សាកលវិទ្យាល័យជាតិគ្រប់គ្រង

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Remarks from the Editors

We are pleased to publish this fourth volume of the NUM Research Series which aims to promote the continuing research activities among our faculty members and disseminate their research findings as part of an ongoing process of knowledge sharing with our academic community. Our goal is to promote research activities and publication through a series of volumes of the NUM Research Series. As a university fully committed to promoting a higher quality of academic life, publishing the NUM Research Series is one of the many tasks which will help us to move in this direction.

This fourth volume consists of sixteen articles on a wide range of topics which include: exports and economic growth, ASEAN China trade, sustainable tourism, higher education in Cambodia, experiential learning, consumer behavior and the mobile phone sector, social media and online advertising.

We do believe that through the publishing of the NUM Research Series, which covers a wide variety of academic subjects, will help to make the National University of Management a center of excellence for academic research, discussion and development in Cambodia.

Thank you all very much.

Sincerely,

Hor Peng, Ph.D., Chief Editor
Ly Sok Heng, Ph.D.
Dr. Kang Sovannara
Stephen Paterson, MA

Table of Contents

National University of Management Government Spending and Economic Growth in Cambodia

Dr. Ly Sok Heng[1] and Dr. Chhun Rady[2]

Abstract

In this study, we investigate the short run and long run effects of government spending on the economic growth of Cambodia for the period of 1993 to 2014. For this purpose, the bounds testing approach to cointegration and error correction models are used, developed within an autoregressive distributed lag (ARDL) framework. In term of the value of F-statistic indicates that there are cointegration in the long run. As a result of this study shows that the government consumption and investment have positive impact on the economic growth.

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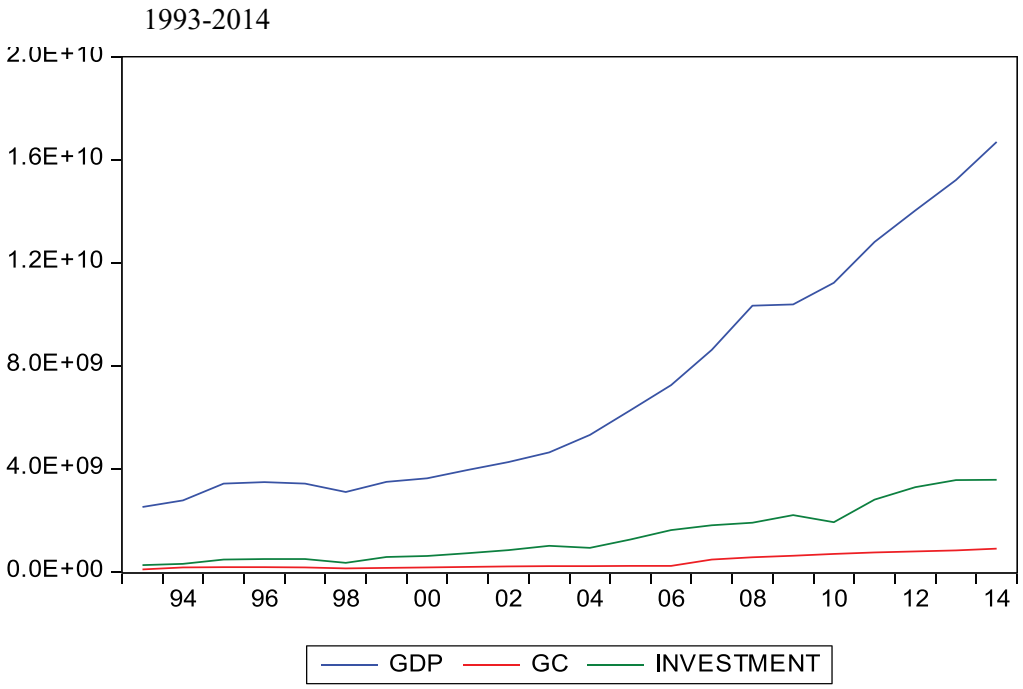
1 Introduction

The relationship between government expenditures and economic growth is one of the most debated issues in economic analysis. The general view is that public expenditure, notably on physical infrastructure or human capital, can be growth-enhancing although the financing of such expenditures can be growth-retarding. Government spending or expenditure includes all government consumption, investment, and transfer payments (Lequiller, 2006). Government final consumption expenditure was defined as expenditure incurred by the general government sector on goods or services that are used for the direct satisfaction of individual needs or wants (individual consumption goods and services) or expenditure on the collective needs of members of the community (collective consumption services). Investment is an essential element to analyze growth, as it increases the economy's production capacity, either expanding the capital stock or incorporating new technology that makes more efficient the production process. Investment or gross capital formation is measured by the total value of the gross fixed capital formation and changes in inventories and acquisitions less disposals of valuables for a unit or sector (International Monetary Fund). According to Keynesian theory, investment affects positively economic growth and depends on the expected return rate of capital. In personal income, transfer payments are income payments to persons for whom no current services are performed. They are payments by government and business to individuals and nonprofit institutions. Lin (1994) points out some important ways in which government can increase growth. These include provision of pubic goods and infrastructure, social services and targeted intervention. As Keynesian economics argue and numerous empirical findings have proven, an increase in government expenditure on socio economic and physical structures encourage economic growth.

Cambodia has made substantial progress in economic reconstruction and economic growth averaged 7 percent a year subsequently. There has been progress in developing the institutions of effective state. The level and effectiveness of government spending has steadily increased, and donor support has remained large (World Bank, 2011). Base on figure 1, Cambodia's GDP decreased in 1998, but it has continued to increase since 1999. Investments had increased step by step and it has growth faster since 2010. Government consumption has also increased step by step until now.

Figure 1. Annual GDP, Government Consumption, and Investments in Cambodia,



The objective of this study is the empirical testing of the relationship between government spending (such as government consumption, investments) and economic growth for the case of the Cambodia economy by using data during 1993 – 2014 whether government spending has positive or negative relationship with economic growth and their short and long-term effects as well as to what extent?

2 Literature Review

Economic theory has explained how government spending may either be beneficial or detrimental to economic growth. In the literature review they did, they found that many empirical studies were carried out to examine the influence of economic growth on government expenditure. For instance, Hsieh and Lai (1994) found no clear evidence in G7 countries as to whether government spending enhances the growth according to the VAR model. However the results had mixed interpretations and conclusions. In some countries government expenditure contributes positively towards the economic growth while some others show opposite results and some do not show any relationship. On the empirical side, employing the ARDL approach to cointegration, using data for the Greek economy covering the period 1958-2004 revealed a long-run equilibrium

relationship between government expenditures and economic output (Katrakilidis and Tsaliki, 2009). Landau (1983) studies the effect of government expenditure on economic growth in 96 countries and finds a negative relationship between government spending and economic growth. In addition, Landau (1983) also states that economic theory does not give a clear prediction about the impact of an increase in government expenditure on economic growth. On the other hand, there was the existence of a long run positive relationship between economic growth and government expenditure in Malaysia for the period of 1950-1992 (Sinha, 1998). Branson (1989) states that government expenditure raises aggregate demand that will lead to an increase in output. However, Khalifa (1997) found no consistent evidence that government spending can increase Saudi Arabia's per capita output growth. For this reason, the impact of government spending may vary depending on the component of government expenditures (Barro, 1990)

Government consumption spending has a negative impact on growth (Tanninen, 1999). Productive spending has a positive, while non-productive spending has a negative impact on growth (Hansson and Henrekson, 1994). Non-productive spending had no effect on growth in the advanced countries but a positive impact in the developing countries (Lin, 1994). An increase in government investment expenditures enhances productivity and consequently private consumption and real wages. It means that involving government investment expenditures would support Keynesian outcome (Turnovsky and Fisher, 1995). Public investment has no significant effect on growth rates (Barro, 1991). Public investment in developing countries is often used for unproductive and inappropriate projects (Pritchett, 1996). There is a strong relationship between economic growth and public investment in transportation and communication (Easterly and Rebelo, 1993). In addition, public and private investment impacted positively on economic growth in the short and long run process (Haque, 2013). In this case, the analysis found that changes in government consumption or changes in government investment can contribute to economic growth is that the findings as with the aggregated approach are mixed.

3 Methodology and Data Analysis

Annual time series data was used in exploring the relationship between the government spending and economic growth in Cambodia. In applying this study, data sourced from the World Bank and IMF for the period 1993 to 2014. The description of variables used in this research study was given as under:

$$\mathbf{LnGDPt = \beta 0 + \beta 1 LnGCt + \beta 2 LnINVt + ut \quad (1)}$$

All variables such as GDP, GC, and INV represent, respectively, Gross Domestic Products , Government Consumptions, and Total Investments. The parameters β1and β2 measure, respectively, the government consumption and total investment elasticities. ut is the long run random disturbance term.

3.1 Unit Root Test

The first step requires that the unit root test be conducted in order to determine whether the series are stationary in levels I(0) or non-stationary in levels, but stationary in first differences, that is integrated of degree one I(1). According to Phillips(1987), for a set of variables found to be integrated of order one or I(1) but not cointegrated, any regression involving the levels of these variables is spurious. The augmented Dickey-Fuller (ADF) or Phillips-Perron (PP) test was performed. A version of test was performed, that is, with a constant and trend. To further enhance the quality of the results in the ADF or PP test, we included a number of lagged differences according to the Schwarz Information Criterion (SIC; Schwarz 1978). Inclusion of the optimum number of lagged differences ensures that the error becomes approximately white noise. The regression equation for the ADF test is as follows:

$$\Delta X_t = \mu + \beta t + \gamma X_{t-1} + \delta_1 \Delta X_{t-1} + \delta_2 \Delta X_{t-2} + \cdots + \delta_{p-1} \Delta X_{t-p-1} + e_t \ (2)$$

Where e_t niid (0, δ^2), X_t represents a time series, Δ implies the first difference of the natural logarithm of the series, and t is the time trend. This equation corrects for higher order correlation by adding lagged differences of the series X_t to the regressors. The null hypothesis in this test is unit root or non-stationary, while the alternative hypothesis is the series X_t is stationary, requiring X to be negative and significantly different from zero.That is, H0: X = 0; H1: X < 0. The null hypothesis of a unit root is rejected against the one-sided alternative if the ADF or Phillips-Perron (PP) test-statistic is less than (lies to the left of) the critical value.

The study used two different tests, i.e. Augmented Dickey Fuller (ADF) test, Phillips-Perron (PP) test for finding unit roots in time series. LnINV variable was stationary in levels, I(0) and other two variable (LnGDP and LnGC) were stationary at first difference, I(1). Hence, all three tests were undisputedly declared that all the variables were stationary at level, I(0) and integrated of order one, i.e. I (1) as shown in Table 1.

TABLE 1
Unit Root Test

	Augmented Dickey Fuller test statistic		**Phillips-Perron Test Statistics**	
Variables	**Null Hypothesis: Variable is Non-stationary**		**Null Hypothesis: Variable is Non-stationary**	
	Level	First Difference	Level	First Difference
LnGDP	-1.340150	-3.384198*	-1.454959	-3.384198*
LnGC	-1.750549	-4.899450***	-1.861644	-4.913002***
LnINV	- 3.570221*		- 3.679479**	
Test critical values (MacKinnon, 1996)				
1% Level		-4.498307		-4.498307
5% Level		-3.733200	-3.644963	-3.658446
10% Level	-3.277364			

*** implies significant at 0.01 percent probability level
** implies that the coefficient is significant at 0.05 percent probability level
* implies significant at 0.10 percent probability level

1 Testing for co-integration

In practice, some variables are stationary in level, I(0), while others might have I(1), it means that variables are stationary in zero or first differences. If the orders of integration of the variable under study are different, Autoregressive Distributed Lag (ARDL) approach is used for the cointegration of the model (Pesaran and Shin, 1995, 1998; Pesaran et al, 1996; Pesaran et al, 2001). It is argued that ARDL has a numerous. The first advantage of ARDL is that it can be applied irrespective of whether underlying regressors arepurely1(0), purely1(1) or mutually co-integrated (Pesaran and Pesaran 1997). The second advantage of using the bounds testing approach to co-integration is that it performs in small samples. The third advantage of this approach is that, the model takes

sufficient number of lags to capture the data generating process in a general-to specific modeling framework. Finally, ARDL is also having the information about the structural break in time series data.

An ARDL representation of Equation (1) is convered as follows

$$\Delta(\boldsymbol{LnGDP}) = \boldsymbol{a} + \sum_{\boldsymbol{i=1}}^{\boldsymbol{n}} \boldsymbol{b_i}\,\Delta(\boldsymbol{LnGDP})_{\boldsymbol{t-i}} + \sum_{\boldsymbol{i=0}}^{\boldsymbol{n}} \boldsymbol{c_i}\,\Delta(\boldsymbol{LnGC})_{\boldsymbol{t-i}} + \sum_{\boldsymbol{i=0}}^{\boldsymbol{n}} \boldsymbol{d_i}\,\Delta(\boldsymbol{LnINV})_{\boldsymbol{t-i}} + \boldsymbol{\delta_1}(\boldsymbol{LnGDP})_{\boldsymbol{t-1}} + \boldsymbol{\delta_2}(\boldsymbol{LnGC})_{\boldsymbol{t-1}} + \boldsymbol{\delta_3}(\boldsymbol{LnINV})_{\boldsymbol{t-1}} + \boldsymbol{\varepsilon_t}$$

(Model 3)

Investigation of the presence of a long run relationship amongst the variables of Equation (1) is tested by means of bounds testing procedure of Pesaran, *et al.* (2001). The bounds testing procedure is based on the F-stat. or Wald statistics and is first stage of the ARDL cointegration method. Accordingly, a joint significance test that implies no cointegration, (H0: δ_1=δ_2 =δ_3 = 0), should be performed for Equation (2). The F-test used for this procedure has a non-standard distribution. Thus, two sets of critical values are computed by Pesaran, et al. for a given significance level. One set assumes that all variables are I (0) and other set assumes that they are all I (1). If the computed F-statistic exceeds the upper critical bounds value, then the H0 is rejected. If the F-statistic fall into the bounds then the test becomes in conclusive. If the F-statistic lies below the lower critical bounds value, it implies no cointegration.

TABLE 2

Cointegration result of bounds test for lnGDP

Variables: lnGDP, lnGC, lnINV		
Lag	**F-statistics**	**Critical value**
1	1.346306	10% CV [3.17, 4.14]
2	1.021659	5% CV [3.79, 4.85]
3	6.669692***	1% CV [5.15, 6.36]
4	0.808660	

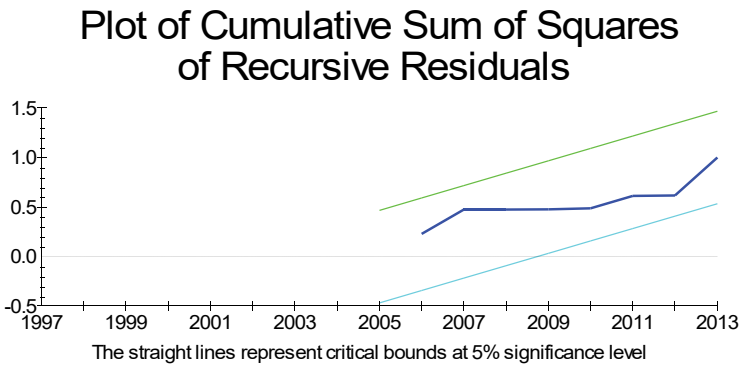
The bounds critical values were obtained from Pesaran et al. (2001); Critical values for the bounds test: Table CI(iii) Case III: Unrestricted intercept and no trend (k = 2) ; ***Significant at 1% level.

Results of long-run relationship are sensitive to lag-length selected in the model (Bahmani-Oskooee and Bohal, 2000). Table 2 presents the computed F-statistic to select optimal lag-length in the model. According to Pesaran et al. (2001), with lag of order 3 the lower and upper bound values at 99 percent significance level are 5.15and 6.36respectively. Table 2 shows that the computed value of F-statistic (6.669692) is greater than the upper bound value of F-statistic which helps us to reject the null hypothesis of no long run relationship. For that reason, we conclude that there is long-run relationship among the variables.

To assess Model 1, concerning the effect of spending components on economic growth imports, we estimated Model 2 by using ARDL approach. We used Schwarz Bayesian Criterion (SBC) to select the optimal lag length of variables included in the ARDL model. The results of dynamic ARDL (1, 0, 0) model are reported in Table 3. Furthermore, based on the goodness of fit of the ARDL model, it is clear from Table 3 that the model is well fitted as it passes all the diagnostic tests. The diagnostic tests revealed no evidence of misspecification. Also no evidence of autocorrelation was found.

Autoregressive Distributed Lag Estimates ARDL(1,0,0) selected based on Schwarz Bayesian Criterion (Dependent Variable = lnGDP)	
Reqressor	**Coefficient and Standard Error**
LnGDP(-1)	0.482099** (0.110072)
LnGC	0.167702** (0.068385)
LnINV	0.281766*** (0.059133)
Constant	2.554903** (0.695003)
***Significant at 1% level. ** Significant at 5% level. R^2 = 0.993461, F-stat. = 1013.792[0.000], Serial Correlation = 0.7634[0.8226] Functional Form = 1.9109[0.167] Normality = 0.012283[0.9131] Heteroscedasticity = 1.357030[0.3895]	

FIGURE 1



The study used CUSUM and CUSUMS to determine the steadiness of the model between upper and lower bound critical value lines. The above mention Figure 1 and Figure 2 of CUSUM and CUSUMS shows a reliable pattern between the upper and lower bounded levels which demonstrate the significant and stable relation among the variables under consideration.

FIGURE 2

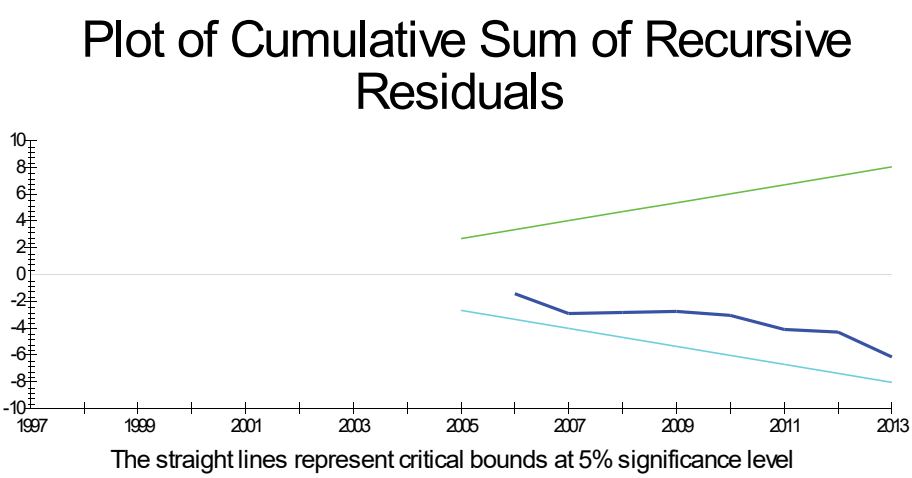


TABLE 4

Estimated Long Run Coefficients using the ARDL Approach ARDL(1,0,0) selected based on Schwarz Bayesian Criterion (Dependent Variable = lnGDP)	
Regressor	**Coefficient and Standard Error**
LNGC	0.323811** (0.096176)
LNINV	0.544054*** (0.083070
Constant	4.933186*** (0.664929)
*** Significant at 1% level ** Significant at 5% level	

After establishing stability and LR relationship, the results of LR coefficients using ARDL approach are presented in Table 4 which presents the results of long-run relationship of the selected ARDL model (1, 0, 0) using SBC. In table 4, the estimates reveal a positive and statistically significant long-run causal effect running from government consumption and total investment towards economic growth (the coefficient of LnGC equal 0.323811 and LnINV equals 0.544054) at 5% and 1% level, respectively. It means that one percent increase in the government consumption, the economic growth increased by 0.33% in long-run and one percent increase in the investment, the economic growth also increased by 0.54% in long-run which indicate that the more government consumption and investments, the more economic growth.

TABLE 5

Error Correction Representation for the Selected ARDL Model ARDL(1,0,0) selected based on Schwarz Bayesian Criterion (Dependent Variable = lnGDP)	
Regressor	**Coefficient and Standard Error**
ΔLnGC	0.167702** (0.068385)
ΔLnINV	0.281766*** (0.059133)
ECM(-1)	-0.517901*** (0.110072)
ECM = LnGDP - (0.3238LnGC + 0.5441LnINV + 4.9332) *** Significant at 1% level. ** Significant at 5% level.	

The next stage of analysis is the estimation of Error Correction Model (ECM) of ARDL (1, 0, 0) for the variable economic growth. After examining LR relationship among variables, the short-run dynamics of these variables can be determined by Error Correction Representation of ARDL model based on Model 1. ECM specification for ARDL (1, 0, 0) model is reported in table 5. The ECM (-1) coefficient indicates how quickly/slowly variables return to equilibrium and it should have a negative sign with high significance. The error correction term, ECM (-1) , shows the speed of modification required to re-establish equilibrium in the short-run model. Bannerjee, etal. (1998) argue that the error correction term is significant at 1 per cent level of significance. The coefficient of ECM (-1) is equal to -0.5179 for the short-run model and implies that deviation from the long-term economic growth is corrected by 51.79 percent over each year. The significant effect of LnGC and LnINV on LnGDP is found in the both SR and LR.

3.2 Conclusion

In this paper offers econometric investigation of the impact of government consumption and investment on economic growth were investigated in the case of Cambodia by employing the ARDL for long run and Error Correction Method (ECM) for short run dynamics. Results show that there are positively significant between the government consumption as well as investment and the economic growth in long-run and short-run. For that reason, the government consumption and investment promote the economic growth to get higher in long run as well as in short run. Application of CUSUM and CUSUMS tests confirm the stability of long run estimates of sample period.

Based on the results of the study, an economic policy proposal may be that the government should manage the effectiveness of public expenditure programs as well as strongly support the investment to foster economic growth in Cambodia.

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NATIONAL UNVERSITY OF MANAGEMENT Topic: "Export and Economic Growth: case in Cambodia"

Keo Kuyly[3] and Dr. Chhun Rady[4]

Abstract

This paper uses Johansen's co-integration analysis and a vector error-correction model to investigate the relationship between export and economic growth in both long-run and short-run in Cambodia during the period 1988-2014. The study finds that real exports and real GDP is cointegrated. It means that the exports have a positive effect on the economic growth in long-run. The result of this study also shows that the exports have a positive effect on the economic growth in short-run. Therefore, promoting exports via export promotion policies will contribute to economic growth in Cambodia.

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[4] Chair of IT Department, National University of Management

1 Introduction

After the new election in 1993, the Royal government tried to rebuild Cambodia that was torn by civil war more than 2 decades. With the support from donor countries and international organization, the process of rebuild was not sufficient, so the government tried to persuade foreign investors come to invest in Cambodia in order to create job for Cambodian people and to produce goods and service for local people as well as export.

Cambodia is a less developing country which has been successful to access into the global economy such as to become a member of ASEAN in 1999 and WTO in 2004. To be a member of ASEAN, Cambodia can improve market access among 10 countries in ASEAN, and a member of WTO is another opportunity that helps Cambodia to get superior market access in a wide range of products and wide range of countries and capacity building. This is an opportunity to attract more foreign investors come to invest in Cambodia for domestic consumption, especially for export to their destination that they used to get MFN and GSP. Among exporting products, garment and footwear industry plays a crucial role in export that the main market is US, EU, ASEAN and other. The growth of export is a factor that made Cambodian economy growth very fast. From 2011 to 2015, the Cambodian's economic growth was stable around 7%[5] . This is to remark that the growth of Cambodian economy was led by export.

Export is a factor that has positive relation with GDP and this factor has more influent on economic growth. This is the reason that Cambodian government try to draft a strategic policy to expand international trade in order to increase economic growth and other benefit such as absorb more capital, technological spillovers, expand production and create more job for local people.

[5] This data is take from world table, World Bank.

2 Literature Review

It is not new about the idea that trade has influence on economic growth. The literature relevant to this idea can divided into 2 categories. The first one developed by some researchers that they focus in developing countries (see Michaely 1977; Balassa 1978; Feder 1982; Chow 1987; Kwan and Cotsomitis 1991). The second category made by another researchers who focus on developed countries (see Kunst and Marin 1989; Marin 1992; Serletis 1992). This paper focuses on the first category.

Export and GDP growth has relationship with each other. There are three relationship between this factor, export-led growth, growth driven exports, and the two-way causal relationship or feedback. Firstly, Michaely M. (1977) found that the countries that exports a large amount of their product seem to accelerate GDP growth faster than the other. Feder (1982) also share similar idea to Michaely (1977) raised that the countries expand their international trade with world have more influence on economic growth. Besides that there are more benefit such as technology spillovers, increasing production and job and other externalities. Secondly, the other researchers tried to prove that the increase of GDP is the main point to increase trade of that country. Bhagwati (1988) expressed that the growth of GDP of a country will lead to an expansion of trade, unless the pattern of growth-induced supply and corresponding demand creates an anti-trade bias. Kunst and Marin (1989) research a case of Austria found the empirical evidence of growth-driven exports. Finally, according to Bhagwati (1988) suggest that the increase in trade will produce more income and more income facilitate more trade. Grossman and Helpman (1991) supported this type of feedback in their models of North-South trade.

GDP growth and export growth seem to be has relationship with each other in complex way. The reason behind this is because of price fluctuations and political intervention influence this relationship. In order to control these factors the term of trade should be included.

The objective of this study is to determine the relationship between export and economic growth in Cambodia through empirical study.

3 Methodology and Data Analysis

Annual time series data was used in exploring the relationship between export and economic growth in Cambodia. In applying this study, the source of data are collect from the World Bank and IMF for the period 1988 to 2014. The description of variables used in this research study was given as:

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All variables such as RGDP, REXP, and RIMP represent, respectively, real Gross Domestic Products, real Exports, and real Imports. The parameters β1and β2 measure, respectively, the Exports, and Imports elasticity and ut is the long run random disturbance term.

3.1 Unit Root Test

The first step requires that the unit root test be conducted in order to determine whether the series are stationary in levels I(0) or non-stationary in levels, but stationary in first differences, that is integrated of degree one I(1). According to Phillips(1987), for a set of variables found to be integrated of order one or I(1) but not cointegrated, any regression involving the levels of these variables is spurious. In addition to Engle and Granger (1987), if variables in equation (1) are integrated of order one 1(1) and cointegrated, then the short-term disequilibrium relationship between them can always be expressed in the error correction form. The augmented Dickey-Fuller (ADF) was performed. Two versions of both tests were performed, that is, with a constant only and with a constant and trend. To further enhance the quality of the results in the ADF test, we included a number of lagged differences according to the Schwarz Information Criterion (SIC; Schwarz 1978). Inclusion of the optimum number of lagged differences ensures that the error becomes approximately white noise. The regression equation for the ADF test is as follows:

$$\Delta X_t = \mu + \gamma X_{t-1} + \delta_1 \Delta X_{t-1} + \delta_2 \Delta X_{t-2} + \cdots + \delta_{p-1} \Delta X_{t-p-1} + e_t \ (2)$$

Where e_t niid (0, δ^2), X_t represents a time series, Δ implies the first difference of the natural logarithm of the series, and t is the time trend. This equation corrects for higher order correlation by adding lagged differences of the series X_t to the regressors. The null hypothesis in this test is unit root or non-stationary, while the alternative hypothesis is the series X_t is stationary, requiring X to be negative and significantly different from zero. That is, H0: X = 0; H1: X < 0. The null hypothesis of a unit root is rejected against the one-sided alternative if the ADF or Phillips-Perron (PP) test-statistic is less than (lies to the left of) the critical value.

The study used two different tests, i.e. Augmented Dickey Fuller (ADF) test, Phillips-Perron (PP) test for finding unit roots in time series. All these tests revealed that all the variables were non-stationary in levels and stationary at first difference which is the common phenomenon in most of the economic time series. Hence, all three tests were undisputedly declared that all the variables were integrated of order one, i.e. I (1) as shown in Table 1.

TABLE 1
Unit Root Test

	Augmented Dickey Fuller test statistic		**Phillips-Perron Test Statistics**	
Variables	**Null Hypothesis: Variable is Non-stationary**		**Null Hypothesis: Variable is Non-stationary**	
	Level	First Difference	Level	First Difference
RGDP	-1.802986	-5.746703***	-1.920690	-5.695002***
REXP	4.371272	-3.432454**	2.339962	-3.413281**
RIMP	3.528717	-2.785961*	3.528717	-2.836037*
Test critical values (MacKinnon, 1996)				
1% Level	-3.711457		-3.711457	
5% Level	-2.981038		-2.981038	
10% Level	-2.629906		-2.629906	

*** implies significant at 0.01 percent probability level
** implies that the coefficient is significant at 0.05 percent probability level
* implies significant at 0.10 percent probability level

3.2 Testing for co-integration

When all the variables are non-stationary at their level but stationary in their 1st difference or I(1), this allows proceeding further for the implementation of Johansen co-integration technique. Cointegration test was used to identify equilibrium or a long-run relationship among the variables. If there was a long-run relationship between variables, then divergence from the long-run equilibrium path was bounded and the variables were co-integrated. There are many possible tests for cointegration, the most general of them is the multivariate test based on the autoregressive representation discussed in Johansen (1988) and Johansen and Juselius (1990). The Johansen maximum likelihood method provides two different likelihood ratio tests, the trace test and the maximum eigenvalue test, in order to determine the number of cointegrating vectors (Hendry and Juselius, 2001). Besides, lag length would be chosen using VAR model on the basis of minimum values of Final Predication Error (FPE), Schwarz Information Criterion (SIC), Akaike Information Criterion (AIC), and Hannan and Quinn information criterion (HQ). It means that this procedure provides framework for cointegration test in the context of vector autoregressive approach. The criteria AIC selected lag length of 4. The maximum eigenvalue test (λ max) and the trace test (λTrace) are applied.

TABLE 2
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.968003	**121.2919**	**29.79707**	0.0000
At most 1 *	0.803145	**45.56513**	**15.49471**	0.0000
At most 2 *	0.359724	**9.808832**	**3.841466**	0.0017

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

TABLE 3
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.968003	**75.72672**	**21.13162**	0.0000
At most 1 *	0.803145	**35.75630**	**14.26460**	0.0000
At most 2 *	0.359724	**9.808832**	**3.841466**	0.0017

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The results for both Trace statistic and Maximal Eigen statistic were reported in Table 2 and Table 3 respectively. Both tests, i.e. the Trace statistic and the Maximal Eigen statistics recognized one cointegrating vectors, therefore, the study used one cointegrating vectors in order to establish the long-run relationships among the variables.

3.3 Long-run relationship

After normalization the first cointegrating vector on Real GDP normalized cointegrating coefficients were estimated as follows:

$$RGDP = 0.706259REXP - 1.067820RIMP$$

$$(0.16369) \qquad (0.16258)$$

According to the first normalized equation, RGDP showed significantly negative relation with RIMP in long-run. On the other hand, normalized equation also showed that there was a significantly positive relationship between RGDP and REXP. It is clear that exports and imports have been very strong impact on GDP in Cambodia. It indicates that the economic growth increase when the exports increase, but the economic growth decrease when the imports increase.

3.4 Vector Error Correction Model

According to Granger (1987) representation theorem, if a cointegrating relationship exists between a series of I(1) variables, then a dynamic error-correction representation also exists. All three tests were undisputedly declared that all the variables were integrated of order one, i.e. I (1) as shown in Table 1. Covert (1) to VECM as follows:

$$\Delta RGDP_t = \delta_0 + \sum_{i=0}^{n} \delta_{1i} \Delta RGDP_{t-i} + \sum_{i=0}^{n} \delta_{2i} \Delta REXP_{t-i} + \sum_{i=0}^{n} \delta_{3i} \Delta RIMP_{t-i} + \lambda ECM_{t-1} + \varepsilon_t$$

Where $\boldsymbol{ECM_{t-1}}$ is the error correction term and $\boldsymbol{\varepsilon_t}$ is the mutually uncorrelated white noise residual.

TABLE 4
Vector Error Correction Model Estimates for Real Economic Growth

Error Correction Model	ΔRGDP
ECM (-1)	-0.389292** (0.11075)
ΔRGDP(-1)	0.151927 (0.09275)
ΔRGDP(-2)	0.292454** (0.07534)
ΔRGDP(-3)	0.102465 (0.07525)
ΔRGDP(-4)	0.072973 (0.08139)
ΔREXP(-1)	0.907128*** (0.10615)
ΔREXP(-2)	0.812991*** (0.08530)
ΔREXP(-3)	0.562806*** (0.07126)
ΔREXP(-4)	0.503805*** (0.07547)
ΔRIMP(-1)	-1.096853*** (0.13243)
ΔRIMP(-2)	-0.966011*** (0.10120)
ΔRIMP(-3)	-0.566089*** (0.07833)
ΔRIMP(-4)	-0.450855** (0.08966)
C	-8.727985** (1.77031)

***Significant at 1% level.
** Significant at 5% level.

Adjusted R^2 = 0.905028, F-statistic = 16.39369 (0.000239)
Serial Correlation LM test = 1.893277[0.3880]
Normality (JB) test = 0.05045[0.975091]
Heteroscedasticity test = 8.839679 [0.8857]

In order to capture the short-run dynamics of the model, error correction mechanism was applied. The results of vector error correction model were reported in Table 4. The coefficients of ECM(–1) showed the speed of adjustment of disequilibrium in the period of study. As the error correction term was significant with negative signs, hence the results of vector error correction model (VECM) depicted that the adjustments in RGDP was due to the error correction term (ECM). The estimated coefficient of the EC suggests the last period disequilibrium is corrected by about 38.93% or more in the next year. This research also found that the exports and imports have effect on the economic growth in the short run.

5 Variance Decomposition Method (VDM)

The variance decomposition provided further evidence of relationships among the variables under investigation. The variance decomposition showed the proportion of the forecast error of one variable due to the other variables. Therefore, the variance decomposition makes possible to determine the relative importance of each variable in creating fluctuations in other variables (Ratanapakorn and Sharma, 2007). The results of variance decomposition approach start from Table 5.

The results consider that a 40.74 per cent portion of economic growth is explained by its own innovative shocks after 24 months While REXP explained 47.97 percent impact on economic growth and innovative shocks of RIMP contribute to economic growth by 11.28 per cent.

TABLE 5
Variance Decompositions

Variance Decomposition of RGDP				
Period	S.E.	RGDP	REXP	RIMP
1	2.359647	100.0000	0.000000	0.000000
2	5.750781	40.74433	47.97222	11.28345
3	8.017691	45.87646	34.26662	19.85693
4	10.56364	46.74565	27.36824	25.88611
5	13.19759	47.54149	23.04759	29.41092
6	15.35707	49.15259	18.79004	32.05737
7	16.86026	47.57192	22.64729	29.78079
8	18.55758	44.18261	30.05726	25.76014
9	20.65020	36.28235	42.47500	21.24264
Variance Decomposition of REXP				
Period	29.30618	6.397205	93.60280	0.000000
1	42.26389	4.756625	94.34027	0.903110
2	69.59999	6.169639	73.36702	20.46334
3	95.95733	6.014193	70.65094	23.33487
4	139.0259	7.174084	66.30717	26.51875
5	164.7390	5.750534	70.08490	24.16456
6	178.5703	6.501958	67.77234	25.72570
7	185.2947	6.052164	69.64954	24.29830
8	188.2033	6.144323	70.29958	23.55610
9	197.4680	5.988589	72.52911	21.48230
Variance Decomposition of RIMP				
Period	S.E.	RGDP	REXP	RIMP
1	21.47746	41.74851	31.25246	26.99903
2	29.25036	42.95493	28.59370	28.45136
3	35.53695	31.94174	48.52239	19.53587
4	48.48616	17.40129	64.93636	17.66235
5	88.21690	8.432657	69.35480	22.21254
6	116.5933	6.373210	71.40338	22.22341
7	141.2276	7.790349	66.22223	25.98742
8	148.8194	7.048573	68.44301	24.50842
9	151.2460	6.934197	69.31460	23.75121

4 Conclusion

The present study was intended to determine the causal linkage between exports and economic growth by incorporating one additional relevant variable for a recent time period. All the series used in this analysis was found non-stationary at levels but stationary at first difference. Empirical evidence from Johansen's multivariate framework suggests that exports, imports, and economic growth are cointegrated in Cambodia. The co-integrating relationship shows that exports have a positive effect and imports have a negative effect on GDP in the long-run. Furthermore, The VECM analysis depicted that exports also have a positive effect and imports have a negative effect on GDP in short-run. The coefficient of ECM (–1) was significant showing speedy adjustment.

From the study's findings, public policies that put forward emphasis on export growth and on domestic production are recommended. The policy implication is that the government of Cambodia should continue to pursue policies aimed at promoting export oriented measure and reduce imports.

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Factors behind the Price of Oil: Vector Error Correction (VEC) Analysis

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Abstract

The current paper observes the factors behind the oil price. We use monthly statistics in order to analyze the relation between Europe Brent Spot Prices, S&P 500 Futures, Gold Futures, production of crude oil by OPEC member states, U.S. Crude Oil Rotary Rigs in operation and Crude Oil stocks in OECD member states. The results suggest that there is a cointegration between these variables. However, only two variables, Number of Rotary Rigs in US and Stocks in OECD, appear significant and have a short-run causality on the price of oil. Moreover, Price of oil (Brent), Production of OPEC and the number of Oil rigs appear to have a long-run relation. We have also established the existence of Granger Causality between stocks of crude oil in OECD countries and the price of oil. Our study concludes that the oil production of US and the policies of OECD member states have a significant impact on the oil price.

Key words: *Oil price, Vector Error Correction Model, cointegration, factors, OECD, OPEC, Granger Causality.*

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1 Introduction

Oil is one of the most used sources of energy in the world. This commodity is a crucial factor for economic growth because it is used to supply energy to the industry, heat homes and transport people and goods. Thus, crude oil is characterized by low price elasticity. When we analyze the demand of oil, we observe that on world level the average growth of oil consumption in the last 13 years is around 1.36%. It is mainly driven by the rapid growth of some developing countries such as China. In 2013, oil was the most common source of energy, it accounted for 32.9% of the world energy consumption, followed by coal (23.7%) and natural gas 30.1%). Oil is a driving force for industrialization of many countries. Member states of the Organization of Economic Cooperation and Development (OECD) account for 49.2% of the world oil consumption. According to the statistics of British Petroleum, between 2000 and 2013, OECD decreased their consumption by 4% (138 million tons of oil), while Non-OECD increased their demand by 5% (804 million tons). On a country level, the biggest consumers are the European Union and USA with 605.2 and 831 million tons respectively. Japan is also a major oil consumer - 208 million tons in 2013. Some developing countries increased dramatically their oil demand. For instance, China has an average annual growth of about 7% per year. The country is also the third biggest oil consumer. Other emerging countries with important roles in the oil demand are India and Brazil, which consumed respectively 175.2 and 132.7 million tons of oil. According to different projections of Energy and Information Administration, it is expected that until 2040, oil would be the primary source of energy and the demand will increase by an average annual rate of around 0.5%. The main factors driving the oil demand up are the population growth, the economic growth and the rapid industrialization of developing countries. On the other hand, major factors such as adoption of new energy efficient technologies, an increased focus on low energy-intensive industries and limited population growth are the main forces pushing down the oil demand in developed states.

Regarding the supply side of oil, issues do not look very predictable. In 2015, the world oil supply was 94.5 mb/day[8] , of which 45.7% was produced by members of Organization of Petroleum Exporting Countries (OPEC). OPEC could be defined as a cartel of the following 14 countries: Algeria, Angola, Ecuador, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, U.A.E. and Venezuela. Even though these countries account for a considerable amount of oil production, the agreement on quotas and oil policies is very difficult to be achieved. Moreover, a lot of crude oil is produced by non-OPEC countries. In the recent years we have observed a sharp increase in oil supply in the US, Canada and Russia. Thus, we could suggest that this

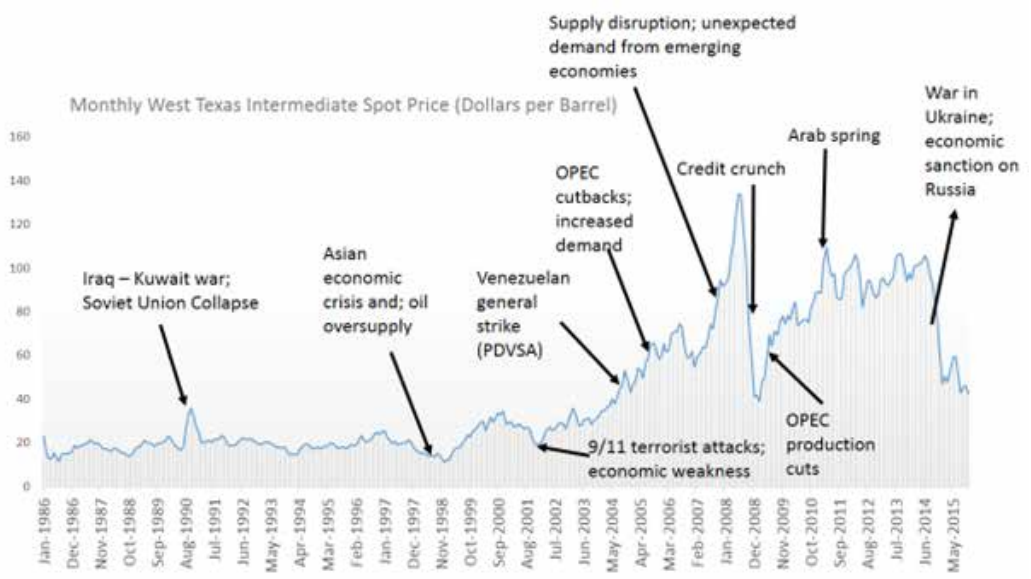
[8] Million barrels per day

cartel is not very stable and *"if OPEC's agreements will not work, its members will have no reason to stick to them" (The Economist, 2016).* Oil is a finite resource and sooner or later it will finish and probably would be replaced with another more sustainable source of energy. The stable demand however, requires oil companies to discover new resources and to improve constantly the technology in order to expand the exploration of new reserves, enhance mobility, improve efficiencies, and find new uses and applications for energy, oil and its derivatives (OPEC, 2015). According to the statistics of HIS[9] , since 2000 upstream capital and operating costs have increased by almost 100%. Therefore, in periods of low oil price, drilling activities in US and oil extraction from tar sand in Canada become less competitive and the supply from these regions tend to reduce. The biggest and most accessible reserves of oil are situated in the Middle East. Another factor that should be considered is the amount of crude oil stocks in OECD countries. In the short run, high level stocks could keep the price low.

The factors on the demand-and-supply side make the prediction of the oil price very difficult. Since 2014, it seems that the supply factors have played a somewhat larger role than demand factors in driving the 50 percent drop in the price of oil between mid-2014 and early 2015 (Husain et al., 2015). In addition, we have political factors such as specific policies in order to avoid oil shortages like during the 1973 Oil Crisis and the 1979 Energy Crisis. In his essay The First Law of Petropolitics, Thomas L. Friedman (2006) stated: "*When I heard the president of Iran, Mahmoud Ahmadinejad, declare that the Holocaust was a "myth," I couldn't help asking myself: "I wonder if the president of Iran would be talking this way if the price of oil were $20 a barrel today rather than $60 a barrel." When I heard Venezuela's President Hugo Chávez telling British Prime Minister Tony Blair to "go right to hell" and telling his supporters that the U.S.-sponsored Free Trade Area of the Americas "can go to hell," too, I couldn't help saying to myself, "I wonder if the president of Venezuela would be saying all these things if the price of oil today were $20 a barrel rather than $60 a barrel, and his country had to make a living by empowering its own entrepreneurs, not just drilling wells."*

[9] https://www.ihs.com/index.html

Figure 1: Oil price shocks due to external factors



Finally, a part of the oil price could be related to the market speculations. Traders are playing a growing role in the oil value chain. In the past few years, traders have moved beyond trading and into the oil and gas value chain, taking significant positions in the storage of oil and also in the upstream and downstream sectors.

Due to its specification, explaining the factors behind the oil price by applying econometric models is not an easy task. Most of the researchers have used Vector Auto Regression (VAR) models to capture the linear interdependencies among multiple time series and Error Correction Model (ECM) where the underlying variables have a long-run stochastic trend (cointegration).

2 Review of Literature

Considering the stochastic? nature of the oil price and the fact that most of the shocks are not associated with the demand or supply, applying an appropriate econometric model is not an easy task. Two types of models have been used by researchers to analyze the relationship between the price of oil and other variables. Liner models such as Vector Autoregressive Models (VAR) and Vector Error Correction Models (VECM). VAR is a statistical method that is able to capture the linear interdependencies among multiple series, predict the impulse response functions and forecast the variance decompositions for the empirical model (Phoong et al., 2013). VECM has the same features, but in addition we include an error-correction feature to a multi-factor model. The second type of models is Markov Chain - Vector Autoregressive (MC-VAR) models. The MS-VAR model is a generalization of the basic finite order of VAR model. The general idea of the model is that the observed time series vectors are dependent on the unobserved regime variable (Phoong et al., 2013).

Table 1 shows some findings of researchers who worked on the price of oil.

Author	Method	Variables	Outcome
Zhang et al. (2008)	Empirical Mode Decomposition (EMD)	WTI crude oil spot prices	The economic meanings of the three components are identified as short term fluctuations caused by normal supply-demand disequilibrium or some other market activities, the effect of a shock of a significant event, and a long term trend.
Toews and Naumov (2015)	Three-dimensional VAR model	Exploration wells, Costs of drilling, WTI (Cushing) price,	The main results are that (i) a 1% increase (decrease) in the oil price increases (decreases) global drilling activity by 1% and costs of drilling by 0.5% with a lag of a year; and (ii) shocks to drilling activity and costs of drilling do not affect the price of oil permanently.

Wu and Zhang (2014)	VAR model	Brent crude oil spot prices, Chinese and Indian crude oil net imports, OECD commercial crude oil inventory and price-adjusted broad US dollar index	During the sample period, China's crude oil imports do not significantly affect Brent price changes, irrespective of the long run or short run.
Chen et al. (2015)	VAR	World crude oil prices, China's oil imports and share of world consumption, speculation, and OPEC supply	OPEC has an immediate effect on world oil prices between 1997 and 2012. During the third oil crisis from 2003 to 2008, speculation became the most important factor, and OPEC supply had a secondary short run and long run influence on oil prices. However, since 2009, OPEC supply has become the key factor, with China's oil consumption share the second most important factor determining oil prices. The China factor appears to be secondary to other factors.
Nwosa and Ajibola (2014)	VECM	Exchange rate in Nigeria, Non-oil export in Nigeria , price of oil	Innovations to international oil price resulted in appreciation of the domestic exchange rate while innovation to exchange rate resulted in decline in non-oil export (a clear reflection of the Dutch Diseases Syndrome)
Sujit and Kumar (2011)	VAR	Gold price, stock returns, exchange rate and oil price.	Exchange rates have a direct influence on gold prices; oil prices and stock market index

Ghosh (2011)	(GARCH) and exponential GARCH (EGARCH)	Crude oil price and exchange rate nexus for India	Positive and negative oil price shocks have similar effects, in terms of magnitude, on exchange rate volatility and oil price shocks have permanent effect on exchange rate volatility.
Olasojiand and Acquah-Andoh (2016)	VECM and OLS	U.S. crude oil inventories and WTI crude oil prices	a 1% increase in U.S. crude oil inventories is associated with 0.46% decrease in WTI crude oil prices (valid for 22%), VECM analysis indicates that there is no short-run relationship between both variables over the trajectory.

We observe that variables used by many researchers to explain the oil price are as follows: price of gold, exchange rates, oil imports, stock market indices and OPEC supply. All kinds of time series have been used (daily, weekly, monthly and quarterly). There are two prices which serve as benchmark and both of them have been used to analyze the oil market. The first one is Brent Crude extracted from the North Sea. The second one is West Texas Intermediate which is the underlying commodity of New York Mercantile Exchange's oil futures contracts. Research shows that the exchange rates, OPEC policy, stock markets, crude oil stocks, price of gold and drilling activities have an influence on the oil price. However, their influence varies throughout different periods. In order to observe how the short run causality and long run dynamics, the most appropriate methods seem to be VAR (in the case of non-cointegration between the variables) and VECM (in the case of cointegration between the variables).

3 Methodology

Granger and Newbold (1974) observed that a standard regression analysis fails when dealing with non-stationary variables and leading to spurious regressions that suggest relationships even when there are none. To tackle this problem, the concept of cointegration has been introduced by Granger (1981). It analyzes the relationship between non-stationary time series which become stationary when we use their first differences. Two variables are said to be cointegrated when neither of them fluctuates around a constant value but some combination of them does. Cointegration can be defined as a particular kind of long-run equilibrium relationship between variables. It also assesses the extent of disequilibrium from the long-run relationship, and the speed at which the

time series adjust to the long-run equilibrium. Cointegration is useful because it allows us to incorporate both short-term dynamics (deviations from equilibrium) and long-run expectations (corrections to equilibrium).

In order to analyze cointegration between multiple variables, we conduct the following steps:

Step1: Applying Dickey Fuller Unit Root Test

Stationarity of each variable is tested by applying Augmented Dikey-Fuller test. The null hypothesis is that the variable contains at least one unit root (non-stationary process), and the alternative is that the variable was generated by a stationary process (doesn't have a unit root). The basic model can be represented as:

$$y\_t=\rho y\_(t-1)+ \varepsilon\_t$$

We have the following hypothesis: H0¬: ρ = 1 against H1: |ρ|<1

We can apply three models in order to test the stationarity of the variable. We use the first difference of the variable and we include a number of lags. The standard Dickey-Fuller test can be expressed as follows:

Unit root test with constant: $\Delta y_t = c + \Phi y_{t-1} + \varepsilon_t$ (1)

Unit root test with constant and trends: $\Delta y_t = c + \delta t + \Phi y_{t-1} + \varepsilon_t$ (2)

Unit root test by suppressing constant and the trend: $\Delta y_t = \Phi y_{t-1} + \varepsilon_t$ (3)

with φ = ρ – 1 and the error term follows a white noise process: ($\varepsilon_t \sim N(0, \sigma_\varepsilon^2)$)

H_0: φ = 0 against H_1: φ < 0

The Augmented Dickey-Fuller test takes into account the autocorrelation and heteroscedasticity? Of the error terms. The hypothesis remains the same just the equations 1,2 and 3 become:

Unit root test with constant: $\Delta y_t = c + \Phi y_{t-1} + \sum_{j=1}^{\rho} \Phi \Delta y_{t-j} \ \varepsilon_t$ (1)

Unit root test with constant and trends: $\Delta y_t = c + \delta t + \sum_{j=1}^{\rho} \Phi \Delta y_{t-j} + \varepsilon_t$ (2)

Unit root test by suppressing constant and the trend: $\Delta y_t = \Phi y_{t-1} + \sum_{j=1}^{\rho} \Phi \Delta y_{t-j} + \varepsilon_t$ (3)

In this paper we apply the Augmented Dickey-Fuller Test in order to test the variables for a unit root.

Step2: Number of lags selection

In the current paper we estimate the number of lags by taking into account the following criteria: final prediction error (FPE), Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC). Information about these criteria and model order statistics can be found here (http://www.stata.com/manuals13/tsvarsoc.pdf). The number of lags is chosen according to the majority of criteria.

Step3: Estimation the rank of cointegration

The trace test: maximum likelihood

$$TR = -T \sum_{i=q+1}^{N} \log(1 - \hat{\lambda}_i)$$

The null hypothesis is that Rg (∏_p) = r ≤ q. There is maximum r vectors of cointegration
If Rg (∏_p) = r = 0 then there is no cointegration and X_t is stationary I(1) but not cointegrated. In this case we cannot apply VAR or VECM models

If Rg (∏_p) = r, with 0 < r < N then X_t is cointegrated of rang r and there are r relations of cointegration. In this case VECM can be applied

If Rg (∏_p) = r = N, recall that ∏_pis full rang, then X_t is stationary I (0), there is no cointegration between the variables and we can estimate VAR model with X_t
The Trace test shows whether there is a cointegration between the variables but it doesn't show which variables are cointegrated.

The maximum eigenvalue statistic is also used to determine the rank of cointegration as well.

It can be expressed as: $EV_{max} = -Tlog(1 - \hat{\lambda}_{q+1})$,

The Null hypothesis is that there is r=q vectors of cointegration and the alternative hypothesis is that r = q+1.
It should be emphasized that the trace statistic provides more reliable results. However, in order to be sure that there is a cointegration between the variables, both have to show the same results of cointegration rank.

In the case of cointegration between the variables, we can apply the Vector Error Correction Model (VECM).

Step4: Estimating VECM

Multivariate approach of cointegration has been introduced by Johansen (1988). The method is based on maximum likelihood. VECMs are used to model the stationary relationships between multiple time series. If we have a vector Xt which has N variables which are non-stationary I(1), the VAR representation is:

$$X_t = \phi_1 X_{t-1} + \cdots \phi_p X_{t-p} + \varepsilon_t$$

where $\varepsilon_t \sim BB(0, \Omega)$ and ϕ_i is a matrix (N × p)

The previous equation can be re-written as a Vector Error Correction Model (VECM):

$$\Delta X_t = \prod_1 \Delta X_{t-1} + \cdots + \prod_{p-1} \Delta X_{t-p+1} + \phi_p X_{t-p} + \varepsilon_t$$

All error terms are stationary I(0) and we transform X into first difference in order to be stationary as well.

VECM can be written as follows:

$$\Delta X_t = \prod_1 \Delta X_{t-1} + \cdots + \prod_{p-1} \Delta X_{t-p+1} - \beta\alpha' + \varepsilon_t$$

Where α' is a matrix (r × N), having r vectors of cointegration, and β is the weight associated to each vector of cointegration.

The rank of cointegration could be written as $r = Rg(\prod_p)$

In order to estimate the different matrices, Johansen suggests using the method of maximum likelihood. The lag likelihood is expressed as:

$$logL(\beta, \alpha, \prod_1, \ldots, \prod_{p-1}, \Omega = -\frac{NT}{2}\log(2\pi) - \frac{T}{2}\log[\det(\Omega)] - \frac{1}{2}\sum_{t=1}^{T} \varepsilon_t' \Omega^{-1} \varepsilon_t$$

Where N is the number of variables having X, T is the number of observations and $\det(\Omega)$ the variance – covariance matrix.

Step5: Validation of the model

In order for our VECM to be validated, we must compute the Jarque–Bera test. The Jarque–Bera results present test statistics for each equation and for all equations jointly against the null hypothesis of normality. For the individual equations, the null hypothesis is that the disturbance term in that equation has a univariate normal distribution. For all equations jointly, the null hypothesis is that the K disturbances come from a K-dimensional normal distribution. Failure to reject the null hypothesis indicates lack of model misspecification.

Finally, we apply the Lagrange multiplier (LM) test for autocorrelation for the residuals of vector error-correction model (VECMs). The null hypothesis of the test is that there is no autocorrelation at lag (t-1). Failing to reject the null hypothesis means that the VECM is misspecified.

4 Data and descriptive statistics

In order for our VECM to be validated, we must compute the Jarque–Bera test. The Jarque–Bera results present test statistics for each equation and for all equations jointly against the null hypothesis of normality. Foa As we have already stated, analyzing the oil price is quite challenging due to the stochastic nature of shocks related to the oil market and political stability in some regions such as the Middle East. Due to data availability we decided to use monthly statistics from May, 1998 to June, 2016 (2018 observation). The following variables have been included in the model:

- **Brent Crude Oil price in USD** – Bren crude oil price is a major trading classification of sweet light crude oil that serves as a major benchmark price for purchases of oil worldwide. This grade is described as light because of its relatively low density, and sweet because of its low sulfur content. Brent Crude is extracted from the North Sea and comprises Brent Blend, Forties Blend, Oseberg and Ekofisk crudes (also known as the BFOE Quotation). The data have been collected from Energy and Information agency (https://www.eia.gov/)
- **Gold Futures, Continuous Contract for 1 in USD** - Non-adjusted price based on spot-month continuous contract calculations. The data were obtained from Quandl Financial and Economic Data (https://www.quandl.com/)
- **S&P 500 Futures, Continuous Contrac**t - non-adjusted price based on spot-month continuous contract calculations. S&P 500 futures contracts give buyers the right to a basket of the stocks in the S&P 500 on expiration date. Priced at 250 times the index, they are used mostly by institutional investors. A lot of stock trading is based on what is deemed “fair value” for the S&P 500

futures. The data source is Quandl Financial and Economic Data (https://www.quandl.com/) (https://www.eia.gov/)

- **Production OPEC Crude Oil in Million Barrels per Day –** This variable reveals whether the policies of OPEC states have any impact on the oil price. The date were collected from Energy and Information administration (https://www.eia.gov/)
- **U.S. Crude Oil Rotary Rigs in operation (Number of elements) –** These variables reveal the behaviour of US oil producers. Recall that extracting oil in US is costly and we expect that in times of low prices, the drilling activities in US increase. The data source is the Energy and Information administration (https://www.eia.gov/)
- **Petroleum Stocks, Total OECD (Million Barrels) -** This variable represents the behaviour of OECD states, which are among the biggest consumers of crude oil. In times of high prices, their stocks should tend to be higher and vice versa. The data were collected from the Energy and Information administration (https://www.eia.gov/)

Appendix 1 graphically presents the oil price in a combination with the other time series in the model. As we can see, the prices of Brent and Gold to move together. However, since 2014, the oil prices tend to decrease while it is not the case with the Gold. We do not see a trend in time series. Exactly the same conclusion is valid for the S&Index and the price of oil. Production of OPEC countries and Operational Oil Rigs in US also seems to follow the similar movement like the oil price. Crude oil stocks of OECD tend to increase when the price is high and decrease when the price is low. However, since 2014, it is not really the case, due to instability in the Middle East and the war in Ukraine. Even though the price is low, OECD states do not seem to feel very secure about the future oil supply, which probably is one of the reasons to drive the prices of oil down. In addition, Stocks in OECD, Production of OPEC and Gold have clear upward trends, which is not the case with the other variables. In general, all variables seem to have some kind of causality. It should be observed whether this relation is a long or short run.

Regarding the descriptive statistics, it is observed that the Price of oil (Brent) has very high standard deviation 34.51 and it varies a lot, from 9.9 USD per barrel to 132.72 USD per barrel. Skewness shows that we have an asymmetrical distribution with a long tail to the right (higher values). It means that most of the values are high, and Kurtosis score reveals that the distribution is more peaked than a Gaussian distribution. The Gold and S&P Index have exactly the same characteristics as the price of Brent.

Table 2 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Brent	221	60.11	34.51	9.82	132.72	0.36	1.81
Gold	221	797.80	482.10	256.78	1762.61	0.43	1.69
SP_Index	221	1328.00	318.35	755.93	2108.46	0.87	3.21
Prod_OPEC	221	31818.03	2071.88	26480.71	35112.	-0.67	2.31
Oil_rigs	221	511.31	463.36	108.00	1596.00	1.19	2.86
Stocks_OECD	221	4138.79	193.08	3734.64	4653.41	0.22	3.00

Regarding the supply factors, the Production of OPEC has relatively low Standard deviation, which can be interpreted as stable supply of oil without major changes. Moreover, the variable has asymmetrical distribution with a long tail to the left (lower values). Similar are the characteristics of the Stocks of crude oil in the OECD states. The oil rigs in US have very high standard deviation and positive Skewness. In general, the Brent, the Gold, S&P Index and Oil Rigs are very volatile. These variables experience major changes during the observed period (February, 1998 and June, 2016), while OPEC production and Stocks in OECD states seem to be stable and more predictable.

In the current paper we have transformed the variables in natural logarithm (ln).

shows that the price of oil, Gold, Prod_OPEC have a strong positive linear relationship. All variables have positive correlation coefficients.

Table 3 Correlation between the variables

	ln_Brent	**ln_Gold**	**SP_Index**	**Prod_OPEC**	**Oil_rigs**	**Stocks_OECD**
ln_Brent	1					
ln_Gold	0.87	1				
ln_SP_Index	0.34	0.42	1			
ln_Prod_OPEC	0.79	0.82	0.51	1		
ln_Oil_rigs	0.75	0.88	0.55	0.72	1	
ln_Stocks_OECD	0.55	0.80	0.47	0.75	0.60	1

The covariance matrix (Table 4) show that the coefficients of all variables are positive, which means that when one variable increases, another one also increases.

Table 4 Covariance matrix

	ln_Brent	ln_Gold	SP_Index	Prod_OPEC	Oil_rigs	Stocks_OECD
ln_Brent	0.45					
ln_Gold	0.38	0.43				
ln_SP_Index	0.05	0.06	0.05			
ln_Prod_OPEC	0.04	0.04	0.01	0.00		
ln_Oil_rigs	0.42	0.48	0.10	0.03	0.68	
ln_Stocks_OECD	0.02	0.02	0.00	0.00	0.02	0.01

Descriptive statistics and graphical representation show that there is probably long and short run a relationship between the selected variables.

5 Results

As we have shown in the methodological part, we follow the five steps in order to determine whether there is a long and short run causality between the price of oil, price of gold, S&P index, Production of OPEC, Number of operational Oil Rigs in US and crude oil stocks in OECD countries.

Step1: Stationarity of the Data, test for Unit root

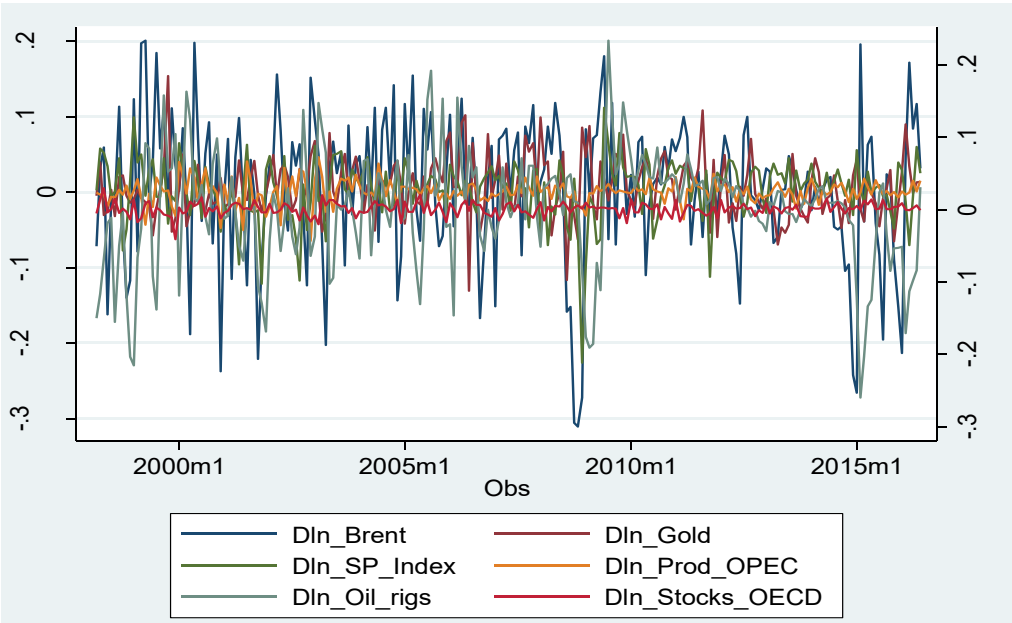
First we test each variable for a unit root. We apply the Augmented Dickey Fuller test. Recall that the null hypothesis states that the variable has a unit root. When the absolute value of 5% critical value (Interpretation Dickey Fuller) is higher that the Test Statistic, we accept the Null hypothesis, thus the variable is not stationary (presence of unit root). It means that the variable becomes stationary when we use its first difference. Such a process is called difference stationary. If we accept the alternative hypothesis, times series is stationary and follows Trend Stationary process. We run three Augmented Dickey Fuller Model. The first one is with the constant, in the second one we include the constant and the trend and in the third one the constant and the trend are suppressed. In each of the models we have included five lags and then progressively decreased the number of lags in order to check whether the results change significantly. We have observed that by decreasing the number of lags, the results of Augmented Dickey-Fuller test are similar.

Table 5 Augmented Dickey Fuller Tests for each variable

		Interpretation Dickey-Fuller		
	Test Statistics	**1% Critical Value**	**5% Critical Value**	**10% Critical Value**
ln_Brent (const)	-2.03	-3.48	-2.882	-2.572
ln_Brent (const and trend)	-1.81	-4.001	-3.434	-3.134
ln_Brent (noconst)	0.312	-2.584	-1.95	-1.618
ln_Gold (const)	-0.694	-3.471	-2.882	-2.572
ln_Gold (const and trend)	-1.087	-4.001	-3.434	-3.134
ln_Gold (noconst)	2.169	-2.584	-1.95	-1.618
ln_SP_Index (const)	-1.094	-3.471	-2.882	-2.572
ln_SP_Index (const and trend)	-1.78	-4.001	-3.434	-3.134
ln_SP_Index (noconst)	0.803	-2.584	-1.95	-1.618
ln_Prod_OPEC (const)	-1.188	-3.471	-2.882	-2.572
ln_Prod_OPEC (const and trend)	-2.83	-4.001	-3.434	-3.134
ln_Prod_OPEC (noconst)	0.719	-2.584	-1.95	-1.618
ln_Oil_rigs (const)	-1.283	-3.471	-2.882	-2.572
ln_Oil_rigs (const and trend)	-1.87	-4.001	-3.434	-3.134
ln_Oil_rigs (noconst)	-0.02	-2.584	-1.95	-1.618
ln_Stocks_OECD (const)	-0.789	-3.471	-2.882	-2.572
ln_Stocks_OECD (const and trend)	-2.639	-4.001	-3.434	-3.134
ln_Stocks_OECD (noconst)	0.743	-2.584	-1.95	-1.618

Table 5 shows that for all variables, the 5% critical value is higher that the Test Statistics. Thus, all variables have a unit root and follow DS process. It means that by computing their first differences, they become stationary. Figure 2 confirms this. As we can see, when we present graphically first differences of all variables in the model, they seem to be stationary

Figure 2: All variables in First Difference



When all variables are not stationary, we could apply Vector Error Correction Model.

Step2: Selection Order Criteria (number of lags)

In STATA we compute four information criteria (FPE, AIC, the HQIC, and SBIC) as well as a sequence of likelihood ratio (LR) tests.

Lag	LL	LR	Df	p	FPE	AIC	HQIC	SBIC
0	680.128				7.20E-11	-6.32984	-6.29157	-6.23515
1	2619.17	3878.1	36	0	1.20E-18	-24.1987	-23.9309	-23.536*
2	2683.48	128.62	36	0	9.60E-19	-24.4646	-23.9671*	-23.2337
3	2729.81	92.672	36	0	8.7e-19*	-24.5616*	-23.8346	-22.7626
4	2758.76	57.899	36	0.012	9.30E-19	-24.4954	-23.5388	-22.1283
5	2785.76	53.991	36	0.027	1.00E-18	-24.4109	-23.2247	-21.4757
6	2820.77	70.016	36	0.001	1.00E-18	-24.4016	-22.9858	-20.8983
7	2844.29	47.056	36	0.103	1.20E-18	-24.2845	-22.6391	-20.213
8	2895.53	102.46*	36	0	1.00E-18	-24.4275	-22.5525	-19.788

The majority of lag selection criteria show that the optimal number of lags to be included in the model is three.

Step3: Johansen Test of Cointegration

Next we check whether there is a long-run relationship between the variables, thus we apply the Johansen Test of Cointegration. If the log likelihood of the unconstrained model that includes the cointegrating equations is significantly different from the log likelihood of the constrained model that does not include the cointegrating equations, we reject the null hypothesis of no cointegration.

The statistics in Table 6 Table 7 are based on a model with three lags and a constant trend. Johansen's testing procedure starts with the test for zero cointegrating equations (a maximum rank of zero) and then accepts the first null hypothesis that is not rejected. In the output below, we strongly reject the null hypothesis of no cointegration and the null hypothesis at most one cointegrating equation. However we fail to reject the null hypothesis for at most two cointegration equations.

Table 6 Johansen Test of Cointegration (Trace Statistic)

max rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	78	2728.208	.	118.4556	94.15
1	89	2750.043	0.18154	74.7839	68.52
2	98	2767.971	0.15166	38.9297*	47.21
3	105	2777.541	0.08406	19.7884	29.68
4	110	2784.452	0.06143	5.9671	15.41
5	113	2787.116	0.02414	0.6394	3.76
6	114	2787.435	0.00293		

Table 7 Johansen Test of Cointegration (Maximum Eigenvalue)

max rank	parms	LL	eigenvalue	max statistic	5% critical value
0	78	2728.208	.	43.6717	39.37
1	89	2750.043	0.18154	35.8542	33.46
2	98	2767.971	0.15166	19.1413	27.07
3	105	2777.541	0.08406	13.8213	20.97
4	110	2784.452	0.06143	5.3277	14.07
5	113	2787.116	0.02414	0.6394	3.76
6	114	2787.435	0.00293		

In case of cointegration, we can apply the Vector Error Correction Model. If the null hypothesis is accepted for max rank = 0 and we found that there is no cointegration equation, we should proceed with unrestricted VAR model. The main guideline for accepting the null hypothesis is that 5% critical value must be higher than the trace statistics. Regarding the eigenvalue, we have the same guideline, but this time 5% critical value must be higher than maximal statistic value. As we can see both tests show similar results, thus we can confirm that there are at most two cointegration equations. Therefore, the variables in our model have a long run association. Whether this association really exists will be analyzed by applying VECM model.

Step4: Applying Vector Error Correction Model (VECM)

We have determined that there is a cointegration between Price of oil, price of Gold, S&P Index, Production of OPEC, Number of Oil Rigs and Crude Oil stocks in OECD countries.

Table 8 contains information about the sample, the fit of each equation, and overall model fit statistics. We can see that each equation is statistically significant and the model fits well.

