

**Application of Game theory on Financial benefits
and Employee satisfaction:**

“Case study on State banks of Sri Lanka”

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ABSTRACT

In any business organization, there are two parties inside. The company and the employees, the company always tries to maximize their profit as well as employees try to demand their gains or benefits. This is not a linear relationship, because the profit and employee earnings have disproportionate equilibrium. To maximize the profit the management always focuses on the performance of the employees and to reduce the cost. As per the motivational theories, it is clearly indicated that the employees have different types of needs. Therefore, the management should focus on a wide range of factors to satisfy the employees to absorb the maximum strength they are holding. In this research, we focus on both employees and the management of a state bank. Management of the state bank is always eager to minimize the cost and maximize the profit. However, the employees make every endeavor to elevate their earnings, which will be a cost to the company. The conflict begins at this point. The author observed that the problem of the institutions and introduced the Game Theory which provides a mathematical framework for understanding the optimal outcome and what the tradeoffs are to achieve that outcome. Therefore, it has to found the main financial benefits and their effectiveness on employee satisfaction to maximize the profit. To fulfill that objective it has to be observed the benefits given to employees, the effectiveness of those benefits on employees and finally recommend an effective benefits allocation mix to the organization, which will address both employee and the top management.

In this game, the top management can be denoted as player and there is using Maximin strategy to maximize their profit. The employees play the game as opponent and they always try to use Minimax strategy to minimize their maximum lost. This is a cooperative game consisting of two parties, which are presenting various strategies to overcome their common issues. Therefore, this game consists of mixed strategies. Management introduced various benefits. The employees' perspective, their answers are varying according to their needs. Therefore, the accuracy and reliability depend accordingly on the selection of the sample units. The sampling technique is uniquely done by considering various parameters. During the data analysis, it is proven that this game is not having any pure solution. The results are based on the probabilities after using the values in linear programming techniques. According to the results the most suitable allowance is medical allowance to allocate more funds because the probability of that is 0.96. According to the test results, it is clearly state that there are some benefits which are totally useless to provide such as Key Holding, Disturbance and Cash loading and there are some benefits that the management should allocate more to motivate the employees as well as to gain profit.

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CHAPTER 01

INTRODUCTION

1.1 Introduction

In this era, the banking industry becoming more popular than ever, because due to this epidemic also many governments including Sri Lanka (SL), announced that the banking sector is an essential service. Therefore, each and every employee together with their families are expecting some allowances for working in this critical situation. Not only state banks, but also private banks are also responsible to work in these days. The employees in those banks also looking for some benefits for that as well.

In the topic the researcher has chosen, will give a wide range of idea about the financial benefits that the state banks offer for employees and the effectiveness of those benefits. The main reason to choose this type of topic for a research, is to observe the satisfaction level of the employees about the benefits that they are receiving. Practically most of the benefits are useless for many employees, those are valuable for senior and top management. In this research the author thoroughly discussing about the effectiveness and the satisfaction of the employees

But the bank is providing some credit facilities for the employees and those cannot be taken in to consideration because each and every employee is getting that benefit after joining the bank. Therefore, the researcher has taken the financial benefits that will be varying among the employees when they are utilizing it.

1.2 Background to the Organization

There are eight State Banks (SB) in Sri Lanka represented for 49% of the total assets of the banking sector. Among these Banking Industry, Bank of Ceylon (BOC) and People's Bank (PB) are the top two largest licensed commercial banks, and consisting with an asset base of Rs 1,193.6 and Rs 926.6 billions, respectively. The National Savings Bank (NSB) is a licensed specialized bank consisting with an asset base of Rs 655 billion and the other five specialized licensed banks, those are as follows,



























- State Mortgage and Investment Bank (SMIB),
- PradeshiyaSanwardena Bank PSB),
- Lankaputra Development Bank (LDB),
- Sri Lanka Savings Bank (SLSB)
- HDFC Bank (HDFC)

Those have an aggregate of Rs 149.2 billion in assets, Out of the total bank network in industry, the state banks accounted for 33% of branches leading to achieve Government's policy of elevating financial accessibility and inclusiveness. The geographic establishment was further extended with state banks consisting a total no of 275 banking outlets and delivery points in 2013, elevating the total branches and outlets to 2,113 in the state banks sector. Bank of Ceylon is the only Sri Lankan bank with an international presence with branches in Chennai, Male, Seychelles and a subsidiary in London. (Ministry of Finance , 2020)

1.3 Justification of the study

As per the image below, it can be seen that there are six banks became the top most valuable brands in Sri Lanka out of ten brands. Also from that, Bank of Ceylon and Peoples Banks be the two top banks. This is because of the reliability and the service. The service depending on the employees in the banks. (Hari Creations (Pvt) Ltd, 2020)

Table 1.1 - Top 100 most valuable Sri Lankan Brands

2020	2019	Logo	Name	Country	2020	2019	2020	2019
1 =	1		Dialog		\$271M	\$335M	AAA	AAA-
2 =	2		Bank of Ceylon		\$266M	\$321M	AA+	AA
3 =	3		People's Bank		\$256M	\$282M	AAA-	AA+
4 =	4		Commercial Bank		\$245M	\$231M	AAA	AA
5 ^	7		Sampath Bank		\$159M	\$160M	AAA-	AA+
6 v	5		NSB		\$156M	\$215M	AA	AA
7 v	6		HNB		\$129M	\$170M	AA	AA+
8 ^	9		Lion Beer		\$120M	\$133M	AA	A
9 v	8		Nestle		\$119M	\$137M	AAA-	AA+
10 ^	11		Keells		\$103M	\$108M	AAA-	AA+
11 ^	12		Cargills Food City					

(Brand Finance , 2020)

State banks are the most stable and most reliable banks in Sri Lanka. They are the one which give more percentage of funds to the Sri Lanka Treasury.

- Bank of Ceylon has paid 4500 million rupees as levy and 346 million rupees as dividends to the Consolidated Fund in 2018.
- Peoples Bank has paid 3200 million rupees as levy and 316 million rupees as dividends to the Consolidated Fund in 2018.
- National Savings Bank (NSB) has paid 500 million rupees as levy and 60 million rupees as dividends to the Consolidated Fund in 2018.

(MINISTRY OF FINANCE, 2018)

State Banks are not giving bonus by looking at their profit. The main target in the state banks are to upgrade the welfare in the country from the profit. Due to that reason, the Ceylon Bank's Employees Union (CBEU) always having arguments with the management to upgrade the allowances of the employees.

In SL, many people choose state banks because of the government security. Also government employee salary is deposited in these banks as well as pension. Therefore, the customer base of these banks are very high and the customers per employee rate is very high comparing to other private institutions. Therefore, treating the customer for their satisfaction is the major challenge in this bank.

Those issue is taken from other banks as competitive advantage. They can easily fulfill this objective, because they have more employees but not customers than state banks. This fact has not been realized the customers and they are always having a negative impact on the state banks.

Also by comparing the financial and non-financial benefits of those institutions is higher than the state banks. In state banks there is no any major non-financial benefits granting to the employees who are achieved the target or gain maximum profit to the bank. Therefore, the customer satisfaction and the employee satisfaction is less than comparing to private sector.

1.4 Problem Identification

State Banks are the most stable banks in Sri Lanka. Most of the people come to do many transactions in these banks. However, most of the client are not satisfy about the service which the government banks are offering. But they are not moving to other banks because of the reliability and the security of the State Banks.

The employees play the major role in an organization for its profitability as well as SBs. In this type of situation it is necessary to take actions to fulfill this objective which is satisfying the employees. Nowadays the satisfaction in many employees depends on their salary scale. Because if there is high salary of any financial institution the employee will make a move to that company. In this scenario the management should focus on the financial stability of the employees first.

In financial industry this type of situation is critical because there can be easily do some fraudulent transactions. To avoid those things the government and the management always give a positive idea about self-stability in financially in each and every employee who works in banking sector or financial sector.

In SBs and the government institutions cannot easily upgrade their salary scale when they are profitable or not. There is a process that they have to follow before they do such thing and that will affect to all other employees in the government as well. Therefore, it is needed to seek any other method to fulfill this objective without considering the salary.

The most suitable way to do that is elevate the non-salary benefits. Mainly SBs have introduced some financial allowance to fulfill employee satisfaction and as the result of it, there is customer satisfaction as well.

There are various types of allowances the SBs are offering to employees. But majority of those is not important and some are categorized as for,

1. Executive management
2. Officers
3. Clerical and allied grades
4. Non Clerical and allied grades such as office assistants and drivers

Therefore, it is not efficient way to allocate funds among them.

