# GOVERNMENT ACCOUNTANTS' READINESS FOR ACCRUAL ACCOUNTING ADOPTION IN JORDAN: CRITICAL SUCCESS FACTORS

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## ABSTRACT

This study aimed to examine the critical success factors of government accountants' readiness for adoption of accrual accounting in Jordan. Based on 331 usable questionnaire survey received, data were analysed using the SPSS version 24. Results of multiple regression analysis demonstrated that human resource and information technology contribute significant and positively influences government accountants' readiness for adoption of accrual accounting. Independent sample t-test and one-way ANOVA were performed in this study to assess the mean difference of government accountants' readiness according to demographic attributes. The results demonstrated significant changes in the mean of the endogenous variable between groups of the demographic attributes including; gender, experience, education and specialization or background. This study not only contributes to expanding the literature concerning adoption of accrual accounting in the Jordanian context, but also provides meaningful guideline to the government of Jordan for adopting accrual accounting, as well as providing insights on the critical success factors in the adoption process.

**Keywords**: accrual accounting adoption, Jordan, government accountants' readiness, human resource, information technology

## INTRODUCTION

Jordan seeks to reform its governmental sector and this requires financial elements of good public governance such as transparency, accountability and better decision-making, which can be achieved through a rigorous accounting system such as accrual accounting. In 2015, the government of Jordan successfully adopted cash accounting based on the International Public Sector Accounting Standards (IPSAS)[1], towards the full implementation of IPSAS by 2021 which needs the adoption of an accrual accounting system (Wiggins, Biggs, & Al-Bokairat, 2016; Alghizzawi & Masruki, 2019a). However, it was reported by the Jordanian Ministry of Finance, that the process of adopting accrual accounting in the government of Jordan is still on hold, as it requires qualifying government accountants through upgrading their readiness for this process (JMOF, 2016). The issue of government accountants' readiness for adoption of accrual accounting is widely discussed by several scholars. For instance, Azmi and Mohamed (2014) concluded that, government accountants' readiness is a dominant and essential factor in ensuring a sound accrual accounting adoption process, as well as to guarantee the success of the adoption process at the time planned by the government without any delay. According to Ismail, Siraj, and Baharim (2018), several official reports such as IFAC (1994) & IFAC (2006) have emphasized on government accountants' readiness to be considered before the real change towards accrual accounting takes place.

Government accountants' readiness can be defined as a desire to accomplish changes in the accounting systems of the governments (Alghizzawi & Masruki, 2019b). Consequently, raising government accountants' readiness for adopting accrual accounting requires providing appropriated factors relevant to the success of the change towards the new system (Alghizzawi & Masruki, 2019a). For instance, human resources must be properly managed and trained in order to cope with the new accrual accounting system (Irvine, 2011). In addition, providing sufficient information technology system is a critical issue to ensure a smooth accrual accounting adoption process (OECD/ IFAC, 2017). In the context of accrual accounting adoption, several prior studies have found a significant link between human resource, information technology and government

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1   IPSAS: established by the International Federation of Accountants (IFAC) to organize the governmental financial operations. Based on IFAC (2018), IPSAS consists of 40 standards on accrual accounting and 1 standard on cash accounting.

accountants' readiness and examples include studies by Upping and Oliver (2012), Ahmad, Mazlan, Ahmad, and Pangat (2015) and Maimunah (2016) in the governments of Thailand, Malaysia and Indonesia respectively.

With these evidence, it's important to consider these variables before the actual accrual accounting adoption takes place. To the best knowledge of the authors however, there is a lack of studies regarding this issue in the context of Jordan, despite the government having started preparing a strict plan to proceed for adoption of accrual accounting (Wiggins et al., 2016). Thus, the objective of this study was to examine the influence of human resources and information technology on government accountants' readiness for adoption of accrual accounting in Jordan. Moreover, in this study we considered the role of government accountants' demographic attributes to assess the mean difference of their readiness for adoption of accrual accounting, following the previous literature conducted in the context of readiness for change (Shah & Shah, 2010; Madsen, Miller, & John, 2005), which emphasized on the important role of employees' demographical attributes with readiness for change.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Many developed countries have reformed their public administration systems in the last three decades (Ouda, 2016). The integration of the global economy, globalization and the growth of financial dealings between governments across countries have played a major role in putting pressure on governments to reform their governmental sectors (Meeks & Swann, 2009). Moreover, an increase in the convergence of accounting reports in an accepted structure across countries was one of the stimuli for the governmental reform (Camfferman & Zeff, 2007), especially governmental accounting reform; which means the shifting from a less informative accounting system into a more informative accounting system (Ouda, 2016). Traditional governmental accounting has been designed primarily to meet the legal requirements within different countries, but over time, this has proved to be inadequate in addressing new challenges in public governance. As a result, substantial reforms have been implemented in these countries (Nasi & Steccolini, 2008; Pérez & Hernández, 2007).

