with national policies, economic development plan, capabilities of government institutions, level of efficiency, and expected benefits to generate. Furthermore, the process of budget preparation passes through five levels, ministerial, regional, provincial, district, and institutional.

Level of efficiency at resource allocation and budget execution in Thailand are not meeting expected standards, even though the technological support is given by providing adequate infrastructure (Grimmelikhuijsen and Welch, 2012). It is further found that, Thai governments have been able to maintain a balanced budget (Blöndal and Kim, 2006) while supporting stakeholder engagement and access to information except during regimes of military governments. Bassoli (2012) mentioned that effectiveness of stakeholder participation depends on critical variables, such as proper coverage of stakeholders, level of engagement, the strength and role of the opposition, and access to information. A study on participatory budgeting in Thai public universities in Thailand found that effective stakeholder engagement helped improve performance, even though level of stakeholder participation varied by university size (Jarernsiripornkul and Pandey, 2018). On the other hand, the same study found that performance evaluation based on standardised criteria has threatened academic freedom and quality of participation, as universities have to dependent on budget allocation of the government and politics (Wang and Niu, 2020).

Thailand emphasises on participatory budgeting on the argument that effective participation improves democracy and performance and that therefore, stakeholders have a legitimate right to involve in government decision making process (Lorsuwanarat, 2016). It is argued that budgetary transparency allows different actors in the process to make decisions with a kind of autonomy (Grimmelikhuijsen et al., 2013). Since 2003, Thailand adopted a strategic budgeting system that promotes public participation in budgeting to ensures public policies embedded in budgeting processes are followed (Lorsuwanarat, 2016). The relevance and significance of participatory budgeting has been emphasised in economic or social projects in education, even under public-private partnerships agreements (Lorsuwanarat, 2016). Indeed, However, Lorsuwanarat (2016) finds that other stakeholders engaged in the budgeting did not use autonomy in decision making as the government institutions at national level have more power that eventually dominate others (Heald, 2003). However, the Budget Bureau of budget in Thailand facilitates public hearings for budget preparation thus highlighting the importance of budgetary transparency. Further, institutions in cities and semi-rural areas in Thailand that are weaker in budget engagement were unlikely to facilitate stakeholder engagement in budgeting, instead, they simply follow the tradition based on institutionalised practices to allocate resources (Krueathep, 2014).

To summarise, the literature is clear that aspects of budgetary transparency and participatory approaches to budgeting are being implemented across the world including in Thailand. However, there is a dearth of research regarding how the quality of education is affected by aspects of the budgeting process such as drivers of budgetary transparency, relationships of transparency, and governance (Gjaltema et al., 2020). Lack of a clear governance framework is a barrier to improving the quality and performance of education in Thailand. An appropriate framework is needed to streamline the present budgeting process to ensure high quality education for all while upholding the transparency in using public money.

3 Research methodology

3.1 Focus of analysis and sample

The focus of analysis for this study is the Education Ministry, which is responsible for promoting and overseeing the entire education sector in Thailand, including pre-primary education, and non-formal education. Budgetary transparency was assessed based on the 48 dimensions specified in the IMF Code. Individual respondents were selected through a stratified sampling method, with assistance from heads of departments and units within the Ministry.

Thailand's education system is organised at central, regional, and provincial levels. Central organisation takes place through five main bodies, while regional and provincial organisation functions through 18 and 77 offices, respectively. Officials of the Ministry of Education that are directly engaged in the budgeting process were identified through communication with human resource department staff regarding typical duties and responsibilities.

3.2 Conceptual framework

Figure 1 depicts how different elements, arranged into four pillars of the IMF code, determine the degree of fiscal transparency. Each pillar contains dimensions that correspond to key transparency principles. For example, the first pillar, named fiscal reporting, consists of four dimensions: coverage, frequency and timeliness, quality, and integrity. Altogether, there are 15 dimensions which are then further broken down into 48 sub-dimensions in the IMF code. We initially developed a set of 48 questions to assess these sub-dimensions, though this was subsequently expanded to 72 items in the final questionnaire in response to expert feedback. Hence, the 48 sub-dimensions, assessed using 72 questions, are the independent variables for this study. Perceived degree of budgetary transparency is the dependent variable.