1.5 Problem Justification

To be the best among the banking sector as well as the financial sector the SBs should consider the satisfaction of the employees. Because the human resource is the major factor to upgrade the business and make the profit as discussed above. In the Problem Identification section, described the issues of the financial benefits allocation among the employees. But in that process many allowances are not useful for the majority, For instance Entertainment allowance, fuel allowance etc. not useful for the majority those are sometimes mainly affect to top management and the area managers. But in many scenarios the lower level employees have to visit the customers than the top management officers

and also they are not paid the actual expenses as well. But for the pressure from the management they are willing to do that from their own funds.

Therefore, the employees are not satisfy the job and they are always trying to miss their job and try to find short paths to fulfill the targets. So the effectiveness of the work may be low as expected.

Therefore, it is useful to take the allowance which is useful for the majority. Also in the banking industry and other financial institutions there are lot of benefits which are allocated to motivate the employees. Therefore, it can be easily considered the allowance that can be satisfied more employees. Therefore, it is necessary to consider the allowance which is helpful to fulfill the customer expectations as well.

Therefore, it is timely matter to consider in this regard and according that issue the researcher has built the topic to fulfill that target.

This is not coming under SBs. But there are some same issues in Private Banks as well. But it is not like in SBs, PBs are always motivating their employees by giving the freedom by delegating the authority among their employees. Therefore, they can cater better service than SBs. For instance some private commercial banks, the manager has the authority to grant some loans without the recommendation of the higher authority, this will affect the efficiency of the bank and many people have the intention that the Private Banks are more effective than the SBs. This is the best example for that reason.

That is if the bank increases the particular allowance the majority of the employees can be taken it and as a result of that, the service of the bank should elevate and customer satisfaction also should be there.

1.6 Research question

The major objective of this research project can be presented as follows,

- ✦ *What is the best strategy for effective fund allocation on Financial Benefits of the Bank and for Employee Satisfaction?*

1.7 Objectives of the study

General Objective

- To observe the main financial benefits and their effectiveness on employee satisfaction to maximize the profit.

Specific objectives

- ✦ To find the benefits given to employees.
- ✦ To identify the effectiveness of those benefits on employees.
- ✦ To recommend an effective benefits allocation mix to the organization

1.8 Chapter outline

This chapter describes about the implications which the researcher tends to do this type of project. The common issues of the banking sector has clearly mentioned and the outcomes of that issue is discussed. Also the background of the organizations, especially SBs. In problem identification and problem justification sections express the main problems, which the employees are facing, and from employees how it penetrate to the customers also discussed. The solutions which have been given by those institutions to overcome those issues mentioned in this chapter as well. Also by referring this chapter the reader can get the clear understanding about the current situation and how the author is going to investigate the solutions to overcome those issues.

CHAPTER 02

LITERATURE REVIEW

2.1 Introduction to Chapter 02

This Chapter will enable the user to take a clear understanding of the research with the help of previous researches. Also the past researches and the places where those researches can be seen also mentioned in this chapter. The accuracy and the dependency of the data also verified in this chapter, because past researches the researchers have mentioned the ideas of the methodology of same researches. The assistance for this research has been taken from various sources. Such as books, journal articles, Newspapers etc. the main idea of those sources have been summarized in this chapter to get the maximum reliability for this research.

2.2 Effect on Employee and customer satisfaction to maximize profit.

There are three stages of labor dependent organizations. Southwest Airlines is on of that kind of institution. Most of the other companies are same like that. The organization's value created can be described as follows in three stage.

Value Creation

In Southwest, management views the employees taken as heart of the service. In that company the management always looks to fulfill the employee objective as a mean of providing the organization value creation.

Value Conversion

After fulfill the employee's objectives and create the values in the organization the management is responsible to take actions to convert those values which can lead the organization to be the popular trade mark in the market. Also the management is responsible for supervise the workers after creating and converting the values. If the employees are satisfied it is a great advantage to satisfy the customers.

Value Capture

The term Value Capture is coming after the Value conversion. It is consisting suppliers, customers and the stakeholders. In this Southwest Company, they apply low cost positioning technique by making Value Creation for employees. Therefore from the employee satisfaction they can easily capture gain from values.

(Hallowell, 1996)

The article discussed about the service provider's dissatisfaction should be taken in to consideration for the successfulness of the organizations. This is because it connects to the most important outcome for the organization which is the customer satisfaction. Considering the results of this research, it shows there is positive correlation between service provider's service and the customer satisfaction. Also there should be empowerment in the employees which serve the customers.

The empowerment can be done in many steps. Providing high salary is one method but there are many other ways than increasing salary. The organization can provide training programs. Because of the empowerment the employees can face any problem come to the day to day work. Also by satisfying, the employees treat the customers in a pleasant manner. Before implementing the empowerment programmes the organization should look at how the employee is satisfying. Also this article describe that the over empowerment of employees also affect badly in treating customers because if more power comes to the employees they may reject the customers and they treat some selected customers only.

(Yagil, 2006)

2.3 Game Theory applied for similar research

1. The analysis based on Game theory based on duopoly market to make decisions.

Given below are the reasons that game theory used for the market

- I. This theory will help and give the usefulness of strategic interaction of enterprises in this type of markets.

II. Game theory assist to provide the mathematical view and special features of the organization's behavior in this type of market competition versus forming and maintaining, the advantages and disadvantages of the industry occurred in product differentiation

III. The Theory present the relationship between the performance and the chosen strategy. This will assist to compare and make the conclusion in this regard

Arguments above made in game theory, it is practical application contains doubtful because of the given major fact,

The certain assumption, have to be done in practical scenarios to apply the game theory, therefore, its accuracy should be considered very carefully. (*Romualdas Ginevičius, 2008*)

2. Game theory used for find the corruption survey. The theory is performed on effectively to find the best solution and make the decision how the corruption people react. This is based on bribery commission and the company. They tried to find the corrupted people by giving some questions and answer those questions. It is some kind of simple model which is presented that bribery might be dominant strategy. Also this a same approach like prisoner's dilemma type of situation. Also it is difficult to predict the winning party but this has taken various parameters like legal remedies. This paper then reviews the principal general equilibrium effects and concludes that their likely effect on economic development is negative (*MACRAE", 1982*)

3. In this article, they discussed about the Final Offer Arbitration game (FOA). Which is explaining that the decision making process will give both parties to negotiate and come to a conclusion. This is one of the best way to find the solution in any issues

Table 2.1 - Perception of risks by private investors of transport infrastructure investments in Latin America

Perception of risks by private investors of transport infrastructure investments in Latin America (percentage of respondents)			
Risk	Very important	Fairly important	Not important
Inconvertibility/ transferability	93	7	0
War	72	26	2
Expropriation	54	32	15

Also the article described, how the private and the public transportation systems mitigated their risk factor by using the game theory. This game also have the options to the private sector to make the decision. The public sector has introduced some strategies, those elements are given in the table above and the three strategies which the private sector also used has given in the aforesaid table above. By considering those strategies and the payoff values it can be seen that they had made an assumption that priority will be given to the player 2 and as the result of that the payoff values have been taken according to the consideration of private sector. Therefore, in FOA games, it can be clearly seen that the negotiation must have to do and the realistic values must be presented in other party. (*Medda, 2007*)

4. In this article, it can be clearly seen that the Game theory analysis assisted them to be profitable. They are describing that the first years of twenty first century, The Europium Football clubs faces a problems in financially. This is because the leagues should hire the best players and the players should give their maximum strength to win the clubs. But if they lose, the club management also loses their profit. The following table indicates that

the profit divided between 2000 to 2010. In this situation many leagues have lost their profit.

Table 2.2 - Operating profit/loss per club

	Operating profit/loss per club (€-million)						
	01-02	02-03	03-04	04-05	05-06	06-07	07-08
England: Premier League*	6.5	8.9	11.1	12.0	10.0	7.1	11.7
England: Championship*	-0.9	-4.7	-2.2	-2.6	-3.2	-4.6	-5.4
Germany	5.6	7.7	4.9	10.2	4.6	13.9	7.6
France	-5.4	-3.1	-5.1	-0.8	1.9	1.2	-4.2
Italy	-22.4	-14.7	-13.0	0.1	-0.1	-2.0	-3.3

In this scenario, the author has introduces a mathematical way to look at the other teams and select players. The author used the game theory for that findings. He has taken each and every player's salary or allowance for each league as payoff values and find the most suitable player for each club. Also it should have mentioned that the author has made some realistic assumptions to fulfill this objectives. (Solberg, 2010)

CHAPTER 03

RESEARCH METHODOLOGY

3.1 Introduction to Chapter 03

This part of the research will discuss the methodology of the research and the strategies that the player one and the player two have introduced. The attributes and the purpose of the findings could be understood by referring the conceptual frame work of the project. Also by referring this section, it can be easily understand the importance of the “Game Theory” which can be applied for day to day activities. The questions also made by referring the bank documents and specially the payment circulars. Also the selection of the sample and the size will discuss toughly in this section. The equation which should refer to answer the questions also included in this section to avoid the complexity of this research and minimize the effort of understanding this.

