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The articles in this journal are contributed by researchers from all academic departments of our university. We fully appreciate the contributions of the researchers. We also admire their great efforts to contribute in this journal though gradually increasing numbers of the students enrolled in Yangon University of Economics make them occupied with teaching.

Yangon University of Economics has always been trying to promote the quality of education. This research journal is a proof of such endeavour.

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RELATIONSHIP BETWEEN ORGANIZATIONAL JUSTICE AND CITIZENSHIP BEHAVIOR: THE MEDIATING EFFECT OF ORGANIZATIONAL COMMITMENT

Dr. Tun Aung¹ & Mya Thet Oo²

ABSTRACT

Today, changes in organizational environments call for voluntary behavior from members of an organization. Employees react and elicit different behaviors depending on different external and internal stimuli. Employees exhibit two types of behaviors: in-role and extra-role behavior, which is also known as the organizational citizenship behaviors (OCB). OCB can be classified into two_ citizenship behaviors towards individuals and citizenship behaviors towards the organization. This study tries to find the relationship between organizational justice (OJ) and citizenship behaviors (OCB) of both of OCBI and OCBO among employees, using affective commitment as a mediator, a proxy to social identification. A total of 96 employees from seven hotels in Yangon and Mandalay were collected as sample. With the permission of their supervisors, each employee received a structured questionnaire, with five-point Likert scales for each question. Multiple regression analysis was used to explore the relationship between OJ, OCBs and commitment, using SPSS 22. Baron and Kenny approach was used to determine the mediation role of commitment and it was found that OJ has positive significant relationship both on commitment and OCB. Commitment was found to have a partial mediating effect on OJ and OCB relationship.

Keywords: organizational justice, organizational citizenship behaviors, affective commitment, and social identity theory.

1. Introduction

Organizations in this competitive business environment will need to promote their efficiency and performance for their survival and long-term growth in the future. Companies need employees who are capable, highly committed and able to cope with the dynamic environment. The success or failure of an organization largely depends on the behaviors of employees. Today, changes in organizational environments, their resultant innovations, flexibility are emphasized, which necessarily calls for voluntary behavior from members of an organization. Consequently, an organization should not only try to promote employees' job commitment and satisfaction to retain them, it should also be capable of shifting its members' attitudes and behaviors which act for organizational development from egoistic behaviors. Employees, as members of the organization, react and elicit different behaviors depending on different external and internal stimuli.

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Employees exhibit two types of behaviors core task behaviors and arbitrary behaviors (Zhu, 2013). Katz and Kahn (1966) officially proposed that core task behaviors means in-role behaviors and extra-role behaviors as arbitrary behaviors. Both the in-role and extra-role behaviors are important for the success of the organization in the long run. The in-role behavior (IRB), also known as core-task behavior, was defined by William and Anderson's (1991) as the necessary or the expected behavior for the accomplishment of work; and reflected in the official salary system in the organization. Organ (1988) categorized extra-role behaviors as organizational citizenship behaviors. He defined extra-role behaviors, or "organizational citizenship behaviors" (OCB) as purely discretionary behaviors that could not be explicitly rewarded or punished, but which on the whole, contributed to organizational functioning. OCB come in a variety of forms such as loyalty, helping others, and organizational compliance and organizations benefit employees who are willing to contribute their efforts and abilities to the organizations even though that is not officially required of them. OCB can be divided into two categories: the organizational citizenship behavior towards organization (OCBO) and the organizational citizenship behavior towards individuals (OCBI) or OCBS specifically if these are targeted towards and benefit the supervisors.

On the other hand, employee's thoughts about work and their feelings about work are likely to influence behaviors (Lee & Allen, 2002). Again, these are influenced by their perception of how they are treated fairly by their organization and their superiors. The individual's perception of fairness in organizations was termed as "organizational justice" by Greenberg (1987). Organizational justice participates practically in reducing the gap between the objectives of the organization and the objectives of the employees, also in creating links to find ways and means to assure the administrative units that there exist a positive organizational climate in which the employees deal with it from the concept the organizational justice is an indicator includes the interpretation of many different values of work and behavior of employees.

The justice constructs itself has passed through its own history and has developed from initially two dimensions in 1970s (distributive and procedural justice), to three dimensions (distributive, procedural and interactional justice) in 1980s and lately to four dimensions (distributive, procedural, interpersonal and informational justice) in 1990s (Lee, 2007). Looking back to the history of justice literature, organizational justice has developed initially from the idea of distributive justice; followed by the idea of procedural justice; and interactional justice which again was broken down into interpersonal and interactional justice. By combining each different dimension of justice, the aggregate term of organizational justice appeared as a higher order latent factor, representing the general justice concept which explains the fairness perceptions of individuals or of group and then their

behaviors can be observed according to the treatment they receive from their organization (Deutsh., 1975). This study is based on the idea of organizational justice as a single latent construct which comprised of four different dimensions: distributive, procedural, informational and interpersonal justice. Justice theory suggests that individuals consider each of the four types of justice and subsequently develop evaluations of fairness. In reality, this assumption is impossible because focusing on distinct dimensions may not accurately capture justice perceptions.

As a result, general justice judgments are assumed to be relatively stable and exert an enduring influence on cognitions, attitudes, and behaviors. Any subsequent information will not formally be processed by the four justice dimensions, but instead it will be reinterpreted and assimilated to be congruent with the existing general fairness judgment. This general perception will then serve as a subsequent lens to frame experience, impact attitudes, and drive behaviors. Thus, overall judgments of justice are necessary to respond to the high demands of the social environment. Again, scholars of justice literature have been debating about the issues that the different dimensions of justice are much correlated to each other, thus, it is controversial that using many dimensions for the same justice construct might create the multicollinearity problem. The new trend in the field of justice literature, therefore, is worth to consider using an aggregate term, called organizational justice.

Only relatively few recent research in the field of organizational justice have been considering the mediating variables in the relationship between justice and its outcomes. Among those mediators, social identity theory explains well about the psychological reactions of employees on their perception of justice of their organization. The main objective of this study is to find the impact of organizational justice on citizenship behaviors of employees at hotels in Myanmar, using the social identity theory. As equity theory explains the direct relationship between inputs that the employees exert and the outcomes or the benefits they get back from the organization. Based on the perception on the justice or injustice of the organization, it is assumed that employees will adjust their behaviors towards the organization and towards their supervisors as they see the managers or the supervisors as the agent of the organization. Group identity theory suggests that people identify themselves with the organization if they feel they are proud of being there. Employees get the high level of self-esteem if they believe their organization is treating fairly to them as well as their coworkers, thereby resulting in commitment towards the organization. This study tries to find the relationship between organizational justice and organizational citizenship behaviors of employees with the mediation effect of organizational commitment.

With the rapidly growing market potential, the demand for hotel business in Myanmar is eventually growing; and the competitiveness in this industry will gradually be intense in the

near future. Meanwhile, they need to strive for the survival and long term growth in the economy, by trying to boost up the performance of the organization. Out of the other factors that influence the performance of the organization, one of the important yet often less emphasized one is employees' behaviors. The behaviors of employees are most likely to be influenced by the organizational justice. This gives motivation to study what are the antecedents of employee behaviors, especially how different dimensions of organizational justice influence on employee behaviors; considering the role of commitment as a mediator on this relationship in the context of hotel business in Myanmar. This study contributes to the justice and OCB literature in Myanmar, as it employs the social identity theory between the OJ and OCBs relationship.

Literature Review and Hypotheses

Relationship between Organizational Justice and the employee behavior

The concept of organizational justice, firstly coined by Greenberg (1987), was termed as an employee's perception of fairness in their organizations' behaviors, decisions and actions and how these influences the employees own attitudes and behaviors at work. Within the past five decades, organizational justice literature has emerged as one of the hottest topics to be discussed in the fields of human resource management, organizational behavior and organizational psychology. Justice becomes a concern for both employees and management in organization and scholars. Employees are concerned about being treated fairly; managers are concerned with treating fairly those for whom they are responsible. Equity theory proposed that employees react their behaviors towards the organization based on the outcomes they received in comparing with the inputs they have contributed to the organization. Distributive justice as part of organizational justice is the idea that can state the economic outcomes for an individual to compare to their contribution. Instrumental model also explained that employees want to feel safe and secure staying in the organization if they believe they are treated fairly by the organization, which in turn, motivate employees to return with the citizenship behaviors. The organizational justice theory provides a useful framework to understand individual's attitudes toward work, work behaviors, and job performance, based on their perception of fairness (justice) in the workplace (Lee, 2007). However, while organizational injustice may lead to undesired organizational outcomes such as lower job satisfaction, retaliation, turnover, misbehavior, low productivity, and lower work commitment; perceived fairness of rewards, decision-making procedures, and interpersonal treatment in an organization contributes to the development of high quality work relationships (Srivastava, 2015).

If we consider fair treatment on the part of the organization as a perceived benefit for employees, social exchange theories suggest that employees will be motivated to reciprocate

that benefit (Greenberg and Colquitt, 2005), and this reciprocation could include OCB according to Organ (1990). The norm of reciprocity suggests that people act to help others who have helped them because reciprocating the receipt of benefits is proper and appropriate for the continued health of the relationships between people. Reciprocity can be used to explain the motivation of OCB because it may come from aspects of work beyond the formal pay system. Therefore, OCB performance may more likely be related to socioemotional outcomes received rather than formal economic outcomes (Foa & Foa, 1980).

There are many studies finding the relationship between justice and employee behaviors. In the study of Wang et al. (2010), interactional justice was the best predictor of task performance in comparing with distributive and procedural justice. Procedural justice has positive significant relationship with OCB according to Sani (2013). Organizational justice as single construct comprising of items from four different dimensions was shown to have positive impact on OCB through organizational identification by Guangling (2011) and direct relationship by Yassine et al. (2014).

Hypothesis 1: Organizational justice has a positive relationship with (a) organizational citizenship behaviors towards individual or supervisor (OCBI) and (b) OCB towards organization (OCBO).

OJ and commitment

According to social identity theory, people feel being identical to the organization if they feel proud of being part of it. Knowing that their organization is fairly treating to them, employees are motivated to feel self-esteem, and arouse the desire to be a prototype of the organization they belong to. Consequently employees start to show the feeling of identification which in other words can be stated as organizational commitment. Commitment is mostly defined as (1) a strong desire to remain as a member of a particular organization, (2) the desire to strive as what organization desires (3) certain beliefs and acceptance of the value and purpose of the organization. Organization commitment concerns the degree of an employee's identification with, and involvement in the organization. Organizational commitment refers to the state in which people sense loyalty with their respective organization, aligned themselves with organizational goals and value it (Lambert, Hogan, & Griffin, 2007). Committed employees often have strong positive feelings about one particular aspect of their job, such as their colleges, their manager, or the particular work they do.

Organization commitment is the level of trust and the acceptance of labor toward organizational goals and having a desire to remain within the organization. According to Meyer and Allen (1997), organizational commitment has three distinct dimensions namely, affective commitment, normative commitment and continuance commitment.

Out of these three dimensions, affective commitment has stronger relationship to predict in-role performance and organizational citizenship behaviors of employees (Wang et al., 2010). Justly treated employees are more committed to their employers (Cropanzano, Bowen, & Gilliland, 2007). Distributive and procedural have relationship with affective and normative commitment according to (Ayobami & Eugene, 2013). (Lee, Cypress, 2007) found the significant relationship between organizational justice and organizational commitment. Allen and Meyer (1996) also assessed the relation between organizational commitment and organizational justice and found strong relationships among the three dimensions of organizational justice (distributive, procedural and interactional justice) and affective commitment.

Hypothesis 2: Organizational justice has a positive relationship with affective commitment of employees.

Organizational Commitment and OCB

Organizational commitment means employees' emotional attachment, identification, and involvement in the organization. Commitment is mostly defined as (1) a strong desire to remain as a member of a particular organization, (2) the desire to strive as what organization desires (3) certain beliefs and acceptance of the value and purpose of the organization. Organizational commitment refers to the state in which people sense loyalty with their respective organization, aligned themselves with organizational goals and value it (Lambert, Hogan, & Griffin, 2007). Committed employees often have strong positive feelings about one particular aspect of their job, such as their colleagues, their manager, or the particular work they do. Affective commitment defined as a desire to remain a member of an organization due to emotional attachment to, and involvement with, that organization. Affective commitment or how much an employee actually *likes* or feels part of an organization has a tremendous effect on employee and organizational performance. High levels of affective commitment in employees will not only affect continuance commitment, but also encourages the employee to try to bring others into the talent pool of the organization. An employee with high levels of affective commitment acts as a brand ambassador of the organization. Affective commitment of an employee is directly proportional to positive work experience.

As affective commitment the strong desire to keep up with the organization's goal and to maintain in the organization (Van Dyne et al., 1995), it can lead the behaviors of employees with little expectation of rewards (Allen & Meyer, 1996). Karriker (2005) showed the mediation effect of organizational commitment on the relationship between system-referenced justice and OCB towards organization (OCBO). Zeinabadi & Salehi (2011) found out the positive impact of organizational commitment on OCB in their study. Sani (2013) confirmed the positive impact of organizational commitment on OCB. So, organizational

commitment can be thought of a strong predictor of organizational citizenship behavior and should be included in the model to be tested.

Hypothesis 3: Affective commitment of employees has positive relationship with (a) OCBI and (b) OCBO.

Commitment as the Mediator between OJ and OCB

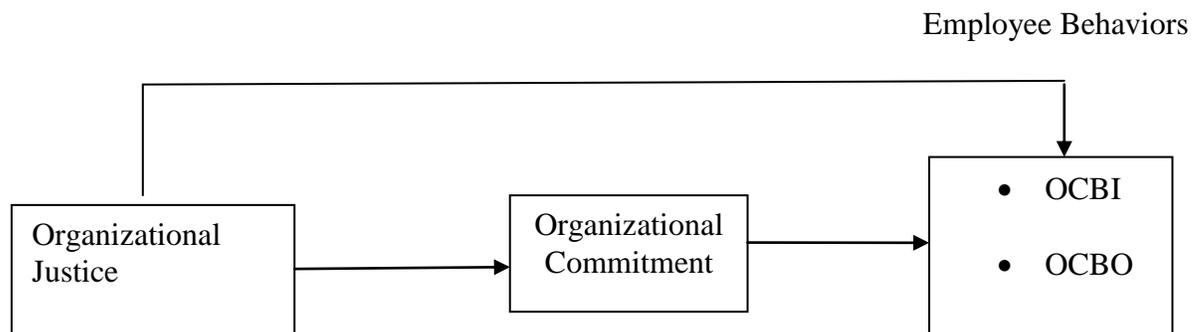
Traditionally, mediation analyses were conducted according to the Baron and Kenny approach where the effect of mediation is determined by checking the relationships between independent variable and mediator (path a), between mediator and dependent variable (path b) and the direct path between independent and dependent variable (path c).

Reviewing the previous discussions of hypotheses, hypothesis 2 is assumed to have a positive relationship between OJ and commitment (path a), hypotheses 3 (a) and (b) proposed positive relationships between OJ and OCBI and OCBO of employees (path b), and a significant positive relationship is expected between OJ and OCB as per hypothesis 1 (path c). Thus, affective commitment could be expected to have a mediation role between OJ and OCBs of employees.

Hypothesis 4: Affective commitment mediates the relationship between OJ and (a) OCBI and (b) OCBO of employees.

The conceptual framework of this study is shown in Figure (1).

Figure (1) Conceptual Framework



2. Method

Sample and research design

Data were collected from 120 employees from seven hotels in Yangon and Mandalay. With the permission of the respective managers concerned, employees in those hotels were interviewed using the structured questionnaires, with the help of post graduate diploma students from Diploma in Marketing run by Yangon University of Economics. The respondents include the employees from Chatrium Hotel, Hotel Queen, Jasmine Palace

Hotel, Park Royal Hotel, Royal Garden Hotel, Sedona Hotel, and Summer Palace Hotel. Although total number of sample collected was 120, some of the data were rejected because of the missing values, unresponsive questionnaires and for outlier adjustment purpose as well. Finally, a total of 96 responses were remained for the purpose of data analysis.

The questionnaire was divided into two parts. Part A tried to investigate the demographic characteristics of the respondents such as gender, age, number of years in the current job, educational status, etc. Part B seeks the respondents self-rated scales about their perception on organizational justice, OCBO, and OCBI. It was also made sure that respondents were well informed about the consent, the purpose of the study, and their confidentiality. For each sub item of Part B in the questionnaire, five-point Likert Scale was used, ranging from 1 meaning “strongly disagree” to 5 “strongly agree” to the question about their perception.

Measures

Measures for each construct variables were picked up from previously well-established literature, tested and generally accepted by many scholars. Streiner and Norman (1995) suggested that well established measures should be used for research. For all the measures, only self-rated items were used believing that such kind of personal questions like OCBO, OCBI and perceptions on justice, and commitment are more likely to reflect the actual perception of the employees.

Organizational Justice. Four dimensions of organizational justice, developed and validated by (Colquitt et al., 2001) was used for this study; comprising of distributive justice (DJ), procedural justice (PJ), interpersonal justice (IPJ) and informational justice (IFJ). Employees were asked about their perception on the above justice dimensions of their respective immediate supervisor. Organizational justice was measured using the scales developed by (Colquitt & Shaw, 2005) with 20 items. A sample item is “Does your (outcome) reflect the effort you have put into your work?”

Organizational Commitment. Organizational commitment was measured using the affective commitment scales developed by (Meyer & Allen, 1997) with 5 items. A sample item is “I would be very happy to spend the rest of my career in this organization?”

Organizational Citizenship Behaviors. A total of 17 items of employee behaviors were classified into organizational citizenship behaviors (OCB). Twelve OCBO measures were also taken from Williams and Anderson (1991) and a sample item is “Defends the organization when other employees criticize it.” Five OCBI measures were taken from Maletesta (1995) and a sample item is “I normally accept added responsibility when my supervisor is absent.”

3. Analysis and results

Multiple regression analysis was conducted with the help of SPSS version 22 software. Firstly, the descriptive statistics of the sample were computed. Out of the 96 remaining respondents, 41 were male participants, accounting for 43% of the whole sample; while 55 were females, representing 57% of the sample, proving that gender ratio is quite equal among the participants. The age of the respondents ranged from 19 to 46 after removing the outlier of 62 years old respondents. The majority of the respondents were from 18 to 25 age group comprising 44.8% of the whole sample, followed by 26 to 30 age group, with the number of 31 respondents, which means 32% of the whole sample group, while 31-35 group falls about 16.7%, 36-40 group accounts for 2% and respondents over 41 occupied 3% of the sample. The respondents had different range of the service in their current hotel. About 58% of the respondents have 1 to 3 years of service; 23% had less than 1 years of experience in their current organization; 13% of them had 3 to 5 years, 4% had 5 to 8 years and only 2% had over 8 years of service in their current occupation. Majority of them were graduates (63.5% of the sample); high school graduates comprises of 26% of the sample and other diploma holders or students at University of Distance Education represents 9% of all the samples. In checking the area of work respondents belong to, it was found that respondents have diverse distribution of the fields in hotel service. It is good news as different sets of employees could give different information for the study.

Table (1) Correlations Matrix of Study Variables

	Mean	SD	Cronbach's alpha	OJ	OC	OCBI	OCBO
OJ	3.32	0.62	0.938	1			
OC	3.42	0.63	0.661	.387**	1		
OCBI	3.48	0.80	0.908	.665**	.433**	1	
OCBO	3.45	0.56	0.799	.495**	.670**	.609**	1

*p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001. OJ= overall organizational justice, OC= organizational commitment, OCBI= organizational citizenship behaviors towards individuals, OCBO= organizational citizenship behaviors

Source: SPSS Output

Mean, standard deviation, and the correlations of the variables are shown in Table (1), with Cronbach's alpha values for each variable. All the variables except organizational commitment have alpha value above the 0.7 which is the cut-off criteria to show the reliability of the construct variables (Harir, Black, Babin, & Anderson, 2009). The Cronbach's Alpha for OC was a little bit low (0.661). Then, Pearson's correlation analysis

was conducted to test the further regression analysis. The results were shown in table 1. From the table, we can see that variables have high, significant correlations to each other. It shows a good signal for further regression of the model.

Then, multiple regression analysis was run with the help of SPSS version 22 to test the hypotheses. The results were shown in table 2. Firstly, the regression was run to test the relationship between OJ and OCBI. The R square was 0.442, showing that the variance of the organizational citizenship behaviors of employees towards supervisor was explained by 44.2% of the change in organizational justice. Again, F value is 74.539 and its p-value is 0.000, OJ could significantly explained by 44.2% of the change in OCBI of employees towards supervisors. The regression coefficient is 0.665 (t=0.634, p=0.000) said that OJ is strongly and positively related with OCBI. Since the relationship is positive, OJ can be said to have a direct relationship with OCBI. So, hypothesis 1 (a) was approved.

Secondly, the regression was run to test the relationship between OJ and OCBO. The R square was 0.245, showing that the variance of the organizational citizenship behaviors of employees towards organization was explained by 24.5% of the change in organizational justice. Again, F value is 30.527 and its p-value is 0.000, OJ could significantly explained by 24.5% of the change in OCBO of employees towards organization. The regression coefficient is 0.495 (t=5.525, p=0.000) said that OJ is fairly, significantly and positively related with OCBO. Since the relationship is positive, OJ can be said to have a direct relationship with OCBO. Consequently, hypothesis 1(b) is supported.

Table (2) Regression Analysis on the Relationship between OJ and OCBO

	Standardized Coefficient	t value	Sig	F value	Sig	R ²
OCBI	0.665	0.634	0.000	74.539	0.000	0.442
OCBO	0.495	5.525	0.000	30.527	0.000	0.245

Independent variable: OJ

Source: SPSS Output

Baron and Kenny’s approach to mediation analysis (1986) was used to determine the mediating effects of commitment on the relationship between OJ and OCBI, and OCBO respectively. Multiple regression analysis can be divided into four steps. The first one is regression analysis on the relationship between organizational justice and employee behaviors such as OCBI, OCBO. The second one is regression analysis on the relation between organizational justice and mediator, commitment. The third one is the regression analysis on the relationship between mediator and employee behaviors. All the above three paths should be significant to have a mediation effect. And the fourth and final one is mediator (commitment) adding to the third step. Again, if the effect of independent variables

on dependent variables is significantly reduced, it shows the existence of partial mediating role; if the effect is 0, it shows the existence of full mediation role. The result is shown in Table (3).

Table (3) Regression Analysis of the Model

Independent variables	Dependent Variable			
	Step 1	OCBI		OCBO
Standardized Coefficient		Sig.	Standardized Coefficient	Sig.
OJ	0.665	0.000	0.495	0.000
Step 2	Commitment			
	Standardized Coefficient		Sig.	
OJ	0.387		0.000	
Step 3	OCBI		OCBO	
	Standardized Coefficient	Sig.	Standardized Coefficient	Sig.
Commitment	0.179	0.040	0.519	0.000
Step 4	OCBI		OCBO	
	Standardized Coefficient	Sig.	Standardized Coefficient	Sig.
OJ	0.585	0.000	0.277	0.001
Commitment	0.207	0.013	0.562	0.000

Source: SPSS Output

According to the results shown in the first step of three regression models, the standard regression coefficient between OJ and OCBI is 0.665 ($p=0.000$), and that of between OJ and OCBO is 0.495 ($p=0.000$). Since all the paths are significant from OJ to employee behaviors, the model in this step sets up. In the second step, the regression was run with the mediator and the dependent variables. The standardized regression coefficient between OJ and commitment is 0.387 ($p=0.000$). Since commitment is significantly related with OJ, the condition of the second step about mediating role is established and hypothesis 2 was approved. In the third step, the standardized regression coefficient between commitment and OCBI is 0.179 ($p=0.040$) and significant. Hypothesis 3(a) was supported. The standardized regression coefficient between commitment and OCBO is 0.519 ($p=0.000$) and the path is

significant that we can further proceed to the mediation analysis. Again, hypothesis 3(b) was again approved. In the fourth step, commitment was added to the overall model of OJ and OCBs. The results show that from the path of OJ to OCBI, the standard regression coefficient is 0.585 ($p=0.000$). When commitment is added the coefficient is significantly lower than the direct path from OJ to OCBI (which was 0.665), commitment serves as the partial mediator on the relationship between OJ and OCBI. Hypothesis 4(a) was approved. From the path of OJ to OCBO, the standard regression coefficient is 0.277 ($p=0.001$) when commitment is added. Since the coefficient is much lower than the direct path from OJ to OCBO (which was 0.495) when commitment was entered and the path is significant, commitment serves as the partial mediating role on the relationship between OJ and OCBO. Hypothesis 4(b) was supported again.

4. Discussion and Recommendation

From the results, it was seen that the direct path between OJ and both of OCBI and OCBO were positively related. It is recommended that firms should try to find ways and means to promote the employees' perception on justice. As justice concept composed of four dimensions, such as distributive justice, procedural justice, interpersonal justice and informational justice, different perspectives of these dimensions should be improved. As of distributive justice, hotels in Myanmar should follow the minimum wage law and observe the market rate of salary and wages. Managers should also try to add other fringe benefits to basic salary to enhance the perception of fairness by the employees. As procedural justice also relates to OCBs according to previous literature, managers should try to encourage employees to participate in the decision making process more. The ideas and suggestions of employees should be carefully listened and the outcome distribution systems such as pay, and promotion should be arranged to have transparency to the employees. This will also contribute to have more commitment by employees to the organization. In order to have the interpersonal justice, hotels should give awareness to the managers to create a sound leader-member exchange relationship. If necessary, coaching and training may be needed for the managers to train them. For informational justice, there should be a good information system so that proper information is passed through the organization. As commitment serves as the mediator, organizations should also create more committed employees by building trust and a good relationship with employees so that they will react with favorable citizenship behaviors to the hotel.

5. Conclusion

Treating organizational justice as a general justice concept was the main contribution of this study. And it also contributes the literature of organizational justice, by employing the social identity theory with mediation effect of commitment to have an impact on OCBs. The instrumental perspective of the justice was seen as the direct path between OJ and OCBs. The social perspective was added to the model by using organizational commitment as the mediator, and this study finally could give a contribution to the justice literature, especially in the context of hotel business in Myanmar.

Strength and Limitations of the Study

Using organizational justice as a general construct variable was the strength of this study. It also used the commitment as the mediator to know the better understanding of justice and OCBs of employees. This study suffers some limitations as follows. Firstly, in terms of employee behaviors, only the self-reported answers of employees will be collected from the single source of employees. It would be better if more objective data could be used to avoid bias. Second, the data used was cross-sectional data and in order to have a more generalized idea of the model. Next, this study used only hotel industry. This may give a specific understanding of the industry and the perceptions of employees in it but, wider sample range could be able to explain more about the situation in Myanmar. Although commitment alone was used as a mediator, there might be many other mediating variables affecting OCBs.