Table 8: Fit of Each equation and Overall Model Fit

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_ln_Brent	21	0.09	0.21	53.08	0.00
D_ln_Gold	21	0.04	0.18	42.16	0.00
D_ln_SP_Index	21	0.04	0.20	50.06	0.00
D_ln_Prod_OPEC	21	0.01	0.20	47.54	0.00
D_ln_Oil_rigs	21	0.05	0.54	229.51	0.00
D_ln_Stocks_OECD	21	0.01	0.17	41.10	0.01

Table 9 contains the estimates of the short-run parameters, along with their standard errors, z statistics, and confidence intervals. The two coefficients on L1._ce1 and L1_ce2 are parameters in the adjustment matrix for this model. Only L1._ce2 is significant and it shows that there is relatively slow adjustment towards equilibrium. The short run coefficient of D.L1_ln_Brent, D.L1_Oil_Rigs, .L1_ln_Stocks_OECD and D.L2_ln_Stocks_OECD are significant. The positive sign of the coefficients of D.L1_ln_Brent D.L2_ln_Stocks_OECD applies that Brent and the second lag of Stocks of OECD are above the equilibrium. On the other hand the Number of Oil rigs and the first lag of OECD stocks are below the equilibrium.

Table 9 Short Run Relationship (VECM)

		Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
D_ln_Brent	**L1._ce1**	-0.04	0.03	-1.52	0.13	-0.10	0.01
	L1._ce2	0.16	0.05	3.08	0.00	0.06	0.27
ln_Brent	**LD.**	0.17	0.08	2.21	0.03	0.02	0.32
	L2D.	0.04	0.08	0.53	0.60	-0.11	0.19
	L3D.	0.03	0.08	0.40	0.69	-0.12	0.19
ln_Gold	**LD.**	0.28	0.17	1.65	0.10	-0.05	0.61
	L2D.	-0.13	0.17	-0.76	0.45	-0.45	0.20
	L3D.	0.18	0.17	1.04	0.30	-0.15	0.51
ln_SP_Index	**LD.**	-0.08	0.17	-0.45	0.65	-0.42	0.26
	L2D.	0.20	0.17	1.14	0.25	-0.14	0.54
	L3D.	0.05	0.17	0.28	0.78	-0.29	0.38
ln_Prod_OPEC	**LD.**	0.19	0.44	0.44	0.66	-0.67	1.05
	L2D.	-0.62	0.43	-1.43	0.15	-1.47	0.23
	L3D.	-0.49	0.44	-1.12	0.26	-1.34	0.37
ln_Oil_rigs	**LD.**	-0.23	0.11	-2.03	0.04	-0.46	-0.01
	L2D.	0.09	0.13	0.73	0.47	-0.16	0.34
	L3D.	-0.02	0.11	-0.19	0.85	-0.23	0.19
ln_Stocks_OECD	**LD.**	-1.35	0.79	-1.71	0.09	-2.90	0.20
	L2D.	2.09	0.79	2.64	0.01	0.54	3.64
	L3D.	0.20	0.80	0.25	0.80	-1.36	1.77
	_cons	0.00	0.01	0.45	0.65	-0.01	0.02

Table 10 contains the estimated parameters of the cointegration vector for this model, along with their standard errors, z statistics, and confidence intervals.

Table 10 Estimated Parameters of the cointegration vector for VECM

Equation	Parms	chi2	P>chi2				
_ce1	4	158.8449	0				
_ce2	4	1070.306	0				
beta		Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1	ln_Brent	1	.	.	.	.	.
	ln_Gold	0	(omitted)				
	ln_SP_Index	0.0709704	0.2804276	0.25	0.8	-0.47866	0.620599
	ln_Prod_OPEC	-4.51535	1.447873	-3.12	0.002	-7.35313	-1.67757
	ln_Oil_rigs	-0.5802522	0.0967635	-6	0	-0.76991	-0.3906
	ln_Stocks_OECD	2.348845	1.87355	1.25	0.21	-1.32325	6.020936
	_cons	26.275	.	.	.	.	.
_ce2	ln_Brent	0	(omitted)				
	ln_Gold	1	.	.	.	.	.
	ln_SP_Index	0.5269147	0.1163765	4.53	0	0.298821	0.755008
	ln_Prod_OPEC	-0.5476919	0.6008621	-0.91	0.362	-1.72536	0.629976
	ln_Oil_rigs	-0.5778022	0.0401565	-14.39	0	-0.65651	-0.4991
	ln_Stocks_OECD	-6.837915	0.7775166	-8.79	0	-8.36182	-5.31401
	_cons	55.75488	.	.	.	.	.

The Johansen identification scheme has placed four constraints on the parameters. In the first cointegration equation we have ln_Brent = 1, ln_Gold = 0 and in the second one we have ln_Brent = 0 and ln_Gold = 1. We interpret the results of the first equation as indicating the existence of an equilibrium relationship between the Price of oil (Brent), Production of OPEC and the Oil rigs. In the second equation we have an equilibrium between the Gold, S&P Index, Oil Rigs and the Stocks in OECD countries.

Next, we look at the estimates of the adjustment parameters.

Table 11 Adjustment parameters VECM

	alpha	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
D_ln_Brent	L1. _ce1	-0.04	0.03	-1.52	0.129	-0.10	0.01
	L1._ce2	0.16	0.05	3.08	0.002	0.06	0.27
D_ln_Gold	L1. ce1	0.04	0.01	3.75	0	0.02	0.07
	L1._ce2	-0.07	0.02	-3.2	0.001	-0.12	-0.03
D_ln_SP_Index	L1. ce1	-0.01	0.01	-0.58	0.562	-0.03	0.02
	L1._ce2	-0.02	0.02	-0.76	0.447	-0.06	0.03
D_ln_Prod_OPEC	L1. ce1	0.00	0.00	0.21	0.83	-0.01	0.01
	L1._ce2	0.02	0.01	2.59	0.01	0.01	0.04
D_ln_Oil_rigs	L1. ce1	0.05	0.02	3.05	0.002	0.02	0.08
	L1._ce2	0.02	0.03	0.49	0.623	-0.05	0.08
D_ln_Stocks_OECD	L1. ce1	-0.01	0.00	-2.33	0.02	-0.01	0.00
	L1._ce2	0.02	0.00	3.7	0	0.01	0.03

Regarding the first cointegration equation, ln_Brent, ln_SP_Index, ln_Prod_OPEC are insignificant. From an economic perspective, the issue is whether these variables adjust when the first cointegration equation is out of equilibrium. When we observe the second cointegration equation, we see that ln_Oil_rigs, ln_SP_Index are insignificant, which means that these variables do not adjust when the second equation is out of equilibrium. The coefficient of ln_Brent 0.16 suggests that the prices of oil readjust relatively quickly, which is not the case for the other variables in the model. Moreover, ln_Prod_OPEC is significant, which means that polices of OPEC countries have a long run effect on the oil price.

After fitting a VECM, we analyze Granger causality between oil price and each one of the other variables. The dependent variable is D.ln_Brent and we observe whether jointly, the three lags of another variable in the model Grange-cause D.ln_Brent. The null

hypothesis is that the estimated coefficients on the lagged values of x are jointly zero. Failure to reject the null hypothesis is equivalent to failing to reject the hypothesis that the selected variable does not Granger-cause D.ln_Brent.

Table 12 Granger Causality (Dependent variable is D.ln_Brent)

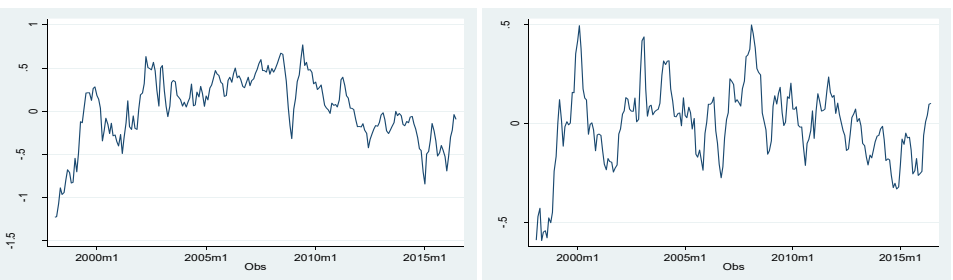
Variables	Prob > chi2	chi2(3)	
D.ln_Gold (3 lags)	0.2601	4.01	H0 accepted
D.ln_SP_Index (3 lags)	0.5844	1.94	H0 accepted
D.ln_Prod_OPEC (3 lags)	0.3095	3.59	H0 accepted
D.ln_Oil_rigs (3 lags)	0.2517	4.09	H0 accepted
D.ln_Stocks_OECD (3 lags)	0.0102	11.3	H0 rejected

As we can see in Table 12, we reject the null hypothesis only for D.ln_Stocks_OECD. It means that jointly the lagged values of D.ln_Stocks_OECD have an effect on the oil price.

Step5: Validation of the model

Inference on the parameters depends crucially on the stationarity of the cointegrating equations, so we should check the specification of the model. A first predict the cointegrating equations and graph them over time. Although the large shocks apparent in the graph of the levels have clear effects on the predictions from the cointegrating equations, our only concern is the positive trend from 2002 to 2009 in the first cointegrating equation. Although we could try to account for this effect with a more formal analysis, we will proceed as if the cointegrating equations were stationary.

Figure 3 Prediction of cointegration equation one (left) and cointegration equation two (right)

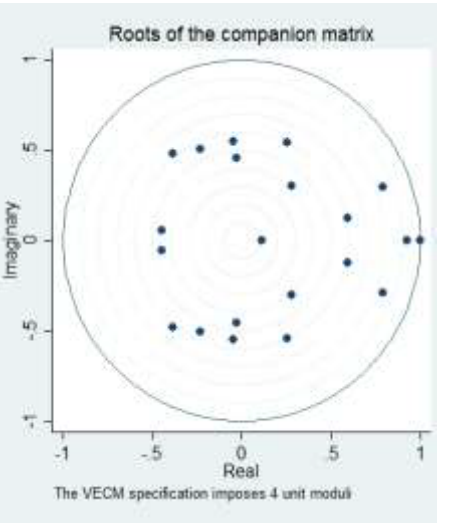


Inference after fitting VECM requires that the cointegrating equations be stationary and that the number of cointegrating equations be correctly specified. Eigenvalue stability condition provides indicators of whether the number of cointegrating equations is

misspecified or whether the cointegrating equations, which are assumed to be stationary, are not stationary

Table 13 Eigenvalue stability condition

Eigenvalue			Modulus
1		1	
1		1	
1		1	
1		1	
0.929864		0.929864	
0.79028	+	.2932602i	0.842938
0.79028	-	.2932602i	0.842938
-0.38734	+	.4795154i	0.616412
-0.38734	-	.4795154i	0.616412
0.59358	+	.1257036i	0.606744
0.59358	-	.1257036i	0.606744
0.254033	+	.5406995i	0.597402
0.254033	-	.5406995i	0.597402
-0.23359	+	.5078017i	0.558952
-0.23359	-	.5078017i	0.558952
-0.04679	+	.5500368i	0.552024
-0.04679	-	.5500368i	0.552024
-0.02514	+	.4588679i	0.459556
-0.02514	-	.4588679i	0.459556
-0.44578	+	.05528802i	0.449199
-0.44578	-	.05528802i	0.449199
0.282067	+	.3001261i	0.41187
0.282067	-	.3001261i	0.41187
0.112467	|	0.112466	



The output indicates that there is a unit root at about 0.93. Although there is no distribution theory to measure how close this root is to one, we conclude that the root of 0.93 supports our earlier analysis, in which we concluded that the predicted cointegrating equations are probably not stationary.

Next, we check for autocorrelation in the residuals of VECMs by applying Lagrange-Multiplier Test. The null hypothesis of the test is that there is no autocorrelation at lag j.

Table 14 Lagrange Multiplier Test

Lag	chi2	Df	Prob > chi2
1	32.4111	36	0.64003
2	57.3664	36	0.01326
3	39.128	36	0.33121

Results from Table 14 suggest that there is autocorrelation at lag 2.

Finally we analyze disturbances in the model. Jarque–Bera test computes a series of test statistics of the null hypothesis that the disturbances in a VECM are normally distributed. Failure to reject the null hypothesis indicates lack of model misspecification.

Equation	chi2	df	Prob > chi2
D_ln_Brent	4.464	2	0.10729
D_ln_Gold	11.937	2	0.00256
D_ln_SP_Index	64.334	2	0
D_ln_Prod_OPEC	32.001	2	0
D_ln_Oil_rigs	40.926	2	0
D_ln_Stocks_OECD	11.118	2	0.00385
ALL	164.78	12	0

The Jarque–Bera results present test statistics for each equation and for all equations jointly against the null hypothesis of normality. Results indicate that our model has some misspecification because for all equations we reject the null hypothesis for normality. However, the equation which we are interested in, D_ln_Brent, we accept the null hypothesis, thus the results regarding the variables which have an effect on the price of oil could be accepted.

6 Conclusion and Future Research

Explaining the factors behind the oil price is important because the world economy is highly dependent on its limited resources. Major political and other external factors play an important role in the oil market. However, our study has focused on supply and demand factors. Results suggest that there is a long-run relationship between the price of oil, price of Gold features, OPEC production and the number of operational rotary rigs in US. However, the OPEC polices do not affect the price of oil in a short run. This could be explained by the reserves of crude oil in OECD countries and other production factors. On the other hand, the variables affecting the price oil in a short run are the number of operational rotary rigs in US and the stocks in OECD countries. The stock market index S&P 500, Gold features and OPEC production do not have a significant short-run effect on the oil price.

We have to be cautious with the interpretation of the extent of the causality between the variables because our model has some issues regarding its stability, stationarity of the cointegrating equations and distribution of disturbances. In our future research, we will use RATS[10] software, which provide more accurate results regarding VECM and VAR models. Moreover, we will include dummy variables in order to improve our analysis. We plan to include additional variables such as US/EUR exchange rate, Shanghai Composite Index, Oil price futures etc. Analyzing the price of oil is a hot topic due to the substantial financial interest, the dependence on oil consumption of many states, the issues regarding the climate change and the market structure. Our paper established some reliable results which should be confirmed by improving the model-fit and applying additional methods such as Markov Chain Switching Models and Structural Vector Auto Regression.

The major players in the crude oil market are confronted with a number of issues on the supply and demand side as well as some external factors such as instability and green energy policies implemented by developed countries. There will be a need of more research in this sector in order to improve the cooperation between the major stakeholders in the oil market and find sustainable solutions for the future of the industry and our planet.

[10] https://www.estima.com/

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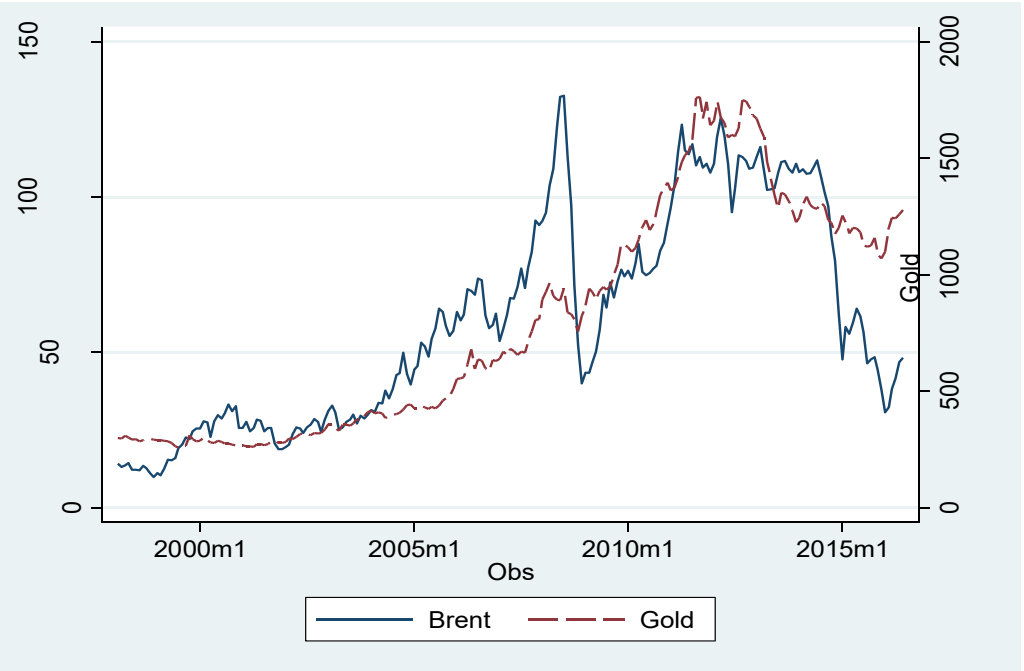
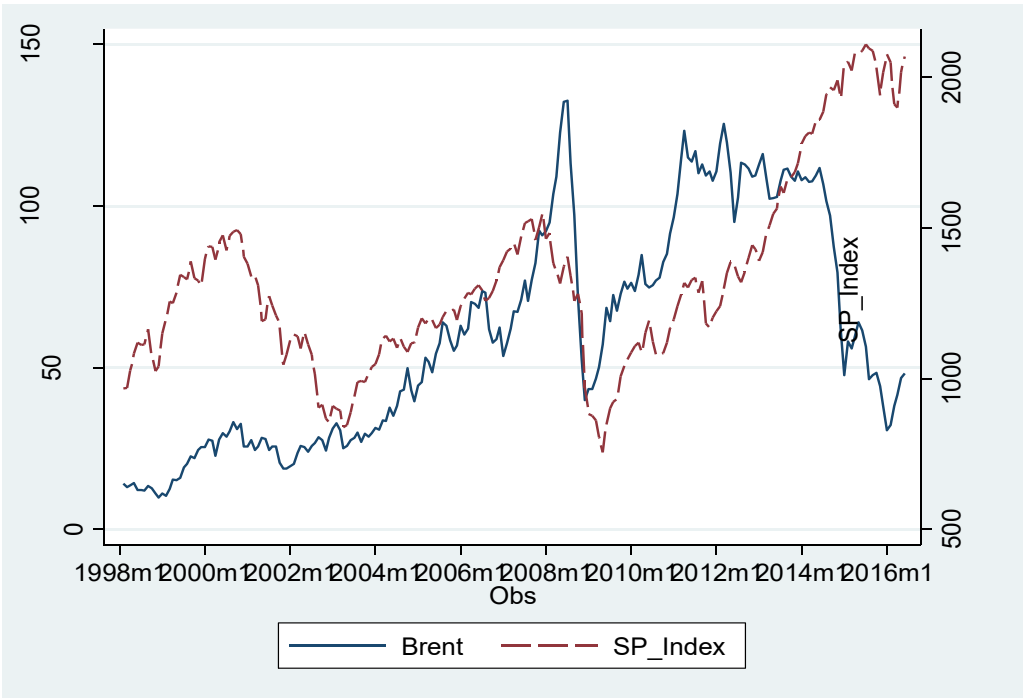
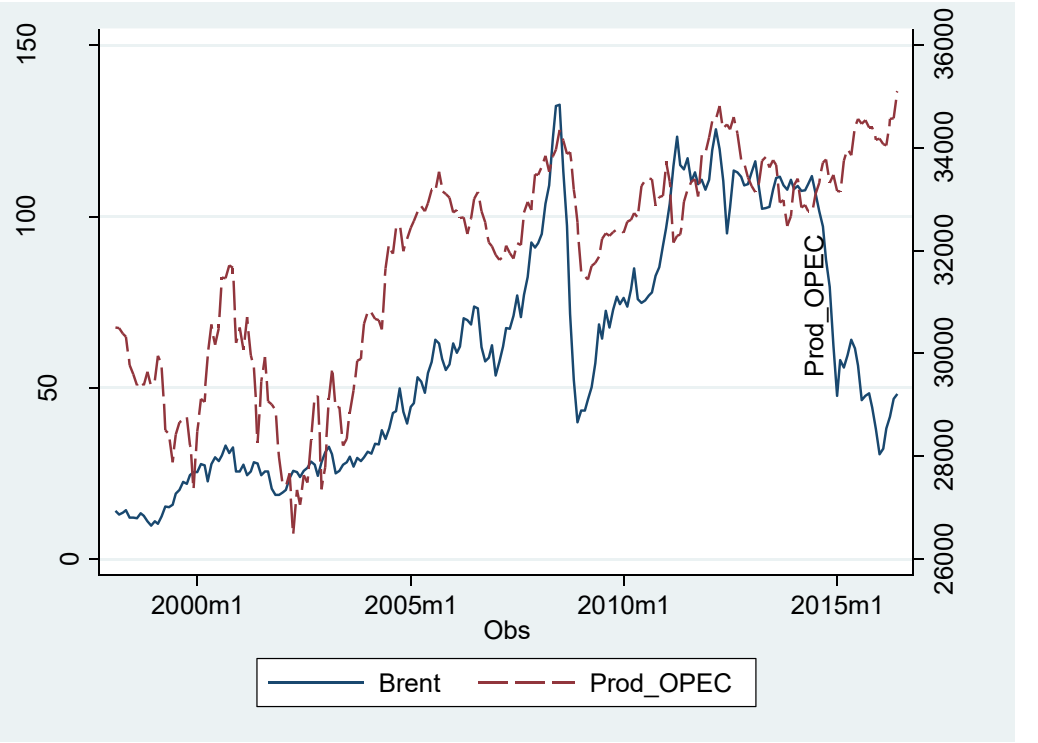
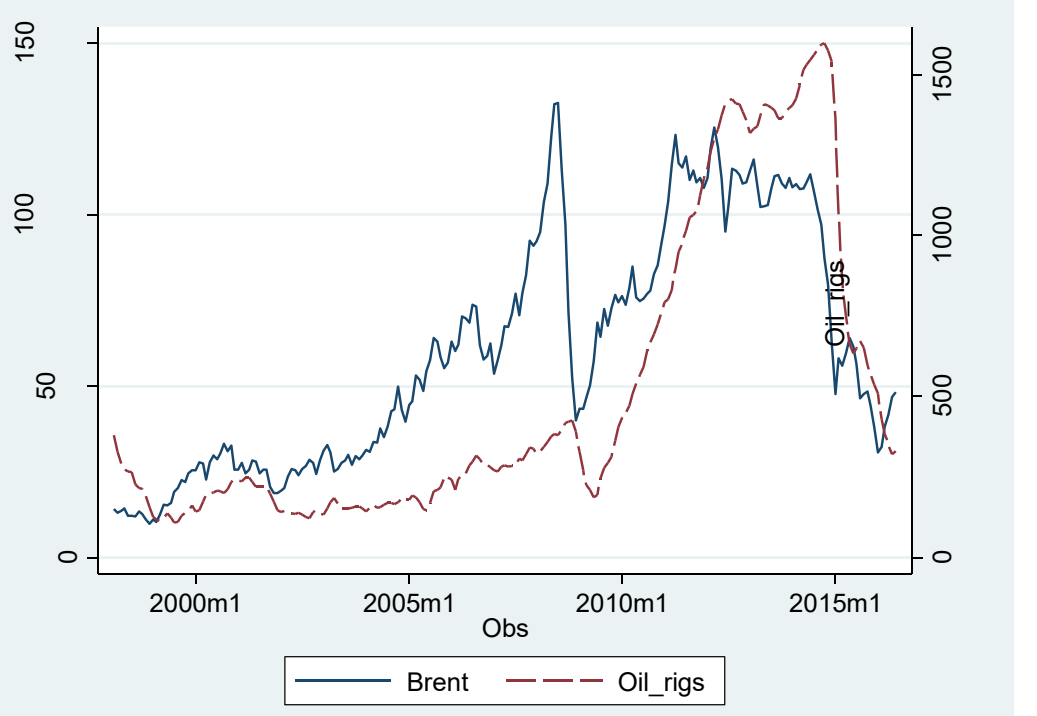
Appendices

Appendix 1: Graphical representation of the variables in the model






150
100
50
0
36000
34000
32000
30000
28000
26000
Prod_OPEC
2000m1
2005m1
2010m1
2015m1
Obs
Brent
Prod_OPEC


150
100
50
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500
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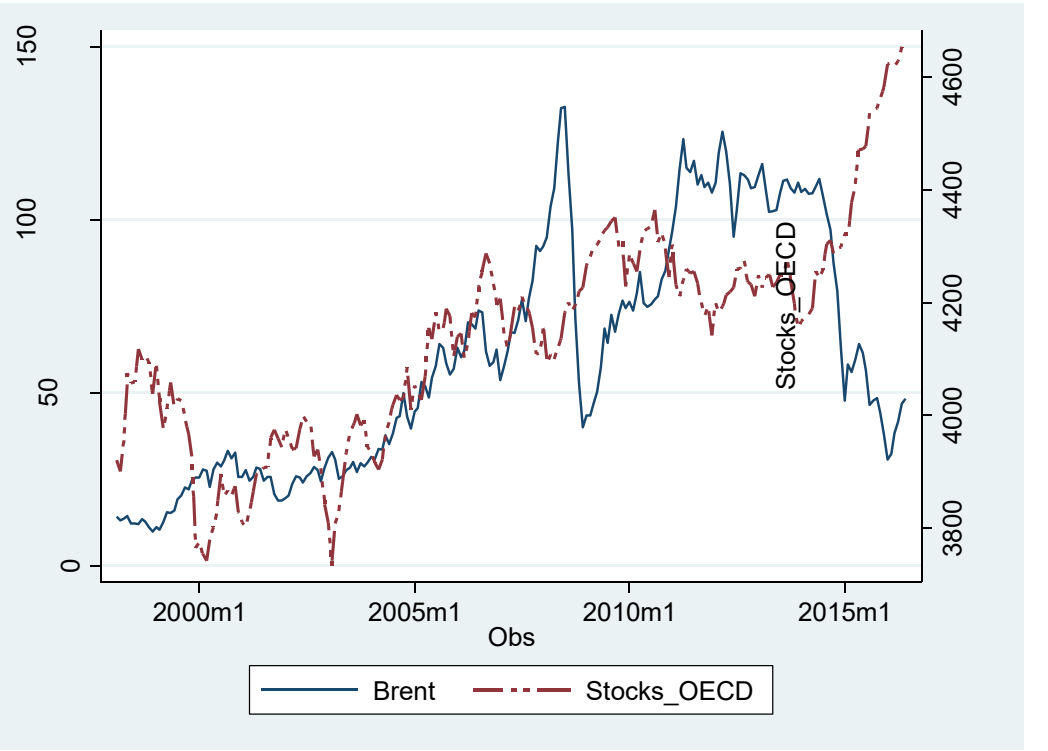
Oil_rigs
2000m1
2005m1
2010m1
2015m1
Obs
Brent
Oil_rigs


150
100
50
0
4600
4400
4200
4000
3800
Stocks_OECD
2000m1
2005m1
2010m1
2015m1
Obs
Brent
Stocks_OECD

Estimating Relative efficiency of ASEAN container ports and terminals by applying Data Envelopment Analysis

KUTIN Nikola[11] *, Prof. VALLEE Thomas*[12]

Abstract

The current paper analyzes the relative efficiency of 50 ASEAN container ports and terminals. The ports have been categorized according to their Container Yard Equipment (type of lifting equipment) and geographical location (inland or sea port). The traditional output oriented Data Envelopment Analysis (DEA) method has been applied. In order to compare the units situated on the efficiency frontier, the measures of Super-Efficiency Constant Returns to Scale have been estimated as well. The results show that seaports operate on a better efficiency scale than inland ports. Most of the ports are operating under increasing returns to scale, which suggests that they have not reached their optimum size. Only 8 ports are experiencing decreasing returns to scale meaning that their size has a negative effect on their performance. These findings could be useful for port managers to assess by how much the container traffic could be increased in ASEAN and which the most efficient container terminals are. Moreover, policy makers may consider the results in order to improve the trans-ASEAN transport network and ASEAN trade competitiveness.

Key Words: *Data Envelopment Analysis (DEA), Association of Southeast Asian Nations (ASEAN), Efficiency, Performance, Container Ports, Container Terminals, Container Yard Equipment, Inland and Sea.*

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1 Introduction

Production optimization is a central topic in the conventional microeconomic theory. Productivity can be defined as the ratio between the outputs volume and the volume of inputs. It is assumed that producers optimize by not wasting resources in a systematic way: producers operate somewhere on the boundary of their production possibility sets (Daraio and Simar, 2007). However, it is necessary to compare the productivity of different organizations in order to determine which ones use their factors of production in the most efficient way. Based on the pioneer works of Debreu (1951), Koopmans (1951), Shephard (1972) and Farrell (1957), the frontier and efficiency analysis have been widely applied in the fields of Operation Research and Management Science. These approaches are nonparametric, and they require a small amount of assumptions. Neither the functional form of the relation inputs-outputs, nor the distribution form of the inefficiency term needs to be specified. Two main nonparametric methods are used, the Data Envelopment Analysis (DEA) and the Free Disposal Hull (FDH). Both methods provide a mathematical programming for the estimation of production frontier and evaluation of relative efficiency of different entities, called Decision Making Units (DMUs). FDH relies on the free disposability of inputs, whereas, DEA relies on the free disposability as well as on the convexity of the production set. These methods are suitable for the comparison of different homogenous organizations in a specific sector. In the last decades, DEA and FDH were applied by many researchers in order to analyze the performance of container terminals and ports.

As ports are an important link in the logistics chain, the level of port efficiency affects to a large extent a country's productivity and competitiveness (Wu and Goh, 2010). The competition between container ports is more intensive than before. Port markets used to be perceived as monopolistic due to the exclusive and immovable geographical location of the port and the unavoidable concentration of port traffic. However, the rapid development of international container and intermodal transportation has drastically changed the market structure from one of monopoly to one where fierce competition is rife in many parts of the world (Cullinane and Wang, 2007). Along with these trends, the economy is becoming more regional (Danish Ship Finance, 2015; UNCTAD, 2015). A recent example is the establishment of the ASEAN Economic Community (AEC) in 2015. It offers opportunities in the form of a market of US$2.6 trillion and over 622 million people. In 2014, AEC was collectively the third largest economy in Asia, the seventh largest in the world, and accounted for 14% of the world container throughput. According to the formulation of strategies to realize an ASEAN Single Shipping Market, rationalization, synchronization, liberalization and harmonization of shipping services and trade procedures are key requirements (EIRA, 2010). ASEAN

Single Shipping Market, rationalization, synchronization, liberalization and harmonization of shipping services and trade procedures are key requirements (EIRA, 2010). ASEAN has designated 47 main ports in the trans-ASEAN transport network. There are a number of challenges faced by these ports in providing a more efficient shipping network services given the varying levels of port infrastructure development (ASEAN, 2011). Thus, it is necessary to analyze the efficiency and productivity of these ports in order to pursue the realization of ASEAN Single Shipping Market (ASSM).

The current paper evaluates the relative efficiency of 50 ASEAN container ports and terminals. The objective of the research is to highlight the most efficient ports in the sample according to their type (inland or sea) and their container yard equipment. Such categorization is necessary because, by applying DEA method, we need to compare homogenous units. We applied the traditional DEA output oriented models to determine, for each port, the target values of the outputs (containers throughput in 2014). The important contributions of this study include providing a benchmarking analysis based on the DEA and assisting decision makers in their ports' development operations and improvement of trans-ASEAN transport network.

2 Literature review

The production efficiency has been analyzed by many researchers. Debreu (1951) created the first measure of productive efficiency with his coefficient of resource utilization. It focuses on the maximum feasible equiproportionate reduction in all variable inputs, or the maximum feasible equiproportionate expansion of all outputs. In 1957, Farrell proposed a similar method of measuring the efficiency by including multiple inputs and outputs. The so-called input-based Farrell efficiency can be defined as the maximum proportional contraction of all inputs that allows us to produce the same amount of output. In the opposite case, output oriented Farrell Efficiency measures the proportional expansion of all outputs with a given amount of inputs. There are two types of efficiency, allocative (cost) and technical. The former represents the optimal combination of inputs and outputs under the assumption that the producer wants to minimize the costs, whereas the latter is associated with the ability of the effectiveness with which a given set of inputs is used to produce an output. The main drawback of the Farrelll efficiency is the attribution of weights to the inputs and outputs. To overcome this problem, Charnes, Cooper and Rhodes (1978) defined an optimization method based on mathematical programming. They created the DEA method with Constant Returns to Scale (CRS) or the so-called DEA-CCR. It allows to measure the relative efficiency of DMUs without attributing any predetermined weights or conducting any time series analyses. In 1984, the method was extended by Banker,

Charnes and Cooper (BCC) in 1984 by including Variable returns to Scale (VRS), this method is also known as DEA-BCC. Since then, the DEA method has been extended in multiple ways, such as Dummy or categorical variables, Discretionary and non-discretionary variables, Incorporating judgment, longitudinal analysis, Weight restriction, Stochastic DEA, Fuzzy and imprecise DEA, nonparametric Malmquist indices, Technical change in DEA, Sensitivity etc. We decided to apply the traditional DEA method, because we do not have time series and our objective is to determine the most efficient ports in ASEAN.

DEA is suited for comparison of homogenous units such as container ports. A common feature of port benchmarking studies is the use of operational data due to the difficulty of obtaining port's costs and prices (Bichou, 2013). Thus, the current study focuses on the technical efficiency measurements.

Table 1: Nonparametric methods used to analyze the relative efficiency of container ports and terminals

Authors	Model	Sample and region	Inputs	Outputs
Almawsheki and Shah (2015)	DEA-CCR	19 container terminals in the Middle East	Terminal Area; Quay length; Quay cranes; Yard equipment; Maximum Draft	Container throughput
Bichou (2012)	DEA-CCR; DEA-BCC; Panel data	420 container terminals	Terminal area; Max draft; Quay length Quay crane Index; Yard-stacking index Gates	Container throughput
Bray et al. (2014)	Fuzzy DEA	16 container ports	Number of cranes; Container berths; Number of tugs; Terminal area; Delay time; Number of port authority employees	Container throughput; Shiprate; Shipcalls; Crane; productivity
Cullinane and Wang (2007)	DEA-CCR; DEA-BCC;	57 container ports	Terminal Area; Quay cranes; Yard cranes Straddle Carriers	Container throughput
Cullinane et al. (2006)	DEA-CCR; DEA-BCC	30 container ports	Terminal length; Terminal area; Quay cranes Yard gantry cranes; Straddle carriers	Container throughput
Garmendia and Schwartz (2015)	DEA-CCR DEA-BCC	63 container ports in Latin America and the Caribbean	Quay length; Terminal area; Mobile cranes with more than 14 t. capacity; STS gantry cranes	Container throughput
Gonzales and Trujillo (2007)	Parametric and DEA	10 Spanish ports	Length of berths; Port area; Number of employees	Containers Liquid bulk Other cargo Passengers

Garmendia and Schwartz (2015)	DEA-CCR DEA-BCC	63 container ports in Latin America and the Caribbean	Quay length; Terminal area; Mobile cranes with more than 14 t. capacity; STS gantry cranes	Container throughput
Gonzales and Trujillo (2007)	Parametric and DEA	10 Spanish ports	Length of berths; Port area; Number of employees	Containers Liquid bulk Other cargo Passengers
Guimaraes et al. (2014)	DEA-CCR; DEA-BCC.	15 Brazilian container terminals	Total Energy; Non-renewable energy Sewage emission; Office supplies consumption; Total emissions (CO2+CH4 + N2O); Total emissions (PM + NOx+SO2+Co+HC+MNHC) Water consumption per worker	Container Throughput
Hai-bo and He-zhong (2009)	SFA	13 port companies in China	Net permanent asset; Total employees	Main business revenue
Hung et al. (2010)	DEA-CCR; DEA-BCC; DEA with bootstrap method	31 container ports in Asia-Pacific	Terminal area; STS container gantry cranes (No); Berths (No); Total quay length	Container throughput
Jiang and Li (2009)	DEA-CCR; DEA-BCC.	12 container ports in Asia	Import/Export by customs; GDP by regions Berth Length; Crane number	Container throughput
Li et al. (2013)	DEA; SFA	42 Coastal ports on China	Terminal length Handling equipment (bridge, mobile and beam cranes) Number of employees	Container throughput
Lim, Bae and Lee (2011)	Additive non-oriented DEA RAM	26 Asian container terminals	Quay length; Total area; Gantry Cranes	Container Throughput
Lozano, Villa and Canca (2010)	Centralised DEA using a non-radial Russell measure of technical efficiency.	50 Spanish container ports	Land and stacking area; Total quay length Total number of cranes; Number of tugs	Total port traffic Container Throughput Ship calls
Sanchez and Millan (2012)	Malmquist index	46 ports in Spain	Number of employees; Intermediate consumption; Capital	Liquid bulk Solid bulk Containerized general cargo Non-containerized general cargo
Sharma and Yu (2010)	DT based context-dependent DEA	70 container terminals	Quay cranes; Transfer cranes; Straddle carriers; Reach stackers; Quay length Terminal area	Container throughput
Tongzon (2001)	DEA-CCR; Additive DEA.	4 Australian and 12 other international	Number of cranes; Number of container berths Number of tugs; Terminal Area; Delay time	Container throughput Number of shipcalls

Wanke (2013)	Network-DEA centralized efficiency	27 Brazilian ports	Number of berths; Warehousing area Yard area; Container frequency (shipments)	Container throughput
Wilmsmeier and al. (2013)	Malmquist index	40 ports in Central and South America	Terminal area; Ship-to-shore crane capacity equivalent; Number of employees	Container throughput
Wu and Goh (2009)	DEA-CCR; DEA-BCC; DEA Windows Analysis.	21 major international container ports	Terminal area; Total quay length No. of pieces of equipment	Container throughput

Table 1 provides a literature overview of the DEA use to evaluate the relative efficiency of container terminals and ports. In this list, the sample size varies between 10 and 70 DMUs. The study of Bichou (2013) is the only one which analyzed a considerable number of terminals, i.e. 420. The most applied DEA methods are the traditional ones, DEA-CCR and DEA-BCC. In the literature, the selected inputs are usually the terminal area, the quay length, the number of container berths, the number of quay cranes, and the number of employees. In order to compare homogenous units using similar technologies, many researchers included some specific indicators regarding the ports infrastructure such as the number of tugs, the number of straddle carriers, the number of reach stackers, the number of Ship-to-shore (STS) gantry cranes, etc. The most suitable indicator to evaluate the ports' production is the Annual Container Throughput in TEUs, because the main purpose of any container terminal is to unload and load boxes. Another potential output indicator is the number of ship calls. Two studies used non-conventional indicators as inputs or outputs. Hai-bo and He-zhong (2009) evaluated the allocative efficiency of 13 port companies in China by taking into account the net permanent asset and the total employees as production factors, and the main business revenues as output. The second study, conducted by Guimaraes et al. (2014), evaluated the environmental performance of 15 Brazilian container terminals by using as inputs the total energy consumption, the consumption of non-renewable energy, the sewage emissions, the office supplies consumption, the CO2 emissions, and the water consumptions. The Container Throughput was included as an output. By using DEA-BCC, DEA-CCR, and Panel data, the empirical results of Bichou (2013) show that most of the container terminals clearly depict a VRS production technology. Similarly, Hung et al. (2010) concluded that the overall technical inefficiencies of Asian container ports are primarily due to pure technical inefficiencies rather than scale inefficiencies. Only 26% of the Asian container ports are regarded as efficient. This also suggests that port managers should focus first on improving their management practices to the market requirements of container ports, and then container ports can be subject to improving their scale efficiencies. Cullinane and

Wang (2007) conducted a rather arbitrary dichotomous classification of the sample between large and small ports on the basis of a cut-off throughput of 1 million TEU per annum. Their findings suggest an association between large ports and decreasing returns to scale, and between small ports and increasing returns to scale. On the other hand, the proportion of large ports (or terminals) that exhibit constant returns to scale is similar to the proportion for the sub-sample of small ports (or terminals). In Tangzon (2001), the underutilization of labor is highlighted as a main source of inefficiency for 11 among 12 ports of the sample. In the study of Wanke (2013), based on a two-stage network DEA model to calculate the physical infrastructure and shipment consolidation efficiency levels, it is shown that just 7 out of 27 (25.9%) ports achieved 100% efficiency in the first stage of physical infrastructure efficiency. The results of DEA-CCR analyzing 19 container terminals in the Middle East show that 84.21% of the terminals are inefficient (Almawsheki and Shah, 2014). Wexin and Pian (2013) assessed the efficiency of coastal container terminals in China via three-stage DEA model. The following issues of coastal container terminals in China have been found. Firstly, the overall coastal container terminal efficiency is relatively low because of scale inefficiency. Secondly, there is a vast regional difference in terminal efficiency among different port groups. Thirdly, there is a serious input excess in coastal container terminals in China, approximately 35%. Fourthly, in the assessment of terminal efficiency, the environmental influences and statistical noise both affected the efficiency value (Weixin and Pian, 2013).

The main conclusion of the literature review are as follows: a) there is a need to find appropriate criteria to categorize the container terminals, b) the size of the sample varies between 11 and 420 container terminals and c) the most commonly output used by the researchers is the annual container throughput d) for a small sample with homogenous ports, it is appropriate to apply only DEA-CRS; e) for a bigger sample with ports with different size, both methods, DEA-CRS and DEA-VRS should be applied.

3 Methodology

DEA provides a mathematical programming method of estimating best practices production frontier and evaluating the efficiency of different Decision Making Units (DMUs). In the current paper DMUs are container ports. This approach finds the smallest set that envelopes the input-output observations for all DMUs, hence its name "Data Envelopment Analysis". DEA models can be input and output oriented. The former minimizes the inputs for a given set of outputs, while the latter maximizes the outputs for a given set of inputs. In the current study the output oriented DEA-VRS and DEA-CRS models have been applied. We have chosen only output oriented models, because ports' managers are more interested in how they could increase the container throughput rather than decrease their inputs. In addition, there are inputs such as depth at berth and container yard size, which are very costly to reduce. We have only one output (Container Throughput in 2014) and by applying DEA output oriented models, we could give precise results regarding the relative efficiency of ports and their capacity to increase their productivity.

When we have K number of DMUs, firm "k" uses a combination of *m* inputs denoted as $x_k = (x_{1k}, \dots, x_{mk}) \in \mathbb{R}_+^n$ to produce *n* outputs $y_k = (y_{1k}, \dots, y_{nk}) \in \mathbb{R}_+^n$. Let $\lambda_k = (\lambda_1, \dots, \lambda_K) \in \mathbb{R}_+^K$ be non-negative vector which forms the linear combination of the K firms. Finally we have the technology set or production possibilities set: $T = \{(x, y) \in R_+^m * R_+^n \mid \text{x can produce y}\}$.

The reference technology (benchmark) set is T^*, which is constructed according to the minimum extrapolation principle. It is the smallest set of $R_+^m \times R_+^n$ that contains the data $(x^k, y^k), k = 1, \dots K$, and satisfy certain technological assumptions.

Following Bogetoft and Otto (2011), mathematically, the output oriented DEA model could be presented as follows. $F^0 = F((x^0, y^0);\ T^* = F \in R_+ | (x^0, Fy^0) \in T^*$

F^0 is the output efficiency score of DMU "0". F^0 is obtained by the resolution of the following maximization problem.

$$\max_{F, \lambda^1, \dots, \lambda^k} F$$

$$\text{s.t.} \quad x^0 \geq \sum_{k=1}^K \lambda^k x^k \quad \textbf{(1)}$$

$$F\lambda^0 \leq \sum_{k=1}^K \lambda^k y^k \quad \textbf{(2)}$$

Constraint (1) says that the inputs of DMU "0" must be bigger or equal to the sum of weight (λ) multiplied by the inputs of the others DMUs in the sample. Constraint (2) says that the output efficiency score of DMU "0" multiplied by its real output must be smaller or equal to the sum of attributed weights to all others DMUs, multiplied by their outputs.

In the DEA model, the efficiency score is computed under the assumption of different economies of scale. Each assumption involves adding one of the following constraint:

- $\forall\lambda_k \geq 0$, if the efficiency score represent the operation of the DMU under constant returns to scale (CRS).
- $\forall\lambda_k \geq 0 \; and \sum_{k=1}^{K} \lambda_k = 1$, if the efficiency score is computed under the assumption of variable returns to scale (VRS).
- $\forall\lambda_k \geq 0 \; and \; \sum_{k=1}^{K} \lambda_k \leq 1$, if the efficiency score is calculated under the assumption of decreasing returns to scale (DRS).
- $\forall\lambda_k \geq 0 \; and \; \sum_{k=1}^{K} \lambda_k \geq 1$, if the efficiency score depicts how the DMU operate under increasing returns to scale (IRS)

When $F^0 = 1$, the DMU "0" is efficient and it is a benchmark for at least one inefficient DMU. The F^0 scores of inefficient DMUs are smaller than 1. For these DMU, we can find the target value of output (the output that the DMU, if efficient, may produce with its current set of inputs) by dividing the original output by the efficiency score, $Target\ Value^0 = n^0/F^0$.

Thus, DEA identifies the most efficient DMUs and shows by how much the inefficient DMUs could increase their outputs. By estimating the scores of a given unit under CRS and VRS, the scale efficiency (SE) can be computed.

$$SE^0 = \frac{F^0_{crs}}{F^0_{vrs}}$$

A DMU having a SE score closer or equal to one has an optimum scale of production. The source of its inefficiency is related to the management of the organization. If a DMU has a SE score considerably smaller than 1, it means that the observed DMU operate on an inefficient scale and according to the efficiency scores under DRS and IRS, it should increase or decrease its size.

DEA models can identify the most efficient DMUs. But, if all of them have the same score, the ranking is meaningless. Therefore, the concept of super-efficiency has been introduced. Super-efficiency measures are constructed by excluding the evaluated firm and checking how the efficiency frontier would change. Thus, the reference technology set could be written as T* (γ ┤|-k), where γ refers to the different assumptions of DEA. We compute the optimum solution by excluding DMU "k".

$$F^{sup}=F\ ((x^k,y^k);T^*\ (y\mid -k))$$

The super-efficiency measures on the input and output sides are not restricted to either below or above 1. On the output side, F^{supk} (the super-efficiency score of firm k) is smaller than one when the DMU have reduced all of its outputs by a factor of F^superk without being dominated by another firm (Bogetoft and Otto, 2011). However, in some cases, the Farell-based super-efficiency may not provide feasible solutions F^sup k=- ∞. The presence of infinite super-efficiencies simply means that there are no other units against which to gauge firm k with the given data and the imposed technological regularities. Such DMUs can be defined as hyper-efficient (Bogetoft and Otto, 2011). Such infeasible solutions appear frequently in the cases of DEA-VRS models.

In the current study, the efficiency CRS and VRS scores have been computed by using Win4Deap 2[13] software. The CRS super-efficiency measures were calculated with R[14] software and its Benchmarking[15] package. These softwares are freely available.

[13] http://www.sigmdel.ca/aed-dea/install2-en.html

[14] https://www.r-project.org/

[15] https://cran.r-project.org/web/packages/Benchmarking/Benchmarking.pdf

4 Data

DEA can be used only to compare homogenous units using similar technologies. In order to choose the most appropriate indicators, one must examine how a container terminal operates. There are two main types of container terminals, according to their geographical location, inland and sea. The former are situated on the river bank and in general they are smaller and accessible only for small vessels (barges). On the other hand, sea terminals are much bigger located on the sea shore and some of them are able to accommodate very large container vessels (Triple E class with a capacity of more than 16 000 TEUs). Following Carlo et al. (2014), another way to categorize the container terminals is according to their storage yard operations.

Figure 1: Container terminal areaSource: Carlo et al. (2014)

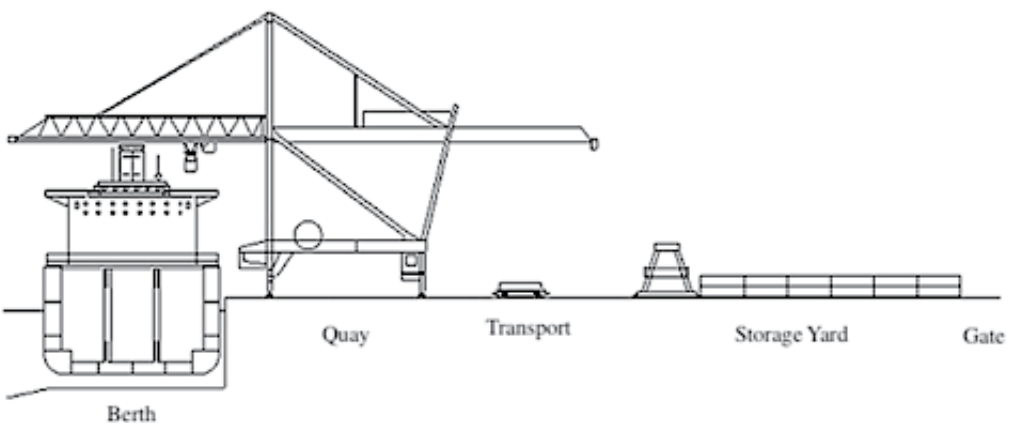


Figure 1: Container terminal area
Source: Carlo et al. (2014) illustrates the main facilities and the process of transportation of containers. The vessel arrives at the berth. Then, quay cranes load and unload containers in and out of the vessel. These cranes are also known as "container handling gantry cranes" or "ship-to-shore cranes". There are three types of quay cranes according to their size. The first one is "Panamax" crane, which can fully load and unload containers from a panamax class container ship (12–13 containers wide). The second type is "post-Panamax", it can load and unload containers from bigger Panamax vessels (normally about 18 containers wide). Finally, the largest modern container cranes are classified as "super-post-Panamax", which are used for vessels of about 22 or more containers wide. For smaller mixed terminals (containers, general cargo, bulk cargo), other harbor cranes could be used for loading and unloading containers.

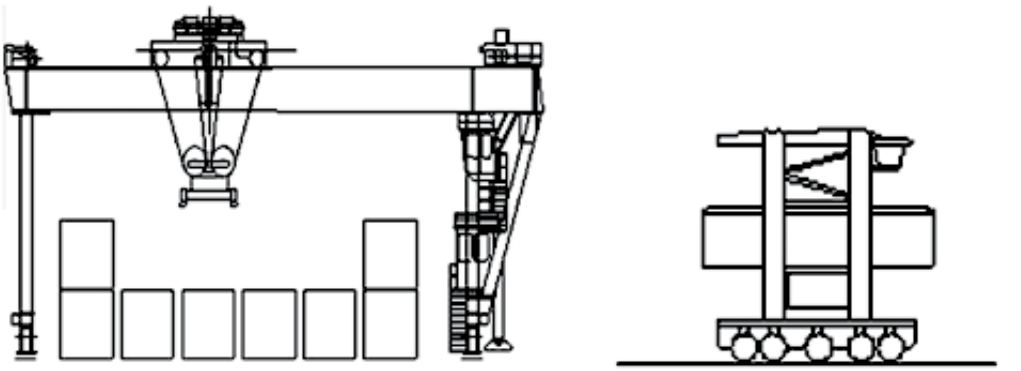
Different types of vehicles can be used both for the ship-to-yard transportation and the interface between the yard and the hinterland. The most common types are multi-trailer systems (MTS) with manned trucks, automated guided vehicles (AGVs), and automated lifting vehicles (ALVs[16]) . These vehicles are also used to move the containers from the storage yard to the gates.

In the container yard, there are different handling systems. The first one is gantry cranes system (Figure 2: Container Yard Equipment (left side a Gantry Crane and on the right side a straddle carrier) Source: Carlo et al. (2014). Their main function is to load containers from trucks or terminal tractors to the container block and vice versa. They can be Rubber Tired Gantry Cranes (RTGC) and Mounted Rail Gantry Cranes (MRGC). The former are also known as transtainers and they operate by onboard drivers. A Normal RTG crane span has 5-8 containers in width and 3-5 in height. Standard RTG cranes are equipped with diesel engines to provide power for travel and lifting. On the other hand, Railed Mounted Gantry Cranes (RMGC) are fully electrified. Main power supply and data transmission is managed by dedicated and highly dynamic motor driven cable reels[17] . They are typically wider and higher than RTG cranes. Fully automated RMGC are known as Automated Stacking Cranes. Another way to transport the containers is by Straddle Carriers (SC) (Figure 2, on the right side). Straddles pick and carry containers while straddling their load and connecting to the top lifting points via a container spreader. They are able to stack containers up to 4 high. Such system is used in some ports such as Singapore, Hong Kong and Port Klang.

[16] http://www.logists.by/library/view/Container-Terminals-and-Cargo-Systems1

[17] http://www.conductix.de/en/applications/rtgrmg-container-crane

Figure 2: Container Yard Equipment (left side a Gantry Crane and on the right side a straddle carrier) Source: Carlo et al. (2014



Finally, in smaller container terminals a forklift system is used only where containers are transported by Reach Stackers and High Stackers. They are able to transport containers very quickly and pile them in various rows depending on their access. Such machines are widely used due to their flexibility and higher stacking and storage capacity. In addition there are also empty stackers that are used only for handling empty containers.

In the sample, all container terminals use mixed system of handling containers in the storage yard. They combine forklift with RTGCs or/and MRGC. Only one terminal, North Port Container Terminal (Port Klang) has SC system. Most of the ASEAN terminals use forklifts with RTGCs. In the sample, there are 4 inland and 22 sea ports which have such equipment. Only four terminals (all of them inland) have MRGCs and Forfklifts. Another four ports use MRGCs, RTGCs and Forklifts.

Table 2: Technology in the Container Yard

Number	type	Technology in the Container Yard					
		RTG + Forklift	MRGC + Forklift	MRTG + RTG + Forklift	Forklift	Straddle Carriers + RTG + Forklift	RTG
17	Inland	7	4	1	5	0	0
33	Sea Port	22	0	3	5	1	1
50	**Total**	**30**	**4**	**4**	**10**	**1**	**1**

Due to the low number of container terminals with SCs and MRGC systems it was impossible to create more categories according to the yard equipment. It should be emphasized that a terminal can belong to more than one category. Finally, we categorized the terminals into six groups:

- Category 1: Inland and Sea terminals with yard cranes in the storage yard;
- Category 2: Inland and Sea terminals with RTGCs and Forklifts in the storage yard;
- Category 3: Sea terminals with yard cranes in the storage yard;
- Category 4: Sea terminals with RTGC and Forklifts in the storage yard;
- Category 5: Inland ports regardless of their storage yard handling equipment;
- Category 6: Inland ports with yard cranes.

The term "Yard cranes" refers to the sum of all cranes (RTGCs, MRGCs and SCs) in the container yard. Table 3 depicts the inputs that we have used to conduct DEA analysis for each category.

Table 3 Inputs used for the DEA analysis about each category of container terminals

	Sample Size	**Max depth at berth (m)**	**Size of the container Yard (m2)**	**Length of the quays (m)**	**No of Quay Cranes**	**No. of RTGC**	**No of Yard cranes (MRGC+ SC + RTGC)**	**No of For klifts**	**No. of Trucks**
Category 1 (Inland and Sea Ports with Yard cranes)	**37**	X	X	X	X		X	X	X
Category 2 (Inland and Sea Ports with RTGC and Forklift)	**29**	X	X	X	X	X		X	X
Category 3 (Sea Ports with Yard Cranes)	**25**	X	X	X	X		X	X	X
Category 4 (Sea Ports with RTGC and Forklift)	**22**	X	X	X	X		X	X	X

Category 5 (Inland Ports)	**16**	X	X	X	X				
Category 6 (Inland Ports with Yard cranes)	**12**			X			X		

The first category is the biggest one, including all inland and sea ports with yards cranes (any type) and quay cranes. It takes into account 7 input indicators. We sum up all types of cranes (RTGC, MRGC and SC) into one input indicator (Number of Yard Cranes in the container yard). In the second category we compare inland and sea container terminals with RTGC and forklift systems. In the third category, we include only sea ports with Yard cranes. In the fourth category were included only sea ports with RTGC and Forklift handling systems in the storage yard. Inland terminals regardless of their handling equipment in the container yard were grouped in the fifth category. Finally, the last category compares inland terminals with yard cranes.

The maximum number of inputs we can use, given the number of DMUs, is given by the thumb rule:

$$\#DMUs > 3 \ (m+n)$$

Hence, for categories four, five and six, we had to eliminate some inputs from the analysis, due to the low number of DMUs in the sample. Inputs were excluded based on their level of correlation with the other inputs.

The data were collected from various sources such as websites of ports, reports, articles, google maps and other sources. A major issue was the availability and reliability of the data. Unfortunately, there is no database which contains the equipment and infrastructure of the ports. Considering the fact that the industry is facing huge issues in terms of oversupply and efficiency, such database could be very useful for decision makers. We have also found out that some sources of information such as "Guide to Port Entry 2015-2016[18] " often do not provide up-to-date information for some terminals.

[18] http://www.portinfo.co.uk/products/product/112-guide-to-port-entry-2015-2016

5 Results

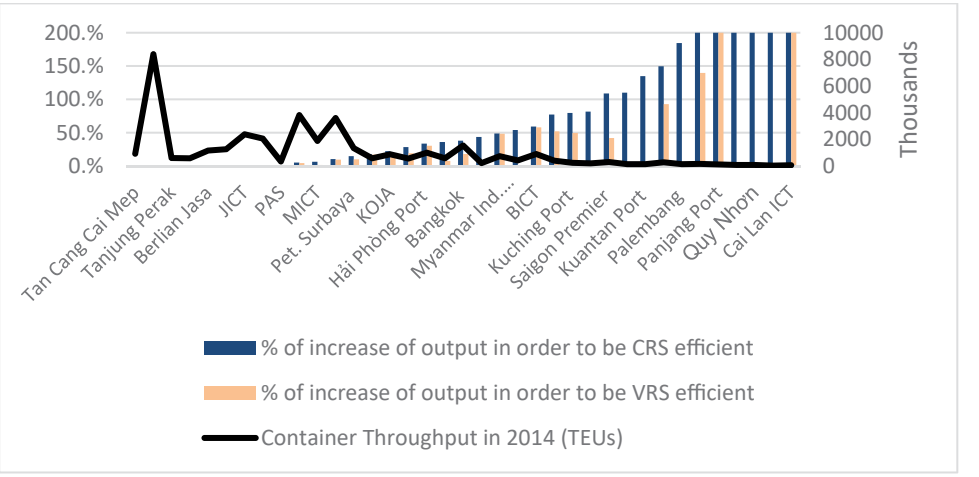
50 container terminals and ports were categorized into six groups. Some terminals appear in more than one group. For all the groups, we have used as an output, the Annual Container Throughput measured in number of TEUs in 2014. In this section are described the main results of the output DEA-CCR and DEA-BCC models applied in the survey.

5.1 Category 1 (Inland and Sea Ports with Yard cranes (RTGC, MRGC and SC))

The first group includes all inland and sea container ports and terminals having yard cranes in the storage area. The ports which have only forklift systems in the container yard were not included in this category. Figure 3: Target values and actual Container throughput of inland and sea ports with yard cranes shows by how much the ports in the first category should increase their outputs (container throughputs) to become efficient. In order for the results to be visible on the graph we have a limit display upper boundary percentage of 200% for all ports which have to increase their outputs by more than 200% to become efficient. The ports are ranked from left to the right according to their super-efficiency measures. As we can see the most efficient port seems to be Tang Cang Cai Mep (Vietnam), followed by West Port Klang (Malaysia) and Tanjung Perak (Indonesia). There is only one inland port which appears to be efficient, Đình Vũ (Vietnam). The most inefficient ports are the following Bến Nghé (Vietnam), Panjang Port (Indonesia), Bông Sen - Lotus port (Vietnam), Quy Nhơn (Vietnam), Jambi Port (Indonesia) and Cai Lan ICT (Vietnam). They need to increase their container throughputs by more than 200% in order to be on the efficiency frontier. We can also observe that these ports have an annual container throughput of around 100,000 TEUs. On average the ports in the sample have good score in terms of Scale Efficiency (0.802). The source of inefficiency is related to their small size, because most of them operate under increasing returns to scale. There are only 4 ports which are experiencing decreasing returns to scale (DRS), Belewan ICT (Malaysia), North Port – Port Klang (Malaysia), Saigon New Port (Vietnam) and Hai Phong Port (Vietnam). The size of these ports is having a negative effect on their performance.

Figure 3: Target values and actual Container throughput of inland and sea ports with yard cranes

(RTGC, MRGC and SC)



Note: The container terminals and ports are ranked from the most to the least efficient (from left to right), according to their CRS Super Efficiency measures.

The average score of all ports in terms of CRS efficiency is relatively low, 0.676. This is probably due to the fact that both inland and sea ports belong to the sample, and there are some outliers (very efficient ports) which make the others appear very inefficient. This is confirmed by the relatively high VRS scores (0.852).

Table 4 Number of times a port is being a benchmark in DEA-CRS and DEA-VRS models (Category 1)

	Country	CRS peer	VRS peer
Bitung	Indonesia	0	1
Pontianak	Indonesia	0	10
Jambi Port	Indonesia	0	2
Jakarta International Container	Indonesia	2	2
Tanjung Perak Port	Indonesia	20	10
Berlian Jasa Terminal	Indonesia	3	2
Kuantan Port	Malaysia	0	1
Penang Port	Malaysia	1	1
West Port Container Terminal	Malaysia	15	12
Phnom Penh Autonomous Port	Cambodia	0	1
Sihanoukville Autonomous Port	Cambodia	0	10
Hutchison Ports Thailand (1.	Thailand	1	1
Đình Vũ	Vietnam	17	7
Tan Cang-Cai Mep	Vietnam	17	12

In 2014, the ports in the first category had a total container throughput of 38 million TEUs. If they had operated efficiently under CRS assumption (producing their CRS efficiency targets), they would have been able to increase the container throughput by 20.17% (7.7 million TEUs). On the other hand, if all ports were VRS efficient, they would have handled 10.83% more containers (4.1 million TEUs).

Regarding the number of times a port is being a benchmark for another unit, we can see with Table 4 that, under the assumption of Constant Returns to Scale (CRS), Tanjung Perak, Dinh Vu, Tan Cang-Mep and West Port Container Terminal (Port Klang) are peers for other ports. However, under VRS, the port of Pontianak becomes a peer for a considerable number of terminals.

In this category, most of the ports are from Indonesia and Vietnam. Indonesian ports have better CRS and VRS scores. On average the ports in these two countries have similar scale efficiency (0.77). Malaysia and Thailand have the highest efficiency, however we cannot make any general conclusions because there are very few ports from these countries in the sample.

Table 5 Average CRS, VRS and SC scores per country (Category 1)

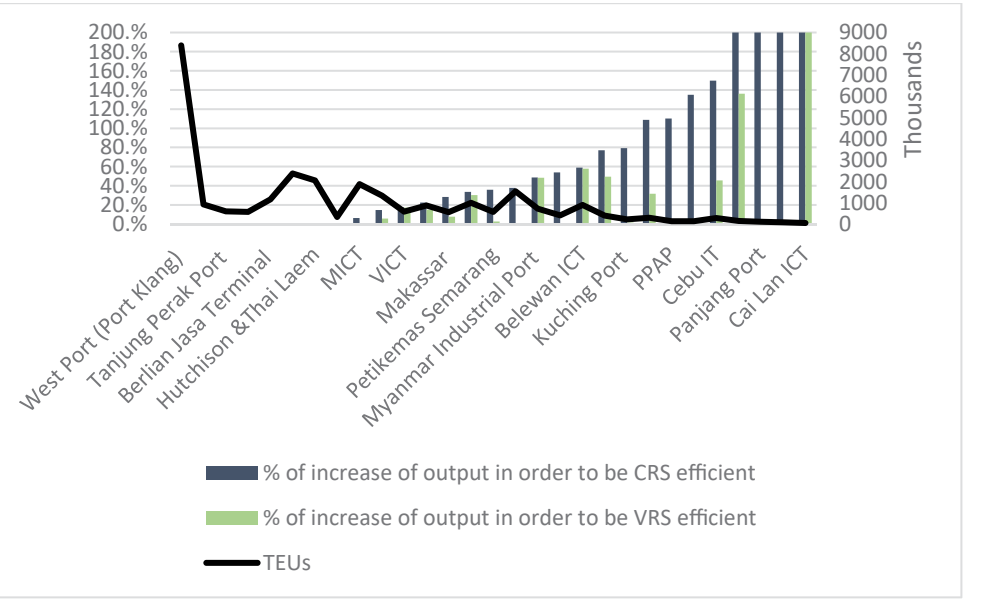
	Number of ports	**CRS Average**	**VRS average**	**Scale average**
Indonesia	14	0.68	0.89	0.77
Vietnam	11	0.59	0.77	0.77
Malaysia	3	0.97	0.97	1.00
Cambodia	2	0.74	1.00	0.74
Thailand	2	0.86	0.92	0.93
Myanmar	1	0.67	0.68	1.00
Philippines	2	0.67	0.75	0.86
Sea Ports	***25***	***0.74***	***0.85***	***0.86***
Inland Ports	***12***	***0.55***	***0.86***	***0.67***

As expected, sea ports have better efficiency scores than inland ports. The former operate on a better scale. However, in terms of VRS efficiency, the performance of both types of ports is almost identical.

5.2 Category 2 (Inland and Sea Ports with RTGC and Forklift systems)

Among the 29 inland and sea ports with Rubber Tired Gantry Cranes and Forklifts in their container yards, 8 are efficient. According to super-efficiency measures, the best performance is reached by West Port Klang which has also the biggest container throughput in 2014, 16.3 million TEUs. Although Sihanoukville Autonomous Port (PAS) has only 330,000 TEUs, it appears to be efficient. The Vietnamese inland port Đình Vũ is again a benchmark. The most inefficient ports are Bến Nghé, Panjang, Quy Nhơn and Cai Lan ICT. Belewan ICT and Hai Phong are the only ones operating under decreasing returns to scale. In 2014, the total container throughput of these ports was 28.6 million TEUs. If all of them were operating on the efficiency frontier, they would have handled 21.36% more (6.1 million additional TEUs). Regarding the efficiency under variable returns to scale (VRS), the total lost in terms of transported containers is 8.82%. Most of the ports have a good scale, on average the scale efficiency is 0.798.

Figure 4: Target values and actual Container throughput in 2014 of inland and sea ports with RTGC and Forklift equipment in the storage yard.



Note: The container terminals and ports are ranked from the most to the least efficient (from left to right), according to their CRS Super Efficiency measures.

Table 6 depicts how many times a port is a benchmark in DEA-CRS and DEA-VRS models. Under the assumption of CRS, Tan Cang-Cai Mep is 16 times benchmark, Đình Vũ is 15 times and West Port Klang and Tanjung Perak are 14 times. In the DEA-VRS models, few ports differ from the others. The first one is Kunatan Port (peer for 4 units) and Phnom Penh Autonomous Port (peer for 7 ports). These ports are not CRS efficient. However, when they are compared to similar ports, they appear to be efficient which means that there exist some factors (structural differences) which do not allow them to be CRS efficient.

Table 6 Number of times a port is being a benchmark in DEA-CRS and DEA-VRS models (Category 2)

Port	Type	Country	CRS peer	VRS peer
Jakarta International Container	Sea Port	Indonesia	2	3
Tanjung Perak Port	Sea Port	Indonesia	13	12
Berlian Jasa Terminal	Sea Port	Indonesia	3	2
Kuantan Port	Sea Port	Malaysia	0	4
West Port Container Terminal	Sea Port	Malaysia	13	8
Phnom Penh Autonomous Port	Inland	Cambodia	0	7
Sihanoukville Autonomous Port	Sea Port	Cambodia	0	10
Thai Laemchabang Terminal Co.,	Sea Port	Thailand	1	1
Đình Vũ	Inland	Vietnam	14	3
Quy Nhơn	Sea Port	Vietnam	0	1
Tan Cang-Cai Mep International	Sea Port	Vietnam	15	6

Table 7: Average CRS, VRS and SC scores per country (Category 2)

	Number of	CRS	VRS	Scale
Indonesia	10	0.77	0.93	0.83
Vietnam	8	0.58	0.73	0.81
Malaysia	3	0.71	1.00	0.71
Cambodia	2	0.74	1.00	0.74
Thailand	2	0.86	1.00	0.86
Myanmar	1	0.67	0.68	1.00
Philippines	2	0.67	0.84	0.76
Sea Ports	***22***	***0.72***	***0.88***	***0.82***
Inland Ports	*7*	***0.61***	***0.83***	***0.74***

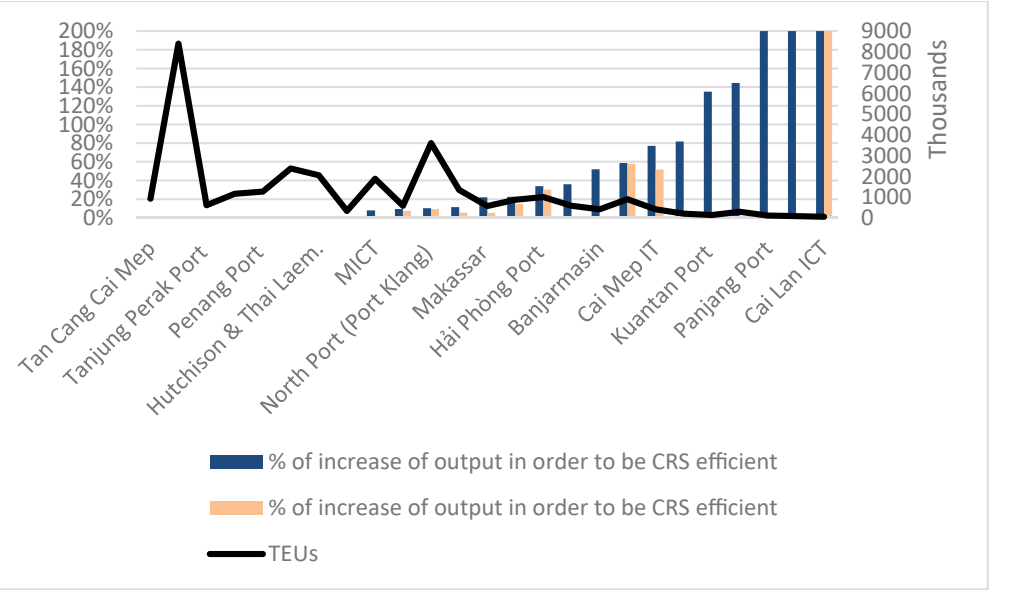
Regarding the average scores at a country level (Table 7), we observe that Indonesia has again higher scores than Vietnam. In this sample, Indonesian terminals have also very good scale efficiency, 0.83 on average. In general, sea ports have better performance than the inland ports. The difference between the two groups is only 0.06 points. This means that by excluding five inland ports using only forklift system, the performance of the other inland ports has increased.