The important reform applied in governmental accounting was adopting accrual accounting, which provides better and more accounting information, and thus enhances accountability, transparency and better decision-making (Broadbent & Guthrie, 2008; Ouda, 2004). This revolutionary movement began towards accrual accounting system in parallel with the New Public Management (NPM) reform movement in the late 1980s. New Zealand and Australia, especially in Western governments, have achieved significant positive results in financial management of their governments (Connolly & Hyndman, 2006). The NPM paradigm, supported by market mechanisms and private management, has become a criterion of confidence for many governmental agencies due to the emphasis on outputs as well as performance management in governments (Hughes, 2013). The transition from traditional cash accounting towards an accrual accounting system which will be partially a governmental reform agenda is taken as a mechanism to enhance financial accountability and transparency (Isa et al., 2014). Consequently, it shows a fair and real scene of the operations results and financial position of governments organizations (FEE, 2008).

## The Role of Human Resource

Before any adoption can properly take place, the capacity of human resources has to be determined (Azmi & Mohamed, 2014); accrual accounting must be driven by qualified and competent human resource, which may slow down the transition process without highly developed accounting skills. Irvine (2011) proposed that human resource must be properly managed and trained in order to cope with the new accrual accounting system. Human resource also must be convinced and have positive perceptions that the upcoming change will have positive implications for them (Armenakis, Harris, & Mossholder, 1993). Thus, human resource concerns whether positive or negative, must be addressed prior, during and post organizational change programs. Positive perceptions propel organizational development and future survival, while negative perceptions bring forth frustration and resistance. Failure in organizational change may negatively impact an organization and its employees (Goldstein, 1988; Martin, Jones, & Callan, 2005); which may include loss of time and cost, resulting in the deterioration in organizational performance, development and reputation (Smith, 2005). Therefore, human resource preparation predictors are explored extensively especially on the factors that galvanize human resources for effective and

successful organizational change (Holt, Armenakis, Feild, & Harris, 2007). Based on this discussion, the following hypothesis was developed:

**H1**: Human resource positively influences government accountants' readiness for adopting accrual accounting in Jordan.

## The Role of Information Technology

Information technology is a general term to describe any technology that helps humans in developing, changing, saving and communicating information (Williams, Hutchinson, & Sawyer, 2001). Considered as one of the important factors in supporting the course of an organization through the increase in effectiveness and efficiency, information technology also assists people in creating, processing and process information. Thus, information technology infrastructure poses various threats but is needed in facilitating the adoption of an accrual accounting system through its technical features (Ouda, 2004). The use of computerized information systems as a key component of financial management is important to the extent of being inadvisable for governments to adopt full accrual accounting without the aid of an integrated financial management information system (Khan & Mayes, 2009). Based on this discussion, the following hypothesis was developed:

**H2**: Information technology positively influences government accountants' readiness for adoption of accrual accounting in Jordan.

## METHODOLOGY

This study employed a quantitative approach, which generally serves to assess a phenomenon of interest based on the collection and analysis of numerical data using statistically designed methods (Aliaga & Gunderson, 1999). Accordingly, the questionnaire was used in this study and distributed to the government accountants working in the ministry of finance; Jordan.

In order to achieve the purpose of this study, the simple random sampling strategy was selected given the sameness of the characteristics of the targeted respondents and the need to acquire a representative sample for the population of interest. With that, all members of the targeted population in this study had a similar chance of being selected, which reaffirmed

the statistical validity of the results (Sekaran & Bougie, 2010). Based on Jordanian General Budget Department report (2018), the number of government accountants was 1948. Thus, the sample of this study, based on Krejcie and Morgan (1970), consisted of 321 government accountants in six departments within the ministry of finance; Jordan. However, 375 questionnaires were distributed in this study; each questionnaire was verbally scanned to clean the data from any missing responses. According to Hair, Black, Babin, Anderson, and Tatham (2010), it is better to exclude respondents if the missing value is greater than 50%. Therefore, all questionnaires were verified immediately with the participants. Only 331 questionnaires were collected back and used for subsequent analyses.