3.3 Hypotheses

Hypotheses were developed in accordance with the argument that budgetary transparency is a critical aspect of good governance and that adherence to transparency as specified in the IMF code should lead to a high degree of fiscal transparency, which in turn should result in better educational performance. Accordingly, the following six hypotheses were put forward:

H1: Compliance with all the dimensions of effective fiscal management outlined in the IMF code positively correlates with the degree of budgetary transparency.

H2: Compliance with 'fiscal reporting' transparency dimensions positively correlates with budgetary transparency.

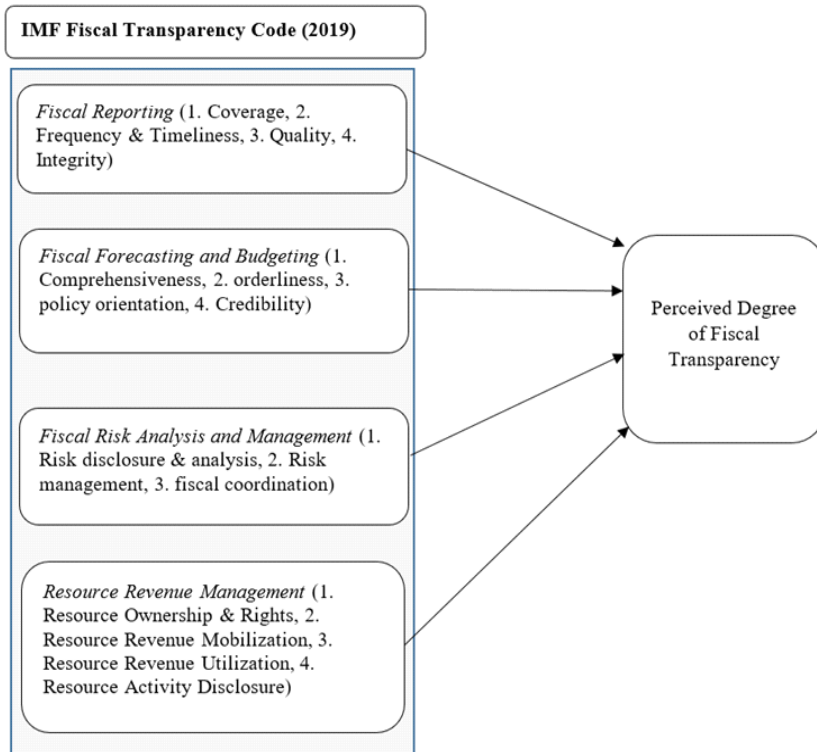
H3: Compliance with 'fiscal forecasting and budgeting' transparency dimensions and positively correlates with budgetary transparency.

H4: Compliance with 'fiscal risk analysis and management' transparency dimensions positively correlates with budgetary transparency.

H5: Compliance with ‘resource revenue management’ transparency dimensions positively correlates with budgetary transparency.

H6: There are differences in perceptions of the determinants of budgetary transparency among the four pillars of the IMF code.

Figure 1 Perception of education officers on the degree of fiscal transparency (see online version for colours)



The IMF Code summarises 48 determinants into 15 dimensions, arranged under four pillars which cover the budgeting areas of planning, resource allocation, budget implementation, execution, and monitoring processes.

3.4 Data collection

Primary data were collected using a questionnaire which was developed by the lead researcher with support from the expert team researcher and based on relevant literature. The questionnaire’s validity and relevance were tested with an expert group of faculty members. Secondary data were extracted from physical and electronic reports and documents made available by the Ministry of Education.

The questionnaire used a 5-point Likert scale response format and included 72 items relating to the 48 dimensions of the IMF code. Degree of fiscal transparency was calculated using average perception scores, which corresponded to questionnaire responses. The questionnaire was administered to individuals from 10 institutions under the Ministry of Education, with each institution selected based on level of engagement in

the budgeting process, assessed using a preliminary survey. The heads of each institution circulated the questionnaire. A total of 252 completed questionnaires were returned. Respondents comprised finance and accounting officials, finance controllers and directors, education planning directors, other staff directly engaged in accounts and payments, heads of divisional heads, internal auditors, assistants for budget preparation, and preparers of financial statement. The sample size was deemed adequate and within the accepted parameters of a valid sample (Tustin et al., 2005).