5.3 Category 3 (Sea Ports with Yard Cranes and forklifts)

The third category includes 25 ASEAN sea container terminals which have yard cranes. Recall that as yard cranes we count RTGCs, MRGCs and SCs. The port of Tan Cang Cai Mep (Vietnam) appears to be the most efficient according to CRS super-efficiency measures, followed by West Port Klang (Malaysia) and Tanjung Perak (Indonesia). Cebu, Panjang Port, Quy Nhơn and Cai Lan ICT appear again inefficient. The ports in the sample handled 30 million container throughput in 2014. If they operated efficiently they would have transported 4.7 million additional containers or 15.36 % more. In the case of VRS efficiency, they would have increased their total throughput by 6.67% (around 2 million additional TEUs).

Tanjung Perak is 14 times a peer (Table 8), followed by West Port Klang and Tai Cang Cai Mep in the case of DEA-CRS output model. In terms of VRS efficiency we see that, despite the fact that Bitung is not CRS efficient, the port is VRS efficient and a benchmark for 2 other ports. On the other hand, regarding CRS efficiency measures, PAS is a peer unit for none of the ports. However, under VRS assumption, it is a benchmark for 7 units.

Figure 5: Target values and actual Container throughput in 2014 of sea ports with yard cranes (RTGC, MRGC and SC) and Forklift equipment in the storage yard



Note: The container terminals and ports are ranked from the most to the least efficient (from left to right), according to their CRS Super Efficiency measures.

Table 8 Number of times a port is being a benchmark in DEA-CRS and DEA-VRS models (Category 3)

Port	Country	CRS	VRS
Bitung	Indonesia	0	2
JICT	Indonesia	2	1
Tanjung Perak Port	Indonesia	14	7
Berlian Jasa	Indonesia	1	1
Penang Port	Malaysia	1	1
West Port (Port Klang)	Malaysia	13	8
PAS	Cambodia	0	7
Hutchison & Thai Laem.	Thailand	1	1
Tan Cang Cai Mep	Vietnam	11	6

Among the countries with more than 2 sea ports with RTGC and Forklift system in the sample, Malaysia has the highest average CRS score, followed by Indonesia and Vietnam (Table 9). In terms of scale efficiency, Malaysian ports have the best performance.

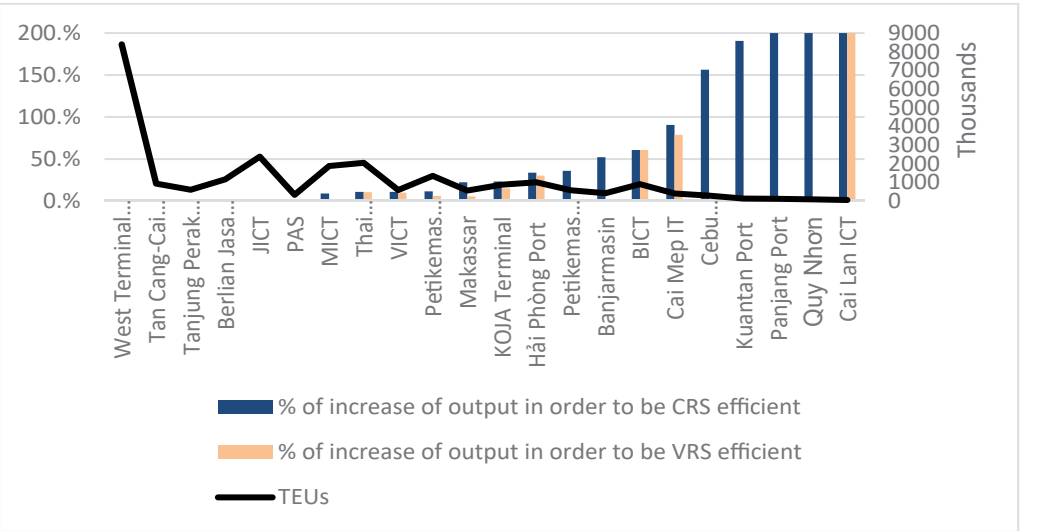
Table 9 Average CRS, VRS and SC scores per country (Category 3)

	Number of ports	CRS Average	VRS average	Scale average
Indonesia	11	0.76	0.94	0.81
Vietnam	6	0.59	0.75	0.78
Malaysia	4	0.83	0.98	0.85
Cambodia	1	1.00	1.00	1.00
Thailand	1	1.00	1.00	1.00
Philippines	2	0.67	0.96	0.70

5.4 Category 4 (Sea ports with RTGC and Forklift Handling Systems in the container yard)

The fourth category includes 22 ASEAN sea container terminals which have RTGC and Forklift handling systems in their storage yards. Because of the low number of ports having such systems, we had excluded one input. The most correlated input was found to be the number of trucks. Therefore the following inputs were used for the DEA models: depth at berth (meters), container yard size (m2), length of quays (meters), number of quay cranes, number of RTG cranes and number of forklifts. Figure 6 shows that the most efficient ports in terms of CRS super-efficiency measures is West Terminal of Port Klang (Malaysia), followed by Tan Cang-Cai Mep (Vietnam), Tanjung Perak (Indonesia), Berliana Jasa (Indonesia), Jacarta International Container Terminal (Indonesia) and Port of Sihanoukville (Cambodia). The least efficient terminals, which have to increase by more than 100% to become CRS efficient, are the following: Cebu (Philippines), Kuntan (Malaysia), Panjang Port (Indonesia), Quy Nhơn (Vietnam) and Cai Lan ICT (Vietnam). However, it should be emphasized that all of these CRS inefficient ports, excluding Cai Lan ICT, are VRS efficient. It means that these ports are somehow different than the others (have significant difference in the distribution of the inputs). All ports except Hai Phong are operating under increasing returns to scale. By removing both the input "trucks", and the sea ports which are not using RTGC and Forklift systems, we can see that Belewan International Container Terminal operates under increasing returns to scale (IRS).

Figure 6: Target values and actual Container throughput in 2014 of sea ports with RTGC and Forklift equipment in the storage yard



Note: The container terminals and ports are ranked from the most to the least efficient (from left to right), according to their CRS Super Efficiency measures.

West Container Terminal of Port Klang appears as a benchmark for 14 ports in the DEA-CRS model. In addition as we have already seen this port is the most efficient in terms of CRS super-efficiency measures. Tanjung Perak also is many times a benchmark (9). It is interesting to analyze JICT and Berliana Jasa terminals. The former is not a benchmark for none of the units in the sample, while the latter is a benchmark for only one. These two terminals probably have significant structural differences than the others.

Table 10 Number of times a port is being a benchmark in DEA-CRS and DEA-VRS models (Category 3)

Port	Typ	Countr	Peer	Peer
JICT	SEA	IDN	4	0
Tanjung Perak Port	SEA	IDN	9	10
Berlian Jasa Terminal	SEA	IDN	1	1
West Container Terminal (Port	SEA	MYS	14	11
PAS	SEA	KHM	3	10
Tan Cang-Cai Mep International Terminal	SEA	VNM	5	4

Table 11 Average CRS, VRS and SC scores per country (Category 4)

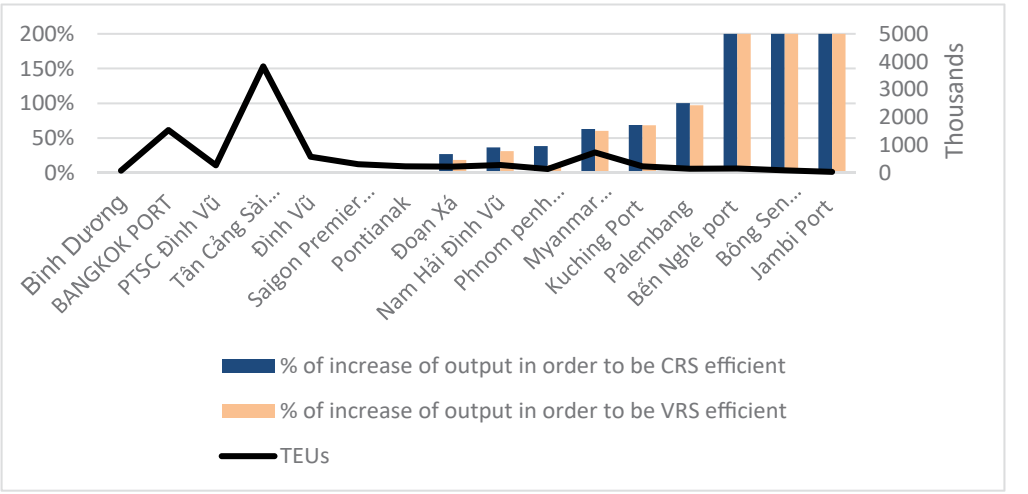
	Number of	CRS	VRS average	Scale
Indonesia	10	0.7795	0.9374	0.8399
Vietnam	6	0.572167	0.724167	0.804833
Malaysia	2	0.672	1	0.672
Cambodia	1	1	1	1
Thailand	1	0.903	0.906	0.997
Philippines	2	0.654	0.989	0.664

5.5 Category 5 (Inland container terminals and ports with forklift or and yard cranes)

In this category all inland ports have been included regardless of their handling equipment in the container yard. There are only 16 container terminal, so according to the rule of thumb we had to select only four inputs. We have chosen the least correlated inputs which are: Maximum depth at berth (m), Container Yard size (m2), length of quays (m) and the number of quay cranes. Figure 7 depicts the necessary percentage of increase of each port outputs to reach their target values and the actual container throughput in 2014. Seven ports are efficient. According to the CRS super-efficiency measure, the most efficient inland port is Bình Dương followed by Bangkok, PTSC Đình Vũ, Saigon New port and Đình Vũ, while the most inefficient ones are Bến Nghé port, Bông Sen (Lotus port) and Jambi Port. The total container throughput in 2014 of all ports in the sample was almost 8.8 million TEUs in 2014. If all of them were on the CRS efficiency frontier, they would have increased their productivity by 20%. In the case of VRS efficiency, these ports would have been able to handle 18.68% more containers.

It should be highlighted that, by removing some input indicators, the efficiency of port of Đình Vũ is reduced. In the first and second categories, this port was the only inland efficient port. In this group of inland ports Đình Vũ appears as efficient, even though in terms of super efficacy it is ranked 5th .

Figure 7 Target values and actual Container throughput in 2014 of inland ports with Forklift and/or cranes equipment in the storage yard



Note: The container terminals and ports are ranked from the most to the least efficient (from left to right), according to their CRS Super Efficiency measures.

Table 12 Number of times a port is being a benchmark in DEA-CRS and DEA-VRS models (Category 4)

	Country	CRS peer	VRS peer
Pontianak	Indonesia	1	5
Bangkok Port	Thailand	6	5
Saigon Premier Container Terminal	Vietnam	3	3
Đình Vũ	Vietnam	6	4
PTSC Đình Vũ	Vietnam	3	6
Bình Dương	Vietnam	4	5
Tân Cảng Sài Gòn (Saigon New Port)	Vietnam	1	2

Table 13 Average CRS, VRS and SC scores per country (Category 4)

	Number of ports	CRS Average	VRS average	Scale average
Indonesia	3	0.57	0.58	0.96
Vietnam	9	0.78	0.79	0.99
Malaysia	1	0.59	0.59	1.00
Cambodia	1	0.72	0.90	0.80
Thailand	1	1.00	1.00	1.00
Myanmar	1	0.61	0.62	0.98

Table 12 shows that the ports of Bankok and Đình Vũ are 6 times benchmark for others, followed by the port of Bình Dương (4 times). Regarding VRS efficiency, the port of PTSC Đình Vũ is still a benchmark for 6 ports. Vietnamese terminals have very good efficiency scores, they are also the most numerous in this category (9 ports). Contrary to the results of the previous group, inland Vietnamese ports seem to be more efficient than the Indonesian ports.

5.6 Category 6 (Inland Ports with Yard cranes)

There are only 12 inland ports with cranes in the container yard. Therefore, similarly to the previous category, we are unable to include all seven inputs. It is possible to have only 2 inputs. So we made 8 DEA output oriented CCR models.

Table 14 gives the ranking of the ports according to some combination of the 7th inputs. We can see that Saigon New Port is 7 times efficient, while Đình Vũ is 5 times a benchmark. The terminals of Pontianak (Indonesia), Bangkok (Thailand) and Saigon Premier are also efficient in some of the DEA models. In 2014, the total container throughput of the ports in the sample was 7.95 million TEUs. On average, if all ports were operating efficiently, they should have been able to increase their container throughput by around 64.5%. However, it should be emphasized that, for each DEA model, we took only 2 indicators. In order to have more reliable results, the sample must be increased. In addition, this high percentage may be due to the presence of outlier(s) or super-efficient port(s) which make the other ones appear very inefficient.

Table 14 Ranking of inland ports with cranes in the storage yard according to DEA-CRS output oriented models with two inputs

Port	Count	TEUs	Number of times the port appears efficient	Depth and length	Depth and CY size	Depth and quay cranes	CY size and length	CY size and forklifts	Length and Yard Cranes	Length and Forklifts	Length and trucks
Palembang	IDN	137685	0	8	6	10	7	7	6	6	6
Pontianak	IDN	227130	2	1	4	6	1	2	4	5	4
Jambi Port	IDN	29379	0	9	12	12	8	8	12	12	12
Kuching Port	MYS	227600	0	10	9	5	10	10	9	8	9
Myanmar Industrial	MMR	728000	0	7	7	7	9	9	7	9	10
PPAP	KHM	133666	0	6	8	8	6	4	8	7	8
Bangkok Port	THA	1536106	2	1	3	3	1	3	3	4	3
Saigon Premier	VNM	301382	4	1	5	4	1	1	5	1	5
Đình Vũ	VNM	574635	5	5	2	1	1	5	1	1	1
Saigon New Port	VNM	3827115	7	1	1	1	1	6	1	1	1
Bến Nghé port	VNM	148306	0	12	11	9	12	12	11	10	7
Bông Sen (Lotus)	VNM	84900	0	11	10	11	11	11	10	11	11

Total	**7955904**									
Average CRS Target Value	**13087662**									
Average % of increase of the output in order to be CRS efficient	**64.5%**									

Most inland ports with cranes in the container yard are from Vietnam. For this category it is impossible to have any additional conclusions because of the small size of the sample and the low number of inputs used for the different DEA models.

5.7 Discussion

By associating the ports to different categories we wanted to compare the performance of inland and sea ports, as well as the performance of ports using different handling systems in their container yards. The results show that the ASEAN sea ports have better performance than inland ports. In the first two categories we have included inland and sea terminals with yard cranes. The average CRS score of all ports in this category is 0.676. In the second one, we kept only the ports with RTGC and forklifts handling equipment in the storage yard. The results show that the CRS scores have improved, which means that on average the terminals using RTGC and Forklift systems are more efficient than those using any other system such SC or MRGC. In the third category we excluded all inland ports. As we can see in Table 15, the average CRS, VRS and Scale scores have increased, which means that sea ports are more efficient than the inland ports. By excluding 3 sea ports, namely North Port Klang, Penang and Bitung, which are not operating with RTG and Forklift handling system, and by removing the number of trucks as input, we observe that the average efficiency scores have decreased. In the fifth category we compare all inland ports in the sample. Their efficiency scores are relatively high.

Table 15 Average Efficiency scores per category

Categories	Average CRS	Average VRS	Average Scale
Category 1 (Inland and Sea Ports with Yard cranes)	0.676	0.852	0.802
Category 2 (Inland and Sea Ports with RTGC and Forklift)	0.696	0.872	0.798
Category 3 (Sea Ports with Yard Cranes)	0.741	0.908	0.818
Category 4 (Sea Ports with RTG and Forklift)	0.717	0.891	0.814
Category 5 (Inland Ports)	0.728	0.748	0.971
Category 6 (Inland Ports with Yard cranes)	0.522	0.699	0.77

Our results show that, by excluding ports having different handling system than RTGC and Forklift, the performance improves, even though the scale efficiency for the first category is higher. In the first three categories, Indonesian ports perform much better than the Vietnamese ports, which is not the case when we compare only inland ports. Malaysian ports are very efficient and in almost every category they have the best scores. However, we should emphasize that in total there are only four Malaysian ports in the sample and we cannot make any general conclusion about all the ports in this country.

In the first four categories, we have almost every time the same sea ports having the highest relative efficiency: Tan Cang Cai Mep, West (Port Klang), Tanjung Perak, Berlian Jasa, Penang Port, JICT, Hutchison & Thai Laem Chabang and PAS. Đình Vũ is the only inland port which has a score of one in the first two categories, this port is a benchmark for all others inland container terminals. Saigon premier is another inland port which is very close to the efficiency frontier in the first category. Some sea ports are also close to the efficiency frontier such as MICT, North Port Klang Pet. Surbaya, KOJA terminal and Makassar.

In the last two categories only inland ports were compared. It appears that, in addition to Đình Vũ and Saigon Premier, Bangkok Port, Bình Dương and Pontianak are benchmarks. In all categories, most of the ports operate under Increasing Returns to Scale. It means that they should increase their inputs in order to become more efficient. Very few are experiencing decreasing returns to scale. Thus regarding the DEA models that we have applied in this study, we could conclude that the source of inefficiency for most of ASEAN ports is their small size.

6 Limits of the study

DEA estimate the relative efficiency of the DMUs. The analysis and results are based on the input and output indicators that we have selected. We should emphasize that our results are sensible to the set of inputs that we use. By including other indicators, such as costs, investments, number of employees, number of ship calls, salaries, time for custom clearance, lifting capacity of gantry cranes, etc. we could have very different efficiency scores.

A basic requirement for any reliable performance benchmarking exercise is the appropriate definition and selection of homogenous DMUs (Bichou, 2013). In our case homogenous DMUs refers to container ports which are using similar technologies (similar type of quay and yard cranes) or having the same function (inland or coastal; domestic or international; hub or small). Due to data availability, we were not able to create more specific categories such as, ports using MRGCs or ports with SCs or categorize the terminals according to the quay cranes (Panamax, Post Panamax or Lifting capacity).

Daraio and Simar (2007) have emphasized the following limits of the traditional non-parametric models: deterministic (meaning that all deviations from the efficient frontier are considered as inefficiency, and no noise is allowed) and non-statistical nature; influence of outliers and extreme values; lack of parameters for the economic interpretation; unsatisfactory techniques for the introduction of environmental or external variables in the measurement of the efficiency. Moreover, Bae and Lee (2011) stated that it is not realistic to use a hypothetical DMU projected on the efficiency frontier and to compare it with real container ports.

7 Conclusion and future research

The relative efficiency DEA analyses conducted in this paper show that the ASEAN ports have relatively good scale efficiency and most of them could handle even more containers by increasing their inputs. There is a need to analyze in details what makes a sea or inland ports efficient. Not surprisingly our study has found out a significant difference between the performance of inland and sea terminals. In addition we observe that by removing container terminals using SC or MRGC, the average efficiency score increases.

For the future research, we want to collect more data about connectivity of the ports. More ASEAN ports should be included in the sample in order to have a complementary analysis at a country level about the relation between the trade performance of each of the ASEAN states and the performance of their container ports. It should be also included additional inputs as well as ports from other regions, China, Europe, Africa and America.

Considering the fact that the competition between the container terminals is getting more intense and that the shipping companies are aiming to realize economies of scale by building bigger vessels, the issue of efficiency has become a hot topic. There is a need to increase the availability and reliability of the data in order to provide useful recommendations to the ports' managers. The current shipping crisis which was further amplified after Hanjin Shipping bankruptcy highlighted the importance of more reliable and available data and cooperation between the main players. Therefore, without increasing the capacity of shipping companies and container terminals to improve their long-term investments and operational costs, the shipping industry will remain in the murky waters of oversupply and uncertainty.

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Appendices

Appendix 1: Category 1 (Inland and Sea Ports with Yard cranes), relative efficiency scores, ranking and returns of scale.

Port	Type	State	TEUs	Crste	Vrste	Scale	Rank Super crste	Super crste	Returns
West (Port Klang)	Sea	MYS	8393000	1.00	1.00	1.00	**2**	0.50	-
Saigon New Port	Inland	VNM	3827115	0.95	0.96	0.99	**10**	1.05	drs
North (Port Klang)	Sea	MYS	3597000	0.91	0.91	0.99	**12**	1.10	drs
JICT	Sea	IDN	2373470	1.00	1.00	1.00	**7**	0.85	-
Hutchison &Thai Laem	Sea	THA	2049000	1.00	1.00	1.00	**8**	0.89	-
MICT	Sea	PHL	1877000	0.94	0.98	0.96	**11**	1.06	irs
Bangkok	Inland	THA	1536106	0.73	0.85	0.86	**19**	1.38	irs
Pet. Surbaya	Sea	IDN	1343523	0.87	0.91	0.96	**13**	1.15	irs
Penang Port	Sea	MYS	1260000	1.00	1.00	1.00	**6**	0.66	-
Berlian Jasa	Sea	IDN	1158947	1.00	1.00	1.00	**5**	0.63	-
Hải Phòng Port	Sea	VNM	1002987	0.75	0.77	0.97	**17**	1.34	drs
Tan Cang Cai Mep	Sea	VNM	922885	1.00	1.00	1.00	**1**	0.47	-
BICT	Sea	IDN	900395	0.63	0.63	0.99	**23**	1.59	drs
KOJA	Sea	IDN	872511	0.82	0.87	0.94	**15**	1.22	irs
Myanmar Ind. Port	Inland	MMR	728000	0.67	0.68	1.00	**21**	1.49	irs
Tanjung Perak	Sea	IDN	601915	1.00	1.00	1.00	**3**	0.58	-
VICT	Sea	VNM	583693	0.85	0.85	1.00	**14**	1.17	irs
Pet. Semarang	Sea	IDN	575671	0.74	0.93	0.79	**18**	1.36	irs
Đình Vũ	Inland	VNM	574635	1.00	1.00	1.00	**4**	0.60	-
Makassar	Sea	IDN	562046	0.78	0.84	0.93	**16**	1.28	irs
Banjarmasin	Sea	IDN	413737	0.65	1.00	0.65	**22**	1.54	irs
Cai Mep IC	Sea	VNM	402714	0.57	0.66	0.86	**24**	1.77	irs
PAS	Sea	KHM	333904	1.00	1.00	1.00	**9**	0.95	-

Saigon Premier	Inland	VNM	301382	0.48	0.71	0.68	27	2.09	irs
Cebu	Sea	PHL	285049	0.40	0.52	0.77	30	2.50	irs
Kuching Port	Inland	MYS	227600	0.56	0.67	0.83	25	1.79	irs
Pontianak	Inland	IDN	227130	0.70	1.00	0.70	20	1.44	irs
Bitung	Sea	IDN	200153	0.55	1.00	0.55	26	1.82	irs
Bến Nghé port	Inland	VNM	148306	0.33	0.42	0.79	32	3.02	irs
Palembang	Inland	IDN	137685	0.35	1.00	0.35	31	2.85	irs
PPAP	Inland	KHM	133666	0.48	1.00	0.48	28	2.10	irs
Kuantan Port	Sea	MYS	131000	0.43	1.00	0.43	29	2.35	irs
Panjang Port	Sea	IDN	107546	0.24	0.28	0.84	33	4.22	irs
Quy Nhơn	Sea	VNM	86766	0.20	1.00	0.20	35	5.00	irs
Bông Sen (Lotus port)	Inland	VNM	84900	0.23	1.00	0.23	34	4.32	irs
Cai Lan ICT	Sea	VNM	49774	0.08	0.11	0.79	37	12.08	irs
Jambi Port	Inland	IDN	29379	0.14	1.00	0.14	36	7.23	irs
mean				**0.68**	**0.85**	**0.80**			

Appendix 2: Category 2 (Inland and Sea Ports with RTGC and Forklift), relative efficiency scores, ranking and returns of scale.

Port	Type	Country	TEUs	Crste	Vrste	Scale	RANK SUPER CRS	SUPER CRS	
West (Port Klang)	Sea	MYS	8393000	1.00	1.00	1.00	1.00	0.29	-
JICT	Sea	IDN	2373470	1.00	1.00	1.00	6.00	0.85	-
Hutchison &Thai Laem	Sea	THA	2049000	1.00	1.00	1.00	7.00	0.89	-
MICT	Sea	PHL	1877000	0.94	1.00	0.94	9.00	1.06	irs
BANGKOK PORT	Inland	THA	1536106	0.73	1.00	0.73	16.00	1.38	irs
Pet. Surbaya	Sea	IDN	1343523	0.87	0.95	0.92	10.00	1.15	irs
Berlian Jasa	Sea	IDN	1158947	1.00	1.00	1.00	5.00	0.63	-
Hải Phòng Port	Sea	VNM	1002987	0.75	0.77	0.97	14.00	1.34	drs
Tan Cang Cai Mep	Sea	VNM	922885	1.00	1.00	1.00	2.00	0.47	-
BICT	Sea	IDN	900395	0.63	0.63	0.99	19.00	1.59	drs
KOJA Terminal	Sea	IDN	872511	0.82	0.87	0.94	12.00	1.22	irs
Myanmar Industrial Port	Inland	MMR	728000	0.67	0.68	1.00	17.00	1.49	irs
Tanjung Perak	Sea	IDN	601915	1.00	1.00	1.00	3.00	0.58	-
VICT	Sea	VNM	583693	0.85	0.85	1.00	11.00	1.17	irs
Pet. Semarang	Sea	IDN	575671	0.74	0.97	0.76	15.00	1.36	irs
Đình Vũ	Inland	VNM	574635	1.00	1.00	1.00	4.00	0.60	-
Makassar	Sea	IDN	562046	0.78	0.93	0.84	13.00	1.28	irs
Banjarmasin	Sea	IDN	413737	0.65	1.00	0.65	18.00	1.54	irs
Cai Mep IC	Sea	VNM	402714	0.57	0.67	0.85	20.00	1.77	irs
PAS	Sea	KHM	333904	1.00	1.00	1.00	8.00	0.95	-
Saigon Premier	Inland	VNM	301382	0.48	0.76	0.63	22.00	2.09	irs
Cebu	Sea	PHL	285049	0.40	0.69	0.58	25.00	2.50	irs
Kuching Port	Inland	MYS	227600	0.56	0.99	0.57	21.00	1.79	irs
Bến Nghé port	Inland	VNM	148306	0.33	0.42	0.78	26.00	3.02	irs
PPAP	Inland	KHM	133666	0.48	1.00	0.48	23.00	2.10	irs
Kuantan Port	Sea	MYS	131000	0.43	1.00	0.43	24.00	2.35	irs
Panjang Port	Sea	IDN	107546	0.24	1.00	0.24	27.00	4.22	irs
Quy Nhơn	Sea	VNM	86766	0.20	1.00	0.20	28.00	5.00	irs
Cai Lan ICT	Sea	VNM	49774	0.08	0.12	0.67	29.00	12.08	irs
mean				**0.70**	**0.87**	**0.80**			

Appendix 3: Category 3 (Sea Ports with Yard Cranes), relative efficiency scores, ranking and returns of scale.

Port	State	TEUs	Crste	Vrste	Scale	Rank Super crste	Super crste	Returns
West Port (Port Klang)	MYS	8393000	1.00	1.00	1.00	2	0.50	-
North Port (Port Klang)	MYS	3597000	0.91	0.91	0.99	11	1.10	drs
JICT	IDN	2373470	1.00	1.00	1.00	6	0.85	-
Hutchison & Thai Laem.	THA	2049000	1.00	1.00	1.00	7	0.89	-
MICT	PHL	1877000	0.93	0.93	1.00	9	1.06	-
Pet. Surbaya	IDN	1343523	0.90	0.95	0.95	12	1.12	irs
Penang Port	MYS	1260000	1.00	1.00	1.00	5	0.66	-
Berlian Jasa	IDN	1158947	1.00	1.00	1.00	4	0.63	-
Hải Phòng Port	VNM	1002987	0.75	0.77	0.97	15	1.34	drs
Tan Cang Cai Mep	VNM	922885	1.00	1.00	1.00	1	0.47	-
BICT	IDN	900395	0.63	0.63	1.00	18	1.59	drs
KOJA	IDN	872511	0.82	0.87	0.94	14	1.22	irs
Tanjung Perak	IDN	601915	1.00	1.00	1.00	3	0.58	-
VICT	VNM	583693	0.91	0.93	0.98	10	1.09	irs
Pet. Semarang	IDN	575671	0.74	0.99	0.74	16	1.36	irs
Makassar	IDN	562046	0.82	0.95	0.86	13	1.22	irs
Banjarmasin	IDN	413737	0.66	1.00	0.66	17	1.52	irs
Cai Mep IT	VNM	402714	0.57	0.66	0.86	19	1.77	irs
PAS	KHM	333904	1.00	1.00	1.00	8	0.95	-
Cebu	PHL	285049	0.41	1.00	0.41	22	2.45	irs
Bitung	IDN	200153	0.55	1.00	0.55	20	1.82	irs
Kuantan Port	MYS	131000	0.43	1.00	0.43	21	2.35	irs
Panjang Port	IDN	107546	0.25	1.00	0.25	23	4.00	irs
Quy Nhơn	VNM	86766	0.20	1.00	0.20	24	5.00	irs
Cai Lan ICT	VNM	49774	0.08	0.13	0.66	25	12.03	irs
Mean		0.741	0.908	0.818				

Appendix 4: Category 4 (Sea Ports with RTGC and Forklift), relative efficiency scores, ranking and returns of scale.

Port	State	TEUs	Crste	Vrste	Scale	Rank Super crste	Super crste	Returns
West Terminal (Port Klang)	MYS	8393000	1.00	1.00	1.00	0.29	1	-
Tan Cang-Cai Mep IT	VNM	922885	1.00	1.00	1.00	0.47	2	-
Tanjung Perak Port	IDN	601915	1.00	1.00	1.00	0.58	3	-
Berlian Jasa Terminal	IDN	1158947	1.00	1.00	1.00	0.63	4	-
JICT	IDN	2373470	1.00	1.00	1.00	0.85	5	-
PAS	KHM	333904	1.00	1.00	1.00	0.95	6	-
MICT	PHL	1877000	0.92	0.98	0.94	1.09	7	irs
Thai Laemchabang Terminal Co. & Hutchison Laemchabang Terminal Limited	THA	2049000	0.90	0.91	1.00	1.11	8	irs
VICT	VNM	583693	0.90	0.91	0.99	1.11	9	irs
Petikemas Surbaya	IDN	1343523	0.90	0.94	0.95	1.12	10	irs
Makassar	IDN	562046	0.82	0.95	0.86	1.22	11	irs
KOJA Terminal	IDN	872511	0.81	0.87	0.93	1.23	12	irs
Hải Phòng Port	VNM	1002987	0.75	0.77	0.97	1.34	13	drs
Petikemas Semarang	IDN	575671	0.74	0.99	0.74	1.36	14	irs
Banjarmasin	IDN	413737	0.66	1.00	0.66	1.52	15	irs
BICT	IDN	900395	0.62	0.62	1.00	1.61	16	irs
Cai Mep IT	VNM	402714	0.52	0.56	0.94	1.91	17	irs
Cebu International	PHL	285049	0.39	1.00	0.39	2.56	18	irs
Kuantan Port	MYS	131000	0.34	1.00	0.34	2.91	19	irs
Panjang Port	IDN	107546	0.25	1.00	0.25	4.00	20	irs
Quy Nhơn	VNM	86766	0.18	1.00	0.18	5.62	21	irs
Cai Lan ICT	VNM	49774	0.08	0.11	0.75	12.34	22	irs
Mean		**0.72**	**0.89**	**0.81**				

Appendix 5: Category 5 (Inland ports), relative efficiency scores, ranking and returns of scale.

Port	State	TEUs	Crste	Vrste	Scale	Rank Super crste	Super crste	Returns
Bình Dương	VNM	78843	1.00	1.00	1.00	1	0.05	-
BANGKOK PORT	THY	1536106	1.00	1.00	1.00	2	0.50	-
PTSC Đình Vũ	VNM	265357	1.00	1.00	1.00	3	0.62	-
Tân Cảng Sài Gòn (SAIGON NEW PORT)	VNM	3827115	1.00	1.00	1.00	4	0.71	-
Đình Vũ	VNM	574635	1.00	1.00	1.00	5	0.90	-
Saigon Premier Container Terminal	VNM	301382	1.00	1.00	1.00	6	0.94	-
Pontianak	IDN	227130	1.00	1.00	1.00	7	0.98	-
Đoạn Xá	VNM	214000	0.79	0.85	0.93	8	1.27	irs
Nam Hải Đình Vũ	VNM	277032	0.73	0.76	0.96	9	1.37	irs
Phnom penh Authonomous Port	KHM	133666	0.72	0.90	0.80	10	1.38	irs
Myanmar Industrial Port	MMR	728000	0.61	0.62	0.98	11	1.63	drs
Kuching Port	MYS	227600	0.59	0.59	1.00	12	1.69	irs
Palembang	IDN	137685	0.50	0.51	0.98	13	2.00	drs
Bến Nghé port	VNM	148306	0.28	0.29	0.99	14	3.56	drs
Bông Sen (Lotus port)	VNM	84900	0.22	0.22	0.99	15	4.61	irs
Jambi Port	IDN	29379	0.20	0.23	0.91	16	4.91	drs
mean		**0.728**	**0.748**	**0.971**				

"THE CHANGE OF ASEAN-CHINA TRADE AFTER THE PEOPLE'S REPUBLIC OF CHINA JOINT FREE TRADE AGREEMENT WITH ASEAN-ACFTA"A Comparative Analysis

HAY Chamroeun[19]

Abstract

This paper is broadly research the change of Trade between the Association of Southeast Asian Nations (ASEAN) and the People's Republic of China (PRC) on the members' trade flows and trade patterns after China joint ASEAN-China Free Trade Agreement (ACFTA). The first part of the paper outlines the various definitions of trade integration and summarizes available empirical evidence on the extent of Free Trade Agreement in ASEAN-China and the larger East Asian region. New determinants that capture the rising importance of global production sharing and intraregional trade in parts and components in East Asia are proposed.

Key words: *Economic Integration, Intra-Industry Trade, Comparative Advantage,China, ASEAN*

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1 INTRODUCTION

1.1 Statement of the Problem

The Association of Southeast Asian Nations (ASEAN)—the People's Republic of China (PRC) free trade agreement or ACFTA came into effect on 1 January 2010. It covers a free trade area with the highest population (1.9 billion) and an economic size next only to that of the North American Free-Trade Area (NAFTA) and the European Union (EU). As part of the agreement, the average tariff on ASEAN-origin exports to PRC was lowered from 9.8 percent to 0.1 percent in 2010, while the average tariff on PRC-origin exports to the six original ASEAN members—Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand—was reduced from 12.8 percent to 0.6 percent. By 2015, the policy of zero-tariff rate for 90 percent of Chinese goods is expected to extend to the four new ASEAN members—Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam.

Numerous studies and reports have documented the benefits, opportunities, and challenges of ACFTA to its member countries (Chia 2005; Tongzon 2005). A key challenge is that ACFTA may intensify competition among member countries and lead to significant job losses. It may also reduce social welfare if the effects of trade diversion dominate trade creation. Still, the main attraction of ACFTA is that it offers vast opportunities and benefits to consumers and firms in member countries. Consumers benefit from having access to a wide variety and cheaper products and produce. Many ASEAN firms in particular can tap more easily into the Chinese market, the fastest growing market in the world. The removal of tariffs also allows freer flows of intermediate goods between the two regions, benefiting producers at every stage of production and deepening regional economic integration. Because of the increased significance of production fragmentation in both regions, it is therefore useful to investigate more closely how the free trade agreement will eventually reshape production and trade relationships between the PRC and the ASEAN countries.

The Framework Agreement on Comprehensive Economic Cooperation between ASEAN and China has sets goals to not just eliminate tariffs. It also addresses behind-the-border barriers that impede the flow of goods and services as well as encourage investment and enhance cooperation.

The Framework Agreement was signed in November 2002, which provided the legal basis for ASEAN and China to negotiate further agreements leading to the creation of

the ASEAN-China Free Trade Area (ACFTA) by 1 January 2010. The ACFTA was the first FTA with external parties to be signed by ASEAN. In August 2014, ASEAN and China decided to upgrade the ACFTA.

The Association of the Southeast Asian Nations (ASEAN) was established in 1967. During ASEAN's early stage, it was found that not much effort was made in terms of economic co-operation among the member countries.

Following the 1976 Bali Submit Meeting, the Agreement on ASEAN Preferential Trading Arrangements (PTA) was signed by the ASEAN Foreign Ministers on 24th February 1977. The instruments for the promotion of intra-regional trade approved by this Agreement consists of the followings: long-tern quantity contracts; trade finance at preferential interest rates; preference in government procurement; extension of tariff preferences; and liberalization of non-tariff measures on a preferential basis. However," practical action has mainly been made in the area of tariff reduction.

In consequence of this Agreement, 71 items of commodity, i.e. 50 items by the voluntary approach and 21 items by the matrix approach were agreed for 10 to 30 percent tariff-cut during the Fourth Economic Ministerial Meeting in Singapore in 1977, and became operational in January 1978. In June 1978, another 755 items were added. This attachment was enforced in September 1978. The number of items offered and covered under ETA increased at each meeting to include 2,327 items by 1979. Note that, prior to 1980; the trade preference negotiations to tariff cuts were on a product-by-product basis. In this approach each country offered in each round of negotiations a list of selected import commodities on which it would be willing to reduce tariffs from ASEAN countries (the so-called "voluntary" approach) and also submitted a list of products for which the country would like to receive tariff concession from the other ASEAN countries (the so-called '"matrix" approach) .

In April 1980, the ASEAN leaders agreed to shift from the product-by-product approach to an across-the-board with a value ceiling. Initially, the 20% across-the-board tariff cuts were approved for more than 6,000 items with import value of less than US$50,000 each in 1978 trade statistics, subject to the national exclusion list of sensitive products. The ceiling was raised to US$ 10 million in 1982. Finally, in 1984, the ASEAN foreign ministers approved the application of a 20-25% tariff cut on all PTA items with import value beyond US$ 10 million, effectively, doing away with the ceiling. Up to June 1986, 12,647 items trade preferences have been exchanged and implemented, with the averaging preference margins of 23.6 percent[20].

[20] Seiji Naya, Toward the Establishment of an ASEAN Trade Area, (a report prepared for the ASEAN secretariat and COTT, 1987) p.28

In 1974, the intra-ASEAN trade liberalization was viewed as providing "the quickest way of expanding markets of individual countries and thus some rationalization of the productive structure of ASEAN economies.[21]" Up to now, it has been one decade since PTA was implemented. Thus, it is useful to assess the effects of the intra ASEAN trade liberalization on trade flows, specifically, trade expansion, trade creation and diversion.

Moreover, Committee on Trade and Tourism (COTT) of ASEAN urged that the margin of preferences under the PTA would be increased from 25 per cent to 50 per cent within five years after the Third ASEAN Summit in December 1987 in Manila, and the exclusion lists would be reduced to less than 50 per cent of ASEAN trade value. Thus, it is interesting to study the potential effects of the 50% tariff reduction over 12,647 items trade preferences, especially, the potential expansion effect on intra-ASEAN trade, and the potential effects of the exclusion list reduction on the trade flows.

It is believed that for the customs union with higher degree of complementarity, intra-trade expansion will be relatively high, while efficiency is likely to be improved in a customs union of competitive economies. Thus, it is useful to investigate competitiveness and complementarity of the ASEAN member countries and the change in them, especially competitiveness and complementarity in manufactured products.

Finally, according to B.A. Jones, "'the lowering of tariffs has, in effect, been like draining a swamp. The lower water level has revealed all the snags and stumps of non-tariff barriers that still have to be cleared away. Thus, the ASEAN also needs liberalization of non-tariff barriers. To clear non-tariff barriers away, it is necessary to identify the non-tariff barriers to intra-ASEAN trade.

It is evident that the economies of East Asia have been the fastest growing economies in the world until 1997. Some people have termed this as the "East Asian Miracle". Through international linkages, the miracle has spread to Cambodia as well as to the world economy.

[21] United Nations, "Economic Co-operation Among Member Countries of the Association of South East Asian Nation," Journal of Development Planning, No. 7, (New York: United Nations, 1974), p.53.

1.2 Research Problem

The reason for selecting this is that the long time ago Cambodia and China have strong relationship together in many sectors such as investment, finance and trade. The People's Republic of China also has Free Trade Agreement with ASEAN. And the ASEAN–China trade was change from year to year, that why this topic is important for this study.

1.3 Research Question

The main problem concerned in this study is how ASEAN-China Trade change under the People's Republic of China Free Trade Agreement with ASEAN?

1.4 Objective of the Study

The objectives of this study can be summarized as follows:

1. To qualitatively assess the ASEAN–China trade before and after PRC's FTAs and potential FTAs with ASEAN, as well as a possible region-wide FTA (ASEAN+1).
2. To review the characteristic and history of China Free Trade Agreement with ASEAN.
3. To explore the cost and benefits of the China Free Trade Agreement with ASEAN.

1.5 Scope of the Study

The scope of this study is try to focus on the ASEAN-China Trade after the People's Republic of China Free Trade Agreement with ASEAN during 2006 to the end of 2015.

2 REVIEW OF RELATED LITURATURE

Interests in the economic impact of ACFTA on the PRC and ASEAN are evident from the growing number of studies in the literature. The two most common methodologies used to study the impact of free trade area on countries are the CGE models and gravity models. Using the CGE approach, Chirathivat (2002), Lee and Mensbrugghe (2007), Kawai and Wignaraja (2008), and Park et al. (2009) apply the Global Trade Analysis Project (GTAP) model or the Global Trade and Economic Analysis (GTEM) model to project trade and economic effects of ACFTA in the Asia-Pacific region. Results from these studies suggest that ACFTA generates a linear pattern of trade creation among member countries either through tariff cuts (supply-side factor) or increases in GDP (demand-side factor), where the net effect is estimated around 20 to 40 percent. On the other hand, Roberts (2004) and Yuan (2010) use the gravity model and stimulate different scenarios of income increases and/or tariff reductions.4 Estimated results from these studies, although different in magnitude from the CGE studies, generally confirm a linear growth trajectory of trade between the PRC and ASEAN.

In order to provide background for our methodology, this study reviews the theoretical background and empirical studies relating to trade expansion, trade creation and diversion, the complementarity and competitiveness. Since the estimation of trade expansion in this study must use the value of price elasticity of import demand, we also discuss theoretical background and empirical studies relating to the price elasticity. Firstly, the theoretical background of trade expansion, trade creation and diversion are discussed as follows.

2.1 Trade Expansion, Creation and Diversion

2.1.1 Theoretical Background

The earliest customs-union theory has a general conclusion that "Customs unions will always, or nearly always, raise welfare". On the contrary, Jacob Viner argued that the formation of a customs union could either improve or worsen resource allocation and welfare. He demonstrated that the formation of a customs union lead either trade creation or trade diversion. The trade creation (or so-called "trade creation proper") resulting from increasing competition and trade among the union member countries (movement towards freer trade) is a union-induced shift from the consumption of higher-cost domestic products to that of lower-cost products of the partner countries. The trade diversion resulting from providing relatively more protection against trade and competition from the rest of the world (movement toward greater protection) is a union-induced shift from

the consumption of higher-cost domestic products to that of lower-cost products of the partner countries. The trade diversion resulting from providing relatively more protection against trade and competition from the rest of the world (movement toward greater protection) is a union-induced shift from the consumption of lower-cost products of the rest of the world to that of higher cost products of the partner countries. He pointed out that trade creation is good and necessarily increases welfare, out trade diversion is bad and necessarily lowers welfare.

Lipsey argued that trade diversion is not necessarily a "bad thing" as Viner has thought. He pointed out that trade diversion may increase welfare. Lipsey explained that Viner's conclusion (trade diversion necessarily reduces welfare) resulted from his assumption of fixed proportion in consumption irrespective of relative prices, i.e., Viner regarded to only production effect and neglected of the consumption effect of trade diversion. Bhagwati offered an alternative condition for a trade diversion to be welfare reducing that is the fixed import level, instead of fixed proportion in consumption as Lipsey suggested.

Johnson pointed out that this dispute arises from a definition of trade diversion which includes (1) diversion of initial trade from a lower-cost source (the rest of the world) to a higher-cost source (partner country), this can be called "pure trade diversion", (2) creation of new trade between the home country and the partner countries resulting both from the adjustment in home country consumption and the replacement of home country's production by partner countries production (due to intra-area tariff cut); this is a good thing.
However, the total increase in trade among members of a customs union brought about through integration, regardless of whether the additional trade replaces domestic production or whether it replaces non-member exports, is called gross trade creation by Balassa. In other words, the summation of trade creation proper and trade diversion is called gross trade creation. But in this study, unless otherwise stated, Balassa's gross trade creation is called trade expansion, and trade creation refers to trade creation proper.

Empirical approaches to measure the effects of integration on trade flows can be broadly classified into residual models and analytical models. The residual models consider the effects of integration as the residual between what actually occurred and the trade predicted on the basis of the continuation without economic integration. On the other hand, the analytical models provide a direct economic explanation of the value or trade flows after economic integration. These models are partial equilibrium analysis. However, there are some literatures relating to general equilibrium analysis which are also discussed in this study. Most of the empirical works deal with the effects of the EEC or EFTA. In the next subsections, we will review empirical studies relating to trade expansion, trade creation and diversion in European Economic Community (EEC) and ASEAN.

2.1.2 Empirical Study Relating to EEC

a. The Demand for Import

Clavaux assumed that relationship between imports and production is constant, so that this relationship can be used as a yardstick for measuring trade creation. Based on the data of 1952-59 and 1959-66 (1959 was taken as the year of integration), he found that (1) imports of manufactures into the EEC countries had increased rapidly since 1959, indicating a substantial gross trade creation, (2) imports of manufactures into the EEC from non-member countries rose after 1959 more than previously, although to a more limited extent than intra EEC imports, it seems that no trade diversion existed.

This model simply assumes that imports will retain the same linear relation to total expenditure, GDP, or GNP, in the hypothetical situation as the same in the pre-integration period. It is simplified approach for measuring the effects. However, according to Williamson and Bottrill, this study makes unlikely assumption that the marginal propensity to import remains constant, whereas the evidence points to its rising with income. Further, this study does not consider price levels or price elasticities of import demand which are the important determinants of import demand changes.

b. Shares in Apparent Consumption

This model assumes that the import shares of each supplier (partner, or nonmember) will remain the same overtime. Thus, the integration effect can be estimated by the differences between the observed shares for any year and a specified hypothetical pattern of shares.

In Truman's study, expenditure on apparent consumption (C) is defined as gross domestic production (V) less exports (B) plus imports from partners; (Mp) and import from non-members (Mw) that is

$$C = V - B + Mp + Mw$$

He computed the changes in the three basic shares of various manufactured products in two cases, i.e., (1) the change between 1960 and 1968 with adjustment for domestic cyclical effects, and (2) the deviation between actual and predicted shares in 1968, where the predicted shares were based upon projections of the experience in the pre-integration period.

He found that 'there was net trade created from the formation of the EEC and EFTA, although the results under the two approaches suggest varying orders of magnitude.

This approach is also a simplified way for measuring the effects. However, the crucial weak point is, as Robson's argues, that the assumption of constant shares – DS, PS and WS – is in conflict with empirical data, i.e., prior to 1960, these shares were changing due partly to the lifting of trade restriction. Moreover, in the absence of integration, DS could be expected to decline but PS and WS to increase due to intra-industry specialization, or a secular loss of competitiveness on the part of Western European countries. Thus, this assumption leads to an overstatement of trade creation and an understatement of trade diversion.

2.1.3 Empirical Studies Relating to ASEAN

Armas attempted to estimate the Philippines' trade expansion due to a 10 per cent across-the-board tariff cut. He employed the following formula to estimate the import expansion;

$$dMv = Nd\left(\frac{atMv}{1+t}\right)$$

Where Mv is value of import, Nd is price elasticity of import, t is the original tariff level, and a is the rate of tariff reduction.

Based on 1975 data, he found that, on the whole, the Philippines imports from ASEAN countries increase by U.S. $ 4.43 million, or about 3.4 per cent of total Philippine imports.

To estimate the trade creation and trade diversion, he used price differential (PD) approach –by comparing unit values of Philippine imports from ASEAN vis-a-vis the world. Based on 1975 data, at the seven-digit SITC level, he concluded that, in terms of the number of items, most of the imports from ASEAN were priced higher than the imports from the world. However, in terms of import value, the majority of the imports from ASEAN countries were priced lower compared to imports from the world.

Wong Hock-Yuen, who employed the same formula as A. Armas (1978), attempted to estimate the expansion of trade volume among ASEAN countries due to the reduction of tariff (both the 71 items effected from January 1, 1978 and 755 items effected from September 1, 1978). Based on 1976 data (for Malaysia) and 1977 data (for others), he found that, in total (both import and export), the tariff reduction would bring a trade expansion of U.S. $ 25.136 million, or 0.38 per cent of intra-ASEAN trade in 1975.

In Ooi Guat Tin's study, he attempted to assess the potential gross trade creation effects on Thai and Philippine imports of the 20% across-the-board tariff reduction on all items with import value of less than U.S. $ 50,000 each in 1978 trade statistics. He employed the same formula as A. Armas (1978), and modified for the case of a 20% cut for items less than U.S. $ 50,000 in import value. He found that the maximum overall gross trade creation effects on total imports (SITC 0-9) are negligible for both the Philippines (0.06%) and Thailand (0.02%).

To estimate trade diversion due to the tariff reduction, he summed the import value of items less than U.S. $ 50,000 each in 1978 trade statistics and simply regarded this as the maximum limit for possible trade diversion from non-ASEAN countries. This total imports (SITC 0-9) is less than one per cent for both the Philippines (0.38%) and Thailand (0.65%). It indicates only outer limits; actual trade diversion effects will be much smaller.

2.1.3 Empirical Studies Relating to ASEAN

(1) The empirical studies relating to ASEAN indicated that, in the past, the ASEAN tariff reduction had marginal effects on the ASEAN trade.
(2) The analytical model can provide a direct economic explanation and can be easily interpreted. It is suitable for analyzing the effects of ASEAN tariff reductions with difference margin of preference rates.
(3) The price differential approach, by comparing unit values of the member country's imports from ASEAN vis-a-vis the world, is fairly reasonable for distinguishing between trade creations diversions.

(2) The majority of these studies disaggregated commodities of import one-digit SITC level. Only a few of then disaggregated the commodities into more than one-digit SITC level.

1 METHODOLOGY

3.1 Methodology

This study uses Qualitative Method to discuss and explain the result of the data collection.Our qualitative analysis is based on the theory of economic integration. Our analysis will focus on the relative cost and benefits of each arrangement, especially from the point of view of the PRC-FTA (ACFTA).

This study uses the data analysis, providing an economic explanation of trade flow, to discuss trade expansion due to tariff reduction. This study also investigates the changes of the competitiveness and complimentarily of the member countries.

Note that trade creation proper refers to a FTA-induced shift from the consumption of higher-cost domestic products to lower-cost products or tine partner countries, while trade diversion refers to a FTA-induced shift in the source of imports from lower-cost external sources to higher-cost partner sources. This means that in ASEAN trade expansion (or gross trade creation) is due to both trade creation and diversion. These benefit form ASEAN-China Free Trade Agreement can be discuss by the member countries' import and export.

3.2 The Sources Of Data

The important source of data in this Study is Commodity Trade Statistics due to availability of continuous time series data, IMF, Ministry of Commerce, ASEAN Statistic Year Book, and World Statistic Year Book World Bank. This study is almost based on the secondary data.

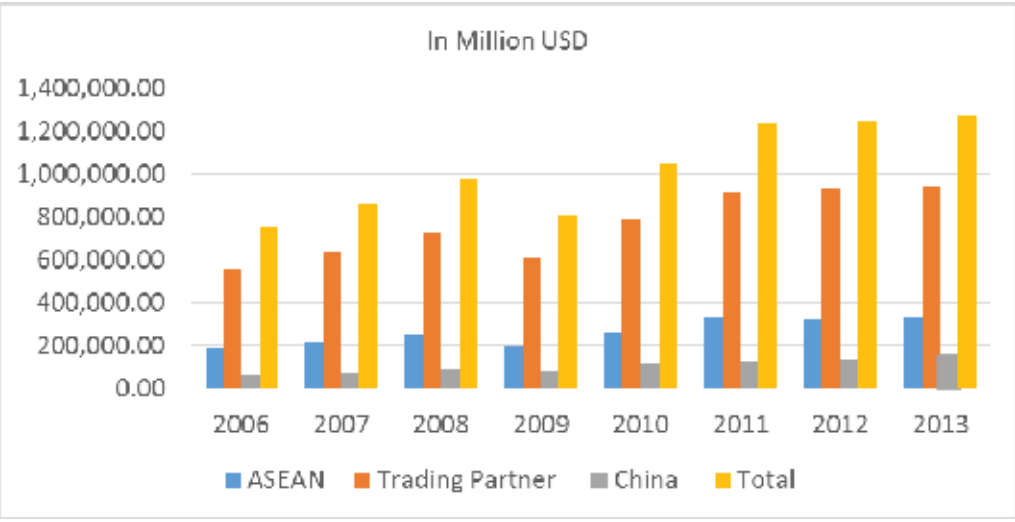
4 FINDING AND DISCUSSION

4.1 ASEAN Import by Trading Partner 2006-2013

Trade between ASEAN and ASEAN has grown at a rapid pace. From 2006 to 2013, The ASEAN's export volume to ASEAN member was increase from 189,254.2 million US in 2006 to 330,318.1 million US in 2013. In the same period ASEAN export to other partner was increase from 561,652.9 million US in 2006 to 940,810.1 million US in 2013.

However, trade between ASEAN and China has grown at a rapid pace. From 2006 to 2013, trade between the two regions had grown more than 20 per cent on average. ASEAN's total export to China has increased from 65,045.2 million US in 2006 to 152,545.5 million US in 2013 (Table 1). China has become one of the major trade partners not only to ASEAN as a group but also to individual members of ASEAN. For instance, China is the fourth largest trade partner for Malaysia and Singapore and the third for Thailand.

Figure 4.1. ASEAN Import by Trading Partner 2006-2013



4.2 ASEAN Import by Trading Partner 2006-2013

Tables 2 and figure 4.2 show ASEAN"s imports under ASEAN-China's trade relationship. The total imports of ASEAN from ASEAN member amounted to about 163,618.5 million US in 2006. The amount rose to 278,240.2 million US in 2013. While the total imports of ASEAN from other partner such as Japan, EU-28, US, Republic of Korea, Australia, Hong Kong, Canada, India, New Zealand, Russia, and the rest of the world was increase from 490,706.8 million US in 2006 to 962,148.2 million US in 2013.

However, the total imports of ASEAN from China for the years 2006 through 2013 was increase from 75,004.2 million US in 2006 to 197,962.8 million US in 2013.

Figure 4.2. ASEAN Import by Trading Partner 2006-2013

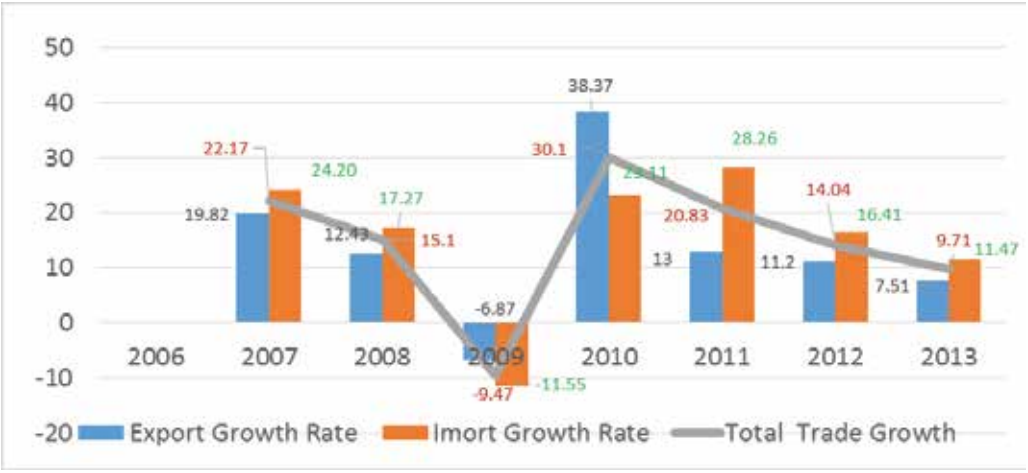
4.3 Annual Growth of ASEAN's Import and Export to China, 2006–2013 (%)

ASEAN trade with China grew in 2007 about 22.7% and declined about -9.47% per annual in 2009. The highest annual growth rate of ASEAN's trade with China was about 30.10% in 2010 and about 9.71% in 2013. However, the annual growth of ASEAN's Export to China grew from 2007 to 2013. It was growth about 19.82% in 2007 and decline to -6.87% in 2009. It was highest growth rate about 38.37% in 2010 and about 7.51% in 2013. In the same period, the annual growth rate of ASEAN's import from China was increase from year to year. It was about 24.20% in 2007 and decline to -11.55% in 2009. However, it was highest growth about 28.26% in 2011 and about 11.47% in 2013 (see figure 4.3a, 4.3b).

China has continued to be ASEAN's largest trading partner since 2009. In 2006, China has also become the premier destination for ASEAN exports, with a value of 65,045.2 million USD, almost increase to the value 152,545.5 million USD in 2013 (Table 1, Table 2). But the main driver of trade has been imports, which at 75,004.2 million USD in 2006 to 197,962.8 million USD in 2013. As imports have been growing much faster than exports, ASEAN's trade deficit with China has continued to widen to US$-9.96 billion in 2006, from -45.42 billion in 2013. Improvement of the trade balance has been identified as one of the key objectives in the on-going discussions on the upgrading of the ACFTA.

Figure 4.3a. Annual Growth of ASEAN's Import and Export to China, 2006–2013 (%)

Figure 4.3b. Annual Growth in ASEAN's Import and Export to China, 2006–2013 (%)



4.4 ASEAN and China ACFTA Preferential Tariff Rate 2005-2015

a . ASEAN 6 and China

Each Party shall reduce to 0-5% not later than 1 July 2005 the tariff rates for at least 40% of its tariff lines placed in the Normal Track. Each Party shall reduce to 0-5% not later than 1 January 2007 the tariff rates for at least 60% of its tariff lines placed in the Normal Track. Each Party shall eliminate all its tariffs for tariff lines placed in the Normal Track not later than 1 January 2010, with flexibility to have tariffs on some tariff lines, not exceeding 150 tariff lines, eliminated not later than 1 January 2012. Each Party shall eliminate all its tariffs for tariff lines placed in the Normal Track not later than 1 January 2012.

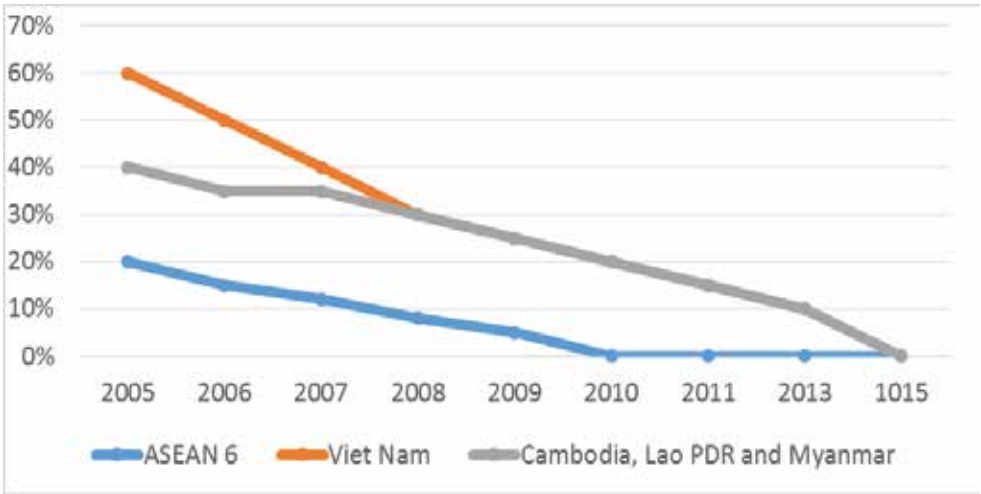
The tariff rate was reduce from 20% in 2005 to 12% by 2007 the tariff rates for at least 60% of its tariff lines. It was eliminate (0%) all its tariffs for tariff lines placed in 2010.

b. Newer ASEAN Member

Each Party shall reduce to 0-5% not later than 1 January 2009 for Viet Nam; 1 January 2010 for Lao PDR and Myanmar; and 1 January 2012 for Cambodia the tariff rates for at least 50% of its tariff lines placed in the Normal Track. Cambodia, Lao PDR and Myanmar shall eliminate their respective tariffs not later than 1 January 2013 on 40% of its tariff lines placed in the Normal Track. For Viet Nam, the percentage of Normal Track tariff lines to have their tariffs eliminated not later than 1 January 2013 shall be determined not later than 31 December 2004. Each Party shall eliminate all its tariffs for tariff lines placed in the Normal Track not later than 1 January 2015, with flexibility to have tariffs on some tariff lines, not exceeding 250 tariff lines, eliminated not later than 1 January 2018.

The tariff rate was reduce from 60% in 2005 to 10% in 2013 for Viet Nam; and from 40% in 2005 to 10% in 2010 for Lao PDR, Myanmar and Cambodia the tariff rates for at least 50%. It was eliminate (0%) all its tariffs for tariff lines placed in 2015,

Figure 4.4. ASEAN and China ACFTA Preferential Tariff Rate 2005-2015



4.5 ASEAN and China ACFTA Preferential Tariff Rate and Trade Growth Rate 2005-2015

Co-operation between ASEAN and China was elevated to a higher level with the signing of the Framework Agreement on Comprehensive Economic Co-operation by the ASEAN and China Heads of State on 4 November 2002 in Phnom Penh, Cambodia, the first of such agreements for ASEAN. The Framework Agreement came into force on 1 July 2003 and is an umbrella agreement providing general provision on the establishment of ACFTA within 10 years.

The Free Trade Agreement cause tariff rate of all ASEAN member to reduce from year to year about 60% in 2005 to 0% by 2015. The Lost from tariff reduction make tax revenue decline (See Figure 4.5).

However, the ASEAN-China Trade in Goods Agreement (AC-TIG) was effective from January 2005, preceded by an early harvest initiative that saw the elimination of tariff lines for agricultural products under Chapter 01-08 for all parties to ACFTA, effective on 1 January 2004. Tariff elimination has been completed for more than 90% of total tariff lines for the ASEAN-6 and China. The result of ASEAN China Free Trade Agreement push the ASEAN trade with China grew in 2007 about 22.7% and the highest annual growth rate was about 30.10% in 2010. All of these are Benefits that ASAEN gain from ACFTA.

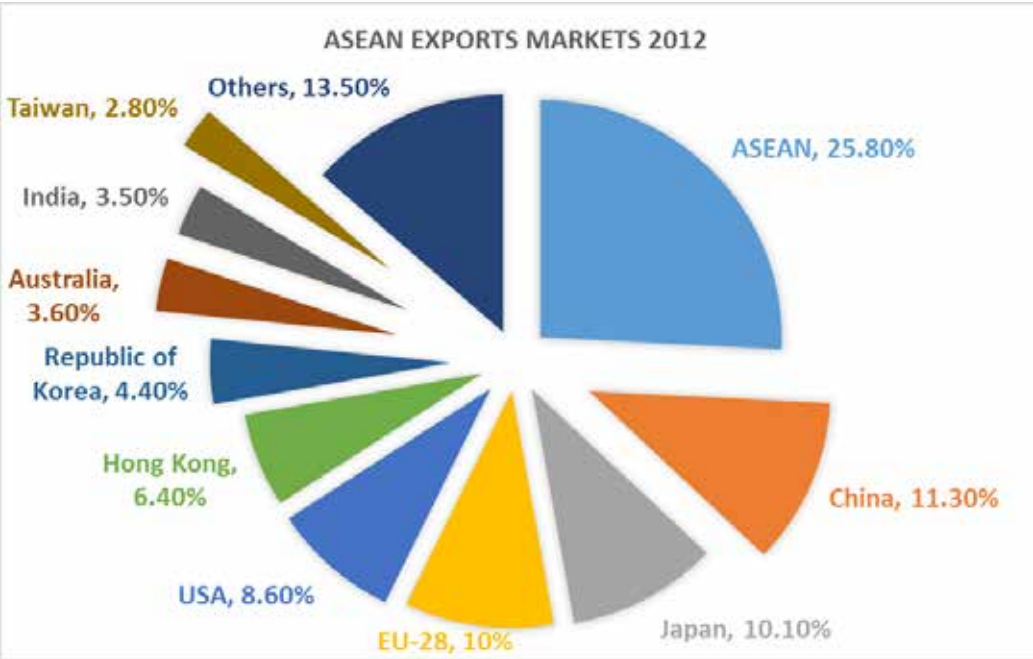
Figure 4.5. ASEAN and China ACFTA Preferential Tariff Rate and Trade Growth Rate 2005-2015

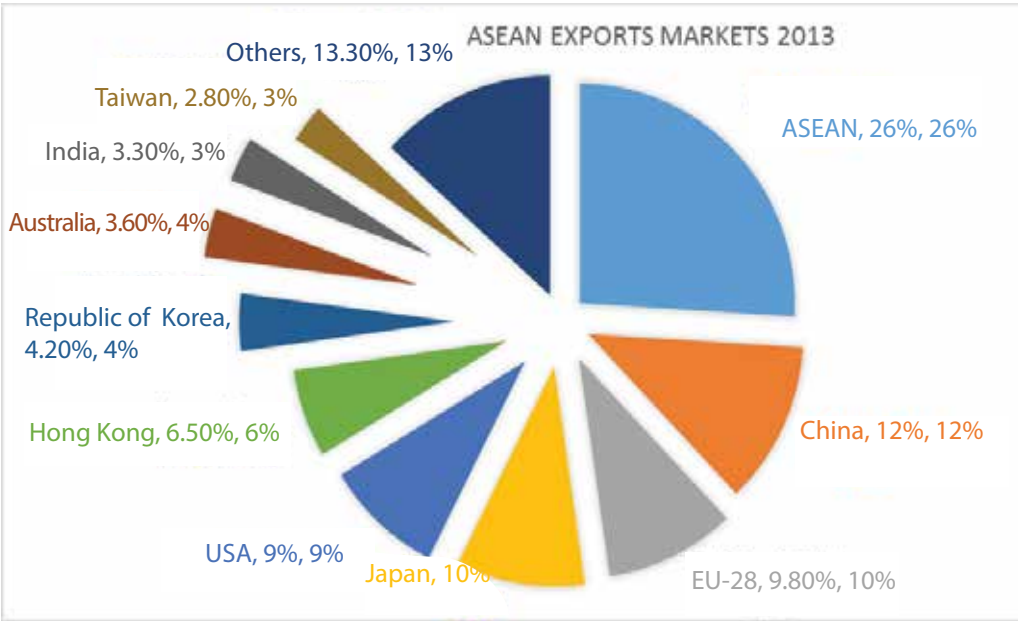
4.6 ASEAN Exports Markets 2012 and 2013

The dominance of developed countries in ASEAN trade has been on a decline. In particular, the trade shares of USA, Japan and EU-28 have been reduced, while China has emerged as ASEAN's biggest trade partner since 2011.

China's share in ASEAN trade (Export) increased from 11.30% in 2012 to 12% in 2013, while the shares of USA, Japan and EU-28 declined from around 8.60%, 10.10% and 10% in 2012 to 9%, 9.7% and 9.8% in 2013, respectively.

Figure 4.6. ASEAN Export Markets 2012-2013



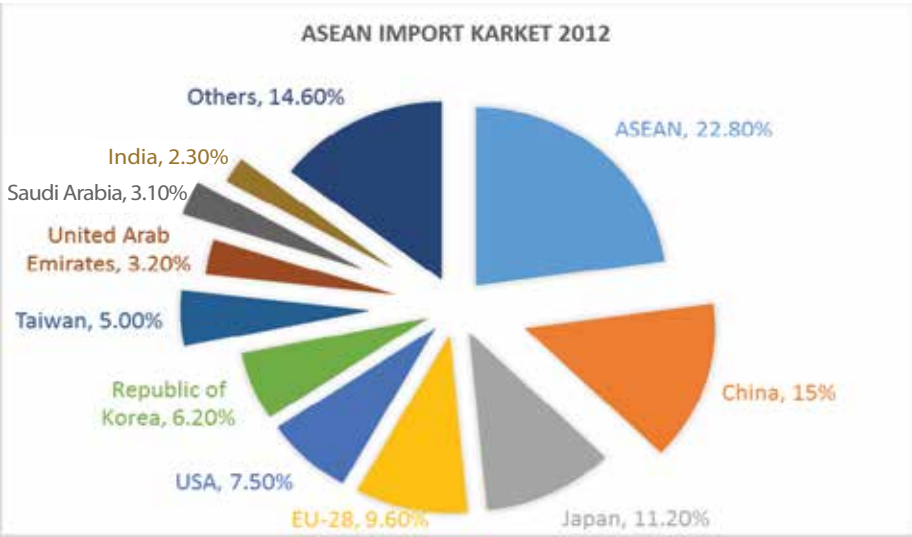


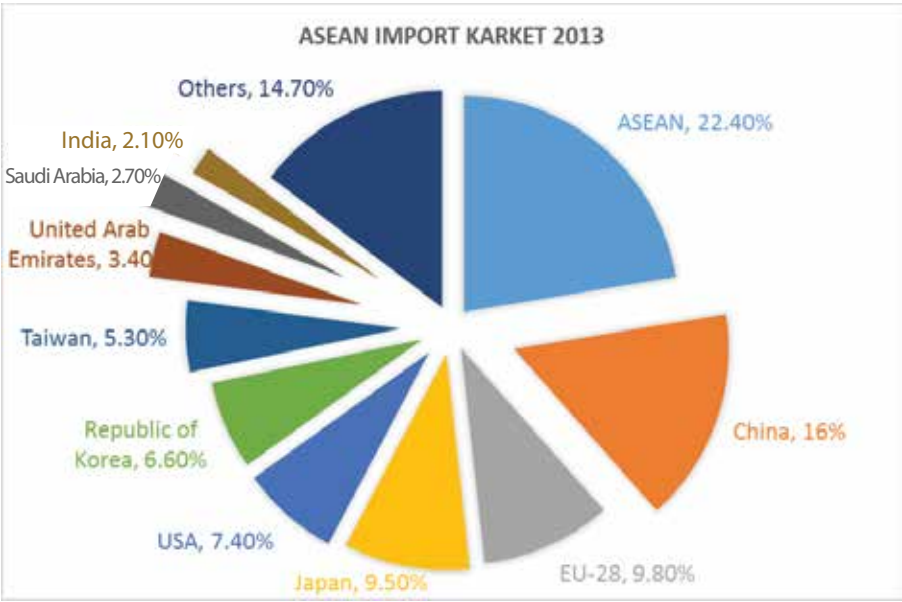
4.7 ASEAN Imports Markets 2012 and 2013

The dominance of developed countries in ASEAN trade has been on a decline. In particular, the trade shares of USA, Japan and EU-28 have been reduced, while China has emerged as ASEAN's biggest trade partner since 2007.