Variables measurements were adopted from previous studies. For human resource, 10 items were adapted from Shaw, Gupta, and Delery (2005) and Holt et al. (2007). Meanwhile, 8 items for information technology were adapted from Karimi, Gupta, and Somers (1996) and Zhu, Kraemer, Gurbaxani, and Xu (2006). Government accountants' readiness, 9 items developed based on Kwahk and Lee (2008) and Bosmans, Pieters, and Baumgartner (2010). Respondents were asked to assess their level of agreement using a five-point Likert scale to motivate a higher response rate and quality where the respondents were prompted to complete the questionnaire survey with ease (Babakus & Mangold, 1992). After that, the instrument was translated into Arabic due to the respondents of this study coming from an Arab country.

Prior to data collection, the authors submitted the instrument to 10 government accounting experts to validate it. The feedback from the experts on the variables of the study were consistent with measurements taken from existing literature. The instrument was prepared in accordance with the findings in existing literature.

In addition, the content validity of the developed instrument in this study was examined to confirm its validity and reliability. According to Rubio, Berg-Weger, Tebb, Lee, and Rauch (2003), the developed content should be evaluated and ambiguous items should be identified. The Content Validity Index (CVI) is the most commonly used means to quantify the content validity of multi-item scales. The assessment of content validity in this study was based on the representativeness of the measurement scale (e.g., how the items represent the content domain), according to a four-point

rating scale. As recommended by Davis (1992), the value of 0.80 is typically set as the lower limit of acceptability for the CVI. In other words, items with an index score of more than 0.80 were retained whereas those with an index score of lower than 0.80 were removed from this study. Thus, 2 items of human resource as well as 2 items of government accountants' readiness were removed from the instrument based on consensus of the experts.

## Pilot Study

The final step in the development of the instrument involved a pilot study. It is one of the central steps in testing the research protocols, such as the method used for sample selection and data collection and the appropriateness of the developed instrument (Abu Hassan, Schattner, & Mazza, 2006), the distribution and collection of questionnaire surveys, formatting, wordings, and measurement scale used, and the arrangement of items (Lancaster, Dodd, & Williamson, 2004). However, after distributing 60 questionnaires, the results of Cronbach's Alpha coefficient showed that the value for all items of Human Resource is 0.925, Information Technology is 0.912 and Government Accountants' Readiness for Accrual Accounting Adoption is 0.856. Hence, items that recorded values of 0.70 and above are said to demonstrate adequate level of reliability following Nunnally and Bernstein (1994). Therefore, the results demonstrated an adequate level of reliability.

## RESULTS AND DISCUSSION

### Descriptive Findings

The demographical findings of this study provided insights on the key characteristics of government accountants that were expected to experience change in the accounting practices in government department. The characteristics examined included respondents' gender, work experience, level of education, educational background and classification category[2]. Table 1 depicts the demographical attributes of the respondents:

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2   Classification Category: represents the job description and classification of government accountants working in the government of Jordan regarding the financial potions (Civil Service Council, 2007). First Category: Main Accountant. Second Category: Accountant. Third Category: Assistant Accountant.