The questionnaire included two parts. Part one asked about basic sociodemographic information such as age, gender, salary level, and years of work experience. Age groups were set as 20–30, 31–40, 41–50, 51–60, and 60+, and coded as 1 to 5, respectively. Gender was coded as males = 1 and females = 2. The years of work experience variable was divided into five groups based on the experience in terms of number of years. Salary levels were also separated into five groups that ranged from 10,000 to more than 100,000 baht.

3.5 Data analysis

Factor analysis was conducted to ascertain the structure of key determinants of budgetary transparency, with findings supported by a reliability test. Regression analyses were conducted with variables grouped according to the dimensions of the IMF code, arranged by pillar. Pearson correlation coefficients were also calculated. An ANOVA test was carried out to assess whether there were significant differences among different groups of respondents regarding opinions about the budgetary transparency determinants.

Descriptive statistics were used to explain the degree of budget transparency and provide a general overview of respondents. Perception scores are reported for each aspect of the IMF code, calculated using cross-tabulation analysis. Perceptions were categorised according to the main theme of each pillar. Average scores equal to or greater than 3 were interpreted as satisfactory, meaning that transparency was perceived to be in line with the IMF code. Scores of less than 3 were interpreted as a perception that fiscal transparency was low.

4 Results

Data collected for this study were ordinal in nature. Factor analysis was carried out to maintain the data's statistical robustness and relevance. This was followed by regression analysis, ANOVA tests, and calculation of descriptive statistics for demographic variables.

4.1 Factor analysis

The primary outcome was budgetary transparency, determined by answers to 72 questions which were designed to address 15 dimensions elaborated into 48 elements, organised under four broad pillars. It was decided that a factor analysis would help improve the quality of the analysis by clarifying whether the transparency elements loaded onto consistent factors, thus increasing the robustness. Separate factor analyses were performed for each pillar of budgetary transparency.

For pillar one, data were satisfactory for factor analysis. The result of the Kaiser Meyer Olkin (KMO) was 0.589, greater than the accepted level of 0.5, while Bartlett's Test was significant. A scree plot showed 6 components from 13 variables, each with eigenvalues greater than 1, that together explained 62.88% of the variance. Commonality output revealed that variables ranged from 0.539 to 0.755, with the exception of "preparation of fiscal reports for each agency" which had a value of 0.382. Most variables showed high correlations with the generated factors. A summary of factor output results for all pillars is shown in Table 1. Varimax rotation with Kaiser normalisation showed how different budgetary transparency dimensions were reflected in each component. Accordingly, classification of government revenue, expenses, sources of financing, information clarity, and international comparisons were grouped into the first component, reflecting the theme of fiscal reporting. Component two reflected reporting structure, comprising public assets, liabilities, and net worth. Component three reflected publishing of audited financial reports, timeliness, and degree of accessibility to financial reports by citizens. Component four reflected disclosures of major changes and compilation and presentation of information in line with international standards. Component five reflected reporting frequency and the importance of auditing. Component six reflected budget estimations on comparable bases. It should be noted that preparation of separate financial reports for all entities did not significantly correlate to any of the components generated for pillar one.

Table 1 Results of factor analysis

<i>Pillar</i>	<i>No. of Variables</i>	<i>Components generated</i>	<i>Total variance explained</i>	<i>KMO and Bartlett's Value</i>	<i>Commonality range</i>	<i>Sig</i>
1	13	6	62.88%	0.589	0.382–0.755	<0.001
2	19	8	59.76%	0.550	0.455–0.728	<0.001
3	18	7	60.67%	0.628	0.446–0.729	<0.001
4	22	8	58.72%	0.591	0.344–0.720	<0.001

Results of varimax rotation with Kaiser normalisation for the remaining pillars revealed that transparency dimensions were significantly correlated with the generated factors. There were 8, 7, and 8 strong factor components generated for pillars 2, 3, and 4, respectively. Total variance explained was over 50% for all pillars, which is satisfactory. The analysis revealed that seven dimensions were key determinants of perceived budgetary transparency. These were: budget reporting content, timeliness, quality, level of integrity in budget reporting, comprehensiveness of budget forecasting, policy orientation, and credibility of budget estimations

Figure 2 presents the scree plot for this analysis, indicating that there were 28 components with eigenvalues greater than 1. These can be considered strong factors, explaining 73.59% of the total variance of item responses.

Table 2 provides a detailed summary of the results of reliability tests for the factor analysis. Cronbach's alpha values are greater than 0.5 for all four pillar factors, suggesting high reliability.