China's share in ASEAN trade (Import) increased from 15% in 2012 to 16% in 2013, while the shares of USA and Japan declined from around 7.50% and 11.20% in 2012 to 7.4%, 9.5% in 2013, respectively, while EU-28 increase from 9.6% in 2012 to 9.8% in 2013.

Figure 4.7. ASEAN Imports Markets 2012 and 2013





4.8 Conclusion

According to the study there are some remarked that: The free trade agreement between ASEAN and China (ACFTA) which was inked in November 2002 has been said to be a bold move in integrating ASEAN's and China's economies. The ACFTA has since then been believed to be a momentum for further integration in the region, being assumed to be the initial stage for the ASEAN+3 FTA, i.e., an FTA between ASEAN and China, Korea and Japan. Although the ACFTA was hailed by many groups at the international level, including ASEAN and China, the agreement has caused some uneasiness among members of ASEAN. The concern over China's rapid economic development and the strength of its economic muscles even before the FTA agreement has raised great concern among members of ASEAN due to the impact on their future economic growth. Since China's economy has grown at a rapid pace, the country has been labelled as a new economic dragon in the world economy; this is actually scary news for ASEAN.

After The People's Republic of China Joint Free Trade Agreement with ASEAN-ACFTA the tariff band was cut off from year to year until free trade. The costs of the ASEAN member countries from those Free Trade Agreement with China-ACFTA is losing of tax revenue (Duty revenue) by tariffs reduction. However, The Benefits of ASEAN Free Trade Agreement with China (ACFTA) is the ASEAN's volume of trade between China was increase from the beginning of the first year of the agreement continues to another year. The annual growth rate of trade between all ASEAN Country members and China was growth faster than other trading partner in the world.

Finally, the net benefit of ASEAN –China Free Trade Agreement (ACFTA) is all ASEAN member will get more benefit than lost from those Free Trade Agreement and will push economy growth faster.

4.9 Limitation and Future Research

This research faced on a few limitations. The data collection from 2006 to 2015 and the factor effect on ASEAN-China trade not just only from the Free Trade Agreement (FTA), but from the other factors. The better focusing on international trade should more and deeply other factors and more period of sampling. The future research can include of other modeling such as foreign real income, exchange rate between home currency and foreign currencies, price of importing goods, price of exporting goods, foreign direct investment.

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APPENDIX

Table 1. ASEAN Exports by Trading Partner, 2006-2013 (in US $ Million)

Trading Partner	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
EXPORT								
ASEAN	**189,254.2**	**217,367.9**	**250,073.2**	**199,569.9**	**263,256.0**	**327,582.0**	**323,855.0**	**330,318.1**
Trading Partner	**561,652.9**	**642,435.7**	**727,478.7**	**610,902.3**	**788,358.1**	**914,617.0**	**930,725.7**	**940,810.1**
Australia	23,149.9	27,444.2	34,442.7	29,041.1	35,220.6	37,463.0	45,724.3	45,526.1
Canada	3,918.0	5,270.5	5,534.5	5,481.1	5,200.2	5,295.8	6,576.9	7,247.4
China	65,045.2	77,934.3	87,620.2	81,601.1	112,917.1	127,598.3	141,892.0	152,545.5
EU-28	94,673.7	108,180.3	115,681.2	92,714.2	115,080.3	126,734.5	124,891.7	124,434.1
Hong Kong	41,088.7	56,734.4	51,869.7	56,714.5	74,271.9	81,024.2	80,507.1	82,084.8
India	18,940.7	24,837.4	30,909.2	26,500.1	35,990.9	42,511.3	44,055.4	41,935.2
Japan	81,291.5	85,137.6	105,880.0	78,085.7	102,851.4	145,691.5	126,507.0	122,863.2
New Zealand	3,017.7	3,552.3	4,528.8	3,139.2	4,243.3	4,576.2	5,561.7	5,684.1
Pakistan	2,987.0	3,782.0	4,473.8	3,831.3	5,111.6	5,997.4	5,255.6	5,274.3
Republic of Korea	27,177.4	29,492.8	36,554.9	34,292.3	44,947.1	54,348.4	55,030.3	52,823.0
Russia	1,583.7	2,075.4	2,735.7	1,656.4	2,588.6	2,658.9	4,875.6	5,243.5
USA	96,950.9	105,896.4	102,682.9	82,078.0	100,401.6	106,281.4	108,035.7	114,509.7
Rest of the World	101,828.6	112,098.1	144,565.1	115,767.2	149,533.5	174,436.1	181,812.5	180,639.0
Total	**750,907.1**	**859,803.6**	**977,551.9**	**810,472.2**	**1,051,614.1**	**1,242,199.0**	**1,254,580.7**	**1,271,128.1**

Source: ASEAN Trade Statistics Database as of 4 December 2014

Table 2. ASEAN Imports by Trading Partner, 2006-2013 (in US $ Million)

Trading Partner	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
IMPORT								
ASEAN	**163,618.5**	**184,545.7**	**220,156.9**	**176,643.3**	**247,763.9**	**270,795.3**	**278,193.2**	**278,240.2**
Trading Partner	**490,706.8**	**566,437.0**	**699,448.3**	**549,761.4**	**709,737.9**	**875,449.7**	**943,653.6**	**962,148.2**
Australia	13,267.4	14,529.4	18,171.3	14,806.6	20,168.8	22,222.5	23,774.8	22,531.4
Canada	2,970.5	4,226.0	5,194.1	3,538.8	4,664.3	5,478.5	5,758.5	6,219.0
China	75,004.2	93,154.6	109,243.2	96,622.0	118,938.6	152,551.5	177,592.8	197,962.8
EU-28	66,303.8	79,127.2	92,122.7	78,716.9	93,507.9	107,886.8	117,707.2	121,794.1
Hong Kong	10,510.1	11,500.6	12,351.4	11,245.7	24,229.1	15,409.7	14,235.3	13,135.9
India	9,777.3	12,406.0	17,931.4	12,575.2	19,392.7	25,679.9	27,760.3	25,926.7
Japan	80,510.3	87,918.4	108,512.5	82,832.1	103,682.4	128,175.6	136,376.8	117,903.9
New Zealand	1,531.3	2,244.7	3,312.3	2,242.1	3,087.3	3,667.7	3,663.1	4,101.3
Pakistan	296.2	342.1	459.9	469.6	1,142.1	765.7	1,050.0	864.2
Republic of Korea	28,772.2	31,716.0	41,739.9	40,479.1	53,613.4	70,054.5	75,999.8	82,139.6
Russia	2,842.4	3,326.1	7,009.4	5,112.5	6,467.2	11,268.6	13,282.6	14,706.0
USA	64,323.5	72,292.4	82,612.2	66,702.0	86,141.2	92,486.0	91,991.5	92,345.7
Rest of the World	134,597.8	153,653.7	200,787.9	134,418.6	174,702.9	239,802.5	254,460.7	262,517.6
Total	**654,325.3**	**750,982.7**	**919,605.2**	**726,404.6**	**957,501.8**	**1,146,245.0**	**1,221,846.8**	**1,240,388.4**

Source: ASEAN Trade Statistics Database as of 4 December 2014

Table 3. Rate of Growth of ASEAN Trade by Trading Partner, 2007-2013
(in percent)

Trading Partner	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	Average Annual Growth 2007-2013
ASEAN	**13.90**	**17.00**	**-19.99**	**35.83**	**17.09**	**0.61**	**1.08**	**8.10**
Trading Partner	**14.87**	**18.04**	**-18.66**	**29.07**	**19.49**	**4.71**	**1.52**	**8.83**
China	22.16	15.06	-9.47	30.09	20.83	14.04	9.71	14.00
Total	**14.63**	**17.78**	**-18.99**	**30.73**	**18.88**	**3.68**	**1.42**	**8.65**

Table 4. ASEAN Export, Import with China and Trade Deficit, 2006-2013

Trading Partner	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Total Trade	**140049.9**	**171088.9**	**196863,4**	**178223.1**	**231855.7**	**280149.8**	**319484.8**	**350508.3**
Export to China	65,045.2	77,934.3	87,620.2	81,601.1	112,917.1	127,598.3	141,892.0	152,545.5
Import from China	75,004.2	93,154.6	109,243.2	96,622.0	118,938.6	152,551.5	177,592.8	197,962.8
Trade Deficit	**-9.959**	**-15.22**	**-21.62**	**-15.02**	**-6.02**	**-24.95**	**-35.7**	**-45.42**
Percentage Deficit of Total Trade (%)	**0.0071%**	**0.085%**	**0.011%**	**0.008%**	**0.003%**	**0.009%**	**0.011%**	**0.023%**

Source: Calculation of Table 1 and Table 2.

Higher Education in Cambodia

H.E Yuok Ngoy [22]

1 Education in the Postcolonial era 1953-1975

The period between 1953 and 1975 was the era where Cambodia has become totally independent from the French colony. However, the education system still totally followed the one established by the French. The system was served as a sorting machine; selecting the best students from basic general education for advanced (higher degree) education so that the country could be equipped with competent civil servant (Nepote, 1979).

The primary schools were opened in most of the provincial towns and by the beginning of the second world war, there were 125 primary schools throughout the country teaching in French language on various subjects such as; mathematics, history, and geography. There were at least few schools included a section for girls only. For instance, in Phnom Penh, Norodom Primary school was established in 1903 (Bilodeau,1955; Delvert, 1956;Forest,1980&Morizon,1931).

Teaching pedagogy, a four-year course, for teacher was offered in 1923 at the Sisowath high school (Morizon,1931). In 1924, a monk in Kampot, a province located at the southern part of Cambodia, sent a few monks who were school teachers from the pagoda for French-style-teacher training (Bilodeau, 1955). By 1930, 58 monks had been successfully completed the training course and had returned to their schools at the pagoda, which then became known as modernized Wat-School. In 1939, 908 of such schools were operating in cities, towns, villages, and rural areas throughout the country (Bilodeau,1955). Modernized Wat-School was believed to provide a bridge for Cambodians into French-style education. As result, by 1944, 15% to 20% of Cambodia's school-age boys and at least some girls attended Franco-Cambodian schools, French-oriented community community schools, or modernized Wat-Schools (Nepote,1979).

Graduates of primary education could enter into the college of the Protectorates, renamed as the College Sisowath (Sisowath middle School) in 1905 and upgraded to "Lycee" (high school) status in 1933 (Forest,1980 & Nepote,1979).

[22] Secretaty of State, Ministry of Education, Youth and Sports

There was no higher education institution in the country. Until 1949, there was the establishment of the National Institute of Juridical Political and Economics Sciences (NIJPES). This higher education institute offered courses at Sisowath High School, the country's only high school (Hayden, 1967).All higher education and most of the basic education was offered in French (Bilodeau, 1955;Delvert,1956; Forest,1980; Morizon,1931;&Nepote,1979).

Preah Bath Samdech Preah Norodom Sihanouk won the Cambodia's independence from France on November 9, 1953. He was at heart a nationalist driven by a sense of responsibility for achieving and preserving Cambodia's independence. Under his leadership, the education sector has been quickly expanded, especially between the 1950s and 1960s. The country allocated nearly 20 percent of the national budget annually to education. As result, more schools had been built and students were enrolled at a staggering rate. While there were less than eight hundred elementary and secondary schools in Cambodia at the start of the country's independence (Bilodeau,1955), by 1970, nearly 5400 of such schools had been in operation (Whitaker et al. 1973; Duvieusart et Ughetto,1973). The number of students in Cambodian schools increased from about ninety thousand to over one million during the same period (Nepote,1979).

For Higher Education, several higher education institutions were founded in the 1950s. The complete list of higher education schools is the table below.

Table 1: List of higher education schools established in the 1950s

Name of the Higher Education Institutions	**Legal documents & issued date**
NIJPES established in 1949 and had started a bachelor of law course in 1953.	by kret # 201-NS, 15/05/1953
Royale School of Medicine	by kret # 513-NS, 12/10/53
Royale School of Administration	by kram # 35-NS, 29/03/56
National Institute of Pedagogy	by kret # 438-NS, 10/07/59
National School of Commerce	by kret # 518-NS, 27/08/58

In addition, several other universities were also built later. For instance, the University of Buddhism was established in 1954 (Phung Ton, reported in the seminar

Higher education institution	Specialties offered
The Royal Technical University	Faculty of Civil Engineering (Faculté de Genie Civil) Faculty of Hydraulics and Navigation (Faculté de Hydraulique et de Navigation) Faculty of Art s and Crafts (Faculté des Arts et Metiers) Faculty of Electronic (Faculté d'Electronique) School of Applied Chemistry (Ecole Supérieure de Chimie Appliquee) School of Aeronautic Engineering(Ecole Supérieure de l'Aeronautique Civile) School Merchant Marine (Ecole Supérieure de la Marine Marchande) Faculty of Construction (in the Institut Technique Superieure de l'Ametie Khmero-Sovietique (ITSAK) Faculty of Mining (In the ITSAK) Faculty of Agriculture Hydraulics (In the ITSAK) Faculty of Electronic (In the ITSAK) Faculty of Textile (In the ITSAK)
University of Fine Arts by kram # 226-CE, 18/01/65	Faculty of Choreographic (Faculté des Arts Choregraphique) . Faculty of Music (Faculté de Musique) . Faculty of Plastic arts (Faculté des Arts Plastiques) . Faculty of Archeology (Faculté de l'Archeologie) . Faculty of Architecture and Urbanism (Faculté d'Architecture et d'Urbanisme)
Royal University of Kg. Cham by kram#227-CE, 18/01/65	Faculty of Mechanics (Faculté de Mecanique) . Faculty of Tropical Crops (Faculté des Cultures Tropicales) . Faculty of Physic and Mathematics Sciences (Faculté des Science-Physico-Mathemathiques)
Royal University of Takeo-Kampot by kram#228-CE, 18/01/65	Faculty of Mechanics and Electricity (Faculté de Mecanique et d'Electricité) . Faculty of Health (Faculté de Médecine) . Faculty of Oceanography (project)
Royal University of Agronomics Sciences by kram#244-CE, 26/05/65	Faculty of Agriculture Sciences (F. des Sc.Agricoles) . Faculty of Forestry Sciences (F. des Sc. Forestieres) . Faculty of Veterinary Sciences (F. des Sc. Vétérinaires) . Faculty of Fish Farm Sciences (F. des Sc. Piscicoles) . Faculty of Rural Engineering (F. des Genie Rural)

	. Faculty of Sociology and Rural Economic (F. de Sociologie et dÉconomie Rurale
Populaire University (Universite Populaire) by kram#258-CE, 19/08/65	Professional Learning Center (Centre d'Apprentissage Professionnel) Training Technical staff and productivity improvement Center (Centre de Formation des Cadres Techniques et de l'Accroissement de la Productivité)
Royal University of Battambang by kram#316-CE, 9/09/67	Faculty of Construction Mechanic (F de Construction Mecanique) Faculty of Agricultural and Agro-Food Industries (F des Industries Alimentaires et Agricoles) Faculty of Applied Geology and Mining Exploration (F de Geologie Appliquée et de Prospection miniére)

by kram # 367-NS, 13/01/60, included by faculties; 1. Faculty of Law and Economics, 2. Faculty of medicine pharmaceutics and science paramedic, 3. Faculty of Sciences and Technology (established in 1959, kret was issued in 1961), 4. Faculty of letterand humanity science (established in 1959, kret was issued in 1961) and 5. National Institute of pedagogy.

The concept of setting up a university network was brought to the country by Preah Bath Samdech Preah Norodom Sihanouk after his visit to Indonesia. During his visit in August 1964, he toured a university campus (Charles Meyer, 1971) with Sukarno (See Bernard Krisher:Yohan Lotus Book 1990: The Prince Sihanouk: A Great Leader).

The creation of the new universities aimed at ensuring that students could obtain almost all higher education within Cambodia. This was also particularly important, especially for those who had long been concerned about the fact that political ideology – communism - could be brought in the country by students returning from studying in French.

According to Bernard Krisher in his book titled "A great Leader I have known", the Prince Sihanouk suggested that "We ought to stop sending students to France where they become communists and instead send them to Peking where they can see communism in action and from where they will surely return anti-communist".

In 1965, the Royal Khmer University regrouped 7 faculties and institutes including l'Institut Technique Supérieur de l'Amitie Khmero-Sovietique (Khmer-soviet Frendship Institute of Technology) and l'Ecole Nationale de Commerce (National school of commerce). The name of the Royal Khmer university had been changed to the Royal University by Kram # 224-CE, 18/01/1965. At the same year, six more faculties were established, by kram # 225-CE, 18/01/6, in the Royal University.

Table 2: List of 7 universities and its faculties/schools

From 1953 to 1970, Cambodia had a total of 9 universities. However, from 1970 to 1975 there was no new university had been established.

2 Higher Education in Cambodia during 1975-1979

Khmer Rouge regime, led by Pol pot, commenced from April 1975 to January 1979. During the regime, Pol Pot perceived Sihanouk's educational system as a "feudal" institution supportive of social structures at odds with the Khmer Rouge's communist aspirations, as result, the whole system was destroyed.

Between 1975 and 1979, Khmer Rouge demolished 90 percent of School buildings, libraries, and equipment (Barron and Paul, 1977; Ek Sam Ol, 1991;Hirschhorn, Haviland, and Salvo,1991). Seven of the nine institutes of Higher Education in the country were destroyed and the remaining two were badly damaged (Ek Sam Ol, 1991). Individuals associated with Sihanouk' s educational system were targeted and killed by the Khmer Rouge. About 75% of the primary and secondary teachers, 91% of the university faculty members, 67% of primary or secondary students and 96% of the tertiary students were killed(Min of Edu, 1990;UNESCO,1991).

3 Higher Education in Cambodia from 1979 to Present

Cambodia was embargoed by the West throughout the 1980s, the Soviet Union, and other Eastern bloc countries provided with billions of dollars in aid (Haas, 1991; World bank,1992), a significant amount of which was directed toward education.

As nearly all Cambodians' professors had been killed by the Khmer Rouge, donor countries also supplied full contingents of faculties. Certain higher education institutions, however, were specifically dedicated to Vietnamese and Soviet geopolitical goals in Cambodia.

Vietnam and the Soviet Union were allies in the international socialist revolution and, as such, were committed to worldwide spread of Marxist-Leninist - Soviet-style communism (Pike, 1987; Vickery, 1986). Similar to most countries in the Eastern bloc, higher education was developed by the Vietnamese and Soviets in Cambodia is used as a mechanism for introducing Marxist-Leninist ideology and, in general, for supporting socialist agenda. The political training was achieved through required courses in Marxist-Leninist.

The higher education institutions opened in the early 1980s were very few, namely;

1- The Faculty of Medicine in1979 with assistance from the Vietnamese government, then became the University of Health Science in 2001.

2- The School of Languages in 1981 with assistance from the Vietnamese government, the Soviet Union, East Germany and Cuba merged with the Teachers' Training College that established in 1980 to become the University of Phnom Penh in 1988.

3- The Khmer-Soviet Friendship Higher Technical Institute with Soviet assistance in 1984, became Institute of Technology of Cambodia in 1992.

4- The Economics Institute with Vietnamese assistance in 1984, became the National University of Management in 2004.

5- The Agricultural Institute with Soviet assistance in 1985, became the Roal University of Agriculture in 1994.

6- The University of Fine Arts in 1989.

7- Prek Leap National School for Agriculture in 1984.

Along with the Vietnamese troops withdrawal in 1989, most Vietnamese educational advisors and professors departed from Cambodia. The Soviet professors were withdrawn shortly after the Soviet Union collapsed. The United Nations Development Program joined effort with the UNESCO to bring twenty-eight Soviet teachers back for preventing the closure of Agricultural Institute and the Khmer-Soviet Friendship Higher Technical Institute.

Rather than allowing Cambodia higher education to be once again turned toward external purposes, the Cambodian government reaffirmed the control with the National Seminar on Higher Education in Cambodia, held in Phnom Penh, October 17-19, 1995.At the Seminar, six themes were identified as the major issues that confronted the higher education in Cambodia today. A working group was assigned to each theme to prepare recommendations to be used for a ten year national strategic plan for higher education, which will be anticipated to be completed in early 1997.

Remarkably, the 3nd theme of the seminar referred to financial resources and the working group wrote that "There were no tuition fee for higher education during the communist regime and even current tuition was extremely low (about 5000 riels or US$2per semester, at that time). The working group recommended that in the future students should contribute more to the cost of their education and that the cooperation between higher education and the private sector should be encouraged".
Based on that recommendation the government started to give the green light for private sector to invest on high education since 1997.

All themes identified at the 1995 National Seminar on Higher Education and the selected recommendations from working groups illustrated the problems faced by higher education system today and it also provides the foundation for the think tank about current educational reform. Three of those themes are;

1. Legislation and Structure.

   Cambodia's higher education institutes are currently under the control of several ministries, including the Ministries of Education, Ministry of Agriculture, Ministry of Fine Art and Culture, and Ministry of Health. The working group recommended that "all Higher Education should be placed under one single ministry which could be the Ministry of Education or a new ministry to be created to deal exclusively with the higher Education"

2. Access and Output of higher education

The Constitution of the Kingdom of Cambodia endorses education for all. Accordingly, the working group " all Cambodian people have the right to education regardless of gender or socio-economic condition". Since 1995, graduates were no longer guaranteed government jobs, as during the communist regime. Higher education "must be responsive to the market demand and a survey of the demand in the labor market should be conducted in order to know the need and type of profession required".

3. Financial Resources

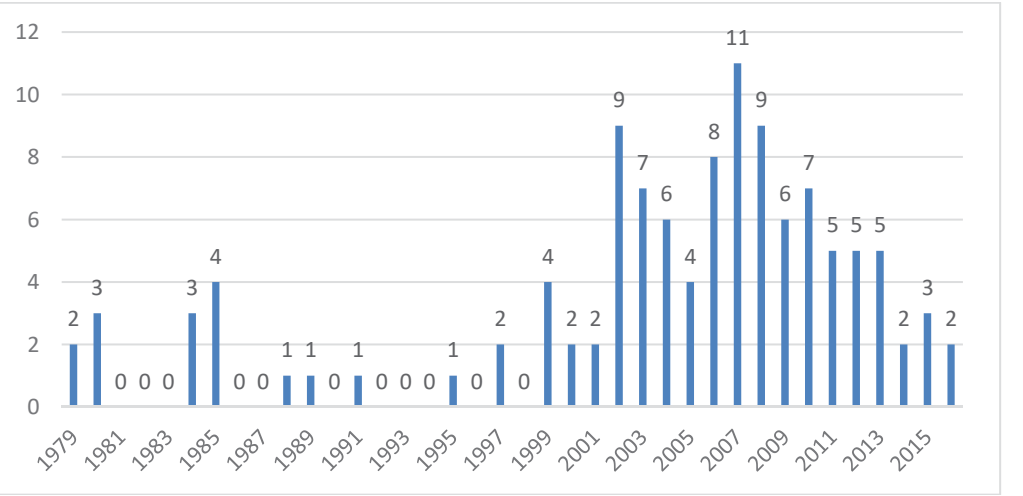
There was no tuition fee for higher education during the communist regime and even currently the tuition was an extremely low 5,000 riels (US$2) per semester. The working group recommended that in the future, students "should contribute more to the cost of their education and that cooperation between higher education and the private sector should be encouraged".

4 Higher Education Institutionsin 2016

Currently, there are 118 higher education institutions in the country and mostly located in Phnom Penh. Majority of the institutions are private (71 private& 47 public institutions). All of the private universities are under the auspice of the Ministry of Education Youth and Sport, while public institutions are either under the Ministry of Education or other Ministries.

There are 2 phases of the establishment of the higher education institutions in Cambodia. The first phase was between 1979 and 1995, where only few public higher institutions have been in operation. Another phase started from 1997 where private institutions has been mushrooming. Majority of the higher institution was established after 2001 and the peak was in 2007 where 11 higher education institutions started its operation in that year alone.

Figure 1: Trend of number of higher institutions by years



Note: 4 institutions have no exact year of establishment, thus excluded from the figure

The complete list of all higher education institutions is presented in the table below;

Table 3: Details of higher education institutions in Cambodia

Number		Institutions	Location	Ministries	Pb	Pv	Established Year
No.	Br.						
1		Royal University of Phnom Penh	PP	MoEYS	Pb		1988
2		Royal University of Law & Economics	PP	MoEYS	Pb		2003
3		National University of Management	PP	MoEYS	Pb		1984
4	2	University of Chea SimKamchaymea	P.Veng	MoEYS	Pb		1991
5		SvayRieng University	S. Rieng	MoEYS	Pb		2005
6		Meanchey University	B.M.Chey	MoEYS	Pb		2007
7		University of Battambang	BB	MoEYS	Pb		2007
8		Kratie University	Kratie	MoEYS	Pb		2014
9		HengSamrinT.Khum University	T. Khmum	MoEyS	Pb		2016
10		Institute of Technology of Cambodia	PP	MoEYS	Pb		1984
11		National Institute of Education	PP	MoEYS	Pb		1980
12		Kg.Chheuteal Institute of Technology	Kg.Thom	MoEYS	Pb		2015
13		Kg Speu Institute of Technology	Kg.Speu	MoEYS	Pb		2015
14		Norton University	PP	MoEYS		Pv	1997
15	7	Build Bright University	PP	MoEYS		Pv	2000

16	2	Pannasastra University of Cambodia	PP	MoEYS		Pv	2002
17	6	Cambodia University of Specialities	PP	MoEYS		Pv	2002
18		International University	PP	MoEYS		Pv	2002
19	1	Cambodia Mekong University	PP	MoEYS		Pv	2003
20		University of Cambodia	PP	MoEYS		Pv	2003
21	1	Western University	PP	MoEYS		Pv	2003
22		IIC University of Technology	PP	MoEYS		Pv	2008
23	3	Angkor KhemaraUniversity	Kampot	MoEYS		Pv	2008
24		Angkor University	S.Reap	MoEYS		Pv	2004
25		Asian Euro University	PP	MoEYS		Pb	2003
26		Human Resource University	PP	MoEYS		Pv	2005
27	7	University of Management and Economics	BB	MoEYS		Pv	2000
28		University of Puthisastra	PP	MoEYS		Pv	1999
29		Life University	S.Ville	MoEYS		Pv	2007
30		South East Asia University	S.Reap	MoEYS		Pv	2006
31	1	Chenla University	PP	MoEYS		Pv	2007
32		Limkokwing University	PP	MoEYS		Pv	2008
33		Khmer University Technology and Management	S.Ville	MoEYS		Pv	2008
34		Panhachet University	PP	MoEYS		Pv	2009
35		Zaman University	PP	MoEYS		Pv	2010
36		Dewey International University	BB	MoEYS		Pv	2011
37		Beltei International University	PP	MoEYS		Pv	2012
38		Kg.Cham University	Kg Cham	MoEYS		Pv	2013
39		American University of P Penh	PP	MoEYS		Pv	2013
40		Cambodia International University	PP	MoEYS		Pv	2010
41		University of Economics and Finance	PP	MoEYS		Pv	2011
42		Chamroeun University of Poly Technology	PP	MoEYS		Pv	2002
43		Phnom Penh International University	PP	MoEYS		Pv	2002
44		Khemarak University	PP	MoEYS		Pv	2004
45		Bolyno Institute	Kg Chhnang	MoEYS		Pv	2010

46	1	Vanda Institute	PP	MoEYS		Pv	2001
47		SETEC Institute	PP	MoEYS		Pv	2002
48	1	Angkor City Institute	Kg.Thom	MoEYS		Pv	2002
49		Sachak Asia Development Institute	PP	MoEYS		Pv	2002
50		Social Science and Technology Institute	S.Rieng	MoEYS		Pv	2007
51		Institute of Management and Development	Pursat	MoEYS		Pv	2006
52		SIU International Institute	PP	MoEYS		Pv	2003
53		Bright Hope Institute	Kg Chhnang	MoEYS		Pv	2007
54		KhemaraSatra Institute	P.Veng	MoEYS		Pv	2008
55		Saint Paul Institute	Takeo	MoEYS		Pv	2009
56		CamEd Institute	PP	MoEYS		Pv	2004
57		St Clemens Institute	PP	MoEYS		Pv	2012
58		PCL Management Institute	PP	MoEYS		Pv	2010
59		Raffles International College P. Penh	PP	MoEYS		Pv	2010
60		PPenh Institute of Nursing and Paramedical Science	PP	MoEYS		Pv	2012
61		Learning for Success Institute	PP	MoEYS		Pv	2013
62		InterEd Institute	PP	MoEYS		Pv	2004
63		Phnom Penh International Institute of the Arts	PP	MoEYS		Pv	2013
64		BB Institute of Nursing Sciences	BB	MoEYS		Pv	2016
65		ACLEDA Institute of Business	PP	MoEYS		Pv	2015
66		Asia Institute of Science	PP	MoEYS		Pv	2008
67		Financial Institute of Cambodia	PP	MoEYS		Pv	2012
68		American Intercon Institute	PP	MoEYS		Pv	2008
69		Business Institute of Cambodia	PP	MoEYS		Pv	2006
70		Sineru Institute	PP	MoEYS		Pv	2012
71		ICS Institute	PP	MoEYS		Pv	2004
72		University of Health Sciences	PP	MoH	Pb		1979
73		National Institute of Public Health	PP	MoH	Pb		1997
74		Royal University of Fine Arts	PP	MoCFA	Pb		1989
75		Royal University of Agriculture	PP	MoAFF	Pb		1985

76		Prek Leap National College of Agriculture	PP	MoAFF	Pb		1984
77		Kg Cham National School of Agriculture	Kg.Cham	MoAFF	Pb		1995
78	2	Preah Sihanouk Raja Buddhist University	PP	MoCR	Pb		2006
79		PreahSihamony Raja Buddhist University	PP	MoCR	Pb		2007
80		SamdechAkkaMohaSenaPadeitechoHunSen Buddhist University	Kg.Cham	MoCR	Pb		2011
81		National Defense University	PP	MoND	Pb		2006 (1979)
82		Health Science Institute of R.C.A.F	PP	MoND	Pb		2005 (2004)
83		Cambodia Army Institute	Kg.Speu	MoND	Pb		2009
84		Techo Hun Sen Military Technical Institute	Kg.Speu	MoND	Pb		2010
85		Active Soldier Tmat Pong School	Kg.Speu	MoND	Pb		2003
86		Police Academy of Cambodia	Kandal	MoI	Pb		2007
87		Royal Academy of Cambodia	PP	CM	Pb		1999
88		Cambodia Marine Human Resource Institute	PP	MoPWT	Pb		2009
89		Centre of Banking Studies	PP	NBC	Pb		1999
90		National Institute of Social Affairs	PP	MoSAVYR	pb		2011
91		Institute of Electrical Science	PP	MoME	Pb		2011
92		National Institute of Business	PP	MoLVT	Pb		1985
93		National Technical Training Institute	PP	MoLVT	Pb		1999
94		Kampot Institute of Polytechnic	Kampot	MoLVT	pb		2008
95		Regional Polytechnic Institute of DechoSenBattambang	BB	MoLVT	Pb		1980
96		Battambang Institute of Technology	BB	MoLVT	Pb		2007
97		Regional Polytechnic Institute DechoSenSiemreap	S.Reap	MoLVT	Pb		NA
98		PreahKossamak Polytechnic Institute	PP	MoLVT	Pb		2001

99		National Polytechnic Institute of Cambodia	PP	MoLVT	Pb		2005
100		Industrial Technical institute	PP	MoLVT	Pb		1980
101		Cambodia India Entrepreneurship Development Center	PP	MoLVT	Pb		2006
102		Kg Thom provincial Vocational Training Center	Kg.Thom	MoLVT	Pb		NA
103		Siemreap provincial Vocational Training School	S.Reap	MoLVT	Pb		NA
104		Business Institute of Cambodia	P.Veng	MoLVT		Pv	2006
105		Institute of New Khmer	PP	MoLVT		Pv	2002
106		Institution for Development of Economy	PP	MoLVT		Pv	2009
107		Cambodian Youth's Future Institute	PP	MoLVT		Pv	2007
108		Business Neakporn Institution	Kg.Cham	MoLVT		Pv	2006
109		Cambodia International Cooperation Institute	PP	MoLVT		Pv	2007
110		Student Development Institute	PP	MoLVT		Pv	2008
111		Belton International Institute	PP	MoLVT		Pv	2010
112		Polytechnic Institute of Cambodia	Koh Kong	MoLVT		Pv	NA
113		Asian Institute of Cambodia	Kratie	MoLVT		Pv	2013
114		Vanda Institute	BB	MoLVT		Pv	2014
115		Professional Training Center of Electrical Cambodia	PP	MoLVT		Pv	2009
116		Don Bosco Vocational Training Center	PP	MoLVT		Pv	2006
117		National Institute of posts and Telecommunication and ICT	PP	MoPT	Pb		1985
118		Economics and Finance Institute	PP	MoEF	Pb		1985

Note: 1).Br= Branch
2).Pb= Public
3).Pv=Private

MoEYS : Ministry of Education Youth and Sports
MoLVT : Ministry of Labor and Vocational Training
MoH : Ministry of Health
MoCFA : Ministry of Culture and Fine Arts
MoAFF : Ministry of Agriculture Forestry and Fisheries
MoCR : Ministry of Cult and Religion
MoND : Ministry of National Defense
MoI : Ministry of Interior
CM : Council of Ministers
MoEF : Ministry of Economy and Finance
MoPWT :Ministry of Public Works and Transport
MoSAVYR : Ministry of Social Affairs Veteran and Youth Rehabilitation
MoME : Ministry of Mine and Energy
NBC : National Bank of Cambodia
MoPT : Ministry of Posts and Telecommunication

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CHANGING METHODS AND STRATEGIES OF TEACHING IN THE NATIONAL UNIVERSITY OF MANAGEMENT

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Abstract

The study is attempted to find out the new methods and strategies of teaching in order to improve the quality of education at the National University of Management. Like many other industries, higher education has forced to adapt to a new reality. Changes in the global business environment are driving changes to the way business schools deliver higher education. Classroom and field-based learning methods were discussed in this study, that including case-based learning, role-play learning, business games, simulation-base learning, student seminar, problem-base learning, internship, practicum, cooperative learning, community-based learning, industry visit, and study abroad. In this study, the secondary data is the main sources of information for discussion. Observation and monitoring of teaching activities in classroom is also the method of study. After make a conclusion, several recommendations have been proposed for faculty in orders to learn and to redesign course plan with in part of active and/or experiential learning based on learning outcomes.

Key words: *Changing, teaching method, teaching strategy, traditional teaching, modern teaching, experiential learning,*

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1 INTRODUCTION

1.1 Background

In today's world, because knowledge and technology becomes outdated rapidly and is updated constantly, much of what students will need to know in their future career after graduation has not yet been generated. This knowledge explosion cannot be solved by adding more courses. Therefore, the responsibility of teachers in university or college is not only to teach the students with the particular or professional knowledge of their discipline but also to help them develop successful lifelong learning skills (Yong Ling, 2005). Higher education needs to prepare students to tackle issues in the complex and challenging world that they will face as professionals. The complexity of management issues, augmented by rapid changes in the global business environment are driving forces for business schools to continue to evolve the way they prepare students for modern organizations (Brew, 2010).

Changes in the global business environment are driving changes to the way business schools deliver higher education. However, the long debated gap between academia and industry (research-practice) remains unsolved. The most important goal of education is improving the quality of teaching. There are several modern teaching methods that can be used in teaching and learning (Anabel, G. 2011). Like many other industries, higher education has forced to adapt to a new reality (Maureen, Robert, Cherie, 2010). Changes in the global business environment are driving changes to the way business schools deliver higher education (Anabel, 2011). In modern business environment change is the way of life, the industry requires business graduates who possess good personality with professional etiquettes, good team work abilities and leadership skills, good communication skills with very good public relations, problem identification, solving ability and analytical skills (Abdul Quddus, 2015).

Traditionally we have been using lecturing method in teaching business courses which is useful to make students understand the concept in direct logical manner but this method make students passive because of its one way nature of communication, learning is difficult to gauge, no participation of audience, and it can't present realistic picture of a real world situation of business (Abdul Quddus, 2015). Students not only learn the lesson effectively but activity based knowledge further enhance their ability to solve real life problems, and enrich their understanding at highest level (Boud & Feletti, 1997 in Mahmoodi, Khatoon, Ali, Ejaz & Qureshi, 2013). Today, however, MBA programs face intense criticism for failing to impart useful skills, failing to prepare leaders, failing to instill norms of ethical behavior and even failing to lead graduates to good corporate jobs (Bennis and Toole, 2005).

1.2 Research Question

There are many studies that explored teaching techniques that encouraged students to actively engage in the material because the classroom engagement has been found to promote deeper levels of thinking and better facilitate encoding, storage, and retrieval than traditional lecture (Mc Glynn, 2005; Peck, Ali, Matchock, & Levine, 2006). It is reported that these techniques may range from demonstrations, to discussions, to in-class activities. Examples of in-class activities can range from management games, simulations, discovery learning, and exam reviews (Cook & Hazelwood, 2002; Saranson & Banbury, 2004) to in-class journaling (Bolin, Khramtsova, & Saarnio, 2005).

Instructional strategies can be classified by Menko et.al., (2011) into direct instruction which is teacher centric, indirect instruction which is student centric, interactive instruction which is participatory in nature, experiential learning is activity oriented and independent study i.e. flexible and can used in combination with other strategies. Within each strategy there are numerous teaching methods, for example, field trips, management games, roleplaying, model building, surveying etc. form the part of experiential learning strategy whereas direct instructions strategy focuses on structured overview, demonstration, lecturing, drill, didactic questions and practice exercises. The current study by Internal Quality Assurance of the National University of Management, found that most faculty members are low performance in interaction and communication students. Thus, this study is attempted to find out the new methods and strategies of teaching in order to improve the quality of education at the National University of Management. So, the research question of this study is on *what are the new teaching methods and strategies should be used for business education in the National University of Management?*

This study focuses only on teaching methods and strategies of business and management education. The discussion of the concepts and models are mostly derived from literature review and from the experiences of other business schools on the world. The study uses qualitative approach, so that the results of discussion is based on secondary data which could be a lack of an important variable, missing some information or some other aspect of the research that may lead to the limitation of making a conclusion and recommendation.

1.3 Significant of Study

The study is attempted to introduce changes of teaching methods and strategies at the National University of Management in order to improve quality of education, so that the results of study would be significant contribution to support the implementation of NUM Strategic Plan 2014-2018. The contribution of study is also to encourage NUM's faculty members to redesign their teaching course syllabus based on learning outcomes and to incorporate active or experiential learning in part of their teaching courses. It would be also helpful to other business schools for considering changes of teaching strategies to support quality improvement of higher education reforms in Cambodia.

1.4 Methodology

In this study, the secondary data is the main sources of information for discussion. Observation and monitoring of teaching activities in classroom is also consiclered as the method of study. We discussed the issues of traditional teaching with faculty members and MBA students and their opinions on the change of new teaching strategies at NUM. Organizing faculty seminar to open discussion on the change of teaching strategies in order to improve quality of education is also the one of methodology. Thus, qualitative method would be useful for discussion and recommendation of this study.

2 CHANGING METHODS AND STRATEGIES OF TEACHING IN BUSINESS SCHOOL

2.1 Teaching Method and Teaching Strategy

The teaching method is the way the teacher approach the students. Teaching method primarily fall into two approaches: teacher-centered and student-centered (Teach.com.2016). Teaching strategy is the action to be taken by the students to reach the objective. A teaching strategy is a set of learning activities to implement a variety of teaching methods. The key is to create learning environments that are more interactive, to integrate technology where applicable into the learning experience, and to use collaborative learning strategies when appropriate (Montana State University).

Traditional teaching method is classroom-based and consists of lectures and direct instructions conducted by the teacher. This teacher-centered method emphasizes learning through the teacher's guidance at all times. Students are expected to listen to lectures and learn from them. Lecture is a traditional teacher-centered method, that placing students in a passive role, and cannot significantly involve learner participation (Chariton, 2006).

However, most students cannot stay focused throughout a lecture. A classroom research study showed that immediately after a lecture students recalled 70% of the information presented in the first ten minutes and only 20% of that from the last ten minutes (McKeachie, 2002). More than a hundred years ago, Hermann Ebbinghaus formulated the learning curve, which describes the relationship between memory and time. In a nutshell, it says that, during a lecture, if your absorption rate is at 100 percent on day one, there is a 50-80 percent loss of learning from the second day onward, which is reduced to a retention rate of just 2-3 percent at the end of thirty days (LEARNTech Asia 2014).

It is a long time that the theoretical courses for business schools are mostly taught through the traditional lecture method, but recently, lecture method is much criticized because of its non-accountable for student academic needs, low-stimulus for further study and non attractive for students (Soltani, 2012). The traditional "chalk and talk" method of teaching which persisted for years is now acquiring inferior results when compared with the more modern and revolutionary teaching methods (Jackson, 2012).

The learning paradigm shifts educators away from simply teaching towards students actually learning. The traditional model of academia which was characterized by the teacher-centered approach is being replaced by a more student-centered approach that focuses on learning (Klein, 2006). As we move towards more learning centered education, we are more likely to provide opportunities for self-direction; reshape the authority relations in our classroom; implement experience-based learning activities; adopt a relational-learning approach and foster lifelong learning (Hannay, 2009)

Cheney (2001) confirms that experiential learning reinforces the link by drawing upon students' life experiences and helping students to see connections between knowledge gained in the classroom and its application in real life. Experiential learning teaches students the competencies they need for real-world success. Although we can simulate the real world in the classroom and laboratory, authentic experiential learning creates an invaluable opportunity to prepare students for a profession or career, learn the craft of a fine artist, or discover how the discipline creates evidence to contribute to its body of knowledge (Ambrose, et al. 2010).

2.2 Experiential Learning

Experiential learning is referred to learning by doing, learning through action, learning through experience, and learning through discovery and exploration. Experiential learning is so effective because it's a process of learning by doing (Northern Illinois University, 2011). Confucius (450 BC): I hear and I forget; I see and I remember; I do and I understand. Benjamin Franklin (1750): Tell me and I forget; Teach me and I remember; Involve me and I will learn.

Students are motivated when they are provided opportunities for practice and feedback. Experiential learning provides the conditions for optimally supporting student learning (Ambrose, et al. 2010). Experiential learning creates self-directed learners. This requires students to reflect on their prior knowledge and deepen it through reflection; transfer their previous learning to new context; master new concepts, principles, and skills; and be able to articulate how they developed this mastery (Linn, et al. 2004).

Field-based learning is the oldest and most established form of experiential learning, having been integrated into higher education in the 1930s. Field-based learning includes internships, practicums, cooperative education, and community-based learning. Classroom-based learning can take a multitude of forms, including case studies, role-playing, games, simulations, presentations, and various types of group work (Lewis & Williams, 1994)

2.2.1 Internship

An internship is a work-related learning experience for individuals who wish to develop hands on work experience in a certain occupational field. Most internships are temporary assignments that last approximately three months up to a year. Some students will have a part-time internship, where they work at the office for just a few days or hours a week. Others will have full-time internships, meaning they work the same hours as the company's full-time employees. They learn how their course of study applies to the real world and build valuable experience that makes them stronger candidates for jobs after graduation. Some companies do extend full-time job offers to exceptional interns, though this is not guaranteed and is the exception rather than the norm. To better chances of this happening, students should be proactive in their works, pay attention to detail, be willing to listen and take criticism and volunteer for special projects. Student should be positioning himself as a hard-working, reliable worker puts in good standing for consideration. If the company is not hiring at the time student internship ends, do not be disappointed or think it's a reflection of student's work. It's often simply a budgeting issue. Student can still probably count on them for a glowing reference, which student can leverage when applying for jobs later on (Loretto, 2016).

2.2.2 Practicum

A relative of the internship, this form of experiential learning usually is a course or student exercise involving practical experience in a work setting as well as theoretical study, including supervised experience as part of professional pre-service education. Practicum can be described as a sort of field experience where an individual has to assist someone or, observe, or record data and take limited responsibility. A practicum involves limited exposure to the real-world scenario with limited or predetermined objectives. It can be done part-time or maybe once a week. Here an individual may or may not have to rely on his/her previous coursework to gain knowledge or experience in the related field. Since practicums are generally done part-time, or for small durations, the remuneration is also relatively low. Practicums are field experiences that allow a student to observe and document how working professionals perform their job responsibilities. Students will also participate to a limited extent in performing tasks under supervision by program professors and on-site staff. Concurrently, students enroll in a course which outlines the expectations and requirements of the practicum (Best Counseling Degrees, 2016).

2.2.3 Cooperative Learning

Cooperative learning is a teaching method where students of mixed levels of ability are arranged into groups and rewarded according to the group's success, rather than the success of an individual member. Cooperative learning is instruction that involves students working in teams to accomplish an assigned task and produce a final product. Guidelines for using cooperative learning:

- Form teams of 3-4 students for out-of-class assignments
- Instructor-formed teams generally work better than self-selected teams.
- Give more challenging assignments to teams than to individuals.
- Help students learn how to work effectively in teams.
- Take measures to provide positive interdependence.
- Impose individual accountability in as many ways as possible.
- Require teams to assess their performance regularly.
- Do not assign course grades on a curve (Johnson et al., 1998).

Cooperative learning researchers David and Roger Johnson (1999) have identified five elements that define cooperative learning:

- Face-to-Face Interaction: Students are promoting each others' learning through face-to-face activities where they discuss and explain assignment topics with each other.
- Positive Interdependence: Students have the sense that they're 'in this together,' feeling that each member's individual effort will not only help him, but the whole group. The grade of each student is dependent upon the effort of other group members.
- Individual Accountability: Each student is accountable for their own contribution to the group. Clearly described goals ensure that each student knows what she is responsible for and what the group is responsible for.
- Group Processing: Students are given a means for analyzing their group for how well the group has learned, and whether or not collaborative skills are being used.
- Collaborative Skills: Students learn not only the subject matter, but interpersonal skills and how to work in teams. Students are taught skills of communication, leadership, and conflict management during the early stages of cooperative learning sessions.

2.2.4 Community-Based Learning

Faculty and students cooperate with local organizations to conduct studies to meet the needs of a particular community. Students gain direct experience in the research process. Learning in communities (team learning) learning with peers, either through collaboration in a group project or through discussion in small-groups provides variety to students' learning experience. Students can improve Social and motivational skills, and they get exposed to critical thinking, team working and problem solving skills. When a teacher initially puts students into a group, the students are a "group," not a "team." As the students begin to trust each other and develop a commitment to the goals and welfare of the group, they become a team.

Community-based learning unites sets of strategies designed to engage students in learning at high standards, including academically based community service, civic education, environmental education, place- based learning, service learning, and work-based learning. Each of these strategies has its own advocates and practitioners, history, and accomplishments. Separately, each brings a unique perspective and valuable resources to teaching and learning (Melaville, A., Amy, C., & Martine, J., 2006).

2.2.5 Industry/Field Visit

Students can be taken to nearby companies to make them understand how the company operates, which will give them real world experience. According to Sanroman pazos and Longo (2010), industrial visits give students insight into their future professions by giving them the opportunity to observe industrial processes in operation. In addition to benefiting the student, industrial visits also benefit stakeholders by bringing them into contact with prospective employees (Nyamaptene, 2012). Therefore industrial visit make students understand the subject to its core and its deeper practical experiences in real field situation. Universities apply different methods to incorporate practical experiences and real world applications into their curricula to prepare students for the technical challenges they might face in workplace (Frempong et al., 2005).

2.2.6 Study Abroad

Students usually engage in courses at higher education institutions in another country. The experiential learning component is the cultural immersion which provides novel challenges for navigating living in a new place. Study abroad demonstrates knowledge of the host country's culture through course content specific to the individual program's curriculum and academic focus. Study abroad develops a set of skills (adaptability, ability to problem-solving) to manage the new challenges of daily life in a different culture. Develop a greater sense of responsibility for oneself (Debra Terzian (2013).

2.2.7 Case-Based Learning

This gives the clear knowledge about the business tactics needed when the student goes to the field. The cases will likely be assigned ahead of time to allow the students a chance to read through the materials and be prepared with their analyses for the class discussion. The lecturer will then lead the class discussion and encourage debate between the students. Qualitative study conducted by Jakka & Manta (2012) suggests that case study teaching method is most practiced instruction technique belonging to indirect instructions which tests student capability to use the information, apply the concepts they have been taught and inculcate the habit of logical approach rather than theoretical approach. However it is not the best way to communicate large amounts of new information.

2.2.8 Role-Play Learning

This is also one of the modern techniques used to inculcate the real Internalization of the character and situation. The sales training skills are taught in that manner. For example asking student to act as salesman and sell product to another student who act as customer. Role-play is a learning structure that allows students to immediately apply content as they are put in the role of a decision maker who must make a decision regarding a policy, resource allocation, or some other outcome. This technique is an excellent tool for engaging students and allowing them to interact with their peers as they try to complete the task assigned to them in their specific role. This work can be done in cooperative groups and/or students can maintain the persona of their role throughout the class period. Students are more engaged as they try to respond to the material from the perspective of their character.

According to the Science Education Resource Center (2016), there are 3 steps for using the role-play learning:

- This scenario should include the role the student must play, the informational details relevant for decision making in this role, and a task to complete based on the information. This information might be provided on the screen through power point or by using a handout. It is highly recommended that the instructions be provided in writing so it is clear to students what they must do and how?
- The instructor might have students do this alone or in small groups or follow the think-pair-share format in which students work individual and then discuss their results with their partner.
- The instructor might ask students to write their replies to submit or this might be a very good lead in to a larger class discussion where students can justify their differing outcomes or opposing views.

2.2.9 Business Games

A business game may be defined as a sequential decision-making exercise structured around a model of business operation, in which students assume the role of managing the simulated operation. Greco et al. (2013) argues that a business game is a serious game in a business environment that can lead to one or both of the following results: the training of players in business skills (hard and/or soft) or the evaluation of players' performances (quantitatively and/or qualitatively). Faria et al, (2009) shows that the five most discussed areas are: (1) experience gained through business games; (2) the strategy aspects of business games; (3) the decision-making experience gained through business games; (4) the learning outcomes provided by business games; and (5) the teamwork experience provided by business.

Games can be designed to teach facts, skills, processes and behaviors as well as problem solving, reasoning and creativity. For example: Giving $10 to student group as capital to start any business and asking them to make profits by using his entrepreneurial skills. Student motivation can increase with the use of games to reinforce skills and concepts learned. Games are always fun and exciting for all irrespective of age. The students will learn the concept and theory by funny way. The teacher has to complete by linking the purpose of the game and the concept derived out of it. The involvement from the participants is cent per cent. The games may be played indoor and outdoor. Varieties of games are available from ice breaking to risk taking.

2.2.10 Simulation-Based Learning

Simulation is a technique for practice and learning that can be applied to many different disciplines and trainees. It is a technique to replace and amplify real experiences with guided ones, often "immersive" in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion. A simulation is a method of training or research that attempts to create a realistic experience in a controlled environment. The earliest practical use of simulation was in the construction of physical models of real objects. The purpose then was to permit the designer to test specific aspects of the object that he wanted to build on the replica. This put him in a better position to avoid making mistakes and reduce wastage in the construction of the real object (Peter Mack (2009).

2.2.11 Student Seminar and Workshops

Monthly seminars and workshops on various business subjects are must and all the students are required to participate actively. The best speaker of the seminar from the entire batch is given an award and weight age marks. The seminar helps participants improve their skills as learning-centered teachers. Participants study how to identify and select challenging and transformative learning objectives. By understanding the principles of integrated course design, participants appreciate how to best guide students to the successful achievement of these goals. Further, participants develop educative assessment strategies that allow them to measure success, continue to innovate, and create even deeper learning (American Association of Philosophy Teachers, 2016).

2.2.12 Student Seminar and Workshops

Problem-based learning (PBL) is an instructional method that challenges students to "learn to learn," working cooperatively in groups to seek solutions to real world problems. The role of the instructor is critical in facilitating and guiding the learning process. PBL is a curriculum design and a teaching/learning strategy which simultaneously develops higher order thinking, disciplinary knowledge bases and practical skills by placing the learner in the active role of practitioners (or problem solvers) confronted with a situation (ill-structured problem) which reflects the real world (King, 2005). PBL is also a style of learning in which the problems act as the context and driving force for the learning. In a PBL environment, the learner is encouraged to solve the problem, which is set in a real world framework and is interesting, challenging and complex for the learner. In order to solve the problem, the learners have to discover or learn new knowledge either individually or together in groups, analyze relevant information obtained from different sources, think critically, and discuss the solution with others. Generally the problems used in PBL are open-ended, they do not have only one correct solution, so that the learner tends to focus on the learning process as well as obtaining a correct answer (University of Beijing, 2005).

3 CONCLUSION AND RECOMMENDATIONS

3.1 Conclusion

It is important to recognize that in the modern world the student has changed, technology has changed and it may be time for the National University of Management to change the teaching strategy in order to improve the quality of education. There is evidence that experiential learning, when properly designed, is highly engaging for students and leads to better long-term memory. This new methods lead to deeper understanding, and develops skills for a digital age such as problem-solving, critical thinking, improved communications skills, and knowledge management. Certainly, experiential learning approaches require considerable re-structuring of teaching and a great deal of detailed planning if the curriculum is to be fully covered. It usually means extensive re-training of faculty, and careful orientation and preparation of students.

3.2 Recommendations

- *Recommendation #1:* To implement the new teaching strategies, our instructors should be willing to accept a less teacher-centric role in classroom. Instructors should be a guide, a cheerleader, a resource, and a support. Instructors should allow opportunities for student involvement, allow students to experiment and discover solutions on their own, provide interaction with their peers, and always praise students for the participation.

- *Recommendation #2:* Instructors should provide a precise course description, course objectives and learning outcomes. Tie the course objectives and learning outcomes to course activities and direct experiences so students know what they are supposed to do. Instructor smust decide which parts of the course can be instructed more effectively with experiential learning, think about how any potential activities match the course learning outcomes, and explain the purpose of the experiential learning situation to the students.

- *Recommendation #3:* Instructor should be preparing and planning of a course in advance. Think about the grading criteria and evaluation method that would match the proposed activity. Provide relevant and meaningful resources to help students succeed. Instructor should be knowledgeable in the field of study, should be an early adopter, be willing to explore new technologies, and leading the conversation to social networks.

- *Recommendation #4*: In order to support new teaching strategies, all Faculty Deans should think and redesign curriculum based on program learning outcomes. Course learning outcomes cannot be developed in isolation from other courses or from the overall program learning outcomes. Course learning outcomes are integrally related to program learning outcomes. Faculty Deans should organize training for faculty members on the new teaching strategies and motivate and facilitate them to implement the new change.

- *Recommendation #5*: Sponsorship and commitment of the University management is very critical for the implementation of the new teaching strategy. Modernize classrooms should be prioritized for this change implementation. Class size should be considered for reducing to maximum of 25-30 students and also for the number of teaching hours. Internet system and e-library must be considered for upgrading to support the students accessibility of experiential learning.

- *Recommendation #6*: The involvement of all academic levels must be considered and unified. This requires mapping the various components of the curriculum and their developmental sequences across the university learning outcomes, program learning outcomes and course learning outcomes.

- *Recommendation #7*: To integrate experiential learning in teaching course, faculty members must:
  a. Plan the experience by tying it to the course learning objectives and determine what students will need to successfully complete the exercise.
  b. Prepare materials, rubrics, and assessment tools and ensure that everything is ready before the experience begins.
  c. Provide students with all of the content and information and complete answers to their questions. Guide students through the process of finding and determining solutions for themselves.
  d. Evaluate Success of an experiential learning activity can be determined during discussions, reflections and a debriefing session.

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The Educational Experience and its Effects on the Graduates' Satisfaction at their Workplaces Case study: National University of Management

Dr. Tan Saroeun [24]

Abstract

The present study oriented to solve some issues which negatively impacts of NUM education experience on graduates' satisfaction in their workplace. The research design was used the sample size only 220 alumni who are working in 7 types of work organizations, by using snowball sampling. Referring to the sources of data; the literature review was used based on the theoretical framework and the primary one, the research was analyzed by using a 5 rating scale (1. Strongly disagree -5. Strongly agree) for the independent variables and for the dependent variable (1. Strongly unsatisfied -5. Strong satisfied). The statistical tools were used to analyze, including frequency, weighted arithmetic mean, and multiple regression. The result of mean tended to agree and satisfied .In the among of the 6 independent variables, there is only one independent variable, critical thinking that is insignificant, i.e. the critical thinking skill is not satisfied from NUM educational experience for the graduates in their work. Thus NUM, especially faculties has revised and strengthen teaching in following some domains from national qualification and bloom taxonomy, knowledge, skills and attitude to equip generic skills and hard skills for realign teaching methods, and the student assessment. Rubric assessment should be used more detail on assignment, including report writing, presentation, and research paper. etc.

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All the developing countries have oriented potential skilled manpower to develop the social economy. To build the potential human resource, the first priority is to build an education model, especially the national qualification that shows the educational directions for all higher educational institutions in order to enhance educational quality for labor force matched. For example, Malaysia National Qualification sets 8 domains for soft and hard skills of learning outcomes.

In Cambodia, the royal government drawing a road map by setting the national qualification which emphasizes on three potential quality pillars to enhance educational quality, such as degree of study levels, credit of course teaching and learning hours at HEIs and education based five domains of soft skills and hard skills for learning outcomes (National Qualification, 2013). Furthermore, the ministry of education, youth and sport promoted the vision for five years to orient the goals of learning outcomes hierarchy for the public and private higher education institutions (MoEYS Strategic plan, 2009-2013). These goals will help the public and private higher education institutions to follow for setting their own strategic plan to operate as action plans and operational plan of education based outcomes toward labor markets.

Most of Universities have their own mission and strategic goals for improving academic quality through the program initiation for employment by following the national qualification. In the amongst of the public Universities in Cambodia, National University of Management is one that has set an own strategic plan, such as the goal 1st, "Improve Quality of Services and Community" (NUM Strategic plan, 2014-2018). The goal was set up the action plan and operating plan to enhance quality of the student learning outcomes by equipping students with following program outcomes, course outcomes, and chapter outcomes including, soft skills and hard skills to please the employability market skills.

However, most of higher education institutions in Cambodia have least efficiently performed on the education based outcomes, i.e., the HEIs missed to study on what the employee traits which the employers need for their goal achievement, such as generic skills and hard skills. These skills used to design the program, mapping the curriculum based learning outcomes.

Thus, the program design of the most HEIs is based benchmarking from other HEIs'one in the region or globally. Moreover, it relates to the course syllabus preparing which the teachers design for teaching plan. Actually, if the teachers are not clear on what are the program or curriculum learning outcomes, he or she also did not write the course and chapters learning outcomes clearly, i.e. the course syllabus design did not write based the student learning outcomes , soft and hard skills.

While the student learning outcomes are not oriented, the infrastructure and facility for practicum are also not equipped, the collaboration with internal and external regions for the student exchange, internship and work exercise are not necessary. Like Feiman-Nemser (1990) remarked that the new technologies given the teachers and students the opportunities to explore other methods to learn, research, and information, especially infrastructure and facilities including computers and other instructional tools.

All the above shortages of the learning outcome hierarchy implementation, the higher education institutions in Cambodia have met with some issues related to preparing the graduates 'satisfaction mechanism to match with employability at the labor market, including lack of fund to research, lack of infrastructure and facilities, the curriculum design is not mapped based employees' trait, teaching courses without specific student learning outcomes orientation. Like, Kwok et al., (2010) remarked that the key challenges for the employability skills due to the universities arrange no specific specialized skill ranks and career paths for whom are promoted and are higher paid for their quality work life, the both academic staff and alumni labor market. Further, at that place is also weak in research facilities which tools for academic's quality performance in theory, practice of literal work, such as laboratories, computer skilled labs and other academic database.

The National University of Management has also met, challenged some above issues which have been really lacking for solving the gaps between the learning outcomes and employability skills for the graduate satisfaction. To challenge these issues, the present study needs to survey whether the educational experiment which the graduates studied at the National University of Management in the past, has provided in satisfaction at their workplace or not.

- Are NUM graduates satisfied with educational experience at their workplace?

- Is there significant relationship between the educational experiences and the graduates' satisfaction in the workplace?

2 Objectives of Study

The present study aims to the factors which the graduates consider that NUM provided them some educational experiment for their present duties at the workplace. Thus a few phrases are stated as the following:

- To evaluate the efficiency of the graduates' satisfaction of educational exper ence providing by the National University of Management.
- To measure the effectiveness of the relationship between the educational experience and the graduates' satisfaction, providing by the National University of Management.
- To provide a conclusion and recommendation.

3 Hypothesis

Based on the objective of the study, the null hypothesis was proposed to test for statistics. The hypotheses tested are used an SPSS and AMOS software to find out whether they are true in the real empirical conceptions. The following the model for hypotheses tested.

- Ho1: The graduates are not satisfied with educational experience by NUM at the workplace.
- Ho2: There is no relationship between the educational experience providing by NUM and the graduates' satisfaction in the workplace.

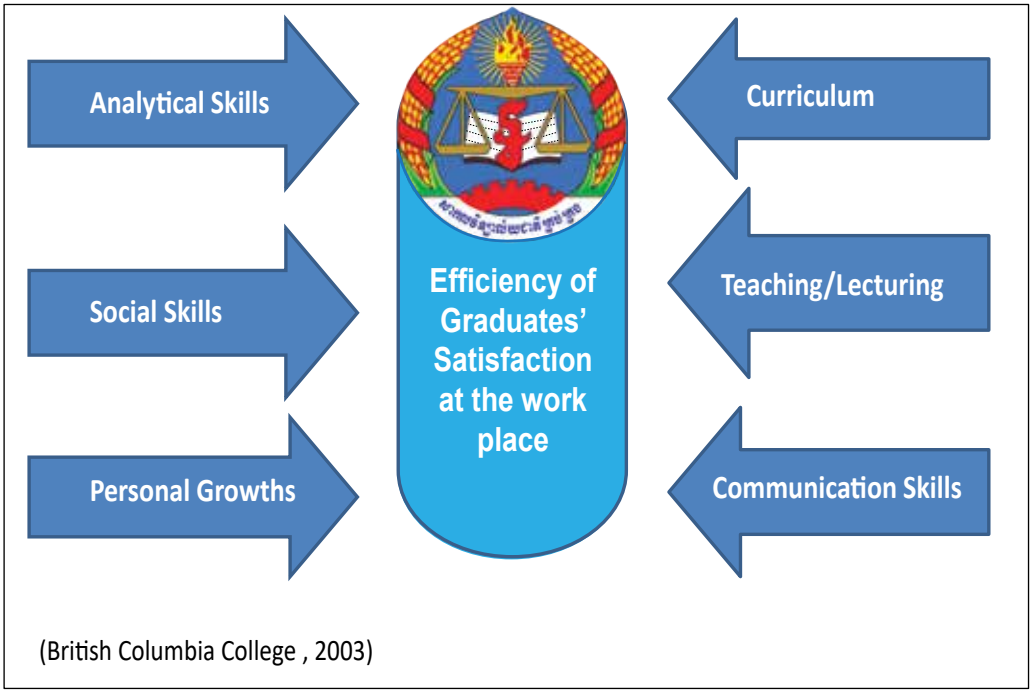
4 Literature Review

This section is to find out the evidences in secondary data, conceptual and empirical review are performed . For covering the whole section, the literature is divided into four parts; the first is the conceptual framework, the second is the literature review, methodology and the last one are concluded.

4.1 Conceptual Framework

The dimensions are measured by the relationship between the independent variables, and a dependent variable. In the six predicted variables, there are only two variables that NUM used for providing services for education, including the curriculum and teaching, and the four others are employability skills, analytical skills, communication skills, social skills, and personal growth or value awareness. As the graduates 'satisfaction in the workplace stands as dependent variable.

Figure 1. The Relationship between Independent variables and dependent variable



(British Columbia College , 2003)

4.2 Literature Review

4.2.1 What is Student Satisfaction?

According to Hunt (1977, p.49) defined "Consumer satisfaction with a product refers to the favorableness of the individual's subjective evaluation of the various outcomes and experiences associated with buying it or using it".

Schools are different from consumers. The student satisfaction needs two student evaluation, first direct assessment in the class and second indirect assessment from employers at the workplace. Therefore, they require a period for reflecting through the evaluation from labor market outside. In this event, Allen et al. (2002) and Wang (2003) noted that the students' satisfaction is based on their awareness of the dimension of needs from the effectiveness of the education from which they receive.

As Weisz (1999) recovered that the little relationship between academic attainment and levels of generic skills that employability do not need to link academic ability.

4.2.2 Students Satisfaction and Curriculum

Student outcomes such as satisfaction with academic courses, self-perception of knowledge and skills learned through course work, and their future ambitions are valid educational goals that should be used when performing an assessment (Corts et al., 2000).

Kotler and Fox (1995) notified that not only academic programs of studies are matched for the most of the students, but including service supporting, such as teaching, academic advice, and career counseling.

Another researcher, Witowski (2008) stated that the students 'satisfaction data were the curriculum which reverted into employable skills responded completely to the needs of the changing marketplace.

4.2.3 Student Satisfaction and Teaching

Standing on Hersh (2007) observed that the student satisfaction is concentrated on teaching and learning, the instructors should prepare the course plan clearly, expected learning outcomes, giving real activities of student learning and finally a clear assessment of the students' ability and point to their results and compared to the expectation.

Other researchers; Aman (2009) and Coleman (2010) addressed that the high quality of instruction related to the degree to which students perceive the mode of instruction, including the variety of instruction, teaching strategy and learning needs, learning about students and explore possibilities.

As for Winberg and Hedman (2008) also stated that the student satisfaction is linked to the role of instructor and student learning. The instructional methods, student-centered techniques are oriented to vital roles of students' thinking and learning oriented to ensure students' academic success.

Juillerat (1995) examined an academic satisfaction relevant a qualified professors, exciting coursework and high teaching ability of professors and so on.

4.2.4 Soft Skills and Student Satisfaction

Like Weisz (1999) found that for an academic degree program of the graduates, the employers expect generic competencies required to be equipped early at school before employment chosen.

Based on other researchers, Ocker and Yaverbaum, (2001) highlighted that as the learners, the precious desirability is instructional techniques, including academic freedom, student centered, to giving a chance for group assignment for training them to analyze and solve problems in order to reinforce their critical thinking and creativity to orient successful academic outcomes. While the expected learning outcomes met, the students' satisfaction is strongly desired.

4.3 Methodology

There are several previous researchers measured in empirical tests by using the relationship between education and students 'satisfaction. Referring to Corts et al.(2000) measured the five independent variables impacting on the students 'satisfaction. Another researcher, Browne et al. (1998) identified the students 'satisfaction by using regression analyzed on the SerQual dimension and curricular dimensions.

Eom and Wen (2006) used correlation to measure the students 'satisfaction and six predictor variables, including student self-motivation, student learning styles, instructor knowledge, instructor feedback, student interactions, and course structure.

There were both an independent and dependent variable measured in an academic setting and the students' satisfaction in the workplace, referring to Elliott and Healy (2001), student satisfaction which comes from a short- term behavior is against an evaluation of their experience with the education service supplied by their college or school and their employability in the workplace.

4.4 Conclusion

For measurement of the students 'satisfaction is not different in using statistical tools, correlation or regression. For the present study, the measurement of the students 'satisfaction through multiple regression by using six predicted variables, curriculum, teaching, critical thinking, communication skill, social skills, and personal growth and one dependent variable, the students 'satisfaction in the workplace. Moreover, some researcher's evaluated not only good curriculum that was not provided the students 'satisfaction, but other educational services supported also.

5 Significance of Study

After examining the issues, the National University of Management will obtain some valuable contributions from the findings as the following:

1. To reform better curriculum for the right modern labor market.
2. To strengthen teaching through new methods of teaching by orienting the student learning outcomes , especially mastery
3. To enhance the student learning outcomes by focusing soft skills related employable skills.
4. To orient and seek the best methods for the student assessments, direct student assessment in the class and the graduate assessment in the organizations.

6 Research Design

Data of research are confidentially designed, the one that prepared in reasonable methodology, including sample size and sampling designs, sources of data, and statistical tools.

6.1 Sample Sizes and Sampling Designs

Based on the study made by Green (1991) determined that N > 50 + 8 m (IVs) is an appropriate for participation. Therefore, the main sample size is 220 alumni items for administering data analysis. The data are collected from the alumni who studied in major, such as Management, Tourism, Business economics, Marketing, Accounting -Finance, MBA, MFI, IT and Law at their workplaces in Cambodia.

