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## THE IMPACT OF TOLERANCE FOR AMBIGUITY AND THE MODERATING EFFECT OF ATTITUDE TOWARDS CHANGE ON THE ADOPTION OF PERFORMANCE-BASED BUDGETING SYSTEM

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### ABSTRACT

*This paper aims to examine the impact of tolerance for ambiguity on the adoption of Performance-Based Budgeting (PBB) in Libyan higher learning institutions. It also examines the moderating role of attitude towards change on the relationship between tolerance for ambiguity and the adoption of Performance-Based Budgeting System (PBBS). The data is obtained from a survey of 432 respondents comprising: financiers, accountants and policy makers in the Libyan higher learning institutions. Hierarchical multiple regression was used to test whether factors such as tolerance for ambiguity and attitude toward change influence the adoption of PBBS. The findings provide support for the hypothesized negative relationship between the adoption of PBBS and tolerance for ambiguity and the importance of attitude toward change as a moderating variable.*

*Keywords: performance-based budgeting, adoption theory, psychology theory and planning behavior.*

### INTRODUCTION

The first attempt to adopt and apply Programming Performance Budgeting System was in New York City through the period (1913 to 1915). In 1948 the Department of Marine used two budget systems, traditional method and programmes performance and transferred these methods to the U.S. Department of Defense. In 1949, "Hoover" Commission was formed for the purpose of reforming the federal government budget in America. In 1946 U.S president (Harry Truman) issued his direction to the director of the office of the general budget to provide basic ideas on Programmes and performance (Schich 1966). In 1965, U.S. President Johnson asked to introduce the budget of programmes and performance in the ministries of the United States. Later on some other world countries began to apply the system such as Philippines, Malaysia and Sweden. In 1992, President Clinton has emphasized the use of the budget based on performance that will establish a link between the allocation and the satisfaction of people with services.

The concept of ambiguity tolerance or its many synonyms has attracted research in various branches of psychology for more than 40 years (Frenkel-Brunswick 1948). It has been conceived as a personality variable (Budner, 1962). Ambiguity tolerance (AT) refers to the way an individual (or group) perceives and processes information about ambiguous situations or stimuli when confronted by an array of unfamiliar, complex, or incongruent clues. AT is a variable that is often conceived on a unidimensional scale. The person with low tolerance of ambiguity experiences stress, reacts prematurely, and avoids ambiguous stimuli. At the other extreme of the scale, however, a person with high tolerance for ambiguity perceives ambiguous situations/stimuli as desirable, challenging, and interesting and neither denies nor distorts their complexity of incongruity.

The reason, for the adoption of Performance-based budgeting system (PBBS) to be considered, is the role played by people that have control over council policy decisions (Kluver, 1999). Another reason is that Libya has small population with huge resources and revolution in technology so that there is a need to adopt and implements PBBS to help the country to improve the higher Education learning Institutions effectiveness and efficiency and to enhance transparency in order to overcome the shortages of line-item that is in use currently. The study is particularly important as it could provide us with a better understanding of the relationship between the adoption of PBBS and tolerance for ambiguity, attitudes toward change, particularly in the Libyan context, as the dynamics of the business environment is changing rapidly.

The study has two main objectives: 1) to examine the impact of tolerance for ambiguity on the adoption of Performance-Based Budgeting system (PBBS) in Libyan higher learning institutions, and 2) to examine the moderate role of attitude towards change on the relationship between tolerance for ambiguity and the likelihood of adopting performance based budgeting system (PBBS). In accordance with these objectives, the following research questions are introduced:

- 1- Does the tolerance for ambiguity affect the adoption of performance-based budgeting system (PBBS) in Libyan higher learning Institutions?
- 2- Does attitude toward change moderate the relationship between tolerances for ambiguity and the likelihood of adopting performance based budgeting system (PBBS)?

## LITERATURE REVIEW

Budgeting is a system changes which mean an innovation. Innovation adoption studied extensively in the literature is most of the fields' science from agriculture, medicine, psychology to social science. The review that most addressed such research field is done by Rogers.