Suggestions for Future Research

In order to overcome the limitations of the study, researchers in the future should consider the following suggestions. While justice perception was taken from employees, perception on their behaviors can be collected from supervisors to avoid single-source bias. The longitudinal data could be used to find the causal effect in the long run. For more generalizable data, researchers can collect data from various industries. A more comprehensive idea of organizational justice and OCBs, future researchers can deploy other mediators such as trust, leader-member exchange relationship and so on, as they have a relationship with both of the dependent and independent variables according to literature.

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A STUDY ON THE URBAN INFORMAL SECTOR IN YANGON: CASE STUDY IN STREET VENDORS

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ABSTRACT

The urban informal sector is a sub-set of the total informal sector as well as of the total urban sector. In the context of Myanmar, the urban informal sector is described as livelihood activities. In this sector, street-based activities are more distinct than other activities. In this thesis, it has studied what factors involve to push into street-based activities and the public views on it in Yangon. This study used descriptive method base on both primary and secondary data. Activities of street vendors in Yangon include selling food and goods, and providing services in prescribed or unprescribed markets or areas, such as streets, roadsides, in front of supermarkets and at bus stops. These activities are owned by one or two persons, a family or by group of people. The street vendors activities are boosted by a continuous stream of rural to urban migration because of no work opportunity in rural areas. Most of the people who engaged the street vending are reasonably educated; a few even highly educated (graduates) and they are clearly not recent migrants. The control is not properly implemented to the vendors' activities. The predominant feeling among the general public toward the urban street vendors' activities is more negative than positive.

Key Words: urban informal sector, livelihood activities, street-based activities, street vendors

1 Introduction

1.1 Rationale for the study

Informal sector is the part of the urban economy of developing countries which characterized by small competitive individual or family firms, petty retail trade and services, labor-intensive methods, free entry, and market-determined factor and product prices (Todaro &

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Smith, 2012). The informal sector continues to play an important role in developing countries, despite decades of being neglected and even outright hostility. In many developing countries, about half of the employed urban population works in the informal sector. The informal sector accounts for a very large share of income, output and employment in low and middle income countries, providing jobs to over two billion people worldwide. Nevertheless, the current policy debate is largely biased against informality, with major actors assertively pushing for formalization. Yet as the informal sector continues to expand, some have asked whether this phenomenon could in fact be a lifeboat for poor economies. In 2009, informal activity accounted for over 80% of nonagricultural jobs in Sub-Saharan Africa and South Asia, 50% of gross national savings in India, and 58% of non-agricultural growth in Ghana. This expansion shows no sign of slowing down. Even in the presence of strong economic growth in Southeast Asia and Latin America, rates of informal employment have increased steadily over the past twenty years, with formal employment stagnating in comparison (Jutting & Laiglesia 2009, as cited in Biau, 2011, p.2).

Myanmar has a large informal sector with the majority of the poor. According to the UNDP IHLCA (2011), report a rough estimate of the informal sector in 2009-10 would be 73 percent of the total labor force. This estimate is up 4% from the 2005 estimate of 69 percent. If agricultural activities are excluded, per ILO practice, the share of the informal sector in 2009-10 was an estimated 57 percent. By way of comparison, according to ILO estimates, the informal sector share of non-agricultural employment was 42 percent in Thailand (2010) and 68 percent in Vietnam (2009). The average for a sample of 39 lower and middle income countries was 51 percent (World Bank, 2014). The existence of the informal sector in Myanmar has been had unofficial status. The present situation of the employment in Myanmar, the formal sector was unable to absorb the growing labour force within the national labour market. According to 2014 Myanmar census, there are 1,391,057 people who migrants from other states and divisions to Yangon.

In the case of Myanmar, particularly in Yangon, the informal sector is a source of employment, income and survival for a large number of population; especially the middle and low-income earners. At the same time it should be noted that street vending survives not merely because it is an important source of employment but also because of the services it provides to the urban population. For the urban poor, street vendors provide goods, including food, at low prices. It means one section of the urban poor, namely, street vendors, subsidize the existence of the other sections of the urban poor by providing them cheap goods and services. Middle-income groups get too benefit from street vending because of the affordable prices offered.

In addition, Yangon is receiving the most migrants' population in the country. There is no concrete evidence, but the assumption is that the increase of street vendors in present days is due to the increasing migration from rural areas. Many people have been rendered homeless and displaced by the rural-urban income gap. In Yangon, most of the urban poor get easy access of goods from those vendors. However, the vendors occupy the footpath leaving no space to the pedestrians. This has become a public concern because it creates problem for vehicular and pedestrians movement, and has polluted the environment of the surrounding. One of the main problems of street vending activities is that it creates difficulty for the traffic to move more smoothly during peak hours. They occupy public places and roads, which can also create social problems like pick pocketing, hoodlum and theft. This situation has created several problems in management, development and has destroyed the morphology of the city. Therefore, much more needs to be understood in Yangon about the nature of the informal sector - to what extent street vending provides a means of livelihoods to the urban poor, and - to what extent street vending is a problem or a resource in Yangon. In this stance, the study provides understanding of why street vending is increasing and how public view migrants' street vendors in the urban area of Yangon City.

1.2 Objective of the study

This thesis has two aims:

- (1) To examine the factors that involve the nature of the urban informal sector, especially street vending, in Yangon, Myanmar, and
- (2) To explore public views on the urban informal business activities in Yangon, Myanmar.

1.3 Method of the study

Descriptive method was used in this study which based on survey. Quantitative data were collected by two questionnaire surveys with structured types. These surveys were interviewer administrated survey with respondents. The questionnaire surveys were conducted to identify the nature of the informal sector, to identify the kinds of people who engage informal sector activities, to discover the reason for migration, to examine the effects of the control on informal business activities and to explore the general perceptions of the people living in Yangon with regard to informal sector activities.

1.4 Scope and Limitations of the study

This research has focused on 300 street vendors who worked in Hlaing Thayar and Shwe Pyitha Township in Yangon Region. Moreover, this research also focused on 200 persons from every level of people who live in each township. Accordance with International Labour Office's Survey, the poverty line is used as \$ 1.25 per day standard.

This research has some limitations. Firstly, the data collection was limited to two major townships in Yangon. Future research can be extended to other townships and other cities. Secondly, the persons from Yangon City Development Committee (YCDC) did not want to give the answer for survey concerning with rule and regulation. Thirdly, there is no definition on informal sector by the government. So, the definitions from other countries and organization were used.

1.5 Organization of the Study

This thesis is organized into five chapters. Chapter 1 is introduction with the rationale, objectives, method, scope and limitation, and organization of the study. Chapter 2 is designed to review literature of both theoretical and other relevant literature. Chapter 3 shows an overview of Myanmar's development and informal sector. In chapter 4, survey results are presented and finally, chapter 5 is conclusion and suggestion.

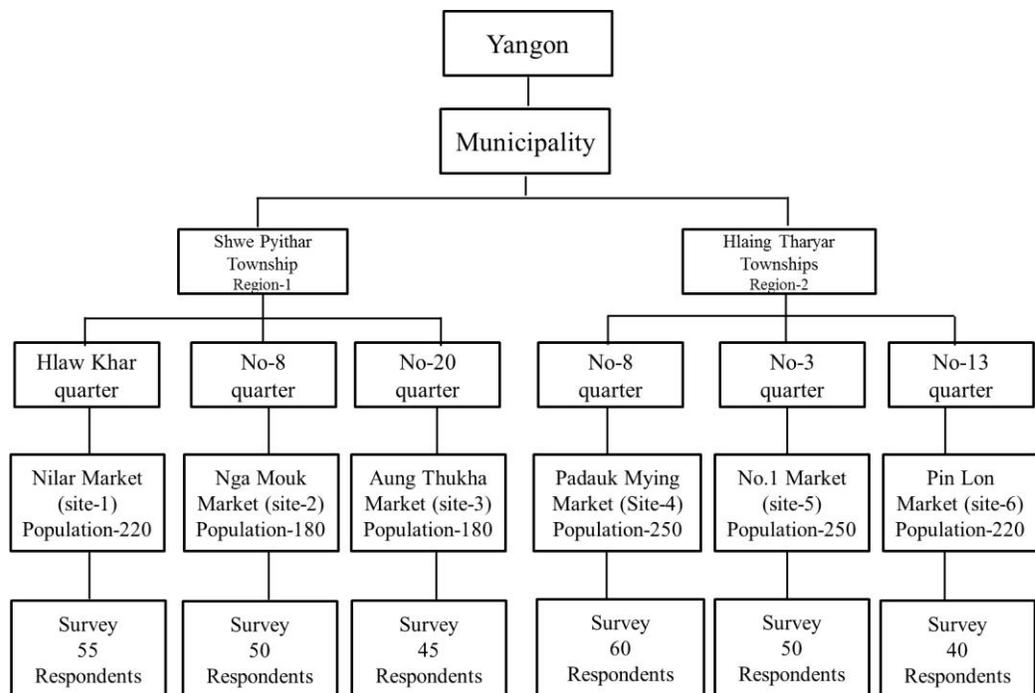
2 Survey Design

To achieve its objectives, this research involved fieldwork over a five weeks period between September and October of 2015 in Hlaing Tharyar and Shwe Pyithar townships in Yangon. Targeting street vendors and their families in the city, the selection of the street traders for quantified surveys was concentrated in six different sites that represent their agglomeration.

2.1 Selection of sites and respondents

Yangon covers a large boundary in terms of land size and number of street traders. The research locations focus on the municipality area especially in Hlaing Tharyar and Shwe Pyithar Townships, because the number of population was very large and concentrated in various locations of the city.

Figure (1) Sampling design and procedures



Source: Survey data

Figure 2.1 highlights the procedure of selection for research sites and participants. The selection of the research sites involved several stages. The first was to determine the municipality as the area for the study. This decision was mainly based on the argument that it represents the core of Yangon city in which many conglomerations of street enterprises exist. The second step was to select regions within this municipality area.

When information about the numbers of administrative townships with each region was gained, two townships out of 44 were selected. They are Shwe Pyithar (region 1) and Hlaing Tharyar (region 2). The third task was to choose three quarters from each township. In this respect, three quarters out of six, in Shwe Pyithar and three quarters out of six in Hlaing Tharyar Township were selected by sample random sampling. The quarters were quarter No.8, No.20 and HlawKhar quarter in the region 1 and quarter No.3, No.8 and No.13 in the region 2.

The final procedure was to determine more specific locations in order to select the sites where the street traders operated their enterprise. Six sites were selected from six quarters to represent as a sampling frame. In general, while these sites characterized the most intense street trader operations, each location represented all sectors of the city. After refinements, the total sample selected from each site was 300 people. On average, this represented about 23 percent of the population in the sampling frame. Participants were selected, or hand-picked, in line with the purpose of the study.

2.2 Data collection

Technique of data collection used during the fieldwork included standardized questionnaires. This technique was employed on a complementary basis depending on the appropriate situation. This flexible application enabled the study to plan as well as to refine its routes to go in the right direction, and to apply appropriate research instruments at a particular time, place or event.

Hlaing Thaya and Shwe Pyitha townships in Yangon were selected as a study location for this research. Yangon is the commercial city and the largest city in Myanmar. Many people from 7 States and 7 Regions in the country have migrated to this city. Accordance with 2014 census, the estimated population in Yangon was about 5,160,512 people. In Yangon most of the migrates lived in Hlaing Thaya and ShwePyitha township, who are unemployment, and underpaid employees more to the informal sector activities.

A questionnaire survey of public perception was conducted in Hlaing Tharyar and Shwe Pyithar to address research question one and four to explore the factors that the general views about the informal sector, and the perception of street vendors' behavior. According to Vaus (2000), questionnaires are the most common way of obtaining survey data. It is helpful to distinguish between five distinct types of question content: behavior, beliefs, knowledge, attitudes and attributes. A sample size of 300 respondents was targeted to participate in the questionnaire survey, 150 in Hlaing Tharyar and 100 in Shwe Pyithar.

The population considered for the questionnaire survey to be administered was public sector workers, private sector workers and the general public in Hlaing Tharyar and Shwe Pyithar. A sample size of 200 respondents was targeted to participate in the questionnaire survey, 100 in Hlaing Tharyar and 100 in Shwe Pyithar. The response rate completed was 100%.

2.3 Questionnaire design

In order to have systematic, representative and reliable information, a series of structured type questions were employed to scrutinize selected respondents. The main purpose of this questionnaire was to obtain a sizeable volume of information that could be classified by type, frequency and central tendency, by means of descriptive statistical measurements. Most of the data obtained from this questionnaire was statistically amenable for use as a basis for generalization. The 300 street traders were mainly surveyed in their enterprises during the day and night business operations. It took one to two visits per respondent to fill in one questionnaire. The information pursued by this questionnaire focuses on enterprise structures of street trading (i.e. history of business activities , production process and employment figures, and legality) and characteristics of human development of street traders (i.e. economic capital, human capital, and social capital).

3 Results / Findings

3.1 Demographic characteristics

Most street trading in Yangon are owned and operated by women. There are not significant differences by gender. Male traders are likely to have larger scale operations and to deal in non-food items, while female traders are likely to have smaller scale operations and to deal in food items. No women in the study areas were involved in service activities.

When data on age, marital status, and number of children are combined, the information shows that adults, between 31 and 40 years of age and married with one or two children, were the predominant portion of streets vendors. This shows that single people of whatever age are less likely to be the street traders. Marriage seems to provide support in establishing a successful enterprise, and spouses are often partners in such schemes. Most women in this age category were already married and even having children. The figure also demonstrates that as many as six people, or about five percent of the street vendors, were divorced or widowed. Most of them were women in an older age category having double roles in heading the family and running the business.

When an analysis of the surveyed data is broken down on the basis of their length of stay in Yangon, the information reveals that most vendors had lived in the city for 5 -10 years (25%), followed by those who had lived in the city for 10-15 years (20%), less than 5 years (13%), and those who were born in the city (28%). So, 72% of street vendors migrate from other states and regions especially from rural areas.

The most reason for migration is no work opportunity in rural area about (22%) and they cannot live with present income in rural area about (13%). (10%) percent of respondents, especially young people, were attracted to the city because of the bright light.

The domination of long-term migrants in this sector, however, is slightly inconsistent with the patterns of the dualistic view, especially in the Harris-Todaro model. Most of street vendors are not recent migrants, but migrated to Yangon from the other states and regions between five and twenty years ago.

3.2 Information of business activities

Most street traders (53% and 33% respectively), stated that their previous occupation was in the informal sector or not working. This information shows that the mobility of employment in Yangon labour market generally takes the form of horizontal mobility within the informal sector.

The majority of respondents (60%) perceived that they participate in the street trading because of the ease of entry into street trading. In order to obtain some incomes, it is relatively easy to start and operate the business and the difficulty of entry into the formal job sector or alternatively. They can, for example, operate it by following their predecessor through kinship networks, or they can adjust it to their knowledge and skills. As to the rest of the variable (questions number 6 to 9), their low percentage may indicate that these reasons have had relatively less influence on their decision.

(a) *Production process and number of workers*

Production process and number of workers of the respondents are presented in that the majority of street vendors purchased and resold, especially goods traders who purchased all that they sold from other merchants. However, notable exceptions were food traders, where 39% of them are made and prepared their food at home and then brought them to the street for selling. It is important to note that for street service providers, the data on the source of products were attributed to the tools they used since, and hence, most services available were basically derived from their own.

The information about number of workers demonstrates this pattern of family business. It shows that most establishments are very small: well 83% of the street vendors consist of only one person working alone. Most enterprises are indeed operated by a single trader or by a trader or by a trader couple with no employees, but generally they obtain considerable unpaid assistance from family members. Nearly all traders rely heavily on family labour or assistance, both at the place of sale and at the production site in the home. The data on working hours reveal that the overwhelming numbers of street vendors are hard workers and keen entrepreneurs. About 19 percent of the traders can be categorized as under employed, overall, they work very long hours: more than 10 hours a day, seven days a week, year-round. As indicated above, some street traders work only in the morning, some work all day, and many works until late at night.

(b) *Legality*

More than 95 percent of the street enterprises in Yangon operate without license. Some of them have some kind of identification. The common identification is mainly in a form of registration card with a photo stating the name of the owner, main type of trading, and specified location. Most, if not all, street vendors pay registration fees. Street vendors near an office building, public park or market also rent regular stall space or pay a value of the stocks and the attraction of the business location.

Formal enterprises once registered are subject to pay taxes, whereas street enterprises that are officially unregistered do not pay taxes. However, the latter does not necessarily intend to break the rules or evade taxes.

3.3 Human Development of Street Vendors

This study considers the indicators of human development of street traders as consisting of economic, human and social capitals. Economic capital includes working capital, profits and household incomes. Human capital includes attainment of education, access to health service. Social capital covers access to social institutions as indicated by the participation in social cultural activities.

(a) Financial capital

Two of the crucial economic variables affecting the business performance of the street enterprise are working capital and trading revenues. The majority (42%) of street trader capital was indeed very minimal, under 20000 kyats wide variations were also found among different activities with vendors offering services having less capital than vendors selling food and goods.

It is important to bear in mind that the high revenues of street enterprises are based on averages that may mask the real profits of the majority. The wide range of household incomes as illustrated by interval figures, for example, shows that most street traders (60%) obtain daily revenues of more than 5000 kyats and 8 percent of the traders earn less than 1500 kyats a day. Separately, the household incomes of street trader selling goods were better than those selling food and services respectively.

On the basis of such an official poverty line is US \$ 1.25 a day line (nearly 1500 kyats). The average of daily profits and incomes of 92% street vendors are higher than the minimum basket of poverty measures of the country. 6% is slightly more than poverty line. But again, this cannot be used to justify that the street traders in Yangon are amongst the non-poor, let alone the rich, in the population.

Taking into account the limitation of poverty line, the link between poverty and street trading in Yangon appears to be more adequate if it is categorized into three groups on the basis of the multiplication of the poverty line.

1. **Group one:** the poor street vendors defined as the traders whose daily earnings are lower than 1500 kyats. They are categorized as poor since their economic situation is less than the basic poverty line of 1600 kyats. This group consists of 6 percent and 2 percent of the traders based on their trading revenues and household incomes per day, respectively.

2. **Group two:** the vulnerable street vendors defined as those having daily earnings between 1500 kyats and 3600 kyats. They are vulnerable because their gross profits and incomes are higher than the poverty line, but still around or only slightly above twice the minimum level. Based on both trading revenues and household incomes, 42 percent and 20 percent of the traders are under this category.
3. **Group three:** the better-off street vendors defined as those having daily earnings higher than 3600 kyats (standard minimum wages of formal) and hence well above twice the poverty line. Based on trading revenues and household incomes, respectively, the number of street vendors categorized as the “rich” traders is 53 percent and 77 percent of the total population.

According to these groups, 53% of street vendors earn more than those in the low skilled formal sector.

(b) *Human capital*

Education and health have been regarded as essential human capital for further economic and social development. The evidence show the level of human capital of street traders with respect to access to education and health service. In general, the findings show that street traders in Yangon have adequate access to such human capital.

Almost all street vendors have had some formal education except only 6%, literacy is not a major problem for street traders in Yangon. The data show that the majority of street vendors have achieved middle school level followed by primary levels of education. The pattern of educational level by types of trading is even more striking where street traders selling goods have had relatively better education than those selling services and food respectively.

Data on health show that 75 percent of street vendors used a health center and 10 percent of the traders used a doctor when they got sick, while 3 percent of them go to hospital. The “other” category in the table indicates some other ways of curing sickness, such as traditional healing or self-medication (using medicines not prescribed by a doctor) to cure their sickness. This high utilization of health centers seems to reflect easy to go and cheaper cost of medical treatment than other.

3.4 Results of survey data of public opinion

This sector presents the quantitative results from the data that have been collected from the questionnaire survey of public view on informal sector activities. The sector focuses on validating the qualitative results on perception of attitudes and behaviour towards street vendors and the perception of the control.

(a) *Perception of attitudes and behaviour towards street vendors*

Statements one (1) and two (2), implied negative attitudes and behaviour towards the urban informal sector activities performed by the city authorities and the general public interaction with the vendors. In addition, statements three (3), four (4) and five (5) the views held by the respondents were of a higher (over 50%) response rate in agreement. This shows that YCDC, and the general public had negative views toward the urban informal sector street vendors' engagement in street selling. This is clearly seen in confrontation between the vendors and the city authorities.

(b) *Perception of the control*

Unsurprisingly the quantitative results were similar to the qualitative results. The general public, public sector and private sector strongly held negative views about the control. The highest positive response rate was to statement (1), in which the respondents strongly held the negative view that there was no proper implementation of the control.

(c) *Perception of Street Vendors' Behaviour*

The general public, public sector and private sector employees strongly hold negative views about the street vendors' behavior. The respondents were more strongly negative about urban street vendors' behaviour. They do not comply with safety and health requirements.

(d) *Perception on consumers*

The general public, public sector and private sector employees strongly hold that street vendors are essential for very low income family. They also strongly hold positive views that low and middle income people consume from street vendors.

4 Discussion

The empirical analysis of the factors that determine the nature of the urban informal sector, views on informal sector activities and the implementation of the control has produced a number of key findings.

This study found that one of the major factors that contributed to the development of the informal sector was rural-urban migration. Evidence presented shows that, vendors left their villages and migrated to the city because of lack of work opportunities, a push factor. The other push factors include lack of rural development, provision and maintenance of services and employment in the rural areas. This reason supports the Harris-Todaro model. Some, however, have other reasons for migrating.

This study found that, according to the survey evidence, rural-urban migration and unemployment are the main factors that increased the activities of the informal sector in the urban sectors.

Previous research by Conroy (1974) and Williamson (1977) (as cited in Timalina, 2002) concluded that the poor take up informal economic activities as a last resort for survival. However, this study found that most people who engaged in the main informal sector activities were reasonably educated; a few even highly educated (graduates). Respondents from the focus group claimed that many of them do not have a formal job. Street vending was their only means of survival. They were in the category of those who are entirely dependent on the informal sector.

Forty percent of the traders are in the 31-40 years old age bracket, usually a married couple with one or two children. This shows that the role of family in street trading is very important. In relation to demographic characteristics, most of the street vendors (71%) were migrants from rural areas. However, since many amongst them (51%) were long-term residents, who migrated to Yangon between 5 and 20 years ago, street traders, are not recent migrants.

Street vending is regarded as the easiest and best available source of income especially amongst the poor. Previously, most street traders were employed in small income earning activities, largely in small jobs in the informal sector. This demonstrates that the shift of employment in the Yangon labour market usually takes the form of horizontal mobility within the informal sector.

Not all street vendors are poor, and they are not the poorest group compared to other low-income household. In aggregate and average, while some street traders can earn higher incomes than other comparable jobs, for those who are unemployed and have no advanced labour skill, street vending provides a reasonable source of livelihood. With reference to human and social capital indicators, street traders are possibly not poor. They have adequate basic education and access to health service.

One of the ILO experts, Sethuraman (1976), identified nine informal activities characteristics. In this study, informal activities employ 5 persons or less from family members. It does not observe fixed working hours or days of operation and operates in temporary structure or in a shifting location. So, the characteristics of informal activities in Yangon are consistent with characteristics of informal activities that identified by the international experts.

The high scores of access to health services (i.e. doctor and health centre) seem somewhat surprising. It was expected that the low trading profits and household incomes would be

followed by shortage of human capital. This does not happen. The findings show that there was no simple and causal link between poverty and street vending.

The control has not achieved public wants concerning with street vending. The evidence presented shows that the control on street vendors was not properly implemented. The feeling among the general public towards the urban street vendors' activities was more negative than positive.

They were seen to have attitude problems and their behaviour was seen to be driven by market forces. However, some respondents expressed positive views, while others expressed negative views about the urban street vendors. In terms of the positive views, the street vendors provided a quick fix and affordable service to the public. In addition they were expressing their democratic right to earn a living and contributing to the urban economy by providing cheap goods at convenient places. They were sensitive to market demands and responded to them. On the other hand, in terms of negative views, urban street vendors were nuisances conducting street selling in public places. They were seen as an eyesore, filling the streets with stalls made up of scrap and debris found along side roads and polluting areas with what they market. Rubbish created led to the spread of diseases. This creates a bad image for the city and the country as a whole.

5 Conclusion

Myanmar's experience conforms to the former, with most of the population being dependent on the rural informal sector. The Harris-Todaro (1970) model provides a rationale for the rural-to-urban migration in the face of rising urban unemployment. There were connected urban pull and rural push factors leading to rural-to-urban migration. This model depends upon the rural-urban wage gap and the rate of growth in urban employment. The "decision to migrate from rural to urban areas is related to two principal variables: (1) the urban-rural income differential and (2) the probability of obtaining an urban job" (Todaro, 1969, p. 139).

This research makes a contribution to identifying the types of people involved in the informal sector with its new finding that most of the people who were engaged in activities in this townships were reasonably educated, a few even highly educated. The informal sector in Myanmar is not just for the unskilled.

The key findings of this research suggest the following directions for further research: Researchers in future studies should consider data collection in other regions throughout Myanmar to obtain broader views of the informal sector activities. The socially undesirable and illegal activities such as prostitution, drug dealing and street begging have not been

researched, due to time constraints and difficulty of getting adequate and reliable information about them. Researchers in future with more resources may consider undertaking such research.

Microfinance in other countries has been discussed in relation to the rural and urban informal sector. Future studies should consider exploring how it could assist the participants in the rural and urban informal sectors of Myanmar.

One way of solving the problems of increasing street vending activities can be by proving vendors with a specific location for trading. It can be done with the help of local authorities giving them responsibility for control and managing the surrounding environment. Such other locations can also be identified and provided for trading that can protect livelihoods right of the vendors and manage the city environment. Upgrading of the vendors into formal shops should be facilitated. Providing loans and encouraging them to establish formal shops by giving training, skills can be taken into consideration. YCDC and the authorities should take the initiative to upgrade vending activities by approaching various NGOs to work in the management of vending activities in the city. Appropriate and effective programmes for employment generation to urban poor in Yangon should be designed and implemented.

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WHY RURAL PEOPLE ARE POOR?

A CASE STUDY ON RURAL AREA OF DRY ZONE IN SAGAING REGION

Dr. Thar Htay⁵

ABSTRACT

The study aims to analyze the extent of poverty and income inequality and the causes of poverty in the rural area of Dry Zone in Sagaing Region. Head count index and the poverty gap index are used to measure the extent of poverty while Lorenz curve. Based on the data from survey data, the logistic regression model is used to find out the causes of poverty in the study area. The survey on NGOs and Focus Group Discussion (FGD) are also used to identify the causes. The results show that 49.60 percent of respondents in study area are poor. The logistic regression results reveal that household size, age dependency ratio, economic dependency ratio, land ownership, number of source of income, accessibility of information and the accessibility of irrigation water have significantly affect the poverty condition in this area. The results of survey on NGOs and FGD have demonstrated that the causes of poverty in the study area are limited job opportunity, lack of human resource development, poor road and transportation facilities, weak access to credit, no irrigation water, insufficient information, knowledge, and effort and large household size.