6.2 Sources of Data

Primary data are collected by interviewing alumni who are working for work organizations in Phnom Penh, such as Banking and services, Commercial trading , Manufacturing, Own business, NGOs, and Public organization. Secondary data gathered are administered from the strategic plan and policies of the NUM, MoEYS, and some educational documents relevant the research problem, including books, educational journals... etc..

6.3 Statistical Tools

According to the research problem, the research questions, and hypothesis are determined and find the statistical tools are utilized for data analysis. First, Frequency and percentage are used for identifying respondents , such as age, gender, workplace, education, and work experience, major of study…etc.. Second; weighted arithmetic mean is used for measurement of the dimension of graduates' satisfaction tendency. and the last one, multiple regression analyzed to find out the relationship between the six independent variables of NUM educational experience and NUM graduates' satisfaction at the work places. All statistical tools are used by software, IBM 21, SPSS and AMOS.

7 Data Collecting Techniques

This method is applied to educational respondents who are NUM alumni, the data were gathered by sending mail questionnaires (snow ball) and direct administered questionnaires to whom are working in the sectors, public and private organization.

8 Reliability

The research instrument is designed by based on research problems and statistical tools. Moreover, the interval scale, the questionnaire is using 5 rating scales. Each hypothesis contains a few or several item questions. Thus, the item reliability measurement, the Cronbatch's alpha is performed before analysis. (>.70).

Table 8.1. Show about the result of Cronbatch's Alpha of Items

No	Variables	Items	Alpha (α)	Interpretation *
1	Curriculum	4	0.800	Good
2	Teaching	4	0.822	Good
3	Analytical Skills	4	0.810	Good
4	Communication Skill	4	0.849	Good
5	Social Skill	4	0.838	Good
6	Personal Skill	4	0.874	Good
7	Education Experience	12	0.846	Excellent
Total		36	0.915	Excellent

*George, D., & Mallery (2003)

9 Data Analysis

The data analysis was administered based the kinds of variables. For the respondents identified, data analysis is used frequency and percent tools. To find the tendency of some skills where the National University of Management provided to the graduates, the statistical tool, weighted arithmetic mean was used to analyze data. And the last one to recover the relationship between the independent variables and a dependent variable, the regression tool to be used to check whether the independent variables have positively impacted on the graduates' satisfaction or not.

9.1 Frequency Distribution

Before weighted Arithmetic Mean and the multiple regression were analyzed, the identification of the respondents was analyzed by using frequency distribution in ages, gender, education, specialization, employment situations, work organization, rank, salary, and work experience.

9.1.1 Respondents' Ages

The result of frequency shown that the age of the respondent percent is 70.9% (20-29) , 27.3% (30-39), 1.8% (40-49).

9.1.2 Gender and Education

As for the gender of the respondent percent is 57.7% male and 42.3% female to share answer the questions. For the education of graduates, there are 65% bachelor degree, and 35% master degree.

9.1.3 Graduates' Specialization

This part shown about the result of the graduates' specialization, the result concluded that there are 32% management, 16% finance, 15% eco-business, 14% accounting, 7% marketing, 6% finance and banking, 5% law, 4% tourism, 1% IT.

9.1.4 Employment work Skills

The graduates from the National University of Management employed in full time of 94.5% and part time employment of only 5.5%. For the right skills of their specialization in school is 68.6% and the mismatch is only 31.4%.

9.1.5 Alumni Organization

The graduates' respondents came from 61% of Banking and Service, 19.13% from Civil servant , 28.13% from manufacturing , 12.5% from Commercial trade, 7.3 % from Own business , and 7.3% from NGOs .

9.1.6 Rank of the Respondents

The rank of NUM alumni who joint to respond the questions, there are 6.8% top management, 20% Middle management, 14.1% low management.

9.1.7 Graduates' Salary

The salary of the respondents shown in the interval is 22.3% of over USD 500 , 41% of USD 451-500, 15.5% of USD 401-450, 11.8% of USD 351-400, 15.5% of USD 301-350 , 12.3% of USD 251-300, 9.5% of USD 201-250, 4.1% of USD 151-200, 5% of USD 100-150.

9.2 Weighted Arithmetic Mean

This tool measured to find the tendency of five rating scales of the independent and dependent variables.

Table 9.2.1. Show the results of Mean and Standard Deviation

N0	Variables	SD	$\overline{X}$
1	Curriculum	0.58	3.59
2	Teaching	0.60	3.55
3	Analytical Skills	0.61	3.56
4	Communication Skills	0.68	3.41
5	Social Skills	0.74	3.37
6	Personal Growth	0.67	3.54
7	Graduates' satisfaction	0.66	3.45

5 = Strong Adequate, 4 = Adequate, 3= Fairly Adequate, 2= Undecided, 1 = Inadequate

The result of the Weighted Arithmetic Mean shown that the variables, curriculum was tended to adequate (M= 3.59, ± 0.58), teaching variable was tended adequate (M: 3.55, ± 0.60) analytical skills variable was tended adequate (M: 3.56, ± 0.61) , and personal growth was tended adequate level (M: 3.54, ± 0.67) . However, the communication skills, social skills, and graduate satisfaction ware tended fairly adequate (M: 3.41, ± 0.68, M: 3.37, ± .74, M: 3.45, ± 0.66).

9.3 Weighted Arithmetic Mean

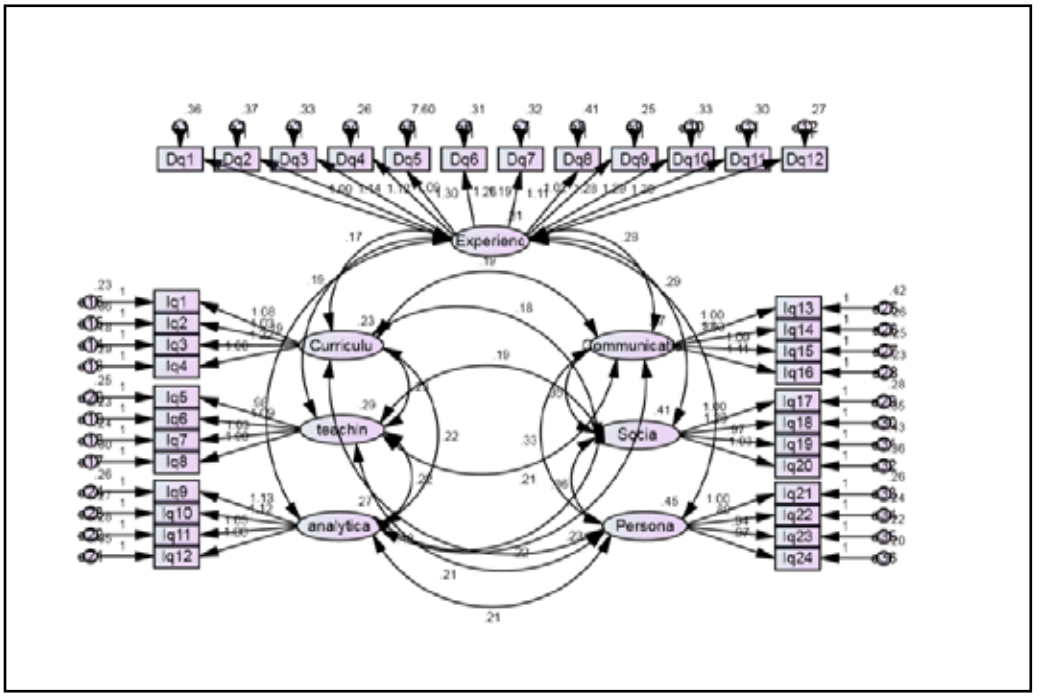
Referring to the rule, for the regression data; the assumption checked should be performed before the regression equation is analyzed.

9.3.1 Assessing Measurement Model

Before the multiple regression applied by SEM, the model measurement was assessed by using AMOS 21 for 220 sample size to confirm the model that applies in the present study as the following :

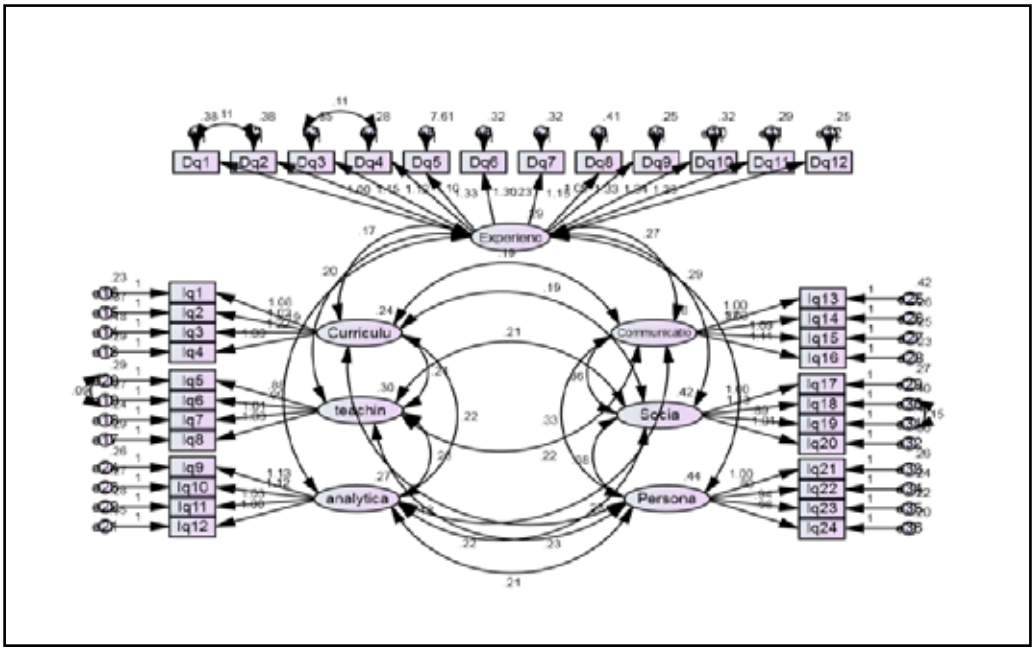
1. To check the model of good fitness (CFA)
2. To evaluate the strength of the construct reliability (C.R.) and the average variance extracted (AVE)

1. First Value Index for GOF



The result of CFA shown that the model of the equation is reasonable (Phillip Hyland, 2014) Chi-square (x^2) = 942.87, df = 573 at p <0.001; CFI = 0.924 < 0.95, TLI = 0.916 < 0.95, RMR = 0.038 < 0.05, RMSEA= 0.054 > 0.05. To make better of GOF indices, the Standardized Residual Covariance is applied by checking Modification Indices for covariance that is suggested linkage between errors that higher value in the same latent variable.

2 . Re-specific Value Index for GOF



After connecting the errors that take higher value, the result becomes better, such as Chi-square = 863.55, df= 569 at $p < 0.001$ was statistical significance due to the ratio of it (x^2 / df = 1.51) was less than the required cut-off value of 3 (Bagozzi & Yi. , 1988). Other indices, including CFI= 0.939 < 0.95; TLI= 0.933 < 0.95 indicate a reasonable model fit; RMR= 0.036 < 0.05 and RMSEA = 0.049 <.05 indicate a good model fit (Phillip Hyland, 2014).

Table 9.3.1 Result of GOF1 and GOF2

GOF Index	1st GOF	2nd GOF	Rule of the thumb for Index
Chi-Square (x)	942.87	863.55	Statistic significant
df & p-value	573***	569 ***	Ratio (x /df) =1.51 < 3) (Bagozzi &Yi. , 1988)
CFI	0.924 < 0.95	0.939 < 0.95	Reasonable fit model (Hu & Bentler, 1999)
TLI	0.916 < 0.95	0.933 < 0.95	Reasonable fit model (Hu & Bentler, 1999).
RMR	0.038 < 0.05	0.036 < 0.05	Good model fit (Browne and Cudeck, 1989)
RMSEA	0.054 > 0.05	0.049 < 0.05	Good model fit (Browne & Cudeck , 1993)

9.3.2 Model Measurement

The measurement model was checked on the strength and significance of the factor loading to find the Construct Reliability (C.R.) and the Average Validity Extracted (AVE).

Table 9.3.2 Result of Model Measurements

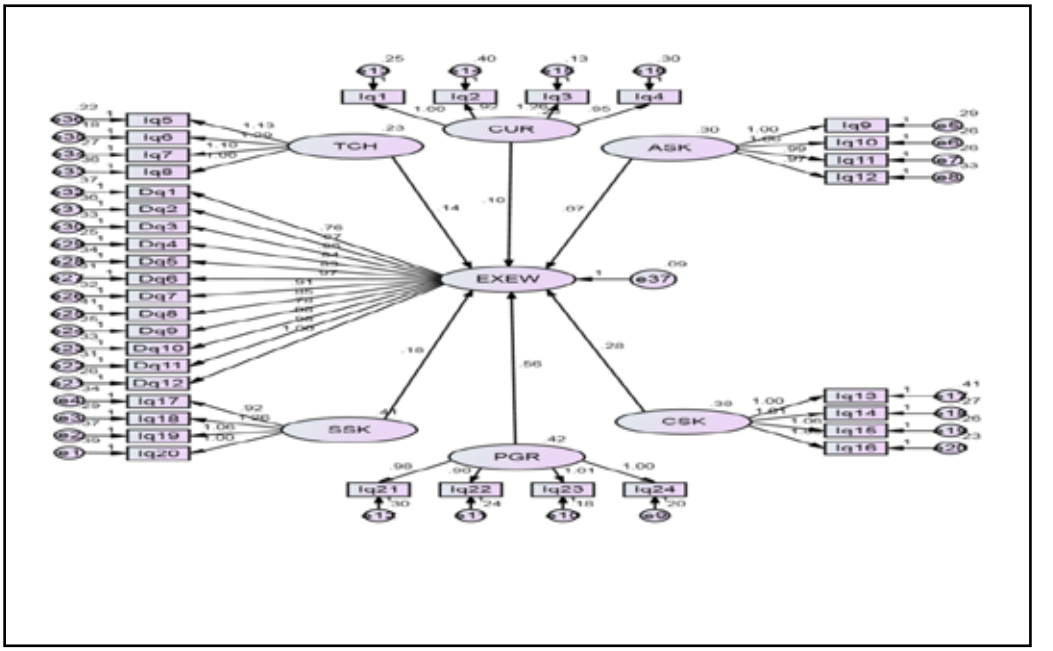
Variables	Factor Loading	Error Variance	C.R.	AVE
CURRICULUM	.669 .813 .634 .739	.031 .024 .038 .026	.985	.514
TEACHING	.714 .751 .726 .668	.031 .032 .033 .029	.985	.511
ANALYTICAL SKILLS	.656 .712 .745 .754	.038 .031 .031 .030	.984	.515
COMMUNICATION SKILLS	.680 .776 .794 .813	.044 .029 .029 .028	.986	.588
SOCIAL SKILLS	.783 .760 .639 .739	.031 .045 .051 .040	.981	.536
PERSONAL GROWTH	.793 .770 .801 .825	.030 .026 .025 .024	.989	.635
NUM GRADUATES' SATISFACTION AT THE WORK PLACES	.719 .680 .667 .634 .574 .645 .676 .599 .663 .621 .606 .549 .719	.038 .039 .035 .028 .035 .033 .033 .041 .025 .034 .032 .027 .038	.990	.557

The values of each factor loading item were greater than the 0.50 threshold, the values of each constructed reliability variable were over 0.70 and AVEs of the constructs are larger than value suggested by 0.50. This fit indices indicates that the measurement model has a good convergent validity.

9.3.3 Structural Equation Model

$$\mathbf{Y= a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e}$$

Y = Graduate Satisfaction in the Work Place
X_1 = Curriculum
X_2 = Teaching
X_3 = Analytical Skills
X_4 = Communication Skills
X_5 = Social Skills
X_6 = Personal Growth



According to the hypothesis model, the present regression analysis will find out the relationship between the National University of Management's Educational experience (IVs), curriculum, teaching, critical thinking skills, communication skills, social skills, and personal growth, and the graduates' satisfaction in the workplace (DV). The results shown as below:

Table 9.3.3. Show about the result of the regression

H	IVs	β	C.R.	p	Interpretation
H1	Curriculum	.097	1.701	.089	Partial Significant
H2	Teaching	.143	2.318	.020	Significant
H3	Analytical Skills	.071	1.335	.182	Insignificant
H4	Communication Skills	.275	5.152	.000	Significant
H5	Social Skill	.180	3.752	.000	Significant
H6	Personal Growth	.560	9.014	.000	Significant

9.3.4 Result of Regression and Hypothesis Test

Hypothesis 1: Curriculum for NUM graduates' satisfaction in the workplace is only partial relationship for their value of β= 0.097, CR=1.701 at p-value = 0.089 < 0.10.

Hypothesis 2: Teaching for NUM graduates' satisfaction in the workplace is a positive relationship to their value of β = 0.143, CR= 2.318 at p-value = 0.02 < 0.05.

Hypothesis 3: the analytical skills and NUM graduates' satisfaction in the workplace is not insignificant, so they have not effected each other (β = 0.071, C.R=1.33 at p-value= 0.182 > 0.05).

Hypothesis 4: the communication skills and NUM graduates' satisfaction in the work place is positively related to their value of β= 0.275, C.R. = 5.152 at p-value= 0.000< 0.05.

Hypothesis 5: the value of the Social skills and NUM graduates' satisfaction in the workplace is about β= 0.180, C.R. = 2.318 at p-value= .000< 0.05. Thus the both variables have positively affected.

Hypothesis 6: The last one, personal growth and NUM graduates' satisfaction in the workplace is positively impacted because of their value of ß = 0.560, C.R.= 9.01 at p-value = 0.000 < 0.05 .

9.4 Discussion

Referring to the hypotheses tested, the relationship between five independent variables, curriculum, teaching, communication, social skills, and personal growth and NUM graduates 'satisfaction at the work places are significant; except, analytical skills are not. Hence, the study discussed the first five variables. Like Weisz (1999) found that for an academic degree program of the graduates, the employers expect generic competencies required to be equipped early in school before employment chosen.

Another researcher, Stasz (1997) likewise found that the workplace context defines the relative important needs, including problem-solving, teamwork, communication skills, and personal qualities for the vital competencies. Furthermore, Maes, Weldy and Icenogle (1997) remarked that oral communication, problem-solving skills and self-motivation, the three generic skills are most important to equip the required graduates.

Based on the survey evidence from 280 New Zealand, Joseph (1997) inferred that the top ranked competencies of required graduate employers are two abilities of willingness to learn; a positive attitude, being motivated, good communication skills, and the ability to work independently.

However, the independent variable, analytical skills have not effected on the graduates' satisfaction in the workplace. As Weisz (1999) recovered that the little relationship between academic attainment and levels of generic skills that require employability is not necessary to link academic ability.

10 Conclusion

Based on the six hypotheses tests, there are only five independent variables have positively impacted on the NUM graduates' satisfaction in the workplace; the null hypotheses were rejected. However, one variable, analytical skills have not effected on NUM graduates 'satisfaction, the null hypothesis was accepted. Hence, the present study concluded that the graduates' satisfaction on academic program should links to generic skills for achieving their organizational goals in their workplaces. The National University of Management should reform program designed to enhance student learning outcomes.

11 Recommendation

Ground on the career choice at the university are really different between developed countries and developing countries, like Cambodia. HEIs as well as NUM prepare the program or curriculum designed only benchmark from other famous HEIs in the region or the world. Therefore, some comments are implied as the following:

- NUM should examine the academic program to revise by basing the programlearning outcomes to create same type's courses, soft skills and hard skills for the NUM curriculum.
- Reform and strengthen teaching methods toward specific realignment of the student learning outcome orientation , teaching activities and student assessment.
- The student learning outcomes respond to cognitive, affective and psychomotor.
- The student learning outcomes should orient soft skills, communication, analytical skills, social skills, and personal growth which results from surveys of employee traits and skills in the labor organizations.
- The student learning outcomes are reformed by teaching activities such as lecturing, teacher facilitated, learner self-controlled, and student center (active learning) through the three principal domains, including know edge, skills and attitudes.
- The student assessment tools should use rubrics; including essays, case study, report writing, presentation and research paper or thesis.
- Rubrics should be used more detail for the student group study or work in research or assignment, including critical thinking, communication skills, social skills, and personal growth.

12 Future Research

Grounding on research problem, the present study aimed only the relationship between educational experiment, including curriculum, teaching, critical thinking, communication skills, social skills, and personal growth, and the graduates' satisfaction in the workplaces. For the future research, the graduates' GPA should be included as more evidences to analyze clearer to their satisfaction of the relationship between the independent variable and dependent variables.

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DETERMINANTS RESEARCH WRITING INTENTION AMONG INSTRUCTORS IN HIGHER EDUCATION IN CAMBODIA

Dr. SAU Lay[25] *and CHHAY Phang*[26]

Abstract

Purpose*-In a competitive market, maintaining current and expanding market share of a firm are very challenging issues. One strategy to overcome the issues is to build research culture in its own university. The aim of this study is to investigate factors influencing research productivity among universities in Cambodia.*

Design/methodology/approach *A dropped off survey, involving 301 respondent instructors from universities and educational institutions around the country, was conducted, and followed by structural equation modeling analysis to yield strong evidence in support of our proposed research model.*

Findings *The results confirmed the Theory of Planned Behavior is well applied to this research. Additionally, low research productivity is resulted from not strong enough research intention, which in turn was in fluenced by not strong enough attitudes and low perception of research usefulness . In addition to attitudes , personal motivation is also i mpacted on the research intention .*

Practical implications *The results of this study can assist university managers and policy makers in understanding critical determinants that influence the research productivity. Besides personal attitude, the results suggest that university managers and policy makers should set formal standard to motivate researchers beyond the current level.*

Future Research *sample frame was included only business university with a convenient sampling method; the sample frame in future research could be extended to other types of universities with other sampling techniques.*

Keywords: perceived usefulness, perceived ease of writing, government support, university support, collaborative support, social motivation, attitude, personal motivation, research intention, the Theory of Reason Action (TRA), and structural equation modeling.

Paper Type– Research paper.

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1 INTRODUCTION

For the past half-century, research publication has put pressures on universities, whose primary mission has traditionally been teaching-based and changed to research-based. This trend has had unfortunate consequences. Intense pressures of bringing in grants and publishing papers force professors to spend most of their time on their research Felder (2010). Because research-based is likely to be more responsive to problem solving than teaching based. Because, the research can also enhance a university's reputation, prestige and raise a university's rank (Lertputtarak 2008). Research (basic research) may be especially good at developing the ability to tackle and solve complex problems - an ability that often proves of great benefit in firms and other organizations (Salter and Martin 2001). Additionally, beside the university's benefit, the research can also provide several benefits to personal researcher. For most academic disciplines, publication of research is one of the central benchmarks of professional development. Professional identity, recognition, promotion, various forms of remuneration, job advancement, personal reward, and numerous other benefits come to higher education staff members when they have higher levels of academic research production (Ministry of Education 2010; Keranen, Prudencia et al. 2012).

There has been major policy change in higher education institution (HEI) sector in Cambodia. The number of universities and institutions has been overwhelmingly increased, from 8 institutions by 1997 (Kian-Woon, Sopheap et al. 2010) to 105 universities and institutions in 2012 (HEMIS 2012).This figure indicates that the higher education is currently a very competitive system. Having good reputation or prestige can help university to survive. Many recognize that the university's reputation or prestige can be obtained by research activity. Even though it is so important, but research productivity in this country is still low (Kian-Woon, Sopheap et al. 2010). If all important associated factors have been identified and there is an appropriated research model has been conducted to investigate what significant factors contributed to this issue, the problem of low research productivity may be effectively and efficiently solved.

2 RESEARCH OBJECTIVE

There are two main objectives for this study:

- To identify what factors relevant to the research intention,
- To determine what statistically significant factors correlated with the research intention.

3 SIGNIFICANCE OF STUDY

At least three groups of people will get benefits from this study:

- Lecturers or researcher first may understand advantages of research journal publication then prepare themselves or improve their knowledge for this activity
- Understanding the advantages of publication of research journal may help universities or institutions allocate their resources to support this activity and then they may get higher university rank, prestige and reputation.
- If significant factors associated with issue research productivity have been known, the government can set up its policy to help researchers and universities to improve this activity effectively. As result, the human resources are strong and the economy grows sustainably.

4 LITERATURE REVIEW

Bland et al. (2002, as cited in Bland, Center et al. 2005) model suggests the characteristics associated with research productivity cluster into three unique groupings: individual, leadership, and institutional and leadership levels. Among the potential individual variables at play, the personal beliefs, conceptions, and definitions in the minds of teachers of what constitutes research are, of course, constructs which can and have been considered when attempting to understand research engagement (Keranen, Prudencia et al. 2012). Most of those characteristics.

of research productivity are well described in the Theory of Reason Action (TRA), which is created by Ajzen (1991). Therefore, literature review of this study will cover those things.

5 Perceived Usefulness

For most academic disciplines, publication of research is one of the central benchmarks of professional development. Professional identity, recognition, promotion, various forms of remuneration, job advancement, personal reward, and numerous other benefits come to higher education staff members when they have high levels of academic research production (Keranen, Prudencia et al. 2012). Lertputtarak (2008) also confirms that research productivity in universities has become a most important criterion for making promotion and tenure decisions.

Beside the personal benefit of researcher, the research publication can also enhance a university's reputation, prestige and raise a university's rank (Lertputtarak 2008) that are important indicators or tools for competition and university's survival and development (Prince, Felder et al. 2002; Remler and Pema 2009).

Ho1: Perceived usefulness is positively related with research intention

6 Perceived Ease of Writing

- Perceived ease of behavior‖ will make a positive attitude. Conversely,
- Perceived difficult of behavior‖ may lead to a negative attitude toward that behavior (Ajzen 1991). Similarly, researchers may not be interested in writing when they perceive research writing activity which is difficult; however, they may favor that task if they perceive the task which is not difficult.

H02: Perceived ease of writing is positively related with research intention.

7 Attitude

In general, positive attitude usually enhances stronger behavioral intention (Ajzen 1991). This is confirmed by Wei, Sadikova et al. (2015) that attitude toward individual research and intention is significantly positive, indicating that graduate students are more likely to join research teams when they have positive appraisals of individual research.

H03: Attitude is positively related with research intention

8 Government Support

Research and education are at the core of the knowledge society. Therefore, it received increasing attention from policy makers. Public funding support for research and development, an important input into innovation, is substantial (PCRR 2007). Hence, support for basic research should be seen as an investment in a society's learning capabilities (Salter and Martin 2001). With limited public resources to finance higher education and academic research, incite governments and universities to look for private funds (Schoenenberger 2005). Hottenrot and Lawson (n.d) stressed that it is important to maintain high levels of public funding to ensure the quality of the higher education research sector.

Complexities associated with privacy regulation across jurisdictions and multi-site ethical review processes can adversely affect the conduct of some types of research (PCRR 2007; ARL 2012). This privacy is recognized by most jurisdictions such as Cambodia copy right law as well. The core of the law is focused on the economic right, which allows the authors to sell, rent or transfer their work (BNG-LEGAL 2012). The economic right tends to be valuable and sustainable with support or intervention from government under its jurisdiction.

H04: Government support is positively related with research intention

9 University support

Individual research productivity – and consequently departmental research productivity – is affected by institutional and personal characteristics, Fabel, Hein et al. (2008). Many institutions recognized that institutional motivation is a very important factor for research productivity. Hardré, Beesley et al. (2011) believed that perceived departmental support remains an important influence on efficacy and on effort that faculty members invest in research. Similarly, Sax, Hagedorn et al. (2002) found that productivity in one's research may elevate rank and salary, while higher rank and salary provide the level of resources and job security that serve to bolster one's level of productivity. Other professional variables, such as research orientation and desire for recognition, presumably precede research productivity.

H05: University support is positively related with research intention

10 Collaborative Support

For research productivity, collaboration is one form of motivation. It may take form such asindividuals, groups, departments, institutions, sectors and countries (Smith and Katz 2000). The institutional collaboration allows individuals, based in other institutions, to benefit not just from access to equipment but from wider interaction with and contribution to the life of the research community (Dearing 1997 as cited in Smith and Katz 2000). At individual collaboration level, researchers talked freely about specific collaborations indicated initially by joint authorship of research papers. Both collaborations tend to increase research productivity. Therefore, understanding the operating paradigms of collaborative research at institutional level is an important issue for leaders. As evidence provided by Roleda, Bombongan et al. (2014), who found that network is significantly correlated with research productivity. Similarly, Rey-Rocha, Martín-Sempere et al. (2002) found that researchers belonging to consolidated teams are more productive than their colleagues in non-consolidated teams, and these in turn more than individuals without team. Additionally, Bland, Center et al. (2005) suggest that having a network within the department is not necessary for research productivity, whereas having an external network is essential. In contrast, Abramo, D'Angelo et al. (2008) found that collaborations with domestic parties show a strong correlation with productivity in the area of biological sciences, and to a lesser degree, in physical sciences and earth sciences.

H06: Collaborate support is positively related with research intention

11 Social Influence/Motivation

Pantano and Pietro (2012) defined ―social influence‖ is influences of other people in performing such behaviors. Social motivation is driven factor to explore, understand, and follow one's own ideas, and to advance and contribute to society through innovation, discovery, and creative works (Bland, Center et al. 2005). The motivation may come from spouse, friends, and supervisor. A related study on Web acceptance by teacher by Sadaf, Newby et al. (2012) found that peer and supervisor were influenced on teacher's intention to use Web.

H07: Social motivation is positively related with research intention

12 Personal Motivation

Kalburgi and Dinesh (2010) affirmed that the workers were positively affected toward higher productivity with the provision of regular promotion, assurance of adequate job security and bonus for excellent performance. Nevertheless, monetary incentives and rewards do not exert stronger influence on workers than any form of motivational factor. Additionally, Lertputtarak (2008) asserted that ―if there are no fundamental drivers despite institutional effort of providin.

other supportive factors, the university's endeavor will be fruitless‖. Self-motivation, essential skills and experience are the fundamental drivers that encourage a faculty to do research.

H08: Personal motivation is positively related with research intention

13 Research Intention

Bratman (1984) classifies intention into two types. Present-directed intentions are "the primitive sign of wanting is trying to get. The basic role present-directed intentions play is in motivating and guiding present conduct. Meanwhile, Future-directed intentions are typically elements in larger plans. The word ―plan‖ is very difficult to define. He also states that intention is Janus- faced, tied both to intentional action and coordinating plans. Cohen and Levesque (1990) stressed that intention is a choice with commitment, and can be adopted relatively to a background of relevant beliefs and other intentions or goals, by relativizing one agent's intentions in terms of beliefs about another agent's intentions (or beliefs). Later research by Sadaf, Newby et al. (2012) found that that positive attitudes and perceptions of perceived usefulness are significant predictors of pre-service teachers' intentions to use Web 2.0 technologies to improve their teaching. Additional findings indicate that pre-service teachers intend to use blogs, wikis, and social networking in their future classrooms.

14 THEORETICAL FRAMEWORK

An interesting technique was employed by Taylor and Todd (1995), who decomposed the Theory of Planned Behavior (TPB) to investigate factors influencing technology usage. Finally the authors found that the Decompose TPB is well predicted the usage. A similar technique was employed in current study, because most studies described in the literature review are non- theory-based and can be combined into six constructs that associated with research productivity. All of those constructs seem to be suitable for the Theory of Reasoned Action (TRA), which was developed by Fishben and Ajzen (1975). TRA has been applied in numerous studies that have addressed the study of human actions, for example, Chin-Shan, Kee-hung et al. (2007) using TRA to predict intention of shippers to use Internet services in line shipping; Muse and Stamper (2007) using TRA to investigate factors affecting job performance; Kuechler, McLeod et al. (2009); Zhang (2010); Downey, McGaughey et al. (2011), using TRA to determine factors influencing business major choice.

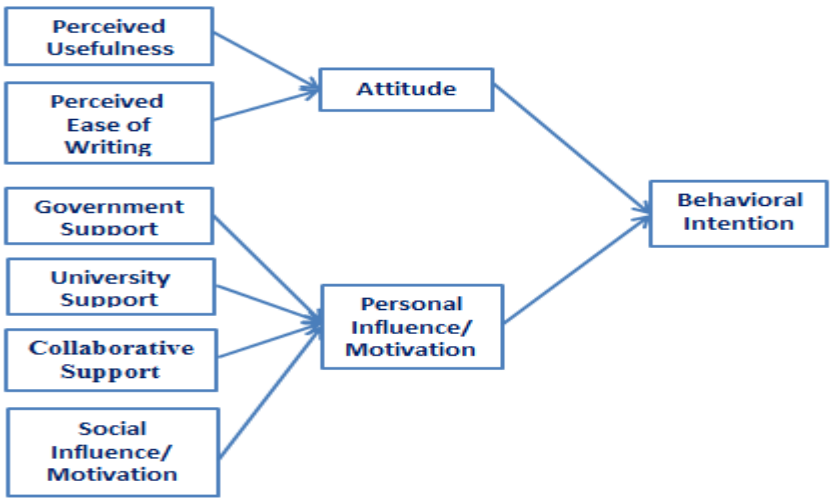

Figure 1: The Decomposed Theory of Reasoned Action (Fishbein and Ajzen, 1975)

According to TRA, the attitude of a person toward a behavior is determined by his beliefs on the consequences of this behavior, multiplied by his evaluation of these consequences. Beliefs are defined by the person's subjective probability that performs a particular behavior which will produce specific results. Moreover, behavioral intention is also determined by the subjective norms that are themselves determined by the normative beliefs of an individual and by his motivation to comply to the norms. TRA also claims that all other factors which influence the behavior only do so in an indirect way by influencing the attitude or subjective norms.

In sum, the conceptual model of this study is resulted from integration of the previous studies about academic research productivity into the TRA with some modifications. The whole proposed model is showed in Figure 1.

15 RESEARCH METHODOLOGY

15.1 Construct Operationalization

Unfortunately, most of prior researches are descriptive natures; consequently, some of the operationalization of research constructs were adapted, and some were self-designed with careful content validity check and test as guided by Hair, Black et al. (2006). Perceived usefulness was measured by seven items adapted from Sadaf, Newby et al. (2012), and (Bland, Center et al. 2005); perceived ease of writing was measured by five items adapted from Davis (1989) and self-designed; attitude was measured by six constructs adapted from Taylor and Todd (1995) and Gardner and Amoroso (2004); government support was measured by Chong, Ooi et al. (2010), Schoenenberger (2005); and self-designed because of contextual gap; university support was measured by ten items adapted from Bay Jr and Clerigo (2013), collaborative support was measured by four items adapted from Bay Jr and Clerigo (2013) and Smith and Katz (2000); social motivation was measured by four items adapted from Taylor and Todd (1995) and Sadaf, Newby et al. (2012); personal influence or motivation was measured by four items adapted from Bland, Center et al. (2005), and Taylor and Todd (1995); finally intention was measured by four items adapted from Taylor and Todd (1995), Bratman (1984), Gardner and Amoroso (2004), and Wei, Sadikova et al. (2015).

15.2 Instrument Validation

The questionnaire was designed by using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Because the items were originally developed in English, the items were first translated into Khmer and then distributed to respondents (instructors). A pilot test was then performed by distributing the questionnaire to a sample of 100 instructors from different state universities in Cambodia. Of the 100 responses, 15 were discarded because the answers were either incomplete or invalid. The remaining 85 responses were preserved, and resulting in an effective response rate of 85 percent. A confirmatory factor analysis was performed to examine the measurement model. The composite reliability values of the constructs all surpassed 0.7. Since the average variance extracted (AVE) values were larger than the correlation squared (CS) of the two constructs, it is supported discriminant validity (Fornell & Larcker, 1981) and

the factor loadings of all items were significant and higher than 0.7, and (Hair, Black et al. 2006; Meyers, Gamst et al. 2013), the results demonstrate a satisfactory convergent validity of measurement.

15.3 Sample Size

A sample size of 310 respondents is subjectively adopted, and this number is satisfied by all conditions stated by various authors (Karin Schermelleh-Engel, Moosbrugger et al. 2003; Tabachnick and Fidell 2007; Meyers, Gamst et al. 2013) . After screening, 301 were remained for further analysis.

Sampling Technique: A convenient sampling is used to draw the sample from an unknown population of both public and private instructors of various universities around the country.

Data Collection Process: Three hundred and teen copies of questionnaire were distributed to instructors at the target universities by personal researchers and peers within 20 day interval from distribution to collection period.

16 DATA ANALYSIS

Three types of statistical analyses were used for current study. First, respondent profile,descriptive analyses for each item and finally is correlations of each construct with intention construct.

• Sample Characteristics

Among the sample of 301 respondents; 237 respondents are male and 64 are female. Most of their ages are between 26 and 35 which are account for 54.8 percent and their monthly incomes are between $250 and $500 (see Table 1)

Table 1. The Profile of Respondents

Demographics	Frequency	Valid Percent
Gender		
Male	237	78.7%
Female	64	21.3%
Age		
18-25 years	10	3.3%
26-35 years	165	54.8%
36-45 years	75	24.9%
46-55 years	48	15.9%
Above 56 years	3	1.0%
Education		
Bachelor Degree	68	22.6%
Master Degree	196	65.1%
Doctoral Degree	37	12.3%
Monthly Income		
Less than $250	53	17.6%
From $250 to $500	113	37.5%
From $500 to $750	75	24.9%
From $750 to $1000	20	6.6%
From $1000 to $1500	15	5.0%
More than $1500	25	8.3%

• Descriptive Analysisl

Table 1.2 shows means, standard deviation, and reliability of each construct. The means rank

from 4.36 to 5.52. First, perceived usefulness (PU) has the score of 5.30, which ranges from slightly agree, 5, to agree, 6. Second, perceived ease of writing (EOW) hasthe score of 4.72,

which ranges from no idea to slightly agree. Meanwhile, attitude toward writing research paper (ATT) has the score of 5.35, which ranges from slightly agree, 5, to agree, 6.

However, government supports (GS), universities supports (US), collaborative support (CS) and social support (SM), received the scores of 4 to 5 (from neutral to slightly agree). Meanwhile, personal motivation (PM) and research intention (INT), received the scores of 5.52 and 5.33 respectively.

Table 2. Descriptive Statistics of Variables

Variable Name	Items	Mean (Std.Dev.)	Reliability
PU	7	5.30(1.20)	82.10%
EOW	5	4.72(1.38)	76.90%
ATT	6	5.35(1.17)	68.1.8%
GS	9	4.36(1.56)	92.30%
US	10	4.49(1.41)	89.50%
CS	4	4.75(1.19)	80.00%
SM	4	4.81(1.25)	77.60%
PM	4	5.52(1.15)	93.20%
INT	4	5.33(1.21)	79.30%

• Measurement Model Analysis

There are two steps in structural equation modeling analysis; measurement model or CFA, and path analysis (Meyers, Gamst et al. 2013). The assessment criteria for measurement model for current study are followed by suggestions by Kline (2011) and a cutoff value of indices is followed by a suggestion by Hu and Bentler (1999)Hu and Bentler (1999). After CFA, fit indices in Table 3 are relatively good: CMIN/df ratio of 1.903 (<2); p-value of 0.055, after bootstrap (>0.05); comparative fit index (CFI) of 0.943 (CFI>0.90); Tucker-Lewis index (TLI) of 0.952 (TLI>0.95) and root mean square error of approximation (RMSEA) of 0.055 (<0.08). Therefore, CFA analysis would be conducted.

Table 3 Goodness of Fit Analysis -Confirmatory Factor Analysis (CFA) Measurement Models

Final Models	Initial CFA	CFA after Fit
Item Remain	51	22
Chi-square (x2)	4227.30	329.228
df	1187	178
CMIN/df	3.65	1.903
p-value	0.000	0.000
CFI	0.706	0.943
TLI	0.684	0.952
RMSEA	0.142	0.055
Bollen-Stine bootstrap p-value	0.000	0.055

Table 2 shows that all of construct reliability is surpassed 0.70, which indicates adequate convergence or internal consistency (Paswan 2009). Additionally, Table 4 indicates that all of estimated loading factors are ranked from 0.511 to 0.943; none of these are less than 0.50. This additionally indicates that all of items are adequate internal consistency. Similarly, the average variance extracted (AVE) ranks from **0.534** to 0.783, which are surpassed 0.50. This supports evidence of discriminant validity. In sum, all constructs are valid and reliable for further analysis. From those fit indices, it can be concluded that the measurement model is good enough for further analysis.

Table 4 Variance Extracted of Variables and Construct Reliable

Observe Variables	**Std. Regression Weight**	SMC	Error	AVE	CR
PU2	0.537	0.288369	0.711631	**34**	**0.848**
PU4	0.756	0.571536	0.428464		
PU5	0.849	0.720801	0.279199		
PU6	0.682	0.465124	0.534876		
PU7	0.789	0.622521	0.377479		
EOU3	0.599	0.358801	0.641199	**0.500**	**0.748**
EOU4	0.729	0.531441	0.468559		
EOU5	0.781	0.609961	0.390039		
ATT2	0.534	0.285156	0.714844	**0.539**	**0.851**
ATT3	0.766	0.586756	0.413244		
ATT4	0.738	0.544644	0.455356		
ATT5	0.739	0.546121	0.453879		
ATT6	0.856	0.732736	0.267264		
SG1	0.518	0.268324	0.731676	**0.643**	**0.934**
SG2	0.788	0.620944	0.379056		
SG3	0.877	0.769129	0.230871		
SG4	0.846	0.715716	0.284284		
SG5	0.890	0.7921	02779		
SG6	0.845	0.714025	0.285975		
SG8	0.788	0.620944	0.379056		
SG9	0.802	0.643204	0.356796		
US2	0.788	0.620944	0.379056	**0.707**	**0.935**
US3	0.822	0.675684	0.324316		
US4	0.886	0.784996	0.215004		
US5	0.884	0.781456	0.218544		
US7	0.863	0.744769	0.255231		
US10	0.796	0.633616	0.366384		
CS1	0.814	0.662596	0.337404	**0.663**	**0.887**

CS1	0.814	0.662596	0.337404	**0.663**	**0.887**
CS2	0.871	0.758641	0.241359		
CS3	0.789	0.622521	0.377479		
CS4	0.780	0.6084	0.3916		
SM2	0.604	0.364816	0.635184	**0.621**	**0.827**
SM3	0.864	0.746496	0.253504		
SM4	0.867	0.751689	0.248311		
PM1	0.859	0.737881	0.262119	**0.773**	**0.932**
PM2	0.912	0.831744	0.168256		
PM3	0.861	0.741321	0.258679		
PM4	0.884	0.781456	0.218544		
INT1	0.888	0.788544	0.211456	**0.783**	**0.915**
INT2	0.854	0.729316	0.270684		
INT3	0.912	0.831744	0.168256		

• Structural Model Analysis

Table 1.5 Significant Relationships between Construct

Relationship between							
Endo.	and	Exgo.	Estimate	S.E.	C.R.	P	Hypothesis
ATT	<---	EOU	0.101	0.098	1.317	0.188	InSig.
ATT	<---	PU	0.475	0.157	4.698	***	Sig.
PM	<---	SM	0.496	0.071	6.538	***	Sig.
PM	<---	CS	0.109	0.068	1.532	0.126	InSig.
PM	<---	US	0.019	0.095	0.271	0.786	InSig.
INT	<---	PM	0.658	0.042	8.841	***	Sig.
INT	<---	ATT	0.406	0.037	5.728	***	Sig.

Square Multiple	Estimate
PM	0.274
ATT	0.265
INT	0.655

***p-value<0.01; *p-value <0.10

Table 1.5 shows that there are totally 8 hypotheses; four hypotheses are significant at 5 percent confidence interval, one hypothesis is significant at 10 percent confident interval, whereas the other three are not. The significant relationships include PU to ATT, GS to PM, SM to PM, PM to INT and ATT to INT. Among the significant hypotheses, PM is the highest contribution to the model as indicated by its beta of 0.658, whereas, GS is the least (B=-0.139). Notably, the power of explanation is quite interesting. SM explained PM is about 27.4 percent. Meanwhile PU alone explained ATT is about 26.5 percent. Overall, ATT and PM explained INT is about 65.5 percent, which is higher than the average. Summary of the structural result is shown in Figure 2.

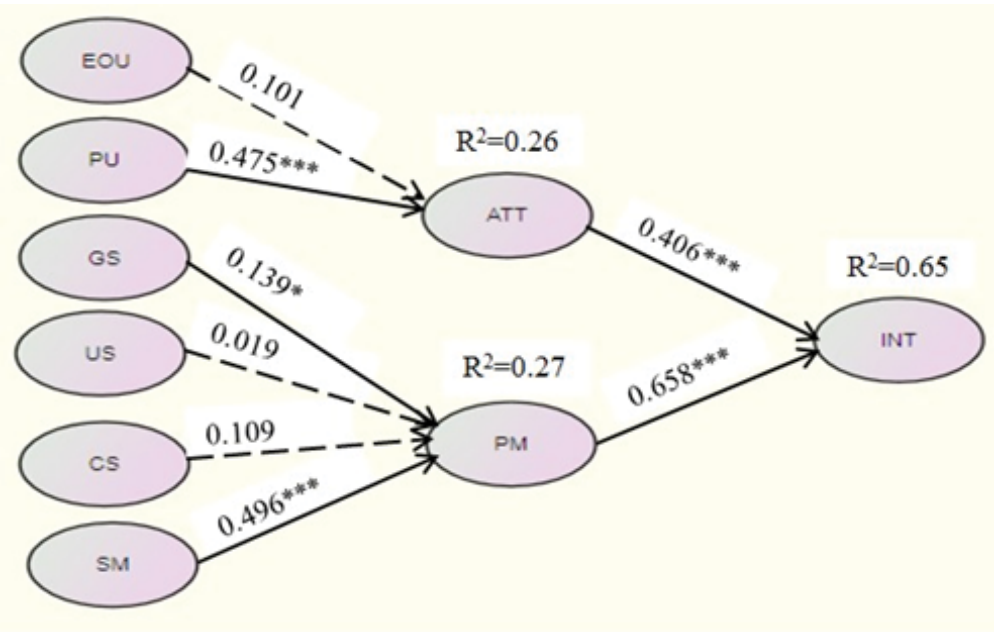

Figure 2. Summary of the Structural Result

17 INTERPRETATION

Before the result can be meaningfully interpreted, all assumptions under SEM have been checked. Some residuals are greater than 4; Bollen-Stine bootstrap was used to satisfy normal assumption. Several factors were found significantly in current study. According to descriptive result, respondents in the sample were found that they have low level of intention (INT received a score of 5.33; 4= neutral, and 7= strong intention) to write research papers. The INT are influenced by attitude (ATT had a positive beta of 0.406, and $p < 0.01$) and the personal motivation (PM has a positive beta of 0.658, and $p < 0.01$). It can be said that the positive attitudes together with more personal motivation lead to high research writing intention. The study also found that the respondents had a medium positive level of attitude toward in research writing (ATT had a score of 5.35), in turns this attitude was not influenced by perceived ease of writing (EOW), rather than the perceived of usefulness (PU) due to they perceived that writing research paper might not be much easy task (EOW has a score of 4.72). Additionally, the study also found that respondents had a medium positive level of personal motivation (PM has a score of 5.52), which was in turn effected by social motivation (SM has a beta of 0.496, and $p < 0.01$). Additionally, government support (GS) had a little effect on personal motivation (Beta of 0.139, $p<010$). This might resulted from respondents perceived that the government support was not strong enough. Whereas, university support (US has a score of 4.49), and collaborative support (CS has a score of 4.75) had not significant effect on PM. This might result from lack of collaboration with other individuals or support from university.

18 THEORETICAL AND EMPERIAL DISCUSSION

Several studies on research productivity had been conducted, and found differently. This study found that attitude had a positive effect on research writing intention. This finding supports A study by Wei, Sadikova et al. (2015), who found that attitude toward individual research and intention is significantly positive. The finding also supports the TRA (Ajzen 1991), which postulates that positive attitude usually enhances stronger behavioral intention. Surprisingly, the current study found that university supports (US) are not influenced by personal motivation (PM), whereas are in turn influenced by INT. The finding confirms the results of a study by Bay.

Jr and Clerigo (2013), who contend that organizational support to research activities and their research confidence in writing the paper particularly the technical and major parts were all not indicators associated with their research productivity. In contrast, Bland, Center et al. (2005), who found both individual and institutional characteristics had effect on research productivity. Interestingly, government supports (GS) were positively significant on personal motivation. The result confirms the result study by Hottenrot and Lawson (n.d), who stressed that it is important to maintain high levels of public funding to ensure the quality of the higher education research sector. The GS is very complicating, it ranges from own, or private fund to privacy, which is most recognized under several jurisdictions.

Additionally, collaborative support (CS) construct was found as not significant effect on PM. However, most studies recognized that it is positively correlated with research productivity (Rey-Rocha, Martín-Sempere et al. 2002; Bland, Center et al. 2005; Roleda, Bombongan et al. 2014). The different effect might result from less understanding about importance of collaboration in both individual and institutional levels as indicated by the score of CS (4.75), which ranges from no idea (4) to slightly important (5).

Interestingly, perceived usefulness of research writing was found significantly positively influenced on attitude (ATT), which in turn influenced on INT. The funding conforms to result of a study by Keranen, Prudencia et al. (2012), who contend that in academic disciplines, publication of research is one of the central benchmarks of professional development, professional identity, recognition, promotion, various forms of remuneration, job advancement, personal reward, and numerous other benefits coming to higher education staff members when they have high levels of academic research production. The finding also conforms to TRA, which postulates that the attitude of a person toward a behavior is determined by his beliefs on the consequences of this behavior, multiplied by his evaluation of these consequences. However, the perceived easy of writing EOW was not significantly influenced by ATT due to the most respondents in the sample perceived that writing a research paper was not much easy job (EOW has a score of 4.72; 4= neutral, and 5 slightly very easy). It means that respondents might have some trouble in research writing.

19 CONCLUSION

This paper studies factors contributed to low productivity of research writing based on decomposed Theory of Reasoned Action (TRA). The study assumes that behavioral intention and actual behavior are strongly correlated as specified Ajzen (1991). Therefore, the conclusion could be made by either theory or empirical results.

- The result of the study revealed that all correlation coefficients are consistent with prior expectation of the theory, and its explanation power was quite high (r-square). All together indicate that TRA is pretty well applied in this study.

- Intention construct has a score of 5.33 (5=slightly agree and 7= strongly agree). This can be concluded that the intention in research writing is not strong enough. First, this might result from low level of positive attitude, which is in turn resulted from the respondents might have low level perception of usefulness of research. Second, the low level of intention resulted from low level of social motivation, such as motivation from spouse, supervisor and friends.

- Consequently, the low level of intention leads to low level of research productivity as indicated by TRA, which postulates that ―the stronger intentions lead to increased effort to perform the behavior‖ (Fishben and Ajzen 1975)

20 POLICY IMPLICATION

With low level intention of research writing among public instructors, attitude and personal motivation have become useful tools for pushing research writing stronger. Additionally, other insignificant variables should be checked, because based on literature reviews, they are important elements in support of research productivity, and cannot be ignored or omitted from this regard. Therefore, the implication should be included both significant and insignificant variables.

- **Government:** to increase research productivity, government should: strengthen copyrights law enforcement to respect privacy or author's work, increase funding support for research and development, and enable researchers to access to real data and publication. Additionally, government should nominate professor rank, which puts more weight on research productivity.

- **University:** each university should have job security and salary motivation policy, which bases on research productivity. Additionally, the university should increase collaboration at individual and institutional levels to enable

researchers increase their experiences in their researches. Moreover, the university should provide enough time and resources to researchers.

- **Individual** instructor should understand the benefits of writing research paper, and then invest his/her time and resources to increase his/her knowledge in research. For inexperienced researcher, at the beginning, he/she should actively collaborate with other experienced researchers. Meanwhile, experienced researchers should share writing research with other inexperienced researchers.

21 FUTURE RESEARCH

Current study has several limitations. First, sample frame included all experienced and inexperienced public instructors. Future research could be conducted separately between the two. Second, this research applied the Theory of Reason Action (TRA), future research should apply other theory such as the Theory of Planned Behaviour (TPB), which is more complete than TRA because TPB includes perceived behavioral control—beliefs about the presence of factors that may facilitate or impede performance of the behavior, such as self-efficacy, time and resources, and/or add other factors in the model.

APPEMDIX

B1. Perceived Usefulness (PU) Sources of Constructs and Items

Code	To what extend do you believe the following statements are valid in your opinion	ounces: Adopted/Adapted
PU1	Writing research paper will improve my general knowledge	Bland, Center, Finstad, & Staples, 2005; Fred D Davis, 1989; Sadaf, Newby, and Ertmer (2012;
PU2	Writing research paper will improve my teaching	
PU3	Writing research paper is academic prestige	
PU4	If I write research paper I will get good reputation	
PU5	If I write research paper I will be promoted	
PU6	If I write research paper I will gain extra income	
PU7	Wring research paper will ensure my position	

B2. Perceive Ease of Use (EOU)

Code	To what extend do you believe the following statements are valid in your opinion	
EOU1	Access related documents through Internet is easy work for me	Davis, Bagozzi et al. (1989); and self-design
EOU2	Getting idea from literature review is easy task for me	
EOU3	Writing research paper is easy to learn for me	
EOU4	Writing research paper is easy task for me	
EOU5	I feel comfortable writing research paper	

B3. Attitude (ATT)

Code	To what extend do you believe the following statements are valid in your opinion	
ATT1	Writing research paper is good idea	Taylor and Todd Gardner and (1995); Amoroso (2004)
ATT2	Writing research paper is wise idea	
ATT3	I like writing research paper	
ATT4	Writing research paper would be pleasant/exiting work	
ATT5	Writing research paper is important job	
ATT6	I enjoy writing research paper	

B4. Government Support (GS)

Code	To what extend do you believe the following statements are valid in your opinion	
GS1	Private funding for research activity is encouraged by government.	Chong, Ooi et al. (2010); Schoenenberger (2005); Copyright Law of Cambodia,
GS2	Government has own competitive research fund to encourage research activity	
GS3	Government has a special annual award for research paper	
GS4	Government has a clear regulation to govern research funding	
GS5	Government has coordinated researchers to access data	
GS6	Government always recognized researcher's work	
GS7	Government has promoted official rank based on research productivity	
GS8	Government has recruited public lecturer based on research paper criteria	
GS9	Open research policy is encouraged by government	

B5. University Support (US)

Code	To what extend do you believe the following statements are valid in your opinion	
US1	The organization offers competitive pay in conducting research	Bay Jr and Clerigo (2013)
US2	The organization provides enough budget for conducting research	
US3	The organization provides sufficient in-house and outside trainings to enhance my research competencies	
US4	The organization provides consultation services to advise researchers	
US5	The organization provides enough services of reader/referee	
US6	The organization provides enough services of the editor/grammarian	
US7	The organization provides enough statistical services	
US8	The organization provides reliable internet access for conducting a research paper	
US9	The organization provides access to online journals for conducting a research paper	
US10	The organization has a clear policy for promotion rank that bases on individuals research paper productivity	

B6. Collaborative Support (CS)

Code	To what extend do you believe the following statements are valid in your opinion	
CS1	Collaborative conduct of research with students in my organization is encouraged	Bay Jr and Clerigo (2013); Smith and Katz (2000)
CS2	Collaborative conduct of research with individuals from other institutions is ncouraged by my organization	
CS3	Collaborative conduct of research within my organization is encouraged	
CS4	My organization has collaborated with other organization to enhance research productivity	

B7. Social Influence/Motivation (SM)

Code	To what extend do you believe the following statements are valid in your opinion	
SM1	My spouse understands the value of research and supports it	Taylor and Todd (1995); Sadaf, Newby et al. (2012); (Wei, Sadikova et al. 2015)and Self-design
SM2	Writing research paper is encouraged by my superior	
SM3	My friend(s) really supports me to advise on research writing	
SM4	My friend(s) supports me to review my research paper	

B8. Personal Influence/Motivation (PM)

Code	To what extend do you believe the following statements are valid in your opinion	
PM1	I think that I should write research paper	Taylor and Todd (1995); (Bland, Center et al. 2005)
PM2	I should enhances my research paper	
PM3	I should collaborate with other researchers to broaden my research area	
PM4	I should advance my research paper	

B9. Intention (INT)

	To what extend do you believe the following statements are valid in your opinion	
INT1	I try to write research paper	Taylor and Todd (1995); Bratman (1984); Gardner and Amoroso (2004); Wei, Sadikovaetal. (2015)
INT2	I intend to do write research paper	
INT3	I plan to write research paper	
INT4	I will write or repeat writing my research in the future	

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Determinants of Households' Behavior on Sustainable Solid Waste Management Practices in Phnom Penh, Cambodia

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The present study aims to solve the problem about the behavior of householder individuals on sustainable waste management practice. Even though the corporation between Phnom Penh City Hall and JICA for sustainable waste management from 2006-2009, the result of the corporation has remained unexpected result. Thus the present study uses the model of the theory of planned behavior (Ajzen, 1991). The study survey administered 404 households from communities in 9 districts. The data were analyzed as frequency, weighted arithmetic mean, and regression. The result of weighted arithmetic mean tends to agree, important, influence rating scales. Moreover, the relationship between attitude, subjective norm, and perceive behavior control and behavior intention. As the result only subjective norm was not significant, i.e. the householders 'attitude gave strongly belief to the behavioral intention (behavior) without undue influence from other stakeholders. Moreover, there are some barriers for which implement the sustainable waste management. Therefore, the city hall should cooperate with investors (manufacturing) for recycling waste, strengthen waste collection on time and clearly, train the community to create some trashes into usable items for sales or reusable, promote the community more how to reduce trash and manage them, free to pay for the trash for the poor, arrange to bring off the trash on time at publicity, and measure strictly who makes messy some trash in public ground or road.

Nowadays the modern real life has increasingly developed through rapid science and technology why causes the increased more and more population turning their lives from rural agriculture to the lives of industrials in the cities. These changes that make the rural people go together into the city. While the increase population densities inurban area have also provoked to increase volume of solid waste which has causeda massive threat to the city environment.Phnom Penh is the capital of Cambodia has also challenged the above problem that is negatively impacted on tourists and the occupants. According to the population statistic 2014, the population of Phnom Penh has been increased 1,445,902. Another research of CICP (2006) noted that the waste was increased 906 tons per day during the dry season and approximately 875 lots per day during the

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rainy time of year, but there was only 63.9% waste collected. As of 2013, Phnom Penh gathered about 1,286 tons of solid waste a day. (Cambodia Daily, August 8, 2015). Based on the forecasting the increased population in the capital, the Phnom Penh Municipal Hall sought partner , JICA for ensuring environment management in the capital.

The destination of the cooperation aims to improve sustainable solid waste management to prepare a beneficial environment and build the green scene in Phnom Penh municipality. The project focused on the aims of building up the capability of the Phnom Penh Waste Management Authority (PPWM) for an adequate operation of the waste collection, the final disposal and its post operation (JICA Project 2006-2009).

The transportation for final disposal, Cintri was in 2002 awarded a 50-year contract giving it exclusive rights to keep Phnom Penh clean. Nevertheless, till now, the task of the cooperation on sustainable waste management in Phnom Penh has provided unexpected result. The mountain of trash stayed for a long time, the cleaner is not properly clear from emergent store placers, including in front of the house residents, near traditional markets, and sometime along the fence of public buildings or pagodas.

This had to pollute air, land (street), water (sewage drained dikes). Air pollution has provoked a bad odor on the tourists, especially nearby markets, pagoda or along the streets for walks. Every year, particularly in the rainy seasion; the trash is filled up for a long time and moved by the rain flowed covering the hole of sewage pipes and call forth the rain flooded into the metropolis. Moreover, then trashes moves to the sewage canons and filling portions of bottom land provoke the shadow dike and also causes easily flooded some streets and the residential houses in the city, this is one hand; and other hand, the wet trash also provokes the bad smell in the streets and traditional markets where the foreign tourists stay and see the city. During the dry season, the rubbish is given outside the bins, as Morn Vanntey and Daniel de Carteret (2016) observed in the Phnom Penh Post "Sometimes people don't drop their rubbish in the trash bin that is presented to them by Cintri, they simply drop it anywhere, and it makes it difficult for us to amass it." It makes messes on the surface on the streets or road sides and sometimes have been hurled into the air by the wind blowing strength.

For the above challenges with the certain issues, it is not up to the whole cooperation with partners and local agencies, the resident householders in communities in the city should aware to contribute the program of sustainable waste management too. It is significant to have good relation between the great unwashed and the government to go through any policies (Kojima, 2005'). Thus, the present study chooses some options related to the household resident's behavior for sustainable solid waste management practice for the metropolis. The probe on the several constituents about the householders' behavior to practice sustainable waste management in residential areas of Phnom Penh.

1 Research Questions

- What sustainable waste management programs have the resident households implemented in their operations?
- How enough are the provisions made in the implementation of sustainable waste management in Phnom Penh?
- Is there a significant relationship between attitude, subjective norms and perceptive behavior controls with behavioral intention?

2 Objectives of study

Based on the research questions , the purposes of the study propose a few statements of study as the following:

- To measure effectiveness of the households' implementation of sustainable solid waste management in Phnom Penh.
- To analyze the efficiency of the relationship between households' attitude, subjective norms, and barriers and their behavioral intentions on the sustainable solid waste management practice in Phnom Penh.
- To provide a conclusion and recommendation.

3 Hypothesis

Ground on the objective of the study, the null hypothesis was proposed to test for statistics. The hypotheses tested are used an SPSS software to find out whether they are true in the real empirical conceptions. The following the model for hypotheses tested.

Ho1: There is no insight of how to manage a sustainable solid waste practices of the households in Phnom Penh.

Ho2: There is not enough made by households in the implementation of the sustainable solid waste management in Phnom Penh.

Ho3: There is no significant relationship between household's attitudes, su jective norms, and perceptive behavior control and their behavioral intentions implement a sustainable waste management program.

4 Literature Review

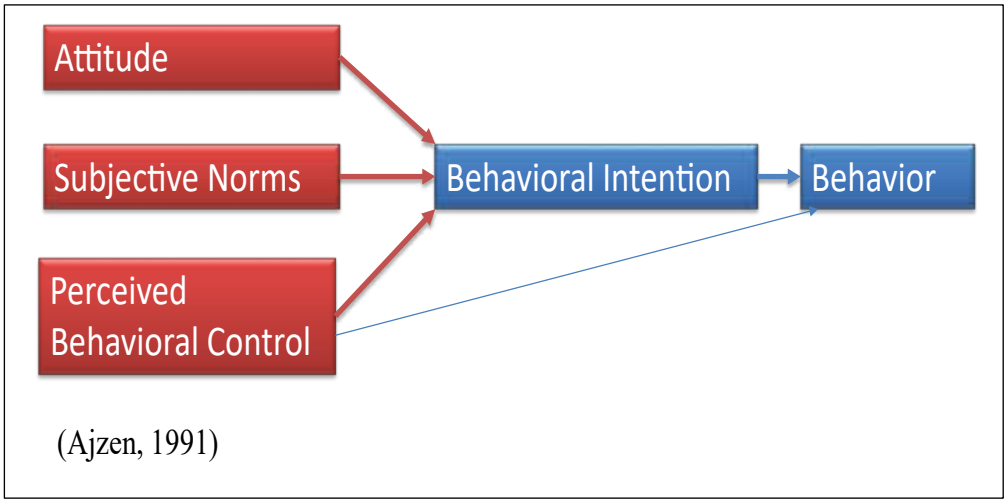
This section is used for the secondary data to seek the more evidences in both ,empirical and conceptual theories support the independent variables, attitudes, subjective norm, and perceived behavioral control in the hypothesis. So the review is organized into three parts, including the conceptual framework, key term meaning, and reviewing literature relevant methodology of the variables.

4.1 Conceptual Framework

Conceptual Framework is interpreted through two models of behavior which the research problem of the topic. The model for the present study based on the theory of planned behavior (Ajzen,1991) . The model defined three factors that are used as independent variables, attitude, subjective norm , perceptive behavioral control and effects on dependent variable, behavioral intention.

4.1.1 Theory of Planned Behavior

This theory provides the model of the relationship between attitudes, subjective norm, perceives behavior control and behavioral intention, behavior. Attitude is the internal source of behavior. Subjective norm is the influence of others who are relevant the problem, including family, community, local authority, expert .etc..., perceive behavioral control is the monitoring on the insight of one before emerge activities as behavior.



(Ajzen, 1991)

4.1.2 Theory of Planned Behavior

According to Ajzen (1991) defined that "attitude is Attitude is an individual's overall judgment and assessment of behavior". The subjective Norm (Ajzen, 1991 and Francies et al, 2004) is "an individual's perception of the social pressure to perform or not to perform the target behavior." Another researcher, Brouwer et al., (2009) defined "perceived behavioral control that is an individual's belief about his or her capabilities of exhibiting certain behaviors." The last ones that gave the meaning of behavior intention is Ajzen and Fishbein (1980, p.43) was "a measure of likehood that a person will engage in a given behavior".

4.1.3 Attitude toward Behavior

Before individuals wish to do something, their action is not happening without pressure and control feelings to attain their intents.

Ajzen and Fishbein (1980) addressed that every intends that individuals will perform as action (behavior), they always evaluate it to ensure the action positively and then they confirm that it is important in others thought, the result, they should perform it. As Turner (1982) noted that the individual builds context- specific group norms based on sharing to group information and when social identity is happening. Not the difference from the previous researchers, Hogg& Abrams (1987) and Turner et al. (1987) described that the group norms influence behavioral performance at the individual, based on their observations of group members, seeks to act in a manner similar to their in-group, therefore achieving categorization as a group member.

Ajzen (1988; Beck & Ajzen, 1991) explained the theory of planning behavior help to predict one's behaviors when he or she may unable to implement at will. Thus, the model has been used in a diversity of fields of behavior research. Another conclusion, only Ajzen (1991) remarked that the person's intends to do something is determined by three predictors, first favor doing of the own person (attitude), second the feelings of social pressure to achieve their intends (subjective norms), and third, the feeling of owning action's control (Perceived behavioral control); furthermore , he argues that perceived behavior control (PBC) influences intention and, to the extent that it represents real control, behavior directly.

For other predictor, social support; Sallis, Prochaska, and Taylor (2000) studied that Adult who joins in physical activity and is assisted by reports from friends and family to operate the behavior as important. The research also indicated that the subjective norms in predicting physical activity intentions have a weaker influence than social support. (Courneya et al., 2000).

Buchan (2005) found that the theory of planned behavior that is implemented in predicting ethical intention demands considering of moral sensitivity and ethical climate of the decision making in the public accounting professionals with influencing from subjective norms that significant relationship with attitudes.

Chan and Tang (2006) highlighted that attitudes are a good interior predictor that can predict of one's nature behaving tendency may be abusing the resource; not whistle blowing, theft, corruption and deception.
H1: There is a positive relationship between attitude and behavior.

4.1.4 Subjective Norms toward Behavioral Intention

As the notes of the source of attitude (of Chichester: UK, Wiley 1996) the perception Referring to Turner (1982) noted that the individual builds context- specific group norms based on sharing to group information and when social identity is happening. According to the theories, when social identity is salient, the individual constructs context-specific group norms based on shared intragroup information and conform themselves to these group norms.

Accordingly, group norms influence behavioral performance at the individual, based on their observations of group members, seeks to act in a manner similar to their in-group, therefore achieving categorization as a group member (Hogg & Abrams, 1988; Turner et al., 1987).

Sauser (2007) noted that many work groups influence under informal norm to facilitate in toleration of promoting petty stealing. It relates the individual's feelings, attitudes, behaviors or thoughts in changes affect when they interact. (Rashotte, 2007) Other researchers, Lin (2008) remarked that norms are active that the individual is complying and conforming a positive feedback from his or her community.

Wilson's (2008) researched that a weak prediction of subjective norms on intention to perform their behavior is the reason why the behavior of business students conduct unethical manner. For other predictor, social support; Sallis, Prochaska, and Taylor (2000) studied that Adult who joins in physical activity and is assisted by reports from friends and family to operate the behavior as important. The research also indicated that the subjective norms in predicting physical activity intentions have a weaker influence than social support. (Courneya et al., 2000).

Referring to Scellato (2011) noted that the subjective norms are impacted two sources, one normative affect us to relate with others on social media. Another source, information affect is to get properly insights from the expert's comments or viewpoint.

H2: There is a positive relationship between subjective norms and behavioral intention.

4.1.5 Perceptive Behavioral Control toward Behavioral Intention

Ajzen and Fishbein (1980) addressed that every intends that individuals will perform as action (behavior), they always evaluate it to ensure the action positively and then they confirm that it is important in others thought, the result, they should perform it.

Ajzen (1988, 2002) addressed that the relationship of perceived behavioral control, from the tendency of uncertainty and magnitude, creating, is against one's type of behavior and the nature of the situation.

Ajzen, Brown & Carvajal (2004) remarked that Perceived Behavioral Control is the individuals' ability from the level of their confidence to perform the behavior based on their perception to perform easily or difficultly as it involves to facilitators. But Smith et al. (2008) and some researchers emphasized that no or limited influence of the perceived behavior controls on intentions or behavior.

Lam and Hsu (2006) remarked that Perceived behavioral control is a valid predictor construct for visitors' intention to revisit in the future.

H3: There is a positive relationship between Perceptive Behavioral Control and Behavioral Intention.

4.1.6 Methodology

There are many researchers used the theory of a behavioral plan to measure about the effect of attitude, subjective norm, and perceive behavioral intention and behavioral intention. Some researchers, Ying (zoe) zhou, (2007) measured the behavior of the students about sustainable waste management practice, there is perceive behavioral control (barriers) had not effected on behavioral intention, i.e. the students have a strongly attitude to implement the sustainable waste management, though there were some barriers to practice it.

5 Significance of Study

This present studied will investigate the households' attitudes, subjective norms, and barriers to implementation of sustainable waste management programs. The results from the research data analysis can be used to evaluate the gap between the theory of planning behavior and the environment of attitudes, subjective norms, and barriers to implementation of sustainable waste management program in their communities.