### Tolerance for ambiguity

Recent accounting literature suggests that the accounting profession needs individuals who are creative (Albrecht et al. 1994; AAA and The Bedford Committee 1986) and able to deal with ambiguity (Albrecht et al. 1994; Conrad and Rapp 2003; PwC 2003). Viewed in the context of personality research, this implies that the "right type of person" for accounting would be highly tolerant of ambiguity. In the accounting area, however, perhaps more than

other disciplines, a shift to valuing high ambiguity tolerance regardless of job requirements may not be wise since certain accounting jobs may be more conducive to lower levels of ambiguity tolerance. The tolerance for ambiguity research indicates that individuals who are creative and attracted to ambiguity are also more likely to be risk- and sensation-seeking (Johanson 2000; Judge et al. 1999; Yurtsever 2001; McLain 1993), arguably a less than ideal feature for certain accounting and auditing positions, especially given recent accounting irregularities. In contrast, the same creative and ambiguity-tolerant individual may be just the type of accountant needed to analyze and design controls in financial systems. One practical implication is that jobs that depend upon a traditional attitude toward risk may be best assigned to low ambiguity-tolerant individuals, while jobs that require very high levels of creativity may be best completed by individuals with high ambiguity tolerance.

Hartmann (2005) puzzled by the inconsistent effect of uncertainty and its relation to Accounting performance measures, tried to investigate the effects of task uncertainty, environmental uncertainty and tolerance for ambiguity on manager's opinions about the appropriateness of accounting performance measures in addition to testing the interactive effect of tolerance for ambiguity with uncertainty on manager's opinions. Using survey methodology the author found that all the three uncertainty variables affect manager's opinions. The task uncertainty and environmental uncertainty have opposite effect on manager's opinions directly however; tolerance for ambiguity has indirect effect on manager's opinions directly, however; tolerance for ambiguity has indirect effect on manager's opinions through the interaction with task and environmental uncertainty. It was found that uncertainty of managers with low tolerance for ambiguity has higher effect than managers with high tolerance for ambiguity.

Lamberton, Fedorowicz and Roohani (2005) investigated the relationship between tolerance for ambiguity and the relative interest of accountants and accounting technology professionals in information technology. Using 123 respondents, they found that tolerance for ambiguity is an important factor in explaining the effect on the interest of IT among accounting professionals. The results indicated that accountants with lower tolerance for ambiguity have higher interest in IT.

### **Likelihood of Performance based budgeting (PBB)**

Most of the studies on the adoption of performance based budgeting system (PBBS) have been carried out in the US. Performance-based budgeting is defined as the utilization of strategic planning techniques in reference to agency missions, goals, and objectives, while simultaneously requesting quantifiable data for establishing meaning to program outputs and outcomes (Willoughby and Melkers, 1998, 1999, 2001a, 2001b).

Majority of States have claimed that performance measurement was being utilized as long as two decades ago; such performance-based budgeting system, then as now, has been planned to measure results, outcomes and impacts (Botner 1985). They usually require strategic planning relating to the purposes and goals of an agency and subsequent evaluation or assessment of outcomes. The rationale for focusing on performance is that it is supposed to change the behavior of budget decision-makers. Botner (1985) and Wildavsky (1992) noted that "any effective change in budget relationships must necessarily alter the outcomes of the

budgetary process. Otherwise, why bother?" Similarly, others have noted that changing the budget format does have an effect on the budget process (Grizzle, 1986; Pettijohn and Grizzle, 1997). According to Bonter (1985), Combined, these studies have transformed the perceptions surrounding performance budgeting. Wildavsky (1992) argues that managers cannot use the information produced by PBB. The researcher agrees with Wildavsky that PBB afford information for managers however some of them do not know how to use and invest this information. As far as empirical studies concern, most of the budget studies were carried out in the United States and focused on the State budgeting as below.

Yi Lu, (2007) examines the perspective and role of state agencies in Georgia on performance budgeting. Total of 194 questionnaires was distributed to the fiscal/budget offices and agency heads of 97 entities including large agencies. The response rate was 65 percent. In addition, interviews were conducted with 31 fiscal/budget officers. These interviews were conducted during the period from July 2005 to May 2006. The minimum length of the interviews was 30 minutes. The finding indicates that for agencies to conduct performance-informed budgeting, the focus needs to be on elevating managerial capacity to use performance information, and improving measurement quality. Moreover, it is crucial to recognize that performance budgeting is a collaborative process in which each participant plays a valuable role.

(Melkers and Willoughby 2001) conducted a survey study to assess perception among legislatives in the United States. The survey utilized a random sample of legislative and executive budgeters from 50 states asking them for their impressions of performance based budgeting (PBB) in their states. The findings indicate that implementation of PBBS is proceeding slowly and there are some benefits of bringing to light performance results as well as with some implementation problems. The study reveals also that budget officers are satisfied with the role of performance information in the budgeting process.