Keywords: Poverty, incidence of poverty, Head count index, causes of poverty, income equality,

1. Introduction

Poverty reduction is now the core of development policies in the developing countries. There is considerable disagreement, however, over the extent of poverty and over whether it is increasing or decreasing worldwide. There is also disagreement over how to define poverty.

In a recent World Bank study, Akhter et. al (2007) estimates that in 2002, 75% of the developing world poor still live in rural areas. In the case of Myanmar, the IHLCA report shows that 84% of poverty is found in rural areas and disparities are pronounced across regions. Measuring the incidence of poverty is an important first step in understanding it, but measurement alone does not explain the causes of poverty. Therefore, some questions arise to answer, to what extent, how poverty and rural areas are correlated? And what are the causes of poverty in the rural area?

According to the IHLCA 2010, the poverty in Sagaing Region decreased by 11.5 percentage point from 26.6 percent in 2005 to 15.1 percent in 2010. In Sagaing Region, the decrease is also higher in rural areas than in urban areas (12.5 percentage point and 5.9 percentage

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point respectively). However, JICA (2010) reported that in the Dry Zone of Myanmar, the poverty levels were 33%, 55% and 43% for farm households, rural landless households, and the whole of Dry Zone respectively. Thereby, another question arises, what will be the poverty status and its characteristics in the rural area of Dry Zone? To answer this questions, there are no research papers that have conducted on poverty in rural area of Dry Zone in Sagaing Region. Therefore, this paper aims to fulfil this gap to explore the causes of poverty in rural area of Dry Zone in Sagaing Region.

Objectives of the Study

The objectives of the study are:

- (1) To measure the extent of poverty and income inequality in the rural area of Dry Zone in Sagaing Region
- (2) To explore the causes of poverty in the rural area of Dry Zone in Sagaing Region.

2. Method of Study

Both quantitative and qualitative methods are used in this paper. Descriptive method, tabular and graphic illustrations are also used. Required data and information are collected from secondary sources as well as primary sources.

To calculate the extent of poverty in rural area of Dry Zone in Sagaing Region, required data are collected from the selected households that are chosen by using four-stage sampling method. Head Count Index and the Poverty Gap Index are used to calculate the extent of poverty.

Based on the data from the household survey, the Logistic Regression Model is used to find out the causes of poverty in the study area. In addition, to explore the causes of poverty, a survey on NGOs is conducted in the study area. There are 17 working groups from these NGOs that are providing various types of assistance gathered by Focus Group Discussions (FGD) with representative residents regarding main causes of poverty, main activities they are engaged in, their income, their mechanisms of cultivation/inputs in agriculture, household education status, and accessibility to markets, transport conditions, access to credit, information, knowledge and effort of household members.

Measuring Poverty

The extent of poverty and income inequality is calculated from the data collected. Head Count Index and the Poverty Gap Index are calculated to measure the extent of poverty. In addition, Lorenz curve is also developed and Gini Coefficient is estimated for income inequalities in the study area.

Head Count Index

Absolute poverty may be measured by the number of head count (H) of those whose income falls below the absolute poverty line when the head count is taken as a fraction of the total population (N). The Head Count Index (HCI) may be defined as;

$$HCI = \frac{H}{N}$$

where,

H = the number of poor households

N = the total number of households

The Poverty Line

In order to calculate the Head Count Index, the poverty line must be constructed. It is needed to have a baseline survey to calculate the food and non-food poverty lines. In this paper, therefore, it is assumed that the Integrated Household Living Conditions Survey in Myanmar (2009-2010) is a baseline survey to estimate the poverty line. The 2015 poverty line is estimated based on 2010 IHLCA poverty line by adjusting only inflation, other things are assumed to be constant. The actual value of the poverty line per person equivalent per year, in 2005, 2010, and 2015 are shown in Table (1).

Table (1) Poverty Line (in kyats)

Year	2005	2010	2015
Poverty Line	162136	376151	450877

Source: Author's estimation based on 2010 IHLCA

The Head Count Index is the percentage of the population whose living standards (typically proxied by income) lie below the poverty line.

The head count indices presented in Table (2) show that 49.37 percent of the respondents come under the category of poor, while 50.63 percent were in non-poor for Monywa Township. In Ayadaw Township, Head Count Index was 49.44 percent in the poor, while 50.56 percent were reported not to be poor. This means that there are not so different in Head Count Index between Monywa and Ayadaw Townships. The overall number of respondents which represented as Monywa District was 417, of which 49.40 percent were poor, while 50.60 percent were not poor.

Table (2) Head Count Index (2015)

District/Township		Poverty Status		Total	
		Poor	Non Poor		
Monywa District	Monywa Township	No.	117	120	237
		%	49.37%	50.63%	100%
	Ayadaw Township	No.	89	91	180
		%	49.44%	50.56%	100%
		No.	206	211	417
		%	49.40%	50.60%	100%
Yinmarpin District	Yinmarpin Township	No.	98	81	179
		%	54.75%	45.25%	100%
	Sarlingyi Township	No.	81	99	180
		%	45.00%	55.00%	100%
		No.	179	180	359
		%	49.90%	50.10%	100%
Overall		No.	385	391	776
		%	49.60%	50.40%	100%
IHLCA		27.4% (2005)		14.9% (2010)	

Source: Survey Results 2014 and 2015

Similarly, in Yinmarpin Township, Head Count Index was 54.75 percent in the poor, while 45.25 percent were reported not to be poor. In Sarlingyi Township, Head Count Index was 45.00 percent in the poor, while 55.00 percent were reported not to be poor. This implies that Yinmarpin Township has a higher number of people living below the poverty line as compared to those in Sarlingyi Township. The overall number of respondents which represented as Yinmarpin District was 359, of which 49.90 percent were poor, while 50.10 percent were not poor.

As comparing the Head Count Index between Monywa District and Yinmarpin District, Yinmarpin District has a higher number of people living below the poverty line as compared to those in Monywa District. The overall number of respondents which represented as the rural area of Dry Zone was 776, of which 49.60 percent are poor, while 50.40 percent are not poor.

The findings of the poverty rate in the present study are quite high compared with the two IHLCA poverty rates of 2005 and 2010. However, this study represented only the rural area

of Dry Zone in Sagaing Region. The findings are also supported by 2010 JICA study which reported that in the Dry Zone of Myanmar, the poverty levels were 33%, 55%, and 43% for farm households, rural landless households, and the whole of Dry Zone respectively.

The Poverty Gap Index

The HCI is the most commonly used method of estimating the incidence of poverty. However this indicator does not take account of the intensity of poverty. The HCI does not change as long as they remain below the poverty line, even though the poor's living standards may improve. Therefore, it is needed to develop a measurement to measure the intensity of poverty.

A popular measure of poverty is the Poverty Gap Index (PGI). The PGI measures the intensity of poverty. It is defined as the extent to which households/individuals fall below the poverty line (the poverty gap) as a proportion of the poverty line. In other words, the Poverty Gap Index can be interpreted as the average percentage shortfall in income for the population, from the poverty line. The PGI is a more important measure than the HCI because two regions may have the same HCI, but distinctly different PGIs. A higher PGI means that poverty is more severe.

The Poverty Gap Index (PGI) is calculated as.

$$PGI = \frac{1}{N} \sum_{j=1}^H \left(\frac{z - y_j}{z} \right)$$

where

N = the total population

H = the total population of the poor who are living at or below the poverty line

z = the poverty line

y_j = The income of the poor individual j .

By definition, the poverty gap index is a percentage between 0 and 100%. Sometimes it is reported as a fraction, between 0 and 1. A theoretical value of zero implies that no one in the population is below the poverty line. A theoretical value of 1 implies that everyone in the population has zero income. In some literature, PGI is reported as P_1 while the HCI is reported as P_0 .

Table (3) indicates that in Monywa Township the average poverty gap was 178796.89 kyats, while in Ayadaw it was reported to be 145333.2 kyats. This shows that the amount of income required to remove the poor out of poverty is much higher in Monywa Township than in Ayadaw Township. For the overall Monywa District, 164339 kyats of income is needed to remove the poor out of poverty. The Poverty Gap Index of Monywa Township is higher than

those of Ayadaw Township. These Poverty Gap Indices show the intensity or severity of poverty in these areas. The poverty gap indices are 0.20, 0.16, and 0.18 for Monywa Township, Ayadaw Township, and Monywa District respectively. For the Monywa District, the Poverty Gap Index is 0.18 and poverty line is 450877 kyats, then an average increase of 81158 kyats per individual per year would eliminate extreme poverty.

Table (3) Poverty Gap and Poverty Gap Index

District/Township	Poverty Gap	Poverty Gap Index
Monywa Township	178796.89	0.20
Ayadaw Township	145333.20	0.16
Monywa District	164339.00	0.18
Yinmarpin Township	171025.00	0.21
Sarlingyi Township	165587.80	0.17
Yinmarpin District	168565.00	0.19
Overall	166304.00	0.18

Source: Survey Results 2014 and 2015

Similarly, in Yinmarpin Township the average poverty gap was 171025 kyats, while in Sarlingyi Township it was reported to be 1165587.8 kyats. This shows that the amount of income required to remove the poor out of poverty is much higher in Yinmarpin Township than in Sarlingyi Township. For the overall Yinmarpin District, 168565 kyats of income is needed to remove the poor out of poverty. The Poverty Gap Index of Yinmarpin Township is higher than the Sarlingyi Township. The Poverty Gap Indices are 0.21, 0.17, and 0.19 for Yinmarpin Township, Sarlingyi Township, and Yinmarpin District respectively. This indicates that 85667 kyats require for per individual per year to eliminate the poverty in the Yinmarpin District.

As shown in Table (3), the Poverty Gap Index for Monywa District and the overall Dry Zone are the same, while it is slightly higher in Yinmarpin District. These poverty gap indices show the intensity or severity of poverty in these areas. The Poverty Gap Indices are 0.18, 0.19, and 0.18 for Monywa District, Yinmarpin District, and the Dry Zone respectively. This indicates that the depth of poverty for Yinmarpin District is deeper than that of Monywa District. For the study area, the Poverty Gap Index is 0.18 and poverty line is 450877 kyats, then an average increase of 81158 kyats per individual per year would eliminate extreme poverty.

Empirical Analysis on Causes of Poverty

In this part, the determinants of poverty are analyzed with Logistic Regression on household survey data and macroeconomic data from survey on village and NGOs and the results of FGDs.

Household Determinants of Poverty

To analyze the determinants and identify the causes of poverty in the study area, logistic regression is applied to primary data. Logistic regression analysis allows one to predict probability of a binary dependent variable from a set of independent variables that may be continuous, discrete, or a mix of them. Logistic regression method is a powerful technique because it is relatively free of restrictions and it allows analyzing a mix of all types of predictors.

The Logistic Regression Model can be shown as follows:

$$Prob (y = 1) = \frac{e^z}{1 + e^z}$$

where

y = binary dependent variable (y = 1 if event occurs, y = 0 otherwise)

e = the base of natural logarithms and

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_p X_p$$

With constant β_0 coefficient, $\beta_1, \beta_2, \beta_3, \dots, \beta_p$ are coefficients for p predictors

Proposed $X_1, X_2, X_3, \dots, X_p$ (Independent Variables) could be the gender of household head, number of household size, age dependency ratio, economic dependency ratio, land ownership, number of source of income, education of household head and occupation of household head.

The gender of household head means that 1 for male household head and 0 for female household head. The household size is the number of household members. The age dependency ratio compares the number of household members less than 15 and over 59 year of age, relative to those between the ages of 15-59. The higher the ratio value, the higher the dependency burden on the household. The economic dependency compares the number of unemployed and number of earners. The land ownership means the total acres owned by household. The number of source of income means the number of income generating activities of household. The education of household head means that 1 for up to primary education and 0 for above primary education for household head. The occupation of household head means the type of occupation of household head as 1 for unemployed and casual labor and 0 for others.

The dependent variable is poverty status of households. Let $y = 1$ if the household is poor and $y = 0$ if it is not poor.

The results in Table (4) show the results of Logistic Regression Model of poverty which is applied to primary data for Monywa District. Dependent variable is poverty status, while the independent variables are gender of household head, education of household head, and occupation of household head, household size, age dependency ratio, economic dependency ratio, land ownership, and number of source of income.

Table (4) Results of Logistic Regression Model of Poverty for Monywa District

	Coefficient	Standard Error	Wald Statistic	P-Value
Gender of Household Head 1 = Male & 0 = Female	-.087	.306	.081	.775
Household Size	.283***	.068	17.420	.000
Age Dependency Ratio	.195	.252	.598	.439
Economic Dependency Ratio	.953***	.241	15.681	.000
Land Ownership (Acre)	-.090***	.019	23.263	.000
Number of Source of Income	-.669***	.172	15.187	.000
Education of Household Head Up to Primary =1 & Above Primary = 0	.147	.300	.238	.626
Occupation of Household Head Unemployed and Casual Labor = 1 & Others =0	.557	.379	2.161	.142
Constant	-.671	.546	1.510	.219

Note: *** indicates statistical significance at 1% level.

Source: Survey Results 2014 and 2015

The empirical results show that gender of household head, age dependency ratio, education of household head, and occupation of household head are not statistically significant. Variables such as household size and economic dependency ratio are statistically significant at 1% and it has a positive sign. This indicates that as household size and economic dependency ratio increase, there is a probability that poverty can increase. The variables, land ownership and number of source of income are also statistically significant at 1% and it shows a negative sign which means that as land ownership and the number of source of income increase, there is probability that poverty decreases.

Table (5) shows the results of Logistic Regression Model, which is applied to primary data for Yinmarpin District. Table (5) shows that gender of household head, age dependency ratio, education of household head, and occupation of household head are not statistically significant. Variables such as household size and economic dependency ratio are statistically

significant at 1% and it has a positive sign. This indicates that as household size and economic dependency ratio increase, there is a probability that poverty can increase. The variables, land ownership and number of source of income are also statistically significant at 1% and it shows a negative sign which means that as land ownership and the number of source of income increase, there is probability that poverty decreases.

Table (5) Results of Logistic Regression Model of Poverty for Yinmarpin District

	Coefficient	Standard Error	Wald Statistic	P-Value
Gender of Household Head 1 = Male & 0 = Female	-.043	.344	.016	.899
Household Size	.345***	.076	20.364	.000
Age Dependency Ratio	.218	.269	.655	.418
Economic Dependency Ratio	.944***	.250	14.310	.000
Land Ownership (Acre)	-.100***	.020	24.659	.000
Number of Source of Income	-.803***	.199	16.210	.000
Education of Household Head Up to Primary =1 & Above Primary = 0	.115	.317	.132	.716
Occupation of Household Head Unemployed and Casual Labor = 1 & Others =0	.244	.296	.681	.409
Constant	-.813	.559	2.118	.146

Note: *** indicates statistical significance at 1% level.

Source: Survey Results 2014 and 2015

The results in Table (6) show the poverty predictors using Logistic Regression Model which is applied to primary data for the study area. Since the Omnibus Chi-square test is significant at 1% level, the binary logistic regression model can explain the relationship of poverty status and the independent variables.

Table (6) Results of Logistic Regression Model of Poverty for Rural Area of Dry Zone in Sagaing Region

	Coefficient	Standard Error	Wald Statistic	P-Value
Household Size	0.238***	0.049	23.681	0.000
Age Dependency Ratio	0.374**	0.179	4.369	0.037
Economic Dependency Ratio	0.857***	0.169	25.688	0.000
Land Ownership	-0.08***	0.015	30.592	0.000
Number of Source of Income	-0.558***	0.126	19.568	0.000
Accessibility of Information	-0.417***	0.091	20.798	0.000
Accessibility of Water	-0.566***	0.185	9.403	0.002

Constant	0.561	0.343	2.678	0.102
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Note: *** and ** indicate statistical significance at 1%, and 5% level, respectively.

Source: Survey Results 2014, 2015 and 2016

From Table (6), it is found that variables such as household size and economic dependency ratio are statistically significant at 1% and it have positive signs. This indicates that when a household size becomes larger and has more economic dependency burden, it has a probability of being poorer. The land ownership, and number of sources of income and accessibility of information are also statistically significant at 1% but it have negative signs. This means that as land ownership, and the number of sources of income increase and information are easily accessed, then there is a probability that poverty decreases. The accessibility of irrigation water is statistically significant at 1% and it is also negative. This means that if the accessibility of irrigation water increases, there is a probability that poverty will decrease in the rural area of Dry Zone in Sagaing Region. The age dependency ratio is also statistically significant at 5% level and it has a positive sign. This indicates that when a household becomes larger age dependency burden, it has a probability of being poorer.

Macroeconomic Determinants of Poverty

In the macroeconomic determinants, no access to credit or inappropriate credit system, poor transportation, deficiencies in labor market, limited information and knowledge to extend, low human resource development, and no irrigation water are included. To analyze these macroeconomic determinants that are causes of poverty in the study area, surveys on NGOs and FGD are conducted. There are 17 working groups from various NGOs operating in the study area. To collect the required data, a survey is conducted on these 17 working groups of NGOs with a questionnaire. The qualitative data is also collected by FGD for 13 groups organized in 13 villages. To acquire more in-depth information on perceptions, insights, experiences or beliefs, each group was organized by about 10 participants who are village administrators, elders of the community and enthusiastic peoples.

Survey Results of NGOs

Besides the government authorities and government supported programmes for improving the socio-economic status of the rural community especially the rural poor, non-government organizations, both local and international, are also taking part in this process. It is generally assumed that these NGOs have important roles in supporting the socio-economic status of a community or society in order to achieve the poverty reduction status. The role of these NGOs in reducing poverty is not a new issue. Especially since the post-World War II, NGOs' involvement in poverty reduction has become a mainstream (Suharko, 2007). They are

generally engaged in relief, emergency or longer-term development works or the mixture of all three.

For the study area, there are 17 working groups from these NGOs that are providing various types of assistance to the village community of this study area. The various NGOs include Marie Stopes International (MSI), Groupe de Recherche et d' Exchanges Technologiques (GRET), Pact Myanmar, Shae Thot, and Worth. During the interviews with representatives of the respective NGOs, the representatives produced important contributions and various activities that are needed to improve the welfare of the local people. The activities that are provided for the community's welfare are shown in Table (7).

Table (7) Activities of NGOs for Community Welfare

	No. of NGO	Percent
Poverty Alleviation	9	53
Income Generation	9	53
Community Health	7	41
Transportation	3	18
Water Supply	2	12
Women Empowerment	2	12

Source: Survey Results 2014 and 2015

There are 6 areas (activities) that the representatives have reported in the discussions in order to improve the welfare of the local community in the study area. This indicates that these 6 activities are the most important to be provided in improving the welfare of the people in the study area. Those activities are income generation, women empowerment, community health, transportation, water supply, and poverty alleviation.

According to Table (7), nine groups (53%) out of 17 groups are undertaking programmes for income generating activities. This indicates that there are low job opportunities and most of the low income people are working in the private informal sector in this area. In addition, to improve the role of women, 12% of representatives have stated as also working in activities for income generation of women. Women's income can also support as additional income to the household such that the living status of these poor households can be improved. However, with NGOs involving in income generating activities point out that there is a deficiency in labor market resulting limited job opportunities in the study area.

The second important activity is improving the community health care service activity. Out of 17 groups from the NGOs, seven groups or 41% of representatives of the groups have

agreed that the community health care service needs to be improved and that it is urgently needed to provide the people with healthcare facilities in the study area.

Similarly, three groups (18%) out of 17 representatives of the NGOs have launched programmes to improve the transportation facilities. This indicates that there is poor transportation network in some of the villages in the study area. Improvement of transportation facilities is essential as connection within the rural areas and with the nearest towns and cities is important for both economic and social activities.

Then, two groups or 12% of representatives have also suggested that it is needed to implement a water supply project as there is insufficient water in some of the villages in the study area as mentioned before in this chapter. The villages in the study area do need water supply for other activities rather than with only to drinking water.

Table (8) Recommendations of NGOs to Improve Poverty Alleviation Programmes

	No. of NGO	Percent
Job Opportunity	10	59
Education	7	41
Vocational Training	5	29
Health Care	3	18
Transportation	2	12
Market	2	12
Loan	2	12
Livestock	1	6

Source: Survey Results 2014 and 2015

According to the survey conducted on NGOs, the recommendations of NGOs for promoting poverty alleviation programmes, the perceptions of NGOs on areas that they should provide in order to achieve the goals of poverty alleviation and perceptions about the causes of poverty in the study area are shown in Tables (7), (8), and (9) respectively.

From Table (8), it is found that the NGOs involved, recommended the areas in which improvement is required in order that the poverty alleviation programmes provided are to be effective. The majority of the representatives recommended job opportunity as first priority followed by education, vocational training, and healthcare and with transportation, market, and loans and with livestock as the last priority.

Job Opportunity

Table (8) reveals that 59% of the representatives suggested that more job opportunities should be created for the poor to generate income for them. This is supported by the

perceptions of NGOs that they should be provided with needed programmes so as to achieve the goals of poverty alleviation as shown in Table (9). 47% of representatives agree that the income generation activities should be contributed to the poor people who have no specific jobs. There are many people who have no specific jobs because of a deficiency in labor market resulting in limited job growth in the study area. This is one of the causes of poverty in the study area. According to the perceptions of NGOs about the causes of poverty as shown in Table (10), 35% of representatives agree that the limited job opportunity is also the causes of poverty in this study area.

Table (9) Perceptions of NGOs on Areas to Achieve the Goals of Poverty Alleviation

	No. of NGO	Percent
Income Generation	8	47
Education	5	29
Health Care	5	29
Technical Training	4	24
Capital	4	24
Vocational Training	3	18
Transportation	1	6

Source: Survey Results 2014 and 2015

Human Resource Development

According to the results shown in Table (8), 41%, 29% and 18% of NGOs' representatives suggested to give priority to the areas of education, vocational trainings and health care services as part of the work to improve poverty alleviation programmes, respectively. This indicates that human resource development is important to reduce the poverty level and it is needed to provide human resource development projects for improving the community as part to undertake poverty alleviation programmes in the study area. These results are also supported by Table (9) where 29% of representatives stating that the NGOs should provide the requirements for education, also 29% for health care services, 24% and 18% respectively, for technical trainings and vocational training to the local community to achieve the goals of poverty alleviation. This is because the formal and informal education is needed to support the people who rely on farming and non-farming activities for their livelihood.

Table (10) Perceptions of NGOs Concerning the Causes of Poverty

	No. of NGO	Percent
Formal Education	8	47
No Capital	7	41

Low Technology	6	35
Job Opportunity	6	35
No Irrigation Water	5	29
Vocational training	4	24
Poor Transportation	3	18

Source: Survey Results 2014 and 2015

Similarly, according to Table (10), 47% and 24% of representatives perceived that the main causes of poverty are the low level of formal education and lack of vocational trainings in the study area, respectively. Therefore, it can be said that the lack of human resource development trainings is also one of the causes of poverty in the study area.

Transportation and Communication

Similarly, according to information presented in Table (8), 12% of representatives suggested that transportation is needed to be facilitated, while 12% said that markets should be created for the local products and also 12% suggested that credit facilities should be provided with low interest rates in order to help and support income generating activities for the community as part of the effort to alleviate poverty. Road and transport facilities should be provided in places where these improvements are essentially needed so that the farmers and businessmen can transport their goods from their villages to the markets with easy access. In the study area, some villages are far from the nearest towns or markets needing long distance travels to reach those destinations and having poor transport facilities, they found it hard for their deliveries of goods to markets and other places. Sometimes it is very difficult to transport and to communicate with the markets especially during the rainy season. Three groups or 18% of representatives of NGOs perceived that there is poor transportation in the study area. This indicates that poor transportation and communications are also the causes of poverty in the rural area of Dry Zone.

Irrigation Water

In addition, Table (10) shows that 29% of NGOs' representatives report that no irrigation water is also a cause of poverty in this study area as irrigation water is essential for farming activities. In the study area, the farmers of some villages rely heavily on the weather conditions as rain water is much needed for cultivation. Unpredictable weather conditions (especially drought) have negatively affected the yields of agricultural products. This is vulnerable for the farmers in the study area and if irrigated water is provided, it will become another source of water for the villages without irrigation water at present.

Capital

According to the survey results regarding the perceptions of NGOs about the causes of poverty as presented in Table (10) shows that 41% of respondents agreed as one of the main causes of poverty is also scarcity of capital or no capital at all for the poor to do business and to extend their present businesses. Most of them are poor and they have no collateral to get the credit. When low income households have no access to credit with low interest rates, they cannot start or expand their businesses. That is also one of the reasons why they are poor.

Results of Focus Group Discussions

In FGD, discussions are made on the main causes of poverty, the main activities that the respondents are engaged in, their income conditions, agriculture and their mechanisms of cultivation/inputs, household education status, and accessibility to markets, transport conditions, access to credit, information and knowledge and also the effort of household members.

Job Opportunity

In the FGD when asked, what are the main causes of poverty in their village, almost all respondents in the FGD told that because of no regular jobs and therefore no regular income and for this, most of the people are poor in their villages. Some respondents replied that the majority of poor are landless laborers and they heavily rely on agriculture for their livelihood, so that beyond the agricultural seasons they have no regular jobs to generate income. According to the FGD respondents, even during the agricultural season, it is not easy for them to have regular jobs and in just only during cultivating and harvesting periods that they have regular income and jobs. Some respondents told that some people have left their villages to find other jobs outside their community.

Human Resource Development

Many of the respondents in the FGD said that no modern method of cultivation is being used by farmers and that they are still using traditional and primitive methods. It is one of the reasons why farm work cannot prosper and improve the life of farmers leaving them in poverty. The FGD respondents requested as to provide the essential technical trainings for farmers. It is also unexpected to find out that in one village (Kyaukkwe village), there are still no matriculation passed students in this village and only 4 or 5 students are studying in the middle school level education. When the discussion group is asked, why the children are not sent to other villages or towns to study the middle school level education after passing the primary education level and many respondents in the FGD responded that because they have not enough income and they cannot afford to send their children to other villages and towns to study higher education levels after completing the primary level education. So it can be stated that lack of income leads to lack

of education for the families in this village. Support for improvement of education is highly needed in this area.

Transportation and Communications

According to the respondents of FGD in four villages (Motesoekone, Kyaukkwe, Sapatwin and Sihlaung), there is very poor transportation and poor road conditions in and around their villages. The respondents of FGD in Kyaukkwe village told that their village is too far and it is at least 20 miles from the nearest market (Monywa) and they can travel only about two times a month to this market to buy what they need and to sell their products. Poor road conditions also hinder their access to market their products.