The gaps of the implementation will benefit for solving some issues:

- To maintain a good environment of the resident communities in Phnom Penh
- To reduce less pollution of streets, water dikes, air to convert the nature green city.
- To review the households and local authorities to be responsible in better sustainable solid waste management at own community.
- To solve by reducing less barriers to households' implementation of sustainable waste management in their communities.
- To identify the households' intention to sustainable waste management practices to support them in the right communities in the right needs.

6 Research Designs

Research designs are the plan of research to ensure the data gathering techniques are reliable. In the present study, this section covering on sample size and sampling, sources of data, and statistical tools.

6.1 Sample Size and Sampling Designs

Sample sizes are defined by selecting from only the districts in the city center, such as Chakarmon, Daun Penh, Prampi Makara, Toul Kok, and Resey Keo where there are 113,979 households and sample size for primary data collection for 399 households (Yamane, 1964). Stratified sampling will be arranged by formula $n_k = \frac{n \times N_k}{N}$

N	Districts	Commune No	Household No	Sample Size
1	Chamkarmon	12	24,015	42
2	Meanchey	4	31,835	56
3	Daun Penh	11	15,976	28
4	Prampi Makara	8	13,388	24
5	Toul Kok	10	26,658	47
6	Ressey Koe	6	33,942	60
7	Sen Sok	4	26,397	46
8	Dang Kor	13	17,456	31
9	Porsen Chey	10	37,051	65
Total			**226,718**	**399**

6.2 Sources of Data

The data are collected from two sources (1) primary data are gathered by using research instrument, a questionnaire that is divided into 8 parts and 5 scales to interview the household chair. Secondary data are gathered from books in the library, webpages, and some documents from CINTRY and Phnom Penh municipality hall.

6.3 Statistical Tools

Statistical tools are administered by IBM SPSS 21 for analyzing data, including frequency, weighted arithmetic mean, standard deviation and multiple regressions. Besides this, before the multiple regression is applied, normal distribution of the data set was checked on residual standardized and studentized.

7 Data Gathering Techniques

The primary data are gathered by potential experimental learners, who are divided into groups by districts where they are located as the residents. Thus, the collected techniques are administered by two ways, interview for low educational households and direct administrative questionnaire for high educational households.

8 Limitations and Research Procedure

The present study will be made under limitation of the plan of behavior model (Ajzen, 1991), such as attitude to behavior, subject norm, barrier to implement the SWM program and behavioral intention to implement the SWM program. Thus the data gathered is boundary only 5 districts of the Phnom Penh municipality. For the research procedure, the permission letter will be submitted to the city hall.

9 Validity and Reliability of the research instrument

9.1 Validity of the research instrument

The questionnaire is designed by specification of the research problem and expected to measure them, this is content validity. Another one is concurrent validity, i.e. the questionnaire is tested 20 to 30 sample size for data analysis before the main sample size is administered. When the pilot test is feasible, the present study will be predicted as significant tests for the main sample size. This is the predicted validity

9.2 Reliability

The effects of test Cronbatch's Alpha are divided into three sections. First, the result test of 16 items for attitude - behavior belief. Second, the result test of 14 items for subjective norms and finally, 15 items for barriers to implementation of sustainable waste management. The result of reliability of 45 items over 0.70, which is a good reliability (Sekaran, 2000)

Table 9.1. Shown about the result of Cronbach Alpha

Variables	Items	α	Interpretation
Attitude , Belief	8	0.77	Acceptable
Attitude, Outcomes	8	0.72	Acceptable
Subjective Norm, Normality	7	0.85	Good
Subjective Norm, Motivation	7	0.91	Excellent
Barrier	14	0.86	Good
Behavioral Intention	3	0.53	Poor
Total	**47**	**0.91**	**Excellent**

10 Data Analysis

Data analysis was divided into five sections: (1).Personal data identification, (2).Waste management practice by recycling, (3) percentage of sustainable waste management practice, (4) mean of sustainable waste management practice, and (5) the relationship of attitude , subjective norm ,and perceptive behavioral control and behavioral intention.

10.1 Personal data

The personal data are the respondents' identification orients on ages, gender, location, job, education to answer the questions of SWM practice in Phnom Penh communities by using the frequency and percent.

Table 10.1. Show about the respondents 'identification

Variables		Frequency	Percent
Ages	20-29	306	75.6
	30-39	75	18.5
	40-49	13	3.2
	>50	11	2.7
	Total	**405**	**100**
Location of Householder	Meanchey	52	12.8
	Chamkarmon	44	10.9
	DaunPenh	45	11.1
	7 Makara	39	9.6
	Toul Kok	61	15.1
	Ressey Keo	91	22.5
	Sen Sok	48	11.9
	Dang Kor	04	1.0
	Porsenchey	21	5.2
	Total	**405**	**100**
Respondents' Rank	Local authority	3	0.7
	Civil servants	49	12.1
	Employees	148	36.5
	Businessmen	23	5.7
	Housemaid	30	7.4
	Students	133	32.8
	Others	19	4.7
	Total	**405**	**100**
Respondents' Education	Secondary School	26	6.4
	High School	18	4.4
	Undergraduate	48	11.9
	Bachelor	252	62.2
	Master	60	14.8
	Ph.D.	1	0.2
	Total	**405**	**100**

10.2 Waste Recycle

The resulting frequency shown that the participants' insight on the items can be recycled such as 51.1% office paper , 57.8% newspaper , 55.8% usable books or sheets , 72% cartoon , 65.2% tin/can , 43.5% bottle , 50.4% plastic and rubber , 64.7% iron ware , 32.3% electric spare parts , 23.7% textiles , and 19.3% organic 19.3%.

N0	Item Recycle	Recycle	%
1	Office Paper	207	51.1
2	Newspaper	234	57.8
3	Usable books or Sheets	226	55.8
4	Cartoon	295	72.8
5	Tin can	264	65.2
6	Bottle or Glass and Ceramic	176	43.5
7	Plastic and Rubber	204	50.4
8	Iron ware	262	64.7
9	Electronic spare parts	131	32.3
10	Textiles	96	23.7

10.3 Measurement of SWM Practice

The householders request to support some programs of SWM practice that find in the frequency results of responding "yes", including Training SWM (94.8%), cost analysis recycles (49.4%), provide separated waste receptacles (83.2%), composting food waste (51.6%), partnering for composted waste (43%), using reusable (44.4%) donating reusable (83.2%), waste reduction strategy (82.5%) , purchasing products with less packaging (79.3%).

N0	Variables	Yes	%	No	%
1	Training family members about sustainable waste management practices.	384	94.8	21	5.2
2	Performing a cost / benefit analysis for each recycling and trash- handling program you use.	200	49.4	205	50.0
3	Providing waste receptacles that are clearly marked to segregate recyclables (e.g. biodegradable materials and other waste).	337	83.2	68	16.8
4	Composting food waste.	209	51.6	196	48.4
5	Partnering with others to use composted waste for landscaping or farming programs.	174	43.0	231	57.0
6	Using reusable service ware (e.g.cups and glassware).	180	44.4	225	55.6
7	Donating reusable (e.g. leftover food, old uniforms, tablecloths, cloth napkins, and linens).	337	83.2	68	16.8
8	Developing solid waste reduction strategies.	334	82.5	71	17.5
9	Purchasing products with less packaging.	321	79.3	84	20.7

10.4 Model Variables Mean ($\overline{X}$)

For the main variables, the attitude was separated into two parts, Attitude belief and Attitude outcomes. As the subjective norms, normative and motivation. Besides this, barrier and behavioral intention were not divided. Each variables and sub variables were measured by weighted ari - thmetic mean for rating scales, agree - disagree, important - not important, likely support/ inapplicable, likely influenced - inapplicable.

10.4.1 Attitude

Attitudes are a good interior predictor that can predict of one's nature behaving tendency (external) may be abused the resource (Chan and Tang, 2006). Attitude is separated in belief and outcomes. Belief gives the human to evaluate what is right, what is wrong and outcome gives make a decision for behavior.

10.4.1.1 Attitude, belief

Attitude, belief was measured by asking the householders about their behavior rating how they would agree with the sustainable waste management in the daily habit lives, 1. Strongly disagree with 7. Strongly Agree. In the measurement of the weight arithmetic mean, and standard deviation including improved community clean (M: 5.97, 0.91), decrease food waste (M: 5.59, 1.17), better environment (M: 6.25, 0.94); decrease costs in the family (M: 5.43, 1.28), International visitor attracting (M: 6.20, 1.04), Community reputation (M: 5.85, 1.05), competing advantage (M: 5.57, 1.31). The result of the measurement about the householders' behavior in operating sustainable waste management tends between fairly agree to agree.

10.4.1.2 Attitude, outcomes

This type attitude would evaluate on important rate; 1. Strongly not important to 7. Strongly Important, including maintain the visitors' satisfaction (M:6.44, 0.79), reducing food waste (M:5.34, 1.27), protecting the environment (M:6.28, 0.80), decreasing costs (M:5.46,1.20), eliminating community flooded (5.21,1.56), stakeholders' job satisfaction (M: 5.79, 0.96), increasing the public health (M: 6.29, 0.92), educating the new generation (M: 6.32, 1.06), most of the respondents on the attitude, behavioral outcomes tends fairly important to important.

10.4.2 Subjective Norms

The subjective norm is the recession impacting on attitude, feelings, behavior or thoughts of individuals or group from others, such as family, community, authority or media. Thus, subjective norms are separated normative belief and motivation to comply. The normative belief is the supporting to the individuals or group to do something in official activities and the motivation to comply is the influence of others, such as family, community, authorities.

10.4.2.1 Subjective Norm, normative belief

The type of subjective measured to find how likely the stakeholders would support the householders to practice of sustainable waste management (1. Not applicable to 7. being extremely likely), including local authority (M:5.46, 1.21), family members (M:5.87, 0.98), households in your community (M:5.67,1.01), schools in the community (5.93, 1.12), department and offices (5.58,1.24) , supplier(s) / businessmen / buyer(s) (M:5.37, 1.17), traveler(s) (M: 6.05, 1.05). Thus, the stakeholders that gave the supporting sustainable waste management practice tend from less supporting to support.

10.4.2.2 Subjective Norm, Motivation to Comply

The measurement was administered to wonder how likely stakeholders would influence on householders to practice the sustainable waste management (1. Not applicable to 7. Being extremely likely), including local authority (M: 4.84, 1.71), family members (M: 4.76, 1.70), households in your community (M: 4.77, 1.58) ,schools in the community (M: 4.84, 1.63), department and offices (4.84, 1.63), supplier(s) / businessmen / buyer(s) (M: 4.50, 1.83), traveler(s) (M: 4.87, 1.82). Totally, the stakeholders responded who was influenced in SWM practice tend to less influence.

10.4.3 Perceptive Behavior Control

The last one of independent variable, perceptive behavioral control was measured to find the fourteen barriers of the householders in implementing sustainable waste management in their communities by using agree rating from 1. Strongly disagree with 7. Strongly agree. There are fourteen barriers included , lack of information (training/education) (M:5.87, 1.19) , lack of community coordination (M:5.76, 1.24) , lack of tools and financial resources (M:5.82 , 1.31) ,lack of ability to create lasting changes (M:5.95, 2.73) , lack of willingness to change (M:5.71 , 1.20) , lack of support from local administration (M:5.83, 1.29), lack of cost of recyclable, reusable products (M:5.35 , 1.45) , lack of quality recyclable products available for purchase (M: 5.76, 1.24) , lack of training time (M: 5.80, 0.99), lack of supervision for practice (M:6.05, 0.99), lack of support by households due to additional costs (M:5.34, 1.35), lack of recycling facility and storage areas (M:5.93, 1.26 , lack of behavior of some householders (M: 5.66, 1.18), lack of efficiency of waste collected (M:6.02, 1.25) . Thus, the result of the householders recognized the barriers from fairly agree to agree rating.

10.4.4 Behavioral Intention

The behavioral intention was measured on how likely the householders are implementing the sustainable waste management in communities (1. Not being extremely likely to 7 Being extremely likely), such as continue to reduce waste in their community (M: 6.34, 0.51), to explore the ways of the sustainable waste management (M: 6.19, 0.55) and increase the action of the sustainable waste management in the future (M: 6.50, 0.57). Consequently, the householders have the willingness at their implementing of sustainable waste management program on being likely rating.

10.5 Regression Analysis

The model of the equation for the multiple regression followed by the plan of behavior theory model (Ajzen, 1991). The present study to find whether the relationship between the independent variables, attitude, subjective norms, perceptive control behavior and dependent variable, behavioral intention and behavior is significant. However, the rule of the regression analysis, the data should be checked by assumption first before before the multiple regression applied.

10.5.1 Assumption Check

The original data of 415 items that the datasets could not be normally distributed. Thus, the casewise diagnostics are checked for removing some data numbers that their values of standard deviation are over 2. There are two stages of the numbers of data removed. The first stage, the data removed are 6, 20, 26, 39, 349, 365 and 385. Second stages are 67, 376, and 390. Hence, the main data that are used to check assumption for the multiple regression are 405 items.

10.5.2 Normal Distribution

To make sure the multiple regression to be feasible to operate the model, the datasets are checked normally distributed. Therefore, there are two types of checking normality (Kent Lofgren, 2013) including: Skewness and Kurtosis Check, Mathematic Approach, Graphical Approach.

10.5.2.1 Skewness and Kurtosis Check

These checks found whether the z- values of standardized and studentized residuals should be somewhere in the span of -1.96 to +1.96 or not. (Statistic value / Statistic error) (Doane & Seward, 2011). Based on the results in the below table, z-value of Skewness and Kurtosis of the both residuals are staying somewhere in the span of -1.96 to +1.96.

Residuals	Skewness	Kurtosis	Interpretation
Standardized Residual	-1.10	1.32	Neither below -1.96 nor above +1.96
Studentized Residual	-0.97	1.47	Neither below -1.96 nor above +1.96

10.5.2.2 Mathematic Approach

Based on the sample size is only 405, Shapiro-Wilk test is performed. In the above table, the significant (p-value) of the both residuals are 0. 354 and 0.305 > 0.05; the null hypotheses are accepted, so normality test states that the both residuals are normally distributed. The center point is really at zero. (Shapiro & Wilk, 1965)

Shapiro-Wilk Check			
Residual	**Statistic**	**df**	**Significant**
Standardized Residual	0.996	405	0.354
Studentized Residual	0.996	405	0.305

10.5.2.3 Graphical Approaches

The first Graph, the histogram shown that the standardized residual is the center of zero, the first graph, the line draws as normality (bell curve) and the middle point is at zero. Second graph, the plot line hanged on the straight line. Next graph, the plots is too closely covering a long straight-line. The last one, the graph is a box plot, its median line is located almost at the center of the box, so the graphs are really normally distributed shapes.

Figure 1. Standardized Residual

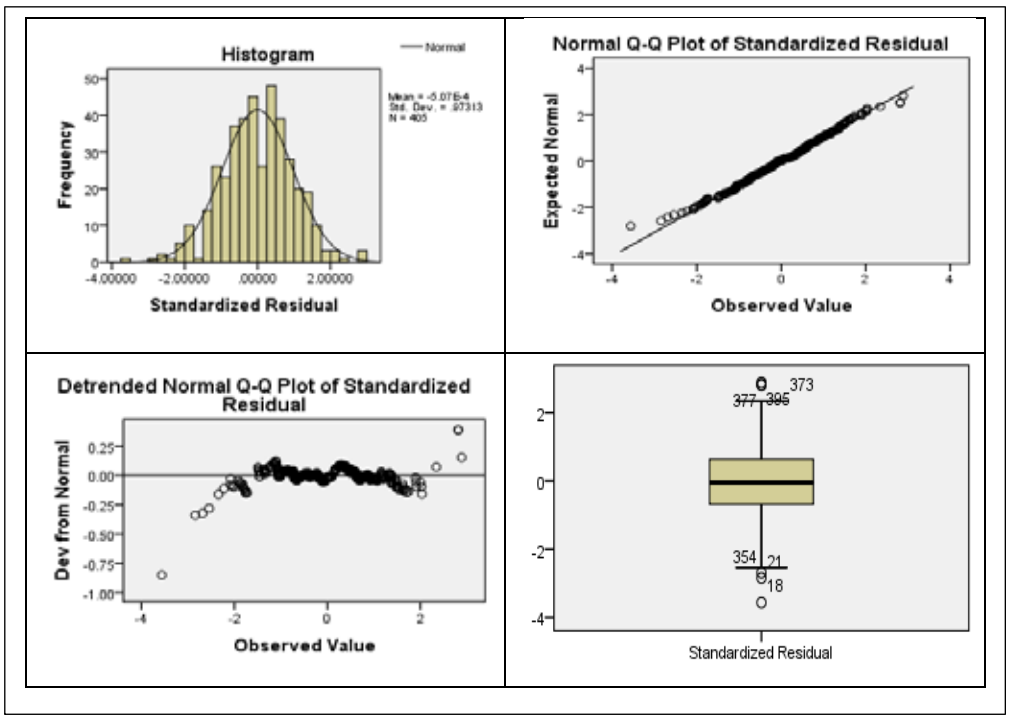
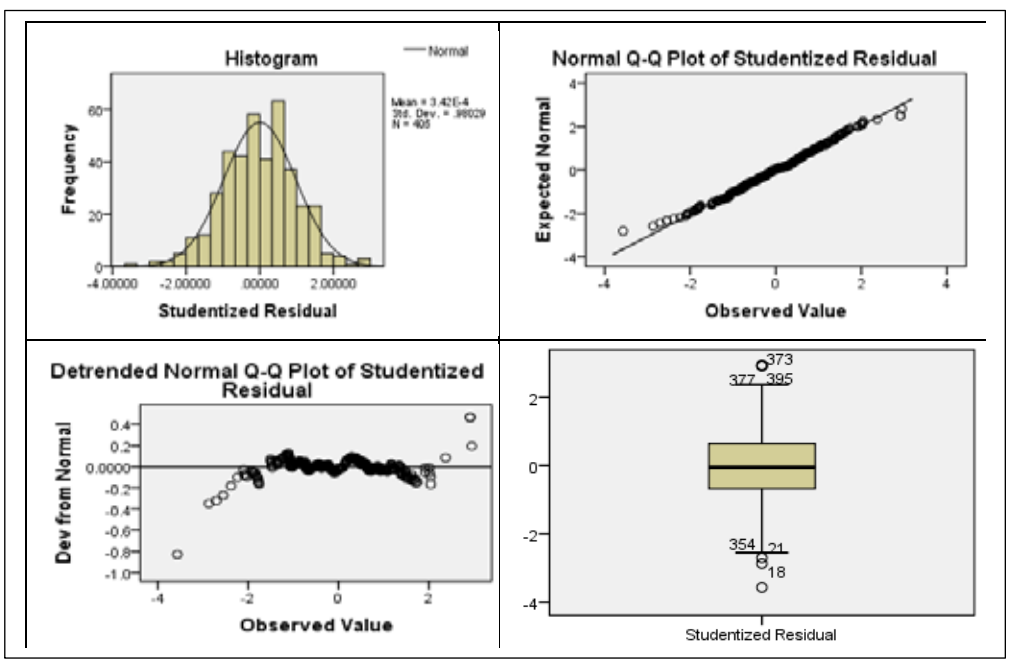


Figure 2. Studentized Residual



Referring to the three tests of normal distribution, the results tested are inferring that the data are good enough condition of the assumption to arrange to perform the multiple regression.

10.5.3 Regression Analysis and Hypothesis Test

The model of hypothesis is to find out the relationship between summative attitude (belief and outcomes), subjective norm (normative and motivation) and perceptive behavior control (Barrier) with behavioral intention, to implement sustainable waste management in their communities.

Variables	β	t-test	p-value	Interpretation
Intention (Constant)		25.724	.000	-
Attitude	.199	3.796	.000	Significant
Subjective Norm	.047	.943	.346	Insignificant
Perceptive B Control	.312	6.197	.000	Significant

10.5.3.1 Attitude and Behavioral Intention

The result found that β= 0.199, t = 3.79, p = .00< .01. The attitude has a strong effect on the behavioral intention of sustainable waste management practice. The result is paralleled the inference of Brouwer et al, (2009) said that the attitude of the individual bases on intention to conduct a specific after the outcomes of the assessment defined. Furthermore, Ajzen (1991) explained that attitude is an important element in the individual perceptions which performs behavioral intention through overall judgment and evaluation of the individual's behavior together with the expected outcome.

10.5.3.2 Subjective Norm and Behavioral Intention

The result shown that β= .047, t-value = .943, p = .346 > .05 that concluded the subjective norm has not influence on the behavioral intention of the householders to implement the sustainable waste management in the community. The result suggests that the sustainable waste management practice of the resident individuals in Phnom Penh strongly depends on their own willingness, not because of undue influence or supporting from other stakeholders' pressure.

Like Taylor and Todd (1995) found that the individual's performance has limited direct experience from their insight from the conceptual belief. This can be described

that mostly resident individuals have experience in habitual implementing sustainable waste management in their communities. This is one hand, another hand Cambodian culture, especially the households with daughter(s) and Chinese cultural belief householders always take care sustainable waste management or keep the houses clean because in Khmer culture, the daughter(s) represents cleanliness, beautiful and honorable reputation. As referring to Chinese cultural belief, sustainable waste cleanliness represents wealth, health and happiness in the family members.

10.5.3.3 Perceptive Behavioral Control

The outputs found that $\beta = .312$, $t = 6.19$, p-value $= .000 < .05$. This result found that the perceptive behavioral control has an impact on the behavioral intention of sustainable waste management practice. This hypothesis are inferring that there are some barriers to impact implement the sustainable waste management, and the individuals' perceptions have strong control belief influences on behavioral intention of sustainable waste management practice. Francis et al., (2004) and Brouwer et al. (2009) affirmed that the perceived behavioral control is the process of individuals' perceptions to form a conception's belief that performs ability to check their level of confidence in performing or not performing. Hence the individuals 'belief always effect on and encourage their performance toward the specific conduct.

11 Scope and Limitation of Study

Even though the test hypotheses show confidential result, but some issues have been restricted as the following: Time frame: For only 5 months for one research publication, the data collected was covered in 9 districted in Phnom Penh where the agents used mostly snowball sampling of their classmate year 4 students, their neighbors and relatives in the different districts. The sample size in the each district is not stratified to survey for covering poor, medium, and high standard of living in the community. Thus, the hypotheses tested showed the behavior of 77.3% householder has higher education and only 22.7% lower secondary and high school background. Besides the scope of study , the limitation define only the measurement of the relationship between the independent variable , attitude , subjective norm and perceive behavioral control and dependent variable ,behavioral intention as dependent variable.

12 Conclusion

Based on the result of the hypotheses tested, there are only two hypotheses, attitude and perceptive behavioral control are significantly effected on the behavioral intention of sustainable waste management practice. However, the subjective norm is insignificantly influenced on implementing sustainable waste management of the resident individuals in the community.

13 Recommendation

Even though the resident individuals 'experience on habitual implementing sustainable waste management in their community, they have the ability to implement sustainable waste management under restriction from some barriers. This means the dimension of the sustainable waste management in the community needs to contribute from the local authorities and other relevant. Thus the local authorities and the city hall should strengthen some measurement as the following:

- To train the community to create some trashes into usable items for sales or uses,
- To train the householders to reduce rubbish by using reusable products,
- To promote the community more how to reduce trash and manage them,
- To drive the residents on how to pack the trash perfectly for trash collection,
- To separate the poor families without pay for the trash transportation fee,
- To assist budget plan and finance to sustainable waste management program,
- To cooperate with investors (factory) to innovate wastes into recycling,
- To promote the householders to clean not only house ground, but also the community and public playground,
- To strengthen waste collection on time and clearly, especially from the storage place in the community,
- To measure strictly punishment for whom makes messy some trash in public ground or road.

14 Future Research

According to the plan of behavioral theory, the present study focused on the relationship between independent variables, attitude, subjective norms and perceived behavioral control and dependent variable, behavioral intention. In the future, the study made will be considered the behavioral intention as mediating variable and behavior as the dependent variable.

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CHALLENGES FACED BY CAMBODIAN WOMEN ENTREPRENEURS IN PHNOM PENH

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Abstract

Nowadays, women are more and more starting their own businesses. However, women entrepreneurs face a wide variety of challenges both in starting and in growing their business ventures. The objective of this paper is to investigate the challenges facing women entrepreneurs in Phnom Penh. Purposive sampling method was chosen for data collection. A questionnaire survey was used to approach 205 women entrepreneurs in SMEs in Phnom Penh. Descriptive Statistics was used to interpret data. The challenges identified as impediments to women entrepreneurs are: too much competition, unavailability of unique selling points, combination of her role as a woman and an entrepreneur, lack of proper business and skills trainings, difficulties to find appropriate markets, lack of guidance and control, family obligations, improper training and development facilities, lack of governmental support, and difficulties in hiring competent staff. With the findings, this study provides some insights into the perceptions, feelings and attitudes of women entrepreneurs in the sampled area on the challenges that they face and also has some recommendations for them and the government.

Key words: Women Entrepreneurs, Challenges

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1 Introduction

Customarily, a women's role has been that of mother and wife. Entrepreneurship and business in general have been male dominated for a long time, but this has changed over the years. Nowadays women empowerment has been increasing so rapidly all over the world and women are starting their own businesses to seek greater control over their personal and professional lives (Nieman & Nieuwenhuizen, 2009). Clearly, the growth of female enterprises is good for economies. The benefits derived when women start and operate their own businesses are truly remarkable: increased self-esteem, quality of life, and life expectancy as well as reduced infant mortality, incidences of AIDS and other diseases, and domestic violence (Coughlin, 2002).

In the last few decades women had started to realize the value of self-employment and they are now utilizing their capabilities in entrepreneurial activities. The International Labour Organisation (ILO) estimates that women entrepreneurs now account for a quarter to a third of all businesses in the formal economy worldwide (Nxopo 2014). It is noted that there has been a rapid upsurge in self-employed women in the developed nations. In USA, 25% of the total business is owned by women and almost same patterns are being identified in Canada and France where one-third and one-fifth small businesses are owned by women respectively. Whereas in Asia, women comprise 40% of the total workforce. However, in China women are dominating the men at least by two fold and similar inclinations are observed in Japan (Rao, Rao and SuriGanesh, 2011).

Cambodia is a developing economy in South-east Asia, where women are engaged in diverse productive ventures mostly concentrated in Small and Medium Enterprises (SMEs). The economic impact of female entrepreneurial activities on economy is substantial. The total number of Cambodian enterprises is 513,759 of which Cambodian women own 313,391 enterprises, or 61 percent (NIS, 2014). Although Cambodian women entrepreneurs have been recognized for their significant contributions to the socio-economic development of this country, limited knowledge and empirical research exist on them, especially their teething problems. Therefore, the intent of this working paper was to identify the challenges facing by Cambodian women entrepreneurs in Phnom Penh.

2 Literature Review

2.1 Women Entrepreneurs Defined

There has been little consensus in the literature on the differences between individual and corporate entrepreneurship, small business owners, and self-employment (Cunningham & Lischeron, 1991). Throughout the literature, the terms "women entrepreneurs," "self-employed women," "women-led firms," and "women business owners" have been used to describe different types of business ownership. Among them are women who established and operate their own businesses, those who purchased businesses, those who inherited family businesses, or operate businesses with spouses.

The international definition of an entrepreneur is that he or she is an enterprise builder, perceives new business opportunities, creates businesses where none existed before, directs these businesses by using his or her own and borrowed capital, takes the associated risks and enjoys profit as rewards for the efforts (International Labour Organization, 2015).

According to Moore and Butner's (1997: 13), they defined a female or a woman entrepreneur as "a woman, who has initiated a business, is actively involved in managing it, owns at least 50 percent of the firm, and has been in operation one year or longer." The OECD (2004) endorsed this definition, and earlier on this definition of women entrepreneurs was successfully used in the study of women's entrepreneurship in Ireland (Butler, 2003).

Therefore the criteria developed from the attributes of women entrepreneurs according to the above definition, in addition to the general features of an entrepreneurial venture, were applied to the determination of the sample of the study. The attributes were:

- The woman entrepreneur either owned all of her business, or was the majority shareholder (50%).
- The woman entrepreneur, who had initiated the business, was actively involved in managing it.
- The business had been in operation for at least one year.
- The business venture had to exhibit entrepreneurial features.

2.2 Challenges

According to Stevenson (2010:287), a challenge is a situation that tests someone's abilities and points out that a challenge is a thing, action or situation that causes an obstruction; it blocks or hinders progress. Nani (2011:03) is of the view that a challenge is something needing great mental or physical effort in order to be done successfully. Challenges could be analogous to barriers. In line with this thought, Horn, et al., (2009:90) define barriers as obstacles that prevent movement or access. For the purpose of this paper, challenges will refer to those hurdles that hinder women entrepreneurs in their businesses, requiring them to use great mental effort. Additionally, challenges will be viewed as hurdles that make a woman entrepreneur's business not run effectively and efficiently.

2.3 Challenges Facing Women Entrepreneurs

In the last few decades women had started to realize the value of self-employment and they are now utilizing their capabilities in entrepreneurial activities. Although there are many contributions to be accredited to women entrepreneurs, a number of constraints have been identified as detriments to these contributions. Women entrepreneurs face many challenges, which include: government rules and regulations, lack of access to finance, assets, information technology, infrastructure and other facilities that enable their efficiency and business growth (United Nations, 2006). Kantor (1999) rightly argued that women often experience greater constraints on their economic actions relative to men. Mayoux (2001) also noted that there are certain factors that limit women entrepreneurs' ability to take advantage of the opportunities available to them in their environment and these factors have been identified as the reasons why their business fail (Kantor,1999). Other factors according to Mayoux (2001) and United Nations (2006) include: poor financial management, liquidity problems, management inexperience and incompetence, poor or nonexistent books and records, sales and marketing problems, staffing, difficulties with unions, the failure to seek expert advice, limited social and business networks, a low level of demand in the local economy, the value and system of tenure for housing, constraints in access to finance, lack of work experience and skill, and lack of role models. Other barriers to women entrepreneurship development are cultural obstacles, lack of motivation, high crime rates and problems during the transition from reliance on government benefits and employment.

Researchers claim that family issues such as giving proper time and fulfilling family culpabilities are the chief issues confronted by them (Rao, Rao and SuriGanesh, 2011). Another inquiry supported the findings that women are mainly impelled to be the home makers (Roomi and Parrot, 2008). Whereas Hafizullahet al (2012)

highlighted that male dominance in culture creates problems for female entrepreneurs in terms of limiting their mobility, business participation and market interactions.

The major factors that restrain women from business are gender-based discrimination, lack of communal support, limited access to information, inadequate education & training facilities, absence of trust in one's capabilities and access to resources (Afza, Hassan and Rashid, 2010). These arguments are supported by the findings of another research that says that the lack of proper leadership, planning and inadequate financial resource allocation is some other difficulties that women usually face during execution of their businesses (Palaniappan, Ramgopal and Mani, 2012). Besides all the problems women also face some challenges and significant of them are uncloaked guidelines, challenging interactions due to gender, dependence upon their male counterparts for transactions and extra restrictions imposed on them as compared to their gender counterparts (Ahmad, 2011).

According to Crampton and Mishra (1999) a major obstacle for women is the presence of constraints imposed upon them by society, the family, and women themselves. They see women still working in a society that often does not accept them as powerful and influential business leaders (Crampton and Mishra 1999). Relationships in our society are structured hierarchically, with women subordinate to men, and having less power, opportunity and access to resources. Relations between men and women in the family, the workplace or in the public sphere reflect how society understands appropriate male and female characteristics and behaviour. Growe and Montgomery (2001) find that society's attitude towards appropriate male and female roles is thus an obstacle that identifies women as not task-oriented enough, too dependent on feedback and evaluations of others, and lacking independence.

A survey among more than 14,000 firms across 34 countries showed that female firms were charged an interest rate 0.45 higher than males and also that they were 5% less likely to even obtain a loan (Muravyev et al., 2009). Because of the difficulties, women might face in terms of fundraising they need to turn to their families. However, due to some cultural norms families do not necessarily prioritize female entrepreneurship, but instead tend to focus on ensuring that female are wed (Zhang, 2010)

Another barrier recurring throughout the literature is the dual role stress that women face. This refers to the concern that women business owners have about balancing work and family commitments. Universally, family responsibility falls primarily on women, and this can occur even when women are involved in entrepreneurship. This may lead to time fragmentation, less chance of entrepreneurial success or general career progression (Brush, 1997). Women experience 'time poverty' in attempting to deal with both commercial and domestic work, leading to greater stress and difficulty (Still, 1997).

According to Dzisi (2008), women also ranked very high the lack of management experience, financial planning, business or strategic planning, and keeping customer contact as some of the major problems faced at the start-up phase. The findings from this study coincide with recent research by Britwum et al. (2006), which found that women entrepreneurs in SMEs in Ghana faced management, financial and strategic planning problems in the operation of their businesses.

Moreover, the main obstacles that women face in business are educational and work-related. Literature confirms that skills training and business education have a positive effect on enterprise performance (Akanji, 2006; Cheston & Kuhn, 2002; Kuzilwa, 2005). It is acknowledged that the exploitation of entrepreneurial opportunity depends on the entrepreneur's level of education, skills or knowledge acquired through work experience, social network and credit (Shane, 2003). Many women entrepreneurs lack training and education both in developed and developing countries (Ibru, 2009) and hence the need for training especially in developing economies must be highlighted. Hadary (2004:4) argues that women also tend not to have the relevant education and experience in starting and managing a business and this in most cases leads to less potential for success.

The ability to enter into new markets requires expertise, knowledge and contacts. Women are unable to market goods and services strategically, because they often lack access to training and experience on how to participate in business activities. Thus, women-owned SMMEs, are often unable to take on both the production and marketing of their goods (Hookimsing & Essoo, 2003). In addition, female entrepreneurs have often not been exposed to the international market, and therefore lack knowledge about what is internationally acceptable. The high cost of developing new business contacts and relationships in a new country or market is a big deterrent and obstacle for many SMMEs, in particular women-owned businesses.

Once, if women decide to start up their businesses, they are prone to certain problems and challenges. Credit unavailability and lack of finances are the chief issues. Male dominant society, family obligations, unpredictable market behaviors, absence of sale points, hostile attitude of society, rigid system of rules, unrealistic policies and inadequate education and training facilities have worsened the situation. Such factors not only adversely affect the enterprises but also undermine the morale of women (Muhammad, et al., 2012).

Many Somali women succeed to start their own business, but there are many challenges they were facing before and now. Financial problem, family background and double rule they are playing (one of their family and other for their business) are the most challenges women are facing. On the other hand, women entrepreneurs are

dominant violence such as kidnap and rape. Although there is government in Somalia, the women entrepreneurs are not getting support from the government. While there are external challenges women entrepreneurs are facing, there are also internal challenges that women entrepreneurs are facing. Insufficient skills, lack of confidentiality of their abilities are major internal challenges the women are facing (Abdel and Ali, 2013).

3 Methodology

3.1 Instrument

With respect to internal and external validity, the study instrument utilizes established scales and questions which have been used by many previous researchers. A set of demographic questions were posed, as well as well-established measures of challenges facing women entrepreneurs using a 5-point scale: (1) Not at all; (2) To little extent; (3) To some extent; (4) To large extent; (5) To great extent. The measures selected have been used in previous researches and conducted a pilot study.

3.2 Research Design and Data Collection

The overall research design is exploratory. Purposive sampling was chosen for data collection. Data for this research were collected by means of an interview questionnaire. The target population of this research is women entrepreneurs in Phnom Penh, where they own 71,594 enterprises (NIS, 2014). Data collection was conducted from February to May 2016. The researcher trained his 246 undergraduate and graduate students to interview women business owners whom they knew clearly. One student was assigned to interview one woman entrepreneur. 250 surveys were used for collecting data. After checking data in the surveys, 45 cases were not usable due to incomplete data. As a result, a sample of 205 female business owners was used for data analysis in this study. The response rate is 83%.

3.3 Data Analysis

The researcher trained two students to help enter data into SPSS software Version 16. For data analysis, the researcher used Descriptive Statistics: Frequencies and Percentage for descriptive findings and Mean for the results.

4 Results and Discussion

4.1 Descriptive Findings

Business Sectors

Table 1 reports the distribution of business sectors in the sample. 65.4% of businesses in the study sample were operating trading businesses, followed by service-related business (24.9%), and manufacturing (9.8%) of respondents.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trading	134	65.4	65.4	65.4
	Manufacturing	20	9.8	9.8	75.1
	Service	51	24.9	24.9	100.0
	Total	205	100.0	100.0	

Table 1: Business Sectors in the Sample

Years in Business

Table 2 demonstrates the number and percentage of number of years in business of business owners in the sample. The greatest number of respondents (33.7%) fell within the 3-5 years category, and the lowest (6.3%) fell within the less than 1 year category.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	13	6.3	6.3	6.3
	1-2 years	42	20.5	20.5	26.8
	3-5 years	69	33.7	33.7	60.5
	6-10 years	41	20.0	20.0	80.5
	11-20 years	26	12.7	12.7	93.2
	Over 20 years	14	6.8	6.8	100.0
	Total	205	100.0	100.0	

Age of Owners

Table 3 reports the number and percentage of age of women business owners in the sample. The greatest number of respondents (38%) fell within the 25-34 age category, followed by the 35-44 age category with 28.8% of the sample. The lowest number of respondents (0.5%) fell within the over 65 years category.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 25 years	22	10.7	10.7	10.7
	25-34 years	78	38.0	38.0	48.8
	35-44 years	59	28.8	28.8	77.6
	45-54 years	31	15.1	15.1	92.7
	55-64 years	14	6.8	6.8	99.5
	Over 65 years	1	.5	.5	100.0
	Total	205	100.0	100.0	

Table 3: Age of Owners in the Sample

Marital Status

Table 4 provides the number and percentage of marital status of women business owners in the sample. Those surveyed were predominantly married (82% of the sample) whereas single accounted for only 9.3% of respondents.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	19	9.3	9.3	9.3
	Separated or divorced	1	.5	.5	9.8
	Married or cohabiting	168	82.0	82.0	91.7
	Widowed	17	8.3	8.3	100.0
	Total	205	100.0	100.0	

Table 4: Marital Status in the Sample

Education Level

Table 5 provides the number and percentage of education of women business owners in the sample. There were diverse distributions for respondents such as secondary school (41%), primary school (29.8%), bachelors (25.4%), and masters or above/no formal education (2%).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	4	2.0	2.0	2.0
	Primary school	61	29.8	29.8	31.7
	Secondary school	84	41.0	41.0	72.7
	Bachelors	52	25.4	25.4	98.0
	Masters or above	4	2.0	2.0	100.0
	Total	205	100.0	100.0	

Table 4: Marital Status in the Sample

4.2 Results

Table 6 provides means of challenges facing Cambodian women entrepreneurs in the sample. Thirty-four factors are arranged from highest to lowest on the basis of their respective means. The highest means are: “Too much competition” at 3.82; followed by “Unavailability of unique selling points” at 3.47; “Combination of your role as a woman and an entrepreneur” at 3.38; “Lack of proper business and skills trainings” at 3.31; “Difficulties to find appropriate markets” at 2.29; “Lack of guidance and control” at 3.24; “Difficulties to find appropriate markets” at 3.29; “Lack of guidance and control” at 3.24; “Family obligations” at 3.21; “Improper training and development facilities” at 3.20, “Lack of governmental support” at 3.17; and “Difficulties in hiring competent staff” at 3.17. However, the lowest means are: “Harassment” at 2,24; “Sex discrimination” at 2.20; and “Male dominance” at 2.04.

	N	Range	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Std.Error	Statistic
Too much competition	205	4.00	3.8195	.07950	1.13829
Unavailability of unique selling points	205	4.00	3.4683	.08762	1.25449
Combination of your role as a woman and an entrepreneur	205	4.00	3.3854	.10194	1.45951
Lack of proper business and skills trainings	205	4.00	3.3073	.08959	1.28269
Difficulties to find appropriate markets	205	4.00	3.2878	.07976	1.14194
Lack of guidance and control	205	4.00	3.2390	.08346	1.19494
Family obligations	205	4.00	3.2049	.09035	1.29364
Improper training and development facilities	205	4.00	3.2000	.09314	1.33358
Lack of governmental support	205	4.00	3.1707	.10176	1.45694
Difficulties in hiring competent staff	205	4.00	3.1707	.09841	1.40905
Lack of business planning	205	4.00	3.1512	.08887	1.27247
Unfavorable market behaviors	205	4.00	3.1317	.07937	1.13639
Lack of business networks	205	4.00	3.1073	.09299	1.33144
Lack of financial planning	205	4.00	3.0829	.08350	1.19556
Difficulties in attracting customers	205	4.00	3.0683	.08513	1.21881
Lack of managerial experience	205	4.00	3.0683	.08707	1.24665
Difficulties to maintain customers	205	4.00	3.0293	.08267	1.18368
Lack of finances	205	4.00	2.8732	.08193	1.17303
Lack of women role models	205	4.00	2.8244	.09325	1.33519
Stringent regulations and policies	205	4.00	2.7220	.08082	1.15714
Inflation	205	4.00	2.7171	.07725	1.10611
Red-tape/bribery etc.	205	4.00	2.6780	.10542	1.50937
Heavy taxes/fee/duties etc.	205	4.00	2.6585	.08721	1.24872
Poor credit facilities for women	205	4.00	2.6488	.07986	1.14342

Hostility of society towards engagement of women in businesses	205	4.00	2.5756	.08527	1.22089
Lack of financial support from family	205	4.00	2.5707	.09073	1.29899
Difficulty in dealing with males	205	4.00	2.4976	.08543	1.22324
Weak bargaining position	205	4.00	2.4780	.09005	1.28938
Non-cooperation of male counterparts	205	4.00	2.4439	.08918	1.27688
Cultural and traditional aspects	205	4.00	2.3610	.08900	1.27435
Lack of spiritual support from family	205	4.00	2.2439	.08799	1.25987
Harassment	205	4.00	2.2390	.08317	1.19083
Sex discrimination	205	4.00	2.2049	.08261	1.18279
Male dominance	205	4.00	2.0390	.08771	1.25575
Valid N (listwise)	205				

Table 6: Challenge faced by cambodian women entrepreneurs in the sample

The table gives a clear picture of most to least affecting factors. These results are consistent with other previous research findings. Such challenges not only adversely affect the enterprises, but also undermine the morale of women. The least ranked factors do not mean that they exert less adverse effects on women who are running their enterprises, in fact these factors are considered less contributory.

5 Conclusion and Implications

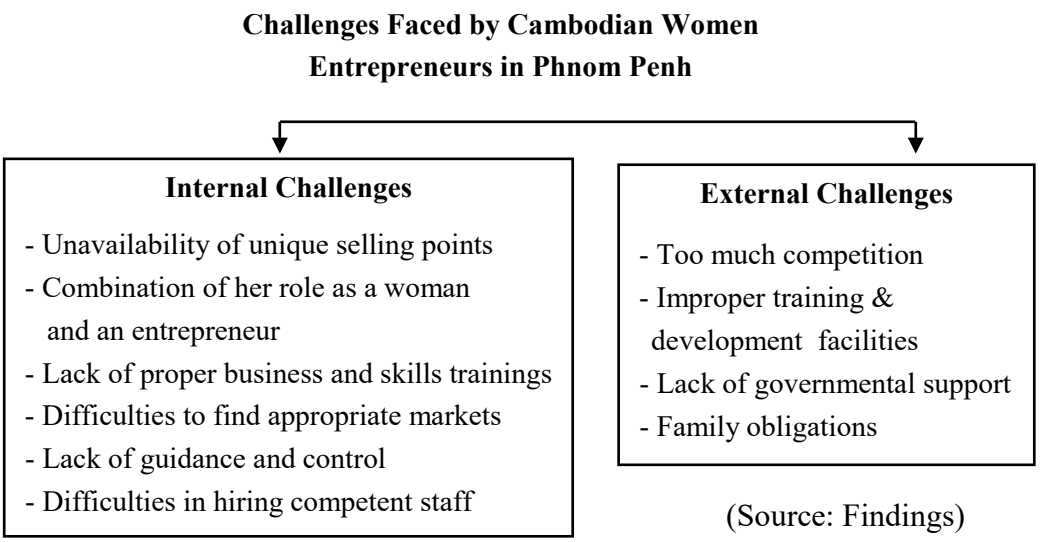
5.1 Conclusion

Having studied the challenges faced by 205 Cambodian women entrepreneurs in Phnom Penh, the results of this study found top ten challenges: too much competition, unavailability of unique selling points, combination of her role as a woman and an entrepreneur, lack of proper business and skills trainings, difficulties to find appropriate markets, lack of guidance and control, family obligations, improper training and development facilities, lack of governmental support, and difficulties in hiring competent staff.

N.	Challenges Faced by Cambodian Women Entrepreneurs in Phnom Penh
1	Too much competition
2	Unavailability of unique selling points
3	Combination of your role as a woman and an entrepreneur
4	Lack of proper business and skills trainings
5	Difficulties to find appropriate markets
6	Lack of guidance and control
7	Family obligations
8	Improper training and development facilities
9	Lack of governmental support
10	Difficulties in hiring competent staff

Table 7: Top ten challenges faced by Cambodian women entrepreneurs

Based on the study of Abdel and Ali (2013), these challenges could be divided into six internal challenges and four external challenges. The internal challenges are: unavailability of unique selling points, combination of her role as a woman and an entrepreneur, lack of proper business and skills trainings, difficulties to find appropriate markets, lack of guidance and control, and difficulties in hiring competent staff. The four external challenges are: too much competition, improper training and development facilities, lack of governmental support, and family obligations.



(Source: Findings)

5.2 Implications of the Study

This study has several implications for women entrepreneurs and the government on how to minimize the challenges that they are facing. To overcome these challenges, here are some suggestions:

Cambodian women entrepreneurs should:

- Hire professional help in the area they are not strong, esp. marketing skills;
- Develop themselves through organizing or participating in programs like marketing management training, sales training, market study tours, etc.
- Delegate household responsibilities to family members or employ on a part-time or full-time basis at least one person so that they have more time for their family and can take interest in other occupations, actively participate in their entrepreneurship activities.

The government should provide the following support:

- Establish a National Women Study Center to conduct research and publications about women's needs, problems and prospects, particularly relating to the development of women's enterprises;
- Encourage mass media and donor agencies to assist in women entrepreneurship activities;
- Establish more business incubation centers for women to:
  - design needs-based training programs for women entrepreneurs;
  - offer support and encourage more women entrepreneurs to engage in business;
  - encourage women and assist them in relevant business support initiatives;
  - provide training workshops targeted towards women within SMEs in business management for their capacity building;
  - provide technical support, special loans, subsidies, funds, counselling, training, consultation/advisory support, information products and web portals for women who need help;
  - create women entrepreneur platform and easy access for them to the local administrative support and public institutions;
  - provide the chances to learn from the successful entrepreneurs of other regions/countries;
  - provide entrepreneurship awards to outstanding women entrepreneurs and promote them as a role model.

- Allow more organizations to be established for the development of women entrepreneurs. These organizations could support them with training and development, financing the business and other support for their entrepreneurial development. Training and development could assist women entrepreneurs to obtain management skills, including skills in preparing business plans, marketing and financial management;
- Provide more childcare facilities to fit women entrepreneurs' needs. This would entail extended opening hours or flexible opening hours according to the woman entrepreneur's needs. Alternatively measures should be taken for fathers to be in the position to take parental leave, and men should be encouraged to take the leave.

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QUESTIONNAIRE

I am Dr. SokSeang, Lecturer at the National University of Management, and I am conducting research about women entrepreneurs in small and medium enterprises in Cambodia. I would be grateful if you could use 20 to 30 minutes of your time at your convenience to answer the questions in the survey. The purpose of this survey is to obtain data to measure the challenges that Cambodian women entrepreneurs in Phnom Penh are facing. By completing it, you will be helping in making a significant contribution to knowledge about women entrepreneurs in Cambodia. Your response to this questionnaire will be kept confidential.

Name: _____ **Phone:** _____

Name of Business: _____

Part A:

[1] In which business sector do you primarily operate? (Please check only one)

1. Trading □
2. Service □
3. Construction □

[2] How many years have you been in business?

1. less than 1 year □
2. 1-2 years □
3. 3-5 years □
4. 6- 10 years □
5. 11-20 years □
6. Over 20 years □

[3] In what age category do you fall?

1. Under 25 years □
2. 25-34 years □
3. 35-44 years □
4. 45-54 years □
5. 55-64 years □
6. Over 65 years □

[4] What is your marital status?

1. Single □
2. Separated or divorced □
3. Married or cohabiting □
4. Widowed □

[5] What is the highest educational level you have achieved?"

1. No formal Education □
2. Primary school □
3. Secondary school □
4. Senior secondary school □
5. Bachelors □
6. Masters or above □

Part B: To what extent do you experience the following problems now?

1 Not at all
2 To little extent
3 To some extent
4 To large extent
5 To great extent

N	**Financial & Economic Factors**	**Circle the box you decide**
1	Poor credit facilities for women	□1 □2 □3 □4 □5
2	Lack of finances for women	□1 □2 □3 □4 □5
3	Heavy taxes/fee/duties etc.	□1 □2 □3 □4 □5
4	Inflation	□1 □2 □3 □4 □5
5	Lack of financial planning	□1 □2 □3 □4 □5
6	Lack of financial support from family	□1 □2 □3 □4 □5
7	Lack of spiritual support from family	□1 □2 □3 □4 □5
8	Male dominance	□1 □2 □3 □4 □5
9	Lack of women role models	□1 □2 □3 □4 □5
10	Lack of managerial experience	□1 □2 □3 □4 □5
11	Lack of proper business and skills trainings	□1 □2 □3 □4 □5
12	Combination of your role as a woman and an entrepreneur	□1 □2 □3 □4 □5
13	Lack of guidance and control	□1 □2 □3 □4 □5
14	Lack of business planning	□1 □2 □3 □4 □5
15	Family obligations	□1 □2 □3 □4 □5
16	Lack of business networks	□1 □2 □3 □4 □5
17	Stringent regulations and policies	□1 □2 □3 □4 □5
18	Red-tape/bribery etc.	□1 □2 □3 □4 □5
19	Lack of governmental support	□1 □2 □3 □4 □5
20	Improper training and development facilities	□1 □2 □3 □4 □5
21	Difficulties in hiring competent staff	□1 □2 □3 □4 □5
22	Hostility of society towards engagement of women in businesses	□1 □2 □3 □4 □5
23	Non-cooperation of male counterparts	□1 □2 □3 □4 □5
24	Difficulty in dealing with males	□1 □2 □3 □4 □5
25	Weak bargaining position	□1 □2 □3 □4 □5
26	Harassment	□1 □2 □3 □4 □5
27	Sex discrimination	□1 □2 □3 □4 □5
28	Cultural and traditional aspects	□1 □2 □3 □4 □5
29	Difficulties in attracting customers	□1 □2 □3 □4 □5
30	Unavailability of unique selling points	□1 □2 □3 □4 □5
31	Difficulties to find appropriate markets	□1 □2 □3 □4 □5
32	Unfavorable market behaviors	□1 □2 □3 □4 □5
33	Too much competition	□1 □2 □3 □4 □5
34	Difficulties to maintain customers	□1 □2 □3 □4 □5

THE ASSESSMENT OF CUSTOMER LOYALTY IN MOBILE INDUSTRY IN CAMBODIA

Dr. SAU Lay[29] and CHHAY Phang[30]

Abstract

Purpose-In *competitive market, maintaining and expanding current market share of a firm are very challenging issues. One strategy to overcome the issues is to make customer loyal to its company. The aim of this study is to investigate factors influencing customer loyalty in mobile phone industry.*

Design/methodology/approac*h –A dropped off survey involving 304 respondents was conducted, followed by structural equation modeling analysis, which yielded strong evidence in support of our proposed research model.*

Findings *– The results confirmed that service quality serves as important ante- cedents of perceived trust, corporate image, customer satisfaction, and customer loyalty among mobile phone subscribers; whereas, system quality tend to be influenced only on perceived trust.*

Practical implications *–The results of this study can assist mobile telecommuni- cation service providers in understanding the critical determinants that influence mobile phone subscribers' decisions to be loyal to current service. Besides system quality, the results suggest that service providers should also improve service quality, image, and trust to reflect users concern about the service beyond the current level.*

Future Research*– sample frame included only business students at the National University of Management (NUM) with a convenient sampling method. The sample frame in future research could be extended to other universities or mobile subscribers with other sampling techniques.*

Keywords*–System quality, service quality, perceived trust, corporate image, customer satisfaction, customer loyalty, mediating effect and structural equation modeling.*

Paper Type*– Research paper*

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INTRODUCTION

The world is seeing a rapid technology migration to both higher speed mobile broadband networks and the increased adoption of smartphones and other connected devices. Mobile broadband connections will account for almost 70% of the global base by 2020, up from just under 40% at the end of 2014 (GSMA 2015). With a supportive regulatory framework, the mobile sector will continue to drive socio-economic progress, benefiting individuals, companies and governments alike. In addition to the direct and indirect contribution to GDP by mobile operators and the wider ecosystem, an estimated 2.2% of global GDP can be attributed to the increased productivity created by the widespread use of mobile technology. Mobile technology has transformed the way in which economic activity is carried out in virtually all the sectors of the global economy, allowing more efficient ways for worker s and businesses to communicate and access information. Additionally, governments also have a role to play in encouraging innovation, and policymakers can help the mobile industry build the necessary trust and confidence in the digital economy. As result, investment will increases, the economy will expand, creating prosperity and new jobs. In effect, economic expansion will put firms in the strong competition. Customers' loyalty is considered as a tool of competitive advantage. It brings benefits not only to customers, but also to manufacturers, commercial intermediaries, society, and, of course, brand owners (Denoue and Saykiewicz 2009).

Mobile phone industry in Cambodia has strong expansion and competition. Obviously, in 2015, there was about 94% of Cambodians owning their own phones (Phong and Solá 2015) and nine players competing in this industry (McLeod 2009). Strong promotion increasingly heats up cause some subscribers to switch from one supplier to other suppliers. Consequently, some firms went out of business (i. e., Mfone company), some firms strongly remain in the industry. To counter the completion issues, customer loyalty is seen to be critical factor to the success of business organizations because attracting new customers is more expensive than retaining existing ones. Many argue that loyalty of customers is always important for companies to generate profit. In such a scenario, it is momentous to know about the services delivered by telecom operators' influence on user's loyalty.

OBJECTIVES OF RESEARCH

- To identify factors associated with mobile satisfaction and loyalty
- To determine significant factors contribute to mobile satisfaction and loyalty
- To determine an appropriate mobile satisfaction and loyalty in Cambodia.

SIGNIFICANCE OF RESEARCH

- Business organizations can build organization image, customer satisfaction and lo alty.
- As results, they can gain competitive advantages in the mobile industry.
- Researchers can base on this model or result to extend next research.

LITURATURE REVIEWS AND HYPOTHEIS DEVELOPMENT

Research on mobile loyalty has been well investigated in different countries, especially developed and developing countries with different dimensions. Among academy as in business practice, there is an overwhelming agreement that among the most important determinants of brand loyalty and customer satisfaction. One can make a statement that satisfaction makes a positive influence on customer attachment to the brand, makes necessary conditions to create loyalty, but it is not enough. An important determinant in this stage of loyalty is perceived superiority of a product or service resulting from the quality of the product, quality of service and quality of the marketing communication process (Denoue and Saykiewicz 2009). Additionally, Roostika (2011) stressed that service Quality and trust are important dimensions in the mobile internet industry, particularly in predicting loyalty as identified by numbers of past research.

Quality of System (SYQ)

According to Roostika (2011), service Quality and trust are important dimensions in the mobile internet industry, particularly in predicting loyalty as identified by numbers of past research . Author further stressed that trust has stronger effect on loyalty than service quality. Without service quality, it will be impossible to build customer's trust. He also found that indirect process from service quality to trust and then to loyalty. This results is confirmed by Quoquab, Basiruddin et al. (2013). Additionally, the authors found that perceived service quality and corporate image both found to be significant predictors of

trust. Another study by Mohd, Maiyaki et al. (2011) found that both service quality and customer satisfaction significantly affect the level of customer loyalty of mobile phone users in Malaysia. Another author suggested that in order to improve the trustworthiness, they need to work upon their marketing strategy to further improve their network quality John (2011). Wahab, Zahari et al. (2011) found that that privacy was positively significant towards customer loyalty, and they also suggested that the mobile service provider has to ensure their services fully satisfied their customer privacy. Therefore, based on the above literature and the proposed model, we propose the following hypotheses:
H5: Service quality has a positive effect on customer satisfaction H6: Service quality has a positive effect on customer loyalty
H7: Service quality has a positive effect on corporate image H8: Service quality has a positive effect on customer trust

Corporate Image (CM)

The advantages and benefits of a strong, valuable brand mentioned above may contribute to the creation of an attractive competitive advantage for a firm. Often this type of competitive advantage related to customers' loyalty based on brand attractiveness helps the firm to dominate the market in a given product category and achieve above average profitability. (Denoue and Saykiewicz 2009). A good brand image is impacted positively on entire customer variable: customer satisfaction, loyalty, perceived quality and commitment to a market offering and not necessarily on one or few of the variables (Miryala 2011). Recent research of Tabaku and Çerri (2015) on loyalty in telecommunication industry in Albania confirmed that image impacted positively on customer loyalty. With arguments discussed in the literature, we propose the following hypotheses:
H9: Corporate image has a positive effect on customer trust H10: Corporate image has a positive effect on customer loyalty

Perceived Trust (PT)

Pantano and Pietro (2012) defined trust is a psychological state involving the intention to accept vulnerability of a positive expectations another behavior. In regarding to Internet, Kim and Benbasa (2003) view "trust" as (1) providing assuring information reported by other, (2) Providing assuring information about store policies and practices (such as information to protect privacy or security), (3) utilizing trust transfer (such as a reputable site influence consumers' perceptions), and (4) providing opportunities for interaction and cues for simple examination (such as receiving e-mail for a confirmation of an order protection of personal information, return policy). The management of customer trust is especially important. In order to trust a service, customers should

perceive the quality as being positive. In the integrated model, Roostika (2011) found that trust had positive effect on loyalty. The indirect effect should be taken into account, where there is an indirect process from service quality to trust and then to loyalty. Similar result, Quoquab, Basiruddin et al. (2013) also found that trust was significant prediction of service loyalty. Furthermore, trust partially mediates the relationship between perceived service quality and service loyalty as well as between corporate image and service loyalty. Base on this argument, the following hypothesis could be proposed:

H11: Perceived trust has a positive effect on customer satisfaction H12: Perceived trust has a positive effect on customer loyalty

Customer Satisfaction (CS) and Loyalty (CL)

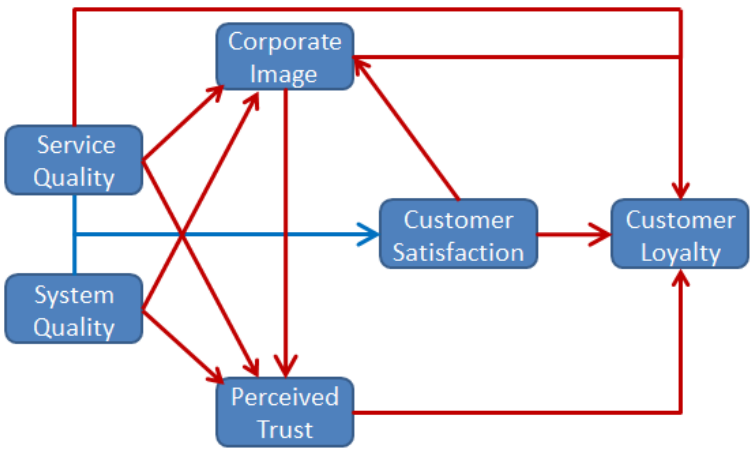
Oliver defines loyalty as "A deeply held commitment to re-buy or re-patronize a preferred product or service in the future despite situational influences (cited by Kotler, 2000). Pantano and Pietro (2012) define satisfaction is a feeling emerging from the consumers' experience with a product. This construct measures the assessments of the experience including overall pleasure related with the service received. The customer satisfaction plays important role to enhance the level of customer loyalty. This means the higher the level of customer satisfaction the more loyal the customer of mobile phone become and the reverse is the case (Mohd, Maiyaki et al. 2011). This result later is confirmed by Tabaku and Çerri (2015), who found that there were positive customer satisfaction on loyalty and the same time it also has a positive impact on corporate image. In contrast, Ishaq (2012) found that service quality and corporate image on customer loyalty. The results showed that corporate image has no influence in promoting customer loyalty in telecommunication industry of Pakistan whereas service quality got high importance by the customers. Based on the literature review, we thus propose the following hypotheses:

H13: Customer satisfaction has a positive effect on corporate image H14: Customer satisfaction has a positive effect on customer loyalty

RESEARCH FRAMEWORK

This study re-examined the integrated model as previously developed byTabaku and Çerri (2015), Quoquab, Basiruddin et al. (2013), and Wang and Lin (2012). In a investigation on customer loyalty in telecommunication industry, Tabaku and Çerri (2015) included four constructs such as service quality, image, satisfaction, and loyalty, but without trust construct. Whereas, Quoquab, Basiruddin et al. (2013) also inclued four constructs (loyalty, image, trust and serivice quality), but without "satisfaction" construct. The two model was integrated to form a proposed research model as showed in Figuure 1, but with additon of a new construct, namely "system quality" was adapted from Wang and Lin (2012) because the author investigated on value added on mobile phone. Moreover, sercurity, and privacy items were adopted from Ion and Alin (2011). Because, the contextual gap in measurement image construct, three new items were added into the construct, namely, respect employees' interest, solving any problem of current customers timely, respect relevant regulations and laws, to reflect reality in this domain.

Figure 1. Conceptual Framework



RESEARCH METHODOLOGY

Construct Operationalization

The operationalization of research constructs was implemented by using validated items from prior research. Service quality was measured by ten items, image was measured by five items, satisfaction was measured by four items and loyalty was measured by five items, developed by Tabaku and Çerri (2015),and Quoquab, Basiruddin et al. (2013). System quality was measured by five items adapted from Wang and Lin (2012) and Ion and Alin (2011).

Instrument Validation

The questionnaire was designed using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Because the items were originally developed in English, they were first translated into Khmer and then distributed to respondents (instructors). A pilot test was then performed by distributing the questionnaire to a sample of 100 students at the National University of Management (NUM). Of the 100 responses, 15 were discarded because the answers were either incomplete or invalid. The remaining 85 responses were preserved, resulting in an effective response rate of 85 percent. A confirmatory factor analysis was performed to examine the measurement model. The composite reliability values of the constructs all surpassed 0.7. Since the average variance extracted (AVE) values were larger than 0.50 and the factor loadings of the all items were significant and higher than 0.7, and (Hair, Black et al. 2006; Meyers, Gamst et al. 2013), the results demonstrate a satisfactory convergent validity of measurement.

Data Collection

The population in this study is all mobile phone subscribers in the country; it is very large and very difficult to reach. A convenient sampling and survey method were adopted. A total of 300 questionnaires were distributed to bachelor and master degrees during semester two, and then 300 responses were collected, among which 43 were discarded for being either incomplete or invalid. Thus, 257 valid responses were considered valid, and, yielding a response rate of 85.67 percent.

DATA ANALYSIS

Sample characteristics

The 257 respondents consist of 138 males (53.70 percent) and 119 females (46.30 percent) (see Table I). A large portion of these respondents hold Bachelor's degree (54.45 percent) and Master's degrees (41.63 percent) and they mainly range from 26 to 35years old (86.2 percent). Additionally, most of the respondents' income range from 250 dollars to 500 dollars (33.85%).

Table 1.Respondent Profiles

Demographic	Frequency	Valid Percent
Gender		
Male	138	53.70%
Female	119	46.30%
Total	257	
Age		
18-25 years	109	42.41%
26-35 years	129	50.19%
36-45 years	17	6.61%
46-55 years	2	0.78%
Total	257	
Education Level		
Bachelor Degree	140	54.45%
Master Degree	117	45.55%
Total	257	
Income Level		
Less than $100	25	9.73%
From $100 to	67	
From $250 to	87	
From $500 to	31	
From $750 to	15	
From $1000 to	17	
More than $1500	15	5.84%
Total	257	

Descriptive Analysis

The descriptive statistics (see Table 2) show that the means of each construct range from 4.70 to 4.80 (between 4: neutral and 5: slightly agree): The system quality (SYQ), service quality (SQ), corporate image (CM), perceived trust (PT), and customer satisfaction, has a score of 4.78, 4.82, 4.70, 4.77 and 4.78, respectively. These numbers indicate that the system, service, image, trust and degree of satisfaction are still limited in this industry. Additionally, customer loyalty (CL) had a score of 4.84 (see Table 2). These numbers lie between neutral slightly loyalty. Therefore, the initial assessment is that the degree of customer loyalty in the mobile phone is uncertainty.

Table 2. Descriptive Statistics of Variables

Variable Name	No of Items	Mean (Std.Dev.)	Reliability
SYQ	5	4.78(1.220)	88.90%
SQ	10	4.82(1.080)	84.50%
CS	4	4.70(1.090)	83.00%
CM	5	4.77(1.080)	81.20%
PT	5	4.78(1.171)	84.80%
CL	5	4.84(1.050)	82.00%

The Measurement Model

There are two steps in structural equation modeling analysis; measurement model or CFA, and path analysis (Meyers, Gamst et al. 2013). The assessment criteria for measurement model for current study are followed suggestions by Kline (2011) and a cutoff value of indices are followed a suggestion by Hu and Bentler (1999) and Bentler (1999). After CFA, fit indices in Table 3 are relatively good: CMIN/df ratio of 1.903 (<2); p-value of 0.055, after bootstrap (>0.05); comparative fit index (CFI) of 0.943 (CFI>0.90); Tucker-Lewis index (TLI) of 0.952 (TLI>0.95) and root mean square error of approximation (RMSEA) of 0.055 (<0.08). Therefore, CFA analysis would be conducted.

Table 3. Goodness of Fit Analysis - Measurement and Structural Models

Final Models	Confirmatory Factor Analysis (CFA)	CFA Fit	SEM Fit
Item Remain	37	24	24
CMIN	936.059	304.136	304.136
df	513	239	239
CMIN/df	1.825	1.273	1.273
p-value	0.000	0.003	0.003
GFI	0.822	0.910	0.910
CFI	0.899	0.975	0.975
TLI	0.889	0.971	0.971
RMSEA	0.057	0.033	0.033
Bollen-Stine bootstrap p-value	0.007	0.212	0.212

Table 3 shows that before fitness, CFA contains 37 items (see Appendix), after fitness both measurement and structural models remain only 24 items, GFI of 0.91 (GFI>0.90), CFI of 0.97 (CFI>0.95), TLI of 0.97 (TLI>0.95), RMSEA of 0.03 (RMSEA <0.08) and p-value after bootstrap of 0.21 (p>0.05). In sum of these fit indices indicate that the measurement and structural models are fit for further analysis.

Table 4 reveals that all factors loading and average variance extracted are greater than 0.50, and construct reliability are greater than 0.70. Because all of the values are above the recommended level of 0.7 Meyers, Gamst et al. (2013) and, the reliability of the measures is assured. The AVE values for all constructs values are greater than 0.5 and greater than their correspondent value of correlation square values (see Table 5 and 6), are indicated that the convergent validity supported. Therefore, all measures under SEM are satisfied for further analysis.

Table 4. Construct Validity: Factor Loading, Variance Extracted, and Construct Reliability

Observe Variables	Std. Regression Weight	SMC	Error	AVE	CR
Customer Loyalty (CL)					
CL1	0.843	0.711	0.289	**0.57**	**0.844**
CL2	0.754	0.569	0.431		
CL3	0.632	0.399	0.601		
CL4	0.795	0.632	0.368		
CS1	0.779	0.607	0.393	**0.52**	**0.848**
CS2	0.733	0.537	0.463		
CS3	0.765	0.585	0.415		
CS4	0.728	0.530	0.470		
CS5	0.619	0.383	0.617		
Image (IM)					
IM3	0.747	0.558	0.442		
IM4	0.767	0.588	0.412		
IM5	0.838	0.702	0.298		
IM6	0.723	0.523	0.477		
IM7	0.641	0.411	0.589		
IM8	0.838	0.702	0.298		
Service Quality (SQ)					
SQ1	0.823	0.677	0.323	**0.50**	**0.861**
SQ2	0.590	0.348	0.652		
SQ3	0.762	0.581	0.419		
SQ4	0.544	0.296	0.704		
SQ5	0.615	0.378	0.622		
SQ6	0.860	0.740	0.260		
SQ7	0.570	0.325	0.675		
System Quality (SYQ)					
SYQ2	0.707	0.500	0.500		
SYQ3	0.822	0.676	0.324		
SYQ4	0.844	0.712	0.288		

SYQ5	0.817	0.667	0.333		
SYQ6	0.690	0.476	0.524		
Trust (TR)					
TR2	0.738	0.545	0.455		
TR3	0.752	0.566	0.434		
TR4	0.722	0.521	0.479		
TR5	0.741	0.549	0.451		

Table 5. Correlation Square Matrix among variables

Variable	SYQ	SQ	CS	IM	TR	
SYQ	1.000					
SQ	0.060(**.004**)	1.000				
CS	0.097(**.009**)	0.533(**.284**)	1.000			
IM	0.071(**.005**)	0.608(**.370**)	0.534(**.285**)	1.00		
TR	0.430(**.185**)	0.477(**.228**)	0.345(**.119**)	0.448(**.201**)	1.000	
CL	0.093(**.009**)	0.658(**.433**)	0.504(**.254**)	0.588(**.346**)	0.549(**.301**)	1.000

Table 6. Average Variance Extracted (AVE) Matrix of Variables

Variable	SYQ	SQ	CS	IM	TR	CL
SYQ	1.00					
SQ	0.54	1.000				
CS	0.55	0.516	1.000			
IM	0.53	0.502	0.514	1.000		
TR	0.55	0.516	0.529	0.514	1.000	

Structural model

Direct Effect Assessment

Table 7 shows the summary results of the structural model analysis. Overall, the research model is supported and explains 55.3 percent of the variance in customer loyalty. In addition, the model explains 42.4 percent of the variance in consumer trust, 43.2 percent of variance in corporate image, and 29 percent of the variance in customer service. System quality has no effect on customer satisfaction (H1), system quality has no effect on customer loyalty (H2), and system quality has also no effect on corporate image (H3), however, system quality has a significant effect on customer trust (H4) at the $p<0.01$ level. Meanwhile, service quality has a significant effect on customer satisfaction (H5) at the $p<0.01$ level, customer loyalty (H6) at the $p<0.01$ level, corporate image (H7) at the $p<0.01$ level, and customer trust (H8) at the $p<0.01$ level. Similarly, corporate image has significant effect on customer trust (H9) at p-value of 1.3 percent, and has also significant effect on loyalty (H10) at p-value of 2.3 percent. Interestingly, customer trust has also a significant effect on loyalty (H11) at the $p<0.01$. Customer satisfaction has a significant effect on corporate image (H12) at the $p<0.01$, however, it has no effect on customer loyalty (H13) at 5 percent significant level ($p=0.07$).

