

FACTORS AFFECTING BANK BRANCH LOCATION DECISIONS AND USING GIS AS DECISSION SUPPORT TOOL: THE CASE OF COMMERCIAL BANK OF ETHIOPIA

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Declaration

I, Sara Amare, declare that this thesis entitled ***Factors Affecting Bank Branch Location in Ethiopia and the Power of GIS as Decision Support Tool: The Case of commercial bank of Ethiopia*** is my own original work and has not been submitted for any degree in any other university. It is offered for the award of the degree of master of business administration in management from Addis Ababa University.

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Statement of Certification

This is to certify that the thesis prepared by Sara Amare entitled ***Factors Affecting Bank Branch Location in Ethiopia and the Power of GIS as Decision Support Tool: The Case of commercial bank of Ethiopia*** and submitted in partial fulfillment of the requirements for the degree of master of business administration specialization in management complies with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Abstract

One of the most important decision-making processes in banks is site selection for a new branch and for Automated Teller Machine (ATM) location. The site has to be perfectly selected in such a way that the access for the target customers and the highest market potential would be assured. This study shows how a Geographic Information System (GIS) based model is used for locating suitable sites for opening new branches. The model was applied in Commercial Bank of Ethiopia. The main research question of this thesis is: "What are the factors that affect branch site selection in Ethiopia? How does GIS support decision making in branch location in the banking industry? The objective is showing the role of GIS in branch decision making in the banking industry specifically in Commercial Bank of Ethiopia (CBE) and also investigating the real factors of branch site decision in Ethiopia. The materials used for this thesis consist of both primary and secondary data from varied sources like Ethiopian Mapping Agency, district managers of CBE, some staffs in the district head office that are directly involved in the decision making, customers of CBE, and from ground survey. The type of data that was collected from these sources was about GIS based decision making process, factors influencing bank branch location, the manual decision making that has been used so far in CBE. The main research problem is lack of use of GIS in CBE in branch location decision and also absence of literature in Ethiopia about location factors of a bank. This study benefits those who are involved in banking business since it shows them how to use the fast, cheap, and accurate method GIS as decision support tool. Finally, the factors for branch site selection in the Ethiopian context were identified and based on the GIS analysis, the suitable places for locating bank branch in the study area were identified. Accordingly, 30km2 of the total GIS study area/Yeka sub city was found to be suitable for bank branch location.

Key words: GIS, Factors, Location, Decision making

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List of Acronyms

AA = Addis Ababa

ATM = Automated Teller Machine

CBE = Commercial Bank of Ethiopia

DSS = Decision Support System

EMA = Ethiopian Mapping Agency

ESRI = Environmental Systems Research Institute

GDP = Gross Domestic Product

GIS = Geographic Information System

GPS = Global Positioning System

GSE = Geological Survey of Ethiopia

IS = Information System

ISs = Information Systems

IT = Information Technology

ITs = Information Technologies

MCDA = Multi Criteria Decision Analysis

Chapter 1: Introduction

1.1 General Background

In today's competitive business environment, to gain competitive advantage and be successful, any company needs a good decision making. Good decision making in turn needs a valuable or high quality data to rely on. To manage this data and to reach the right decision, a modernized and efficient method/approach is needed. This means a company needs a good Information System (IS) that provides this kind of data, tools, approaches and one of the most important Information Systems (ISs) is Geographic Information System (GIS). By using this Information System, a decision is made based on existing realities from the available qualified data by using the relevant tools and approaches. A traditional decision making process which is based on Intuition or based on wrong, unorganized, and uncertain data foundation will be avoided when making decisions using this important, fast, efficient, and cost effective system. This Information System is used as decision support system (DSS) and enables us to make a modern and reasonable strategic decision.

This system can be applied in almost any business i.e. a business of any kind and any size (Azaz, 2011) starting from small business up to large ones. However, the focus of the current study is on the application of this IS in the banking industry which is the most common financial institution in Ethiopia. Different businesses require different kind of ISs depending on the nature of the business. One of the most important ISs that has a substantial contribution and manifold application in business is GIS. GIS is a computer-based tool for mapping and analyzing things that exist and events that happen on Earth. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization (ESRI, as cited in Dempsey, 2019).

Several factors are proposed from previous foreign literatures that affect bank branch location decision and these are proximity which is a measure of closeness of the bank site to residence house, ease of access which measures how comfortable the topography is or at what floor of the building should the bank be located, neatness which is a measure of how far should the bank be located from dirt/ waste disposal sites, parking which is a measure of how close should the bank be located from parking areas, security which is a measure of how far the bank site is from known gangster sites, accessibility which is a measure of how evenly and abundantly are branches of a bank located, street which is a measure of how close the bank is to main streets,

hotel which measures how close the bank should be to hotels and other recreation centers, office which measures how close the bank site is to big offices/institutions, hospital which measures how close is the bank location to hospitals and other health centers, trade center which is a measure of how close the bank site is to major market areas and trade centers, beauty which is a measure of the attractiveness of the building on which the bank is to be located, competitors branch which is a measure of how close is the bank from other competitor bank branches, cost which is a measure of cost of the building on which the bank is to be opened, population density which is a measure of the amount of population in the place where a bank is to be opened, and income level which is a measure of the income or economic status of the society in the prospect place.

Ethiopian banks, especially CBE are not using GIS to support their decision. Making the branch decision manually without the use of effective IS like GIS leads to leakage of time, money, and energy and also sometimes leads to wrong decision. Therefore the researcher made the study to address this problem by showing the power of GIS in such decisions

1.2 Background of the Case

Commercial bank of Ethiopia (CBE) is a government bank in Ethiopia. It's more than 75 years since this bank is first launched. It has 15 districts all over Ethiopia out of which the four are in Addis Ababa (A.A) namely East, West, North, and South districts. The four districts in A.A encompass the whole A.A city and the surrounding small towns like Debre Zeit, Sululta, Bhere Tsigie, Goha Tsion, Fiche, Debre Brhan, Mendida, Sela Dngay, Molale etc. According to the researchers preliminary interview with the top manager of CBE in the central head office, branch decision is made in a district level i.e. managers in any district decide where to open the new branch in their territory and the basis for their decision is the study or market research made by their staff about the prospect site. There is a marketing department in each district and the manager of the department together with his staffs undergoes some research in the prospect area and if they are convinced that it will be successful, they recommend it to the district manager. The researcher managed to understand from the interview that it takes too long to complete the market research to find a suitable site for the new branch which may take up to three months to complete the study. It also needs energy/effort.

GIS, which is helpful to make fast and accurate decisions related to location is not used in any activities of the bank mainly in branch decisions where it is more necessary. The market research is undergone manually and decided manually. This may lead to human error, leakage of energy, money, and time. Therefore, this study will show the utilization of this significant IS and show how to use it by discovering the following: Where is a potential market located? At what places is a bank needed? Where should I open a new branch? Etc.

1.3. Statement of the Problem

The researcher was motivated to undergo this study by two main reasons or theoretical and practical problems. The theoretical problem is the lack of research in Ethiopia in the subject of factors affecting bank branch location and the role of GIS in location decisions in any business especially in the banking industry and therefore, this thesis is intended to fill this literature gap. The practical problem is the lack of use of GIS in business in Ethiopia especially in the banking industry while it is the actual solution and a necessary tool in this area.