3.2 Research Methodology

In this section, it is clearly explained that method of completing the research. Also it is mention that the allowances provided by the employer and the satisfaction level of the employees for those allowances. The satisfaction of the employees is varying according to the duties which they are assigned. Therefore each and every allowances have different impact to each employee. To find the satisfaction of the employees, several closed questions were asked from the employees who work in state banks without doing any hesitation to them as well as to their job.

The questions have been made referring the non-salary benefit circulars and that would directly affect to the reliability of the research. As player one, the banks will introduced many allowances to satisfy their own employees but in this research there are main benefits have been taken as player one strategies. Also this has taken because other benefits are claimed by some particular groups. The satisfaction is a mental process of the human, but in this case the employee should scientifically must argue with themselves to find the best allowance mix they should get. Therefore, no one can simply answer the

question without knowing the present value and the future value equation. This data can be collected and after that the data can be analyzed by using some applications.

The state banks are providing various types of allowances to satisfy the employees. In this research it has been taken only the allowances which have been allocated to the officer grades and above employees. The minor staff has been omitted as they are willing to get the OT allowances than this and also some of the officer graded allowances are not allocation for them. Also these allowances which will discuss bellow is directly affect to the bank profitability as well.

Medical Allowance, Difficult Station, Key Holding, Disturbance and Cash loading are them.

The summary of these can be incorporate in to a cross tabulation table as shown.

Table 3.1- Pay off values indicator

		Opponent		
		Decision 1	Decision 2	Decision 3
Player	Strategy 1	a_{11}	a_{12}	a_{13}
	Strategy 2	a_{21}	a_{22}	a_{23}
	Strategy 3	a_{31}	a_{32}	a_{33}
	Strategy 4	a_{41}	a_{42}	a_{43}

Main assumption in this methodology is that this is a zero sum game. The benefit that the player 1 makes is equal to the loss of the opponent. In another way that the benefit that the admin of the banks or the employer earn is equivalent to the loss of the employee. The value is measured in a lickert scale and weights are given.

Assumed that there are no saddle points. Therefore, in the long run decision were mixed and used the mixed strategy to find the ultimate value of the game.

Assume the probability of the Strategies are $P_1, P_2, P_3, \dots, P_n$

Where $\sum P_i = 1$

If the opponent decide on Decision 1 the expected game received by player

is $a_{11}P_1 + a_{21}P_2 + a_{31}P_3 + a_{41}P_4 + a_{51}P_5$

Assume the optimal value V of P_1, P_2, P_3, P_4, P_5

That would maximize the worst gain received the Opponents Decision Therefore, the above problem could be developed as a linear programming problem as follows, Max V

$$a_{11} P_1 + a_{21} P_2 + a_{31} P_3 + a_{41} P_4 + a_{51} P_5 \geq V$$

$$a_{12} P_1 + a_{22} P_2 + a_{32} P_3 + a_{42} P_4 + a_{52} P_5 \geq V$$

$$a_{13} P_1 + a_{23} P_2 + a_{33} P_3 + a_{43} P_4 + a_{53} P_5 \geq V$$

$$a_{13} P_1 + a_{23} P_2 + a_{33} P_3 + a_{43} P_4 + a_{53} P_5 \geq V$$

$$a_{13} P_1 + a_{23} P_2 + a_{33} P_3 + a_{43} P_4 + a_{53} P_5 \geq V$$

$$P_1 + P_2 + P_3 + P_4 + P_5 = 1$$

$$P_i \geq 0$$

V value can be found in Linear Programming. Therefore, it can be easily find

P_1, P_2, P_3, P_4 & P_5 values.

3.3 Conceptual framework

This part of the section will discuss about the variables and the main strategies which have taken for this research. Also how the strategies represent the variables and how the research will continue. The entire research has been constructed by referring this frame work or the conceptual frame work. As player one bank introduced some financial allowances to maximize the profit as well as maximize the employee satisfaction. But the allocation mix should have to be an effective manner to fulfill the objective. To observe

the satisfaction of the employees and the effectiveness it should be calculate the probabilities and make recommendations. In this conceptual frame work will assist to understand the real methodology of this research

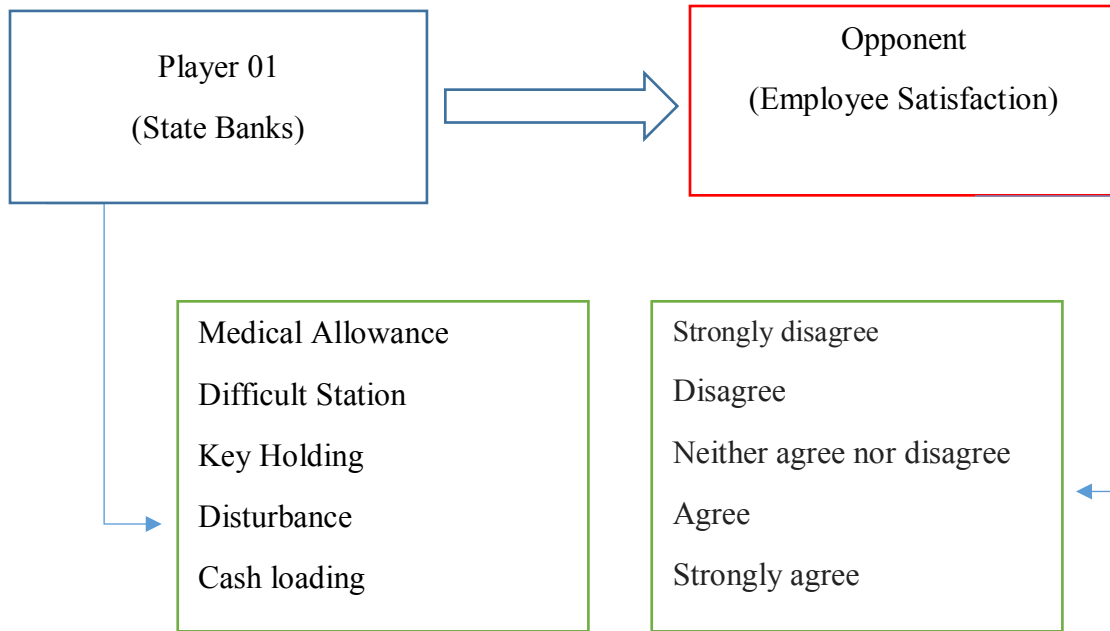


Figure 3.1 Conceptual Frame work

According to the framework, there are five main strategies which have been identified as main strategies that the bank will use to satisfy the employees. Also the employee's perspective there are five strategies that they will introduced to react with the Bank disabilities. The question have been made and those questions are consisting the increments of these strategies. Therefore, the employee should well aware of the future Value of the increments as well as the requirements of these allowances to their lives. The employees can be answered the questions with the help of satisfaction limits.

Assumption

In any organization employees are the main factor of the organization to make profits or bankrupt. Therefore, in the research the employees are prioritized and employees

perspective taken as pay-off values. This is a realistic assumption because; the company can offer various types of benefits for their employees, and also the employee should like it to utilize. If not it is not useful for the company as well as the employee. That is the reason this game described as zero sum game and therefore, the maximum gain of one party would be the maximum lost of the other party.

The main questions which are answered by the employees mentioned as follows.

Select the most appropriate answer

Please use the Likert Scale and rank your preference.

Rank 5 – Highest preference

Rank 1 – Lowest preference

Employee cannot select the same rank twice.

Table 3.2 – Questions asked from the employees

No	Question	“√” According to the scale				
		Strongly Disagree Rank 01	Disagree Rank 02	Neutral Rank 03	Agree Rank 04	Strongly Agree Rank 05
X₁	The most important Allowance is Medical expenses, to allocate more funds.					
X₂	The most critical Allowance type is Difficult station, to increase more funds.					
X₃	The most important Allowance is Key holding, to allocate more funds.					
X₄	The most critical allowance type is Disturbance Allowance, to increase more funds.					

X ₅	The most important allowance is Cash Loading allowance to allocate more funds.					
----------------	--	--	--	--	--	--

In this scale the members of the sample will get a chance to answer the questions as their desirable levels.