Figure 2 Scree plot for all components

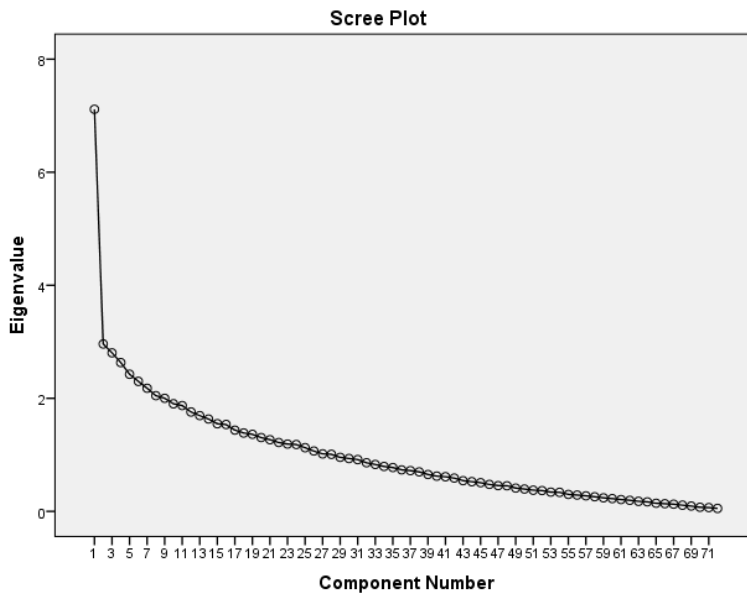


Table 2 Reliability analysis

<i>Item-total statistics</i>				
	<i>Scale mean if item deleted</i>	<i>Scale variance if item deleted</i>	<i>Corrected item-total correlation</i>	<i>Cronbach's alpha if item deleted</i>
Fiscal Reporting	16.0829	10.889	0.139	0.727
Fiscal Forecasting and Budgeting	16.2816	10.900	0.160	0.726
Fiscal Forecasting and Budgeting	17.3073	11.110	-0.011	0.734
Resource Revenue Management	17.3784	11.037	0.081	0.730

4.2 Regression analysis

The reliability of data to be used in the regression models was tested prior to running the analysis. Results showed that Cronbach's alpha was 0.717, indicating high reliability. Regression analysis was carried out to test relationships between the fiscal transparency dimensions and perception of budgetary transparency. An ordinal regression was conducted first. Results showed that the model was a good fit to the data, with a p value of 0.001. The independent variables explained 93.8% of the variance of the outcome variable with a pseudo- R -square of 0.938. A test of parallel lines revealed that the null hypothesis was rejected with a log likelihood p value of zero and general significance value greater than 0.05. It can therefore be concluded that all determinants 'budgetary reporting', 'forecasting and budgeting', 'risk analysis and management', and 'revenue resource management' are highly associated with degree of budgetary transparency.

A linear regression used to test $H1$ indicated a similar pattern of results, showing a significant relation between all transparency dimensions (fiscal reporting, fiscal

forecasting, risk analysis and management, and revenue resource management) and the degree of budgetary transparency. There was a positive correlation with budgetary transparency, with a coefficient of 0.549. However, transparency determinants explained only 41.6% of the degree of budgetary transparency.

Results for the test of *H2* indicated that the transparency variables included in pillar 1, reflecting fiscal reporting, had a significant relationship with degree of budgetary transparency, meaning the null hypothesis is rejected. A correlation coefficient of 0.688 indicated that fiscal reporting determinants have strong positive relationship with degree of fiscal transparency. However, the explanatory power of fiscal reporting variables was less than 50%. All correlation coefficients were positive with the strongest association between fiscal forecasting and budgeting and degree of budgetary transparency ($r = 0.713$). Revenue resource management showed the lowest correlation with degree of budgetary transparency ($r = 0.453$). Table 3 shows a summary of hypothesis testing for *H1* to *H5*.