The respondents of FGD in Sihlaung village told that they cannot use their village road in the rainy season and at that time they have much difficulty to transport and to communicate with the market. They also told that every day in the open season, about 40 people usually go to Monywa to work and about 10 people go to Monywa and others places to sell their handmade products such as chairs made by using stubs of toddy-palm branches. However, during the rainy season they cannot go to work and sell their products because of the very poor condition of roads. One man respondent of FGD in Sihlaung told that his younger brother was bitten by a snake (viper) last year and he passed away because he could not have immediate and sufficient treatment due to poor transportation and communication.

Access to Credit

According to the respondents of FGD, the Agricultural Bank and Cooperatives give loans only to households who are engaged in agricultural activities and so landless laborers cannot have access to credit from these Agricultural Bank and Cooperatives. Many of the respondents in FGD told that landless laborers and low income households also cannot have access to credit easily from private money lenders because of their lack of collateral. They also said that difficulties in access to credit are also one of the causes of poverty for these households.

Some of the FGD respondents told that agricultural credit is too low as compared with the actual costs of production and duration of credit is also too short. Many respondents engaged in agriculture from this FGD mentioned that the current credit system is not convenient for them because the amount of credit is too small and duration is for only one season. They also requested that it is needed to provide them with long term agricultural credit.

Water Sufficiency

Weather, particularly drought is one of the main concerns of the FGD respondents regarding agriculture. The respondents of FGD in five villages (Motesoekone, Kyaukkwe, Sapatwin,

Pyaungpyar and Sihlaung) told that most of the households mainly relied on agriculture for their livelihood. Whenever there is drought, many people are facing difficulties for cultivation because there is no irrigation water in their villages. They also requested to be provided with irrigation water. But, in contrast, the respondents of FGD in Bitethayet mentioned that there have no problems with water for cultivation in their village for they can get sufficient irrigation water whenever it is needed.

Access to Information and Knowledge

According to the respondents of FGD, they know that their methods of cultivation are traditional and primitive, but they do not know how to upgrade their methods of cultivation. There are Chinese watermelon cultivations in some villages (Motesoekone, Sapatwin and Hnawkatoe) and the respondents of FGD in these villages told that they also want to cultivate watermelon like those Chinese watermelon cultivators; however, they have limited information and knowledge about where to sell and how to cultivate. The respondents said that if they have perfect information about the market and knowledge and technology of how to cultivate watermelon, they can also become engaged in cultivating watermelon. The main product of Khoethan is onion and the respondents of FGD in Khoethan village told that the economic condition of many people in their village depend on the price of onion. The respondents said that last year the price of onion declined causing losses to many people who cultivated and stored onion. They have limited information about the price of onion. So, lack of market information is also a problem they have to face in cultivation and distribution of their products and this can result in acquiring less income or may be even they may face losses.

Effort and Household Size

When the respondents in the FGD are asked, which factors are the main causes of poverty in their villages, some respondents answered that household members putting no effort for the household livelihood activity and large household size are the causes of poverty. The respondents of FGD in Sihlaung and Bitethayet told that some poorer people are not trying to work harder or finding extra work to do during free time. The respondents mentioned that the lack of effort to work is the main cause of poverty.

It is concluded that there are many causes of poverty in the study area. These are limited job opportunity, lack of human resource development, poor road and transportation facilities, no access to credit, and no irrigation water, limited information and knowledge, and lack of effort and large household size. It is seen that because of these causes, the study area remains with most of its rural population being poor and still much is needed to improve its all-round development with effort and support from the authorities, NGOs together with the participation of the community.

Conclusion

This paper analyzes the causes of poverty in the rural area of Dry Zone in Sagaing Region. In addition, it measures the extent of poverty and income inequality in the rural area of Dry Zone in Sagaing Region. Based on the data from the household and village surveys, the Logistic Regression Model is used to find out what are the causes of poverty in the study area. Moreover, to fit and support the regression results and explore the causes of poverty, a survey on NGOs and FGD are also used in this paper.

Based on the survey results, it is found that 49.60 percent of respondents in rural area of Dry Zone in Sagaing Region are poor. Since the poverty gap index is 0.18 and poverty line is 450877 kyats, an average increase in per capita income of 81158 kyats per annum would eliminate extreme poverty in the study area.

Logistic Regression Model is applied to primary data from the study area. Dependent variable is poverty status, while the independent variables are household determinants and macroeconomic determinants.

The empirical results shows that the variables related the household determinants (gender, education and occupation of household head) and macroeconomic determinants (access to credit and inappropriate credit system, transportation and job opportunity) are not statistically significant. Household size, age dependency ratio, economic dependency ratio, land ownership, number of source of income, accessibility of information and the accessibility of irrigation water have statistically significant effect on the poverty condition in this study area.

According to the survey results of NGOs and FGDs, there are many causes of poverty in the study area. These are limited job opportunity, lack of human resource development, poor road and transportation facilities, no access to credit, and no irrigation water, limited information and knowledge, and lack of effort and large household size. It is seen that because of these causes, the study area remains with most of its rural population being poor and still much is needed to improve its all-round development with effort and support from the authorities, NGOs together with the participation of the community.

Recommendations

To reduce the poverty in the study area, it is important to improve income generation from nonfarm activities in the rural areas. The vocational trainings, technical supports and seminars are also needed to develop the business knowledge for local people. It is also needed to use more suitable multiple cropping systems, introduce modern agricultural techniques, and improve transportation and agricultural infrastructure such as irrigation systems for improving agricultural activities and further to increase agricultural productivity. The government also needs to provide technical assistance and trainings to introduce the

high-value activities such as horticulture and dairy farming which are labor intensive and generate substantial employment. In addition, the government needs massive investment in rural education and infrastructure such as roads, electricity, and information systems in order to improve productivity and living standards in the study area. By doing so, it can be expected that the reduction of poverty, and thereby socioeconomic development of rural area of Dry Zone in Sagaing Region.

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ZMOT BEHAVIOR OF INTERNET USERS IN YANGON

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ABSTRACT

The term, ZMOT (Zero Moment of Truth) refers to the critical moment online to search for information and evaluation, before making a purchase decision. The objectives of this study are to identify the the ZMOT behavior in consumer buying decision process among internet users in Yangon and to analyze the nature of consumers with ZMOT behavior in Yangon. The study scope is limited to those living in 4 districts of Yangon, and those who use internet. Data collection method of CAWI (Computer Aided Web-based Interview) was practiced by using a structured questionnaire. Descriptive research method was used in this study. To collect primary data, 200 respondents were selected as sample from a certain percent of full time members of MCIA, full time members of UMTA, web site owners, business managers from EMBA 13th and 14th, and online group members of MUA, MEF, MBC. From analysis on survey data, firstly, it is found that ZMOT behavior exists among internet users in Yangon. Secondly, this research discovered the length of ZMOT of internet users in Yangon for two products and two services: one week for mobile phones; one hour for clothing; one day for restaurants and hospitals/clinics. This research also analyzed on evaluating alternatives, information sources, information sufficiency, online evaluation criteria against gender, employment, and internet usage.

Keywords: ZMOT, length of ZMOT, mobile phones, clothing, restaurants, clinics/hospitals

Introduction

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When internet was first opened to public in mid 1990s, first version of the worldwide web was just a medium of one-way information. Publishers wrote. Consumers read. Later, with a more matured internet, widely known as Web 2.0 (second version of the web), consumers on the internet evolved into an environment where everybody writes and everybody reads. When everybody can write and publish online, consumers write all about what they love or what they hated. As a result, the new generation of consumers, empowered by the internet, is able to evaluate products from hundreds of information-sources within minutes, and make better decisions like never before. And that, of course, significantly altered the consumer behaviors, once and for all.

To express the critical decision-making moments in consumer buying decision process, Lafley, the CEO of Procter & Gamble first used the term FMOT (first moment of truth) in 2002. But later, marketing experts at Google discovered that there is a more important critical moment, even earlier than FMOT, if consumers use internet, no matter whether product they buy was online nor offline. After Google made a research over 8,000 internet users about this critical moment, Google coined and brought up a new term, ZMOT (zero moment of truth) as part of the new mental model of marketing.

Objectives of the Study

1. To explore whether ZMOT behavior exists in Yangon.
2. To examine the effect of product/service types on ZMOT behavior.
3. To observe the link between demographic factors and ZMOT behavior.
4. To test the effect of internet usage on ZMOT behavior.

Scope and Method of the Study

The study scope is limited to those living in Yangon, and those who use the internet. Data-collection period was between October and December 2016. To collect primary data, 200 respondents were selected as sample: 3.33% from MCIA (Myanmar Computer Industry Association) members; 1.34% from UMTA (Union of Myanmar Travel Association) members; 3.13% from web site owners at Myanmars.NET; 0.26% from MUA (Myanmar Unicode Area) group members (in Ygn); 12.50% from online Myanmar Economic Forum (MEF) group; 1.67% from online Myanmar Business Community; 26.60% of assorted business managers from EMBA-13; 28.74% of business managers from EMBA-14. Out of 200 selected respondents, a total of 138 respondents answered this survey questionnaire. Secondary data were obtained from the 2014 Census Reports, relevant text books, internet

web sites, and previous research papers. Regarding Method of study in this research, 'descriptive research' and 'convenience sampling' methods were used. Survey questionnaires were distributed off-line and on-line. Both personal interview method and Computer Assisted Website Interview (CAWI) method were applied with participants.

Theoretical Background

Consumer Buying Decision Process

The foundation of this study came from the field of consumer behavior and marketing management, model of the consumer buying decision process, and new mental model of marketing. The famous 5-Stage Model of the Consumer Buying Decision Process (Kotler & Keller, 2009) consists of (1)problem recognition, (2)information search, (3)evaluation of alternatives, (4)purchase decision, (5)Post-purchase behavior.

Throughout the purchase-decision process, consumers engage with ZMOT behavior in 3 of the 5 stages above: while searching, evaluating, and broadcasting the feedback, as a Post-purchase behavior.

New Mental Model of Marketing

When consumers hear about a product today, their first reaction is to search about it online. Next, they go on an online journey of discovery: about a product, a service, an issue, or an opportunity. (Jim Lecinski, 2011) Today marketers are not behind the competition. Marketers are not behind the technology. Marketers are behind the consumer. (Rishad Tobaccowala, 2011) Because that little critical moment going online, searching and evaluating is the moment that's changing the marketing rulebook. It's a new decision-making moment that takes place a hundred million times a day on mobile phones, laptops and wired devices of all kinds. It's a moment where marketing happens, where information happens, and where consumers make choices that affect the success and failure of nearly every brand in the world. (Jim Lecinski, 2011)

ZMOT, FMOT, SMOT, and TMOT

Zero Moment of Truth or ZMOT (pronounced "*Zed Mot*" or "*Zee Mot*"), was coined by Google, meaning 'the critical decision-making moment online, when consumers do information-search, and evaluation of alternatives of a product. ZMOT behavior refers to the habitual behavior of consumers, who go online to find information and evaluate before making a purchase. Their research proved that no matter products and services were sold online or offline, a majority of internet users search for information online and evaluate instantly. (Jim Lecinski, 2011)

First Moment of Truth or FMOT (pronounced "Eff Mot") is the moment when consumers stand in front of store shelf and decide whether to buy one's brand, or a competing brand. (Lafley, 2002)

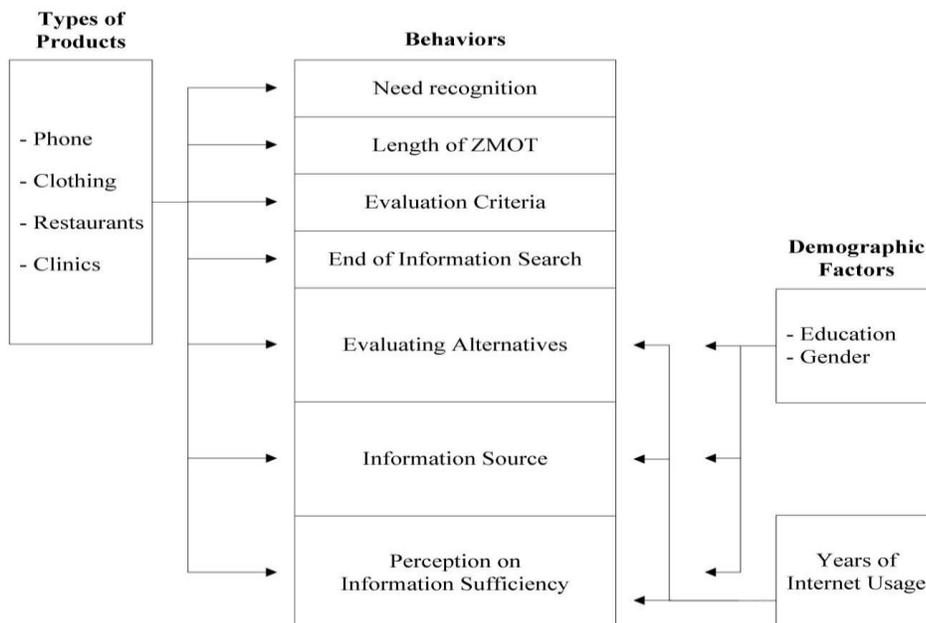
Second Moment of Truth or SMOT (pronounced "Ess Mot") is when consumers use a product and it delivers a delightful and memorable experience - or not, and then decides whether to buy it again. (Lafley, 2002)

Third Moment of Truth or TMOT (pronounced "Tee Mot") is a powerful inflection point where the product experience catalyzes an emotion, curiosity, passion, or even anger to talk about the brand. This is the moment when consumers come online and write about it, as blogs, reviews, or a simple Facebook status, and such actions of TMOT finally become the ZMOT of the next buyer. (Pete Blackshaw, 2006)

Framework for Analysis

Frame work for analysis in this research can be presented as follows:

Figure 1. Framework for Analysis



Results and Findings

Relationship between Type of Products and Need Recognition

Survey questionnaire was designed to include both internal stimuli and external stimuli, in asking about need recognition. Most respondents answered that to buy mobile phones and clothing, or to choose a restaurant, they got their first need-recognition **online**, due to an **external stimuli**. Only in choosing a hospital/clinic, most answered that their need recognition was **internal stimuli**, and need recognition occurred **offline**.

Table 1. Types of Product and Need Recognition

No.	Need Recognition occurred	Average Mean Score	
		Online	Offline
1	to buy a mobile phone	3.52	3.49
2	to buy some of clothing	3.54	2.94
3	to choose a restaurant	3.52	3.27
4	to choose a clinic/hospital	3.06	3.43

Source: Survey data, 2016

Relationship between Type of Products and Length of ZMOT

This research has discovered that, for Myanmar consumers (as of 2016), length of ZMOT (period of information search and evaluation) before buying a phone was 1 week long, for restaurants and clinic/hospitals is 1 day, and for clothing only 1 hour only.

Table 2. Type of Products and Length of ZMOT

No.	Time Frame	Phone (%)	Clothing (%)	Restaurant (%)	Clinics (%)
1	A moment before purchase	3	28	20	21
2	within 1 hour	1	49	15	8
3	1-2 hours before	0	0	3	0
4	3-4 hours before	0	1	0	0
5	5-8 hours before	0	0	0	0
6	9-12 hours before	0	0	0	0
7	1 day before	12	1	20	34
8	2-3 days before	14	9	1	8
9	4-6 days before	2	0	0	0
10	1 week before	35	8	1	5
11	2 weeks before	3	1	0	1
12	3 weeks before	0	0	0	0
13	A month before	13	0	5	5
14	2-3 months before	12	0	0	6
15	4-6 months before	1	0	0	0
16	7-12 months before	1	0	0	0
17	more than a year before	1	0	0	1
18	NOT sure about searching this information online	2	1	33	12
	Total	100	100	100	100

Source: Survey data, 2016

Relationship between Type of Products and Information Sources

From personal sources of information, this survey found out that respondents got most information offline for purchase of phones, clothing, and restaurants. For clinics/hospitals,

people prefer to get information from online. From non-personal information sources, respondents found more information online for phones, clothing, and restaurants, however they got more information offline for clinics/hospitals.

Table 3. Type of Products and Information Sources

Information Source	Mean Score			
	Products		Services	
	Phone	Clothing	Restaurant	Clinics
Personal Sources				
Online	2.72	3.02	3.06	3.50
Offline	3.52	3.29	3.24	3.26
Non-Personal Sources				
Online	3.54	3.33	3.28	3.19
Offline	2.65	2.97	2.68	3.20

Source: Survey data, 2016

Relationship between Type of Products and Evaluation Criteria

When buying a mobile phone, the statistics in this table revealed that respondents had higher interest in searching for product specification, rather than information on price, place, or promotion. When buying clothing, respondents cared more on price and place where they can purchase clothing, while giving less attention on product and promotion. In choosing a restaurant to dine out, respondents gave high priority to get information on product and place. In picking a clinic/hospital to go to, respondents give highest attention on location.

Table 4. Type of Products and Evaluation Criteria

	Purchased item	Question by Marketing Mix	Information Searched online to Evaluate
1	Mobile Phone	Product	4.40
		Price	4.55
		Place	3.57
		Promotion	3.47
2	Clothing	Product	3.90
		Price	4.46
		Place	4.18
		Promotion	4.03
3	Restaurant	Product	4.01
		Price	4.01
		Place	4.35
		Promotion	3.78
4	Clinic/	Product	3.20
		Price	3.80
		Place	3.99
		Promotion	3.42

Source: Survey data, 2016

Relationship between Types of Product and Perception on Information Sufficiency

The respondents' data revealed that a slightly larger majority found sufficient information only about phones. For all 3 other products/services, respondents felt that they did not find enough information online. With this finding, it can be interpreted that people could find sufficient information online for imported goods like mobile phones. But for all other products and services, people either have difficulty searching online, or it is the businesses who do not publish enough information online.

Table 5. Types of Product and Perception on Information Sufficiency

Type	Information found online was sufficient..	Mean Score
Products	to buy a mobile-phone	3.44
	to buy fashion clothing	2.58
Services	to choose to a restaurant	2.75
	to choose to a hospital	2.39

Source: Survey data, 2016

Relationship between Type of Products and Purchase Decision

Purchase decisions are often made at the point of time, when all the information search and evaluation ends. It should be noted that this table below did not mention that the respondents purchase things online. The table described when the purchase decisions were made, or when the evaluation process ended.

Respondents were asked when a purchase decision was made. Majority answered that they made purchase decision online, before buying a phone. For clothing and choosing clinics/hospitals, they decided offline. It was notable that most people replied that they did not choose or even evaluate restaurants from online or offline resources. There just choose loyal brands that they already liked or chosen before.

Table 6. Type of Products and Purchase Decision

The Point of Time that Purchase Decision was Made	Mean Scores			
	Products		Services	
	Phone	Clothing	Restaurant	Clinics
Online: After comparing many alternatives online	4.40	3.71	3.17	2.76
Offline: After seeing TV commercials or print ads.	3.36	2.83	2.50	2.48
Offline: After evaluating at vendor's shop/place	3.69	3.79	3.20	3.26
Neither online nor offline: No need to choose or evaluate, due to a loyal brand	3.23	3.58	3.64	3.24

Source: Survey data, 2016

Postpurchase Behavior Causing Next ZMOT

Postpurchase actions took a very important role, in the era of Web2.0. Words of mouth carrying witnessed information and post consumer experiences about products and services are not local anymore. They went global as in the form of worldwide words of mouth. When those worldwide words of mouth spreads, such information became impersonal online information sources for another consumer’s ZMOT in some other part of the world.

Some call this the Third Moment of Truth (TMOT), to cover the postpurchase actions following the experience stage, Second Moment of Truth (SMOT).

This research has discovered that a bigger majority of respondents tend to share their consumer experiences more offline. As seen in table above, 47 respondents (34%) mentioned that they always told friends or family, about their likes and dislikes. 57 respondents (41%) of this survey used to share their likes and dislikes about products and services online.

Table 7. Postpurchase Behavior Causing Next ZMOT

No.	Postpurchase Action	Always	Very Often	Sometimes	Rarely	Never	Total	Mean Score
1	Online: Wrote about it on Facebook, chat, or a social media	11	30	57	22	18	138	2.96
2	Offline: Told friends or family	47	29	45	14	3	138	3.75

Source: survey data, 2016

It is a widely known fact that many Myanmar like most Asians are introverts. With this mean value of 2.96, it reflected that only a minority of survey respondents post their experiences online. Most are reluctant to express their views on products or services openly on the internet. As per survey data, respondents’ input were found to be weak in feeding product-review information to other persons’ ZMOT to help get sufficient information online.

Type of Products, Information Sources, and Gender

As this researched studied on scenarios on buying 2 products and 2 services, slight gender-dependent behaviors were found.

Table 8. Type of Products, Information Sources, and Gender

Gender	Particulars	Online	Offline
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		Personal	Non-personal	Average Mean Score	Personal	Non-personal	Average Mean Score
Male	Phone	2.75	3.58	3.17	3.46	2.60	3.03
	Clothing	2.96	3.21	3.09	3.17	2.89	3.03
	Restaurant	3.08	3.31	3.20	3.27	2.70	2.99
	Clinic/Hospital	3.51	3.21	3.36	3.27	3.25	3.26
Female	Phone	2.68	3.48	3.08	3.61	2.73	3.17
	Clothing	3.13	3.54	3.34	3.52	3.11	3.32
	Restaurant	3.01	3.22	3.12	3.21	2.65	2.93
	Clinic/Hospital	3.48	3.14	3.31	3.25	3.12	3.19

Source: Survey data, 2016

Male respondent group relied more on online data. But both male and female respondents answered that personal sources gave them more information about clinics. ZMOT behavior is found to be more dominant in the male respondents group.

Type of Products, Information Sources, and Education

People’s perception and attitude differs, depending deeply on their knowledge and educational background.

Table 9. Type of Products, Information Sources, and Education

Education Level	Product/Service	Online		Offline	
		Personal	Non-personal	Personal	Non-personal
Undergraduate	Phone	2.67	3.47	3.28	2.55
	Clothing	2.72	3.02	3.17	2.60
	Restaurant	2.67	2.57	2.33	2.20
	Clinic/Hospital	3.67	3.10	3.33	3.00
Graduate	Phone	2.78	3.59	3.49	2.67
	Clothing	2.93	3.23	3.22	2.89
	Restaurant	3.08	3.41	3.29	2.75
	Clinic/Hospital	3.49	3.24	3.31	3.33
Postgraduate	Phone	2.66	3.49	3.58	2.63
	Clothing	3.17	3.49	3.40	3.10
	Restaurant	3.07	3.18	3.28	2.64
	Clinic/Hospital	3.49	3.12	3.20	3.05

Source: Survey data, 2016

In this section of the survey, more respondents in all 3 levels of educational status, trusted and sought information from online sources. Personal recommendations were found to be vital for health care industry. This research has found out that, as of 2016, minority of people obtained information from non-personal offline sources (such as newspapers, journals, tv or radio). As seen in the table above, most of the highlighted areas are on the left side (online side) of the table. Majority agreed that they found most information online. ZMOT behavior was found to be at the beginning of dominance, in this educational aspect too.

Type of Products, Information Sources, and Years of Internet Use

More tech savvy people are found to skillful at searching the right information at the right places. This significantly influenced on the next 3 more steps of the consumer buying process. Most people in the respondents group with less internet-experience believed that they can find more information ‘offline’, especially from personal sources. However, the more people get used to the internet tools, more respondents in these groups find more information online. Highest numbers in each row were highlighted to be noted.

ZMOT behavior was found among consumers with more internet usage experience as of this survey period.

Table 10 Type of Products, Information Sources, and Years of Internet Use

Years of Internet Use	Products/ Services	Online		Offline	
		Personal	Non-personal	Personal	Non-personal
0 to 3 Years	Phone	2.75	3.43	3.86	2.76
	Clothing	2.57	3.38	3.52	2.72
	Restaurant	2.29	3.54	3.47	2.64
	Clinic/Hospital	3.14	3.66	3.48	2.59
4 to 6 Years	Phone	2.78	3.13	3.33	2.98
	Clothing	2.94	3.31	3.17	2.87
	Restaurant	3.09	3.43	3.33	3.01
	Clinic/Hospital	3.06	3.31	3.33	2.98
7 to 9 Years	Phone	3.31	3.28	3.58	2.75
	Clothing	3.03	3.21	3.10	2.63
	Restaurant	3.09	3.37	3.26	2.73
	Clinic/Hospital	2.98	3.24	3.23	2.65
10 Years or More	Phone	3.39	2.95	3.00	2.88
	Clothing	3.56	3.09	3.24	3.02
	Restaurant	3.40	3.09	3.11	3.19
	Clinic/Hospital	3.56	3.36	3.46	3.38

Source: Survey data, 2016

Type of Products, Information Sufficiency, and Gender

Amount of information found online was researched through all respondents, whether they are satisfied with what they found, depending on gender.

Table 11. Type of Products, Information Sufficiency, and Gender

Gender / Item	Completely	Quite a bit	A little	None
Male				
Phone	65%	33%	2%	0%
Clothing	3%	53%	35%	8%
Restaurant	10%	55%	24%	11%
Clinic/Hospital	8%	39%	41%	13%
Female				
Phone	26%	60%	14%	0%
Clothing	12%	48%	36%	4%
Restaurant	18%	64%	14%	4%
Clinic/Hospital	0%	42%	50%	8%

Source: Survey data, 2016

The difference between gender and information found was not so significant between 2 gender groups. The amount of information found depended by product. For mobile phones, information was easiest to find. For clothing and restaurants, information found was mediocre. But information on clinics/hospitals were most difficult to find. The survey data showed that when buying a phone, there were no one who stated that they found no information online. Most admitted that they searched product information online and found quite a bit of information online. However consumers found less information about clinics/hospitals. ZMOT behavior was found in larger number of people, in aspect of information accessibility.

Type of Products, Information Sufficiency and Education

Since the internet tools, browsers, and computers are dominated by English language, people with language barriers could have difficulty to get information too.

Table 12. Type of Products, Information Sufficiency and Education

	Completely	Quite a bit	A little	None
Undergraduate				
Phone	47%	47%	5%	0%
Clothing	16%	37%	37%	11%
Restaurant	16%	47%	11%	26%
Clinic/Hospital	5%	47%	37%	11%
Graduate				
Phone	62%	31%	7%	0%
Clothing	7%	58%	30%	5%
Restaurant	14%	53%	26%	8%
Clinic/Hospital	8%	35%	45%	12%
Postgraduate				
Phone	33%	60%	7%	0%

Clothing	2%	47%	44%	7%
Restaurant	11%	71%	16%	2%
Clinic/Hospital	0%	44%	47%	9%

Source: Survey data, 2016

As per survey data, the information found did not have an obvious relationship to the educational background of respondents. There was more relationship to the nature of each product. As seen in the table above, more people agreed that they found only a little information on clinics and hospitals. None of the respondents answered that they did not find information about phones.

ZMOT behavior existed among all 3 educational levels of respondents. Larger group of respondents answered that they could find information online.