3.4 Role of the researcher

The person must be an independent person and must know the real situation of the organization. Also the information gather from the institution should be accurate and reliable. If the person is an employee of that organization will be advantage for the collection of data. Also the information may consisting with some confidential data. Therefore, the researcher should responsible to maintain the confidentiality of those. But in this data of research the data is taken from the employees and its depending on the satisfaction of the employees. The ambition of this research to give realistic situation of the organization and introduce the recommendations to overcome those issues.

3.5 Research Design

The research design is created to fulfill the research objectives of the project. There are two main players identified. From the data and the information gathered from the organization it can be seen that Bank and employees are have some conflictions because of the allowances. But still there is no any proper way to identify the Benefits or allowance allocation method to divide those in effective manner. The researcher has chosen a theory called “Game Theory” to fulfill that objective. Also from “Linear Programming” method also taken to do the calculation and Analysis parts of the project. To take the values for these mechanisms the questions will be asked and allocate the marks according to the answers.

3.6 Population

This project is based on the allowances and the satisfaction limits of the employees, and the employees are selected among state banks. Considering the population, it can be identified there are more than 25000 employees work as officers and as clerical grades in all state banks. According to that it is useful to take a large possible sample. Also this should be compatible to every employees excluding minor staff. Therefore, it is needed to select to appropriate methodology collect the data from the employees.

The basic method to collect the data through emails and face to face discussions. Because as an employee in a bank it is easy to access the internal email systems and collect the data, also by going to other banks and through friends the data can be collected and the reliability of the data is high.

3.7 Sample and sample technique

The success of this research will clearly depending on the selection of the sample. As per the population it can be identified there are more than 25000 employees working in all state banks. And by insertion these data in to sample calculator and can be determine as 378. To determine the sample size it has been taken the population as 25000 and the confidence intervals as 95%. Also the confidence level taken as 5. According to those data the variables inserted in to the sample calculator and can be find the sample size which is compatible for this research.

Determine Sample Size

Confidence Level: 95% 99%

Confidence Interval:

Population:

Sample size needed:

Sample Size Calculator Terms: Confidence Interval & Confidence Level

The **confidence interval** (also called margin of error) is the plus-or-minus figure usually reported in newspaper or television opinion poll results. For example, if you use a confidence interval of 4 and 47% percent of your sample picks an answer you can be "sure" that if you had asked the question of the entire relevant population between 43% (47-4) and 51% (47+4) would have picked that answer.

The **confidence level** tells you how sure you can be. It is expressed as a percentage and represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The 95% confidence level means you can be 95% certain; the 99% confidence level means you can be 99% certain. Most researchers use the 95% confidence level.

Figure 3.2 – Sample Calculator
(Creative Research Systems, 2012)

3.8 Data Types

3.8.1 Collection of primary data

3.8.1.1 Method of questioner

The research is consisted of two types of questioner techniques,

- Five point Likert Scale – Which allocates marks from 1 to 5. From (1) it indicates strongly disagree and from (5) it says strongly agree This method has been recommended to find the satisfaction levels.

- Closed questions – This type of questions are consisted of two answers. That is

“Yes” or “No”. These types of questions assist to get the direct answers for particular questions. Those questions are mentioned at the end of this research.

Those are the two questioner techniques to find the best funds allocation mix for the allowances.

3.8.1.2 Questionnaire Design

There are five main allowance which have been identified and from those questions the whole research will continued. Also these questions are very easy to answered and the time should allocate to answer is very less. These questions are based on the officers and clerical grades, and not the minor staff.

3.8.2 Collection of Secondary data

After collection the primary data from questioner survey, the secondary data should be observe to continue the research as well as to convert the data to information. As to find the secondary data the researcher used some circulars in the bank.

Given below a table to explain how the data (primary and secondary) be collected

Table 3.3: collection of data

	Data can be collected	Target	Data can be applied
Primary Data	•Questionnaire e Survey	To find the satisfaction levels	In Likert Scale and get the total marks.
		To find the general information	In to the tables and graphs to prove the accuracy.

Secondary	•Circulars in the Organization.	To find the funds allocation for the employees and the allowances types.	To apply the statistical theories
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3.9 The procedure of data collection

The survey was done to collect the data regarding the satisfaction levels. This survey was done by using the email facility and the in the bank to collect the data from the internal employees in the bank and smart phone to send the emails outside of the bank, as well as watsapp and Viber applications also taken to gather the information.

3.10 Data analytical and presentation

3.10.1 Data Analysis

To fulfill the analytical part of the research, the data should be arranged. The primary and secondary data have been arranged by looking at the satisfaction limits of the employees. The data entered in to a Ex-cel Sheet to calculate the marks. Also this process have been done till the end of the questioner survey part. Before apply those to the statistical theories there are some parts to fulfill.

To find the effectiveness on employee satisfaction, it can be used any Linear programming software and also to find the game theory solutions such as TORA. And if not it can be done by manually of Game theory. Also, there is much software are available for Android phones to find the values.

To allocate the marks and do the Game theory calculations Likert Scale method used.

3.11 Presenting of Data

The finalized data was presented in Tables, Figures, Bar Charts, Graphs and Diagrams. This part of the research had been done by using the MS. Excel and MS. Excel Solver.

3.12 Reliability of Data

3.12.1 Limitations of the Research

- The work was done by using 378 bank employees who are working in different branches in different areas and various state banks in the country. *The number of employees have been calculated through the system also by considering the time frame and the sample size.*
- The allowances which are effected on the employee satisfaction are chosen by referring circulars.
- Main ambition is to observe the effectiveness on employee satisfaction, from the allowances which the bank offers to the employees for specific works
- These questions have given to the employees who are in clerical and officer grades
- Among some allowances the researcher has chosen some basic factors to calculate the effectiveness, because those can be taken as major allowances that is useful for employees.

3.12.2 Reliability of the Research

This project is based on the allowances that effect on employee satisfaction as well as to maximize the profit of the bank. The reliability of the allowance can be ensure because those had been taken by considering the bank circulars. Also the answers which had been collected among the employees can be ensured that they are knowledgeable. All work was done according to the research purpose.

3.12.3 Validity of the Research

The primary and secondary data collect from the bank and the bank officials. The accuracy and the reliability of the data is very high in this research and the validity of this project also very high. By considering the results and the values come after the calculations will assist the bank to upgrade the profit and the employee satisfaction.

3.12.4 Ethical View of the Research

These data collected from the institution and the employees will not be questioned for any other purpose. Some data which was collected from the institution is highly confidential and employees who helped to fulfill this task is not publishing under any circumstances. Also, the details of the employees who participate for this research are also not disclosing under any circumstances.

3.13 Chapter outline

This chapter discussed thoroughly about the methodology of this research and the data. Also chapter assist the reader to identify the method of this project very thoroughly, and also the main ambition of this work and how the researcher trying to fulfill the objectives of the research. By observing the conceptual frame work the reader can easily understand the work flow of this whole project. The information of the collection of data and the analytical parts also mentioned in this section. The sampling techniques and the preparation of questions as well as the theories also described in this chapter.

CHAPTER 04

DATA ANALYSIS AND PRESENTATION

4.1 Introduction of Chapter 04

This Chapter will express the deep mathematical analysis with the answers provided by the employees. Also the graphical view of the data and the method of the analysis is presented in this chapter. The game theory and the linear programming method also clearly explained in this chapter very clearly in this section. Also by referring the data analysis part, the reader could easily understand the accuracy of this research and the logic which the researcher used to fulfill the objectives of this research.

4.2 Analyzing the data

4.2.1 Findings through Research

The information of the sample, which is consisting of the working place (Bank name), age group, and the position details the bank etc. The satisfied levels also mentioned in this chapter in graphical and tables to get the clear picture of the current situation in the bank.

4.2.1.1 Presenting the Employee's Identification Data

The employee's personal data in the selected sample, such as age, gender, occupation and the level of education which have been collected through the survey is consisted in this part. According to the answers the graphs are designed. The main objective of this part is to get the clear identification of the sample and present that the selected sample is compatible to do the research.