There is no use of GIS in CBE in branch location decisions. It was confirmed by the preliminary interview with district managers that most banks in Ethiopia especially CBE, don't use GIS in their activities and decisions while it has manifold applications in any business especially in banking. The lack of use of GIS in branch location decision or using manual method for such decisions in CBE is causing the following problems.

- The manual method takes considerable amount of time, energy/effort, and money to undergo the study while GIS can do the job in a very short period of time, with too little effort and cost
- The manual method is exposed to risk since it sometimes leads to wrong decision i.e. placing the branch in the wrong location and resulting in a poorly performing branch. But GIS supported decision is very accurate and minimizes this risk.
- The data collection and market study made by the manual method is temporary but GIS data is permanent and can be used for other time/future time after it is collected once.
- The GIS method has an advantage of wide area coverage with in a short time while the manual method can cover a small area in a long time.

Therefore, the current study is supposed to fill this gap and familiarize GIS to business in Ethiopia specifically to the banking industry to address such problems by showing how to use this cost effective, quick/time effective, accurate, and simple technology/tool for best and right decision making process by replacing the manual method.

1.4. Objective of the Study

1.4.1. General Objective

- To explore the factors used in determining new branch location in the Ethiopian context and to show the role of GIS as a decision support tool for selecting the site using these factors.

1.4.2. Specific Objective

- To check whether the proposed location factors work in Ethiopia and to identify new factors if there is any.
- To identify the gap between customers' needs and managers concern in location matters
- To show how GIS is used for selection of location for a new branch
- To show the impact of this technology on the organization; cut costs, save time, minimize risk, eliminate work load, save energy/effort, increase organizational performance, and profitability

1.5 Research Question

- What are the factors used by banking industries in Ethiopia to find a good business location/ branch site?
- How does GIS support decision making in the banking industry?
- How GIS based decision increase company's performance and profitability?
- How does GIS help to find the right branch location?

1.6 Significance of the Study

As stated earlier, the location factors of a bank branch and the use of GIS in business or in banking are not researched yet in Ethiopia to the extent the researcher tried to explore. There are limited research works on this subject in the world and they were made in foreign countries by foreign institutions and researchers. Therefore, this study will contribute to the Ethiopian

literature by filling this gap. The other contribution of this study is that it benefits those who are involved in banking business. Meaning, those who intend to enter in to banking business and those who already did, will be benefited in many ways.

One is that they are going to know the real bank location factors that are applicable in Ethiopia and set the factors necessity and priority as per the customers' wants/desires to win their choice and increase satisfaction by increasing convenience. So far, they have been considering some factors on their own to decide on a branch location without involving their customers or without knowing their customers' wants and priorities. But now, this study will let them know what factors to take in to account additionally and which factor is more important than which according to the customers wants/responses.

The other is they will know that they have to replace the old manual method by the modern IS and it will show them how to use this technology or GIS to make good and right decisions by using it as DSS in their branch site selection/decision and increase performance and profitability by saving time, cutting cost, minimizing branch failure risk, improving network performance and etcetera.

1.7 Scope of the Study

Applications of GIS in business are too many to comprise in a single thesis. Therefore, the primary focus of this thesis is on the use of this important IS for a good quality decision making in the banking industry related to location. The primary focus or the most important goal of the study is solving one of the basic issues of decision "Where" leaving the others (when, what, how etc.) using GIS. Hence, this thesis is aimed at solving the issue of "where" since location is becoming the key issue for success and that's why this study gave more attention to it.

1.8 Organization of the Thesis

This thesis contains five chapters. The first chapter/Introduction is about back ground of the study, motivation for the study, significance of the study, and also about scope and limitations of the study. The second chapter holds the related works or reviewed literatures. The third chapter provides the brief description of the method and implementation; both the GIS method and the method to find the factors. The fourth chapter talks about the findings of the study and the discussion of the findings while the fifth chapter holds the conclusion and recommendation part of the thesis based on the findings.

Chapter 2: Literature Review

This section discusses the theoretical review and the empirical evidences on bank location factors and use of GIS in business. Bank location factors were identified and use of GIS as DSS in branch decision was known from the literature review.

2.1 Empirical Literature Review

2.1.1 The Use of Information Technology in Business

Porter, (1985) identified five primary business activities. These are (1) inputs, (2) operations, (3) outputs, (4) marketing and sales, and (5) service. Porter claimed that the ability of performing effectively particular activities, and managing the linkages between these activities, is a source of competitive advantage. And Pick, (2005) confirmed that IT can contribute to the efficient organization of all of these primary business activities. As the competition in business environment increases, the use of IT becomes a vital component of business strategy. He also stated that the initial role of IT in organizations is increasing efficiency and cost reduction.

Pick, (2005) again stated that IT has facilitated the transformation of business and has allowed new business forms to come into existence and also this transformation has reflected the potential of IT both as a cost saving mechanism and as a tool for supporting business decision-making.

The business environment is becoming more complicated through the effects of globalization, growing customer education and sophistication and increasing competition. To stay competitive companies invest in IT, business operations become more automated and measuring technologies more sophisticated (Posthumus, 2008).

Todd and Benbasat, (2000) revealed that people are depending more on ITs to make major decisions recently. Turban et al, (2010) suggested that Organizations should be able to access huge amounts of relevant information to make informed and fast decisions, according to their strategies. Rezie et al, (2011) also explained that investing hugely on IT is becoming so important to gain a competitive advantage and increase organizations operation efficiency. Bashir, (2014) also demonstrated that the effective use and flow of information is a key to success.

Dangolani, (2011) stated that IT helps to save time both for the customers and the employees, cuts costs and facilitate transactions in the banking industry and he concluded that the banking industry needs to invest more on IT and shall apply it extensively to increase quality of customer services and products, to improve its operations, and he also reccomended that banks should allocate more resources for development of secured IT systems, services and products.

Information Technology has been of great importance in banking system. There is a universal agreement that banks can gain great commercial advantages from the use of modern Information Systems, enabling them to improve their competitive position by improving the quality of services provided to customers (Al-Zyood, 2018).

2.1.2 The Use of GIS in Business

Several people defined GIS in different ways. Azaz, (2011) defined it like this. GIS is the combination of digital data / map, Statistical data, and database technology. It links attribute databases with digital maps. Star and Estes, (1990) also specified it like this; GIS is both a database system with specific capabilities for spatial data, and a set of operations for working with the data".

Several people applied GIS for different purposes. For example, Vlachopoulou et al, (2001) used it to warehouse site selection decision and Cheng et al, (2007) applied it to investigate the problem of determining optimum number and locations of ATM's. The main reason to implement GIS is the fact that it leads to better decisions (Murphy, 1995; Mennecke and Crossl, 1996; Todd and Benbasat, 2000).

Al-Zyood, (2018) stated that Information System is used in banks in many different ways and the potential use of GIS to make a number of strategic decisions is one aspect of this. He also demonstrated that GIS provides vast amount of data to banks enabling the optimum deployment of ATMs. Azaz, (2011) elaborated that GIS is an important tool for business since most business problems consist of significant spatial components. Since GIS provides an enhanced and best data structure, it becomes useful to manage large and complex applications like databases and data warehouses. Hence, it enables decision makers to use their spatial data more effectively.

Namazian and Roghanian, (2019) used GIS based model to identify suitable sites to open a new bank branch for Ansar bank in Isfahan, Iran by using MCDM i.e. by considering several factors and analyzing them with a GIS method. It was found out that the proposed model was practical and effective for identifying suitable sites with respect to multiple factor and they regarded GIS as one of the most significant decision-making tool for locating processes for banks.