**Table 1: Demographical Attributes of the Study**

| # | Profile | Frequency | Percentage | Cumulative percentage |
|---|---|---|---|---|
| Gender | Male | 205 | 61.9 | 61.9 |
| | Female | 126 | 38.1 | 100 |
| Experience | Under 5 year | 42 | 12.7 | 12.7 |
| | 6-10 year | 58 | 17.5 | 30.2 |
| | 11-15 year | 95 | 28.7 | 58.9 |
| | 16-20 year | 52 | 15.7 | 74.6 |
| | 21-25 year | 63 | 19 | 93.7 |
| | 26-30 year | 20 | 6 | 99.7 |
| | 31 year and above | 1 | 0.3 | 100 |
| Education | High School | 18 | 5.4 | 5.4 |
| | 2 Year Diploma | 50 | 15.1 | 20.5 |
| | Bachelor | 205 | 61.9 | 82.5 |
| | Master | 49 | 14.8 | 97.3 |
| | Doctorate | 9 | 2.7 | 100 |
| Background | Accounting and finance | 230 | 69.5 | 69.5 |
| | Law and political science | 6 | 1.8 | 71.3 |
| | Information technology | 33 | 10 | 81.3 |
| | Public administration | 18 | 5.4 | 86.7 |
| | Others | 44 | 13.3 | 100 |
| Category | First category | 252 | 76.1 | 76.1 |
| | Second category | 58 | 17.5 | 93.7 |
| | Third category | 21 | 6.3 | 100 |

Table 1 shows that the majority of the respondents were male (61.9 %), while female was 38.1%. The findings demonstrated that the majority of the respondents' experience was between 11-15 years (28.7%), followed by 21-25 years (19%). This implied that the respondents had sufficient experience regarding government transactions. Thus, it increased the credibility of the answers in the distributed questionnaires.

With respect to education level of the respondents, the majority of respondents' had a Bachelor's Degree (61.9%). This implied that the respondents are knowledgeable in answering the distributed questionnaires.

The majority of the respondents were qualified in Accounting and Finance (69.5%), followed by other disciplines such as Economics (13.3%).

These percentages reflected the awareness of the government in Jordan for the difficulty and complexity of government transactions, which requires appointment of specialists to deal with, particularly with today's issue; adoption of accrual accounting. This, in turn, gives a positive indicator of the respondents' knowledge in answering the distributed questionnaires from the specialization side.

The majority of the respondents belonged to the first category (76.1%). The preceding description explains that, the laws and regulations in the government of Jordan take into consideration career promotions of its accountants, each according to the education level and years of experience. This, in turn, gives a positive indicator of the respondents' knowledge in answering the distributed questionnaires from the practical side.

## Normality Test

Prior to hypotheses testing using regression analysis, data were tested to ensure whether it is normally distributed. Data with a non-normal distribution would appear to skew to the left or to the right due to the presence of kurtotic variables (Brown, 2012), resulting in misleading outcomes in terms of the relationships between the variables under study and the significance of these relationships. The uni-variate normality is assessed according to the values of skewness and kurtosis. The value of skewness should be within the values of ±2 and the value of kurtosis should be within the values of ±7 (Olsson, Foss, Troye, & Howell, 2000; Ho, 2006).

Data for this study showed that the values of skewness ranged between -1.029 and -0.227, while the obtained values of kurtosis ranged between -0.278 and 1.949. In other words, the obtained data for all items was normally distributed.

## Descriptive Results

Table 2 below provides the descriptive results of Human Resource and Information Technology as independent variables along with Readiness of Government Accountants for Accrual Accounting Adoption as the dependent variable.

**Table 2: Descriptive Results**

| Variable | Minimum | Maximum | Mean | Std. Deviation |
|----------|---------|---------|------|----------------|
| Mean HR | 1.13 | 4.88 | 3.5585 | .64471 |
| Mean IT | 1.00 | 5.00 | 3.6684 | .57838 |
| Mean GAR | 1.71 | 5.00 | 3.7566 | .61706 |

**HR:** Human Resource, **IT:** Information Technology, **GAR:** Government Accountants' Readiness.

Table 2 above demonstrates that on average, human resource recorded 3.6 as a mid-point, implying that, government accountants have the skills needed to deal with accrual accounting as a result of their experience, training and attendance in relevant workshops. In addition, the majority of government accountants believed that the process of accrual accounting adoption is a step in the right direction to reform the governmental sector and thus, accrual accounting adoption will be beneficial to the government in general and government accountants in particular.

In addition, a mid-point of 3.7 was achieved for information technology, implying that the government of Jordan used information technology systems suitable for its work and activities. On average, government accountants consider information technology systems appropriate for them, showing their satisfaction to the used information technology systems. The results also showed that the government of Jordan appointed information technology specialists who understand the needs of government accountants to do their work in an appropriate manner. Moreover, government accountants believe that the used information technology systems support the process of accrual accounting adoption.