Carl and Randolph (1996) conducted survey on the institutions of higher education in the United States. A questionnaire was distributed to chief academic officers on the colleges and universities asking about their perception about PBB, line-item, and zero base budgeting. The survey results show that most of the respondents prefer to use a combination system and that the line-item system still one of the major system at institutions of higher education in USA. The study also reveals that PBB approach is quite popular.

Jordan and Hackbart (1999) conducted a survey of state executive-branch budget officers in an attempt to determine the current status of state performance budgeting including the perceived impacts on budget decision-making. They confirmed that performance budgeting is used widely. Moreover, about 25 percent of state budget officials agree that performance funding has been very successful in their states. However, few states reported that using "performance funding", which they described as performance assessment, influences the portion of funds.

Willoughby and Melkers, (2000, 2001) found that state budget officials perceived that performance-based budgeting initiative have been less successful in changing appropriation levels than in management improvement in state agencies. The most recent research by Willoughby (2004) is consistent with these findings as well. Both budget and agency staff

continued to indicate that performance budget staff felt that it was not effective at accomplishing this task while more than one-fifth of the agency staff expressed a similar attitude.

McGowan (1984) indicate that PBB has become an accepted management tool in US local governments. The author points out that around 77 percent of the cities surveyed over the period 1987-1988 over 450 municipal managers reported that all they are using PBB. Similarly, Poister and Streib (1989) found that the percentage of cities using PBB had stabilized.

As far as research centers and legislative and agency reports concerns, few reports have published regarding PBB implementations. The first report on "using information on agencies performance in evaluating budget options" was done by Mark (2001) who is a member of Congressional Budget office. The objective of the report was to help departments to disclose information about programming performance as well as to help to develop methods of decision-making and therefore, make departments more effective and efficient. The Congressional Budget Office makes audit reports and information that could assist in the analysis of various options for spending and new options proposed.

Kluvers, (2001) investigated the relationship between using PBB and the accountability in Australia municipalities. The study was conducted in two parts: A questionnaires was mailed to every municipality in Victoria. A covering letter, explaining the purpose and objectives of the research was also sent. There were 120 responses rounding a response rate of 60%. There were 65 councils that reported using program budgeting. The second part of the study consisted of series of semi-structured interviews after the questionnaire has been returned. The results show that program budgeting PBB does not always enhance accountability in local government. The argument is that there are maybe some external factors that may influence enhancement of accountability such as control system or weakness of auditing system in the local government.

Tayib and Rosli, (2003) conducted study on Malaysian universities to identify and explain the present practice of Malaysian public universities budgeting systems and provide some recommendations to Malaysian public universities in improving their budgeting systems. A total of 237 questionnaires had been distributed to eight public universities and 98 were completed and returned providing response rate of 41 percent. The findings indicate that Malaysian public universities to some extent adopt good budgeting characteristics. This indicates that the budgeting systems of the public universities are not that bad and can be used as a control mechanism to strengthen performance measurement systems. However Malaysian public universities are still facing similar problem as indicated by Doh (1972, 1981) and Dean (1990), especially on the lack of trained staff and lack of capability in using data.

Dixon (2005) analyzed Thailand's attempts to reform its budget process. By doing so, the author perceive generalizing Thai findings to other countries with similar institutional structure. The researcher has been involved in the early stages of the second round of Thai budget reforms and utilizing his own experience and reports of subsequent World Bank and USAID missions as references for this study. However, he indicates that other parallel research validates his findings. The findings indicate that a centralized budget system is incompatible with based budgeting system. Moreover, the study highlights that reform requires political will and is not merely a managerial problem.

Abossagr (1981) investigated the Performance based budgeting in Jordan. The researcher examines the performance based budgeting and the importance of application in developing countries and how the reclassification of items of the country budget and measurement of physical achievements. He suggested that there is a need to rebuild the accounting system that fits the performance budgeting system and presented a view on how to build accounting system that fits with the performance based budgeting Jordan Accounting system.

In another part in the Middle East, Yemen, Naim et al. (1999) examined the government financial system effects on the effectiveness of the central supervision and control in the country. The researcher found that there is not link between the expenditures estimates in the budget and the actual spending. Moreover the control provided by line-item is not comprehensive and does not control for performance. Therefore there is inefficient use of resources. Finally the Line-item system hinders the control system on performance and fails to provide data information and statistics.