Table 3 Summary of hypothesis testing – *H1* to *H5*

<i>Hypothesis</i>	<i>Correlation</i>	<i>p value</i>	<i>R² of the model</i>	<i>ANOVA</i>
<i>H1</i>	0.549	<0.001	0.416	0.000
<i>H2</i>	0.688	<0.001	0.474	0.000
<i>H3</i>	0.713	<0.001	0.508	0.000
<i>H4</i>	0.496	<0.001	0.246	0.000
<i>H5</i>	0.453	<0.001	0.453	0.000

Regarding hypothesis 6, results showed that there were significant positive relationships between some of the pillars. Budgetary reporting was highly correlated with fiscal forecasting and budgeting, as shown in Table 4. In addition, it was found that resource revenue management was significantly correlated with fiscal risk analysis and management, and with fiscal forecasting and budgeting. However, fiscal reporting did not show significant positive correlations with fiscal risk analysis and management or with revenue resource management. These findings highlight that the determinants of budgetary transparency under each pillar demonstrate unique factors in determining degree of budgetary transparency.

Results of hypothesis testing revealed that the determinants grouped under pillar one; ‘fiscal reporting’ and pillar two; ‘fiscal forecasting and budgeting’ had significant positive relationships with budgetary transparency. This implies that reporting quality, timeliness, integrity of reporting, adequate coverage of content provided in reporting, policy orientation, and credibility of forecasting budget figures together help to lay the foundation for transparency. These determinants are likely to bridge any information asymmetry gap that may exist between the government and citizens and help to improve transparency. Other variables such as risk analysis and management and resource revenue management were not found to be significantly related to level of budgetary transparency. The overall perceived level of budgetary transparency in Thailand’s education sector was found to be poor, providing evidence that certain dimensions analysed here are critical for achieving a high level of budgetary transparency.

Table 4 Correlations of budgetary transparency pillars

		<i>Fiscal Reporting</i>	<i>Fiscal Forecasting and Budgeting</i>	<i>Fiscal Risk Analysis and Management</i>	<i>Resource Revenue Management</i>
Fiscal Reporting	Pearson Correlation	1	0.440**	0.051	-0.077
	Sig. (2-tailed)		0.000	0.424	0.221
	N	252	252	252	252
Fiscal Forecasting and Budgeting	Pearson Correlation	0.440**	1	-0.008	0.184**
	Sig. (2-tailed)	0.000		0.904	0.003
	N	252	252	252	252
Fiscal Risk Analysis and Management (Pillar 3)	Pearson Correlation	0.051	-0.008	1	0.230**
	Sig. (2-tailed)	0.424	0.904		0.000
	N	252	252	252	252
Resource Revenue Management (Pillar 4)	Pearson Correlation	-0.077	0.184**	0.230**	1
	Sig. (2-tailed)	0.221	0.003	0.000	
	N	252	252	252	252

**Correlation is significant at the 0.01 level (2-tailed).

In support of *H6*, results of the ANOVA, shown in Table 5, reveal the existence of significant differences between groups in relation to perceptions of budgetary transparency dimensions.

Table 5 ANOVA output

		<i>Sum of squares</i>	<i>Df</i>	<i>Mean square</i>	<i>F</i>	<i>Sig.</i>
(Pillar 1)	Between groups	0.3	4.0	0.1	1.6	0.2
	Within groups	10.9	247.0	0.0		
	Total	11.1	251.0			
(Pillar 2)	Between groups	0.4	4.0	0.1	3.0	0.1
	Within groups	7.9	247.0	0.0		
	Total	8.3	251.0			
(Pillar 3)	Between groups	0.4	4.0	0.1	4.2	0.0
	Within groups	6.6	247.0	0.0		
	Total	7.0	251.0			
(Pillar 4)	Between groups	0.3	4.0	0.1	4.5	0.0
	Within groups	4.2	247.0	0.0		
	Total	4.5	251.0			

4.3 *Descriptive statistics*

Our analysis revealed that the mean value for perception of budgetary transparency for all 252 respondents was 2.8563, indicating that general perception about the degree of transparency was low, being slightly less than a middle value of 3. Further, it was found that many determinants were perceived to have low importance for budgetary transparency by officials involved in the budget preparation process. These findings were irrespective of respondent gender, maturity, salary, and work experience. However, determinants of budgetary transparency for fiscal reporting (pillar 1) and fiscal forecasting and budgeting (pillar 2) received average scores of 3.5449 and 3.3463, respectively, showing a higher level of importance and satisfactory scores. Results further suggested that all the determinants pertaining to fiscal reporting, comprising reporting coverage, frequency and timeliness of reporting, quality of reporting, and integrity of reporting, influence the degree of budgetary transparency in Thailand. These findings were further supported by evidence from secondary sources which revealed that improvements to budget reporting systems and preparation of budget estimates are typically made on an incremental basis.