Posthumus, (2008) clarified that there is almost no area in modern business that cannot benefit from GIS with new applications being identified almost every day. He added that GIS technology has been invaluable in measuring and improving bank branch and ATM coverage in previously non serviced areas..

Landis, (1993) confirmed that mapping is the principal requirement of the business use of GIS-based technology. B.Pick, (2005) demonstrated that one element of "knowing your customer" is that customer's geographic location and good service requires an approach tailored to that location and GIS-based techniques have an important role to play in customer location.

Morton, (2002) stated that the importance of both spatial data and modeling is somewhat neglected at present, especially in sectors where decision-makers are accustomed to using statistical and actuarial models, but not tended to use information on the location of their customers and are less accustomed to using maps. Since most business risks are often strongly spatially correlated, such sectors need to make more use of spatial techniques in the future. And he concluded that GIS applications are relevant to a wide range of sectors.

Khan and Yasmin, (2018) suggested that for business expansion planning, banks need location-relevant data, and cost effective site analysis to select a new bank branch or ATM location confidently and reliably in a shorten-time cycle. They showed that GIS enables us to not only find location for ATMs, but also suitable locations for bank branch establishment by developing GIS based model.

GIS benefits organizations of all sizes and industries. More than 80 percent of companies' data is spatial related. Business organizations today, now also focus on the key issue of "where", which is one of the prime rationales of GIS (Versturen, 2006). Furthermore, GIS has characteristics that offer businesses with capabilities that are not present in other Information Systems (Landis, 1993).

Jafrullah et al, (2003) demonstrated that GIS plays a significant role in different practical areas of banking in achieving the various objectives of the banks, like customer base expansion, service quality improvement, improved customer satisfaction, consistent business growth, and increased profitability.

GIS combines information and mapping systems with analytical and modeling tools, allowing the acquisition, storage, analysis, and presentation of large volumes of geographic and attribute data as well as providing a sophisticated tool for data management (Miliotis et al, 2002).

2.1.3 The Importance of Location

Several literatures from recent studies dating back to old ones, declared the importance of location in business. The literatures reviewed about location can witness this.

One of the most significant decision-making processes is the site selection. If the site is correctly selected, the access for the best customers as well as the greatest market potential would be guaranteed. Optimal location of bank branch is one of the most important strategic issues in the competitive market. It is a significant concern for the banks to find the best and optimum location for branching to increase their profitability and market share (Namazian and Roghanian, 2019). Selecting the right location is regarded as a significant decision since poor site selection would be very costly and difficult to reverse (Ernst et al, 2018).

Expanding any business needs long-term planning and always substantial capital expenditure. One can minimize costly mistakes and maximize the performance of ones store with more accurate site selection and market planning. Nowadays, location analytics is the intersection of business analytics and IT. Location is fundamental to all aspects of business. Location matters because it ties many business units together and makes it possible to solve problems that had no solutions before. It enables us to ask new questions and gain insight and understanding by looking at traditional data such as sales, costs, profit drivers, and customer characteristics or desires in new ways (ESRI, 2018).

When customers choose a financial institution, location convenience is a significant factor. To stay competitive, banks usually attempt to increase convenience (be as close as possible to customers) by expanding their branch or ATM networks (Khan and Yesmin, 2018). The maximal covering location problem (MCLP) deals with the problem of selecting an optimal

location of a number of existed facilities within a set of customers. Since each customer has a specific demand, the facilities have to be located to cover demands of customers by the facilities (Atta et al, 2018).

The proper location of branch offices may prevent overlapping banking services within the trading area of potential competitors, thereby increasing future market shares. A good decision may ease financial pressure on the banking operation, because the proper location of a new bank branch reduces capital investment costs, such as leasing costs or property taxes (Avetisyan, 2018).

For a business, location is the key to successful operations and overall growth. A business's success is partially, if not mostly, dependent upon the business's location. Having the best possible location is vital (Gordon, 2017). The problem of deciding on the best site for a new bank branch may be viewed as part of the general problem of restructuring the bank branch network (Cabello, 2017).

Al-Zyood, (2018) also recommended that banks should give great attention to location, which can be a major differentiator in determining customer decisions in a highly homogenized service market. In business, location plays a key role in guaranteeing the success of the business. It is important for business marketing and profit. The location of the competitors should also be considered (Pugi et al, 2016).

Adil et al, (2013) confirmed that location convenience is among the most vital factors for selecting the branch of banks with the customers in a particular area. Cuya et al, (2013), demonstrated that selection of the right Location is an important thing for companies since otherwise it would be an expensive mistake that exposes to unnecessary relocating expenses and it also brings about loss of endeavor and competitive advantages. Inappropriate choice of a site location would lead to higher transportation costs and loss of qualified labor. The aim for finding an appropriate site is to select the best location that meets the predetermined selection factor (Farahani, 2012).

A key factor in business placement is finding the best and most financially stable location for a specific type of business use. Location-allocation models provide an efficient, powerful technique for creating decision support systems for developing location strategies. Using the

power of the computer, these models systematically evaluate a large number of potential store locations in order to find sites that maximize corporate goals such as market share or profits. One of the most important decisions a retailer can make is where to locate a retail outlet. Because convenience is so important to today‘s consumers, a retail store can prosper or fail solely based on its location (Abramovich, 2012).

Location is a critical component in almost every business transaction. Although a lot of data have a location dimension, whether it be customers, stores, warehouses or other assets, this information is rarely exploited in traditional analysis. To gain maximum value from the ever-increasing volumes of data, companies need to make use of the location element to gain deeper business insight in order to improve competitiveness and business performance (Posthumus, 2008).

An optimal location is a key for the success of any business. Big initial investment or capital may be needed to start up a business and therefore location is important to lower operation costs and increase accessibility. ATMs should be convenient to customers since they are designed to serve customers. Their location determines the ease of access of customers' bank accounts. Therefore the question of "where" is a prime issue for both the customer and the bank (Wambugu, 2011). Location is often regarded as one of the most significant factors that lead to the success of a business venture. Businesses derive profits from a good location. This is true whether a small coffee shop with a local clientele or a multinational network of factories with distribution centers and a worldwide chain of retail outlets (ESRI 2006).

Choosing the right commercial location at the right time can help businesses meet and exceed their business goals. For a business, location is the key to successful operations and overall growth. A business's success is partially, if not mostly, dependent upon the business's location (Gordon, 2017).

Costumers choose their banks based on their convenient way to reach the bank (Fung, 2001). A rise in sales is possible with a good location, since it can attract more customers (Pastor, 1994). In deciding on a financial institution, location convenience is vital factor for customers (Driscoll, 1999). Consumers are increasingly demanding the ability to conduct financial business at their convenience and at their preferred location (Morrall, 1996). This calls for

banks to locate ATMs for customers' convenience. Banks too, benefit from well-located ATMs. (Wright, 1999).

Several factors should be taken in to account when locating any retail outlet. These include: the nature and size of the population, the number of people passing the site, available car parking space, visibility of the site and the nature of any legal requirements (Davies and Harris, 1990). Costs of a branch rise with the distance between a province and the location where the bulk of a bank's business is conducted (Cerasi, Chizzolini and Ivaldi, 1998 as cited in Calcagnini et al, 1999). Each bank has a two-stage decision-making process: (1) how many branches to open and (2) in which provinces to site them (Calcagnini et al, 1999).