Table 7. Direct Hypothesis

Relationship Between							**Hypothesis**
Endo.	**and**	**Exgo.**	**Estimate**	**S.E.**	**C.R.**	**P**	**Label**
CS	**<---**	**SQ**	0.53	0.086	7.137	***	Sig.
CS	**<---**	**SYQ**	0.067	0.071	1.013	0.311	InSig.
IM	**<---**	**CS**	0.291	0.084	3.829	***	Sig.
IM	**<---**	**SQ**	0.452	0.100	5.774	***	Sig.
IM	**<---**	**SYQ**	0.015	0.071	0.258	0.796	InSig.
TR	**<---**	**IM**	0.229	0.075	2.485	0.013	Sig.
TR	**<---**	**SQ**	0.315	0.100	3.296	***	Sig.
TR	**<---**	**SYQ**	0.395	0.076	5.071	***	Sig.
CL	**<---**	**CS**	0.131	0.079	1.805	0.071	InSig.

CL	**<---**	**SQ**	0.341	0.111	3.858	***	Sig.
CL	**<---**	**TR**	0.292	0.109	3.217	0.001	Sig.
CL	**<---**	**IM**	0.186	0.080	2.280	0.023	Sig.
CL	**<---**	**SYQ**	0.08	0.079	-1.176	0.239	InSig.

Mediate Effect Assessment

In testing mediation effect, the Sobel test was performed to assess whether the indirect effect of the predictor variable on the outcome variable through the mediator variables. The results (see Table 8) suggest that customer satisfaction (H14) and corporate image (H15) do not mediate the relationship between system quality and loyalty; however, customer trust (H16) partially mediated whereas, customer trust, and corporate image partially mediated relationship between service quality and loyalty, but customer satisfaction did not.

Table8. Indirect Hypothesis

Endo.	**Mediate**	**Exgo.**	**Estimate**	**S.E.**	**C.R.**	**P**	**Hypothesis**
SYQ	CS	CL	0.009	0.012	0.88	0.377	Not Mediate
SYQ	IM	CL	0.003	0.013	0.25	0.801	Not Mediate
SYQ	TR	CL	0.115	0.050	2.71	0.007	Partial Mediate
SQ	CS	CL	0.069	0.050	1.74	0.081	Not Mediate
SQ	IM	CL	0.084	0.050	2.11	0.035	Partial Mediate
SQ	TR	CL	0.092	0.050	2.30	0.021	Partial Mediate

DISCUSSION AND CONCLUSION

Base on descriptive data, customer loyalty construct had a score of 4.84, which are lied between 4= neutral and slightly agree. It can be concluded that the customer loyalty in this industry is not strong enough. The derail information contributed to the customer loyalty would be as follows:

There is enough evidence in support of a relationship between service quality and customer satisfaction, and corporate image, and customer trust, and customer loyalty. This means that good service quality could build higher customer satisfaction, higher corporate image and higher customer trust. These results were conformed to those of Roostika (2011), Quoquab, Basiruddin et al. (2013), Mohd, Maiyaki et al. (2011), John (2011). Whereas, the lack of evidence in support of a relationship between system quality and customer satisfaction, and customer loyalty, in contrast to those presented by Wang and Lin (2012), may result from the contextual factors of this particular study. Wang and Lin (2012) studied in mobile value added context and investigated relationship between system quality both the perceived usefulness and perceived ease of use of services, whereas this study is investigated relationship between system quality and customer satisfaction. However, the study found that system quality had significant effect on customer trust. This means that in order to build customer trust it has to build quality of system.

Interestingly, there is also enough evidence in the support of a relationship between corporate image and both customer trust, and customer loyalty. This means that good corporate image could build both high trust and strong customer loyalty. These results were conformed to those of Tabaku and Çerri (2015) Miryala (2011). In addition, not only service quality and corporate image could build loyalty, customer trust could also build loyalty. The result is conformed to that of Roostika (2011) and , Quoquab, Basiruddin et al. (2013).

Finally, customer satisfaction was found to be impacted on loyalty. This means that higher satisfaction is stronger loyalty and also stronger corporate image. The result is confirmed that of Mohd, Maiyaki et al. (2011). The summarized final research model is showed in Figure 2.

MANAGERIAL IMPLICATION

With strong completion, mobile telecommunications service providers have urgently sought to maintain their sources of revenue. Under such intense pressure, customer loyalty has become a promising opportunity for stable revenue. Therefore, it is important to determine how to convince current subscribers to use the mobile phone in a sustained manner. There are four methods to do this.

- First, mobile service provider has to build good service quality with current subscribers, by providing high availability, reliability, adaptability, accessibility, and quick response time. In addition, the employees of mobile operators have to understand customers' need and want, and provide the service with friendly manner.Second, mobile service provider has to build positive image in customer mind by taking social responsibility seriously, solving any problem of current customers timely, respect employees' interest, regulations and laws.
- Third, mobile service provider has to increase customer trust by increasing service quality, building good image.
- Finally, mobile service provider has to customer satisfaction by improving its service and system quality.

FUTURE RESEARCH

Current study has several limitations. First, sample frame included only business students at the National University of Management (NUM) with a convenient sampling method. The sample frame in future research could be extended to other universities or mobile subscribers with other sampling method. Second, future research could be investigated group invariance of demographic factor such as gender, income, education, and age.

APPENDIX

Sources of Constructs and Items B1. System Quality (SYQ)

Code	*To what extend do you believe the following statements are valid in your opinion*	*Sources: Adopted/Adapted*
SYQ1	*Mobile system keeps transactions error-free.*	*(Wang and Lin 2012)*
SYQ2	*Mobile system has fast response.*	
SYQ3	*Call clarity on my network is high.*	
SYQ4	*The rate of call failure on my network is low.*	
SYQ5	*Network coverage is strong enough.*	
SYQ6	*The overall network quality of the mobile operator is very good*	

B2. Service Quality (SQ)

Code	*To what extend do you believe the following statements*	
SQ1	*The employees of the mobile operator are friendly*	*(SQ) (Nasir, Mushtaq et al. 2014), (Ishaqa 2012) , (ADELEKE and AMINU 2012)*
SQ2	*The employees of the mobile operator show that they understand*	
SQ3	*The employees of the mobile operator have enough knowledge to*	
SQ4	*The services offered from the mobile operator fulfill my personal*	
SQ5	*The access with contact centers /customer service is easy*	
SQ6	*Overall, the service quality of the mobile operator is very good*	
SQ7	*Overall, the service quality of the mobile operator is superior to*	

B3. Customer Satisfaction (CS)

Code	***To what extend do you believe the following statements are valid in your opinion***	
CS1	*I am satisfied with the services of this mobile operator*	*(Nasir, Mushtaq et al. 2014), (Turel and Serenko 2006)*
CS2	*I am satisfied with the interactive process between mobile*	
CS3	*Overall, I am satisfied with the service quality offered by this mobile operator*	
CS4	*This mobile operator meets my expectations from mobile*	
CS5	*System quality meets my expectation*	
CS6	*I am satisfied with the network coverage*	

B4. Image (IM)

Code	***To what extend do you believe the following statements are valid in your opinion***	
IM1	*This mobile operator is innovative and forward looking*	*(Ishaqa 2012), (ADELEKE and AMINU 2012)*
IM2	*This mobile operator has a positive image in customers mind*	
IM3	*This mobile operator takes social responsibility seriously*	
IM4	*This mobile operator is firmly established*	
IM5	*This mobile operator is leader in Cambodia telecommunication sector*	
IM6	*Respect employees' interest*	
IM7	*Solving any problem of current customers timely*	
IM8	*Respect relevant regulations and laws*	

B5. Trust (TR)

Code	***To what extend do you believe the following statements are valid in your opinion***	
TR1	*I trust this Telephone Service Provider (TSP)*	*(Quoquab, Basiruddin et al. 2013), (Nasir, Mushtaq et al. 2014),*
TR2	*I feel that I can rely on this TSP to serve well*	
TR3	*I trust the billing system*	
TR4	*I believe that I can trust this SP that it will not try to cheat me*	
TR5	*This TSP is reliable because it is mainly concerned with the*	

B6. Customer Loyalty (CL)

Code	***To what extend do you believe the following statements are valid in your opinion***	
CL1	*I will go on using the same mobile operator*	(*Ishaqa 2012), (Quoquab, Basiruddin et al. 2013), (Nasir, Mushtaq et al. 2014), (ADELEKE and AMINU 2012*)
CL2	*I will encourage my friends to use this mobile operator*	
CL3	*For similar products, I'm ready to pay more on this company*	
CL4	*My preference for services of this company will not change even*	
CL5	*Even if other operators billing is cheaper, I'll go on using this*	

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CONSUMER BEHAVIOR ON FACEBOOK ADVERTISEMENT PHNOM PENH, CAMBODIA

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Abstract

Consumers have been influenced to purchase products or services by different media advertisements adopted by companies and shops. However, researchers chose only Facebook Advertisment for their studies. In this study, researchers found that among the 227 respondents, there were 132 (58.1%) males and 95 (41.9%) females. Respondents mostly came from the Age Group of 30-39 (68%), from the Education of Undergraduate (54.2%), from Employee (55.9%), and from the Income Group of 100-500 (62.1%). Furthermore, the Devices that consumers mostly used to log-in Facebook is mobile phone (52.9%). Majority of them have used Facebook for more than 5 years (39.2%), and most of them have used Facebook Daily (88.5%). The hours that they have spent per Log in Facebook is Less than 1 hour (74.9%), and the Hours that they have spent for using Facebook per Day is Less than 1 hour (40.1%). In addition, the Products that they mostly have bought through Facebook Advertisement are Clothes (57.7%). What is more, consumers are interested in Facebook advertisement higher than the average a little bit, and they are somewhat influenced by the Content of Facebook adveretisement. However, consumers have less motivation and reliability by Facebook advertisement, but they have nearly somewhat believe in Facebook advertisement. It is suggested that future researchers should extend the sample size to other cities and provinces, and use other statistic tools to improve the data analysis.

Key Words: *Consumer, Advertisement and Facebook Advertisement*

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Introduction

Since the introduction of Facebook in 2004 the rapid growth of online social networking sites has changed the purpose and functionality of the Internet (Kelley, Kerr & Drennan, 2010). Facebook is today the biggest social networking site with more than 800 million users and is estimated to reach one billion users around the world by August 2012 (Wasserman, 2012). As cited by Zephoria Digital Marketing (2016), there are over 1.71 billion monthly active Facebook users (Facebook MAUs) which is a 15 percent increase year over year in the world.

With the rapid development of information technologies worldwide in the past decade, advertisers are increasingly relying on various modes of interactive technology to advertise and promote their products and services. (Yaakop & Hemsley-Brown, 2011).

However, currently as per July 2015, there are 2,900,000 Facebook users in Cambodia, that's quite a lot and it increases by +70% from last year as per August 2014 it was 1,700,000 users. Male users are 1,800,000 (62%), but female users are 1,100,000 (38%) (Syahabi Rofi, 2015).

Founder of Social Media Plus Anthony Galliano said more and more companies operating in Cambodia are realising the value of targeted marketing strategies through social media networks such as Facebook. "Advertising on Facebook has increased dramatically and you can see that by the cost per click now which has probably tripled from when we first started six months ago," Galliano said. From fast food outlets to female beauty products and financial services, companies can target their audiences in greater detail than ever before and carefully tailor their message to support a specific advertising strategy. Cambodia General Manager of Market Research company Indochina Research, Laurent Notin, said that half of Cambodia's internet users are accessing the internet daily, and they are taking notice of online advertising (Daniel de Carteret, 2013).

1 INTRODUCTION

With the rapid increase of Facebook users in Cambodia, many companies have changed their advertising strategies to target their customers. However, no one knows how consumers behave on Facebook advertisement.

2 Research Questions

The research questions for this research are as follows:

- How do consumers behave on Facebook?
- What are the products or services that consumers bought through Facebook advertisement? And
- How do consumers behave on Facebook advertisement?

3 Research Objectives

The objectives of this research are to:

- Find out how consumers behave on Facebook
- Identify the products or services that consumers bought through Facebook advertisement, and
- Find out how consumers behave on Facebook advertisement.

4 Significance of Research

This study provides many benefits. First, companies can use these research findings to change their advertising strategy to attract new customers. Second, new entrepreneurs can find this information as the means to promote their businesses. Third, researchers can get more information related to Facebook advertising for their future research.

4.1 Limitations

This research is carried out in Phnom Penh only. The study focuses on local consumer behavior towards Facebook and Facebook advertisement.

5 Literature Review

Advertising

Advertising is the core idea that is presented in non-personal ways to create purchase intention. Srinivasa (2008) define advertisement as "the sharing of information about products in a non-personal way usually paid by a sponsor through different media". Similarly, Ayanwala et al., (2005) define it as "a non-personal paid form of communication, where ideas, concepts, products or services, and information, are promoted through media (visual, verbal, and text) by an identified sponsor to persuade or influence behavior". Bishnoi and Sharma (2009) emphasized the inherent characteristics of advertisement and suggested that popularity is the aim of advertisement.

Facebook Advertising

Facebook is type of social media, where people with common interest shares their ideas and comments in a virtual environment (Weber, 2009). Facebook advertising enables customers to share their experience, ideas, interest and useful information about a brand. Facebook advertising is useful in the sense that it is interactively helpful in collecting feedback and demographic information of targeted customers. In current business environment, Facebook advertising is an effective source to reach targeted customers (Sendberg, 2010).

Facebook advertising provides the opportunity to build up your brand and engages with customers on a large social network. Facebook advertising is done to create likeness, attraction and influence buying behavior in positive way. Attitude-towards-the ads, is an interesting theory of advertising often used to understand the buying behavior. Effective advertisement influences the attitude towards brand and finally leads to purchase intention (Goldsmith & Lafferty, 2002). Ideally, consumers buying behavior is the products purchase decision (Adelaar et al., 2003).

Social media particularly Facebook has become a marketing channel to reach target market. According to a study, "Expand your Brand Community Online" social media has become a significant marketing channel to reach directly targeted customers and engages them with company brands (Hanlon et al., 2008). For example, Audi (German automobile company) and Dunkin' Donuts (American consumers' product company) are using social media for direct interactions with customers. Audi has established corporate relations with their fans on Facebook (Wasserman, 2011). Similarly, Proper Cloth, New York based company, has created its page on Facebook to post news of their business and pictures of clothes. All its Facebook fans receive their updates in seconds on their Facebook pages. These leading brands have collected consumers on a single platform (i.e. Facebook) and keep them updated at lower cost.

According to Lukka and James (2014), Facebook is an effective source to market your products in a personal way. Facebook has enabled marketers to customize their advertisements for a specific group of people. Marketers target these individual on the basis of demographic information's and mutual interest. Facebook has made it possible to reach these targeted people in cost effective and interesting way instead of traditional marketing channels. Facebook advertisers are using different techniques to effectively convey commercial messages to create purchase decision. Facebook offers better "smart advertising" option that has enabled advertisers to customize all the facts in their ads for viewers corresponding. For example, Facebook and other online communities have enabled Hewlett Packard (HP) to reach customers and helped HP to generate a considerable profit (Mathieson, 2010).

A total of 3,634 members of the Generation Y cohort were surveyed in the Western Cape. A majority of respondents (62.5 %) accessed Facebook by means of both PC and mobile device, habitually logged on to Facebook daily (61.9 %), spent one (48.3 %) to two (27.4 %) hours per session and 75 % updated their profile at least once a week. The sample was marginally dominated by females (55.9 %); a near majority of
the respondents were "born-frees" (45.6 %), and the population groups reflected the ethnicity in the Western Cape with Black (54.9 %) and Colored (25.5 %) in a majority (Rodny, 2015).

Rudaina Othman Yousif (2012) found that advertising messages via Facebook are met with a great interest by users of the website. It means that respondents do show a great deal of interest in advertising messages posted via Facebook. Moreover, it was found that the content of the advertising messages via Facebook is characterized as exciting and appealing, that to say that respondents do find advertising messages on Facebook exciting and appealing. Furthermore, the researcher found that advertising messages via Facebook motivate and urge to buy, but respondents do not tend to encourage their friends to buy products advertised via Facebook, and advertising messages via Facebook do not encourage sample respondents to visit the websites of the companies advertising their products via the website. However, it showed that do you encourage your friends to buy products that advertise to these in advertising messages via Facebook, and advertising messages via Facebook motivate you to visit the companies site to identify their products are weak. In addition, he found that respondents do view the information in advertising messages via Facebook as trustworthy and reliable. What is more, it was also found that respondents do find Facebook to be a successful medium for promotion. Thus, the above dimensions show that sample respondents consider Facebook a successful medium for promotion; they show a great deal of interest in advertising messages posted on Facebook and find the advertising messages on the website to be exciting and appealing, encouraging them to purchase the advertised products.

6 Methodology

6.1 Methods

In this research, researchers have developed questionnaires and produced 365 copies for students to interview consumers and complete these questionnaires. It took them two weeks, the last two weeks of February 2016, to do this work. Upon collecting back all the distributed questionnaires, researchers found that only 62.19% of the questionnaires was useable because some students did not return the questionnaires and some were not completed properly. Then the data was entered into SPSS software Version 16 by a team of experienced students. For data analysis, researchers used Descriptive Statistics: Crosstabulation, Frequencies, Percentage, and Mean for all research objectives.

7 Data Analysis

Demographic Data

Based on Table 1, there were 227 respondents, 132 (58.1%) males and 95 (41.9%) females.

Table 1: Gender

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	132	58.1	58.1	58.1
Female	95	41.9	41.9	100.0
Total	**227**	**100.0**	**100.0**	

According to Table 2, the highest frequency is the Age Group below 30 (66.5%), followed by 30-39 (68%), 40-49 (1.8%) and 50-59 (1.8%).

Table 2: Age Group

Age Group	Frequency	Percent	Valid Percent	Cumulative Percent
Below 30	151	66.5	66.5	66.5
30-39	68	30.0	30.0	96.5
40-49	4	1.8	1.8	98.2
50-59	4	1.8	1.8	100.0
Total	**227**	**100.0**	**100.0**	

In Table 3, the highest frequency of Education is Undergraduate (54.2%), followed by Graduate and Post-graduate (34.4%), Technical/vocational school (4.8%), Senior high school (4.8%), Junior high school (1.3%), and No formal education (0.4%).

Table 3: Education

Education	Frequency	Percent	Valid Percent	Cumulative Percent
No formal education	1	.4	.4	.4
Junior high school	3	1.3	1.3	1.8
Senior high school	11	4.8	4.8	6.6
Technical/vocational school	11	4.8	4.8	11.5
Undergraduate	123	54.2	54.2	65.6
Graduate and Post-raduate	78	34.4	34.4	100.0
Total	**227**	**100.0**	**100.0**	

As shown in Table 4, the highest frequency is Employee (55.9%), then Government official (19.8%), Manager (12.8%), Businessman (7.9%), House wife (1.8%), and Others (1.8%).

Table 4: Occupation

Occupation	Frequency	Percent	Valid Percent	Cumulative Percent
House wife	4	1.8	1.8	1.8
Employee	127	55.9	55.9	57.7
Manager	29	12.8	12.8	70.5
Businessman	18	7.9	7.9	78.4
Government official	45	19.8	19.8	98.2
Others	4	1.8	1.8	100.0
Total	**227**	**100.0**	**100.0**	

Based on Table 5, the highest frequency of Income Group is 100-500 (62.1%), then it is followed by 501-1000 (26.9%), 1001-1500 (4.4%), Below 100 (4%), 1501-2000 (1.8%), and Above 3000 (0.9%).

Table 5: Income Group

Income Group	Frequency	Percent	Valid Percent	Cumulative Percent
Below 100	9	4.0	4.0	4.0
100-500	141	62.1	62.1	66.1
501-1000	61	26.9	26.9	93.0
1001-1500	10	4.4	4.4	97.4
1501-2000	4	1.8	1.8	99.1
Above 3000	2	.9	.9	100.0
Total	**227**	**100.0**	**100.0**	

Behavior on Facebook

According to Table 6, the highest frequency of Devices Used to Log in Facebook is mobile phone (52.9%), followed by mobile phone and computer (44.5%), and computer (2.6%).

Table 6: Devices Used to Log in Facebook

Devices	Frequency	Percent	Valid Percent	Cumulative Percent
Mobile phone	120	52.9	52.9	52.9
Computer	6	2.6	2.6	55.5
Mobile phone and computer	101	44.5	44.5	100.0
Total	**227**	**100.0**	**100.0**	

In Table 7, the highest frequency of the Length of Using Facebook is More than 5 years (39.2%), and then it is followed by 4 years (22%), 3 years (18.9%), 2 years (14.1%), and Less than 1 year (5.7%).

Table 7: Length of Using Facebook

Length	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 year	13	5.7	5.7	5.7
2 years	32	14.1	14.1	19.8
3 years	43	18.9	18.9	38.8
4 years	50	22.0	22.0	60.8
More than 5 years	89	39.2	39.2	100.0
Total	**227**	**100.0**	**100.0**	

As shown in Table 8, the highest frequency of the Times of Using Facebook is Daily (88.5%), 2-4 times/week (10.6%), and 1 time/week (0.9%).

Table 8: Times of Using Facebook

Times	Frequency	Percent	Valid Percent	Cumulative Percent
Daily	201	88.5	88.5	88.5
2-4 times/week	24	10.6	10.6	99.1
1 time/week	2	.9	.9	100.0
Total	**227**	**100.0**	**100.0**	

Based on Table 9, the highest frequency of the Hours per Log in Facebook is Less than 1 hour (74.9%), followed by 1-2 hours (14.5%), 3-4 hours (7%), 5-6 hours (1.8%), and More than 7 hours (1.8%).

Table 9: Hours per Log in Facebook

Hours/Log in	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 hour	170	74.9	74.9	74.9
1-2 hours	33	14.5	14.5	89.4
3-4 hours	16	7.0	7.0	96.5
5-6 hours	4	1.8	1.8	98.2
More than 7 hours	4	1.8	1.8	100.0
Total	**227**	**100.0**	**100.0**	

According to Table 10, the highest frequency of the Hours Using Facebook per Day is Less than 1 hour (40.1%), followed by 1-2 hours (34.4%), 3-4 hours (16.3%), 5-6 hours (4.8%), and More than 7 hours (4.4%).

Table 10: Hours Using Facebook per Day

Hours/Day	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 hour	91	40.1	40.1	40.1
1-2 hours	78	34.4	34.4	74.4
3-4 hours	37	16.3	16.3	90.7
5-6 hours	11	4.8	4.8	95.6
More than 7 hours	10	4.4	4.4	100.0
Total	**227**	**100.0**	**100.0**	

In Table 11, the highest frequency of the Products Bought Through Facebook Advertisement is Clothes (57.7%), then it is followed by Electronics (30%), Others (26.4%), Cosmetics (19.8%), Education (14.5%), Tourism (13.2%), Vehicle (6.6%), Bank (4.4%), Real Estate (4%), and Hospital (1.3%).

Table 11: Products Bought Through Facebook Advertisement

Products Bought	Frequency	Percent	Total
Real Estate	9	4	227
Vehicle	15	6.6	227
Electronics	68	30	227
Cosmetics	45	19.8	227
Clothes	131	57.7	227
Tourism	30	13.2	227
Bank	10	4.4	227
Hospital	3	1.3	227
Education	33	14.5	227
Others	60	26.4	227

Behavior on Facebook Advertisement

As shown in Table 12, the highest Mean is at 3.32 for Interest in advertising message by Facebook as an important source of products and services, then it is followed by 3.30 for Interest in Facebook page, 3.16 for Interest in advertising message by Facebook page, but the lowest one is 3.06 for Interest in getting advertising message by Facebook. Thus, the total Mean for Interest is at 3.21, which means that consumers are interested in Facebook advertisement higher than the average a little bit.

Table 12: Mean of Interest in Facebook Advertisement

	Mean of Content			
Interest in Facebook Advertisement	N	Mean	Std. Deviation	Std. Error Mean
Interest in Facebook page	227	3.3084	.73597	.04885
Interest in getting advertising message by Facebook	227	3.0617	.85997	.05708
Interest in advertising message by Facebook	227	3.1674	.85610	.05682
Interest in advertising message by Facebook as an important source of products and services	227	3.3216	.90114	.05981
Total Mean of Interest	**227**	**3.2148**	**.62123**	**.04123**

Based on Table 13, Attractive content message has higher Mean at 3.11 than Persuasive content message at 3.03. So, the total Mean of the Content of Facebook advertisement is at 3.07, which means that the Content of Facebook advertisement is somewhat influential to consumers.

Table 13: Mean of Content of Facebook Advertisement

Mean of Content

Content of Facebook Advertisement	N	Mean	Std. Deviation	Std. Error Mean
Attractive content message	227	3.1145	.68169	.04525
Persuasive content message	227	3.0396	.88908	.05901
Total Mean of Content	**227**	**3.0771**	**.64971**	**.04312**

According to Table 14, Advertised message by Facebook motivated you to go to company website has the Mean at 2.98 higher than Advertising message by Facebook motivated you to discuss with your friends at 2.94, Advertising message by Facebook motivated you to buy products or services at 2.86, You bought products or service because of advertisement by Facebook at 2.66, and You motivated your friends to buy products or services advertised by Facebook at 2.45. Therefore, the overall Mean for Motivation by Facebook advertisement is 2.78, which means that respondents are less motivated by Facebook advertisement.

Table 14: Mean of Motivation by Facebook Advertisement

Mean of Motivation

Motivation by Facebook Advertisement	N	Mean	Std. Deviation	Std. Error Mean
Advertising message by Facebook motivated you to discuss with your friends	227	2.9471	.77962	.05175
Advertising message by Facebook motivated you to buy products or services	227	2.8634	.83286	.05528
You bought products or service because of advertisement by Facebook	227	2.6696	.89793	.05960

You motivated your friends to buy products or services advertised by Facebook	227	2.4537	.86286	.05727
Advertised message by Facebook motivated you to go to company website	227	2.9868	.93354	.06196
Total Mean of Motivation	**227**	**2.7841**	**.66046**	**.04384**

In Table 15, Information advertised about companies, products or services is reliable has the Mean at 2.60 higher than Reliable on advertised message by Facebook at 2.55. Thus, the total Mean is at 2.57, which means that consumers have less reliability on Facebook advertisement.

Table 15: Mean of Reliability on Facebook Advertisement

Mean of Reliability

Reliability on Facebook Advertisement	N	Mean	Std. Deviation	Std. Error Mean
Reliable on advertised message by Facebook	227	2.5507	.72919	.04840
Information advertised about companies, products or services is reliable	227	2.6035	.76516	.05079
Total Mean of Reliability	**227**	**2.5771**	**.67967**	**.04511**

As shown in Table 16, you believed that advertised message by Facebook represented media for promotion all has the Mean at 3.04 higher than You believed that advertised message by Facebook represented successful media for all at 2.92. Overally, the total Mean of believe in Facebook advertisement is at 2.98, which means that consumers have nearly somewhat believe in Facebook advertisement.

Table 16: Mean of Believe in Facebook Advertisement

	Mean of Believe			
Believe in Facebook Advertisement	N	Mean	Std. Deviation	Std. Error Mean
You believed that advertised message by Facebook represented successful media for all	227	2.9295	.81162	.05387
You believed that advertised message by Facebook represented media for promotion all	227	3.0441	.79143	.05253
Total Mean of Believe	**227**	**2.9868**	**.74359**	**.04935**

8 Findings and Discussion

8.1 Findings

The researchers found that there were 227 respondents, 132 (58.1%) males and 95 (41.9%) females. In addition, the highest frequency is below 30 (66.5%) for the Age Group, undergraduate (54.2%) for Education, employee (55.9%) for Occupation, and 100-500 (62.1%) for Income Group.

Moreover, it was also found that the highest frequency of Devices Used to Log-in Facebook is mobile phone (52.9%). Moreover, the highest frequency is more than 5 years (39.2%) for the Length of Using Facebook, daily (88.5%) for the Times of Using Facebook, less than 1 hour (74.9%) for the Hours per Log in Facebook, less than 1 hour (40.1%) for the Hours Using Facebook per Day, and clothes (57.7%) for the Products Bought Through Facebook Advertisement.

In addition, the researchers found the behavior of consumer on Facebook advertisement as follows:

Firstly, the highest Mean is at 3.32 for Interest in advertising message by Facebook as an important source of products and services, then it is followed by 3.30 for Interest in Facebook page, 3.16 for Interest in advertising message by Facebook page, but the

lowest one is 3.06 for Interest in getting advertising message by Facebook. Thus, the total Mean for Interest is at 3.21, which means that consumers are interested in Facebook advertisement higher than the average a little bit.

Secondly, attractive content message has higher Mean at 3.11 than Persuasive content message at 3.03. So, the total Mean of the Content of Facebook advertisement is at 3.07, which means that the Content of Facebook advertisement is somewhat influential to consumers.

Thirdly, advertised message by Facebook motivated you to go to company website has the Mean at 2.98 higher than Advertising message by Facebook motivated you to discuss with your friends at 2.94, Advertising message by Facebook motivated you to buy products or services at 2.86, You bought products or service because of advertisement by Facebook at 2.66, and You motivated your friends to buy products or services advertised by Facebook at 2.45. Therefore, the overall Mean for Motivation by Facebook advertisement is at 2.78, which means that respondents are less motivated by Facebook advertisement.

Fourthly, information advertised about companies, products or services is reliable has the Mean at 2.60 higher than Reliable on advertised message by Facebook at 2.55. Thus, the total Mean is at 2.57, which means that consumers have less reliability on Facebook advertisement.

Finally, you believed that advertised message by Facebook represented media for promotion all has the Mean at 3.04 higher than You believed that advertised message by Facebook represented successful media for all at 2.92. Overally, the total Mean of believe in Facebook advertisement is at 2.98, which means that consumers have nearly somewhat believe in Facebook advertisement.

8.2 Discussion

Majority of respondents (52.9%) used mobile phone to log-in Facebook; however, the finding is contrary to Rodny (2015) who found that a majority of respondents (62.5 %) accessed Facebook by means of both PC and mobile device. In addition, respondents (88.5%) used Facebook daily, but the result is not the same as Rodny (2015) who found that respondents habitually logged on to Facebook daily (61.9 %). Moreover, (74.9%) of respondents logged in Facebook less than 1 hour, which is contrary to the finding of Rodny (2015) who found that respondents spent one (48.3 %) to two (27.4 %) hours per session.

In addition, the researchers found that consumers are interested in Facebook advertisement higher than the average a little bit, which is different from Rudaina Othman Yousif (2012), who found that advertising messages via Facebook are met with a great interest by users of the website. It means that respondents do show a great deal of interest in advertising messages posted via Facebook. However, it is opposite to the finding of Gustaf Kornias and Ruxandra Hălălău (2012), who found that 18 out of the 20 respondents answered that they do not find the ads appealing.

Furthermore, the Content of Facebook advertisement is somewhat influential to consumers, so this finding is not the same as Rudaina Othman Yousif (2012), who found that the content of the advertising messages via Facebook is characterized as exciting and appealing, that to say that respondents do find advertising messages on Facebook exciting and appealing.

Also, respondents are less motivated by Facebook advertisement, which is opposite to the finding of Rudaina Othman Yousif (2012), who found that advertising messages via Facebook motivate and urge to buy, but respondents do not tend to encourage their friends to buy products advertised via Facebook, and advertising messages via Facebook do not encourage sample respondents to visit the websites of the companies advertising their products via the website.

Moreover, consumers have less reliability on Facebook advertisement, so this finding is contrast to Rudaina Othman Yousif (2012), who found that respondents do view the information in advertising messages via Facebook as trustworthy and reliable. Also, it is different from the finding of Gustaf Kornias and Ruxandra Hălălău (2012), who found that 11 out of the 20 respondents answered that they find the advertisements on Facebook to be credible. Out of those 11, seven 7 stated that previous knowledge of the brands and the increased presence of more well-known brands was the biggest influence toward the overall credibility of the advertisements.

What is more, consumers have nearly somewhat believe in Facebook advertisement; however, this finding is not the same as Rudaina Othman Yousif (2012), who found that respondents do find Facebook to be a successful medium for promotion.

9 Conclusions and Recommendations

9.1 Conclusions

It is concluded that there were 227 respondents, 132 (58.1%) males and 95 (41.9%) females. Respondents mostly came from the Age Group of 30-39 (68%), from the Education of Undergraduate (54.2%), from Employee (55.9%), and from the Income Group of 100-500 (62.1%).

Furthermore, the Devices that consumers mostly used to log-in Facebook was mobile phone (52.9%). Majority of the respondents have used Facebook for more than 5 years (39.2%), and most of them have used Facebook Daily (88.5%). The hours that they have spent per Log in Facebook is Less than 1 hour (74.9%), and the Hours that they have spent for using Facebook per Day is Less than 1 hour (40.1%). In addition, the Products that they mostly have bought through Facebook Advertisement is Clothes (57.7%).

What is more, consumers are interested in Facebook advertisement higher than the average a little bit, and they are somewhat influenced by the Content of Facebook advertisement. However, consumers have less motivation and reliability by Facebook advertisement, but they have nearly somewhat believe in Facebook advertisement.

9.2 Recommendations

Based on the findings and discussion, it is recommended as follows:

- Shops and companies that have not advertised by Facebook should start promoting their products/services by Facebook because most young, educated people from private and governmental sectors use Facebook every day with their mobile phones and computers.
- Cloth shops and electronics companies that have advertised by Facebook should continue to do so.
- Shops and companies should improve the content of their advertisement to be more interesting to consumers so that they are more motivated to look at the advertisement, and lead to the purchase of products/services.
- Shops and companies should be committed to provide products/services with higher quality to consumers as mentioned in their advertisement in order to get reliability and believe from them.
- Shops and companies should not use only Facebook advertisement, but also other media because this channel has limited influence on consumers.

9.3 Future Research

In order to generalize this study, future researchers should extend the sample size to other cities and provinces, and use other statistical tools to improve the data analysis.

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Stakeholders' Perceptions toward Sustainable Tourism Development: Evident from Tonle Bati Destination in Takeo province, Cambodia

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Abstract

Researchers' aims assess the perception and support of community residents, stakeholders for sustainable tourism development using the latent variables of socio-culture, socio-economic, natural environment, local and state service, leisure infrastructure that support for sustainable tourism development and elemental data of the residents, business people, community authority, and tourists of the historical Tonle Bati destination in Bati district, Takeo province in Cambodia which is located in southern Phnom Penh city. The analytical results suggest that infrastructure, socio-economic, environment, and local service are critical factors that affect the level of support for sustainable tourism development in historical Tonle Bati destination. The benefits perceived by stakeholders influence on support for sustainable tourism development.

Key words: *Stakeholders' Perception, Tourism, Sustainable development, Tonle Bati destination, Takeo province, Cambodia*

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1 Introduction

Tourism regarded as the world's largest industry (Kdper et al., 2011; Andriotis and Vaughan,2003) that currently, it can be created for economic development of many sectors of the worlds (García, et al. 2015), an engine for generating a range of new private and public income opportunities, and the creation of jobs and the opportunity for people to increase their income and standard of living in local communities (Marzuki, 2012) and as a means of achieving community's economic development (Kdper et al., 2011). But its industry also face with long-term survival (Andriotis and Vaughan, 2003).

The Tonle Bati destination is a popular weekend site which have a small lake and more innovative bamboo shelters line the side of the lake, offering resort style comfort, fishing spot for satisfying needs of domestic tourists and people. It located along the National Road 2, about 35km south of Phnom Penh, the capital of Cambodia (http://www.tourismcambodia.org/provincial_guide/index.php?view=attdetail&prv=24&att=167).Tonle Bati also is a generally accepted picnic area and a location of adoration and distinguish two ancient temples Ta Prohm and Yeay Peove, and a pagoda, Wat Tonle Bati, which was constructed in 1576 (http://www. tourismcambodia.com/travelguides/provinces/takeo/what-to-see/61_tonle-bati.htm).

For development of sustainable tourism can be regarded as a general social desire for communities in both developed and developing nation (Hall and Lew, 1998 that cited by Shikida, et al. 2010) and generally accepted as a global standard (Reid and Schwab, 2006). Meanwhile, development of sustainable tourism is also vital factor to the conservation of nature and the preservation of originating culture and will give the economic incentive to preserve natural areas for low-impact use with correctly management (Hassan, 2000), to offer growth and quality life of residents and business (Reisinger & Park, undated) that align with Ridderstaat, et al. (2014) pointed out that knowing characteristic and causality of the relationship between tourism development and quality of life is great significant manner. Hassan, (2000) mentions that more tourism attractive areas focus on exploring techniques and strategies for sustainable tourism development and finding the preservations for next generations.

Moreover, for taking right action and good policy making, decreasing the issues, increasing the benefits on tourism development then its planners and developers can absorb of the awareness of residents' perceptions and its impacts because the tourism perceptions of residents was viewed as a key point and the host community people's behavior influence on tourists, too (Andriotis and Vaughan,2003), but also knowing the reactions of domestic people toward developing of his/her local tourism and the

factors that may impact their reactions is vital in successfully bring a local resident's supports for tourism development (Yoon, et al.2001). And regarding to host community peoples' attitude toward further tourism development and scanned residents' perception of the effects correlated with this industry also was surveyed by more researchers since the 1970s (Sánchez et al. 2014).

So the impacts of stakeholders' perceptions toward tourism is the bridge to sustainable tourism development, ensure preservation for next and next generations and to good strategic and tactic plan for host community development.

2 Literature Review

Sustainable tourism development research has attracted increased recognition within academic literature over the last decade (Chand & Vivek, 2012). It is conceptually important, however difficult to implement due to its indeterminate definition (Cooper, Undated). Some researchers (Kdper, Özdemdr, & Saglam, 2011) have attempted to concentrate on the relationship between economics and the environment. Alternately, Butler (1999) defined the concept of sustainable tourism development within three areas of sustainable development (environmental, socio-cultural, economic). On the other hand, Nejati, Mohamed, and Omar (2015) suggested sustainable tourism should aim "to minimize environmental and cultural damage, optimize visitor satisfaction, and maximize long-term economic growth for the region". The most commonly used, however, as well as ultimately most encompassing definition of the concept is that of the World Travel and Tourism Council (1995), referring to sustainable tourism as: "Tourism which meets the needs of the present tourists and host regions while protecting and enhancing opportunity for the future. It is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity, and life support systems." And Assante, Wen, and Lottig (Undeted) stated that currently, there appears to be some consensus that sustainable tourism is comprised of three major components: economic, environmental, and socio-cultural. Similarly, Cooper (Undated) suggested a definition that expands the components for some additional detail, "sustainable tourism development should be ecologically responsible, socially compatible, culturally appropriate, politically equitable, technologically supportive and finally economically viable for the host community."

In terms of sustainable tourism development, Swarbrooke (1999) divided stakeholders into five main categories: governments, tourists, host communities, tourism business and other sectors. Each group of stakeholders is a critical component of the tourism

destination due to the fact that the initiatives and thoughts of stakeholders are external to the strategic planning and management processes (Gross, 2015). Knollenberg (2011) in particular asserted that the involvement of stakeholders in tourism has 'the potential to provide a framework within which sustainable tourism development can be delivered'. However, perceptions of sustainable tourism development must be considered on a case by case basis, given that what constitutes sustainable tourism development may well depend on the values of the stakeholders concerned. To achieve sustainable tourism development, it remains essential that the particular perceptions of the concept among destination stakeholders are incorporated into any attempt to development sustainable tourism development within it (Swarbrooke, 1999).

With the natural environment at a destination has a close relationship to the tourism industry. Often it is the environment that attracts tourists, but tourism stakeholders commonly overlook the importance of the local environment when their goal is capturing economic gains (Dibra & Oelfke, 2013). Therefore, the deterioration of the environment should be the first sign of trouble for a host community (Assante et al., Undeted). Cengiz (2012) have offered a broad definition of the environment as comprising "all the natural and cultural surroundings of people". This offers a great starting point. However, it does not clarify that environment includes both natural and built components (Eraqi, 2007). The environment can be broken down into five components: the natural environment, wildlife, farmed environment, built environment, and natural resources (Swarbrooke, 1999). Tourism can result in both positive and negative impacts on the environment. As more tourists are introduced to a host community, the chances of inducing stress on the local environment increases (Kdper et al., 2011). Existing literature reveals some contradictory findings of resident perceptions of environmental impacts, unlike sociocultural, and economic impacts that are largely viewed as positive by residents (Lee, 2012b). Negative impacts can include water pollution, air pollution, noise pollution, visual pollution, ecological disruption, and the creation of environmental hazards (Liu & Lu, 2014). Tourism often develops in beautiful but fragile environments, which may be at greater risk for negative impacts (Lo, Ramayah, & Hui, 2014). 2001). Positive environmental impacts may include conservation through financial incentive, and increased awareness of environmental issues (Swarbrooke, 1999). Sometimes tourism can even improve environmental quality by giving incentives to clean-up and create access points to natural attractions (Long, Undated). Swarbrooke (1999) indicates that some researchers feel more positive results can be obtained from encouraging good practices, rather than just preventing bad ones.

On the other hand, the social aspect of sustainable tourism typically does not receive the same amount of attention as the other aspects of tourism. Sometimes this can be attributed to the fact that socio-cultural impacts usually occur slowly over time and are intangible, although social impacts are usually lasting, and not always correctable

(Swarbrooke, 1999). The presence of tourism in a host community will "affect people's habits, daily routines, social lives, beliefs, and values" (Mahdavi, Parishan, & Hasar, 2013). Similar to the other dimensions of sustainability, the presence of tourism can offer positive as well as negative impacts. The level of positive and negative impacts varies depending on the socio-cultural structure of the host community and the level of tourism development (Marzuki, 2011). Marzuki (2011) stated that some of the major negative impacts can include a decline in cultural traditions, rise of materialism, increase in crime rates, social conflicts, and crowding. Major draws for tourists are the cultural traditions of the host community. These cultural traditions sometimes motivate tourist to visit third world countries, which are often at the greatest risk for negative socio-cultural impacts. Many academics studying socio-cultural impacts focus on the impacts created from "tourist[s] from the industrial nations on the people of the Third World countries"(Marzuki, 2012). In some cases, the presence of mass tourism requires host communities to replicate their traditional ceremonies beyond the normal level, creating a loss in authenticity

Moreover, tourism can bring many economic benefits to host communities, although tourism can also bring economic cost (Mohammadi, khalifah, & Hosseini, 2010). Potential positive economic impacts of tourism help gain support from various stakeholders. Tourism stakeholders can be attracted by the potential increases in government revenue. The positive economic impacts of tourism are some of the better known impacts from tourism by the general public (Moyle, Croy, & Weiler, 2010). However, the concept of economic sustainability is not nearly as well known. Some economic benefits include employment, increased income levels, diversification of local economy, increased local government revenue, contributions to the local economy from the multiplier effect, help keeping local business viable, and stimulates inward investment (Nejati, Mohamed, & Omar, 2014). The tourism industry helps create jobs in a variety of industries beyond tourism, such as construction, and transportation (Ramchurjee, 2013). Swarbrooke (1999) explains a major issue of economic sustainability is ensuring that what tourists are paying equals the associated cost, or the level of which the tourism industry is subsidized by the public sector. Economic costs include low paying jobs, the opportunity cost of pursuing tourism development, necessary infrastructure investment, increased cost of living for residents, and an over-reliance on tourism (Remoaldo, Vareiro, & Ribeiro, Undated). Many of the jobs created directly from the tourism industry often require little formal education, and are relatively low paying (Stylidisa, Biranb, Sitb, & Szivas, 2014).

For community participation in the tourism planning process is important in order to maintain sustainable tourism development. Tourism planning has gradually changed from myopic and rigid interests to more comprehensive, flexible, responsive, systematic and participatory approaches (Amin & Ibrahim, 2015). This change in

approach to tourism planning looks for ways to sustain tourism as an agent for socio-cultural and economic development. Community participation has become an important and popular concept of tourism development (Amir et al., 2015). Promotion of community participation in the tourism planning process as an integral part of sustainable tourism development has long been discussed. Proponents of community tourism point out that community participation seeks to improve the welfare of the local community and, perhaps most importantly, win their support in the conservation of tourism resources (Junaid, 2015). This suggests community participation is unavoidable and essential for tourism development since most tourist attractions lie within local communities or in their vicinity and in most cases co-exist side by side with the communities, for instance, in wildlife areas. Sustainable tourism and community participation are progressively linked together within this context (Amir et al., 2015). Sustainable development can be accomplished "through investments in human capital such as education and health, investments in social capital such as local-level institutions and participatory processes, and support for community-based development efforts planned and implemented from the bottom up" (Viviers & Slabbert, 2012). Without responsive institutions and legal and regulatory policies that enable, not hinder, local participation, these efforts are less likely to succeed as it has been suggested that the degree of power distribution is the central point underlying people's participation (Untong, Kaosa-ard, Ramos, Sangkakorn, & Rey-Maquieira, 2010). For "authentic participation" involves three elements which are related to the voluntary and democratic involvement of people that is required by participation. These are "(a) contributing to the development effort, (b) sharing equitably in the benefits derived from and (c) decision-making in respect of setting goals, formulating policies and planning and implementing economic and social development programmes" (Nejati et al., 2014).

Consequently, long term planning strategies should include the desired outcomes and define the stakeholders, whose responsibility is to work for those outcomes. Long term planning determines the actual policies that should be more precise and more specific (Dede & Ayten, 2012). According to the WTO there are three basic types of long term planning that have relevance to sustainable tourism. First, the overall tourism long term planning embracing sustainability principles. Second, other relevant government long-term planning dealing with sustainable tourism and finally, long term planning for sub-sectors of tourism (Kerimoglu & Çiraci, 2008). The UNWTO claims that every country should have a long term planning to serve as a framework for the development and management of tourism (Matarrita-Cascantea et al., 2010). It is also recommended that instead of having a separate plan for sustainable tourism, the concept of sustainable development should penetrate the mainstream tourism long term planning of a country. The tourism organization also warns that it is not adequate to discuss sustainability as a separate issue within a tourism long term planning concentrating on impacts and their management only (McKercher, 2003). Consequently, a tourism long

term planning of a country. The tourism organization also warns that it is not adequate to discuss sustainability as a separate issue within a tourism long term planning concentrating on impacts and their management only (McKercher, 2003). Consequently, a tourism long term planning should reflect the consensus of the stakeholders, promote planning at the local level, and concentrate on the above mentioned aims of sustainable tourism specifying concrete objectives, policies and actions, as well (Muganda, Sirima, & Ezra, 2013). Besides mentioning national tourism development long term planning the WTO lays special emphasis on the various types of strategic documents which are necessary for ensuring sustainable tourism (Soteriou & Coccossis, 2010). National sustainable development plan are listed in the first place, but the importance of local level strategies is also highlighted (Muhanna, 2006). Ramona and Carmen (2006) stated that sustainable tourism requires strategy-making both at the national and the local level, the main difference being in their approach: national long term planning should identify policies and instruments, while local documents are about the local objectives and priorities. The number of the national strategies, regarding various topics (such as economy, transport, tourism, energy, education, etc.) definitely increased during the last decades (Rico Escobar, 2011). Long term planning design could be considered a new framework for community planning (Shkira, Zoto, & Theodhori, Undated). An important element of this phenomenon is the appearance of the national long term planning for sustainable development, which respond to the most important challenge of our days: the global ecological crisis (Zamfir & Corbos, 2015).

Clearly, Sustainable tourism generates income for the local community but also integrates local community stakeholders in order to improve living conditions and reduce poverty (Naidoo, Ramseook-Munhurrun, & Seegoolam, 2011). Business in tourism that is based on the principles of sustainable development raises the awareness of local people and creates support for the use of natural resources of the local community (Talib, Lian, & Mereng, 2014). Valle, Silva, Mendes, and Guerreiro (2006) have highlighted the visitor satisfaction levels are an important indicator of visitor industry performance. They provide important feedback on how well services are delivered and how well those services fulfill visitors' expectations. High satisfaction encourages return trips to destination and results in a higher likelihood to recommend community's as a vacation destination (Vaz, Undated).

3 Research Methodology

3.1 Data Collection

Both qualitative and quantitative research approach was conducted by researcher. Sustainable tourism development information involved in Tonle Bati destination in Bati district, Takeo province is obtained by means of a survey conducted to collect the needed information for the analysis. The questionnaire was organized using the 59 selected items. The survey method was adopted to administer the questionnaires with a sample of 500 residents and 300 tourist visiting are considered usable for the analysis in located inside and outside the Tonle Bati district of Takeo province. The questionnaire is classified into three major parts. The first part of the questionnaire contains stakeholders' perception of their tourism development in Tonle Bati destination. In the second part captures the information related to overall sustainable tourism development. Respondents were asked to respond to each item on the widely used five-point Likert-type scale. The third part of the questionnaire is used to get the information on the demographic information of the stakeholders. A pilot test was conducted in the item verification stage to assess the reliability of attributes and to ensure that the wording, format, length and sequencing of questions were appropriate. Reliability analysis was employed to test the internal consistency of the questionnaire. The reliability coefficient crobach's alpha for the user perception scale is more than 0.7 to be reliable.

Roscoe (1975) suggests a series of general rules in determining the acceptable sample size for research, and proposes that for any research intending to conduct a multiple regression analysis, a sample size should be 10 times as large as that of the number of variables. In order to produce the best estimates possible, the collection of a reasonably large data set has to be made from the population. To this end, almost 1000 questionnaires were distributed to stakeholders. The rate of the responses was about 80%. Following cleaning process of the data, a sample of 800 respondents is considered usable for the analysis. Data collection work took approximately four months, starting from April to July 2016.

3.2 Analytical Techniques

An exploratory data analysis was employed since the researcher's aim was to discover each dimension that impact on sustainable tourism development. Statistical packages, in particular the Statistical Program for the Social Sciences (SPSS 20.) was used for analysis after data collected and cleaned. The statistical analysis of data includes descriptive statistics, and multiple regression analysis and other necessary testing to obtain the best possible results. Reliability check is to be carried out in order to assess the degree to which data collection method will yield consistent findings; similar observations would be made or similar conclusions reached by other researchers. In order to test the reliability of the instrument used, the reliability coefficient Cronbach's alpha is used. It is generally agreed that Cronbach's Alpha should exceed 0.70 to be reliable (Hair et al., 2010). Other statistical diagnostic tests will also be used. These tests include multicollinearity checks.

3.3 The Model

This study is of particular interest since, to the best of knowledge, no research was undertaken with respect to the determining factors influencing sustainable tourism development in Tonle Bati historical site in Takeo province in Cambodia.

This model consists of a dependent variable, sustainable tourism development, and five explanatory variables: socio-culture impact, socio-economic development, natural environment quality, state and local service, and leisure infrastructure.
STD = β + β1 socio-culture impact + β2 socio-economic development +β3 natural environment quality + β4 local &state service + β5 leisure infrastructure + ε where STD denotes sustainable tourism development, and ε is error term, which is assumed to be normally distributed.

4 Empirical data analysis and Findings

4.1 Basic Statistics

Before presenting the estimation results, it may be useful to present the demographics of the respondents included in the survey instrument. Table 1 presents characteristics of respondents. It is found that the sample consists of more females (50.4%) than males (49.6%). And also shows that classified the collected data into married status groups, it is found the majority of respondents is married (57.8%), accounting for single 34.7 percent, and divorce (7.3%). It is also found that, of the 311 respondents, 42% are the age of 20 year to 30 year. With respect to frequency of education, more than 34 % of respondents got high school. The data set also reveals that 40.5% of the respondents are business people, followed by students (more than 20%), and farmers (more than 19%). Moreover, with respect to passengers' income, the majority of the respondents seem to have income under $200 (50.8%), followed by 200$ to 400$ (35.7%), and 401$ to 600$ (6.2%). Due to respondents' length residency is over 15 years (nearly 40%).

Table 1: Characteristics of the Respondents

	Frequency	***Percentage***
Gender		
Male	367	49.6
Female	373	50.4
Age		
Under 20 years	63	8.5
20 – 30 years	311	42.0
31 – 40 years	205	27.7
41 – 50 years	121	16.4
Over 50 years	36	4.9

Single	257	34.7
Married	428	57.8
Divorced/Widowed/Separated	54	7.3
Education		
Primary School	171	23.1
High School	253	34.2
University	189	25.5
Other	127	17.2
Occupation		
Civil servant	55	7.4
Business people	300	40.5
Private workers	107	14.5
Students	154	20.8
Framers	142	19.2
Retail/Sales representative	54	7.3
Householder	54	7.3
Retired	18	2.4
Other	48	6.5
Income		
Under 200$	376	50.8
$200 - 400$	264	35.7
$401 - 600$	46	6.2
$601 - $800	10	1.4

4.2 Reliability Check

As can be also seen from table 2, Cronbach's alpha estimated for the socio-culture scale was 0.834; socio-economic scale was 0.821; the natural environment scale was 0.901; local service scale was 0.847; the infrastructure scale was 0.861; and overall sustainable tourism development scale was 0.834 respectively. As the Cronbach's alpha in this study was higher than 0.7, the constructs were therefore deemed to have *an adequate reliability (Hair et al., 2010).*

Table2 : Reliability checks for individual variables

Dimensions	Case	Reliability Statistics	
	No. of Obs.	Cronbach's Alpha	No. of Items
Socio-culture impact	800	0.834	12
Socio-economic impact	800	0.821	8
Environment	800	0.901	9
Local and state service	800	0.847	7
Infrastructure	800	0.861	8
Sustainable tourism development	800	0.834	7

4.3 Model and Empirical Data Analysis

Based on the review of the related literature and previous empirical studies can be explicitly modeled as follows:

$$STD = a_0 + \beta_1 SocioCulture + \beta_2 SocioEconomic + \beta_3 Natural\ environment + \beta_4 LocalService + \beta_5 Infrastructure + \varepsilon$$

Where STD denotes sustainable tourism development, and ε is error term, which is assumed to be normally distributed

The cross-sectional data used for the analysis is from a survey of 1000 stakeholders. Yet, following cleaning process, a sample of 800 is considered to be usable for the analysis. The data set contains detailed information on the explanatory variables-- socio-culture impact, socio-economic development, natural environment quality, state and local service, and leisure infrastructure --which are included in the model presented above. And before presenting econometric results, the researcher reports several tests such as those for multicollinearity, based on variance inflation factor (VIF).

Table 3: Multicollinearity Check

Predictor Variable	Collinearity Statistics	
	Tolerance	**VIF**
Socio-culture	.425	2.353
Socio-economic	.389	2.569
Environment	.304	3.289
Local service	.328	3.051
Infrastructure	.291	3.434

Table 4: Estimation results with usual standard errors

R	R Square	Adjusted R Square	F	Sig.
.809[a]	.654	.651	277.156	.000[b]
Variable	**Coefficients**	**Std. Error**	**T statistics**	**Sig.**
Constant	.634	.104	6.073	.000
Socio-culture	.065	.041	1.612	.107
Socio-economic	.179	.038	4.769	.000
Environment	.143	.032	4.545	.000
Local service	.113	.037	3.090	.002
Infrastructure	.370	.037	9.869	.000

a. Dependent Variable: Sustainable Tourism Development
b. Predictors: (Constant), Socio-culture , Socio-economic, Environment, Local and state service, and Infrastructure,

Table 3 presents the estimation results, along with test statistic. As can be seen from this table, VIF values for all independent variables was much less than 5, implying that multicollinearity issues are of no concerns.

Overall sustainable tourism development is regressed on five dimensions— socio-culture impact, socio-economic development, natural environment quality, state and local service, and leisure infrastructure.

Based on table 4 with standard error above, the five dimensions explain 65.4 percent of the variation of the sustainable tourism development, which is statistically significant at less 1% significance level (F-value = 277.156 with P-value < 0.00). To identify which dimensions contribute most significantly to the sustainable tourism development, a regression is use z-scores are run to obtain standardized coefficients or beta coefficients. Therefore, explanatory variables with higher standardized coefficients contribute more significantly to the dependent variable.

The estimation results of Tonle Bati historical site in Takeo province, Cambodia suggest that the regression model is statistically significant and that the five dimensions exert a positive effect on the overall sustainable tourism development. The highest estimated standardized coefficient on infrastructure dimension of 0.37 implies that the dimension makes the greatest contribution to the sustainable tourism development, followed by the dimensions of socio-economic (0.179), natural environment (0.143), local service (0.113) and socio-culture (0.065). These findings indicate that infrastructure has been the most important predictor of sustainable tourism development in the manner of Tonle Bati destination in Takeo province, Cambodia.

Coefficient of leisure infrastructure dimension is highly statistically significant at the 1% significance level, indicating that leisure infrastructure has indeed positively affected upon sustainable tourism development in Tonle Bati destination. It means that a unit change in the response rate of leisure infrastructure item, ceteris paribus, leads to an estimated change in their sustainable tourism development of about 0.370. And followed by the dimensions of socio-economic (0.179), natural environment (0.143), local service (0.113), respectively, implies that, holding other factors fixed, a unit change in the response rate of dimension for socio-economic, environment, and local service dimension, respectively, leads to a positive change in their sustainable tourism development of about 0.176; 0.143; and 0.113, respectively,. And also followed by dimension of socio-culture (0.065), but it is less significant at more than 5%. Therefore, dimension of infrastructure, socio-economic, environment, and local service dimension really makes the greatest contribution to sustainable tourism development in Bati historical site, in Takeo province in Cambodia.

Morecover, stakeholders offer good commons for contributing sustainable development in Tonle Bati destination and those ideas are vital road map to attract more both foreign and local tourists to visit there. Community and authority of Tonle Bati must be diligent over sanitary and environment, cleaning waste get out of river, place on waste give completeness, renovation of pure water. Meanwhile, street construction, parking place of car or motorcycle, creating garden and plant more trees, broadcasting, creating events in national festival, and improving the bamboo shelters line the side of the lake were priority factors for attracting tourists. But the development of Tonle Bati destination cannot lack of budgets and cooperate between authority and local community to support and ensure the sustainability.

5 Conclusion and Managerial Implications

This is the first comprehensive study ever undertaken to investigate the factors that contribute to overall sustainable tourism development in Tonle Bati destination in Tonle Bati district, Takeo province in Cambodia. Tonle Bati is a panic area that has bamboo shacks built out over the water that all Tourists can relax with a fresh air in a natural environment and eating many kind of local foods and fruits. Tonle Bati also a potential Tourism place in Takeo province that can get the benefits from tourists for the local people. However, there are many problems that effect of this place. So they need to protect and develop Tonle Bati to become sustainable tourism development by focusing on infrastructure, socio-economic, environment and local and state service.

To determine the relative importance of dimensions in explaining overall sustainable tourism development, multiple regression analysis was performed. The findings present a number of managerial implications and recommendations for tourism planner or decision maker for developing Bati destination while it also contributes to the established model of ISEL_Bati (Infrastructure, Socio-economic, Environment, and Local service) with applications to Bati destination, Takeo province in Cambodia (Figure 1). A model for operations for Tonle Bati destination can also be gleaned from findings of this study. It is evident that the overall sustainable tourism development depends on the four dimensions of infrastructure, socio-economic, environment, and local and state service. Therefore, encouraging in publication of the information by the ministry of tourism is also expected to contribute to an effective decision making of managers in development of attractive Tonle Bati destination in Takeo province about the way of sustainable tourism development.

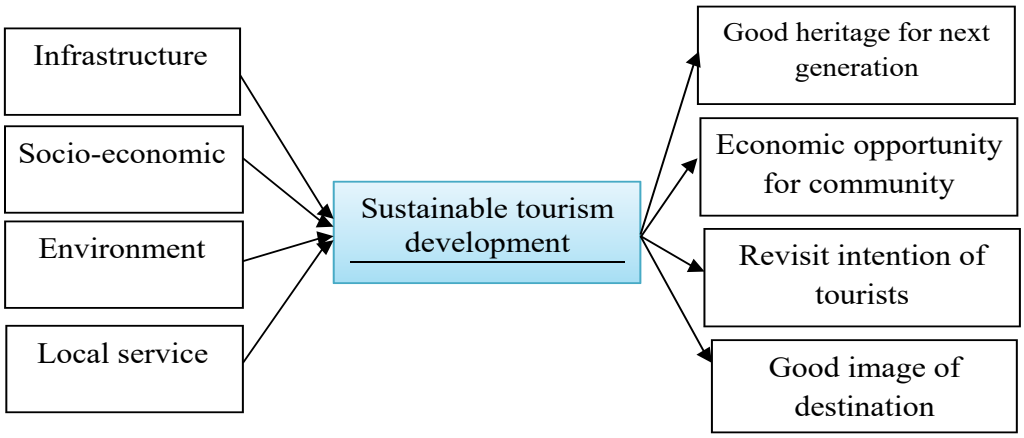

Figure 1: Effects of ISEL model on sustainable tourism development, Economic opportunity for community, revisit intention of tourist, good image of destination, and good heritage for next generation.

Decision managers in development in Tonle Bati tourism destination, Takeo province in Cambodia may find the findings of this study useful, particularly in identifying the dimensions that help promote tourism. Based on the findings, infrastructure dimension is the most important factor or "heart" for predicting sustainable tourism development among residents in community, and tourists in Tonle Bati tourism destination, Takeo province, Cambodia. Therefore, attractive destination of Tonle Bati could overcome enough leisure structure, cultural events, quality tourism objects, enough sports objects, cultural interaction, no traffic problems, all service availabilities, and enough shopping mails. Socio-economic is also vital factor to ensure sustainable tourism organization and management. These include employment opportunities in the community, personal income of local residents, standard of living, variety of shopping facilities in the area, quality of life in general, courtesy and hospitality towards visitors, improve image of there, and increases recreational opportunities

Moreover, Tonle Bati tourism development' managers or planners should also place an emphasis on the other dimensions, namely, environment and local service as these are also found to have a significant, positive impact on Tonle Bati sustainable development. Since environment dimension refers to the neat and clean place, site, destination, natural environment is well preserved (such as community forestry…), the place has enough green areas, quality of building and city planning, multiple-use ecological reserves, resource extraction technologies, pollution control, and efficiency and recycling improvement. Dimension of local service refers to the quality of local service, adequate of local services in meeting residents' demand, financial supports of local services, and for conservation and development, adequacy of state services in meeting residents' demand, level of investment, development and infrastructure spending, manage natural resources, and political stability, peace.

Local residents and authority of Tonle Bati should be diligent over sanitary and environment, cleaning waste get out of river, place on waste give completeness. Meanwhile, authority should improve street, renovation of pure water, parking place of car or motorcycle, creating garden and plant more trees, broadcasting, creating events in national festival. Community should improve the bamboo shelters line the side of the lake better, quality and hygiene foods, and price setting for attracting tourists. In addition, ministry of tourism should have clear strategic plan for development of great potential Tonle Bati destination in Takeo province and should try to find budgets from another sources to support and ensure the sustainable development.

The current study, however, has few limitations. First, the researcher used convenient and purposive sampling method of non-probability sampling for data collection thus the sample may not be true representative of population. Secondly, the study focused only on Tonle Bati destination in Tonle Bati district, Takeo province, Cambodia. The results of the study, therefore, may be applied with caution to other types of attractive tourism destinations. Third, sometime, researcher feel to be hard to collect information from relevant authorities. The future research may be conducted in other types of tourism destinations and other geographical area of Cambodia, and expand model and more detail test on hypothesis. Next researchers may study some important factors such as budgets management, local resident training, lake and temples renovation, and structure of management team for sustainable development in Tonle Bati destination.

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Evaluating Operational Performance of Travel Agencies in Cambodia: A TQM Based Approach

Dr. Heng Sopheap[36] and Chhay Phang[37]

Abstract

This empirical study examines the association between total quality management (TQM) practices and performance, i.e. quality, business, and organizational performance. The quantitative data were obtained through a survey from 216 managers and key employees of Cambodia's travel agency firms. This study supports the hypothesis that TQM practices positively impact the performance. TQM tools and techniques, Leadership (LDS), Human Resource Management (HRM), Information and Analysis System (IAS), Service Quality Culture (SQC or Total Quality Culture), Social Responsibility (SRP), Customer Focus (CUF), Excellent Business Performance Results (EBP) contribute to the successful implementation of TQM. The study reports that successful adoption and implementation of TQM practices results in improving the performance of organization. The main implication of the findings for managers is that with TQM practices, travel agency firms are more likely to achieve better performance in customer satisfaction, employee relations, quality and business performance than without TQM practices.

Keywords: *Total quality management, quality practice, quality performance, business performance, travel agency firms, Cambodia.*

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1 Introduction

Quality, according to Juran (2004), is meeting or exceeding customer expectations. It also means all the activities that an organization undertakes to ensure that its products and/ or services meet their customers' needs. TQM (Total Quality Management) is described as a strategic action that focuses on managing the total organization to provide clients with products or services that satisfy them, through the mobilization of the individuals, management leadership and the cohesion of all the resources of the firm (Oakland, 2004). Much of the research which has looked into the contributions of total quality management (TQM) on competitive advantage shows that its introduction leads to improved performance and greater competitiveness (Samson and Terziovski, 1999 and Zhang, 2001).

An organization can achieve competitive advantage using quality via the operations route or the marketing route (Okwiri, 2012). It is argued that the operations route leads to competitiveness through effectiveness and consistency of processes, which in turn leads to higher productivity, reliability and speed of delivery.

Various models have been used to represent the concept of TQM. Some of these models are; The Malcolm Baldridge National Quality Awards (MBNQA), The European Foundation for Quality Management (EFQM) and the Oakland (2004) model. MBNQA is an award that promotes awareness of performance excellence as an important element in competitiveness (Stone, 1997). In the MBQA (2011) model, TQM elements are expressed as leadership, information and analysis, strategic planning, people, process management, business results and customer and satisfaction (Stone, 1997). While the EFQM (2013) model focuses on enablers and results. Here, the enablers to excellent business results are proposed to be leadership, people, strategy, partnerships & resources and processes.

Oakland (2004), in his new framework, suggests a model with two categories which are expressed as the 'Soft' and the 'Hard' elements. The 'soft' elements are defined as culture, communication and Commitment, referred to as the 3 C's. The 'Hard' elements are defined as Planning, People, Process and Performance. In all the three models above, process is proposed as one of the elements of TQM that organizations use as a strategy to respond to changes in their operational environment. A conclusion based on the above models indicates that processes are keys to delivering operational performance.

Operations seek to achieve the objectives of quality, cost, timeliness/speed and flexibility. Russel and Taylor (2011) argue that to compete on quality, organizations must view it as

an opportunity to please the customer and not just as a way to avoid problems or reduce rework costs (Russel and Taylor, 2011). It includes providing a wide variety of products or services and also the ability of a firm to customize the existing ones quickly in order to respond to customer needs.

The customer would prefer a higher quality service but to pay less for it. In the travel agencies, quality is enhanced by having redundant systems that help meet customers demand for both flexibility and higher speed of service delivery. This may lead to higher quality for the customer, but it causes the problem of idle capacity. The efficiency and effectiveness of an organization are factors in achievement of any of the above objectives. These issues are applicable and affect success in the travel agencies.

2 Research Problem

It has been reported that long-term business success and profitability is directly related to the strength and quality of any business processes. This influence is said to be achieved through cost and quality. The effectiveness of the process also affects the ability of an organization to respond to the risks that it faces. Processes drive the creation of goods and services. Application of process element of TQM to organizations operations will influence quality performance, which entails safety, on-time and customer satisfaction.

The focus on service attributes, labor issues, unpredictability imposed by weather and rapidly shifting demand amid distinctive regulatory constraints are among the many challenges faced in the daily running of the travel agencies. At the same time, issues such as pricing, and yield management compete with operations for the travel agencies. This study focuses on the operation route of quality-profit link. The key dilemma is whether to adopt process based approach or to focus on the human capital infrastructure in the travel agencies in Cambodia. Thus, the question to get answers for is; does process element of TQM have influence on operational performance in the travel agencies?

3 Research Objectives

To answer the above research question, the following specific objectives are to be achieved;

i. To determine the effectiveness of processes in the travel agency operation in Cambodia
ii. To determine the relationship between process effectiveness and operational performance in the in travel agency operation in Cambodia
iii. To determine the effect of environmental instability on the relationship between process management and operational performance.

4 Significant of the Study

The information from this study will be useful in clarifying issues of management decisions, resource allocation and prioritization in the travel agencies operations. Scholars will also benefit in terms of the contribution to the general body of knowledge in the broad area of Quality and Total Quality Management, more specifically on the influence of process management on operational performance of the travel agencies operation in Cambodia. The outcomes of the study can also be used to inform the organizational practices for better operational results even for institutions which are not within the travel agency operation.

5 Literature Review

5.1 Top management commitment and visionary leadership

Campos, Mendes, Silva, and Valle (2014) point out quality management generally is the process of ensuring that a product (good or service) continuously meet and even exceed customer expectations and can be generally looked at as a business management approach that attempts to maximize organizational competitiveness through continuous improvement of its products, services, work-force, processes, and environment. It is an approach aimed at continuously improving the competitiveness, effectiveness and flexibility of the entire organization through total involvement of everyone in the organization led by the (top) management (Arokiasamy, 2014).