The lowest degree of transparency perception with the average score of 2.2494 was observed for 'resource revenue management'. Issues with budgetary allocation and collection of government revenue must have contributed to this low transparency score. Of note, the transparency dimensions grouped under pillar 4 were introduced most recently, and there is a possibility that these dimensions have not yet been achieved in Thailand due to high levels of corruption, political interference, and efforts to cover inefficiencies in revenue collection in the management process.

Demographic information of respondents was analysed, focusing on gender, maturity, salary, and work experience. Results of frequency analysis indicated that there were more female participants than males, most respondents were in the 31–40 age group (46.4%), salaries were between 10,000 and 40,000 baht, and the majority of respondents had 5–10 years' work experience. Just 6.3% of the sample were in the youngest age group of 21–30, while 14.7% were aged 51–60 and 5.6% were above 60.

Respondents were divided into five groups based on level of earnings, with 35.7% in earning 10,000–40,000 baht, 31% earning 40,000–60,000 baht, and 5.6% earning more than 100,000 baht. Regarding work experience, the highest percentage, 31.7% had a working experience of 5–10 years, while 8.7% had more than 20 years of experience, 11.1% were in the least experience group, 25.4% had 10–15 years, and 23% had 15–20 years. The highest number of respondents (21%) were in a group that represented males and females aged 31–40 with 5–10 years' experience and a salary range of 10,000 to 40,000 baht. This group was used as the comparison group for cross-tabulation analysis. Perception of transparency dimensions among this group varied significantly from others, with perception scores for pillars 1 and 2 being relatively higher than for 3 and 4.

A similar pattern of perception scores was seen for pillar 2, representing fiscal forecasting and budgeting, which ranged from 2.37 (low transparency) to 3.58 (moderate) Transparency scores of this same group regarding pillar 3, representing fiscal risk analysis and management, were much lower, with averages between 1.67 and 2.56. It can be concluded from these data that transparency in risk analysis and management were low. These could be due to prevailing problems with data gathering, reviewing, and monitoring processes. Regarding pillar 4, representing resource revenue management, there was also a low degree of transparency. This could be driven by the same issues

affecting pillar 3, as the dimensions in both pillars are exposed to similar influences. Overall average perception scores for groups showed that the lowest average score for pillar 1 was 2.77 and the highest was 4.15. Meantime, the highest number of respondents (17.5%) for pillar 1 had an average transparency score of 3.62, while a moderately agreeable response score of 4 was given by 1.6% of respondents.

The lowest average score for pillar 2 was 2.37, given by just 0.8% of respondents, whereas the highest was 3.68, given by 1.6% of respondents. The largest proportion of respondents (16.7%) had an average score of 3.42. Cross-tabulation analysis revealed that overall average perception scores for pillars 1 and 2 were within a similar range, implying that there were not significant differences between these pillars. However, scores for pillar 3 ranged from 1.67 to 2.89, represented by 0.8% of respondents in each group. The largest proportion of respondents (20.6%) had an average score of 2.33. Similar results were seen for pillar 4, where average scores ranged from 1.77 to 2.59, representing again 0.8% of respondents each. The highest number of respondents (16.7%) had an average score of 2.27. Results of the ordinal regression analyses carried out to test hypotheses 2–4 revealed that there was a strong positive relationship between degree of fiscal transparency and quality of education, measured by competencies in reading, mathematics, and science. It can therefore be argued that the quality of education is compromised due to lack of budgetary transparency, even though the government has allocated a high amount of public money for education to achieve better education performance.

Number of out-of-school children was found to have increased slightly in recent years, while the dropout rate had improved over the last five years. Equity in education, measured by net enrolment rates for primary and lower secondary education did not show a significant relationship with level of budget transparency. Net enrolment rates for primary and lower secondary education during the period from 2016 to 2020 showed no increase, indicating that equity of education has not been achieved and thus does not justify the amount of public money used for education in Thailand.