2.2 Conceptual Framework of the Research

2.2.1. Factors Affecting Bank Branch Location

Before deciding the appropriate branch location, it's necessary to consider some factors. Numerous literatures on the same topic were reviewed and the factors that influence the bank location were identified from the literature reviews. The number of local businesses and residents, spending level, income levels, competitor activities, Population characteristics, and population expansion rates are among the factors proposed by the reviewed literatures as presented below in detail.

Chan-Seok et al, (1993) as cited in Hong et al, (2008) described that during selection of location for a branch, banks consider several factors like cost of land, income level, branch functions, growth potential, competition, and other the presence and number of nearby financial institutions. Population characteristics and population growth rates are measures of increasing demand for banking services (Min, 1989). Banks' placement of branches and ATMs need to comprise location-relevant data from fast and economical site analysis to perfectly and reliably plan strategy, specifically in relation to concentration of market areas, traffic patterns, workplaces or residence house of customers whose demographics and buying behavior match a bank's target customer profile (Jafrullah et al, 2003)

Carol, (1960) said that high centralization of population and commercial activities are given great considerations in banks strategy, with central business districts being the principal places for location of ATMs and main street bank branches. Nelson, (1960) investigated some factors

in deciding branch location. Among them are population, income, branch function, competition, land value, and future development potential. Huff, (1963) included factors of traffic hours and the type of traded goods as contributing factors. Customer and branch characteristics are the two fundamental factors in the location of bank services that affect profitability (Sung-Ryong, 1985 as cited in Al-Zyood, 2018).

Studies have shown that the location of branches of competitor banks in close proximity to those of another institution have an important impact on performance (Clawson, 1974). Consequently, site selection must include situational analysis of the spatial factors and temporal changes, household characteristics, competition, site constraints, local access, parking, visibility and nearby attractions (Jones and Simmons, 1990).

Ghosh and McLafferty, (1987) suggested that factors like site characteristics, traffic flow, accessibility, legal and cost factors, demographics, and retail structure should be considered and evaluated by a wide ranging analysis. Clawson, (1974) also added some more customer focused factors like proximity to shopping centers, parking areas, ease of travel through road networks, and accessibility. According to Morrall (1996), consumers increasingly demand the ability to conduct financial business at their convenience and at their preferred location.

In locating a bank, the most important factor is site evaluation. This includes places or areas where customers of a bank live, shop, work, travel and conduct transactions (Barrath, 1998). Many factors determine the appropriate location for ATMs or branches such as population density, income level, and commercial sector, travelling distance, current and potential competitors, all of which affect market share. The time of travelling and distance are very important factors of how easily customers can reach a branch to obtain financial services and customer investment is subject to distance-decay effects (Al-Zyood, 2018). The main factors for bank Branches location decision are operating costs, the existing competition in the area under investigation, and the accessibility of the place like airplanes, trains, and roads (Min, 1989).

Abramovich, (2012) stated that businesses associated with the operation of various uses like hotels, offices, government offices, municipal and state agencies, restaurants and businesses that have greater environmental impact like automobile oil shops and dry laundries are among

the considerations during business site selection/location. Calcagnini et al, (1999) supported the argument that says it's more likely for banks to open new branches in places where per capita GDP is high. Speedily expanding banks seek to be placed in big cities where sophisticated staff intensive services are provided. McAvoy, (2006) as sited by Avetisyan, (2018) used probability choice models in which cities the Reserve Board Organization Committee would locate its branches; the results show that cities were chosen on the basis of several factors like population, socio economic characteristics, and the current growth of the national banking system. A customer may find a bank convenient, if it has a branch or an ATM near his / her residence or workplace. To stay competitive, banks usually attempt to increase convenience by expanding their bank and / or ATM networks (Khan and Yesmin, 2018). According to Thulasi, (2007); Pugi et al, (2017); Namazian and Roghanian, (2019) and also according to other related reviewed literatures, the factors to be considered when selecting new branch site are summarized as follows:

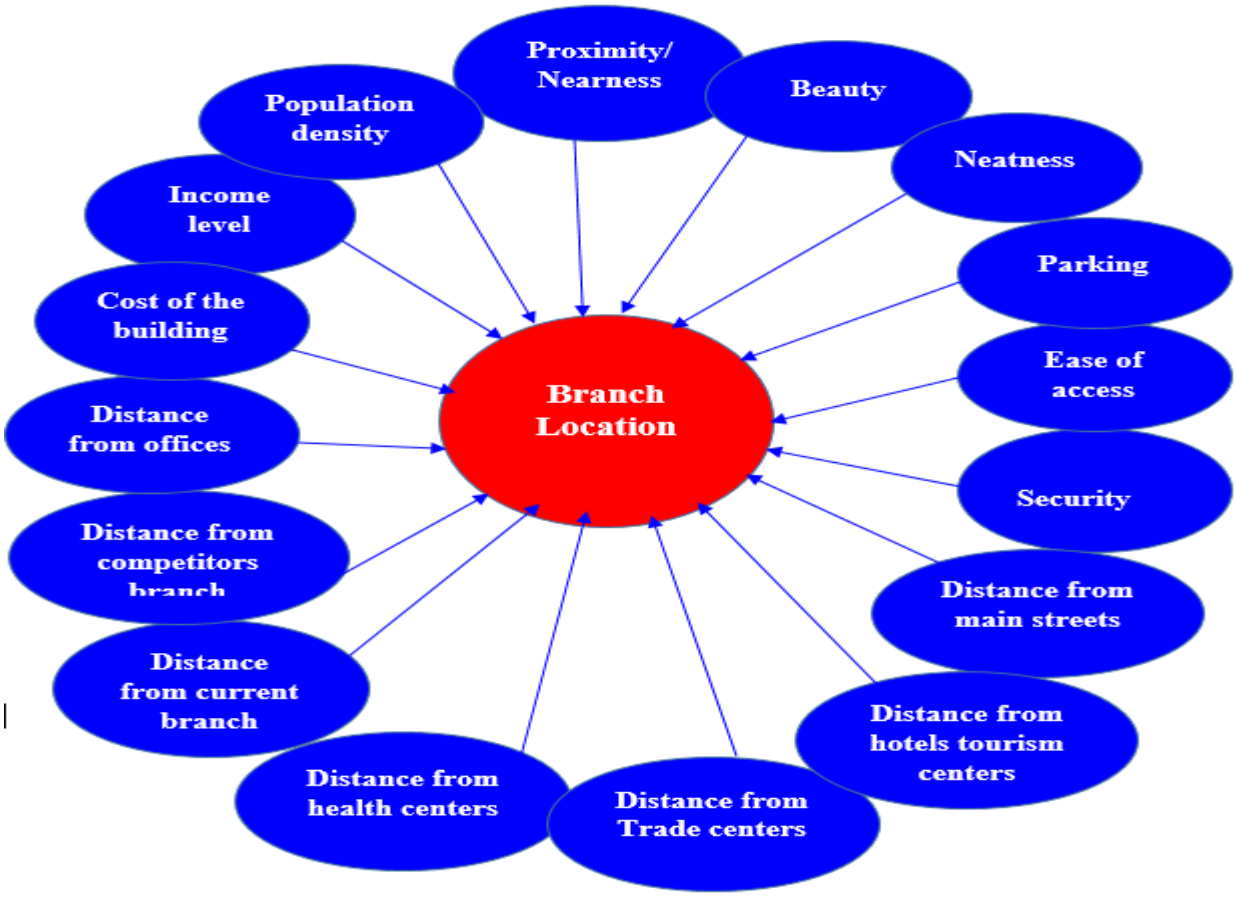


Figure 1: Model of the factors for new bank branch site decision

Chapter 3: Research Design and Methodology

This research has two main parts; the factors part and the GIS part. As to the researcher's knowledge, both the factors and the GIS part haven't been studied before in Ethiopia. Regarding the GIS part, there are studies made in Ethiopia but these studies are about the role of GIS in natural science studies but not about its role in business. Both Qualitative and Quantitative research approaches were followed in order to address the research questions and a stratified random sampling technique was used.