In Sudia Arabia, Bothma (1983) examined the development of the Accounting system structure and the accountability of government. He suggested that there is a need for developing the accounting system to develop the budgeting system. Moreover, he tried to review motives to develop the government's accounting system which is to circumstance that prepared the government's accounting system. Moreover he recommends that in general there must be a link between the government accounting system and the cost accounting system. The study concluded that developing countries should develop their government accounting systems.

Nada (2002) conducted an exploratory study of the government accounting system in Egypt. The researcher found that the current system is unable to assess the performance of government units as well as the performance of employees in these units. Moreover, the author concluded that the current system of cash basis and internal control is causing deficiencies and weaknesses in the system. Thus the researcher suggests that the development of the accounting system of government through: (1) the need to follow the accrual basis and, (2) measurement of depreciation of fixed assets in the units and evaluation of assets based on the criterion of changes in prices. The study also recommended the application of cost accounting in government units and adopting performance based budgeting (PBB) in government units.

### **Attitudes towards change**

Attitudes can be hard to change once they have been learned (Dunham, 1984). This is because there can be resistance to change from within. Dawson (1994) also noted that resistance to organizational change may consequence from one or a mixture of factors such as substantive change in job, decrease in economic security, psychological threats, trouble of social arrangements, and lowering of status. Nonetheless, it cannot be denied that the attitude toward change by individuals may be different. Some are more resistant to change while others are more open to change. According to Elizur and Guttman (1976), there are three types of individuals' or groups' response to organizational change: affective, cognitive and instrumental.

Affective response refers to the feeling of being linked to satisfaction or uneasy about change. Cognitive responses are opinions relating to usefulness and necessity and about knowledge required to handle change, while instrumental responses refers to actions already taken or which will be taken to handle the change. Dunham et al. (1989) stated that there are three types of attitudes toward change: affective, cognitive and behavioral. The affective part consists of the feelings a person has toward an attitude object, which involves evaluation and emotion, and is often expressed as like or dislike for the attitude object. The cognitive component of an attitude consists of the information a person possess about a person or thing which is based on what a person believes is true. The behavioral tendency concerns the way a person intends to behave toward an attitude object.

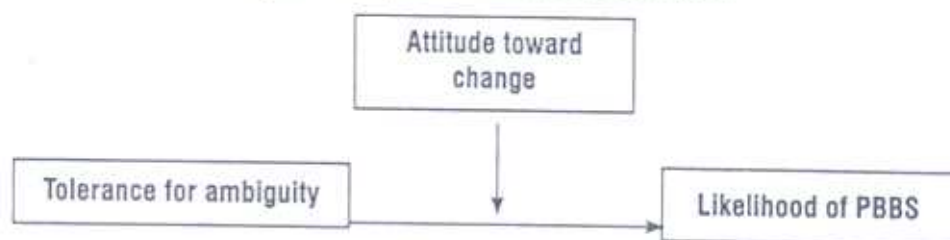
Among the three types of attitudes a proposed by Dunham et al. (1989) namely the affective, cognitive and behavioral attitudes toward change, one issue raised. Which of the three types of attitudes are more critical? Should organizational changes start by adopting the cognitive or affective mode and then followed by the behavioral mode? Following the argument, that one of major obstacles of change is the "fear of the unknown" or "unfamiliar situation", the cognitive mode can be an effective mode to be addressed first. This is because once a person has information and knowledge of the potential changes to be made, his or her feelings toward change may be changed to favor such changes. It should also be highlighted that handling the cognitive component on attitude toward change can also be a daunting task if it is not well communicated (Rashid et al. 2004).

Searching for the gap in the body of knowledge in the area of Performance Budgeting Systems based on the prior studies discussed above, it can be concluded that most prior research in "PPB" have not focused on the budgeting process as whole. A number of studies on budgeting have been conducted in the past years and many concentrated on budgeting in the United States, Australia, Middle East and some other developing countries. However, no previous study has examined the factors that may influence the adoption of performance based budgeting (PBBS). Therefore this study, as far as I am aware, is the first empirical study trying to examine the effects of factors such as organizational support, barriers, relative advantage, training, satisfaction with line-item, tolerance for ambiguity and attitude towards change on the adoption of (PBBS). This study suggests some participation in closing this knowledge gap.