5 Managerial implications

It has been argued that high budgetary transparency should lead to good governance and high education performance, yet there are also implications that issues of transparency could be used to divert attention into finding faults instead of upholding good governance and accountability. The findings of this research imply that determinants of transparency must be complied with to deliver high educational performance. High level intervention by the Budget Bureau, along with assurances of follow-up actions to maintain budgetary transparency, could effectively deal with issues such as budget overruns, inefficiencies in budget allocation and financial progress, and redirecting expenditure. Evidence suggests that no such mandate has yet been given to the Budget Bureau. Symbolic reporting and the compiling of documents to merely comply with requirements is unlikely to improve budgetary transparency unless the objectives of government budgeting are well established, and efforts are made to achieve a common goal of better transparency.

Findings show the importance of adhering to transparency dimensions when preparing budget guidelines. Budgeting procedures should recognise transparency determinants in advance, and these should be well-communicated within relevant departments. That said, it was found that the departments associated with budgeting

processes are required to maintain a high degree of transparency. Use of technology could play a role in improving the status quo.

Another managerial issue that may hinder maintenance of budgetary transparency relates to the limitations imposed by the strict timeframes that are set to finalise budgeting processes. Only two weeks are given for parliament approval, which may mean that the robustness of transparency is compromised due to practical reasons. As above, efforts to integrate technological innovation into this process would help to address budgetary transparency issues in future. However, the success of any such efforts will depend on whether actions are taken to serve the public interest. Current inconsistencies in the government's attempts to deal with new technology highlight the difficulties of ensuring practicality and objectivity of budgetary transparency.

6 Conclusion

The aims of this research were to examine how determinants of budgetary transparency are perceived by officials engaged in the budgeting process at Thailand's Ministry of Education, and to test whether differences in perception exist for various determinants of budgetary transparency. Budget transparency is a key element that must be considered in the spending of public money. High transparency enhances good governance and accountability and in turn contributes to the effective use of public money. This research was focused on transparency in education spending, which is a main component of the government's strategic plan of achieving a set of targets by 2030 through the integration of 4.0 technology across the country. Data were collected using a questionnaire assessing perceptions of budgetary transparency dimensions outlined in the IMF code, administered to relevant officials with the help of the Ministry of Education. Budget transparency was found to hold significant bearing among stakeholders in education, but the overall degree of budget transparency at the Ministry of Education was low for all dimensions, irrespective of dimension groupings and demographic differences.

The transparency dimensions outlined in the IMF code relating to areas of fiscal reporting, fiscal forecasting and budgeting, risk analysis and management, and revenue resource management were all found to be major determinants of budgetary transparency. Both fiscal reporting and fiscal forecasting and budgeting dimensions were perceived by officials to highly influence budgetary transparency, while risk analysis and risk management and revenue resource management were perceived as less influential. The key determinants of budgetary transparency in the Thai education sector were integrity and quality of fiscal reporting, forecasting credibility and policy orientation, fiscal risk analysis, disclosure, risk management, fiscal coordination, revenue ownership, and resource revenue mobilisation and utilisation. It was found that failures to integrate technology into budgeting processes had created a significant bottleneck that hindered budgetary transparency.

The implications of these findings are that budgetary transparency is a key driver of better performance in education, and that transparency can improve public awareness regarding the importance of public finance. The findings can be used to suggest policy directions that encourage authorities and policymakers, particularly as the government allocates the highest proportion of public money on education, as has been the case in Thailand for over a decade.

6.1 Limitations

Despite the study's strengths, a number of issues affect interpretation of findings. First, the scope of data collection was limited to the transparency dimensions outlined in the IMF code. Though this code is comprehensive and internationally recognised, concentrating only on this document may have ignored other factors affecting budgetary transparency. Second, the perceptions reported by officials may not reveal the objective influence of determinants on budgetary transparency, as questionnaire responses were subjective and based on personal judgement and individual knowledge of transparency issues. Third, the 5-point scale used to assess budgetary transparency was perhaps not sensitive enough to gauge finer differences in perceptions.

6.2 Future directions

The outcome of this study highlights the importance of budgetary transparency and illuminates potential new aspects to be investigated in future research. Questions remain as to how to make budgetary transparency a primary concern for governments, and how a general level of transparency relates to the use of public finance. Scholars could also pursue whether there is a connection between budgetary transparency and level of corruption within a country. The role of technology in improving transparency and reducing corruption is also an understudied area, and it remains to be answered why corruption is increasing in some societies despite technological advances. The reasons for this could be explored in future qualitative research. Finally, researchers may wish to more closely explore how the roles of various actors including politicians and officials are connected to transparency, corruption, good governance, and accountability.

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