Type of Products, Information Sufficiency, and Internet Usage

Internet is a tool of the knowledge-based society. Information found depends much on the internet skills and experiences of users. The more someone know how to use it, the more he or she can utilize it. Internet users groups who have used internet over 7 years knew how to find required information, and they were satisfied with the amount of information they can find. Most received complete information to evaluate mobile phones, and many got quite a bit. It is to be noted that none of the respondents answered that there were none who found no information online to buy a mobile phone.

Table 13. Type of Products, Information Sufficiency, and Internet Usage

		Completely	Quite a bit	A little	None
Products	Phone				
	less than 3 years	50%	50%	0%	0%
	between 4-6 years	55%	38%	7%	0%
	between 7-9 years	44%	47%	9%	0%
	10 years or more	54%	41%	6%	0%
	Total	51%	43%	7%	0%
	Clothing				
	less than 3 years	8%	92%	0%	0%
	between 4-6 years	7%	59%	34%	0%
	between 7-9 years	2%	37%	51%	9%
10 years or more	9%	50%	31%	9%	
Total	7%	51%	36%	7%	
Services	Restaurant				
	Less than 3 years	0%	58%	25%	17%
	between 4-6 years	34%	48%	14%	3%

between 7-9 years	2%	70%	19%	9%
10 years or more	13%	54%	24%	9%
Total	13%	58%	20%	9%
Clinic/Hospital				
less than 3 years	8%	42%	42%	8%
between 4-6 years	7%	48%	41%	3%
between 7-9 years	0%	44%	44%	12%
10 years or more	7%	31%	46%	15%
Total	5%	40%	44%	11%

Source: Survey data, 2016

This table showed statistics that the same group of respondents, who found complete information for mobile phones, had less information for choosing restaurants. The problem seemed to be on the service providers' side, where restaurant owners did not publish necessary information online, for people to find.

Within the clinic/hospital related data, it was also found that there were not sufficient information online about clinic/hospitals in Yangon. There could also be reasons that the information was not easy to find. Some possible reasons are that the clinics/hospitals in Yangon do not have own web sites. Probably web sites were not search-engine optimized too. Or they did not publish necessary information on the web. ZMOT behavior dominated more in the people with longer internet usage experience.

Type of Products, Evaluating Alternatives, and Gender

Evaluating things online was an interesting corner of this research. 7 questions were asked for each product, and first 4 questions were on product information, 3 other questions were on price, place, and promotion. All 7 questions covered all 4 P's marketing mix (product, price, place, promotion).

Table 14. Type of Products, Evaluating Alternatives, and Gender

	Information Searched online to Evaluate		Mean Score	
			Male	Female
Products	Phone			
	phone screen size	product	4.26	4.30
	camera quality		4.06	4.31
	memory space		4.62	4.41
	brand name		4.74	4.51
	price	price	4.56	4.55
	available shop location	place	3.54	3.59
	discounts and promotions	promotion	3.40	3.51
	Clothing			
available colors	product	4.38	4.40	

	available designs		4.48	4.48
	country of origin		3.38	3.60
	delivery service is available or not		3.10	3.25
	price range	price	4.44	4.48
	available place to buy	place	4.18	4.18
	bargains and discounts	promotion	3.90	4.10
Services	Restaurant			
	available food types and drinks	product	4.48	4.42
	opening hours		4.06	3.89
	looking at restaurant photos		3.68	3.60
	restaurant name and reputation		4.22	3.92
	price range	price	4.12	3.94
	location of restaurant	place	4.40	4.32
	discounts and promotions	promotion	3.84	3.74
	Clinic/Hospital			
	variety of specialist doctors	product	3.54	3.60
	opening hours		2.72	2.77
	by looking at clinic/hospital photos		2.50	2.43
	reputation of clinic/hospital		3.98	4.00
	price range	price	3.74	3.84
	location of clinic/hospital	place	4.00	3.98
advertisements seen	promotion	3.34	3.47	

Source: Survey data, 2016

This research work has brought the results that male respondents cared about ‘brand’ most, in buying a phone. When buying cloths, they cared more on design, instead of colors. For choosing restaurants, their first priority was to check on the available food. But probably being the head of a family or probably being car drivers, they care most on location of clinic/hospitals, in getting medical services.

The female gender group of this research mentioned that price was the number one criteria in choosing a phone to buy. In choosing clothing to buy, price and designs were considered equally important. Their perception on food, was same as male respondents. To choose a clinic or a hospital, they cared about reputation of a clinic hospital. It was interesting that both male and female respondents do not care much on prices for food. Price was not the highest chosen criteria for most respondents in this group. Instead, they gave more attention on availability and location of the restaurants for them to dine out. Another striking point to note is that for ‘services’, people have more concern over location, while they have low concern over location on products.

Type of Products, Evaluating Alternatives, and Education

Perception of consumers varies much depending on the education and knowledge they had. There would be pros and cons of popular evaluation measures. There were the some relationships between measures of skills versus measures of attitudes and behavior.

One of the greatest wonders of the internet is the use of search-engines. And those, of course, are billions of web pages, in the form of non-personal information sources. An estimated study reported that the size of the internet is as large as 45 billion web pages as of 2016. Researchers had to keep in mind that vast amount of non-personal information would be many times larger than any personal sources possible.

To an undergraduate respondent (See undergraduate column in the table above), the most important criteria was the price, in buying a mobile phone. Memory space available in the mobile phone is the second top criteria, followed by screen size and brand name. But in the same respondent group, availability of designs was most important for him/her in clothing buyers. To them, location was most important in choosing restaurants and clinics/hospitals.

For graduate respondents of this survey, they considered that brand name was the most important criteria. When choosing restaurants, ‘available food’ was their top issue to consider. But for health issues, in choosing the right clinic/hospital, they cared for reputation of the hospital.

For postgraduate respondents, price was the second priority to them, and ‘brand name’ is the top reason in choosing the mobile phone to buy. For them price and designs of clothing are top criteria to choose before buying. In choosing restaurants, available food, for example, whether it was Japanese food, Myanmar food, or western food, were top priorities in choosing the right place to dine out.

Table 15. Type of Products, Evaluating Alternatives, and Education

	Information Searched online to Evaluate	4P	Mean Score		
			Under-graduate	Graduate	Post-graduate
Products	Phone				
	phone screen size	Product	4.33	4.30	4.26
	camera quality		4.00	4.20	4.26
	memory space		4.50	4.50	4.47
	brand name		4.33	4.57	4.66
	price	Price	4.67	4.54	4.55
	available shop location	Place	3.83	3.61	3.50
	discounts and promotions	Promotion	3.83	3.57	3.31
	Clothing				
	available colors	Product	4.17	4.45	4.34
	available designs		4.67	4.50	4.43
	country of origin		3.17	3.49	3.60
	delivery service is available or not		3.00	3.11	3.33

	price range	Price	4.50	4.49	4.43
	available place to buy	Place	4.33	4.15	4.21
	bargains and discounts	Promotion	3.33	3.93	4.22
Services	Restaurant				
	available food types and drinks	Product	4.33	4.36	4.55
	opening hours		3.67	4.04	3.86
	looking at restaurant photos		3.83	3.74	3.47
	restaurant name and reputation		3.67	3.99	4.12
	price range	Price	4.17	4.12	3.84
	location of restaurant	Place	4.67	4.31	4.36
	discounts and promotions	Promotion	4.00	3.65	3.91
	Clinic/Hospital				
	variety of specialist doctors	Product	3.33	3.62	3.55
	opening hours		2.33	2.85	2.67
	by looking at hospital photos		2.33	2.51	2.40
	reputation of clinic/hospital		3.83	4.04	3.95
	price range	Price	3.83	3.77	3.84
	location of clinic/hospital	Place	4.00	3.96	4.02
	advertisements seen	Promotion	3.83	3.35	3.47

Source: Survey data, 2016

Type of Products, Evaluating Alternatives, and Years of Internet Use

Survey respondents' data were again split into 4 levels of internet usage experience. For your information, those with the highest mean scores in each column block by user type were highlighted.

Even when the survey data was split into 4 levels of internet usage experience or e-literacy levels, priorities of most respondents seemed to be somewhat indifferent. An assessment can be made that there is no significant relationship in evaluating behaviors and the internet skills. The likes and dislikes of the respondents seemed to be almost the same in all 4 levels of internet usage experience. Evaluating criteria does not seem to have strong relationship with the either high or low level of internet usage experience.

Table 16. Type of Products, Evaluating Alternatives, and Years of Internet Use

Information Searched online to Evaluate	Mean Score by Years of Internet Use			
	0 to 3 Yr	4 to 6 Yr	7 to 9 Yr	10 Yr++
Phone				
phone screen size	4.42	4.17	4.16	4.41
camera quality	4.42	4.21	4.12	4.26
memory space	4.58	4.55	4.51	4.41

brand name	4.50	4.62	4.67	4.54
price	4.58	4.69	4.47	4.54
available shop location	3.58	3.76	3.44	3.57
discounts and promotions	3.75	3.34	3.42	3.52
Clothing				
available colors	4.58	4.45	4.30	4.39
available designs	4.42	4.62	4.44	4.44
country of origin	3.67	3.41	3.60	3.48
delivery service is available or not	2.92	3.45	3.28	3.06
price range	4.33	4.59	4.44	4.44
available place to buy	4.17	4.38	4.09	4.15
bargains and discounts	4.08	3.93	4.21	3.93
Restaurant				
available food types and drinks	4.08	4.62	4.58	4.31
opening hours	4.17	3.97	3.95	3.89
looking at restaurant photos	3.75	3.62	3.60	3.63
restaurant name and reputation	3.91	4.21	4.12	3.89
price range	4.42	3.72	3.93	4.13
location of restaurant	4.08	4.24	4.37	4.44
discounts and promotions	3.75	4.10	3.77	3.61
Clinic/hospital				
variety of specialist doctors	3.58	3.48	3.40	3.78
opening hours	2.75	2.62	2.58	2.96
by looking at hospital photos	2.58	2.31	2.30	2.63
reputation of clinic/hospital	4.17	3.83	3.91	4.11
price range	3.83	3.83	3.79	3.80
location of clinic/hospital	4.00	3.83	4.02	4.04
advertisements seen	3.50	3.52	3.53	3.26

Source: Survey data, 201

Conclusion

This research encourages to all managers and marketers to give serious attention to the Zero Moment of Truth, the period of information search and evaluation for each product or service, in planning credible marketing strategies. Doing promotion outside of ZMOT risks being a waste.

This research finds that different periods of ZMOT exist for every type of product or services, even in Myanmar, once consumers started using internet. ZMOT of the same product in other countries and in Myanmar could not be the same, due to different cultures, lifestyles, and behavior patterns. For marketers, to maximize the effectiveness of running digital advertisement campaigns, it would be best if marketers research on ZMOT of each product they sell.

For Myanmar, Facebook and Google are the top online media to run online advertising campaigns. Currently only those products and services targeting to people between 20 to 59 years of age would be effective to promote online. Products and services targeting to other age groups will not be quite effective to advertise online for now. Myanmar people are found

to be searching information online. It is time to run online advertising campaigns to advertise all kinds of businesses targeting to consumers in these age groups.

As next steps to the businesses who already had web sites should continue to do search engine optimization (SEO), search engine marketing (SEM), pay per click (PPC) campaigns, social media advertising, email or newsletter marketing, affiliate marketing, banner and rich-media advertising. According to the survey data, people were searching online. However, many were not getting sufficient information to evaluate with their judging criteria.

Phone-related businesses (such as mobile phone handset brands, telecommunication companies), should go further to continue publishing useful information online. For customers, brands and prices were top evaluation criteria. Therefore, their advertising campaigns should emphasize on such criteria.

Clothing manufacturers in Myanmar need informative web sites. People are searching product information online. But they were not getting enough information. They would like to see available designs most. Price was also their top evaluation criteria to emphasize in promotions. It is highly recommended for these businesses to publish more useful information online, by building informative web sites.

Restaurant managers has to come up with informative restaurant web sites, displaying showcase of available food and drinks. People wanted to see these. But information online were not sufficient. The survey data could tell that price was not their highest concern for restaurants. Location also is the most wanted information for consumers. Location maps and directions are essential to be added to web sites and Facebook pages. Information sufficiency was low for restaurants. This would be an opened opportunity window, to develop restaurant review web sites. Clinic and hospitals seriously need to publish sufficient information online. People were not getting enough information online, although they searched. Opportunity window would be for those who can give such information earlier than others, and turn them into customers. Consumers are most concerned with the reputation of hospitals and prices.

In conclusion, the results of this research told us all Myanmar marketers that advertising online has come to the readiness stage, as more and more people are searching for information online than offline. It also could be a reminder to all managers in various fields, that this is a time of digital Darwinism — an era where society and technology evolve faster than businesses can follow and adapt.

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WELFARE SERVICES OF MIGRANT WORKERS ASSOCIATION IN MYANMAR-THAI BORDER AREA (CASE STUDY OF YAUNG CHI OO WORKERS ASSOCIATIONS)

Zin Lin Htwe⁷

ABSTRACT

Labour unions bring lot prosperity to society and it also promotes the equality and justice in the world. Particularly, labour unions play a very important role in the developing countries where most of the people migrate to more developed economies. The author studies the organizations which are supporting Myanmar migrant workers to fully achieve labor rights and also to protect their rights. Based on the ILO instruments for migrant workers, Instruments developed by the United Nations, Instruments developed by the WTO and Role of Trade Union, these organizations promote the well being of Myanmar Workers in Thailand. It is also studied the functions and roles of labour unions which gives a lot of

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advantages not only to workers also to their families. Labour organization movements strengthen social policy, labour law and public policy not only in migrant sending countries but also in host countries. The study also focuses on challenges and opportunities of Myanmar Migrant workers. And it also studies the immigration policy of Thailand on Myanmar workers. The research particularly focuses on the organization named Yaung Chi Oo Workers Association, out of the all organizations which are helping migrant workers. Based on Thai Labour laws, Yaung Chi Oo Workers Association is protecting Myanmar workers' right and it has solved more than 200 cases concerned with migrant workers exploitation.

Key Words: Labour Unions, Migrant Workers, Welfare,

1. Introduction

International migration is a global phenomenon that is growing in scope, complexity and impact. Migration is both a cause and effect of broader development processes and an intrinsic feature of our ever globalizing world. Migration has steadily risen on the agenda of the international community.

Globally, there were 244 million international migrants in 2015. Of these, nearly 59 percent lived in the developed regions, while the developing region hosted 41 percent of the world's total in 2013. Between 1990- 2013, the number of international migrants worldwide rose by over 77 million or by 50 percent. Much of this growth occurred between 2000 and 2010. During this period, some 4.6 million migrants were added annually, compared to an average of 2 million per annually, compared to an average of 2 million per annum during the period 1990-2000 and 3.6 million per annum during the period 2010-2013. Between 2000 and 2015, Asia added more international migrants than any other than major region, or a total of 26 million additional migrants.

International labour migration can occur for economic and noneconomic reasons. Neoclassical economic theory also stated that the main reason for labor migration is wage differences between two geographic locations and availability of job opportunities. In case of Myanmar, most of Myanmar workers move to the neighbouring countries like Thailand.

Presently, an estimated 3.5 million migrants in either regular or irregular status are in Thailand: roughly 3 million of these migrants are in the labour market. According to the Thai Ministry of Labour's statistics on registered migrant workers, 76 per cent of the migrant workforce is from Myanmar. Applying this percentage to the estimated number of registered and unregistered migrant workers, around 2.3 million Myanmar migrants may be working in Thailand in 2013. They also work in manufacturing, agriculture, fisheries, construction, food and drink, mining coal, and domestic works. They engage in limited factory or farm-related industries and commercial professions know as 3-D work (dangerous, difficult, and dirty) in Thailand.

As being the semi-skilled and unskilled migrants, they have to join as mostly factory workers or commercial farming laborers near the bottom of the classifications. Since some of the migrants are illegal and even though legal migrants, they treated discriminately and unevenly. Thus many challenges and problems among migrants are occurs in Thai. To cope these problems (such as less payment of minimum wages, bad working and living condition, discrimination and lack of labor rights and labor law under the Thai labor law) and to assist them for improving safety standards, achieving higher pay and benefits such as health care and retirement, increasing the number of employees an employer assigns to complete the work, and better working conditions, many organizations and unions are developed to solve the problems and issues related the international migrations between the neighbouring countries.

Regarding the Labor union, Dr. Henk Tomas⁸ highlighted that “The labour movement has a major role to play in sustainable development and participatory democracy. Trade unions as a large organized group in civil society can bring a unique contribution to the development community. They are directly involved with economic systems of production and distribution, they can influence the course and content of employment and social and economic policies, they are representative and accountable, they have considerable experience in organizing the more vulnerable sections of society and they have the experience and standing required to access national legal systems and public facilities. They can contribute through their long-standing relationships with such development institutions as: consumer co-operatives, housing society, heal funds and social security organizations.”

In this study, it is mainly highlighted the role of labor Unions (formerly Trade Unions) which have historically been a major force in humanizing and democratizing the economies of nations. Unions promote higher levels of economic equality and social rights for all citizens. Even the notoriously conservative World Bank agreed that unions are good for the economy. In its 2003 report entitled, Unions and Collective Bargaining Economic Effects in a Global Environment, which was based on more than a thousand studies of the effects of unions on the performance of national economies, the World Bank found that high rates of unionization lead to lower inequality of earnings, lower unemployment and inflation, higher productivity and speedier adjustments to economic shocks.

However, what is worth paying attention to is that they are not Thai and did not get like as the right of Thai workers. In that case, their social statuses are lower than the last social class because they cannot get protection from the Thai government. Usually, Myanmar migrant workers have one day off every week but they often stay where they work or ask for more work from employers to earn more money. Mostly factory workers have to work 12 hours

⁸ Professor of Labor Studied at the Institute of Social Studies, publish -ILO ,1999

per day and sometime have to work 20 hours per day. And then if the worker is injured his/her employer would send him/her to hospital. He/she would not get compensation afterwards and might even lose his/her job forever due to lack of efficient contract.

In this context, Yaung Chi Oo Workers Association concentrates on activities that encourage workers to collaborate with each other to improve their living situations and working conditions. YCOWA working in collaboration with Lawyer Council of Thailand, MAP Foundation, other Thai NGOs to provide legal assistance to workers in pursuing justice for exploitative working conditions, which include compensation for workplace injuries, unpaid wages and other forms of abuse. In 2003, YCOWA assisted 43 workers in winning legal battle against their employer for paying less than minimum wage, in the first successful legal case of Myanmar migrant workers in Thailand. From 2001-2015, YCOWA assisted 2754 workers in 207 causes, winning a total of 23,026,907 Bath in remuneration Thai Legal process. In 2004, YCOWA was honored with 8th Tji Hak-Soon Justice & Peace Award of the Republic of Korea for its work in defending victims from unjust laws and human rights violations amidst difficult situations in the field.

This thesis aims to highlight on how the trade unions play a vital role in international labor migration. Similarly, if the trade unions in developing countries are strong enough to provide the framework to workers, there will definitely be justice and welfare within the workers, it will be learnt for the benefit of public administration.

The objectives of this study are: To explore the rule and regulations of migrant workers and function of Organizations providing Welfare Services for the Myanmar Migrant workers in Myanmar-Thai border and To examine how Yaung Chi Oo Workers Association can protect to Myanmar migrant workers by legal assistance. This study uses the descriptive method as well as the qualitative methods by conducting Key Informal Interview (KII) with person who winning legal cause of Myanmar migrant workers in Thailand. The secondary data (relevant data and information) are collected from library research and from Department of Employment, Ministry of Labour in Thailand, International Migration Report UNDESA, World Migration report IOM and ILO International Labour Standards on Migrant Workers and from internet websites.

This study focuses on the Myanmar migrant workers working in Mae Sod, Tak province, Thailand. The period covered in this study is from 2002 to 2015. The study is confined to the mainly activities of YCOWA assisted workers, successful legal case of Myanmar migrant workers in Thailand.

2. Literature Review

International labour migration can occur for economic and noneconomic reasons. When the decision to migrate is economic, it can be evaluated in terms of costs and benefits just as any other investment in human and physical capital. International migration reduces total output and increases real wages in the nation of emigration while it increases total output and reduces real wages in the nation of immigration. These changes are accompanied by a net increase in world output. The migration of highly skilled and trained people confers special benefits on the nation of immigration and imposes serious burdens, in the form of sunk and replacement costs, on the nation of emigration. This problem is referred to as the brain drain⁹.

Migration theories can be classified according to the level they focus on. *Micro-level* theories focus on individual migration decisions, whereas macro-level theories look at aggregate migration trends and explain these trends with *macro-level* explanations. The *meso-level* is in between the micro and macro level, e.g. on the household or community level and can explain both causes and perpetuation of migration. Table (1) gives an overview of the migration theories in terms of their classification as a cause or perpetuation of migration. As it will become clear later on, some theories fit into several categories.

Macro-theories of migration¹⁰: The neoclassical macro migration theories explain migration as part of economic development. Internal migration occurs as a result of geographical differences in the supply and demand of labour, mostly between the rural traditional agricultural sector and the urban modern manufacturing sector. Rural workers are attracted by the positive wage differential and migrate to the urban sector, i.e. they are pulled to migrate. In these models migration occurs until wage equalisation has occurred.

Table (1) Theories of Migration Defined by Level of Analysis

Micro-level	Meso-level	Macro-level	
<p><i>Migration cause:</i> Individual values/ desires/ expectancies e.g. improving survival, wealth etc.</p>	<p><i>Migration cause/perpetuation:</i> Collectives/ social networks e.g. social ties</p>	<p><i>Migration cause/perpetuation:</i> Macro-level opportunity structure e.g. economic structure (income and employment opportunities differentials)</p>	Source: Massey et al. (1993) and own elaboration
<p><i>Main theories:</i> - Lee's push/ pull factors - Neoclassical micromigration theory - Behavioural models - Theory of social systems</p>	<p><i>Main theories:</i> - Social capital theory - Institutional theory - Network theory - Cumulative causation - New Economics of Labour Migration</p>	<p><i>Main theories:</i> - Neoclassical macromigration theory - Migration as a system - Dual labour market theory - World systems theory - Mobility Transition</p>	

⁹ Salvatore. Dominick, (2013) “*International Economics*”

¹⁰ Massey et al. (1993)

Micro-theories of migration¹¹: Lee (1966) was the first to formulate migration in a push-pull framework on an individual level, looking at both the supply and demand side of migration. Positive and negative factors at the origin and destination push and pull migrants towards (non) migration, hindered by intervening factors, e.g. migration laws and affected by personal factors, e.g. how the migrant perceives the factors. He makes a number of predictions, for example that greater diversity among people leads to more migration and for this reason there are high rates of migration within the United States. This theory is barely a theory, it is more a grouping of factors affecting migration, without considering the exact causal mechanisms.

Perpetuation of migration: As Massey (1990) argues the factors that influence migration to start could be very different from the conditions that make migration continue, i.e. perpetuate. After an initial phase of pioneer migration, migration becomes more common in the community, with more and more people imitating current migrants and being helped by them until migration becomes self-sustaining. There are different aspects of the perpetuation of migration, including social capital, social networks, migration institutions and cumulative and circular migration..

Thomas Faist, a sociologist, emphasizes the *meso-level of migration* (1997, 2000). By studying the meso-level, he links the rational individual migration decision models to the structural macro migration models. Social relations and social capital in households, neighborhoods, communities and more formal organisations help migrants in the migration decision and adaptation process, so they are both a resource and an integrating device. Different social relations imply different social capital and obligations and outcomes, for example exchange relationships (e.g. between migrant and migration-brokers) are based on weak social ties and usually do not imply solidarity or reciprocity between the parties involved.

Table (2) Theories of Migration Defined by Initiation or Perpetuation of Migration

<i>Initiation of migration</i>	<i>Perpetuation of migration</i>
- Neoclassical macro-migration theory	- Migration as a system
- Migration as a system	- World systems theory
- Dual labour market theory	- Social capital theory
- World systems theory	- Institutional theory
- Mobility Transition	- Network theory
- Lee's push/ pull factors	- Cumulative causation
- Neoclassical micro-migration theory	

¹¹ Massey et al. (1993)

- Behavioural models - Theory of Social systems - New Economics of Labour Migration	
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Source: Massey et al. (1993) and own elaboration

The term "**migrant worker**" has different official meanings and connotations in different parts of the world. The United Nations' definition is broad, including any people working outside of their home country. Some of these are called expatriates. Several countries have millions of foreign workers. Some have millions of illegal immigrants, most of them being workers also.

Welfare of Migrant Worker: Welfare means faring or doing well. It is a comprehensive term, and refers to the physical, mental, moral and emotional well-being of an individual. The term welfare is a relative concept, relative in time and space. It, therefore, varies from time to time, region to region and from country to country.

Labour welfare refers to taking care of the well-being of workers by employers, *trade unions and governmental and non-governmental agencies*¹². Recognizing the unique place of the worker in the society and doing good for him/her, retaining and motivating employees, minimizing social evils, and building up the local reputation of the company are the argument in favour of employee welfare.

Trade Union Involvement in Labour Welfare Activities: Trade unions have been a major force in the development of modern welfare states, and they still assume multiple roles in shaping and administering welfare states across the world. Historically, trade unions developed mutual insurance as part of associational self-help for lack of private or public insurance. At the same time, unions mobilized together with allied parties for the expansion of social rights. Increasingly, many of the protective functions that unions had experimented with were taken over by the state or at least regulated by public policy.

Trade Union or labor union is an organization of workers who have come together to achieve common goals such as protecting the integrity of its trade, improving safety standards, achieving higher pay and benefits such as health care and retirement, increasing the number of employees an employer assigns to complete the work, and better working conditions. The trade union, through its leadership, bargains with the employer on behalf of union members and negotiates labour contracts (collective bargaining) with employers. The most common purpose of these associations or unions is "maintaining or improving the conditions of their employment". -This may include the negotiation of wages, work rules, complaint procedures,

¹² <http://www.wikipedia.com>

rules governing hiring, firing and promotion of workers, benefits, workplace safety and policies.

Unions may organise a particular section of skilled workers a cross-section of workers from various trades or attempt to organize all workers within a particular industry (industrial unionism). The agreements negotiated by a union are binding on the rank and file members and the employer and in some cases on other non-member workers. Trade unions traditionally have a constitution which details the governance of their bargaining unit and also have governance at various levels of government depending on the industry that binds them legally to their negotiations and functioning.