4.2.1.2 Analyzing the gender of the respondents

Table 4.1 Gender Distribution

Gender	No of Participants
<i>Male</i>	173
<i>Female</i>	205
<i>Total</i>	378

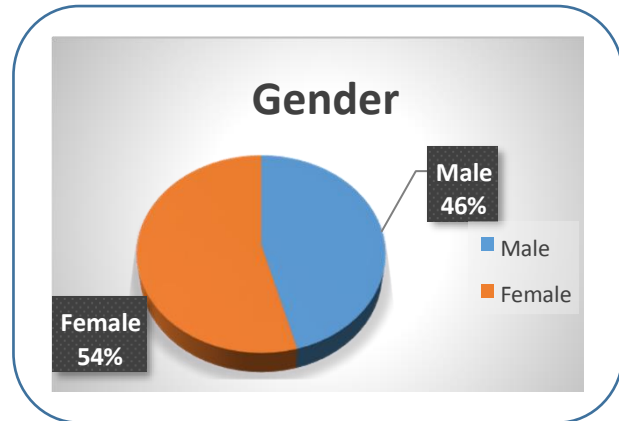


Figure 4.1 - Gender Distribution

By referring the above graph and table, it can be clearly identify that there is 54% females (205 Females) and 46% males (173 Males) in the selected sample. This is because, considering the population and gender distribution in the banking sector, the female percentage is higher than the Male percentage.

4.2.1.3 Age distribution of the employees

Table 4.2 – Age Distribution

Age	No of participants
25-35	91
36- 45	114
46- 55	97
56- 60	76
<i>Total</i>	378

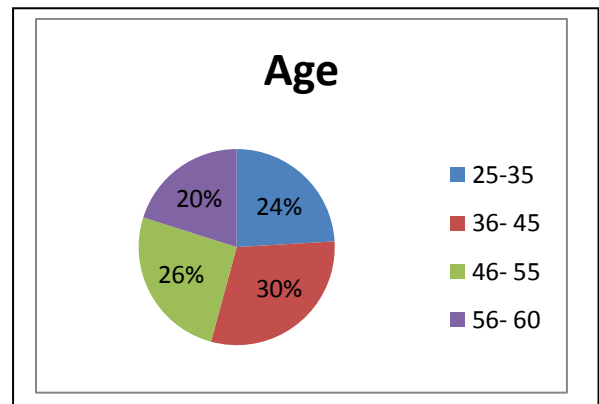


Figure 4.2 - Age Distribution

By referring the above graph and table, it can be clearly identify that there is 24% of age between 25-35 (91 employees) , 30% of age between 36-45 (114 employees), 26% of age between 46-55 (97 employees) and 20% of age between 56-60 (76 employees)in the selected sample. This is because, considering the population and age distribution in the banking sector, the age between 36– 45 are large.

4.2.1.4 Designation of the respondents

Table 4.3 - Designation Distribution

Designation	No of Participants	Percentage %
Junior Executive Officer	117	30.95
Executive Officer	93	24.60
Assistant Manager	74	19.57
Manager	51	13.49
Senior Manager	32	8.4
Chief Manager	11	2.9
Total	378	

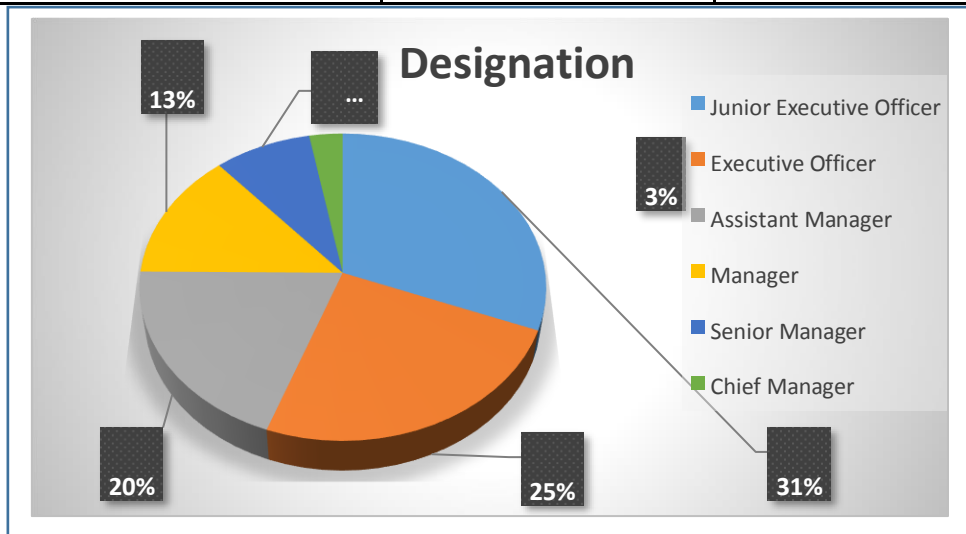


Figure 4.3 - Designation Distribution

The above table and the graph indicates about the designation distribution of the given sample. This type of distribution indicated the realistic distribution of the SBs. Because there are many junior Executives in SBs, this happens because there are two recruitment paths in state banks. One is recruiting the staff who has completed A/Ls and other type is, recruiting after the completion of the degree. But the first method, they are recruiting over 1000 members at a time. Therefore, in the promotion period many staff can promote as Junior Executives. That is the reason why the junior executives are more. Accordingly all other grades are varying. Especially there are lesser amount of Chief Managers, because those vacancies are very low and it will occur when the top management or the executive management personal is retired or diseased.

4.2.1.5 Educational background of the respondents

Table 4.4 - Educational background Distribution

Educational Level	No of Participants
<i>Up to Advanced Level</i>	49
<i>Degree Level</i>	232
<i>Master Level</i>	58
<i>Advanced Level with Professional qualifications</i>	39
<i>Total</i>	378

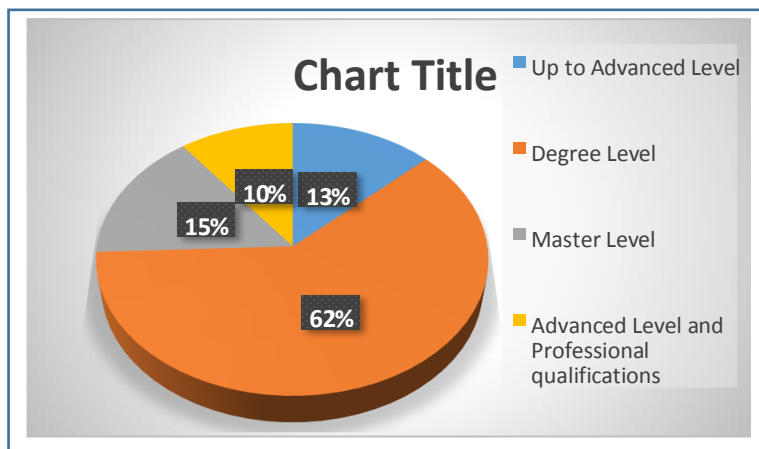


Figure 4.4- Educational background Distribution

In this table and the graph it can be clearly seen that the education level of the employees and the distribution of that. By referring the graph it can be seen that the degree level employees are more than the others, this is because most of the employees are starting to do a degree in externally, with doing a job. Most of them are telling it is worth than to do a degree without doing any job. Therefore, they can easily earn the experience and the degree at the same time.

4.2.2 Data analyzing : section B

This section express the satisfaction limits of the employees in graphical way to understand the reader. Also by considering the table and the graph, the reader can understand how the employees are concerning their financial benefits according to their job role. This information has been gathered through a reliable questioner survey and the structure of this survey clearly mentioned in the conceptual frame work.

4.2.3 Summary of the responses for section B

4.2.3.1 Medical Allowance

Table 4.5: Employee desirable limits for medical allowance

Satisfaction Limit	Amount
Strongly disagree	123
Disagree	83
Neither agree nor disagree	102
Agree	28
Strongly agree	42

According to the above diagram it can be clearly seen that 123 employees are Strongly disagree for upgrading the medical allowance limit, this is because many employees couldn't utilize total medical allowances in each and every year. Therefore after end of the year the outstanding balance of the medical allowance transfer to General ledger account.

4.2.3.2 Difficult Station

Table 4.6: Employee desirable limits for Difficult station Allowance

Satisfaction Limit	Amount
Strongly disagree	102
Disagree	107
Neither agree nor disagree	52
Agree	92
Strongly agree	25

As per the table and the graph it can be clearly seen that many employees are not satisfying about this allowance, this is because many employees are in SBs are female. Therefore they are not like to go in outstation areas if the allowance is increased. But male employees are like that, those can be seen in the graph as well (92+25=117).

4.2.3.3 Key Holding

Table 4.7: Employee desirable limits for Key Holding Allowance

Satisfaction Limit	Amount
Strongly disagree	24
Disagree	30
Neither agree nor disagree	103
Agree	158
Strongly agree	63

By considering the above graph it can be seen that the many employees are agree to increase this key holding allowance. This is because there is no additional work has to be done to receive this allowance. Also there is always dual control system established in banking sector. Therefore the responsibility also divided in to two and the risk also mitigated. But many senior managers and the Chief mangers are not taking this allowance because the keys are taking by managers and below grades traditionally.