### **Theoretical Framework**

The research framework of this study employs Dunham et al. (1989), the diffusion of innovations theory (Rogers, 1983) and psychology theory (Budner 1962) to identify the attitudinal, social and perceived behavioral control factors that would influence the adoption of PPBS. Developing a theoretical framework using a variety of theories helps explain information technology adoption and management change. Therefore, the model is new in the accounting field. The literature develops different conceptual frameworks and associates have been using those frameworks for empirical work. This study framework is depicted in (Figure 1) below.

Figure .1 Proposal of conceptual Framework



### Hypothesis Development

#### *Tolerance for Ambiguity and the Likelihood of PBBS Adoption*

Recent accounting literature suggests that the accounting profession needs individuals who are creative (Albrecht et al. 1994; AAA and The Bedford Committee 1986) and able to deal with ambiguity (Albrecht et al. 1994; Conrad and Rapp 2003; PwC 2003). Viewed in the context of personality research, this implies that the "right type of person" for accounting would be highly tolerant of ambiguity.

The tolerance for ambiguity research indicates that individuals who are creative and attracted to ambiguity are also more likely to be risk- and sensation-seeking (Johanson 2000; Judge et al. 1999; Yurtsever 2001; McLain 1993). It also indicates that creative and ambiguity-tolerant individual may be just the type of accountant needed to analyze and design controls in financial systems. Therefore, jobs that require very high levels of creativity may be best completed by individuals with high ambiguity tolerance.

Hartmann (2005) found that task uncertainty and environmental uncertainty have opposite effect on manager's opinions directly however; tolerance for ambiguity has indirect effect on manager's opinions through the interaction with task and environmental uncertainty. It was found that uncertainty of managers with low tolerance for ambiguity has higher effect than managers with high tolerance for ambiguity.

Since adopting a new system will require learning and understanding new ideas and methods and involves certain level on uncertainty, it is hypothesized that the relationship between tolerance for ambiguity and the level of adoption of PBBS to be positive in the Libyan High learning Institutions. In this study the researcher predicts that the higher tolerances for ambiguity, the higher attitude toward change and the higher the likelihood of PBBS adoption. For the above argument, the following hypothesis in its alternative form is proposed:

*H1 There is a positive relationship between tolerance for ambiguity and the likelihood of PBBS adoption in the Libyan High learning Institutions.*

#### *Interaction Variable of Tolerance for Ambiguity and Attitude Towards Change*

Dunham et al. (1989) defined attitude towards change as a person's cognitions about change, his/her affective reactions to change, and his/her behavioral tendency towards change. Others define it as a "feelings and predispositions towards their jobs and employers in a budgetary context" (Milain1975). Based on that, people who develop better attitudes



towards change, as per Rogers's model (1983), are likely to adopt new systems. In other words, tolerance for ambiguity relationship with likelihood of PBBS adoption can have different levels based on individual's attitude towards change. For the above argument, the following hypothesis in its alternative form is proposed:

*H2 Attitude towards change will moderate the relationship between tolerance for ambiguity and likelihood of PBBS adoption in the Libyan High learning Institutions.*

## RESEARCH METHOD

### *Instrument Development and Measurement Issues*

In this study a survey questionnaire was used to gather data and information. The questionnaire together with covering letter explaining the purpose and objective of the research was self-administered on site personally. The target sample consist of 15 public Universities and Higher Institutions in Libya. Study frame represents all users, accountants and financial offices list kept in the Ministry of higher Education. The questionnaire was delivered to 700 finance staff, accountants, non academic staff, individuals that most likely to recognize the accounting practices and techniques used, executive academic officers, and head of departments in the Ministry of Higher Education. The questionnaire was initially prepared in English and later translated into Arabic language by a professional translator. The questionnaire was designed to obtain a detailed view of the factors influencing the performance based budgeting system (PBBS) in Libyan Higher Learning Institutions. It consists of two main section (1) demographics variables and (2) the factors that may influence the adoption of PBBS such as tolerance for ambiguity and the attitude toward change. The unit of analysis is individual and I have chosen the Higher learning Institutions for this study due to their developed organization system. A non random sampling method was used whereby judgmental sampling was applied to administer the questionnaires.