Current Situation of Migrant Workers in Myanmar-Thai Border

Labor Migration is a trans-national process and neither sending nor receiving countries are in a position to resolve all the issues alone. Inter-State cooperation in managing labour migration is essential and involves three levels: bilateral, regional and multilateral.¹³

Primarily international migration flows from Myanmar are to other Asian countries including Thailand, Malaysia, Singapore, Bangladesh, Korea and Japan. Migration from Myanmar to countries in the Greater Mekong Sub region (GMS), particularly Thailand, accounts for the largest migration flows within the GMS. Within ASEAN, such large scale international out-migration is matched only by Indonesia and the Philippines. Myanmar is therefore a key country in addressing Asia's regional migration challenges. An IOM report (2009) suggests that up to 10% of Myanmar's population, estimated at 50 to 55 million people, is currently overseas. Reasons for migration from Myanmar include relative poverty, lack of jobs, inability to earn enough money to survive as well as political and/or ethnic conflict. Based on the research data of Mahidol Migration Center (2012), the movement of Myanmar migrant workers within Asia, can be seen as follow:

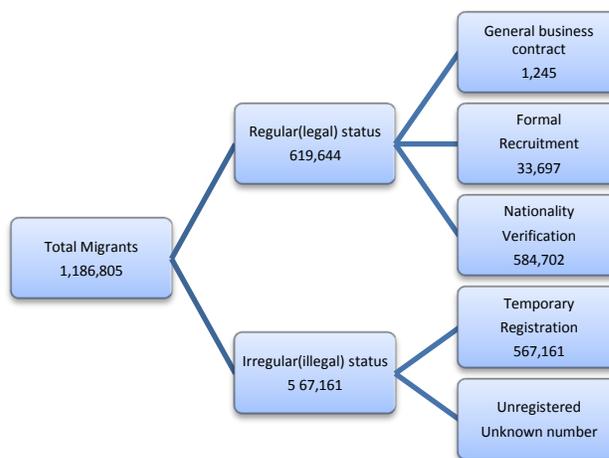
- Thailand (est. 2-4 million –approx. 1.45m officially registered as of Mar 2012)
- Malaysia (est. 100-500, 000 –approx. 250, 000 officially registered as of Mar 2012)
- Singapore (est. 100-200, 000)
- Bangladesh (est. 20, 000 -100, 000)
- Japan (est. 7, 000 -15, 000 - 8, 577officially registered as of Mar 2012)
- Korea (est. 4, 000 to 10, 000 –6, 309officially as of Mar 2012)
- China, India and Indonesia (no reliable estimates available)

In 2012, the total number of 1,186,805 Myanmar migrants in Thailand is registered in different categories according to immigration criteria, as regular (legal) migrants and irregular (illegal) migrants. The regular one comprises of Myanmar migrants who are

¹³ IOM: migration and labour

recruited, holding work permits and proper travelling documents. They are working in business or professional sectors, such as senior officials, managers, technicians, etc. The irregular group holds temporary work permits without proper travelling documents. However, there is another category of irregular migrants who have no documents at all (see Figure 1).

Figure (1) Myanmar Migrant by Categories



Source: Vungsiriphisal, adapted from statistic of Department of Employment, Minister of Labour, December 2011 and June 2012

After migrants in this group have completed verification of their nationality procedure, their status will change to regular (legal) one. Statistics from Ministry of Labour from 2010-June 2012 indicates the registered status of Myanmar migrant in four categories: 1) recruited unskilled migrant, 2) migrant completes nationality verification 3) migrant holds temporary work permit and 4) general skilled migrant. The number of recruited unskilled migrants from Myanmar increases from 4,641 in year 2010 to 8,160 in year 2011 and 33,697 in 2012. The registered number of regular migrant who complete national verification has increased while the number of irregular migrant holding temporary work permits has decreased.

They engage in limited factory or farm-related industries and commercial professions known as 3-D work (dangerous, difficult, and dirty) in Thailand, -- manufacturing, agriculture, fisheries, construction, mining, coal, and transportation. Of course, some skilled workers are granted non-immigration visas and work permits with sponsorship from an established Thai organization. 2) Nationally, in spite of working and living in Thailand, Myanmar migrant workers are not Thai nationals and get insufficient support from the Thai government. 3) In terms of relationships with employers, they are employed by private-owned enterprises, foreign enterprises in Thailand, or by individual workshop owners. The migrant workers are denied more professional selection and “bargaining” with employers as they are a surplus

labor resource. Myanmar migrant workers are mostly factory workers or commercial farming laborers near the bottom of the classifications. However, what is worth paying attention to is that they are not Thai and are not therefore entitled to the rights of Thai workers.

3. Case Study

Yaung Chi Oo Workers Association (YCOWA) was founded in July 1999 by Burmese student activists and migrant workers, with the goal of improving working and living conditions for the Myanmar migrant laborers in the Mae Sot area of Thailand. Since then, it has mainly focused on protecting worker rights, providing rights education, supporting health care and facilitating social activities. YCOWA concentrates on activities that encourage workers to collaborate with each other to improve their living situations and working conditions. Currently YCOWA has 700 active members from 10 different factories. YCOWA has also got involved in the facilitation of the network of Myanmar workers' groups in Mae Sot, Bangkok and the southern provinces of Thailand.

In addition, YCOWA works with the Lawyer Council of Thailand, MAP Foundation, and other Thai and International NGOs to advocate for increased protection and rights for migrants from Myanmar. YCOWA is an active member of the Action Network for Migrants (ANM), a coalition of 15 Thai NGOs that focus on labor, health, and women's rights. YCOWA is also a member of the Asian Transnational Corporation (ATNC) Monitoring Network and Asia Monitor Resource Center (AMRC), which comprises 13 members in eight Asian countries.

Successful Cases of Yaung Chi Oo Workers Association: YCOWA play an important role for the labor's issues at bordering areas and concentrates on activities that encourage workers to collaborate with each other to improve their living situations and working conditions. YCOWA can help for the challenges and difficulties of migrant worker by legal assistant to workers in pursuing justice for exploitative working conditions, which include compensation for workplace injuries, unpaid wages and other forms of abuse.

There are many kinds of labour organization as like YCOWA can bring for change for life of migrant workers and legal protection and protection of rights for migrant workers. The YCOWA implement to solve the labour problems that are dispute between employer and employees. According to the YCOWA data, 207 cases will success and won between 2002 and 2015. Most of the case, the many labors gained the compensations. It can be seen in following Table (3).

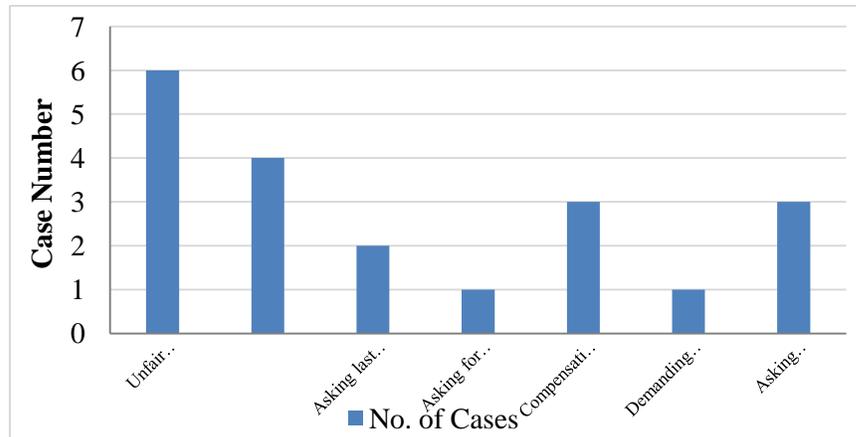
Table (3) Number of Successful Cases by YCOWA

Sr. No	Completed Year	Number of Cases	Number of victims	Total Amount of Compensation Thai Baht (B)
1	2002	1	1	50,000
2	2003	1	159	785,000
3	2004	12	170	1,769,645
4	2005	54	724	1,354,514
5	2006	37	371	2,230,296
6	2007	19	308	4,082,235
7	2008	1	2	1,764
8	2009	8	140	530,643
9	2010	16	266	1,447,935
10	2013	34	202	844,603
11	2014	7	248	1,145,189
12	2015	20	163	8,785,083
Total		207	2754	23,026,907

Source: from appendix table (YCOWA)

From the above table, it is apparent that YCOWA could support and then Myanmar migrant in Thailand in many cases. It was increase more and more year by year. And many victims of Myanmar Migrants got compensation from Thai Government and Enterprise. Up to 2015, total numbers of victims were about 2754 and total compensation amount is 23,026,907 Thai Baht. Majority of the cases are occurred mean garment factories, food and beverage factories due to causes of broken of labour rights and labour laws from employer side. During the 2015, YCOWA supported the 20 labour cases which occurred Dismissal and Asking for compensation. The number of successful cases during 2015 can be categorized in Figure (2). As shown in the Figure, during the 2015 YCOWA Solve the many cases. These are 6 Unfair Dismissal cases, 4 Back wage cases , 2 asking last month salary cases , 1 Asking for deposit fees cases, 3 compensation for various cases such as human trafficking and accidents, 1 demanding for improving good working condition, 3 Asking wages and Salary cases. The cases shown in the figures are most occurred cases in Thailand between employers and employees. YCOWA tried to handle and solve these kinds of problems from the sides of labors or employers.

Figure (2) Number of Successful Cases by Categories in 2015



Source: YCOWA, 2015

YCOWA supports the Myanmar migrant workers from the legal point of view. Most of the issues are concern with exploitation on the labor, some of the cases are exploitation on the wages/salary, some are working environment, some are asking the last month salary, and some are unfair Dismissal. Most of the issues are concern with unfair dismissal. YCOWA is valuable for migrant workers who working in industry and factories that located in Myanmar-Thai border. YCOWA is solving the problems of labor issues, by the two ways. One is the legal support and another is consultation. In the legal support section, YCOWA assists the legal aid and meeting with Thai lawyers and in the consultation section, and also support the negotiations between two group employers and employee to be materialized.

4. Findings

Cross border migration between Myanmar and Thailand has occurred for many years ago. There are so many reasons for labour migration between neighboring countries. According to the former studies, majority of the Myanmar labour are migrating to Thailand. As being unskilled and semi-skilled labour, they involved in 3D jobs (Dangerous, Dirty, Difficult). Moreover they were treated unfair and abuse Labour Rights. Thus their living and working standard are very low. On the other side Thai Government revised the immigration law year by year in line with the negotiation process of Government to Government. And International Organization such as ILO, UN, WTOs, INGOs and Trade Unions support the Labor Laws and Rights for Migrant Workers. In this context Trade Unions play vital role in supporting and solving the problems and challenges of migrant workers. Because of these Unions, Labor Laws and Rights of the respective countries are enforcement effectively. And social welfare and living standard of migrant workers could be raise. Migrant Workers came to know the knowledge of Labor Rights how they can claim to the Government.

In fact there are many problems and issues which could not be reached to solve by Trade Unions. In the globalization era, the migration process occurs continuously across the world in general and especially in crossing border area. Based on the research data the outflow of Myanmar migrant has rapidly increased after 1988 when the political unrest incident broke in Myanmar, amidst the limited economic growth of the country into Thailand. On the other hand, Thailand's economic boom and pressure from Thai entrepreneurs forced Thai Government to open the Thai labour market to these migrants. Over 80% of registered workers were from Myanmar. Myanmar migrants in Thailand can be categorized as regular (legal) migrants and irregular (illegal) migrants. Of them, illegal migrants have faced more challenges rather than legal migrants. Thus Trade Unions are necessary for those facing challenges and Labour Rights abuses.

In this regard, YCOWA, one of the Trade Unions work for Myanmar Migrant Workers in Myanmar-Thai border area, supports the Myanmar Migrant Workers for raising their labor Welfare Services. It plays an important role to protect the labor rights and protection from the exploitation of employers for Myanmar Migrant workers. In any case of the labors issues, YCOWA takes an action by the formal legal ways not only legal assistance but also provide the Social and Health services. Apparently, the successful cases supported by YCOWA are increasing more and more in year by year. And many victims of Myanmar Migrants got compensation from Thai Government and Enterprise. Up to 2015, total numbers of victims were about 2754 and total compensation amount is 23,026,907 Thai Baht. Majority of the cases are accrued mean garment factories and food and beverage factories due to causes of broken of labour rights and labour laws from employer side. During the 2015, YCOWA supported the 20 labour cases; Dismissal and Asking for compensation.

5. Conclusion

Myanmar has migrated all across the world especially in Asian countries including Thailand, Malaysia, Singapore, Bangladesh, Korea and Japan. Migration from Myanmar to countries in the Greater Mekong Sub region (GMS), particularly Thailand, accounts for the largest migration flows within the GMS. So Myanmar government needs to take the action for migrant workers by legally and national interest.

In order to become the happiness and security of the migrant-labor is depended on the four partners' cooperation: -Home Country's government, Host Country's government, CSOs and Employers. If not, CSO takes the major role for the migrant worker's issues instead of the government. In order to get the advantages and benefits from the law with effectively, government should need to take and respect the current rules and regulations.

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Myanmar government needs to take the fully responsible for migrant workers and the collecting the labor information and new government needs to set the labour affaire programme and social protection policy in order to improve and protect of labor issues. Moreover, Myanmar government needs to do more closely relationship with various CSOs and NGOs at located in Thailand to protect the rights of Myanmar Migrant workers.

As a labor Organization, YCOWA takes the major player for the migrant workers in Myanmar-Thailand border. In order to strengthen and improvement, YCOWA should taking connect with various stakeholders such as the State, Market, Civil Society, another labour association and etc. In the analysis of the study, Trade Unions as the Civil Society Organizations are one of the main supporter to protection of labor rights and to promote the living standard of migrant workers. By supporting to the civil society, migrant workers can be achieved and overcome the exploitation and other pressures of employers. Thus, Myanmar has to strengthen its relations with the IOM and ILO in order to allow Myanmar to be better migrant workers accommodation, in such a way as not to harm the socio-economic development of the country while utilizing the intellectual skills and semi-skilled and unskilled migrant workers.

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OUTLIERS AND THEIR EFFECT ON PARAMETERS ESTIMATIONS IN REGRESSION ANALYSIS

Dr. Maw Maw Khin¹⁴

ABSTRACT

This study attempts to investigate the effect of outliers on estimation of parameters in regression analysis. The results about outlier robustness point out that the robust and classical methods both worked well data with no outliers indicating that their mean squares error (MSE) are quite close to each other. If there are outliers in the data, the robust methods perform better than the classical method. The OLS estimates provide poor estimates of true parameters of the regression model. As expected, OLS is a less efficient estimator whatever the type of outliers present in the data.

Keywords: Robust Estimators, Maximum Likelihood, Additive Outlier

1. Introduction

Outliers play an important role in regression. Outliers in the response variable represent model failure. Such observations are called outliers. Outliers with respect to the predictors are called leverage points. They can affect the regression model, too. Their response variables need not be outliers. Observation whose inclusion or exclusion results in substantial changes in the fitted model (coefficients, fitted values) is said to be influential. For this, about the types of outliers that can be found in regression analysis, their effects on regression coefficients and outliers detection were discussed in following.

Outliers can be thought of as observations in a data set that cause surprise in relation to the majority of the data. For example, surprising or extreme observations might be unusually large or unusually small values compared to the remaining data. Outliers are a common occurrence in data. They may be the result of an error in measurement or recording or transmission errors of exceptional phenomena such as earthquakes or strikes, or they may be due to the samples not being entirely from the same population. Apparent outliers may also be due to the values being the same, but nonnormal (in particular, heavy-tailed) distribution.

Outliers should be investigated carefully. Often they contain valuable information about the process under investigation or the data gathering and recording process. Before considering the possible elimination of these points from the data, one should try to understand why they appeared.

Outliers can be classified in statistics as outlying observations in linear regression, time series analysis, survey, directional and contingency table data (Barnett and Lewis, 1978). In the regression context, outliers are classified as y - and x -outliers. They always entail both theoretical and practical problems. Usually, depending on our goal(s), we need one or more

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procedures that are robust, to protect against and detect outlying observations in the data. For instance, in the case of a forecasting model, it is of utmost importance to be able to detect, estimate the effects of, and interpret outliers. In some cases, outliers in a residual series may indicate omission of an explanatory variable from the model. Furthermore, the robust regression estimates are less biased than OLS and provide estimates of outliers that are more strikingly seen in residual series.

Outliers may appear in data due to (i) gross errors, (ii) wrong classification of the data (outlying observations may not belong to the model followed by the bulk of the data), (iii) grouping, and (iv) correlation in the data (Hampel et al., 1986).

Gross errors often show themselves as outliers, but not all outliers are gross errors. Gross errors or outliers are data severely deviating from the pattern set by the majority of the data. This type of error usually occurs due to mistakes in copying or computation. They can also be due to part of the data not fitting the same model, as in the case of data with multiple clusters. Gross errors are often the most dangerous type of errors. In fact, a single outlier can completely spoil the least squares estimate, causing it to break down. Consequently, the estimators may not be efficient estimators. Some outliers are genuine and may be the most important observations of the sample. Rounding and grouping errors result from the inherent inaccuracy in collecting and recording data which are usually rounded, grouped, or even roughly classified. The departure from an assumed model means that real data can deviate from the assumed distribution. The departure from the normal distribution can manifest itself in many ways, for instance, in the form of skewed (asymmetric) or longer-tailed distributions.

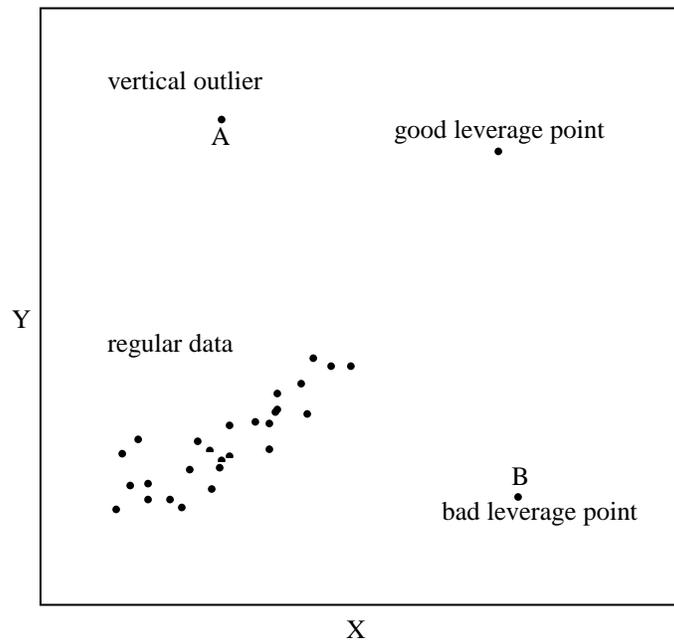
Types of Outliers in Regression

According to Rousseeuw and Van Zomeren(1990), there are several kinds of outliers. They proposed vertical outlier, good leverage point and bad leverage point. A point (x_i, y_i) which does not follow the linear pattern of the majority of the data but whose x_i is not outlying is called a vertical outlier. A point (x_i, y_i) whose x_i is outlying is called a good leverage point which follows the pattern of the majority, and a bad leverage point otherwise. To summarize, a data set can contain four types of points: regular observations, vertical outliers, good leverage points, and bad leverage points. Of course, most data sets do not have all four types. These types of outliers are shown in diagrammatic form.

Figure (1) shows these four types in simple regression. Point A clearly deviates from the typical linear relationship between the dependent (Y) and the independent (X) variable. Such 'vertical' outlier is characterized by an unusual observation in the dependent variable. The impact of vertical outliers on the estimation of regression coefficients is usually small and mainly affects the regression intercept. If unusual observations occur in the set of

independent variables, these outliers are called leverage points. If such leverage point deviates from the linear relationship described by the majority of observations it is called ‘bad leverage point’ such as Point *B* in Figure 1. Due to the exposed position of the outlier it has a leverage effect on the coefficient estimation. In contrast, a leverage point is called ‘good leverage point’ if it does not deviate from the typical relationship. Good leverage points are no outliers and even improve the regression inference as these points reduce standard errors of coefficient estimates.

Figure (1) Simple Regression Data with Points of All Four Types



Rousseeuw and Van Zomeren(1990) pointed out that high leverages can affect the estimated slope of the regression line in OLS, thus they may cause more serious problems than other outliers which might only affect the estimated intercept term. Moreover, their occurrence in regression models may move to some low leverage as well as high leverage and it can turn in vice versa. These two concepts are called masking and swamping in linear regression (Rousseeuw and Leory, 1987). Furthermore, the range of explanatory variables increases when they exist in regression analysis. Thus, the multiple coefficient determination statistics (R^2) which is a well known and popular measure of goodness-of-fit in the regression models will increase even by any changes of a single x variable (Ryan, 1997). In addition, high leverages may be the prime source of collinearity-influential observations whose presence can make collinearity and can destroy the existing collinearity pattern among the x variables (Hadi, 1992). In this respect, the identification of high leverage points to prevent their effect on linear regression becomes necessary.

2. Data and Methods

This paper focuses on the effect of the outlier on parameters estimation in regression by using the OLS method and robust methods. The required data sets are generated by using multiple linear regression models with three explanatory variables. Then, these data sets are transformed into outlier contaminated data sets. After that, the performances are compared in terms of bias and MSE criteria and then the most suitable estimation method is chosen. The statistical software packages namely S-PLUS 2000, STATA 10, and SPSS 13.0 were used to obtain the desired estimates throughout the analyses.

3. Results and Discussion

In this section, the performances of OLS and robust estimators were analyzed by simulations. First, the required data were generated from a multiple regression model. Then, simulated data were used to show that the robust methods outperform the classical method in presence of outliers. The data sets were generated from the following model:

$$y_i = \beta_0 + \sum_{j=1}^p \beta_j x_{ij} + e_i, \quad i = 1, 2, \dots, n \quad (1)$$

where all regression coefficients are fixed $\beta_0 = 5$ and $\beta_j = 1$, for each $i = 1, 2, \dots, n$ and $j = 1, 2, \dots, p$. The explanatory variables were randomly generated from a normal distribution with mean 0 and unit variance. The errors were assumed to be i.i.d. with $N(0, 0.5)$. The data sets were generated under three regressors ($p = 3$) and the sample sizes were ($n = 30$ and $n = 40$) respectively. The true y 's were calculated from the Equation (1).

In this simulation study, two types of outlier namely vertical outlier and bad leverage point were studied because they give different effects in the estimation of parameters of the regression model. After generating the data sets, two scenarios were considered in the following manners. They were seen as follows

- (i) outliers in the independent variable: 10% of the y observations set to be vertical outliers by multiplying constant number 5 and keeping the others.
- (ii) outliers in both y and x : 10% of both y and x observations were modified to be vertical outlier and bad leverage points and the remaining were unchanged. The vertical outlier was obtained by multiplying 5 to its y value and the bad leverage point was obtained by adding 10 to its x value.

All simulations were done with 100 replications. To measure the robustness, the bias (that is the average of the estimated parameters minus the true value) and the mean squared errors (that is the variance of the estimated parameters plus the square of the bias) were used. For the first scenario, among the robust methods the LAV, M and MM -estimators were applied to this simulated data set because these estimators are robust subject to the vertical outliers. Then, this procedure was repeated 100 times and each time the parameters of OLS, LAV, M - (using Huber and Turkey) and MM -estimators (with a 70%, an 85% and a 95% efficiency) were estimated. On the basis of all the estimated parameters, the bias and the MSE were computed and the results were presented in Table (1). Figure (2) summarizes the results of simulations where $n = 30$ and $n = 40$ observations and three predictors. Bars represent bias and MSE for each estimator.

It is seen in Table (1) and Figure (2) that in the presence of vertical outliers, both the bias and MSE obtained from the MM -estimators (with a 70%, an 85% and a 95% efficiency), Huber and Turkey- M , and LAV are much close to each other but inferior to the OLS estimator. Their patterns shown in Figure 2(a) to (d) are intermingled and so no methods have a preferable bias and MSE in this case.

In the case of second scenario, the LAV, M , MM , LTS and LMS estimators were applied to this simulated data set. The results are shown in Table (2) and Figure(3). According to Figure3, the bias and MSE obtained from the Huber and Turkey- M are the smallest, followed by the MM -estimators (with a 70%, an 85% and a 95% efficiency) and LTS estimator in presence of vertical outlier and bad leverage points. In this case, the LMS behaves differently but just slightly, and have a bias and an MSE comparable to that of Huber and Turkey- M and MM -estimators. The OLS method also indicated in Figure 3(a) to (d) performs much worst in these situations. Therefore, the low bias and MSE values of the Huber and Turkey- M and MM -estimators are in line with the asymptotic robustness properties. As expected, OLS is a relatively less efficient estimator whatever the type of outliers occurred in the data.

4. Conclusion

In order to analyze the effect of outliers on the estimation of parameters in regression model, the classical and the robust estimation techniques are used. In this study, the multiple linear regression with three explanatory variables is used to generate the data sets. These clean data sets are transformed into outlier contaminated data sets. In this simulation study, two scenarios are analyzed. According to the findings of the first scenario, it is shown that the MM -estimates (with a 70%, an 85% and a 95% efficiency), Huber and Turkey- M - estimates,

and LAV estimates are more resistant and efficient in the presence of vertical outliers. The OLS estimates provide poor estimates of true parameters of the regression model. Similarly, the Huber and Turkey M -estimates and MM -estimates are in line with the asymptotic robustness properties in the presence of both vertical and bad leverage points. As expected, OLS is a less efficient estimator whatever the type of outliers present in the data.