To undergo the investigation of the factors, the researcher planned to distribute questionnaires to customers of CBE in the four districts in A.A/population of the study area and to interview the managers in the four districts head offices. Data collection from the customers' side was successfully completed. However, the managers' side were found unwilling for the interview. Actually, some of them agreed to have an interview but the rest of them refused to hold an interview to avoid physical contact due to the currently occurred problem/disease and rather they preferred questionnaires. Finally, the researcher decided to deal with the managers' side all in all through questionnaires in order to have consistent data collection method. After the data was collected from both sides, it was analyzed in SPSS software and the importance and importance level of the factors was identified.

To undergo the GIS part of the study, the researcher collected some data from EMA (DEM and Wereda shape file) but most of the data was collected by the researcher by a ground survey. After the data was collected in this way, it was analyzed in ArcGIS software version 10.3 by MCDA method which involves distancing, classifying, and overlaying the factors. And finally the suitable places or strategic areas for bank location were identified.

3.1 The Research Method

The goal of this study is investigating the factors that influence the branch location and showing the power of GIS in the overall decision making in the Banking Industry in decisions involving finding suitable site for a new branch. This study aimed to show the decision making process; i.e. decisions involving "WHERE", using GIS. Also the factors of branch site in the Ethiopian perspective were investigated. To achieve all those things, it was mandatory to go

through several methods. The following methods and procedures were used and followed to accomplish the research work.

3.1.1 Methods for Evaluating Importance of the Factors for Branch Location

The formerly listed factors in the literature review above are proposed by researchers outside Ethiopia. However, this study was made in the thought that the situation might be different in Ethiopia and the deciders may not consider all of these and new once might be important. Therefore, this study aimed at investigating the factors in the Ethiopian context i.e. some of the previously proposed factors might be included and some of them might be excluded. This was done by distributing questionnaires to customers and district managers. The open ended part of the questionnaires included a question that asks if there are other factors to be considered other than the listed/assessed ones just to investigate if there are other location factors. The researcher attempted to identify not only the factors but also the weight of the factors i.e. which factor is more important than which for this case.

3.1.2 The GIS Method for Locating a Branch

The data of the factors was processed in ArcGIS 10.3 software. The process is called Multi Criteria Decision Analysis (MCDA) and it begins in the GIS software with preparing the data in the form of layer. A layer is a GIS data format and it is a basic unit of geographic information that can be displayed as a map digitally carrying a particular information (Franz Pucha-Cofrep et al, 2018). Though there is a number of GIS software like Q GIS, Grass GIS, Saga GIS, Super GIS, Jump GIS, and Arc GIS, Arc GIS was used for this study since it is familiar and commonly used in Ethiopia. It is accessed by down loading from internet and installing in a computer just like other applications. Several literatures can guide how a MCDA process is done and among them is Estoque, (2011). Even though MCDA was used for natural studies in this literature, the method remains the same even if it is used for social or business studies since it is simply a method.

The factors are of two types; those that are associated with distance and those that are not characterized by distance. Factors like beauty of the building, cost of the building, ease of access etc. have no connection with distance and therefore, they were not subjected to distance relationship analysis in ArcGIS. A distance was then set for the factors that are linked to

distance. Degree of suitability was decided in different way for different factors by viewing from different angle based on varied factors. Layer of each factor was classified in to five classes namely most suitable, suitable, moderately suitable, least suitable, and unsuitable in ArcGIS using the classify tool based on the degree of suitability. A factor is a criterion that is to be subjected to the analysis and a layer is a digital picture or representative of the factor that is displayed in the ArcGIS software. Next to this, new weight was assigned to each layer which is associated to distance just before subjecting the layers to the overlay tool. In fact, weight was already assigned to each of the sixteen layers from the SPSS software from the managers and from the customers vote separately. However, weight assigned from managers' side was taken and that of customers was left because, even if customers are considered in the branch decision they are not going to decide where to locate the branch. Only the managers' side does that.

The reason why customers were asked about the factors and weight was assigned for each of the twelve factors based on the rank value given from customers' side is just to know what customers want a bank location to be, to compare it with the managers' result and to identify the gap in-between. But, the managers' side result was used for decision since they are the deciders. However, the weight that each factor gained from them wasn't taken and used as it is. It was modified or a new weight was given to each factor. This is because some factors that are not characterized by distance and some factors that are judged as unimportant were deducted. Due to this and other reasons, only 8 factors were overlain from the total of the 16 factors. Thus, with decreased amount of factors, the percent weight is not going to sum up to hundred tough it has to be hundred to be processed in the overlay tool. So, a new proportional weight for these factors was computed and assigned. And according to their new weight, the factors were analyzed. The layers that were classified earlier were overlain in the overlay tool according to their assigned weight. And finally, the most suitable area for opening new branch was discovered. From Estoque, (2011); Namazian and Roghanian, (2019); Thulasi, (2007); and Pugi et al, (2017), the MCDA can be summarized as shown in the following chart.

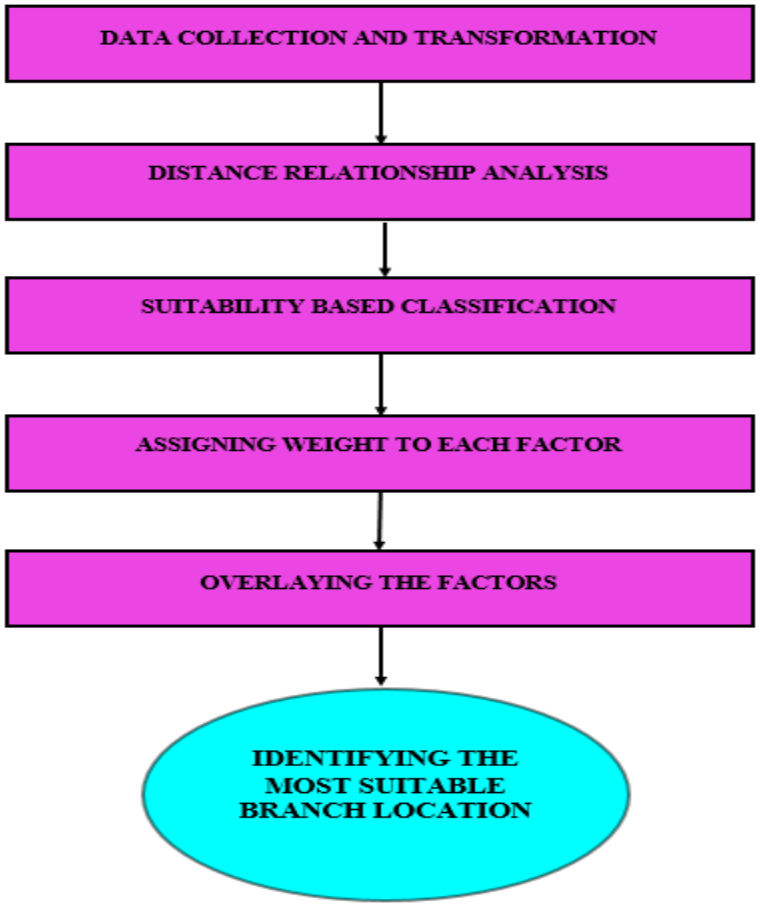


Figure 2: Flow chart of the MCDA method organized from previous literatures

3.2 Data Source and Instruments of Data Collection

To conduct this study, a wide range of data (both primary and secondary) was collected from diverse data sources and used.