### **Measurement issues**

This study examines one dependent variable (PBBS adoption), one independent variable (tolerance for ambiguity) and one moderating variable (attitude towards change). This section discusses the operationalisation of each variable.

A likert scale of (1 = strongly disagree to 5 = strongly agree) is used. A higher score indicates greater tolerance for ambiguity and higher tolerance for adoption and implementation of PBBS. Attitude towards change is measured using Dunham *et al.*'s (1989) 18-item instrument. This instrument comprised three subscales: cognitive, affective and behavioral. Each subscale consisted of six items. A five-point interval scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. The scale is adopted from Subramanian and Mia, (2003). Likelihood of PBBS adoption is measured using a 9-item instrument adapted from Kluevers (1999). The respondents were asked to rate their agreements to the statements on a development from nominal scale (yes or not).

## RESEARCH FINDINGS AND DISCUSSION

### Response Rate

A total of 700 questionnaires were distributed in 11 Libyan public universities and 4 public institutions for higher learning. The targeted respondents were employees (academic and non academic) with accounting and /or finance background. Out of the 700 questionnaires, 500 were filled in and returned, making a response rate of 71.4 percent. After a thorough check on the returned questionnaires, it was found that only 432 can be used for analysis. The discarded questionnaires were mostly incomplete rendering them non useable. So the effective response rate is 61.7 percent, which is relatively high. The number of respondents per university or institution varies from 12 (2.8%) to 40 (9.3%). Table (1) below provides the detailed distribution of the respondents according to the universities and institutions under study.

Table 1  
Distributions of Respondents According to Universities and Institutions

S/No.	University/ Institution	Number of Respondents	Percentage
1	Garyouins University	40	9,3
2	Allfath University	37	8,6
3	Sabaha University	40	9,3
4	Sirt University	35	8,1
5	AmargabUniversity	36	8,3
6	7 April University	33	7,6
7	7 October University	32	7,4
8	Naser University	37	8,6
9	Alljabal Agarb1 University	32	7,4
10	Omar Allmogthar University	34	7,9
11	Arab Medicine University	26	6,0
12	Benwilled Higher Institution	13	3,0
13	Civil Aviation and Meteorology Higher Institute	13	3,0
14	Zeltin Higher Institution	12	2,8
15	Mosrata Higher Institution	12	2,8
	TOTAL	432	100

### Respondents Profile

In this section the profile of the respondents to the questionnaire is given. It is noted that more than 80 percent of the respondents are males, majority of them (more than 90 percent) aged between 20 years and 50 years with a working experience ranging for most of them (more than 70 percent) from 6 years to 25 years. In terms of qualifications, about 80 percent are holders of a Bachelor degree and above working as full time employees either

in the academic departments or finance departments. Only 8.3 percent of the respondents are from other departments. At the time when this research was being conducted, none of the respondents indicated the use of Performance-Based Budgeting System (PBBS) in their universities or institutions of higher learning. However, 78 percent of them believe the adoption of PBBS in their firms will be successful. Table 2 presents the details of the above-discussed demographic profiles of the respondents.

Table 2  
Demographic Profiles of the Respondents

Profile	Frequency	Percentage
Gender:		
Male	348	80.6
Female	84	19.4
Age:		
Under 20 years	7	1.6
20 to 30 years	152	35.2
31 to 40 years	143	33.1
41 to 50 years	97	22.5
51 years and Above	33	7.6
Work Experience:		
Under 5 years	44	10.2
6 to 10 years	87	20.1
11 to 15 years	105	24.3
16 to 20 years	123	28.5
21 to 25 years	45	10.4
26 to 30 years	19	4.4
31 years and Above	9	2.1
Qualification:		
Lower Diploma	22	5.1
Higher Diploma	58	13.4
Bachelor Degree	191	44.2
Masters Degree	74	17.1
Doctorate Degree (Ph D)	87	20.1
Work Department		
Academic	105	24.3
Finance / Accounting	291	67.4
Other	36	8.3
Employment Status:		
Full Time	432	100
Part Time	0	0
Is PBBS in Use?		
Yes	0	0
No	432	100

### Factor Analysis

According to Dyre et al. (2005), the term factor analysis refers to a set of statistical techniques that can be used to either explore or confirm the underlying structure among a set of items/variables to determine those items/variables that tap a factor or latent construct. Table 3 provides the summarized process and some results.