Top Management plays a critical role in any key business decision (Bahri, Hamzah, & Yusuf, 2012). Consequently, the success of any critical decision made in an organization is highly dependent on top management support and commitment (Bhuiyan, Rahman, & Shahnewaz, 2014). Quality issue has become of great importance to every organization and no management can afford to let nature take its course when it comes to quality (Yusof & Aspinwall, 2000). The top management must play a leading role by making available the critical resources, establishing an organization wide quality policy that is well communicated to all stakeholders, establishing a quality management structure and managing the entire process through close monitoring and evaluation. This must be supported by an organization culture and climate of open cooperation and team work among stakeholders in quality management (Terziovski, 2006).

Leadership in TQM requires the manager to provide an inspiring vision, make strategic directions that are understood by all and to instill values that guide subordinates (Lau, Zhao, & Xiao, 2004a). For TQM to be successful in the business, the supervisor must be committed in leading his employees. A supervisor must understand TQM, believe in it and then demonstrate their belief and commitment through their daily practices of TQM. Hence, this study proposes the hypothesis:

H1: Leadership (LDS) has a positive effect on Human Resource Management (HRM)
H2: LDS has a positive effect on Service Quality Culture (SQC)
H3: LDS has a positive effect on Customer Focus (CUF)
H4: LDS has a positive effect on Information and Analysis System (IAS)

5.2 Human Resource Management

Aldaibat and Irtaimeh (2012) demonstrated that Total Quality Management (TQM) has a special relationship with human resource management when it comes to systems for continuous improvement. Human resource management is practiced as part of quality planning at the enterprise level and thus directed to the needs of the internal consumer (Ali, Zairi, & Mahat, 2006). Furthermore, the purpose of performance management in TQM and human resource management is to improve performance; therefore, the challenge is not only to improve the quality of the system, but also to improve people's performance (Chuang, Liu, & Chen, 2015).

Over the past decades, TQM and Human Resource Management were important aspects of the business environment, being a subject of much research in the field due to the major impact that they may have on individual and organizational performance (B.G., V., Garg, & P, 2013). Intensifying the efforts to increase the competitiveness of the enterprise is a necessity nowadays and must be achieved through an approach in terms of TQM and human resources

resources (Gonzalez, Jiménez, & Lorente, 2013). TQM is an approach whose goal is to maximize competitiveness through continuous improvement of product quality, human resources, services, processes and environment (Izvercian, Radu, Ivascu, & Ardelean, 2013). TQM can be explained as a relationship between systems and the implementation of quality, closely related to competitiveness and performance (Kumar, 2012). The role of both human resource management and TQM is to create a culture / high performance-based system (Zabadi, 2013). Hence, this study proposes the hypothesis:

H6: HRM has a positive effect on SQC

H7: HRM has a positive effect on Social Responsibility (SRP)

5.3 Information and Analysis System

In this modern era, due to technological advancements, organizations are growing at rapid pace. Therefore, organizations heavily depend on quality information systems (IS) for their success (Almashaqba, 2013). An organization with the help of IS collect and organizes data to create the desired information at all levels. IS are used as a key information tool to solve business problems and they are based on up-to-date different types of information's that are helpful for managers in making managerial decisions (Qasim & Zafar, 2016). Information technology and quality information systems play important role in the success of organizations and have been identified as a significant factor that impacts service quality (Arshad & Su, 2015). The use of IS can help organizations in improving their quality through reductions of costs, better awareness of quality, high speed processing of quality data and availability of information about the quality management (Khanam, Siddiqui, & Talib, 2013).

TQM is an information intensive management. Information plays a vital role as all quality improvement activities are based on informed decision-making (B.G. et al., 2013). A company's database must be comprehensive and cover all critical areas such as customers, suppliers, employees and projects/processes (Urhuogo, Vann, & Chandan, 2012). As managing quality generates a great deal of data, it is important to determine what data types are worth keeping and how to organize them into an easily accessible structure (Srima & Wannapiroon, 2013). The databases must be able to facilitate different data manipulation and in-depth analysis to fulfill information requirements of each level (strategic, tactical and operational) of decision making activities (Siddiqui & Rahman, 2006). Hence, this study proposes the hypothesis:

H5: IAS has a positive effect on HRM

H8: IAS has a positive effect on SRP

H9: IAS has a positive effect on SQC

H10: IAS has a positive effect on CUF

5.4 Customer Focus

TQM companies are focusing on the customers and their needs (Aghaei, Asadollahi, Nejad, pour, & Dabanlo, 2013). One element of TQM is the focus on customers. Customer-focused performance represents the key dimension and the decisive source of company competitive advantage. Customer value may be the most important factor in determining the superiority of customer-focused performance since customer satisfaction can be generally considered as the consequence of customer value (Al-Ababneh, 2014).

As mentioned by Aghaei et al. (2013) customer focus can be defined as the degree to which a firm continuously satisfies customer needs and as can be expected a successful firm will recognize the need to put the customer first in every decision made. The key to the quality management is maintaining a closer relationship with the customer in order to fully determine the customer need, so the customer should be closely involved in the product design and development with valuable input to every stage (Arokiasamy, 2014).

Because customer focus is one of the important principles of TQM, organizations should understand what customers want and provide the customers with such product, service, commitment, and customer relationship management to meet these requirements (Hassan, Nawaz, Shaukat, & Hassan, 2014). Further, in marketing literature, customer's focus is a central tent of marketing orientation. Fatemi, Wei, and Moayeryfard (2016) defined market orientation as primary essential behaviors which organizations attempt to discover, understand, and satisfy the expressed needs of customers and potential customers.

The customer today dictates the market (Karani & Bichanga, 2012). The primary focus of TQM is the customer. It is aimed at satisfying customer needs. Montasser and Manhawy (2013) have indicated that customer satisfaction is increased by the participation of all employees in TQM. A successful organization recognizes the need to put the customer first in every decision made. In product design and during the development process, the customer should be closely involved and should provide inputs at every stage of the process, so as to avoid waste, defects and quality problems (Montasser & Manhawy, 2013). Hence, this study proposes the hypothesis:

H15: CUF has a positive effect on EBP

5.5 Service Culture

Service culture is of great importance in TQM literature (Sajjad, 2011). The purpose of developing service culture is "service to customers". Organizations which believe in service culture are more likely to provide reliable, responsive and empathetic service to the customers. As a specialized culture within the broader concept of organizational culture, service culture is defined as "a culture where an appreciation for good service exists, and where giving good service to internal as well as ultimate, external customers is considered by everyone a natural way of life and one of the most important values" (Grönroos, 2007). Based on this definition, service culture not only refers to organizational practices but also relates to manner, values, and behavior of both the organization and its employees.

Agus, Hassan, and Hajinoor (Undated) pointed out several perspectives can be used to explain why service culture may lead to better service quality and how differences of service culture between local and foreign service firms in emerging markets. First, based on the resource-based view theory of the firm (Bon & Mustafa, 2014), service culture is regarded as a crucial firm resource that is valuable and inimitable by competitors, thus is likely to lead to positive outcomes. Social exchange theory (Bon & Mustafa, 2014; Hassan, Mukhtar, & Qureshi, 2012; R., Devadasan, G.V., & Kumar, Undated) provides further insights into how service culture may influence customer based service quality evaluation.

Some empirical studies have indicated that employee service attitudes are consequences of service culture (Awan, 2013). Indeed, as important interfaces between the organizations with their customers (Santos-Vijande & Alvarez-Gonzalez, 2007), employees' attitudes such as job satisfaction and commitment are crucial for providing good services (Zubair, 2013). Employee job satisfaction is defined as employee's pleasurable emotional response toward their organization and their employment (Hussain, Tsironis, & Ajmal, 2011). Affective commitment is referred to employee's emotional attachment to, identification with and involvement in the organization (Talib, Rahman, & Qureshi, 2013).

The implementation of TQM concept requires a supportive infrastructure and quality culture (Monsef, Amoopour, & Azizi, 2012). The organizations with adaptive culture can satisfy changing demands of customers, employees and shareholders more quickly and can outperform organization without such a culture (Pourrajab, Basri, Daud, & Asimiran, 2011). Hence, this study proposes the hypothesis:

H11: SQC has a positive effect on CUF
H12: SQC has a positive effect on SRP
H14: SQC has a positive effect on EBP

5.6 Social Responsibility

Arokiasamy (2014) worked on the concept of quality is part of the new paradigm of modern societies. The cultural evolution of a people can be demonstrated through the evolution of that concept (Campos et al., 2014). The model of TQM focuses on customer satisfaction, participatory management and results orientation. As a model, TQM provides a set of methods and practices that are applicable at all levels and areas of management (Eraqi, 2008). This allows the organization to get feedback and evaluation on an integrated way throughout the business cycle of the organization (Fening, Amaria, & Frempong, 2013). Social responsibility is a relatively new concept of management (García, Rama, & Alonso, 2014).

Business ethics and social responsibility are themes that have been given considerable attention in organizations and academic publications (Irfan, Ijaz, Kee, & Awan, 2012). Friedman was one of the authors who first started the discussion about social responsibility, saying it should let the business people do what they must do and that is, let them take care of their business (Irfan & Kee, 2013).

Social Responsibility is the recognition that business activities have an impact on society and that is considered in management decision making (Rodrigues, Valdunciel, & Miguel-Dávila, 2014). According to Steeples (1994, cited by Ghobadian et al., 2007) there is a strong correlation between ethics and quality apparently in the company's shares and on the actions of its employees (Santos-Vijande & Alvarez-Gonzalez, 2007). TQM spread certain values, behaviors and work methods relying on its core integrity, commitment, honesty, openness, respect, participation, membership and meeting the needs of different stakeholders (Sukwadi & Yang, 2014). Hence, this study proposes the hypothesis:

H13: SRP has a positive effect on Excellent Business Performance Results (EBP).

5.7 Excellent Service Performance

The ultimate goal of quality management system based on the concept of TQM is achieving business excellence (which includes the business performance of organizations in financial terms and terms of meeting the demands of all stakeholders), which is reflected in the constant increase in profits and market share, while reducing operating costs (Zubair, 2013). Achieving service business excellence (capturing market position) and the creation of world-class products and /or service are the basic requirements for survival, growth and development of organization (Zakuan et al., 2012).

Business Excellence isn't located in one business function, but is the result of their synchronous activity, according to precisely defined goals, and should be goal of every employee (Wang et al., 2010). It is believed that the former approach, based on rational behavior, the functional organization, (bureaucratic) chain of ordering, should be adjusted to modern business conditions. (Vanagas & Vilkas, 2008) suggests the establishment of business organizations that could be based on three "supporting" pillars. Supporting pillar "breaking old habits" on the most radical way indicates changed business conditions in the global market. Talib, Rahman, and Qureshi (2010) emphasize the attitude of continuous adaptation to change - through continuous changes in business organization, where every change is reflects of temporary custom solutions to existing circumstances.

5.8 Relationship Between TQM Practices and Service Quality

The numerous past studies have revealed positive link between TQM and quality performance (Samat et al., 2007). The aim of TQM implementation is to guarantee that the company fulfills the candid needs and demands of customers. Therefore, implementation of TQM has positive correlation with service quality. The key purpose of TQM implementation is to improve quality performance of products and services (Juran, 1988; Samat et al., 2007). Lam et al. (2012) in their empirical study found that TQM has positive and significant relationship with service quality.

6 Research Methodology

6.1 Introduction

To deal with the research methodology, it considers the research design, the population and sample, data collection and data analysis method.

6.2 Research Design

The study will be conducted by using a cross-sectional research design. This design was appropriate because the given study is largely descriptive and seeks to determine the status at a given point in time. Kitoto, (2005) has used this design in a similar study. This will be study of some travel agencies based in Phnom Penh.

6.3 Population Sampling

The target population composed of employees from travel agencies operating from Phnom Penh. Given that there were two groups of respondents targeted, Stratified sampling method was used and a sample 300 employees from travel agencies. According to Mugenda and Mugenda (2003), a sample of 30 or more respondents is assumed to be enough for a normal distribution. These employees were drawn from departments concerned with day-to-day operations of each of the travel agencies i.e. those that particularly impact on on-time performance and customer services.

6.4 Population Sampling

Perceptual data will be obtained using a structured questionnaire which was developed in line with the objectives of the study. The items in the questionnaire have been obtained from existing literature.

6.5 Data Analysis

The data to be collected was largely quantitative, therefore descriptive method of analysis was used to analyze it. The mean and standard deviation were used to represent the variables. CFA and SEM analysis was applied to achieve the objectives of the study.

6.6 Conceptual Framework

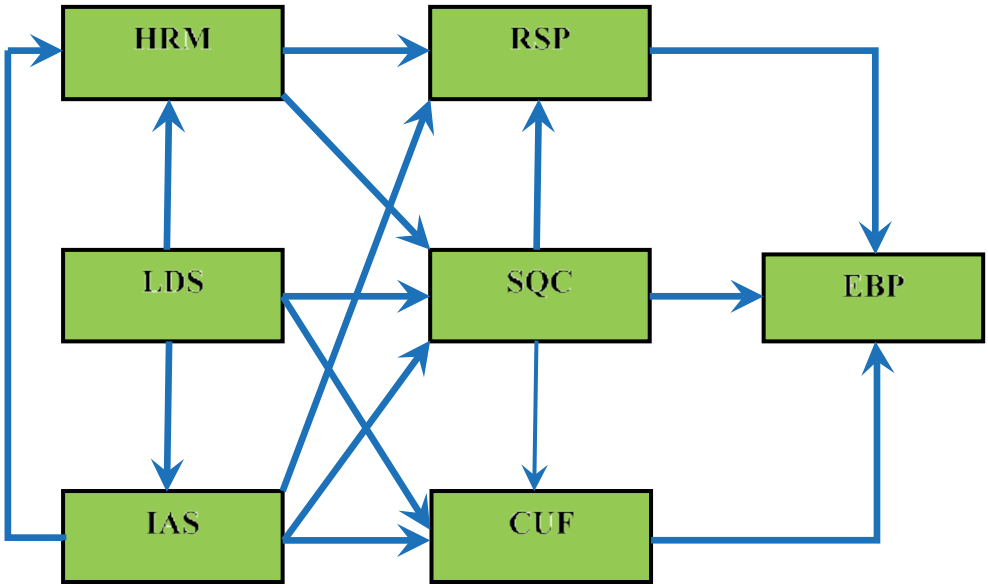

Figure 1. Theoretical Framework

6.7 Research Instrument

A survey instrument was developed based on previously validated scales as mentioned in the literature review, and then administered to 250 consumers, who study at the National University of Management during second semester in 2015. The questionnaire is subdivided into two parts. First part focuses on the independent and dependent variables such as LDS (9 items), HRM (10 items), IAS (9 items), CUF (6 items), SQC (4 items), RSP (6 items), and EBP (7 items). Second part is demographic variable such as gender, race, age, education and personal income. Seven points Likert scale were used to measure those item. One means strongly disagree, 4 means neutral, and 7 mean strongly agree. Those Likert scale were adapted and modified from Wang et al., (2003). Only 250 valid responses were coded into SPSS version 20 software program and analyzed using AMOS version 18. Several statistical validity tests were used in confirmatory factor analysis (CFA) processes. Those testes include reliability, composite reliability tests, discriminant validity for multicollinearity treatment. After CFA was completed, a descriptive analysis and correlation were followed and finally, structural equation modeling analysis was used to determine significant factors Improving Operational Performance of Travel Agencies in Cambodia.

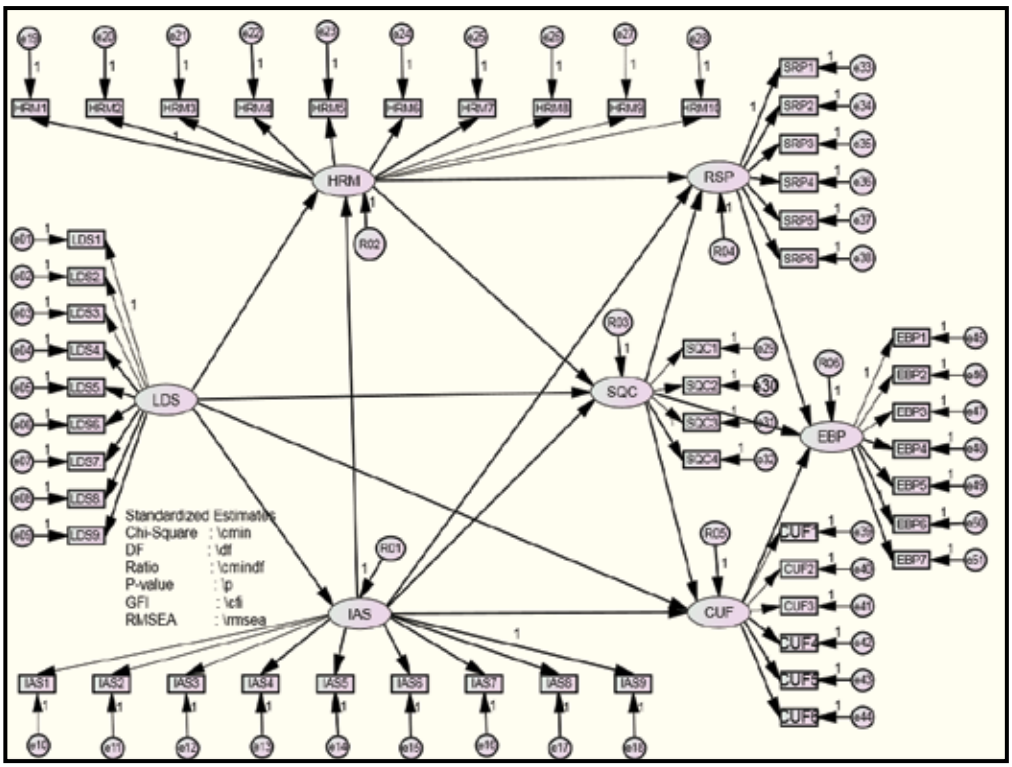

Figure 2. Hypothesize Model

7 Finding

7.1 Demographics

In majority out of a total of 216 usable responses, 112 (52.1%) are female, 188 (87.1%) in the age group of 18-30 years-old, most amount 193 (89.4%) hold master degree, 153 (71.0%) are employees and most of them within work experience between 1 to 4 years. The Table 1 shows the breakdown of the types.

Table 1. The profile of respondents (216)

Demographics	Frequency	Valid Percent
Gender		
Male	104	47.9%
Female	113	52.1%
Age		
18-30 years	189	87.1%
31-40 years	20	9.2%
41-50 years	8	3.7%
Education		
Bachelor Degree	23	10.6%
Master Degree	194	89.4%
Doctoral Degree	0	0.0%
How long have you been familar with the travel agency (as)		
Employeer	63	29.0%
Employee	154	71.0%
How long have you been familiar with the travel agency (Years)		
1 Year	70	32.3%
2 Years	74	34.1%
3 Years	16	7.4%
4 Years	43	19.8%
5 Years	7	3.2%
6 Years	1	0.5%
7 Years	2	0.9%
10 Years	1	0.5%
15 Years	2	0.9%
20 Years	1	0.5%

7.2 Descriptive Analysis of Variables:

Table 2. Reveal that the initial Cronbach's alphas (before the confirmatory factor analysis was conducted) lie between 0.807 to 0.872. These values indicate that the items in each construct is reliable to measure the underlying concept, therefore the reliability of the measures used in this study can be considered as internally consistent (Sekaran, 2003).

Table 2. Descriptive Statistics of Variables

Variable Name	Items	Mean (Std.Dev.)	Reliability
LSP	9	5.32(1.12)	82.30%
HRM	10	5.29(1.13)	84.80%
IAS	9	5.08(1.12)	83.50%
SQC	4	5.23(1.08)	80.70%
RSP	6	5.15(1.15)	83.60%
CUF	6	5.39(1.08)	83.00%
EBP	7	5.11(1.10)	87.20%

7.3 Confirmatory Factor Analysis Result

The confirmatory factor analysis (CFA) result is showed in Table 3. From this table we observed that the factor loadings of all observed variables or items are high enough and ranging from 0.536 to 0.865. This indicates that all the constructs conform to the construct validity requirement.

Table 3. Factor loading, Variance Extracted of Variables and Construct Reliables

Observe Variables	Std. Regression Weight	SMC	Error	AVE	CR
LDS4	0.654	0.428	0.572	**0.533**	**0.850**
LDS5	0.661	0.437	0.563		
LDS6	0.824	0.679	0.321		
LDS8	0.745	0.555	0.445		
LDS9	0.754	0.569	0.431		
	3.638	**2.667**	**2.333**	**0.503**	**0.7963614**
HRM1	0.780	0.608	0.392		
HRM4	0.607	0.368	0.632		
HRM7	0.865	0.748	0.252		
HRM9	0.536	0.287	0.713		
	2.788	**2.012**	**1.988**	**0.577**	**0.844**
CUF1	0.799	0.638	0.362		
CUF2	0.737	0.543	0.457		
CUF3	0.633	0.401	0.599		
CUF5	0.852	0.726	0.274		
	3.021	**2.308**	**1.692**	**0.564**	**0.844**
IAS1	0.79	0.624	0.376		
IAS2	0.655	0.429	0.571		
IAS3	0.752	0.566	0.434		
IAS5	0.845	0.714	0.286		
IAS9	0.698	0.487	0.513		
	3.740	**2.820**	**2.180**	**0.521**	**0.765**
SQC1	0.781	0.610	0.390		
SQC3	0.696	0.484	0.516		
SQC4	0.685	0.469	0.531		
	2.162	**1.564**	**1.436**	**0.528**	**0.815706**
SRP1	0.64	0.410	0.590		
SRP4	0.81	0.656	0.344		
SRP5	0.671	0.450	0.550		
SRP6	0.771	0.594	0.406		
	2.892	**2.110**	**1.890**	**0.510**	**0.861**
EBP1	0.618	0.382	0.618		
EBP3	0.753	0.567	0.433		
EBP4	0.725	0.526	0.474		
EBP5	0.789	0.623	0.377		
EBP6	0.749	0.561	0.439		
EBP7	0.632	0.399	0.601		
	4.266	**3.058**	**2.942**		

7.4 Composite Reliability and Discriminant Validity of the Constructs

Table 3 shows the result of the calculated composite reliability and variance extracted to support composite reliability of each construct (with error consideration) and discriminant validity of constructs respectively. According to Fornell and Larcker (1981), average variance extracted (AVE) should be more than the correlation squared of the two constructs to support discriminant
validity (compare table 4 and table 5). Each AVE value is more than correlation squared, therefore, discriminant validity is supported or multicollinearity is absent.

Table 4. Correlation Square Matrix among variables

Variable Name	LDS	HRM	CUF	IAS	SQC	SRP	EBP
LDS	1.000						
HRM	0.654(**.427**)	1.000					
CUF	0.720(**.518**)	0.707(**.499**)	1.000				
IAS	0.741(**.549**)	0.752(**.565**)	0.755(**.570**)	1.000			
SQC	0.723(**.522**)	0.711(**.505**)	0.723(**.522**)	0.695(**.483**)	1.000		
SRP	0.690(**.476**)	0.798(**.636**)	0.741(**.549**)	0.715(**.511**)	0.701(**.491**)	1.000	
EBP	.623(**.388**)	0.706(**.498**)	0.559(**.358**)	0.705(**.497**)	0.670(**.4488**)	0.664(**.441**)	1.000

Table 5. Average Variance Extracted (AVE) Matrix of Variables

Variable Name	LDS	HRM	CUF	IAS	SQC	SRP	EBP
LDS	1.000						
HRM	0.522	1.000					
CUF	0.555	0.540	1.000				
IAS	0.549	0.571	0.571	1.000			
SQC	0.527	0.512	0.549	0.543	1.000		
SRP	0.531	0.515	0.552	0.543	0.524	1.000	
EBP	0.522	0.506	0.543	0.537	0.515	0.519	1.000

7.5 Goodness of Fit Indices:

In measurement models process, CFA was conducted on every construct and (see Table 6). All CFAs produce a relatively good fit as indicated by the goodness of fit indices such as CMIN/df ratio (<2); p-value (>0.05); Goodness of Fit Index (GFI) (GFI>= 0.90); and root mean square error of approximation (RMSEA) of values less than 0.08 (<0.08). The measurement model has a good fit with the data based on assessment criteria such as GFI, CFI, TLI, RMSEA (Bagozzi & Yi, 1988; Nejatian, Piaralal, Sentosa, & Bohari, 2011). Table 6 shows that the goodness of fit of generated or revised model is better compared to the hypothesized model.

Table 6. Goodness of Fit Analysis -CFA of Measurement Models and structural Models

Final Models	CFA	CFA Fit	Hypothesised Model	Revised Model Fit
Item Remain	51	34	51	31
CMIN	2165.466	728.034	2179.106	594.669
df	1204	507	1210	420
CMIN/df	1.799	1.436	1.801	1.416
p-value	0	0	0	0
GFI	0.724	0.846	0.722	0.859
CFI	0.816	0.928	0.812	0.935
TLI	0.803	0.92	0.802	0.928
RMSEA	0.061	0.045	0.061	0.044
Bollen-Stine bootstrap p-value	0.05	0.363	0.05	0.353

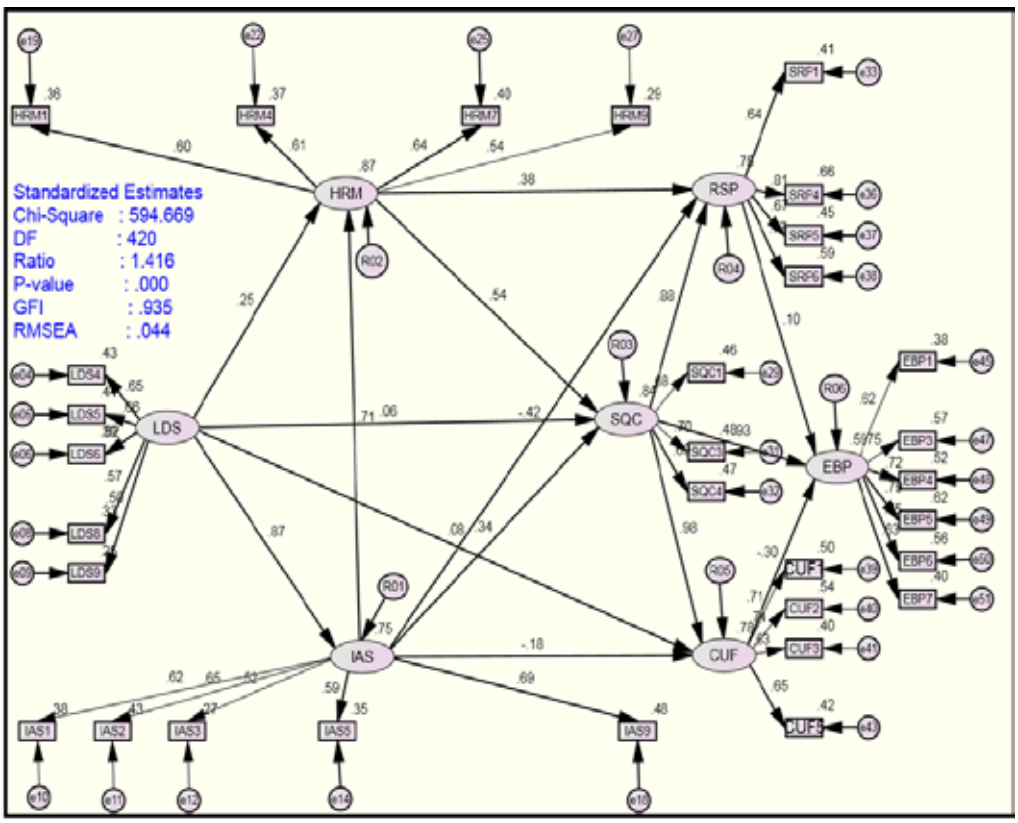

Figure 3. Revised Model

7.6 Result of Hypothesis

Table 7 and Figure 3 show that LDS has a direct positive and significant/insignificant influence on: (1) HRM (ß=.248; CR=1.157; p>.05);(2) SQC (ß=.058; CR=.301; p>.05); (3) CUF (ß=.079; CR=.414; p>.05); and IAS (ß=.866; CR=6.167; p<.001). Thus, H1, H2, H3 are not asserted and H4 is asserted. IAS has a significant and positive link with HRM (ß=.709; CR=3.105; p<.01); and IAS a insignificant and positive link with RSP (ß=.416; CR=1.059; p>.05); SQC (ß=.345; CR=1.035; p>.05); CUF (ß=.184; CR=.663; p>.05). Thus, H5 asserted and H8, H8, H10 are not asserted. HRM has a positive and insignificant on SQC (ß=.539; CR=1.521; p>.05); RSP (ß=.376; CR=.838; p>.05). So H6, H7 are not asserted. SQC has a positive and significant with CUF(ß=.982; CR=4.031; p<.01); RSP(ß=.882; CR=2.98; p<.01) ; EBP(ß=.934; CR=3.281; p<.01). Thus H11, H12, H14 are asserted. However, RSP and CUF are found to be insignificantly related to EBP (ß=.098; CR=.586; p>0.05); EBP (ß=.3; CR=1.324; p>.1). Thus, H13,H15 are rejected.

Table 7. Direct Impact of Revised Model: Standardized Regression Weights

H	Relationships between Exog. and Endog.			Estimate	S.E.	C.R.	P	Label
H1	HRM	<---	LDS	0.248	0.263	1.157	0.247	InSig.
H2	SQC	<---	LDS	0.058	0.242	0.301	0.764	InSig.
H3	CUF	<---	LDS	0.079	0.24	0.414	0.679	InSig.
H4	IAS	<---	LDS	0.866	0.187	6.167	***	Sig.
H5	HRM	<---	IAS	0.709	0.211	3.105	***	Sig.
H6	SQC	<---	HRM	0.539	0.365	1.521	0.128	InSig.
H7	RSP	<---	HRM	0.376	0.495	0.838	0.402	InSig.
H8	RSP	<---	IAS	-0.416	0.4	-1.059	0.290	InSig.
H9	SQC	<---	IAS	0.345	0.316	1.035	0.301	InSig.
H10	CUF	<---	IAS	-0.184	0.262	-0.663	0.507	InSig.
H11	CUF	<---	SQC	0.982	0.242	4.031	***	Sig.
H12	RSP	<---	SQC	0.882	0.318	2.981	***	Sig.
H13	EBP	<---	RSP	0.098	0.149	0.586	0.558	InSig.
H14	EBP	<---	SQC	0.934	0.273	3.281	***	Sig.
H15	EBP	<---	CUF	-0.3	0.219	-1.324	0.185	InSig.

7.7 Variance Explained (Squared Multiple Correlation-SMC)

From Table 8, it could be deducted that LDS and IAS explains 86.9 % of the variance in HRM; LDS explains 75% variance in IAS; LDS, IAS and HRM explains 74.9%variance in SQC; HRM, IAS and SQC explains 74.9% of the variance in RSP; LDS, IAS, SQC explains 78.4% of the variance in CUF; and RSP, SQC and CUF explains 58.8% of the variance in EBP.

Table 8. Square Multiple Correlation Results

Endogenous Variable	Square Multiple Correlation(SMC)= R^2
HRM	86.9%
IAS	75.0%
SQC	74.9%
RSP	74.9%
CUF	78.4%
EBP	58.8%

8 Discussion, conclusion and recommendation

The purpose of this research paper is to examine the relationship between the six key practices of TQM and TQM performance (excellent business performance results) of travel service firm. From the results generated by SEM, leadership has proven to be positively and significantly related with information and analysis system; whereas information and analysis system have significant effects on human resource management within the Cambodian travel agency firms. Meanwhile, leadership do not support human resource management, customer focus and service quality culture in the Cambodian travel agency firms.

Human resource management and service quality culture were demonstrated to be not significantly related with service quality culture, social responsibility and customer focus in the travel agency firms. Social responsibility and customer focus do not support excellent business performance results whereas service quality culture supported, and also proven to be positively and significantly related with customer focus and social responsibility in the Cambodian travel agency firms. Such a finding implies that the top management has not been proactively participating in human resource management, customer focus and service quality culture or in the worst case scenario, they may have even prevent attempts to involve themselves in the external and internal customer in service performance activities.

This is not in line with the studies conducted by several researchers in the likes of Lau, Zhao, and Xiao (2004b), which suggest leader holds a vital position to cultivate a healthy human resource environment within the company. The findings of this study are also not in line with that of Hassan et al. (2014), whereby top management support and involvement are needed to encourage the human resource programme in order to ensure success. Specifically, it is also not in line with Talib et al. (2013) and Politis (2002) in that leadership styles can positively and significantly affects the dimensions of human resource management.

Furthermore, the studies of Meyer and Collier (2001) and Srivastava et al. (2006) proved the significant ability of a leader to initiate the service quality culture was also not supported in this study. However, the study of Moghadam, Sharifian, and Mosthfezian (2013) and Widyaratne (2012) which concludes the insignificant relationship between leadership and information and analysis system supported the findings of this result. Evidenced from the past studies, there needs to be active involvement among the senior managers in the quality management and improvement process, amidst advocating change and information and analysis system implementation. Adequate resources, such as training and education, need to be provided to staff by the managers of the sampled firms, so that the firms' future direction will be shared and subscribe by all staff. Hence, there needs to be proper implementation of information and analysis system.

The result obtained from this quantitative study also reveals that information and analysis system is a significant factor in influencing human resource management. This result is on par with the findings from the study of Mehrabi, Abtahi, and Dehbalaee (2013) which state that the process of disseminating and creating new information and analysis system is supported to an effective practice in human resources. The results in this study also further supported the findings of Hassan, Hassan, Shaukat, and Nawaz (2013) that employees will be able to be to build information and analysis system if they are trained and educated accordingly. In line with our findings that human resource management can affected by information and analysis system are studies of Lau et al. (2004b) and Zarraga and Bonache (2003). Our result demonstrated that these sampled firms strongly emphasized on human resource management practices, in which a proper firm-wide training needs to be provided to the staff at different levels. When such an environment is in place, employees will be more willing to obtain and share information during the training sessions and from there, the information and analysis system accumulated can be applied to solve problems. Deemed as the most effective manner to develop human resources, employees will continue to be a valuable asset in the improvement of company's performance.

Another result in this study is that information and analysis is not significantly related to social responsibility, service quality culture and customer focus in Cambodia's travel agency firms. Our finding did not confirm the study conducted by Hassan et al. (2014) and Talib et al. (2013) and Serban (2002) which stated that information technology is essential in supporting a firm's social responsibility, service quality culture and customer focus. Specifically, the result in this study did not show a significant relationship between information and analysis and firm's social responsibility, service quality culture and customer focus, opposing to the studies of (Meyer & Collier, 2001) and Xu and Walton (2005). Furthermore, no relationship was concluded between information and analysis and firm's social responsibility, service quality culture and customer focus in this study, which contradicts the findings of Moghadam et al. (2013) and Lee et al.

(2006). Additionally, the findings also concluded the insignificant relationship between information and analysis and human resource management. Based on such a result, there is a need for Cambodia firms to integrate a human resource management system that is unique, in order for the most recent information pertaining to the latest trends, products and services offered by other players and the expectations from the end users can be gathered at the shortest time possible. The use of the most advanced technology can speed up the process of acquiring, distributing and applying information and hence it can be concluded that the relationship between information analysis and human resource management is closely knitted.

Service quality culture has shown to significantly affect customer focus in the travel agency firms in Cambodia. The finding from our research is similar with the findings of Mehrabi et al. (2013), as a well-structured business plan has been found to be a factor for the success of service quality culture and customer focus. This result is also parallel with Hassan et al. (2013), in that the creation of a common vision will create a passion among both managers and employees to pursue customer focus. Specifically, service quality culture was proven to significantly affect customer focus, which is in line with Lau et al. (2004b). Besides that, the significant association between service quality culture and social responsibility was also reported in the results, which is consistent with Hassan et al. (2014), Ooi (2012), and Pieris et al. (2003). The relationship between service quality culture and excellent business performance results was further confirmed to be significantly related in this study, in which a similar proposition was made by Talib et al. (2013). From the results reported in the study, when a company's vision includes the service quality culture and social responsibility and excellent business performance results and information and analysis activities, alongside a structured plan that permits staff to gather, share and interpret new ideas, this will enable information knowledge to flow freely among various organizational units, therefore allowing the company to be able to manufacture products and services that are of good quality.

It was discovered that customer focus has a negative influence on excellent business performance results in Cambodian travel agency firms. In other words, the negative and insignificant relationships between customer focus on the excellent business performance results dimensions portrays that the time and effort being invested into customers' needs is deemed ineffective. Moreover, the ever changing demand of the customer due to the dynamism law in the recent years may have led to this phenomenon. In view that the wants and desires of customer change dynamically, companies are having a challenging time to update each customers' distinctive demand. On the other hand, the rapid changing customer requests may cause deterrence for the companies to grasp on their customer request due to the additional time, initiative and resources needed, which may bring undesirable effect to the aspect of excellent business performance results. In contrast with our research finding are the studies of Meyer and Collier (2001) and Waddell and Stewart

(2008), in which firms are strongly encouraged to gather information from customers to produce goods that are consistent with the desires of customers. Former study of Moghadam et al. (2013) and Lee et al. (2001) also confirms that stronger ties need to be built up among organization and its customers in order to acquire customer preference information to research into better quality and preferred goods. Furthermore, insignificant relationship between customer focus and excellent business performance results was also found in the present research, opposing the results reported in Mehrabi et al. (2013) and Ju et al. (2006), but in line with the study recently carried out by Hassan et al. (2013). Additionally, no significant relationship was also found between customer focus and excellent business performance results, which is inconsistent with the proposition of Talib et al. (2013). As evidenced from past literatures, firms need to look into the needs of their customers more extensively by conducting a customer satisfaction survey every year, and collecting feedbacks from them. In order to do so, the front lines of these firms need to establish close relationship with the customers in order to continuously seek new information from them and share this information with the members of the firms. This will enable such knowledge to be applied when developing new products and services.

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MOBILE PHONE ADDITION, Case Study for NUM'S Students

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Abstract

According to lecturers' observation at the National University of Management (NUM) as well as at other universities in Cambodia, university students seem to be addicted to cell phone, and what to worries is the trend of cell phone addiction among the students in Cambodia will get worse in the future; therefore, investigating whether the students are addicted to their mobile phones, exploring phones addicted traits and behaviors, and diagnosing the effects of mobile phone excessive usage becomes the objectives of this study. Semi-structure i.e. open and close ended questions were used to get the responses from the NUM's students by using simple random sampling technique. 250 students were asked and the response rate is 88.0%.

Firstly, the results express that 20.0% are addicted to their device, 53.6% are addicted to technology, and 44.5% are addicted to instant and constant communication. Regarding the addicted effect, 46.4% suffer sleep loss, 37.7% make longer calls, 33.6% decline in productivity, 32.7% get complaint from others about their excessive use, 33.2% feel nervous, moody or depressed when away from mobile, and without phone; they feel disconnected 56.4%, stressed 24.1%, alone 8.2%, and other 11.4%. Next, traits and behaviors of the usage; 23.2% don't show their phone out and the rest are texting, 21.8%; playing game, 13.6%; holding, 10.5%; taking photo, 6.8%; talking, 2.3%; listening, 1.8%; and others, 20.0%. Finally, 76.8% believe addiction to technology contribute to negative psychological effects and self-esteem. As a result, only 17.3% lose the real world while being with their cell phone, 36.6% use cell phone everywhere, 29.1% avoid keeping cell phone on silent or vibration mode, 35.0% use cell phone to make new friends, 31.8% get annoyed by botheration, so 30.0 % ignore face-to-friends to be on phone, and 27.7% conceal the usage from others.

Keywords: *Mobile Phone Addiction, Addicted Behavior, and Addicted Effects*

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1 INTRODUCTION

1.1 Background

The use of cell phones has played a vital role in communication across the globe in recent years; citizens of the United States, like people in other countries, are consumed in the technological revolution (Jones, 2014) A generation ago, people left their homes without any form of electronic device; however, now more than 90.0% of American adults have a cell phone of some kind, and for people under the age of 44, that number is closer to 97.0% (Mataconis, 2013). Similarely, the study of Phong and Solá (2014) found that almost 94.0% of Cambodians claim to own their own phone, and more than 99.0% are reachable through some sort of phone.

Each and every invention has brought comforts as well as some threatening effects with it; the case of mobile phone technology is the same. This is a medium that allows youngsters to communicate and interact with others without parental and teachers' monitoring (Ahmed, Qazi, & Perji, 2011). Consequently, throughout this study, what to be addressed are questions related to cell phone addiction and analyze its consequent psychological effects.

1.2 Research Problem

One of the biggest surprises surrounding the growth of technology is the worldwide acceptance and intense use of cell phones among youth (Ling, 2005). With cell phone ownership becoming so widespread, society is starting to see and question the impacts of cell phone use on adolescent development (Morrill, 2009).

Brian (2013) claims, "It is common for teens' sleep to be interrupted by texts. Sometimes teens even send texts filled with nonsense words when they don't wake up all the way thus many teens have troubling problems when they try to go without cell phones or technology."

Jones (2014) said that the feelings of stress and anxiety due to an absence of technology are new to teens acroose the globe, these addictions have altered the way humans personally interact with one another, and have created a distance in the ways in which they communicate, and cell phones have driven a wedge between intimate and direct conversation and communication, so it is becoming an addiction that is impeding personal well-being, causing unnecessary anxieties and pressures." Ahmed et al. (2011) quoted

from (The Sydney Morning Herald), "psychiatrists proclaim that in the 21st century mobile phone addiction has become one of the major non-drug addictions, and addict victims suffer social isolation and economic losses."

Observations and a survey of student's on Elon's campus showed that Elon is not an exception to the phenomenon that cell phone addiction is affecting many young adults. Some people claimed that addictive behaviors and habits arise because they don't want to be disconnected from their friends and family. They need to have their cell phones so they are able to respond, or reach out to people instantly and impulsively. Others believe that the use of technology to communicate has decreased our ability to communicate with one another in person (Jones, 2014).

Similarly, according to lecturers' observation at the National University of Management as well as at other universities in Cambodia, university students seem to be addicted to cell phone that is to say they spand age time holding, listening, texting, talking, taking picture, playing game, and doing the like activities with their cell phone. They seem to feel of high self-esteem, elegant, proud, and even more important than the others by holding and using their smart phone. They use their devices in classroom regardless of studying time and they seem to be unable to go for a day without using mobile phone. Hence, what to worries is the trend of cell phone addiction among university students in Cambodia will get worse in the future.

1.3 Research Questions

This study was organized to answer three research questions as follows:

- Are the university students addicted to their mobile phones? if so to what extent?
- What are obvious traits and behaviors that show addiction to mobile phones?
- What effects of mobile phone excessive usage do the university students have?

1.4 Research Objectives

The research paper has three main objectives and basically was designed to:

- Investigate whether the university students are addicted to their mobile phones,
- Explore mobile phones addicted traits and behaviors of the university students, and
- Diagnose effects of mobile phone excessive usage on the university students.

1.5 Scope and Limitation

The scope of this research is in area mobile phone addiction of the university students, and its limitation is that data are collected from the National University Management's students on their behavioral addiction, which may be calling, texting, internet, and the like addiction, to mobile phone but not substance addiction.

2 LITERATURE REVIEW

2.1 Telephone Revolution

Technological revolution has provided the world with luxurious inventions. Communication channels has been so fabulously upgraded that corresponding to a persons with thousands of miles apart is just a game of seconds now. Ahmed et al. (2011), said Invention of fixed telephone in 19th century was no more a wonder in 21st century when human brain invented mobile phone. Ahmed et al. (2011) cited from (Tech-FAQ) that Mobile phone technology has experienced a tremendous growth.

In 1946, Swedish mobile used the first official mobile phone. In 1983, Motorola presented first truly portable cell phone. This industry has been among the fastest growing categories of consumption goods. Remarkable growth can be seen in its users especially among young people. They are the most vivid users of this technology. Situation becomes more pathetic when serious social, educational and health hazards come up as a consequence of excessive cell phone usage (Ahmed et al., 2011).

2.2 Mobilephone Addiction

It is important to understand the definition of addiction before analyzing human interactions with cell phones. Alavi et al. (2012) explained that all entities capable of stimulating a person can be addictive. They found, "whenever a habit changes into an obligation, it can be considered as an addiction." And "Psychiatrists suggest *a person to be addict if he feels an overwhelming need of cell phone usage for more than half an hour daily,"* (Ahmed et al., 2011) quoted from (The Sydney Morning Herald).

Niaz (2008) proposed that addictive mobile use has now become a public health problem and awareness about the dangers associated with excessive usage and addictive behaviors must be extended among common people

2.3 Mobilephone Addicted Behavior and Effects of the Excessive Usage

Alavi et al. (2012) said that behavioral addiction refers to the individual who is not addicted to a substance but the behavior or the feeling brought about by the relevant action such as internet addiction. Mozes (2012) stated that the way we treat and interact with our devices is often impulsive and uncontrollable. Due to the status symbol of our iPhone or Blackberry, when we've got important people to talk or text to, we may be even more important than the people right in front of us; we're so important that we have to talk everywhere and all the time in front of others, so numerous factors including materialism and impulsiveness play a role in turning cell phone use into an addiction.

Bianch and Phillips (2005), Paragras (2003), Monk, Carroll, Parker, and Blythe (2004), and Palen, Salzman, and Youngs (2001) also recognized the problematic dimension of excessive usage of mobile phone in young people. Therefore, many mobile phone users suffer from a new type of mental disease called 'mobile phone dependence' syndrome and it is common especially amongst the youth. When such users observe a drop in phone calls or text messages then symptoms of addiction appear. These symptoms are often observed in eccentric, non-confident and unsociable people (Ahmed et al., 2011) quoted from (The Times of India).

Brian (2013) conducted an experiment with two teens who would go without phones for 48 hours. Her research was published in the article of "Two Days with No Phone." Brian asked the two teens about their phone habits and the amount of time they spend with their devices, and she found the two students woke up several times during the night to text. One student even slept with his phone beneath his pillow.

Warner (2003) said that young people use SMS to be in touch with their belongings and to feel a sense of their presence all the time. Similarly, Ito (2006) claimed that, young people seem to be desperate to be in touch with their friends. Thererfore, Morrill (2009) explains, "Measuring the constant connection and distraction; the amount of time spent in voice-to-voice communication and text messaging; as well as the length of cell phone ownership may identify the impacts on an adolescent's psychosocial development during one of the most critical periods in their life.

James and Drennan (2005) conducted a study on Australian students and identified a higher usage rate of 1.5 hours to 5 hours a day. They also highlighted the financial costs, emotional stress, damaged relationships and falling literacy as adverse consequences of excessive usage. There are a lot of researchers sate about misuse of mobile phone; for example, Griffiths and Renwick (2003) stated that higher usage of mobile phone leads towards being indebt and other financial worries of adolescents.

Consequencetley, Thompson and Ray (2007) emphasized security of children using mobile phone. They pinpointed the potential risks of uncontrolled expenditures, exposure and access to prohibited, damaging or adult material and bullying via mobile phone. Age matters when we talk about the extent of mobile phone usage.

Rice and Katz (2003) revealed that mobile phone usage is associated with income, work status, and marital status of the potential users. Also, (Turner, Love, & Howell, 2008) proposed that phone-related behaviors are differentially associated with user's personality and individual attributes (age, gender and etc.) For instance, in the study of Devís-Devís, Peiró-Velert, Beltrán-Carrillo, and Tomás (2009) concluded that boys spend more time on using mobile phone than girls do. Also, adolescents consume more time on using mobile phones on weekend than on casual week days. It reflects that various factors contribute towards the extent of mobile phone usage.

Aoki and Downes (2003) proposed that majority of United States students tend to make calls at night. This can lead to sleep loss and other adverse outcomes. Srivastava (2005) claimed "students even use their mobile phones while lecturing," (Haworth et al., 2005) proposed that young people are often prone to serious safety hazards as they use their mobile phone simultaneously while driving. In addition, Bianch and Phillips (2005) and Palen, Salzman, and Youngs (2008) stated that youngsters also use their cell phones at prohibited places like petrol stations, planes and hospitals.

2.3 Suggestion on Mobilephone Addiction

Jones (2014) suggests that there needs to be a balance between time spent with these devices, and without them. Without a set balance, people will continue to become more obsessed and consumed by technology, and there is a concern that humans will lose all closeness and affection that can come from personalized conversations; if humans learned to control their impulses related to cell phone use, they would be given the opportunity to interact and communicate with the present environment in which they are surrounded.

Hence, Carbonell, Guardiola, Beranuy, and Bellés (2009) concluded that the considerable amount of cell phone use in today's global society isn't as much an issue of addiction and dependence, but rather it is an issue of controlling impulses.

3 RESEARCH METHODOLOGY

This study was conducted with an aim to describe the aspects of mobile phone usage among Cambodian university students including *usage and addiction patterns, addicted traits and behavior patterns, and effects of mobile phone excessive usage.*

For this purpose, questionnaire with semi-structure i.e. open and close ended questions were used to get the responses from the population of National University of Management's students. Major chunk of questionnaire was taken from the research report of study conducted by MACRO (market analysis and consumer research organization) in May, 2004 with some editing for meeting with NUM environment. SPSS 19 was used to analyze the descriptive data.

Simple random sampling technique was used to collected from students of four shifts. Sample was consisting of 250 students in which 220 students responded back; therefore, this research comprised 88.0% response rate.

4 DATA ANALYSES AND EMPIRICAL FINDINGS

4.1 Participant Details

First, amoung all, only 14.0% of respondents is in the age group of 19 or less, 73.0% is in the age group of 20-29, 13.0% is in the age group of 30-39, only 1.0% is in the age group of 40-49. Next 45.5% is female, 54.5% is male; third 25.0% is in the low income family, 69.5% is in the middle income family, 5.5% is in the high income family; and finally 16.8% is married and 83.2% is single.

4.2 Open-ended Questions (Q1-9)

Q1.What type of mobile phone do you own? If you own more than one, what is your main one?

Among the types of owning mobile phones, there are around quarter of respondents own more than two mobile phones but the main one are iPhone, 50.0%; Samsung, 35.0%; Nokia, 5.5%; Huawei, 4.1%; and than follow by HTC, Singtech, or Sony Ericsson which each is occupied 0.9%; Oppo or Motorola which each is occupied 0.5%; and finally other brands, 1.8%.

Q2. How many hours do you use your mobile phone per day in average? Do you feel overwhelming need of cell phone usage for more than half an hour daily?

Among 220 students; 15% use mobile phone for 1 hour per day in average; 19.5%, 2 hours; 17.3%, 3 hours; 14.5%, 4 hours; 9.5%, 5 hours; 6.4%, 6 hours; 4.1%, 7 hours; 7.7%, 8 hours; and 5.9%, more than 8 hours. Moreover, 20% of the students feel overwhelming need of cell phone usage for more than half an hour daily; it seem become their obligation to use cell phone; therefore, according to Alavi et al. (2012) and Ahmed et al. (2011) quoted from (www.smh.com.au), those students are addicted their device.

Q3 What is the primary purpose of using mobile phone?

The primary purpose of using mobile phoneis is calling, 46.4%; social networking, 37.3%; playing game, 5.5%; texting or listening, 4.1%; taking photo, 1.8%; and mailing or reading, 0.5%.

Q4. Do you believe you are addicted to instant & constant communication? Why?

Around 44.5% of respondents believe they are addicted to instant and constant communication because of overwhelming need cell phone for instant and constant communication and it takes more than half an hour daily, but 55.5% don't.

Q5. Do you ever purposely leave your mobile at home to disconnect? Why?

Only 20.0% of respondents purposely leave your mobile phone at home to disconnect, for the way that they feel overwhelming need of cell phone usage consumes and wastes a lot of times, but 80.0% don't—that is to say 30.5% think that keeping cellphone with them is helpful for communication and 49.5% think it is in different.

Q6. How do you feel without your mobile phone?

Without your mobile; students feel disconnected, 56.4%; stressed, 24.1%; alone, 8.2%; normal, 4.1%; depressed, 1.4%; nervous or nake, 0.5%; and other ie bore, 5.0%.

Q7 Do you think university students look for a sense of gratification through various platforms in technology? Why?

96.8% of the respondents think university students look for a sense of gratification through various platforms in technology because the status symbol of their phone i.e. iPhone or Samsung are so important for them; those platforms in technology are even more important than the people right in front them; they use their phone everywhere and all the time in front of others. However, 3.2% don't think so.

Q8. Do you believe our addiction to technology contribute to negative psychological effects and self-esteem? Why?

76.8% of the respondents believe that addiction to technology contribute to negative psychological effects and self-esteem because for those students who don't own brading phone, they normally don't show their phone out in front of others if it is not necessary as they think their phone will lower their self-esteem and vice versa for those who own brading phone. Anyway, 23.2% don't.

Q9. What are the students doing with their mobile phone during the classes?

During the classes, 23.2% of the university students don't show their phone out, the rest are doing the following activities—texting, 21.8%; playing game, 13.6%; holding, 10.5%; taking photo, 6.8%; talking, 2.3%; listening, 1.8%; and others, 20%; such as time telling, assisting in study process i.e. check dictionary, search internet and etc.

4.3 Open-ended Questions (Q10-14)

Q10. What is your agreement with the extent of mobile phone addiction?

Q10 Extent of mobile phone addiction in percentage	**1**	**2**	**3**	**4**	**5**
Q10.1 Being addicted to my mobile phone	5.0	25.5	49.5	15.9	4.1
Q10.2 University students are addicted to mobile phone technology	1.8	6.4	38.2	38.6	15.0
Q10.3 When I walk across campus, the majority of people are on their mobile phones	2.7	7.7	30.5	44.1	15.0
Q10.4 I feel stressed and alone when I don't have my mobile phone	9.1	23.2	35.5	21.8	10.5
Q10.5 I wish society would rely less on instant and constant communication	10.0	27.3	38.2	19.5	5.0
Q10.6 I wish I could disconnect more and I enjoy communicating with friends in person without the added distraction of mobile phones	9.5	35.0	39.5	11.4	4.5

Note: 1 Strongly disagree, 2 Disagree, 3 Indifferent, 4 Agree, 5 Strongly agree

In term of agreement with the extent of mobile phone addiction in percentage, there are very few only 4.1% of students strongly agree, 15.9% agree that they are being addicted to my mobile phone; but there are 15.0% strongly agree, 38.6% agree that are addicted to mobile phone technology; and 15.0% strongly agree, 44.1% agree when they walk across campus, the majority of students are on their mobile phones. Likewise, only 10.5% of students strongly agree, 21.8% agree that they feel stressed and alone when they don't

have their mobile phone. Therefore, 5.0% strongly agree, 19.5% agree they wish society would rely less on instant and constant communication. Moreover, 4.5% strongly agree, 11.4% agree that they wish they could disconnect more and enjoy communicating with friends in person without the added distraction of mobile phones.

11 What is your addictive behaviors and traits on mobile phone usage?

Q11Addictive behaviors and traits on mobile phone usage in percentage	0	1	2	3	4	5
Q11.1 Making calls longer than intended	6.8	19.5	35.9	23.6	11.4	2.7
Q11.2 Ignoring face-to-face friends for using mobile phone	16.8	26.4	26.8	17.7	9.1	3.2
Q11.3 Using cell phone to communicate at home with family	10.9	12.3	10.9	17.3	23.2	25.5
Q11.4 Others complaint you about excessive mobile phone usage	15.5	24.5	27.3	15.0	15.5	2.3
Q11.5 Decline in productivity due to mobile phone usage	25.9	22.3	18.2	16.8	8.2	8.6
Q11.6 Getting annoyed on someone bothering you during mobile phone usage	15.5	26.8	25.9	19.1	8.6	4.1
Q11.7 Suffering sleep loss due to late night usage	7.3	18.6	27.7	16.4	20.9	9.1
Q11.8 Trying to reduce the extent of mobile phone usage	7.3	10.9	25.9	30.9	16.8	8.2
Q11.9 Concealing facts about mobile phone usage from others	33.2	19.5	19.5	18.6	6.4	2.7
Q11.10 Feeling nervous, moody and depressed while away from phone	16.8	23.6	26.4	20.0	8.2	5.0
0 No, 1 Rarely, 2 Occasionally, 3 Frequently, 4 Often, 5 Always						

This is the collection percentage of addictive behaviors and traits on mobile phone usage. First, majority 62.3% of students do not, rarely or oaccastionaly make longer than intended calls, so only 37.7% of students frequently, often or always make longer than intended calls; likewise, a lesser percentage 30.0% frequently, often or always ignore their face-to-friends to be with their mobile phone i.e. 70.0% of them face their firends.

Next, 34.1% do not, rarely or oaccastionaly use their cell phone to communicate with their family at home, but 65.9% think that having mobile phone is necessary for college students to keep in touch with their family. While asked about excessive usage, only 32.7% claimed that others frequently, often or always complaint about their excessive usage, and 67.3% didn't. Similarly those who frequently, often or always suffer a decline in their productivity due to mobile phone usage were only 33.6% of total respondents respondents and 66.4% didn't. Majority 68.2% do not, rarely or oaccastionaly

get annoyed by any botheration while using cell phone, but 31.8% do. Similarly, 53.6% of total respondents claimed that they do not, rarely or oaccastionaly suffer sleep loss due to mobile phone usage, but 46.4% do. When questioned about the efforts to reduce usage, 55.9% of respondents frequently, often, or always try to reduce the extent of mobile phone usage, but 44.1% don't. Majority 72.3% do not, rarely or oaccastionaly conceal their usage facts from others, but 27.7% do. Finally, 66.8% do not, rarely or oaccastionaly feel nervous, moody or depressed being away from their cell phone, but 33.2% do.

Q12 What (psychological) effects of mobile phones usage do the students have?
This is the (psychological) effects of mobile phones usage to the students in gathering percentage. First, only 17.3% of respondents agree and strongly agree they lost out of the real world while being with their cell phone, but 50% disagree and strongly disagree, and 32.7% is indifference. Next, only 36.6% of respondents agree or strongly agree to the fact that they use cell phone everywhere without considering the place where they are, but 37.7% disagree and strongly disagree, and 28.6% is neutral. Third, 29.1% of respondents were those who agree or strongly agree to avoid keeping their cell phone on silent or vibration mode due to fear of missing the incoming alerts of calls or text, but 33.6%

The (psychological) effects of mobile phones usage to the students in percentage					
Q12	**1**	**2**	**3**	**4**	**5**
Q12.1 I am in different world while using mobile phone	14.5	35.5	32.7	11.4	5.9
Q12.2 I use mobile phone irrespective of the place where I am	14.1	23.6	28.6	25.0	8.6
Q12.3 I avoid activating silent/vibration mode of mobile phone	13.2	20.5	37.3	19.5	9.5
Q12.4 I have made new friends whom I came to know using mobile phone	18.2	18.6	28.2	25.5	9.5
Q12.5 Presence of others bother me while I am talking over my mobile phone	15.9	26.4	44.1	10.0	3.6
Q12.6 Lengthy conversations on mobile phone are okay	23.2	39.5	26.4	9.1	1.8
Q12.7 I respond to unknown calls/ messages	25.9	28.6	34.5	7.3	3.6
Q12.8 Information stored in mobile phones are private	3.6	7.7	18.6	41.8	28.2
Q12.9 Using mobile phone while driving is ok	45.9	25.5	19.1	4.5	5.0
Q12.10 Excessive usage of mobile phone causes health hazards	1.4	5.5	15.5	32.3	45.5
Q12.11 I am used to text/call to someone living under the same roof	7.3	9.5	21.8	43.6	17.7
Q12.12 I cannot stop thinking about the chat I had on my mobile phone	13.6	22.7	39.1	19.5	5.0
Q12.13 I look forward to get to a peaceful place to attend the call/text from my friends	12.3	30.0	39.1	15.5	3.2
Q12.14 My inbox remain full of saved text that I use to read in leisure	7.7	20.9	37.3	25.9	8.2
Q12.15 I give priority to my cell phone over my professional and personal commitments	42.7	29.5	16.8	6.8	4.1
Q12.16 I cannot relax if my cell-phone signal does not have good signal strength	5.0	15.9	37.7	27.3	14.1
Q12.17 I respond to someone's call/text even when it is not convenient for me	13.6	31.8	36.8	14.5	3.2
Q12.18 Mobile phone usage is just wastage of time and resources	9.1	19.5	49.5	16.8	5.0
Q12.19 I cannot live or go a day without using my mobile phone	28.2	27.3	26.8	12.3	5.5

Note: 1 Strongly disagree, 2 Disagree, 3 Indifferent, 4 Agree, 5 Strongly agree

disagree and strongly disagree, and 37.3% is indifferent.

Fourth, 35.0% of respondents were those who agree or strongly agree to use cell phone as a medium to make new friends, but 36.8% disagree and strongly disagree and 28.2% is neutral. Fifth, respondents who agree or strongly agree to be bothered by other's presence while talking over their cell phone was only 13.6%, but 42.3% disagree and strongly disagree, and 44.1% is indifferenrent. Sixth, only 10.9% of respondents agree or strongly agree having lengthy conversations on mobile phoneidentity are okay, but 62.7% disagree and strongly disagree and 26.4% is in neutral. Seventh, 10.9% of respondents agree or strongly agree responding to all calls or text irrespective of the identity are okay, but 54.5% disagree and strongly disagree and 34.5% is indifferent. Eighth, however, 70% agree or strongly agreed that information stored in mobile phones are private, but 11.4% disagree or strongly disagree, and 18.6% is in neutral. Ninth, smaller percentage only 9.5% agree or strongly agree using mobile phone while driving is not an issue, but 71.4% disagree or strongly disagree, and 71.4% is indifferent. Tenth, about 77.7% agree or strongly agree to the fact that excessive usage of mobile phone causes health hazards which means users are well aware of the potential health threats of excessive usage, 6.8% disagree or strongly disagree, and 5.5% is in neutral. Eleventh, 61.4% of respondents agree or strongly agree that they are used to text or call to someone living under the same roof, but 16.8% disagree or strongly disagree, and 21.8% is in neutral. Twelfth, 24.5% of respondents agree and strongly agree they cannot stop thinking about the chat they had on their mobile phone, but 36.4% disagree or strongly disagree, and 39.1% is in neutral. Thirteenth, 18.6% of respondents agree or strongly agree to look forward to get to a peaceful place to attend the call or text with friends, but 42.3% disagree or strongly disagree, and 39.1% is in neutral. Fourteenth, 34.1% agree or strongly agree their inbox remain full of saved text that they use to read in leisure, but 28.6% disagree or strongly disagree, and 37.3% is in neutral.

Fifteenth, 10.9% agree and strongly agree they give priority to cell phone over their professional and personal commitments i.e. they prefer using cell phone over responsibilities, but 72.3% disagree or strongly disagree i.e. they use cell phones under reasonable limits and don't tend towards extreme behaviors regarding addictive cell phone usage; they are able to have definite priorities between their responsibilities and commitments and their cell phone usage and 16.8% is in neutral. Sixteenth, 41.4% of respondents cannot relax if their cell-phone do not have strength signal, but 20.9% disagree or strongly disagree and 37.7% is in neutral. Seventeenth, 17.7% of the student agree or strongly agree to respond to someone's call or text even when it is not convenient for them i.e. they use their cell phone even being uncomfortable with other tasks to be performed, but 45.5% disagree or strongly disagree i.e. they do not use their cell phone when it is inconvenient for them, and 36.8% is in neutral. Eighteenth, 21.8% agree or strongly agree that Mobile phone usage is just wast of time and resources, but 28.6% disagree or strongly disagree and 49.5% is in neutral. Finally, only 17.7% of respondents agree or strongly agree that they cannot live even a day without using their cell phone, but 55.5% disagree or strongly disagree and 26.8% is in neutral.

As a final point, there are 62.7% of respondents give final thoughts and opinions on cell phone usage—within this 79.7% give positive ideas i.e. 38.4% of studnents said mobile phones give us more advanages if using with consideration, 28.3% said mobile phones are very useful and give us more information, 12.3% said it is useful, convience and fast for communication, and 0.7% said it is useful but unable to efford. However, 10.1% give neutral ideas, which means it is indifferent between using mobile phone or not; likewise, another 10.1% give negative ideas that is to say 5.1% said it is unuseful, wastage time and resources for using mobile phone, 2.2% said it is unable to afford, 1.4% said it harzard to health, and 0.7% said it is health harzard, unuseful, wastage time and resources or spend a lot.

Final opinions on cell phone usage		**Frequency**	**Percent**	**Valid Percent**
Valid	More advanages if using with consideration	53	24.1	38.4
	Very useful and give more information	39	17.7	28.3
	Useful, convience and fast	17	7.7	12.3
	Useful and unable to afford	1	.5	.7
	Indifference	14	6.4	10.1
	Unuseful and wastage time and resources	7	3.2	5.1
	Unable to afford	3	1.4	2.2
	Health harzard	2	.9	1.4
	Spend a lot	1	.5	.7
	Health harzard, unuseful, wastage time and resources	1	.5	.7
	Total	138	62.7	100.0
Missing	System	82	37.3	
Total		220	100.0	

5 CONCLUSION AND RECOMMENDATION

5.1 Participant Details

Among 220 students, first the age group (20-29) occupied the hightest amount, which is 73.0%; then it is followed by the age group (19 or less), 14.0%; (30-39), 13.0%; and (40-49), 1.0%. Next, 45.5% is female, and 83.2% is single. For family income, 25.0% is low; 69.5%, middle; and 5.5%, high. Finally, although there are around quarter of students own more than two mobile phones, the most used ones are iPhone, 50.0% and Samsung, 35.0%. Students mainly use mobile for calling, 46.4%; social networking, 37.3%; playing game, 5.5%; texting or listening, 4.1%; taking photo, 1.8%; and mailing or reading, 0.5%.

5.2 Extent of Addiction to Mobile Phones

Through accumulation, although there are 85.0% of the university students use their device for two or more hours, only 20.0% positively agree that they are addicted to their mobile phones. Likewise, 96.8% think the university students look for a sense of gratification through various platforms in technology; however, there are only 53.6% addicted to mobile phone technology, and 44.5% believe they are addicted to instant and constant communication.

5.3 Traits and Behaviors of Mobile Phone Usage

During the classes, although 23.2% of the university students don't show their phone out, the rest are doing the following activities such as texting, 21.8%; playing game, 13.6%; holding, 10.5%; taking photo, 6.8%; talking, 2.3%; listening, 1.8%; and others, 20.0% such as time telling, assisting in study process i.e. check dictionary, search internet and etc. Moreover, 59.1% positively agree when they walk across campus, the majority of the students are on their mobile phones, and 32.3% of the students feel stressed and alone when they don't have their mobile phone.

5.4 Effect of Mobile Phones Excessive Usage

Regarding extensive mobile usage, 46.4% claimed they positively suffer sleep loss, 37.7% make longer than intended calls, 33.6% suffer a decline in their productivity, 32.7% claimed others positively complaint about their excessive usage, 33.2% feel nervous, moody or depressed being away from their cell phone, and without mobile phone; they feel disconnected, 56.4%; stressed, 24.1%; alone, 8.2%; normal, 4.1%; depressed, 1.4%; nervous or nake, 0.5%; and other i.e. bore, 5.0%. 31.8% positively get annoyed by any botheration while using cell phone, so 30.0 % ignore their face-to-friends to be with their mobile phone, 27.7% conceal their usage facts from others.

Therefore, about the efforts to reduce usage, 55.9% of respondents positively do, again 20.0% of respondents purposely leave mobile phone at home to disconnect, for their overwhelming need of cell phone usage consumes and wastes a lot of times, 24.5% wish society would rely less on instant and constant communication, and 15.9% wish they could disconnect more and enjoy communicating with friends in person without the added distraction of mobile phones.

5.5 Psychological Effects of Mobile Phones Usage

76.8% of respondents believe that addiction to technology contribute to negative psychological effects and self-esteem. As a result, only 17.3% positively agree they lost out of the real world while being with their cell phone, 36.6% positively agree to the fact that they use cell phone everywhere without considering the place where they are, 29.1% positively agree to avoid keeping their cell phone on silent or vibration mode due to fear of missing the incoming alerts, 35.0% positively agree to use cell phone as a medium to make new friends, 13.6% positively agree to be bothered by other's presence while talking over their cell phone, 10.9% positively agree having lengthy conversations on mobile phone are okay, 10.9% positively agree responding to all calls or text irrespective of the identity, 70.0% positively agreed that information stored in mobile phones are private, 9.5% positively agree using mobile phone while driving is not an issue. 24.5% positively agree they cannot stop thinking about the chat they had on their mobile phone, and 42.3% don't look forward to get to a peaceful place to attend the call or text with friends. 34.1% positively agree their inbox remain full of saved text that they use to read in leisure. Majority 77.7% positively agree to the fact that excessive usage of mobile phone causes health; however, 65.9% still think that having mobile phone is necessary for college students to keep in touch with their family, so 61.4% are used to text or call to someone living under the same roof as it is useful.

5.6 Participant Details

Among 138 respondents, 62.7%; giving final thoughts and opinions—within this 79.7% give positive ideas that is to say 38.4% said mobile phones give them more advantages if using with consideration, 28.3% said mobile phones are very useful and give them more information, 12.3% said mobile phones are useful, convenience and fast for communication, and 0.7% said they are useful but unable to efford. However, 10.1% either give neutral ideas, or negative ideas i.e. using mobile phone is not useful, wast age time and resources; sometimes unable to afford, and hazard to health.

5.7 Recommendation

Students should not overwhelmingly use cell phone for more than half an hour daily to avoid addiction, which can lead to accident, loss of social interaction, poor leaning productivities, and wast resources such as time, energy, money and so on.

Mobile phone usage for the students in the university should be complied with school policy and communication ethic i.e. students should consider whether place, time, event and so forth is appropriate to use their device or not.

NUM should set and enforce regulation for mobile usage in the university according to appropriate circumstances that is to say students should turn their mobile to silent or vibration mode in classroom, turn off mobile phone during exam, keep mobile phone in locker of library if any, and no mobile at all in certain events, for example in the reception of top government leaders' arrival at the university.

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