3.2.1 Primary Data

Distributing questionnaires (closed & open ended questions) to customers and managers was the major primary data collection method and the response was the major primary data used for this study. The other primary data used was location data of most factors which was collected by the researcher using GPS (Global Positioning System) machine from field survey, meaning, the researcher journeyed almost all over Yeka sub city to take digitally GPS measurement/geographic location of each health center, hotel, trade center, main street, CBE branch, other banks branch, large institution/office, street, etc.

3.2.2 Secondary Data

Branch information and customer data that was collected from CBE was among the secondary data used for this thesis. Data about some of the factors that affect the bank branch were collected from different sources. Wereda shape file/ boundary of study area and DEM (Digital Elevation Model) of the study area were collected from Ethiopian Mapping Agency (EMA) as a secondary data.

3.3 Target Population of the Study

The total population of this study is all customers in any branch of the four districts and all concerned management bodies in the head office of the four districts of CBE in A.A. city. From the managers' side, they are twenty in number and from the customers' side, they are totally above 8.5 million (8,791,850) at the time the researcher collected the data and even increasing each day since new book openers come every day in each branch. According to preliminary interview with customers and IT department heads in each district, some customers may open more than one bank book in different branches and more than one book even in a single branch. For example if one customer was living in one locality and opened a bank book in a nearby branch, this customer may move to other locality after some time and may open a new book in other branch near the new locality since the former one will be too distant to be served there. If he/she moves again, there might be opening of more books as much as the movement. Due to this, one customer might be counted twice or more than that and therefore, the population may have fewer customers in reality than thought to have.

Generally, the total population is the total number of customers in the four districts of CBE embraced by Addis Ababa city i.e. the South district, the North district, the West district, and the East district. These four districts comprise the whole A.A. city and some small towns out of A.A. The North district encompasses a total of 133 branches in its domain i.e. in A.A city like Kidist Mariam, Arat kilo, Piassa, Arada Giorgis, Adwa deldiy, Arbegnoch, Sdist killo, Sellassie, Addisu Gebeya etc and extends out of A.A up to Fche Selale and Goha Tsion. The South district comprises 128 branches in its domain both in A.A. city and towns near A.A. i.e. Lideta Maryam, African Union, Stadium, Legehar, Mexico, Gofa Gebriel, Saris Abo, Mechanisa Michael, Gotera, etc and continues out of A.A beyond Debrezeit. The West district includes branches in A.A such as Teklehaimanot, Mercato, Tabot maderiya, Sefere Eyor,

Sefere Selam, Addisu Michael, Eyesus Gedam, Kolfe Keranyo, Ehil berenda, and extends out of A.A up to Ambo, Welkite, and Werabe, totally it encompasses 125 branches. And the East district embraces Bole Medhanealem, Bole Michael, Hayahulet, Megenagna, CMC, Ayat, Tafo and extends beyond Debre Berhan up to Mendida, Enewari, Sela Dingay, and Molale and totally it comprises 133 branches.

3.4 Sample Size of the Study

Sometimes the population of interest consists of too many individuals for any research project to include as participants. This time we need to pick some selected part of the population that represents the whole population well. These selected representatives are called samples and the process of selecting statistically representative individuals from the population is called sampling (Majid, 2018). There are different sampling strategies and these strategies depend on the characteristics of the population of interest that researchers/ investigators use to obtain a representative sample. In the current case, the researcher used two kind of surveying techniques since there are two kinds of population for this study, i.e. the managers in the four districts and other staffs that are involved in branch decision that were dealt with a census survey since they are too few to take a sample from and also the customers that are the other kind of the population that were dealt with a sample survey which is called a stratified random sampling technique since there are sub groups in the population. Simple random sampling is one of the sampling techniques in which everyone in the population of interest has equal chance to be selected as a participant. Stratified random sampling (which is the current sampling technique) is a simple random sampling within predefined sub groups (Majid, 2018).

The selection of sample was done in such a way that equal chance was given to each group of the population (in the current case the four districts) i.e. equal number of samples was taken from each group, but the way of taking was random within each single group (Majid, 2018).

Sample size from the current population size was taken based on the following formula according to Cochran, (1963). Cochran formula was used to determine the sample size as the population was too large. The formula is given below and the sample size was yielded to be 384 out of which 3 were non-respondents.

$n_0 = \frac{Z^2 pq}{e^2}$ Where; e is desired level of precision, p is the total population, q is 1-p, n is the sample size and Z is a value found from Z-table.

3.5 Validity and Reliability

In this study, the researcher tried to investigate bank location factors in Ethiopia and identify suitable location for a bank using GIS based MCDA. The reliability of this analysis and findings were validated by ground truth or by the location of presently existing CBE branches and also by the East District manager and the IT department staffs confirmation in this district head office. This is because the GIS study area of this thesis which is half of the Yeka sub city is under East Addis Ababa district of CBE. The other half is under the North Addis Ababa District. However, it is beyond the GIS study area even if it is our area of study in the overall analysis since all areas under the four districts are the study area for this research. Therefore, the manager and IT department staffs in east district office were used for the validation since the performance of each branch under their district is reported to the district head office and the IT staffs can access the performance information of each branch from the computer system. From this, the performance of each branch and its association with the suitability of the location was confirmed by them.

3.6 Ethical Considerations

Conducting research, its design, data collection strategy, etc. require acceptable ethical considerations (Saunders et al., 2009). Therefore, the researcher required to be abide by ethical research principles. From that point of view, respondents from the four district offices (the managers, marketing department heads and staffs, IT department heads and staffs) has given all the necessary information transparently to the researcher that was needed for the study. The researcher assured to keep the confidentiality i.e. the responses for the questionnaire and any other verbal information are not exposed to third party but they are used only for academic purpose.

Chapter 4: Data Analysis and Interpretation

4.1 Customers Responses

As stated earlier, questionnaire was the major means of data collection method from customers and managers. Accordingly, 381 customers responded out of 384 out of which 301 are men and 80 are women. Their age ranged from 20 to 64. Out of the 16 factors that might affect bank location, the customers dealt with only twelve of them since the rest four factors are not their concern. These four factors are managers' considerations and customers have nothing to do with them. These are cost of building, population density, income level, and distance from competitors' branch. At the time when preliminary interview was conducted, most customers said that proximity is the first thing that comes to their mind when they choose a bank to open a book and to be served. The same is true for accessibility. Each factor was ranked as most important, important, moderately important, least important, or unimportant according to its degree of importance or intensity of influence to the location. 5, 4, 3, 2, and 1 are rank numbers that represent the degrees of importance respectively. Different respondents can give different rank to a single factor. At this time, the mean rank value is taken to characterize the factor. Below is the detail of all the twelve factors which is collected from customers.