4.2.3.4 Disturbance

Table 4.8: Employee desirable limits for Disturbance Allowance

Satisfaction Limit	Amount
Strongly disagree	91
Disagree	88
Neither agree nor disagree	63
Agree	74
Strongly agree	62

Above graph also indicates that the most of the employees are dissatisfied with the disturbance allowance. This is because most of the employees are not willing to come in early morning and return after late night. This type of allowance is useful for the employees who are unmarried and the family commitments are less. But most of the employees are engaged with family matters and if they like to increase, they have to consider about the family matters. Most of the agreed people are young employees and they like to come to the bank early in the morning.

4.2.3.5 Cash loading

Table 4.9: Employee desirable limits for Cash loading Allowance

Satisfaction Limit	Amount
Strongly disagree	37
Disagree	59
Neither agree nor disagree	62
Agree	142
Strongly agree	78

By considering the above table and the graph, it can be clearly seen that the cash loading allowance is having 142 agreed employees and 78 strongly agreed employees. The total is 220. Therefore, it can be understood that many employees are willing to upgrade the cash loading allowance. This is because, the responsibility and the risk is very less and if they increase the allowance, especially in festive seasons the officers who are responsible for this can earn much money. This is because in festive seasons the customers are withdrawing their money from the banks to buy goods and always there should be the officers to fill the ATMs.

4.2.3.5 Summery of the responds

Table 4.10: Summery of the responds

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Total
Medical Allowance	123	83	102	28	42	378
Difficult Station	102	107	52	92	25	378
Key Holding	24	30	103	158	63	378
Disturbance	91	88	63	74	62	378
Cash loading	37	59	62	142	78	378

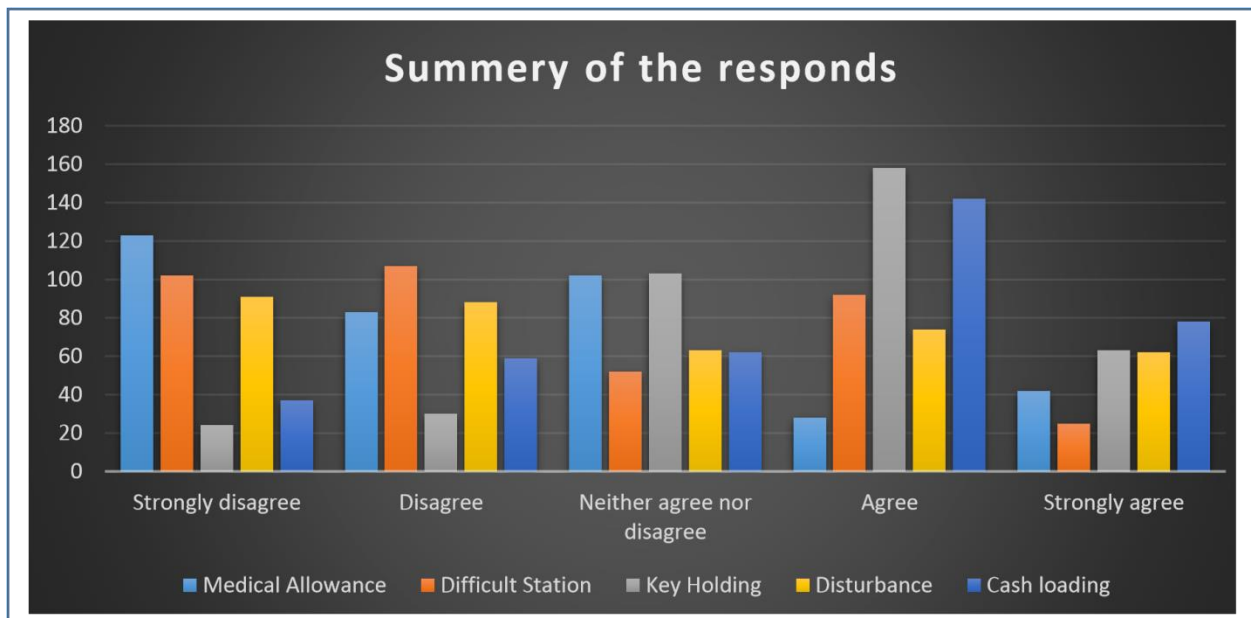


Figure 4.5: Summery of the responds

Considering the above graph which indicates all allowances and the satisfaction levels in the separate graph, it can be seen that key holding allowance having the higher number of value that tells that the employees are agreeing for that. But the issue is to calculate how much funds should be allocate for this with the consideration of each employee to maximize the profit and maximize the customer satisfaction. To fulfill that objective the author has used the “**Game theory**” with “**Linear Programming**” method to find the best funds allocation mix for this type of problem.

4.2.4 Values according to Likert scale

Considering the table no 4.10, it can be seen that the total number of the satisfaction levels of the employees. Therefore, it is needed to apply the Likert Scale values in to the table to make the calculation.

Table 4.11: Summery of the responses with given weights/Likert Scale values

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Medical Allowance	123*1=123	83* 2=166	102*3=306	28*4=112	42*5=210
Difficult Station	102*1=102	107*2=214	52*3=156	92*4=368	25*5=125
Key Holding	24*1 =24	30*2=60	103*3=309	158*4=632	63*5=315
Disturbance	91*1=91	88*2=176	63*3=189	74*4=296	62*5=310
Cash loading	37* 1=37	59* 2=118	62*3=186	142*4=568	78*5=390

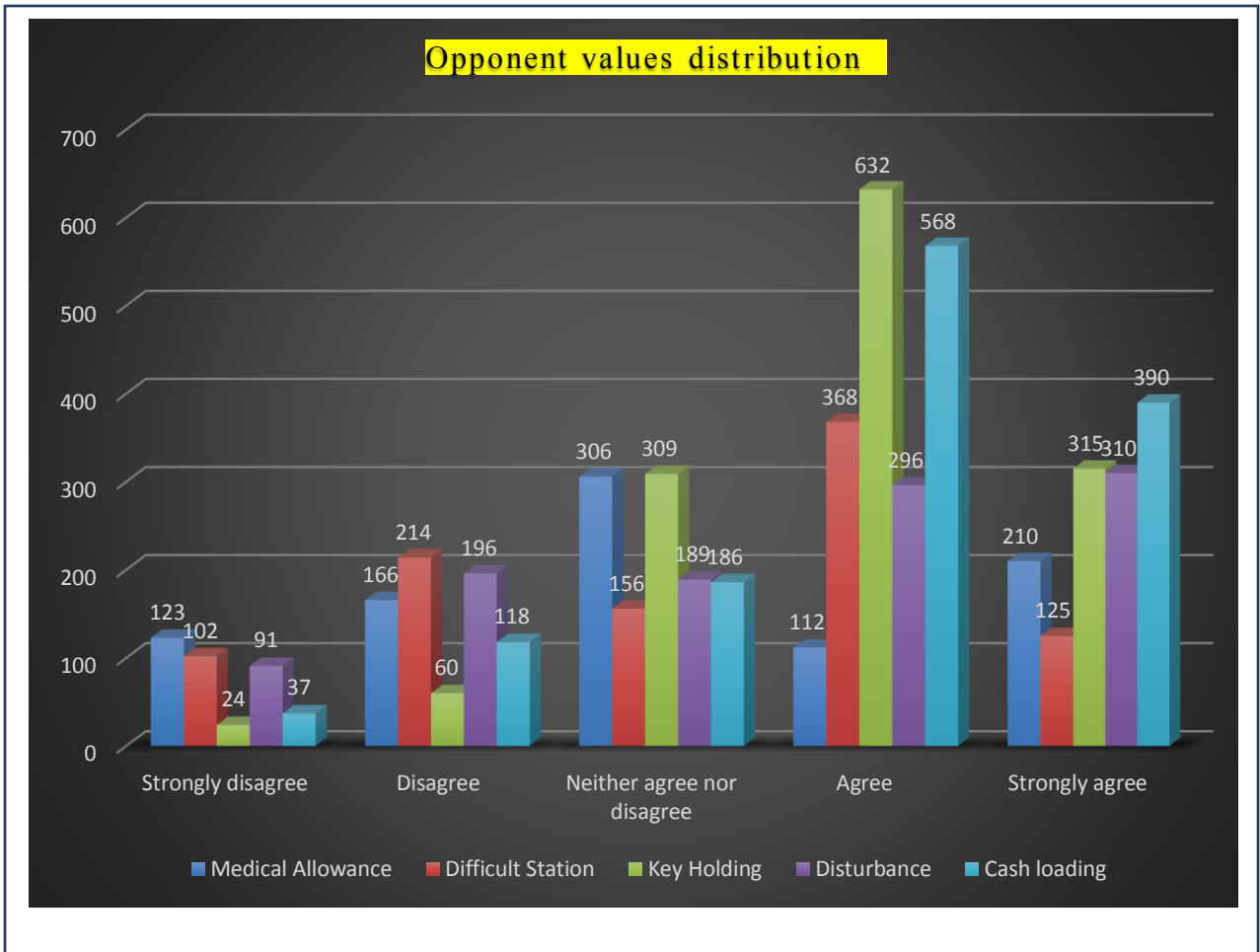


Figure 4.6: Summary of the graph after applying the LS responses

4.3 Game Theory application

4.3.1 Method of finding the strategy

According to the values obtained by doing the calculation considering the LS values, it can be seen that, there is no any pure solution for this game. Therefore, the author has taken the “Minimax” and “Maximin” principles to fulfill the objectives.