Table 3  
Factor Loadings for Items of Independent variable (TR)

	Variable
	TA
ta3	0,849
ta2	0,805
ta4	0,735
ta5	0,711
ta9	0,710

Table4  
Factor Loadings for Items of Moderating Variable

	Variable
	ATC
atc12	0,939
atc17	0,932
atc11	0,924
atc13	0,920
atc18	0,914
atc15	0,913
atc16	0,909
atc14	0,905
atc10	0,873
atc9	0,865

Table 5  
Factor Loadings for Items of Dependent Variable

	Variable
	PBBS
pbbs4	0,885
pbbs5	0,872
pbbs9	0,855
pbbs2	0,838
pbbs3	0,818
pbbs1	0,736

### Reliability tests

Reliability is described as the extent to which measures are free from error thus being able to produce consistent results (Hair et al., 2006; Pallant, 2005; Zikmund, 2003; Garver and Mentzer, 1999; Kline, 1998). It is known to have two dimensions underlying it: repeatability and internal consistency. The commonly used method to determine repeatability is the test-retest method that involves the administration of the same scale or measure to the same respondents at two separate points in time (Zikmund, 2003; Kline, 1998). The method is basically a longitudinal study approach, which in many cases the first study sensitizes respondents thus influencing their participation in the repeat study. Also time lapse has effect especially when it happens to be too short or too long. The technique of splitting halves i.e. taking results from one half of scale items (e.g. odd numbered items) and comparing them to results from the other half, is the most basic method for checking internal consistency of measures containing large numbers of items (Zikmund, 2003; Kline, 1998).

In studying the reliability of a measure, it all culminates to a reliability coefficient. The most common reliability coefficient is the Cronbach's Alpha value which is calculated using the split – half method. In many literatures including all mentioned in this section, alpha values of 0.7 and above to indicate good reliability. There are cases of values lower than 0.7 being acceptable depending on the kind of studies being conducted e.g. in exploratory studies values as low as 0.5 and 0.6 are acceptable (Nunnally, 1967; 1978 respectively). It is stated in Garver and Mentzer (1999) that for one to determine Cronbach's alpha there should be at least three items in the construct in question.

The results of reliability analysis for this study are presented in Table 9. It shows that all the variables demonstrate acceptable values of reliability coefficient (Cronbach's Alpha), with values ranging from 0.822 to 0.977. These results leads to a conclusion that the study variables demonstrate good reliability as the alpha values (except one value) are above the recommended 0.7 threshold. The value that falls below the 0.7 threshold still meets requirements for the 0.6 threshold.

Table 6  
Results of Reliability Analysis and Variance Extracted for Study Variables

Variable	Number of Items	Reliability Cronbach's Alpha	Variance Extracted (%)
Tolerance for Ambiguity (TA)	5	0.822	58.738
Attitude towards Change (ATC)	10	0.977	82.755
PBBS likelihood (PBBS)	6	0.912	69.782

### Regression results

Hierarchical Multiple regression analysis was employed in this study to examine the role of the independent variable in predicting the dependent variable and to test the moderating effect of attitude towards change on the relationship between tolerance for ambiguity and the likelihood of performance based budgeting system (PBBS).

Table 7  
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,317(a)	,101	,096	,41381
2	,352(b)	,124	,118	,40887

a Predictors: (Constant), avattc2, avtlamb

b Predictors: (Constant), avattc2, avtlamb, tolatt

Table 8 ANOVA(c)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8,215	2	4,107	23,985	,000(a)
	Residual	73,463	429	,171		
	Total	81,677	431			
2	Regression	10,125	3	3,375	20,188	,000(b)
	Residual	71,552	428	,167		
	Total	81,677	431			

a Predictors: (Constant), avattc2, avtlamb

b Predictors: (Constant), avattc2, avtlamb, tolatt

c Dependent Variable: avpopf

Table 7 and 8 above report the goodness of the fit for the models using two main indicators namely R-square and the F-value. The R-squared and the adjusted R-Squared indicate that 12 % of the variation in the Adoption of PBBS is explained by tolerance for ambiguity and attitude toward change and the interaction variable of attitude towards change and tolerance for ambiguity. The F-value is significant at 1% level of significance indicating that the null hypothesis that none of the variable influences the Adoption of PBBS is rejected. The R-squared and the adjusted R-squared as well as the F-value indicate that the model is acceptable.