1. **Proximity**

Proximity is the nearness of the bank to customers' residence house. It is measured by distance of the bank from home. Almost all (374) of the surveyed customers ranked it (proximity) as most important 350 of which wish their bank to be located not more than 1km distance from their home. Its rank ranged from important to most important. 98.2 % of the respondents ranked it as most important while the remaining 1.8% graded it as important. Its mean rank value is 4.98 which is very close to 5, a number which represents the most important category. This shows this factor is among the most significant ones that customers take account of when they decide their preferred bank. The proximity table and histogram are shown below.

Table 1: Result table of importance of proximity from customers' view

proximity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	important	7	1.8	1.8	1.8
	most important	374	98.2	98.2	100.0
	Total	381	100.0	100.0	

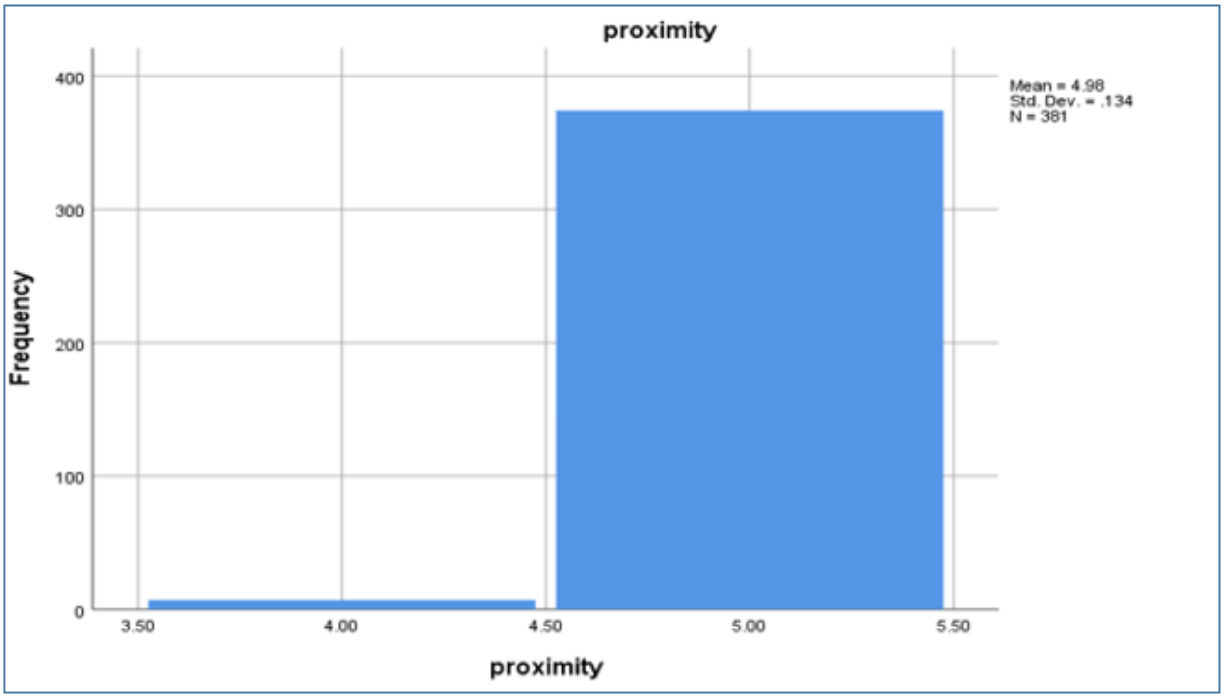


Figure 3: Histogram of importance of proximity from customers' view

2. **Accessibility**

Accessibility means the reachability of the bank or its availability within little distance interval. If a bank is accessible, it has many branches in little interval so that customers can access it almost anywhere. As said by the respondents, this factor is one of the most significant ones and most of them labeled it as most important. Majorities of the respondents (320 of the 381), they wish to access the bank at every 1km interval. 97% of them labeled it as most important and the rest 3% rated it as important. Its rank ranged from most important to important. It has got a mean rank value of 4.97 meaning, this factor goes to the most important category since this value is close to five. The proximity table and histogram of accessibility are shown below.

Table 1: Result table of importance of accessibility from customers' view

accessibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	important	11	2.9	2.9	2.9
	most important	370	97.1	97.1	100.0
	Total	381	100.0	100.0	

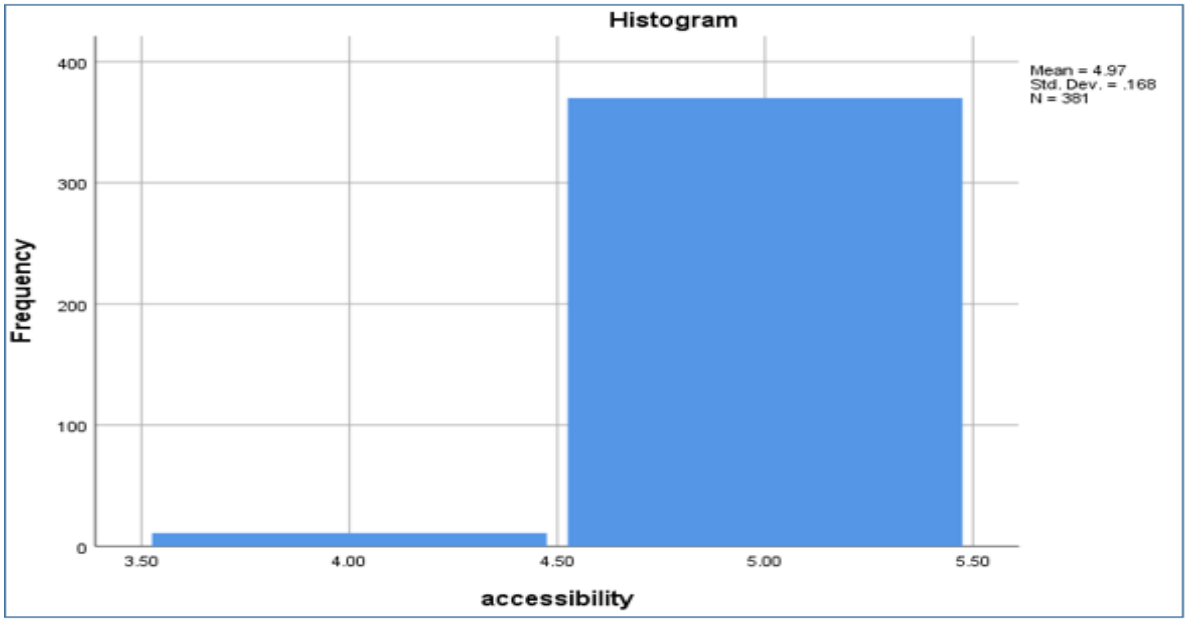


Figure 4: Histogram of importance of accessibility from customers' view

3. **Security**

Based on the response of the survey, security is the most vital factor that is considered during bank choice decision. Again almost all of the respondents considered it as most important. If the place where the bank is located is safe or if the location has no security issue, the chance of the bank to get chosen by the customers will be favored. It is one of the criteria the customers need on a bank to make the bank their choice. 99% of the respondents ranked it as most important while 1% of them rated it as important. Still, there are no respondents that voted for unimportant, least important, or moderately important. The rank of this factor ranged from most important to important. Its mean rank value is 4.99 and this is the greatest of all factors. With this, security is the most important of all factors from the customers' perception. The next best factors that follow are proximity and accessibility. Below are the table and histogram of the result of security from customers.