Lastly, a mid-point of 3.8 was achieved for the government accountants' readiness for accrual accounting adoption, implying that that the majority of government accountants were ready for accrual accounting adoption, looking forward for the adoption process as well as supporting the process. Besides that, the government accountants showed their willingness to realize the adoption process, which is as a result of their inclination for new ideas along with suggesting new approaches for work inside the government of Jordan.

Using the SPSS version 24, the results of multiple regression analysis demonstrated that the human resource and information technology positively influence government accountants' readiness for accrual accounting adoption in Jordan as indicated in Table 3. Thus, H1 & H2 are supported. This is in line with the prior studies (Upping & Oliver, 2012; Ahmad et al., 2015; Maimunah, 2016), which discovered a significant association between these variables.

**Table 3: Multiple Regression Results**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | .735 | .169 | | 4.363 | .000 |
| Mean HR | .493 | .041 | .515 | 12.047 | .000 |
| Mean IT | .346 | .046 | .324 | 7.583 | .000 |

$GAR = \alpha_0 + \gamma_1 * \beta_1 HR + \beta_2 IT + \varepsilon$

a. Dependent Variable: Mean GAR
**Note:** *Significant at 1% level

## Comparative Test

Independent sample t-test and one-way ANOVA were performed in this study to assess the mean difference of the dependent variable according to the (1) gender, (2) working experience, (3) education level, (4) specialization or background and, (5) classification category of respondents. Before performing the independent sample t-test to determine the mean difference of the dependent variable between male and female respondents, the homogeneity of variances between both samples (of male and female) were compared (whether the samples demonstrated equal variance) based on the results of Levene's test. When the samples demonstrate equal variance (p-value > 0.05), the null hypothesis of equal variance is accepted where the obtained mean difference may occur based on random chance. Otherwise, the null hypothesis of equal variance is rejected when the p-value is less than 0.05 (significant). Table 4 shows the results of the Levene's test for examining the equality of variance between the groups of gender.

**Table 4: Results of Levene's Test for the Groups of Gender**

| Gender | |
|---|---|
| F-Statistic | 5.137 |
| P-value | 0.024 |
| Equal Variances Assumed | No |

The obtained results of Levene's test revealed a p-value of 0.024 (< 0.05) at 0.05 level. Hence, the null hypothesis of equal variance was rejected in this case.

Table 5 below presents the results of independent sample t-test according to the gender of respondents. In this case, the null hypothesis assumed the mean difference of endogenous variable is not significantly different between male and female respondents (p-value > 0.05).

**Table 5: Results Independent Sample T-test for the Groups of Gender**

| Gender | |
|---|---|
| Male (n = 205) | 3.898 |
| Female (n = 126) | 3.532 |
| Mean Difference (Δ) | 0.367 |
| T – Statistics | 5.207 |
| Degree of Freedom (DF) | 225.280 |
| P-value | 0.000 |
| Significant Difference | Yes |

The mean difference of the dependent variable between the male and female respondents recorded 0.367 with a p-value of less than 0.05. Furthermore, the male respondents recorded significantly higher mean value of dependent variable compared to the female respondents in this study.

Apart from the independent sample t-test, one-way ANOVA was conducted as another comparative test in this study. The analysis specifically involves an analysis of variance between a single independent variable and dependent variable. In this study, the analysis assessed the mean difference of endogenous variable according to the different demographic attributes. Similar to the independent sample t-test, the samples should satisfy the assumption of one-way ANOVA, specifically the homogeneity of variances. The Levene's test was also performed for the samples prior

to subjecting the data to one-way ANOVA. When the samples demonstrate equal variance (p-value > 0.05), the null hypothesis of equal variance is accepted. Otherwise, the Welch ANOVA test was conducted instead. Table 6 shows the results of Levene's test for examining the equality of variance.

**Table 6: Results of Levene's Test for Testing Equality of Variance**

| Groups | F | p-value | Equal Variance |
|---|---|---|---|
| Experience | 2.227 | 0.051 | Yes |
| Education | 0.645 | 0.630 | Yes |
| Background | 1.979 | 0.097 | Yes |
| Category | 1.694 | 0.110 | Yes |

As shown in Table 6, the samples demonstrated equal variance for all demographic attributes. The null hypothesis of equal variance was accepted (p-value > 0.05). In this case, the mean difference of the endogenous variable between different groups of each demographic attribute may occur based on random chance. Hence, this study ensued with the one-way ANOVA to assess the mean difference of endogenous variable between different groups of demographic attributes as presented in Table 7.