Table (1) Bias and MSE for OLS and Robust Methods of Simulated Data with Vertical Outliers

Sample Size	Estimation Method	β_0	β_1	β_2	β_3	
n = 30	OLS	Bias	1.9748	0.9043	1.0060	1.1331
		MSE	4.4833	1.7279	1.6046	2.0718
	LAV	Bias	0.3237	0.3173	0.2570	0.2460
		MSE	0.3378	0.3391	0.1148	0.1133
	M-H	Bias	0.3151	0.2832	0.2277	0.2381
		MSE	0.3284	0.3018	0.0916	0.0958
	M-T	Bias	0.2354	0.2419	0.1813	0.1787
		MSE	0.2809	0.2519	0.0625	0.0574
	MM-(0.70)	Bias	0.2481	0.2794	0.2143	0.2081
		MSE	0.2905	0.2940	0.0934	0.0762
	MM(0.85)	Bias	0.2403	0.2513	0.1914	0.1892
		MSE	0.2800	0.2744	0.0690	0.0647
	MM-(0.95)	Bias	0.2387	0.2506	0.1932	0.1813
		MSE	0.2827	0.2744	0.0729	0.0593
n = 40	OLS	Bias	2.0424	0.9613	0.7830	0.8337
		MSE	5.2361	1.4872	1.0443	1.3226
	LAV	Bias	0.3744	0.1748	0.2479	0.2070
		MSE	0.9587	0.0454	0.1463	0.1095
	M-H	Bias	0.3800	0.1810	0.2233	0.1918
		MSE	1.0227	0.0544	0.1283	0.1095
	M-T	Bias	0.2994	0.1446	0.2092	0.1579
		MSE	0.8796	0.0346	0.1100	0.0643
	MM-(0.70)	Bias	0.3171	0.1702	0.2202	0.1726
		MSE	0.8723	0.0455	0.1151	0.0696
	MM(0.85)	Bias	0.3099	0.1543	0.2111	0.1599
		MSE	0.8772	0.0407	0.1081	0.0602
	MM-(0.95)	Bias	0.2999	0.1511	0.2153	0.1556
		MSE	0.8763	0.0380	0.1107	0.0585

Simulation setup: simulations = 100, contamination = 10%

Source: Calculations based on simulation data

Table (2) Bias and MSE for OLS and Robust Methods of Simulated Data with Vertical Outlier and Bad Leverage Points

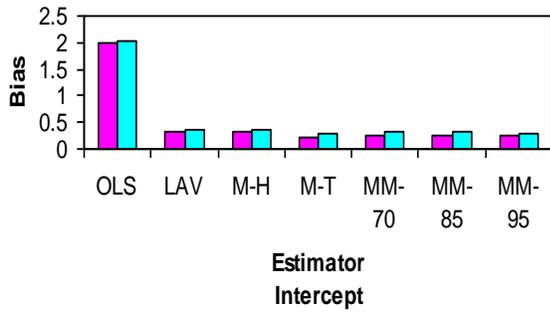
Sample Size	Estimation Method		β_0	β_1	β_2	β_3
n = 30	OLS	Bias	0.7798	0.1761	0.1618	0.6959
		MSE	1.1732	0.0558	0.0464	0.8442
	LAV	Bias	0.3016	0.0832	0.0983	0.2025
		MSE	0.6038	0.0135	0.0166	0.0829
	M-H	Bias	0.2894	0.0796	0.0855	0.1934
		MSE	0.5636	0.0124	0.0120	0.0743
	M-T	Bias	0.2896	0.0926	0.0932	0.1814
		MSE	0.5688	0.0201	0.0180	0.0624
	MM-(0.70)	Bias	0.3057	0.1286	0.1261	0.2095
		MSE	0.6098	0.0397	0.0387	0.0852
MM-(0.85)	Bias	0.2966	0.1175	0.1165	0.1872	
	MSE	0.5638	0.0309	0.0315	0.0665	
MM-(0.95)	Bias	0.2905	0.1218	0.1112	0.1841	
	MSE	0.5686	0.0387	0.0262	0.0674	
LMS	Bias	0.3150	0.0992	0.0999	0.2046	
	MSE	0.5869	0.0233	0.0215	0.0762	
LTS	Bias	0.4382	0.2175	0.2680	0.3365	
	MSE	0.7850	0.1027	0.1484	0.1802	
n = 40	OLS	Bias	0.4899	0.1193	0.1449	0.1400
		MSE	0.2817	0.0240	0.0556	0.0357
	LAV	Bias	0.1614	0.0775	0.0855	0.0762
		MSE	0.0462	0.0097	0.0170	0.0094
	M-H	Bias	0.1408	0.0637	0.0714	0.0708
		MSE	0.0352	0.0067	0.0152	0.0082
	M-T	Bias	0.1432	0.0786	0.0804	0.0769
		MSE	0.0362	0.0163	0.0177	0.0099
	MM-(0.70)	Bias	0.1559	0.1138	0.1013	0.0944
		MSE	0.0444	0.0296	0.0242	0.0172
MM(0.85)	Bias	0.1546	0.1016	0.0886	0.0905	
	MSE	0.0407	0.0253	0.0182	0.0144	
MM-(0.95)	Bias	0.1462	0.0962	0.0887	0.0800	
	MSE	0.0366	0.0252	0.0203	0.0107	
LMS	Bias	0.1701	0.1078	0.0953	0.0855	
	MSE	0.0515	0.0290	0.0228	0.0129	
LTS	Bias	0.3212	0.2157	0.1847	0.1872	
	MSE	0.1621	0.0978	0.0715	0.0750	

Simulation setup: simulations = 100, contamination = 10%

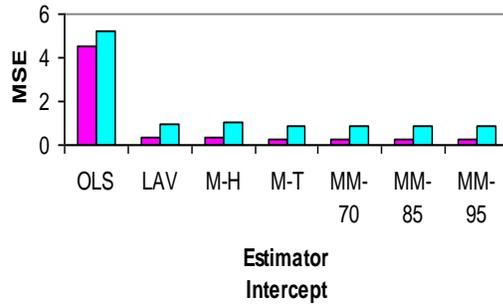
Source: Calculations based on simulation data

Figure (2) Bias and MSE of Simulated Data with Vertical Outliers

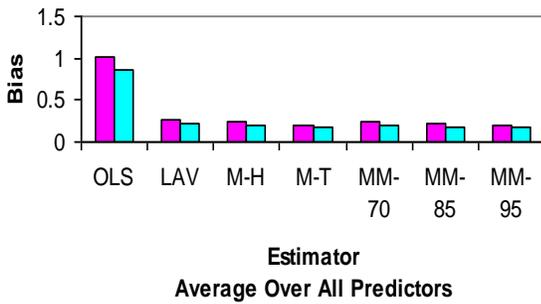
■ Sample Size n = 30
 ■ Sample Size n = 40



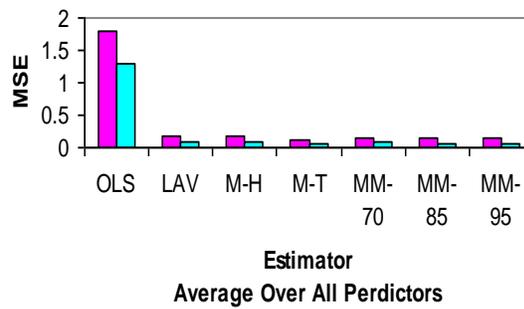
(a)



(b)



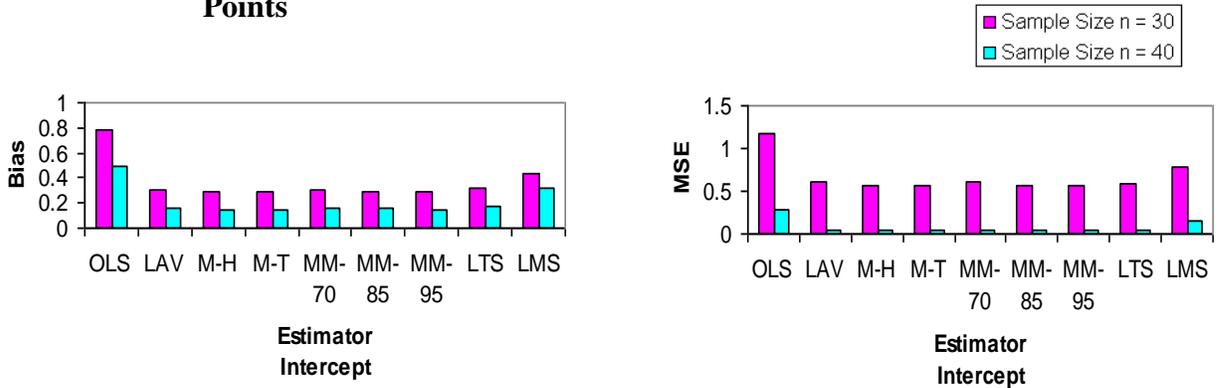
(c)



(d)

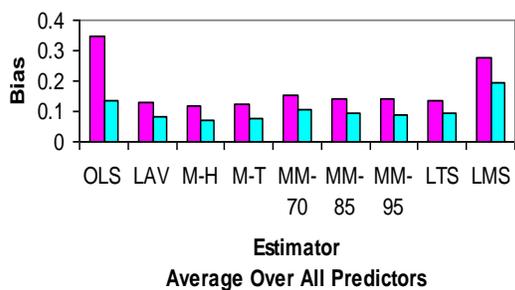
Source: Table (1)

Figure (3) Bias and MSE of Simulated Data with Vertical Outlier and Bad Leverage Points

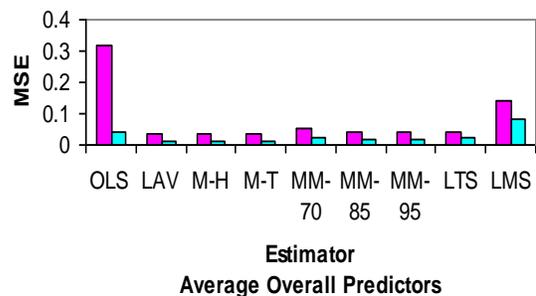


(a)

(b)



(c)



(d)

Source: Table (2)

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SOLVABLE GROUPS AND ITS RELATED RESULTS

Dr. Phyu Phyu Khin¹⁵

ABSTRACT

Some properties related to solvable groups are investigated together with the solvability of symmetric group. Moreover, some solvable groups of order under 120 are also explored.

Introduction

Solvable groups which have many applications, including applications in Galois Theory. In this paper, two parts are organized, the first one concerns commutator subgroup and the second one relates to solvability of symmetric groups. Relevant results are also studied.

Preliminaries

Definition. Let $N \subseteq G$ be a group, and $g \in G$. A *left coset* gN and *right coset* Ng of N in G are defined, respectively, as $gN = \{gn \mid n \in N\}$ and $Ng = \{ng \mid n \in N\}$.

Let G be a group. A *normal subgroup* N of G , written $N < G$, is a subgroup of G such that for all $g \in G$, $gN = Ng$.

The number of distinct right cosets of N in G is called the *index* of N in G and it is denoted by $[G:N]$.

Proposition. Let G be a group. A subgroup N of G is normal if and only if for every $g \in G$ and $n \in N$, $gng^{-1} \in N$.

Proposition. Every subgroup of an abelian group G is normal in G .

Lemma. Let G be a group and N be a normal subgroup of G . Then $gN = N$ implies $g \in N$.

Definition. Let S be a nonempty set and $\text{Sym}(S)$ is the set of all bijections of S onto itself. Then $\text{Sym}(S)$ is a group, called *symmetric group* under the operation of composition of functions.

If $S = \{1, 2, \dots, n\}$, then $\text{Sym}(S)$ is called the symmetric group on n letters and it is denoted by S_n and the order of S_n is $n!$ An element in S_n is called a *transposition* if it interchanges two elements, leaving the other fixed.

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The permutation $\sigma \in S_n$ is an **odd permutation** if σ is the product or composition of an odd number of transpositions, and is an **even permutation** if σ is the product of an even number of transpositions.

S_n has a normal subgroup of A_n , which we called the **alternating group** of degree n , which is a group of order $\frac{n!}{2}$ if $n \geq 2$. In fact, A_n was merely the set of all even permutations in S_n .

Example. If G is a group and N is a subgroup of index 2 in G , then we can prove that N is a normal subgroup of G .

If $N \leq G$ and $[G:N]=2$, there are precisely two right and left cosets of N in G . The right cosets are N and Nx where $x \notin N$, and the left cosets are N and xN where $x \notin N$, but $Nx = G - N$ and $xN = G - N$. Thus $Nx = xN$. So every left coset of N in G is a right coset of N in G . Then we get $N < G$.

Theorem. If G is a finite group and N is a subgroup of G , then $|N|$, is a divisor of $|G|$.

Example. The converse of above theorem is false.

Let $G = S_3$, where S_3 is symmetric group and let $N = \{e, (12), (123)\}$. Then $|G| = |S_3| = 6$ and $|N| = 3$. So $|N|$ is a divisor of $|S_3|$, but N is not a subgroup of S_3 .

Commutator Subgroup

Definition. Let G be a group and N be normal subgroup of G . The **quotient group (factor group)** of G with N , written G/N , is the set of all cosets of N in G under the operation $(aN)(bN) = (ab)N$ for all $a, b \in G$. Note that the identity of G/N is simply N .

Note: If G is abelian, then any factor group G/N is abelian.

Definition. Let G be a group. The commutation of two elements $a, b \in G$ is the element $aba^{-1}b^{-1}$. The commutation of two elements is a **commutator**. $aba^{-1}b^{-1}$ is usually denoted by $[a, b]$.

Let G be a group. The **commutator subgroup** G' of G is defined as $G' = \langle aba^{-1}b^{-1} : a, b \in G \rangle$

Note: The commutator subgroup is the group generated by all the commutators of G .

Example. The inverse of a commutator is a commutator.

Let G be a group and $a, b \in G$, Commutator $[a, b] = aba^{-1}b^{-1} = z$,

so $z^{-1} = (aba^{-1}b^{-1})^{-1} = (b^{-1})^{-1}(a^{-1})^{-1}b^{-1}a^{-1} = bab^{-1}a^{-1} = [b, a]$, for all $a, b \in G$.

Example. G is abelian if and only if $G' = \{e\}$.

Suppose G is abelian and $a, b \in G$. As a and b commute, we have $ab = ba$.

$[a, b] = aba^{-1}b^{-1} = baa^{-1}b^{-1} = b^{-1}eb = bb^{-1} = e$. Then G' is a subgroup of G generated by e and $G' = \{e\}$. Suppose

$G' = \{e\}$, then any commutator $[a, b] = aba^{-1}b^{-1} = e$.

Hence $(aba^{-1}b^{-1})b = eb$

$$(aba^{-1})(b^{-1}b) = b$$

$$(aba^{-1})e = b$$

$$aba^{-1} = b$$

$$aba^{-1}a = ba$$

$$(ab)(a^{-1}a) = ba$$

$$(ab)e = ba$$

$ab = ba$, for all $a, b \in G$. Thus G is abelian.

Example. Let N be a normal subgroup of G . Then G/N is abelian if and only if $[x, y] \in N$ for all $x, y \in G$.

Assume that G/N is abelian and take any x, y in G . Then the product of the factor groups xN and yN can be written as $(xy)N = (xN)(yN) = (yN)(xN) = (yx)N$.

$$(xyx^{-1}y^{-1})N = ((xy)(yx)^{-1})N = (xy)N(yx)^{-1}N = (yx)N(yx)^{-1}N = ((yx)(yx)^{-1})N = N.$$

Therefore $[x, y] = xyx^{-1}y^{-1} \in N$.

Assume that $[x, y] \in N$ for any $x, y \in G$. Since N is normal, then G/N is defined and

$[y^{-1}, x^{-1}]N = N$. Recall this is the identity element.

$$\text{so } (xy)N = (xy)N[y^{-1}, x^{-1}]N = ((xy)[y^{-1}, x^{-1}])N = ((xy)(y^{-1}x^{-1})(yx))N = (yx)N.$$

Hence, $(xN)(yN) = (xy)N = (yx)N = (yN)(xN)$. Therefore G/N is abelian.

Theorem. Let G be a group and G' be its commutator subgroup then G' is a normal subgroup of G .

Example. If G is a group and G' , the commutator subgroup of G . Then G/G' is an abelian.

Let G be a group and elements a, b in G . Then the commutator of a and b is the element

$a^{-1}b^{-1}ab$ in G' .

We have to show that G/G' is an abelian.

Given any two elements aG', bG' in G/G' for some $a, b \in G$.

Then $(aG')(bG') = (ab)G'$ since G' is a normal.

$$= (baa^{-1}b^{-1})abG' = (ba)(a^{-1}b^{-1}ab)G'$$

$$= (ba)G' \quad \text{since } a^{-1}b^{-1}ab \in G'$$

$$= (bG')(aG') \quad \text{since } G' \text{ is a normal. Therefore } G/G' \text{ is an abelian.}$$

Solvability of Symmetric Groups

Definition. A group G is said to be *solvable* if we can find a finite chain of subgroups $G = N_0 \supset N_1 \supset N_2 \supset \dots \supset N_k = \{e\}$ where each N_i is a normal subgroup of N_{i-1} and such that every factor group N_{i-1}/N_i is an abelian ($i = 1, 2, \dots, k$).

Example. Every abelian group is solvable.

Let G be abelian group.

Let $N_0 = G$ and $N_1 = \{e\}$. Then $G = N_0 \supset N_1$.

By proposition, $N_1 < G$. So G has a finite chain and G/N_1 is abelian since G is abelian and G/N_1 is any factor group of G . Thus G is solvable.

Example. The symmetric group S_n is solvable for $n = 1, 2, 3, 4$.

For $n = 1$, $S_1 = \{e\}$.

We know that the set $\{e\}$ is normal subgroup of S_1 and $\{e\}$, identity set is abelian.

Take $N_0 = S_1$ and $N_1 = \{e\}$. Then $S_1 = N_0 \supset N_1 = \{e\}$. So, S_1 has a finite chain and N_0/N_1 is abelian. Hence S_1 is a solvable.

For $n = 2$, let $S_2 = \{e, (12)\}$.

Take $N_0 = S_2$ and $N_1 = \{e\}$. Then $[N_0 : N_1] = 2$ and $N_1 < N_0$.

Then $S_2 = N_0 \supset N_1 = \{e\}$. So S_2 has a finite chain.

Hence

N_0/N_1 is abelian and S_2 is a solvable.

For $n = 3$, let $S_3 = \{e, \sigma_1, \sigma_2, \tau_1, \tau_2, \tau_3\}$, and

$$e = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \end{pmatrix}, \sigma_1 = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{pmatrix}, \sigma_2 = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 2 \end{pmatrix}, \tau_1 = \begin{pmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \end{pmatrix}, \tau_2 = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}, \tau_3 = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 1 & 3 \end{pmatrix}.$$

So $|S_3| = 6$. Let $S_3 = N_0$.

Take $N_1 = \{e, \sigma_1, \sigma_2\}$ and $N_2 = \{e\}$. Then $|N_1| = 3$. We know that N_1 is a cyclic subgroup of S_3 . Thus $[N_0 : N_1] = 2$ and $N_1 < N_0$. And then $N_2 < N_1$ and $[N_1 : N_2] = 3$

Therefore $S_3 = N_0 \supset N_1 \supset N_2 = \{e\}$. So S_3 has a finite chain and N_{i-1}/N_i is abelian, $i = 1, 2$. Thus S_3 is a solvable.

For $n = 4$, let $N_0 = S_4$ be the symmetric group. So $|S_4| = 24$.

Take $N_1 = A_4$, the alternating group and $N_1 = \{e, \sigma_2, \sigma_5, \sigma_8, \tau_1, \tau_2, \tau_3, \tau_4, \tau_5, \tau_6, \tau_7, \tau_8\}$.

$$e = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \end{pmatrix}, \sigma_2 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 4 & 1 & 2 \end{pmatrix}, \sigma_5 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 2 & 1 \end{pmatrix}, \sigma_8 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \end{pmatrix}$$

$$\tau_1 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 3 & 4 & 2 \end{pmatrix}, \tau_2 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 4 & 2 & 3 \end{pmatrix}, \tau_3 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 2 & 4 & 1 \end{pmatrix}, \tau_4 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 2 & 1 & 3 \end{pmatrix}$$

$$\tau_5 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 3 & 1 \end{pmatrix}, \tau_6 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 1 & 3 & 2 \end{pmatrix}, \tau_7 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 1 & 4 \end{pmatrix}, \tau_8 = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 1 & 2 & 4 \end{pmatrix}$$

Then $|N_1| = 12$ and N_1 is a subgroup of S_4 . Thus $[N_0 : N_1] = 2$ and $N_1 < N_0$.

Take $N_2 = \{e, \sigma_2, \sigma_5, \sigma_8\}$. So $|N_2| = 4$ and we see that N_2 is a subgroup of N_1 and $N_2 < N_1$. And then $[N_1 : N_2] = 3$, so N_1/N_2 is abelian.

Let $N_3 = \{e, \sigma_2\}$ and $|N_3| = 2$. Then N_3 is a subgroup of N_2 and $N_3 < N_2$. And then $[N_2 : N_3] = 2$, so N_2/N_3 is abelian.

Finally, let $N_4 = \{e\}$. Therefore $S_4 = N_0 \supset N_1 \supset N_2 \supset N_3 \supset N_4 = \{e\}$. So S_4 has a finite chain with N_{i-1}/N_i is abelian for $i = 1, 2, 3, 4$. Hence S_4 is a solvable.

Lemma. G is solvable if and only if $G^{(k)} = \{e\}$ for some integer k .

Definition. Let S_n be symmetric group. If a_1, a_2, \dots, a_m are distinct integers in $\{1, 2, 3, \dots, n\}$, (a_1, a_2, \dots, a_m) stands for the permutation that maps $a_1 \rightarrow a_2, a_2 \rightarrow a_3, \dots, a_{m-1} \rightarrow a_m, a_m \rightarrow a_1$ and maps every other elements of $\{1, 2, 3, \dots, n\}$ onto itself. (a_1, a_2, \dots, a_m) is called a *cycle* of length m or *m-cycle*.

Lemma. Let $G = S_n$ where $n \geq 5$, then $G^{(k)}$ for $k = 1, 2, 3, \dots$ contains every 3-cycle of S_n

Proof. Let G be an arbitrary group. We know that if N is normal subgroup of G , then N' must also be normal subgroup of G . We claim that if N is a normal subgroup of $G = S_n$ where $n \geq 5$, which contains every 3-cycle in S_n , then N' must also contain every 3-cycle.

For, suppose $a = (123), b = (145) \in N$ (using here that $n \geq 5$). The

$$\begin{aligned} aba^{-1}b^{-1} &= \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 3 & 1 & 4 & 5 \end{pmatrix} \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 4 & 2 & 3 & 5 & 1 \end{pmatrix} \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 1 & 2 & 4 & 5 \end{pmatrix} \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 5 & 2 & 3 & 1 & 4 \end{pmatrix} \\ &= \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 5 & 2 & 1 & 4 & 3 \end{pmatrix} = (153), \text{ as a commutator of elements of } N \text{ must be in } N'. \end{aligned}$$

Since N' is a normal subgroup of G , for any $\pi \in S_n$, $\pi^{-1}(153)\pi$ must also be in N' .

Choose a π in S_n such that $\pi(1) = i_1, \pi(5) = i_2$ and $\pi(3) = i_3$ where i_1, i_2, i_3 are any three distinct integers in the range from 1 to n ; then $\pi^{-1}(153)\pi = (i_1, i_2, i_3)$ is in N' .

Thus N' contains all 3-cycle. Let $N = G$, which is certainly normal in G and contains all 3-cycle, we get G' contains all 3-cycle.

Since G' is normal in G , $G^{(2)}$ contains all 3-cycles. Since $G^{(2)}$ is normal in G , $G^{(3)}$ contains all 3-cycle. Continuing this way we obtain that $G^{(k)}$ contains all 3-cycles for arbitrary k .

Theorem. S_n is not solvable for $n \geq 5$.

Proof. If $G = S_n$, then by lemma, $G^{(k)}$ contains all 3-cycles in S_n for every k .

Therefore $G^{(k)} \neq \{e\}$ for any k . Hence by Lemma, G cannot be solvable.

Some Basic Theorems on Solvable Groups

Definition. Let p be a prime number that divides the order of G . Let k be the biggest natural number such that p^k divides G . All the subgroups of G with order p^k are called **p -Sylow subgroups** of G . We denote their set to be $Syl_p G$ and $Syl_p G = N_p$.

1st Sylow Theorem. If p is a prime number and p^s divides the order of G then G has at least one subgroup of order p^s .

2nd Sylow Theorem. Every two p - Sylow subgroups of G are conjugate.

3rd Sylow Theorem. N_p divides the order of G and it is equivalent to $1 \pmod p$.

Theorem-Tool. If G is a group and N is a normal subgroup of G such that N is solvable and G/N is solvable then G is solvable.

Theorem. If $|G| = p^k$ where p is a prime number then G is solvable. In other words every p -group where p is a prime is solvable.

Theorem. If $|G| = pqr$ where $p < q < r$ primes then G is solvable.

Some Related Results

(1) If $|G| = 2^k \cdot 3$ for $k \geq 2$ then G is solvable.

Proof. By induction on k ,

(i) For $k = 1$, $|G| = 2^1 \cdot 3 = 6$, since then G has only one 3-sylow subgroup H which is normal, cyclic, abelian of order 3 and the quotient G/H is cyclic abelian of order 2. Thus G is solvable.

(ii) Let the above proposition hold for all $k = 1, 2, 3, \dots, n$.

(iii) We will prove that it holds for $k = n + 1$.

From Sylow's theorems we know that G contains at least one 2-Sylow subgroup of order 2^{k+1} . Let's call that H which is normal, cyclic, abelian of order 2. Then $i(H) = 3$ thus $2^{k+1} \cdot 3$ does not divide $3! = 6$. Thus H contains a normal subgroup of G , say K . But $|K| = 2^m$ thus by theorem, H is solvable. Also $|G/K| = 3 \cdot 2^{k-m}$ thus by (ii) G/K is solvable. Finally from Tool Theorem, G is solvable.

(2) If $|G| = 3^k \cdot 2^2$ then G is solvable.

Proof. By induction on k ,

(i) It holds for $k = 1$, then $|G| = 12$ since $|G| = 2^2 \cdot 3$ and it is solvable by (1).

(ii) Let the above proposition holds for all $k = 1, 2, 3, \dots, n$ with $n \geq 1$.

(iii) We prove that it holds for $k = n + 1$. Thus $n + 1 \geq 2$. From Sylow's theorem we know that G contains at least one 3-Sylow subgroup of order 3^{n+1} . Let's call that H which is normal, cyclic, abelian of order 3. Then $i(H) = 2^2$.

Thus $3^{n+1} \cdot 2^2 = 3^2 \cdot 2^2 \cdot 3^{n+1-2} = 36 \cdot 3^{n+1-2}$ does not divide $2^2! = 24$. Thus H contains a normal subgroup of G , say K . But $|K| = 3^m$ thus by theorem H is solvable. Also $|G/K| = 2^2 \cdot 3^{k-m}$ thus by (ii) G/K is solvable. Finally by Tool-Theorem G is solvable.

(3) If $|G| = 2^k \cdot 5$ then G is solvable.

Proof. By induction on k .

(i) It holds for $k = 1, 2, 3$ where $|G| = 10, 20, 40$ respectively because we can use theorem in this case.

(ii) Let the above proposition holds for all $k = 1, 2, 3, \dots, n$ with $n \geq 3$.

(iii) We prove that it holds for $k = n + 1$. Thus $k = n + 1 \geq 4$. From Sylow's theorems we know that G contains at least one 2-Sylow subgroup of order 2^{n+1} . Let's call that H which is normal, cyclic, abelian of order 2. Then $i(H) = 5$.

Thus $2^{n+1} \cdot 5 = 2^4 \cdot 5 \cdot 2^{n+1-4} = 80 \cdot 2^{n+1-4}$ does not divide $5! = 120$. Thus H contains a normal subgroup of G , say K . But $|K| = 2^m$ thus by theorem H is solvable. Also $|G/K| = 5 \cdot 2^{k-m}$ thus by (ii), G/K is solvable. Finally from Tool-Theorem G is solvable.

Example. Every group of order 56 is solvable.

Since From theorems we know that N_7 is either 1 or 8. If it is 1, G is solvable. So it is 8. Again count all the elements in those groups that are not identity. We get $8 \cdot 6 = 48$ elements. But again by Sylow theorems we get there exists at least one 2-sylow subgroup of order 8. If add them, $48 + 8 = 56$ elements which leaves no room for another 2-sylow subgroup. Thus G is again solvable.