Table 9  
Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	3,220	,218		14,778	,000
	avtlamb	-,022	,052	-,020	-,429	,668
	avattc2	,308	,044	,317	6,914	,000
2	(Constant)	6,283	,931		6,746	,000
	avtlamb	-1,753	,514	-1,549	-3,407	,001
	avattc2	-,377	,207	-,388	-1,819	,070
	tolxatt	,387	,114	1,692	3,381	,001

Dependent Variable: avpopf

Table 9 reports the significant coefficients influencing Adoption of PBBS. In model 2 it is shown that attitude toward change and tolerance for ambiguity are significant at 10% and 1 % respectively. The moderating effect is positive and significant at 1% level of significant.

The hypotheses of the study have been tested by using the hierarchical multiple regression analysis. This analysis is suitable for testing the mediation and moderation simultaneously (Frazier et al., 2004; Muller et al., 2005) The results presented above do support the study hypotheses that are related to the direct relationships between the independent variables, moderate and the dependent variable. The significant coefficient of the independent variable in regression indicates support the hypothesis (Hair et al., 2006). Table 10 summarizes the results of hypotheses testing, showing the relationships, corresponding hypothesis, regression coefficient and its significance level, and remarks on whether the hypothesis is supported or not.

Table 10  
Results of Hypothesis Testing for Direct and indirect Relationships

Link	Hypothesis	Coefficient b (t-value)	Remarks
TA→PBBS	H1: There is positive relationship between tolerance for ambiguity and the adoption of PBBS	-,022*	H1 Supported
TA→ATC→PBBS	H2: Attitude towards change moderate the relationship between tolerance for ambiguity and the Performance based budgeting adoption system (PBBS)	.,387**	H2 Supported

\*\* Significant at  $\alpha < 0.01$  level; \* Significant at  $\alpha < 0.05$ .

## CONCLUSION

This paper is an attempt to examine the impact of tolerance for ambiguity on the adoption of performance based budgeting system (PBBS). Also examine the moderate role of attitude towards change on the relationship between tolerance for ambiguity and the adoption of performance based budgeting system (PBBS). The findings of this study show that tolerance for ambiguity has direct significant relationship with adoption of performance budgeting system (PBBS). Also shows that attitude towards change moderate the relationship between tolerance for ambiguity and likelihood of PBBS. Moreover, the findings highlight that tolerance for ambiguity and attitude towards change are very important components at the beginning of the adoption of performance based budgeting system (PBBS). The results reveal that the two components namely tolerance for ambiguity and attitude towards change represent high importance in the process of adopting PBBS in Libyan higher learning institutions

This study has made important contributions managers and researchers by filling gaps in the area of the adoption of performance based budgeting system (PBBS). It specifically contributed to the existing practical business applications in terms of the adoption of budgeting methods in public sectors.

This study has several important theoretical and practical implications to the adoption PBBS research literature. The study contributes to the behavioral accounting research field by testing the proposed variables simultaneously in a PBBS adoption model using a moderated approach. The results of this study demonstrate the importance of considering individual psychological differences including tolerance for ambiguity as determinants of PBBS adoption. The present study also provides accounting, and financial managers with an understanding of the importance of tolerance for ambiguity and attitude towards change in adoption of new systems. Higher learning institutions could utilize this knowledge to improve effectiveness and efficiency.

This research suffers from some limitations and considers the impact they have on the research conclusion. First, although the results from this study are useful for describing the characteristics of a large population, the generalization of the results is limited to the government based organizations particularly higher education institutes

Second, findings must be used cautiously since the study is limited by its nature to a cross sectional data. A longitudinal study may be a more suitable approach to study the adoption of PBBS. Thus the conclusions related to the causality of relationships among the variables should be treated cautiously.

Third, non-response bias is always an issue with survey-type research although a good response rate is evident in this research (61.7 per cent).

Forth, results discussed in this study also provide the basis for future research in developing a more comprehensive theoretical framework for PBBS adoption.

The implication of this research study is important and significant for PBBS adopters, practitioners, government and academics that have interest in PBBS adoption in Arab regions or other countries. This study has implications for both research and practice. For research, this study is one among a few which empirically test organization adoption model in the context of Libya. For further research, it is suggested to study how leadership style can influence the



PBBS adoption process in public sector, how information networks should be designed to facilitate the PBBS adoption process, how PBBS adoption process is influenced by government regulations? Future studies can look at the adoption from different perspectives by including different factors variables such as management support and information system.

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