**Table 7: Results of One Way ANOVA Tests**
**for Government Accountants' Readiness**

| Groups | One Way ANOVA | | | Significant Difference |
|---|---|---|---|---|
| | F | DF | p-value | |
| Experience | 6.757 | 330 | 0.000 | Yes |
| Education | 13.492 | 330 | 0.000 | Yes |
| Background | 2.773 | 330 | 0.027 | Yes |
| Category | 1.084 | 330 | 0.339 | No |

As shown in Table 7, the results of the one-way ANOVA demonstrated significant changes in the mean of the endogenous variable between groups of the following demographic attributes (p-value < 0.05): (1) working experience, (2) education level, (3) specialization or background.

## CONCLUSION

This study discovered that, human resource positively influences government accountants' readiness for adoption of accrual accounting. Accordingly, more intensive training and workshops are recommended for government accountants in Jordan in order to familiarize them with accrual accounting and to raise their willingness for accrual accounting adoption as well as to convince them about the benefits that will return from this system. Additionally, it is recommended that the government of Jordan recruits more specialists, this in turn will facilitate the adoption process. Besides that, it was found that information technology positively influenced government accountants' readiness for adoption of accrual accounting. Therefore, it's important for the government of Jordan to maintain and develop information technology systems that are used in accordance with accrual accounting adoption requirements. Also recruiting more information technology specialists who understand the work of government accountants and the complexity of accrual accounting (functions of the information technology system) is important. Additionally, independent sample t-test and one-way ANOVA were performed in this study to assess the mean difference of government accountants' readiness according to the demographic attributes. The obtained results demonstrated significant changes in the mean of the endogenous variable between groups of the demographic attributes including; gender, experience, education and specialization or background.

This study is limited by the difficulty to find the literature on the influences of human resource and information technology on government accountants' readiness in the context of Jordan. Therefore, more studies are recommended in this area. For the implications of this study, the developed instrument could be a valuable tool to evaluate the mentioned variables in the government of Jordan. This study also provides meaningful guideline to the government of Jordan for accrual accounting adoption, as well as providing insights on the critical success factors for the adoption process. Lastly, this is the earliest study investigating the changes in government accountants' readiness in the context of Jordan according to their demographical attributes.

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# APPENDIX 1: MEASUREMENTS OF THE VARIABLES

| Variables | Measurements |
|---|---|
| | **Independent Variables' Items** |
| Humane Resource (HR) | I got the training needed for this accrual accounting system; Our organization measure how well our training programs work; Our organization sends us to professional conferences from time to time; There are some tasks that will be required because of this accrual accounting system; I do not think that I can do well (**Removed**); I have the skills needed to make this accrual accounting system work; My experiences make me confident that I will be able to perform successfully after this accrual accounting system made; The complexity of accrual accounting might lead me to resistance the change (**Removed**); I think the government will benefit from this accrual accounting system; In the long run, I feel it will be worthwhile for me if the government adopt accrual accounting system; This accrual accounting system is going to make job easier. |
| Information Technology (IT) | Our IT projects support the business objectives and strategies of our organization; In our organization, the responsibility and authority for IT operations are clear; Our IT function is clear about its performance criteria; The structure of our IT function fits our organization; We constantly monitor the performance of IT function; The IT specialist-user relations in our organization are constructive; Our IT specialist understands our business and the organization needs; Overall, our current IT systems will support this accrual accounting system processes that we need for our organization. |
| **Variable** | **Dependent Variable's Items** |
| Government Accountants' Readiness for Accrual Accounting Adoption (GAR) | I look forward to this accrual accounting system at work; I find most accrual accounting system to be pleasing (**Removed**); Other people think that, I support this accrual accounting system; I intend to do whatever is possible to support this accrual accounting system; I usually support new ideas; I often suggest new approaches to things; I am inclined to try new ideas; I feel ready to start working on the future accrual accounting task; I almost can't wait to start working on the future accrual accounting task (**Removed**). |

Source: (Shaw et al., 2005; Holt et al., 2007; Karimi et al., 1996; Zhu et al., 2006; Kwahk & Lee, 2008; Bosmans et al., 2010).