Example. Every group of order 84 is solvable.

Since $|G| = 84 = 7 \cdot 3 \cdot 2^2$. Consider the number of the 7-sylow subgroups of G , say N_7 . Then $N_7 \equiv 1 \pmod{7}$ and N_7 divides 84. Thus $(N_7, 7) = 1$ so N_7 can be only 1. Let N_7 be normal 7-sylow subgroup P . Then P is normal, cyclic of order 7, abelian and solvable. Again $|G/P| = 12$ which is solvable by related result (1). So by tool-theorem, G is solvable.

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THE EFFECT OF MARKETING MIX ON CUSTOMER LOYALTY TOWARDS MOBILE SERVICE PROVIDERS IN YANGON

Maung Maung¹⁶

ABSTRACT

The objective of this study is to analyze the effect of marketing mix factors on customer satisfaction and the relationship between customer satisfaction and customer loyalty. The study scope is limited to focusing on three service providers such as MPT, Ooredoo, and Telenor. The primary data are collected from 270 respondents – 90 respondents are primary users of MPT, another 90 are primary users of Telenor, and the rest 90 are primary users of Ooredoo. The survey was conducted in Mingalar Taung Nyunt Township. The 30 mobile SIM card and rechargeable card sellers from this township are randomly selected. Then, 10 out of 30 are selected to collect the data for MPT primary users, next 10 are selected for Telenor primary users and the last 10 are for Ooredoo primary users. Systematic sampling method is applied. Every 10th buyer (either for SIM card or for rechargeable card) is identified as respondent. If the selected buyer is not the respective service provider's primary user, the next one is approached again. When 9 respondents from each shop have been asked questions, survey reached desired 270 respondents. Personal interview method is applied to collect data from them. As the research instrument, structured questionnaire is used. From analysis on survey data, it is found that most of the respondents are satisfied with all aspects of service provided by Ooredoo and Telenor. There is a significant effect of product, process and physical evidence marketing factors on customer satisfaction of MPT service. Analysis on service provider Telenor showed that the effect of product, process and promotion is significant on customer satisfaction. Customer satisfaction on Ooredoo depends on place and people factors. For all service providers, the customer satisfaction will lead to customer loyalty. Thus, it can be suggested that MPT should pay relatively more attention to its service quality, process, and physical evidence for customer satisfaction, Ooredoo should emphasize more on availability at many places and its staff's customer service, and Telenor should do more for goodness of service, process and promotion attractiveness.

Keywords: marketing mix, customer satisfaction, customer loyalty, mobile service provider

Introduction

The mobile services industry is now becoming the fastest growing industry in Myanmar today. This current technology is spreading quite rapidly due to several factors which include: growing affordability and ease of adaption, the reducing prices and size of mobile phones and increased power and range. These significant elements of this industry have created a broad range of versatility amongst consumers of these products. In 2013, the

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Myanmar government restructured and relaxed the mobile telecommunication industry by issuing operator licenses to two new operators: Ooredoo and Telenor. The results of the telecom liberalization are clear: the start of the operations by Ooredoo and Telenor, respectively in August and September 2014, have drawn in millions of subscribers. As a result of this, the mobile phone service market is becoming saturated in Myanmar, however, the Myanmar telecom industry continues to struggle because of poor infrastructure which has a direct effect on cell towers signal strength and signals getting to remote areas of the country. This current situation forces mobile telecommunication companies to take drastic measures to promote their service quality. However, by the same token, it creates a need for these mobile service providers to change regarding their customary marketing mix strategy. Now these mobile service providers need to be more cognizant about holding on their customer base not only from an expansion standpoint, but rather trying to embrace their existing customers by providing far greater options in order to optimize the customers' loyalty (Long & Jen, 2004). Therefore, mobile service providers need to look for not only to provide the quality service but also offer different promotion packages of service using marketing mix strategy to get customer satisfaction and customer loyalty. In addition, there is a need to examine ways to raise the value of mobile service customers' perspective. The mobile service providers need to identify the reasons for consumer preference of their products/ services, and the likelihood of sustained repurchases by consumers will provide success for these companies. Therefore, the reality of identifying the influencing factors by the use of marketing mix tools impacts on customer satisfaction, and that associated with customer loyalty will reveal what is most influential. The major objective of the study is to examine which marketing mix factors influences on customer satisfaction and that enhance loyalty towards mobile service provider in Yangon.

Hypotheses of the Study

The hypotheses to be tested in this study are as follows:

1. There is a relationship between marketing mix and customer satisfaction.
2. There is a relationship between customer satisfaction and customer loyalty.

Scope and Method of the Study

The scope of the study is limited to focusing on three mobile service providers such as MPT, Telenor and Ooredoo. Primary data required in line with the objectives were collected from 270 respondents in Mingalar Taung Nyunt Township – 90 respondents are primary users of MPT, another 90 are primary users of Telenor, and the rest 90 are primary users of Ooredoo.

Sample design employed in this study was systematic sampling. The 30 mobile SIM card and rechargeable card sellers from Mingalar Taung Nyunt township are randomly selected. Then,

10 out of 30 are selected to collecting data for MPT primary users, next 10 are selected for Telenor primary users and the last 10 are for Ooredoo primary users. Every 10th buyer (either for SIM card or for rechargeable card) is identified as respondent. If the selected buyer is not the respective service provider's primary user, the next one is approached again. When 9 respondents from each shop have been asked questions, survey reached desired 270 respondents. Personal interview method is applied to collect data from them. As the research instrument, structured questionnaire is used. Multiple regression method is also used to examine the postulated hypotheses.

Literature Review

Marketing Mix

Fornell (1992) pointed out; the study of marketing mix has been consistent in recognizing customer satisfaction as a vital forerunner to customer loyalty. A marketing mix is the overall marketing offer to appeal to the target market. It consists of decision in service basic areas in mobile service industry: product (development of a product, service, or idea to exchange), pricing (what to charge for the exchange), and promotion/ integrated marketing communications (how to communicate with the target market about the possible exchange), and place/ distribution (how to get the product, service, or idea to the target market to consummate the exchange), people (how to contribute the service/ product significantly to strengthen the customer-employee relationship), process (how to manipulate the customers' complaint) and physical evidence (the style and appearance of the physical surroundings at service delivery sites).

(a) Product

Goods or services that are launched in the market to be consumed or to be used by customers to satisfy their needs and demands are called products (Armstrong & Kotler, 2011). The basic essentials of products in mobile telecom service are characterized by quality, design, voice clarity, geographical network coverage, ease of connectivity to the network, features, brand name and sizes (Borden, 1984).

(b) Price

Price is the amount of money charged for a product or service. To express it another way, it is the sum of the values that customers exchange for the benefits of having or using the product or service (Kotler & Armstrong, 2010).

(c) Place

Place or distribution as a set of interdependent organizations involved in the process of making a product available for use or consumption by consumer. A place is anywhere that the customer can obtain a product or receive a service (Kwon, 2011).

(d) Promotion

Promotion involves any vehicle to employ getting people to know more about the product or service. Advertising, sales promotion, direct selling, local events, public relations, point-of-sale displays, and word-of-mouth are all traditional ways for promoting a product or service. Promotion can be viewed as a way of closing the information gap between would-be-sellers and would-be-buyers (Jones, 2007).

(e) People

People refer to the service employees who produce and deliver the service. In addition, customer-oriented service employees with a focus on showing personal attention, interpersonal care, and willingness to help, politeness, and prompt behavior are likely to contribute significantly to strengthen the customer-employee relationship. If there is no support from the personnel, a customer-orientation is not possible to get achievement (Judd, 1987).

(f) Process

The process refers to the best practices in delivering products and services to the customers, then manipulating the customers' complaint with the aim of making them happy and satisfied. The concept of persistence and process are vital in the marketing mix as customers may have the first impression based on the delivery process and persistence depicted by marketers (Hashim & Hamzah, 2014).

(f) Physical Evidence

Service environment, also called service escape or physical evidence, relate to the style and appearance of the physical surroundings and other experimental elements encountered by customers at service delivery sites. Service firms need to manage physical evidence carefully, because it can have a profound impact on customers' impression (Kushwaha & Agrawal, 2015).

Customer Satisfaction

Customer satisfaction can be defined as customer's response to the services they receive in relation to fulfillment of their desires and expectations (Zeithamal & Bitner, 1996). Customer's satisfaction can affect a customer's attitude to a degree where the customer not only feels motivated to re-buy but also offer recommendations to the mobile service provider.

Thus, the mobile service provider is quite evocative to comprehend the degree of customer insight in the services that they offer.

Customer Loyalty

Customer loyalty is defined as “a deeply held commitment to re-buy or re-patronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior” (Oliver, 1997). Customer loyalty is related to the likelihood of a customer returning, making business referrals, passing pertinent information by word of mouth, as well as offering references and publicity (Bowen & Shoemaker, 1998). In the mobile telecommunication industry, customer loyalty is the totality of feelings or attitudes that would favor a customer to recharge the phone bill repeatedly or re-purchase the SIM card from the same mobile service provider or brand.

The Effect of Marketing Mix on Customer Satisfaction

Elements in marketing mix; namely, product, price, place, and promotion, people, process and physical evidence are the controllable tools that will contribute to customers’ satisfaction (Shankar & Chin, 2011). Yelkur (2000) found that the critical elements in the services marketing mix influence and positively effects customer satisfaction. Fornell (1992) pointed out; the study of marketing mix has been consistent in recognizing customer satisfaction as a vital forerunner to customer loyalty.

Relationship between Customer Satisfaction and Customer Loyalty

Several research works have shown that customer satisfaction is positively associated with desirable business outcomes namely; Customer Loyalty, Customer Retention, and Customer Profitability. Gerpott et al. (2001) in their study of the German mobile telecommunication found that customer satisfaction is positively related to customer loyalty, and both factors are important paraments in the mobile telecommunications industry.

Conceptual Framework of the Study

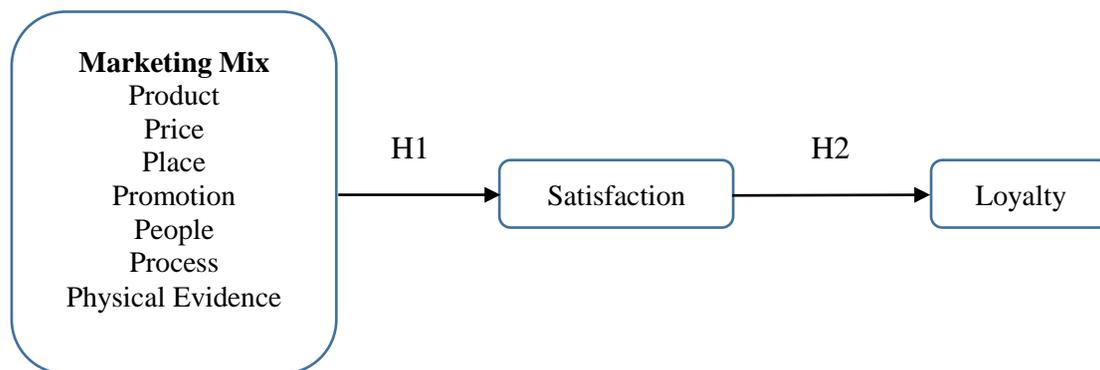
In order to understand the marketing environment of fierce competition within the mobile service industry, marketing mix or the 7P’s (Product, Price, Place, Promotion, Physical evident, People and Process) are utilized to provide a deeper scope of marketing strategies in order to have a better understanding from a customer perspective. Marketing mix has been constant source of inspiration to explore its impact on customer satisfaction and loyalty. As pointed out in the review of literature, based on the theory of customer satisfaction, examining about marketing mix and customer satisfaction relationship, and also the customer

satisfaction and customer loyalty (repurchase intention, word-of-mouth and price incentive), the conceptual framework of the study is illustrated in Figure (1).

Results and Findings

The agreed level of respondents on overall marketing mix (product, price, place, promotion, people, process, and physical evidence), customer satisfaction and customer loyalty are shown in the Table 1, 2 and 3.

Figure (1) Conceptual Framework of the Study



Source: Developed for This Study

Customer Perception on Marketing Mix Elements (7Ps)

The result data obtained from research study uncovers the customer perception on marketing mix of different providers is explained in Table (1)

Table (1) Customer Perception on Marketing Mix (7Ps)

	MPT	Telenor	Ooredoo
	Mean	Mean	Mean
Product	3.13	3.27	3.39
Price	2.58	3.27	3.62
Place	3.19	3.32	3.40
Promotion	3.02	3.28	3.02
People	2.90	3.02	3.03
Process	3.00	3.23	3.14
Physical Evidence	3.07	3.02	2.94

Source: (Survey data, 2016)

The mean value of price and people elements for MPT showed that most of the respondents have negative perception on these two elements of MPT, but they have positive perception

on product; place and physical evidence. Their perception is neutral on process element of MPT. Most of the MPT respondents comprehended the calling rate is high, the price is also not appropriate with the service and the price is not proper by comparing with other providers. Concerning with people element, users from MPT assumed the service providers' staff did not treat the customer as a special and valued customer and also the staff failed to answer most of the inquiries about products/ services.

The mean values of all marketing mix elements of Telenor is significantly above 3 and highest value is for promotion element. From analysis on Ooredoo, it is found that respondents have negative perception only on physical evidence element because the majority of Ooredoo respondents realized that the public facilities such as waiting space, queuing arrangement are not arranged as an important items. However, Ooredoo users have the highest positive perception on price element.

Customer Satisfaction towards Mobile Service Providers

The empirical data achieved from this research study reveals the customer satisfaction of various network providers is presented in Table (2).

Table (2) Results of Customer Satisfaction towards Mobile Service Providers

	MPT	Telenor	Ooredoo
	Mean	Mean	Mean
Level of satisfaction with quality of service offered by mobile service provider	3.34	3.74	3.86
Level of happiness with overall service experience.	3.14	3.40	3.62
Level of feeling pleased with own decision to use the voice service of mobile service provider	2.93	3.56	3.60
Level of feeling pleased with decision to use the data service of service provider	3.29	3.46	3.61
Primary phone service is better than expected.	3.08	3.20	3.39
Satisfaction average	3.16	3.47	3.62

Source: (Survey data, 2016)

The results showed that Ooredoo had the highest satisfaction level among the three mobile service providers while MPT had the least satisfaction level of customer satisfaction. The respondents from MPT were not satisfied with the decision for using voice service because the customer felt calling rate is not reasonable, price is not appropriate with the service, and call rates were too high compared to the other providers.

Customer Loyalty towards Mobile Service Providers

The empirical data achieved from research study makes known the customer loyalty towards mobile service provider is explained in Table (3). The results illustrated in Table 3 revealed that Telenor had the strongest loyalty and Ooredoo was the lowest position of customer loyalty. Majority of the respondents from three operators do not want to encourage their friends and relatives to use their mobile service provider but they would like to recommend their primary using service provider to anyone who seeks their advice. Most of the respondents from Ooredoo primary SIM users disagree to use their service providers when other providers’ prices were cheaper. Nevertheless, the level of customer loyalty’s degree among all three service providers showed no significant difference.

Table (3) Results of Customer Loyalty towards Mobile Service Providers

	MPT	Telenor	Ooredoo
	Mean	Mean	Mean
Will continue to use current using mobile phone service provider as a primary provider	3.78	3.78	3.76
Will recommend primary service provider to anyone who seeks advice	3.61	3.72	3.77
Will encourage friends and relatives to use current using mobile service provider	2.63	2.93	2.78
Will continue using current primary service provider, even if other providers’ prices are cheaper	3.57	3.29	2.80
Loyalty average	3.40	3.43	3.28

Source: (Survey data, 2016)

Relationship between Marketing Mix and Customer Satisfaction

The result data achieved from research study reveals the relationship between marketing mix factors and customer satisfaction is explained in Table (4) and (5).

Table (4) Relationship between Marketing Mix and Customer Satisfaction

Provider	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
MPT	Constant	-0.606	0.847		-0.715	0.477
	Product	0.529	0.089	0.501	5.918**	0.000
	Price	0.129	0.074	0.116	1.741	0.086
	Place	-0.162	0.097	-0.139	-1.67	0.099
	Promotion	-0.016	0.067	-0.018	-0.241	0.81
	People	-0.008	0.076	-0.007	-0.105	0.916

Provider	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
	Process	0.188	0.087	0.157	2.159*	0.034
	PE	0.542	0.087	0.455	6.212**	0.000
Telenor	Constant	2.887	1.307		2.208	0.030
	Product	0.408	0.094	0.409	4.350 **	0.000
	Price	-0.179	0.084	-0.211	-2.122	0.077
	Place	-0.014	0.102	-0.012	-0.134	0.893
	Promotion	0.306	0.103	0.317	2.982 **	0.004
	People	0.089	0.070	0.144	1.279	0.204
	Process	0.344	0.108	0.312	3.174 **	0.002
	PE	-0.003	0.054	-0.004	-0.053	0.958
Ooredoo	Constant	12.366	2.195		5.634	0.000
	Product	-0.154	0.114	-0.199	-1.359	0.178
	Price	0.089	0.098	0.147	0.914	0.363
	Place	0.387	0.102	0.409	3.809 **	0.000
	Promotion	-0.011	0.097	-0.013	-0.109	0.914
	People	0.213	0.090	0.449	2.355*	0.021
	Process	-0.020	0.131	-0.021	-0.156	0.877
	PE	-0.104	0.119	-0.105	-0.872	0.385

Source: (Survey data, 2016)

*signifies $p < 0.05$; ** signifies $p < 0.01$; N= 90

a. Dependent Variable: customer satisfaction

As illustrated in Table 4, multiple regression analysis identifies the marketing mix affects customer satisfaction, and with a positive direction. The hypothesis proposes that marketing mix will affect satisfaction. Specifically, product ($t=5.918$, $p < 0.01$), process ($t=2.159$, $P < 0.05$) and physical evidence ($t=6.212$, $p < 0.01$) contribute to the customer satisfaction for MPT. Moreover, the study of relationships are all positive by implying that the greater in qualities of product, physical evidence and process those are satisfied mostly by customers in mobile service of MPT. However, the price, place, promotion and people do not affect the customer satisfaction at a statistically significant level at 95%. Therefore, hypothesis (H1: marketing mix affects customer satisfaction) is moderately supported, in that three out of seven Ps of marketing mix are related to customer satisfaction of MPT.

In the study model for mobile service provider of Telenor, the multiple regression analysis identifies that product, promotion and process affected customer satisfaction, and with a positive direction. Specially, product ($t= 4.350$, $p<0.01$), promotion ($t= 2.982$, $p<0.01$) and process ($t= 3.174$, $p<0.01$) contributes to customer satisfaction. The relationships found are all positive, implying that the more positive in qualities of product, promotion and process, the greater customer satisfaction in using mobile telecom service of Telenor. The place, people and physical evidence do not affect customer satisfaction at a statistically significant level at 95%. Hence, H1 is supported, in that three out of seven Ps of marketing mix are related to customer satisfaction.

The result of the multiple regression model of Ooredoo identifies only two out of seven dimensions of marketing mix influencing customer satisfaction, and with a positive direction. Specially, place ($t=3.809$, $p<0.01$) and people ($t=2.355$, $p<0.05$), contributes to customers' satisfaction. Moreover, relationships found are all positive, implying that the more positive marketing mix in which place and people, the greater customer satisfaction in using telecommunication service. However, the product, price, promotion, process and physical evidence does not affect the customer satisfaction at a statistically significant level at 95%. Therefore, H1 is moderately supported, in that two out of seven Ps are related to customer satisfaction.

Table (5) Summary of Model Regression of Marketing Mix towards Customer Satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
MPT	0.919	0.845	0.831	1.155	63.622	0.000
Telenor	0.796	0.634	0.602	1.636	20.027	0.000
Ooredoo	0.665	0.443	0.395	1.114	9.301	0.000

Source: (Survey data, 2016)

a. Predictors: (constant), marketing mix (Product, Price, Place, Promotion, People, Process, and Physical Evidence)

b. Dependent Variable: Customer satisfaction

Significant level = 0.01

Regarding to the regression analysis from Table 5, the relationship between marketing mix and customer satisfaction considered with R square of MPT, Telenor and Ooredoo are 0.845, 0.634 and 0.443 respectively. It means that the independent variable (marketing mix) can explain about (84.5%), (63.4%) and (44.3%) of the variation of MPT, Telenor and Ooredoo of the dependent variable (customer satisfaction). Considered with adjusted R square value for MPT, Telenor and Ooredoo shows the value at 0.831, 0.602 and 0.395 respectively. According the F test is 63.622 (MPT), 20.027 (Telenor) and 9.301 (Ooredoo), considering

the result of significant level is 0.000 which is below level of significant or the alpha level ($\alpha = 0.05$) for the hypothesis test. The null hypothesis (H1) of marketing mix was rejected. It means that marketing mix has influence on customer satisfaction.

Relationship between Customer Satisfaction and Customer Loyalty

The result data obtained from research study makes known the relationship between customer satisfaction and customer loyalty is explained in Table (6) and (7).

As demonstrated in Table (6), multiple regression analysis identified customer satisfaction of MPT ($t=9.957, p<0.01$), Telenor ($t=9.682, p<0.01$) and Ooredoo ($t=4.435, p<0.01$) influencing customer loyalty, and with a positive direction. It implies that the more positive customer satisfaction, the greater in the customer loyalty. Therefore, hypothesis (H2: customer satisfaction affects customer loyalty) is supported in that customer satisfaction is related to customer loyalty.

Table (6) Relationship between Customer Satisfaction and Customer Loyalty

Provider	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
		B	Std. Error	Beta		
MPT	Constant	2.561	1.122	0.728	2.283	0.025
	Satisfaction	0.703	0.071		9.957**	0.000
Telenor	Constant	3.051	1.099	0.718	2.775	0.007
	Satisfaction	0.613	0.063		9.682**	0.000
Ooredoo	Constant	0.883	2.763	0.427	0.320	0.750
	Satisfaction	0.676	0.152		4.435**	0.000

Source: (Survey data, 2016)

*signifies $p<0.05$; ** signifies $p<0.01$; N= 90

a. Dependent Variable: Customer Loyalty

Significant level = 0.05

Table (7) Summary of Model Regression of Customer Satisfaction towards Customer Loyalty

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
MPT	0.728	0.530	0.524	1.873	99.146	0.000
Telenor	0.718	0.516	0.510	1.542	93.744	0.000
Ooredoo	0.427	0.183	0.173	2.058	19.67	0.000

Source: (Survey data, 2016)

- a. Predictors: (constant), customer satisfaction
 - b. Dependent Variable: customer loyalty
- Significant level = 0.01

Turning to the regression analysis from Table 7, the relationship between customer satisfaction and customer loyalty, considered with R square is 0.530 (MPT), 0.516 (Telenor) and 0.183 (Ooredoo). It means that the independent variables (customer satisfaction) are able to explain about (53.0%) and (51.6%) of the variation of the dependent variable (customer loyalty) for MPT and Telenor, but for Ooredoo the independent variable (customer satisfaction) is able to explain about (18.3%) of the variation of the dependent variable (customer loyalty). Considered with Adjusted R square value, it shows the value for MPT, Telenor and Ooredoo at 0.524, 0.51 and 0.173 each. According to the F-test was 99.146, 93.744 and 19.67 for MPT, Telenor and Ooredoo. Considering the result of significant level is 0.000 which is below level of significant or the alpha level ($\alpha = 0.05$) for the hypothesis test. It represents that customer satisfaction has influence on customer loyalty.

Conclusion

In the study of product element, MPT and Telenor users agreed their primary mobile service providers had wide network coverage. By contrast, the accuracy in billing system of MPT dropped the agree level of respondents. Noticeably, Ooredoo respondents enjoyed the fast internet speed and clear voice quality. Concerning with price element, respondents from Telenor and MPT considered that calling rate is higher than Ooredoo. Majority of respondents from Ooredoo agreed the price is appropriate by comparing with other operators. For place element, most of the respondents from three mobile service providers agreed their service providers have many branches with their region of residents, but Telenor and Ooredoo users' home or workplace were not close to the service providers' service/ sale locations. MPT respondents disagreed on MPT website, being well organized and up to date. For promotion element, Telenor has the highest agree level on using creative advertising campaign. Majority of the respondents from MPT, Telenor and Ooredoo agree their service providers have special sale promotion plan from time to time. Ooredoo, and MPT respondents perceived that service providers didn't take part in cultural activities and social programs such as independence day, water festival, social activities, etc. The findings from the study of people element, respondents from three mobile service providers agree that the staff are able to provide required service quickly, are well trained, and knows how to deal with customers. But users from three service providers assumed that their staff did not treat customers as special and valued customers. In terms of the process element, most of the respondents from all mobile service providers agree their operators' services are easy and quick, also kept their data confidential. The study showed that three providers are unable to

deal with customer complaints adequately. Looking at the element of physical evidence, customers sampled from three service providers felt that the mobile service providers did not use modern and high tech equipment, while the respondents agree the overall atmosphere is comfortable. In summary, Ooredoo had the highest agree level in product, price, and place elements while Telenor had the highest agree level in promotion, people and process among three service providers.

Overall customer satisfaction, Ooredoo had the highest satisfaction level among the three mobile service providers while MPT had the least agree level on customer satisfaction. MPT customers were not satisfied with the decision for using voice service because the customer felt that call rates were too high compared to the other providers. However, the respondents from Telenor and Ooredoo agreed the price is appropriate with their using service.

Concerning with customer loyalty, majority of respondents from three service providers will recommend for using their current primary service provider to anyone who seeks the advice. So, loyal customers are more likely to spread positive word of mouth about the favorite brands and also refer relatives and friends to use. According to the findings, this shows that Ooredoo customers can easily switch to other providers.

The study of marketing mix consists of seven elements: different elements have different effect to customer satisfaction. The product ($\beta=0.501$), process ($\beta=0.157$) and physical evidence ($\beta= 0.455$) have positive relationship with customer satisfaction for MPT, the product ($\beta= 0.501$) is higher than others, that means the product has more impact than the other elements on customer satisfaction. For Telenor, product ($\beta= 0.409$), promotion ($\beta= 0.317$) and process ($\beta=0.312$) have positive relationship with customer satisfaction. Ooredoo identified place ($\beta = 0.409$) and people ($\beta = 0.449$) impacts to customer satisfaction.

The study ascertained that customer satisfaction of MPT, Telenor and Ooredoo had an influence on customer loyalty. Furthermore, the value B (unstandardized coefficients) of customer satisfaction of MPT, Telenor and Ooredoo are (0.703), (0.613) and (0.676) respectively. This means when customer satisfaction is increased by 1 unit, the customer loyalty will be increased by 0.703 units for MPT, 0.613 units for Telenor and 0.676 units for Ooredoo. It has been confirmed that customer satisfaction is one of the major antecedents of customer loyalty in the telecommunication sector (Nasir & Mushtaq, 2014).

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