Table 4.12: values obtained to check the strategy which is going to be used.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Minimum Raw Value	Maximum
Medical Allowance (P1)	123	166	306	112	210	112	112
Difficult Station (P2)	102	214	156	368	125	102	
Key Holding(P3)	24	60	309	632	315	24	
Disturbance (P4)	91	176	189	296	310	91	
Cash loading (P5)	37	118	186	568	390	37	
Maximum Column Value	123	214	309	632	390		
Minimum	123						

Raw Min, Value = {112, 102, 24, 91, 37}

Max = 112

Column Max, Value = {123, 214, 309, 632, 390}

Min = 123

Therefore,

Maximin Value \neq Minimax Value

Value of the game lies between 112 and 123

To find the effective way to allocate funds among these benefits, it is needed to assign probabilities for that. Therefore, the author has used Linear Programming technique to solve the question

4.3.3 Calculation in Linear Programming

Expected Payoff for Player 01, When Player 02 Choose, Strongly Disagree (SD), Disagree (D), neither agree nor disagree (AD), Agree (A), Strongly Agree (SA)

Objective Functions : Max V

$$E_1 (SD) = 123 P_1 + 102 P_2 + 24 P_3 + 91 P_4 + 37 P_5 \geq V \text{ -----(i)}$$

$$E_2 (D) = 166P_1 + 214P_2 + 60P_3 + 176 P_4 + 118P_5 \geq V \text{ -----(ii)}$$

$$E_3 (AD) = 306P_1 + 156P_2 + 309P_3 + 189 P_4 + 186P_5 \geq V \text{ -----(iii)}$$

$$E_4 (A) = 112P_1 + 368P_2 + 632P_3 + 296 P_4 + 568P_5 \geq V \text{ -----(iv)}$$

$$E_5 (SA) = 210P_1 + 125P_2 + 315P_3 + 310 P_4 + 390P_5 \geq V \text{ -----(v)}$$

Assume that the minimum value of game = V

And, $V > 0$

Subject to, $P_1 + P_2 + P_3 + P_4 + P_5 = 1$

Expected pay-off equations,

- (i) Expected Payoff for Player 01, When Player 02 Choose, Strongly Disagree (SD)
- (ii) Expected Payoff for Player 01, When Player 02 Choose, Disagree (D)
- (iii) Expected Payoff for Player 01, When Player 02 Choose, neither agree nor disagree (AD)
- (iv) Expected Payoff for Player 01, When Player 02 Choose, Agree (A),
- (v) Expected Payoff for Player 01, When Player 02 Choose, Strongly Agree (A),

To apply these values in to Linear programming model,

$$\begin{aligned} \text{Minimum, } Z &= X_1 + X_2 + X_3 + X_4 + X_5 \\ &= 1 / V \end{aligned}$$

The above Linear programming problem was solved using the Excel Solver and shows the relevant spread sheet

	A	B	C	D	E	F	G	H	I
1		X1	X2	X3	X4	X5	V		
2	variables								
3									
4									
5	obj function	0							
6									
7	s.to	123	102	24	91	37	0	>=	0
8		166	214	60	176	118	0	>=	0
9		306	156	309	189	186	0	>=	0
10		112	368	632	296	568	0	>=	0
11		210	125	315	310	390	0	>=	0
12		1	1	1	1	1	0	=	1
13									

Figure 4.7: Values entered in to the Excel Solver

When it was solved the following results were obtained

	A	B	C	D	E	F	G	H	I
1		X1	X2	X3	X4	X5	V		
2	variables	0.96	0.04	0	0	0	122.2		
3									
4									
5	obj function	122.2							
6									
7	s.to	123	102	24	91	37	122.2	>=	122.2
8		166	214	60	176	118	167.9	>=	122.2
9		306	156	309	189	186	300	>=	122.2
10		112	368	632	296	568	122.2	>=	122.2
11		210	125	315	310	390	206.6	>=	122.2
12		1	1	1	1	1	1	=	1
13									

Figure 4.8: Values obtained from the Excel Solver

Further, the relevant sensitivity output sheet and answer sheets are provided below

Objective Cell (Max)			
Cell	Name	Original Value	Final Value
\$B\$5	obj function X1	122.166065	122.166065

Variable Cells				
Cell	Name	Original Value	Final Value	Integer
\$B\$2	variables X1	0.960288809	0.960288809	Contin
\$C\$2	variables X2	0.039711191	0.039711191	Contin
\$D\$2	variables X3	0	0	Contin
\$E\$2	variables X4	0	0	Contin
\$F\$2	variables X5	0	0	Contin
\$G\$2	variables V	122.166065	122.166065	Contin

Figure 4.9: Sensitivity output sheet from the Excel Solver

Variable Cells							
Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease	
\$B\$2	variables X1	0.960288809	0	0	42.1754386		
\$C\$2	variables X2	0.039711191	0	0	21	20.0370	
\$D\$2	variables X3	0	-52.07220217	0	52.07220217		1
\$E\$2	variables X4	0	-15.62454874	0	15.62454874		1
\$F\$2	variables X5	0	-44.90974729	0	44.90974729		1
\$G\$2	variables V	122.166065	0	1	1E+30		

Constraints						
Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
\$G\$12	V	1	122.166065	1	1E+30	
\$G\$7	s.to V	122.166065	-0.924187726	0	11	60.9134
\$G\$8	V	167.9061372	0	0	45.7400722	1
\$G\$9	V	300.0433213	0	0	177.8772563	1
\$G\$10	V	122.166065	-0.075812274	0	266	
\$G\$11	V	206.6245487	0	0	84.45848375	1

Figure 4.10: Detailed sensitivity output sheet from the Excel Solver

From those values given in the output sheet, the value of the game is 122.166

Also the probabilities of the decision 1 is 96.02% and decision 2 should be played 3.97% in the long run to achieve the maximum benefit of the game to player 1. Therefore we can presume that the total fund that has been allocated for employee benefit, 96.02 % of the total fund should be allocated to medical benefits and the rest of the fund should be allocated to Difficult Station.

Accordingly, from X_1 and X_2 Values together with V value it can be found P_1 and P_2 Values

$$P_1 = 96\%$$

$$P_2 = 3.9\%$$

$$P_3 = 0\%$$

$$P_4 = 0 \%$$

$$P_5 = 0 \%$$

As per the above values, the total value of the probabilities should equal to one. i.e.

$$P_1 + P_2 + P_3 + P_4 + P_5 = 1$$

Therefore the total Linear programming values also equal to one

$$(0.96028891 + 0.03971109 = 1)$$

CHAPTER 05

CONCLUSION AND RECCOMENDATION

5.1 Introduction to Chapter 05

This Chapter elaborates the realistic recommendations and the practical suggestions of the research. Also by referring this chapter the reader can get the clear image of the problem identification. The chapter also discusses about the objectives and provides a clear description about the research. The research question and the possible solutions with the mathematical values also include in this chapter and with the mathematical values, the researcher has introduced possible recommendations. Therefore, the reliability is high in this research and all those descriptions have been included in this chapter.

5.2 Conclusion

This research work is based on observing the relationship between the Effectiveness of Financial Benefits Allocation and the Employee satisfaction. Thereby the researcher gathered data from the employees who are working in state banks. This is based on state banks employees. The researcher has made questions based on the financial benefits allocation among the employees. According to the sample calculator, the random sample size has been realized to 378. The age diversification and the other personal information mentioned in graphical way to realize the reliability and accuracy of this work.

The researcher has recognized the competitive advantages of the benefits which have been allocated to employees. Also recognized the effectiveness of those benefits by conducting the questioner survey. Thus, it was observed that some of the benefits are not effect to increase the performance of the employees. Therefore, the researcher has mentioned the basic allowances types, which can be applied for any group in the bank. Some benefits i.e. entertaining allowance, fuel allowance and Driver Allowance etc. are not taken to these observations because it is not needed for every grade.

By referring the conceptual frame work (Figure 3.1) is describing the valuable benefits, which are given to the employees and how the researcher delegated the authority to the

employees to make decisions. In literature review section no 2.3 is discussing about the possible methods that have been used in similar types of researches. Also by referring literature review, Chapter 2, it can be clearly find that the Game Theory is the ideal method to solve and make recommendations to these types of questions.

5.2.1 Medical Allowance

According to the P_1 value obtained by the application, it is clearly state that the Medical Allowance is the most useful type among the other allowances. The value of P_1 is 96%. This is because most of the employees are needed this allowance. This is because the effectiveness is very high. The medical allowances are giving to the employees as well as to their families. Also by considering the cost and other chargers of the hospitals, there will be lot of money should be allocated. Therefore according the bank's and employee's perspectives, this result may be fulfill both player's expectations as much as possible.

5.2.2 Difficult Station

By considering the P_2 Value, it came as 3.9% out of total allowance. In practically, this result would be the most accurate result, because this research had been conducted when Covid – 19 was in the country. Therefore, most of the employees are not willing to go to outstation areas and work, because the uncertainty of the lockdown of the country. Therefore, if the bank increase this allowance that would be useless both employees and the banks as well. However the banks should reschedule this allowance type because if there is no any employee to go to work in rural areas and the banks have to force the employees and do. But in such situation the satisfaction and the commitment on the work would be less among the employees.

5.2.3 Key Holding Allowance

By considering the P_3 Value, comes as 0% out of total allowance. Therefore, by referring the P value it can be justified as, by giving this type of allowances may disappointed some employees. Because manager will give to utilize this to only one employee, who is very close to him. Then the others cannot get this allowance. Therefore, if this will happen, other employees may have bad impression. That may be the reason the P value indicated

as 0. If it happens that will indirectly affect to the bank's profitability and the image of the banks.

5.2.4 Disturbance Allowance

The effectiveness of this allowance is 0%, which is there is no any effectiveness of this allowance. However, in male employees willing to come early. Because they like to come in the morning and also they can fulfill their Overtime Target easily and go early in the evening. That is the reason the P value is 0. The bank is appending useless money on that allowance.

5.2.5 Cash loading Allowance

By considering P_5 Value it came as 0% out of total allowance. Which means the effectiveness of this allowance is nil. In practical situation also same. Because the officers can load small amount of cash and they can frequently go out and claim this allowance. Then it is a useless cost to the bank. The Game theory application will provide us the best value to allocate much funds. Therefore this may be a realistic value.

5.3 Recommendations

The recommendations are made by considering carefully in analyzing section, which is in chapter four. Also the recommendations have made by using of mathematical values taken after solving the problem by using Linear programming. Those values have been entered in to the application and taken the rustles. Therefore, based on those values the researcher has made the possible recommendations in each objective, which is mentioned in Chapter 01. By referring Chapter 03 and Chapter 04 it can be clearly mentioned that the General and Specific Objectives have been fulfilled by the researcher.

5.3.1 Recommendation for Medical Allowance

As recommendations, it has to be taken the results, which have obtained by using the linear programming model and Game Theory. By considering the value of $P_1 = 0.96$, The effectiveness of the medical allowance will be 96% out of total allowance.

It is recommended that the bank executive committee should consider the value of P_1 and make the decisions. It is necessary to focus on the medical scheme, increase the critical categories, and publish. Then it will be a great motivation to the majority of employees and it will cause to increase the profits in the bank.

In addition, this research started in January 2020 and the collecting of the data began from end of January. Therefore, at that time, the world is facing a new infection called Covid – 19. However, at that time there is no any infected person found in Sri Lanka and the attention for this disease is at a low rate. However, in bank employees may have some attention on that disease and that may be a reason that the P_1 value is high.

5.3.2 Recommendation for Difficult Station

In this variable, which is difficult station, it is also very popular among employees. Especially in male employees. Because most of the male employees are willing to earn money than female. In addition, if some employee applies for that allowance, that person can earn it as a fix income.

After applying the values to the mathematical model, it can be seen that the P_2 value is 0.039. It is a small value and from that, Therefore, the effectiveness of that allowance among the employees are 4% considering the other allowances.

As recommendations, it has to take by considering the results of P_2 . Therefore, the allowance is comparatively less important than the medical allowance and better than the other allowances. In this scenario, it has to be reconsidered about the allowance type and make this as a practical effective allowance.

For instance it is possible add some additional amount as an accommodation allowance for the employees who work at difficult stations. Also for the female employees, it can be much higher. Also it can be provided same travelling expenses for that allowance, because if an employee works in outstation that employee should travel from their own place.

5.3.3 Recommendation for Key Holding Allowance

In this variable, it can be seen that among the total employees, most of them are very happy about it. This is because the workload and the stress is lesser comparing to other allowances. There is no difficult for female employees as well. The risk also minimized by the bank by using insurance as a tool. Therefore, if someone steals the key or that employee loses that key also they can claim that amount from the insurance company. .

As per the calculations, it can be seen that the P_3 value came as 0. Then it is clear that the probability of the effectiveness is close to 0. Therefore the executive management should focus that this allowance should keep or should change.

Therefore, it is necessary to add some values for this allowance, for instance this can be rotated in every employee. Then the satisfaction levels will upgrade. Then the team effort will be increased and the effectiveness would be high.

5.3.4 Recommendation for Disturbance Allowance

In this allowance, it can be seen that, the employee should come to the bank early to claim this. Which means the employee should open the system or be in the bank before 6.30a.m. the normal working time is 8.00 a.m. Many employees in the bank and the selected sample is also female employees (table 4.1). this could be happened because of this gender distribution.

As per the conclusion section, it can be seen that most of the employees are not agreeing for this allowance. But after apply the data in to the mathematical model the values have taken and the $P_4 = 0$. Therefore, the effectiveness of the disturbance allowance will be 0% (P_4 Value) out of total allowance.

In practically, most of the starting work is done by senior officers in the bank and most of them are females. Then the expected work cannot be taken by the bank from the employees because they do not like to come early or the shortage of male employees.

In addition, the payment is also done hourly rate and if an employee's willing to claim this per day that employee can eventually earn 1.5 hour per day. Therefore, this allowance is

very useful to many employees and especially the employees who are close to the branches.

Therefore, the bank should reconsider about this allowance and make this allowance as very effective allowance. That can be done by adding some values to this allowance. For instance,

1. The amount can be increased
2. Provide transport charges for them by deducting some amount.

Then the employees are motivated and come to claim this allowance.

5.3.5 Recommendation for Cash loading Allowance

This allowance is very common allowance in banking industry and all the employees including minor staff can claim this type of allowance. In addition, the officers, Clerical Grades and the minor staff are having less risk to do the work to get this allowance. The most risky part and the responsible part are doing the security department and the transport department. In addition, this allowance can be taken for both male and female employees, as this transportation is done in working hours and any one can attend this job without doing Overtime work.

However, considering the bank's perspective the results are different. Therefore, after applying the values to the mathematical model, it can be seen that the P_5 value is 0.

As suggestions, it can be monitored by the managers to find how much money deposited to the machine and purchase new machines, which has high cash loading capacity. Then it can be reduced the unnecessary cash loading expenses.

Especially cash loading is coming when the ATM Machines get empty. In addition, each ATM machine is monitored by the relevant branch which is close by. Therefore, the security risk also minimized. However, the allowance amount is comparatively high. In addition, bank will provide a vehicle with the security. Many employees are willing to claim this because they can earn more money. Especially in town areas, the bank should

load cash several times a week. Also when season comes, (Sinhala Hindu New year, Christmas etc.) many customers are withdraw their money through ATMs, therefore, the officers and the some staff members have to get the responsibility , and because of that those employees can claim that allowance several times per day.

5.4 Suggestions for Further Research

In the research the author discussed several opportunities of the organization has to satisfy the employee. The focus is on the financial benefits and the effectiveness of those benefits. However, there are many ways to upgrade the profitability of the organization in this competitive market.

This theory is a very practical theory to be used in any organization. Especially it can be used to find the best marketing mix to the organization to allocate funds. In addition, it can be done a research to find the best promotion mix. Therefore, the author has opened several areas to start many similar researches by referring this research.

5.5 Outline of Chapter 05

This chapter elaborates how to make the decisions by considering all the facts in the above chapters. Especially it can be seen that the author has taken the analytical section in chapter no 04 to make the recommendations. These recommendations are based on the mathematical values, which is calculated through the computer systems. In addition, there are many paths also indicated to do further researches.

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