Table 3: Result table of importance of security from customers' view

security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	important	4	1.0	1.0	1.0
	most important	377	99.0	99.0	100.0
	Total	381	100.0	100.0	

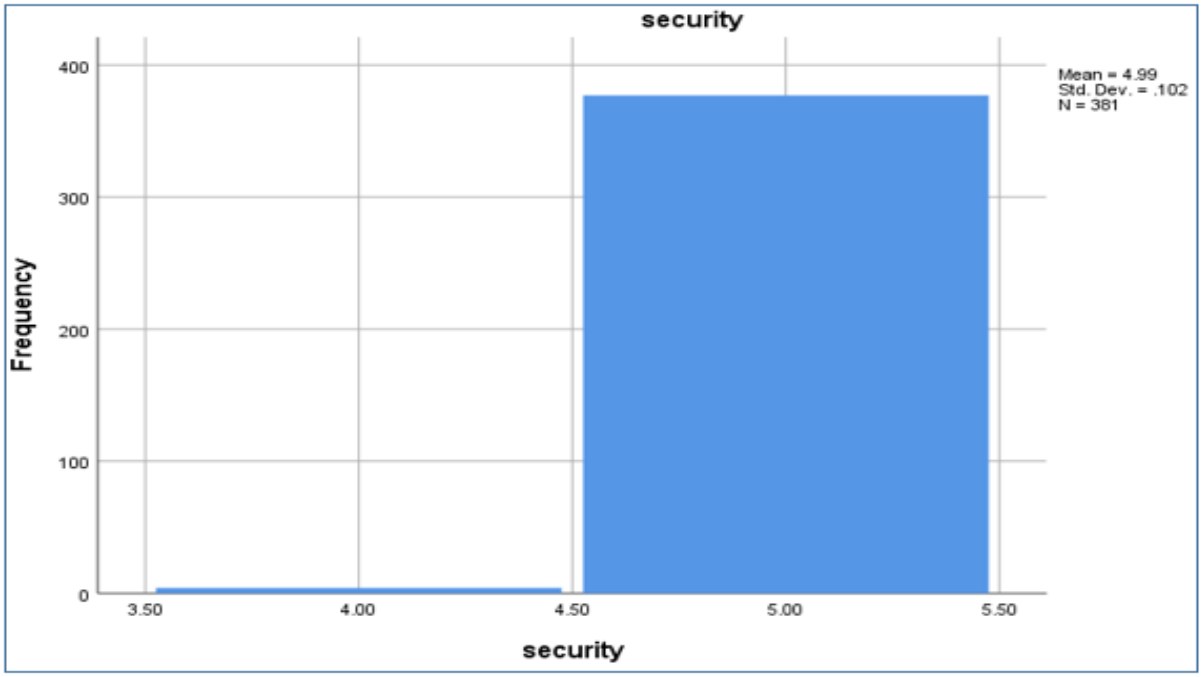


Figure 5: Histogram of importance of security from customers' view

4. **Neatness**

All of the respondents stated that neatness of the bank location matters on their bank choice. From this, neatness of the place and surrounding should be considered when a bank location is decided. This is measured by the distance of the bank location from waste disposal sites and slum or any dirty/bad smelling places. It should be as far as possible from these places since customers bank choice depends on neatness as we can see from the response. Many of the respondents (about 92% or 350 of all) considered neatness as most important factor while some little (about 8% or 31 of all) voted on it as important. Majority of the respondents i.e. 344 of them wish their bank to be located at least 0.5 km/ 500 meters away from dirty place or waste disposal site. Below are the neatness result table and histogram.

Table 4: Result table of importance of neatness from customers' view

neatness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	important	31	8.1	8.1	8.1
	most important	350	91.9	91.9	100.0
	Total	381	100.0	100.0	

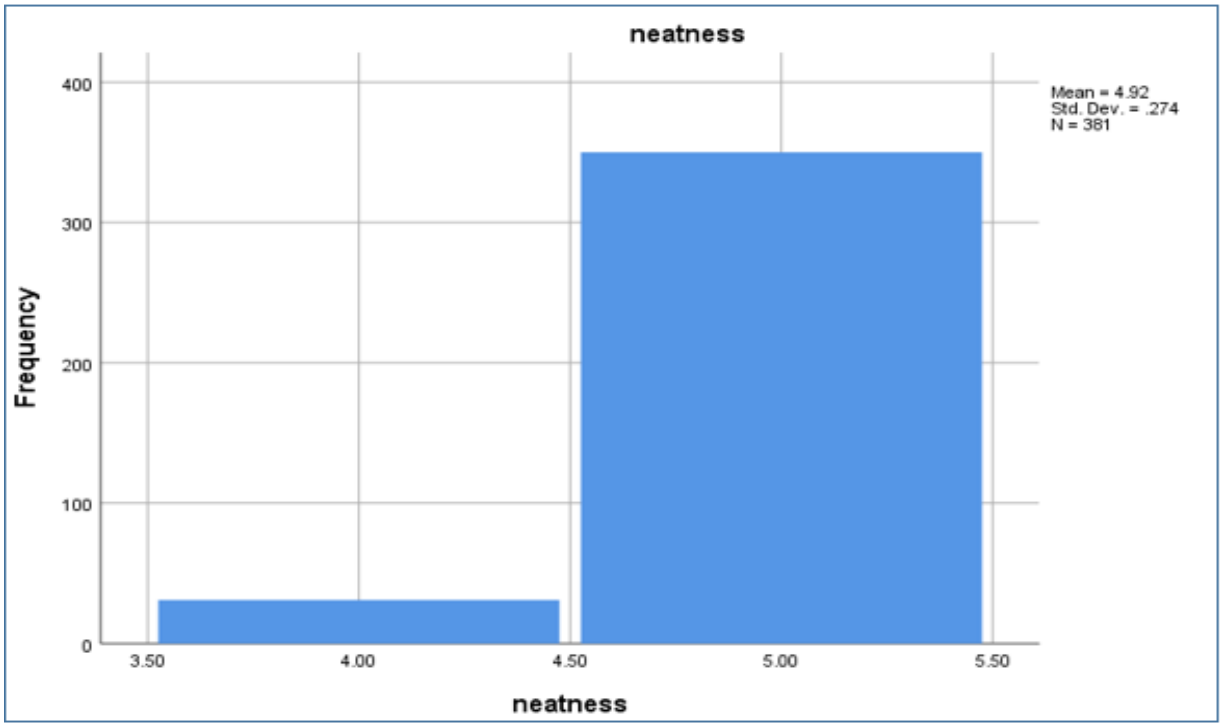


Figure 6: Histogram of importance of neatness from customers' view

5. **Parking**

Not all of the respondents think that parking is an important factor and the location of the bank that they get service should fulfill this criterion. Some think a bank should not be located in a distant place from parking area. But the majorities think it is unimportant. The rank of parking ranged from unimportant to important. The mean rank value is 2.21 which is close to 2, a number which represents the least important category. It might be because most customers don't use car or don't have car. From those who believe it is important, the majority think the bank should be as near as possible from parking area and should not be located more than 200 meter away. Below are the result table and histogram of parking.

Table 5: Result table of importance of parking from customers' view

parking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unimportant	144	37.8	37.8	37.8
	least important	85	22.3	22.3	60.1
	moderately important	81	21.3	21.3	81.4
	important	71	18.6	18.6	100.0
	Total	381	100.0	100.0	

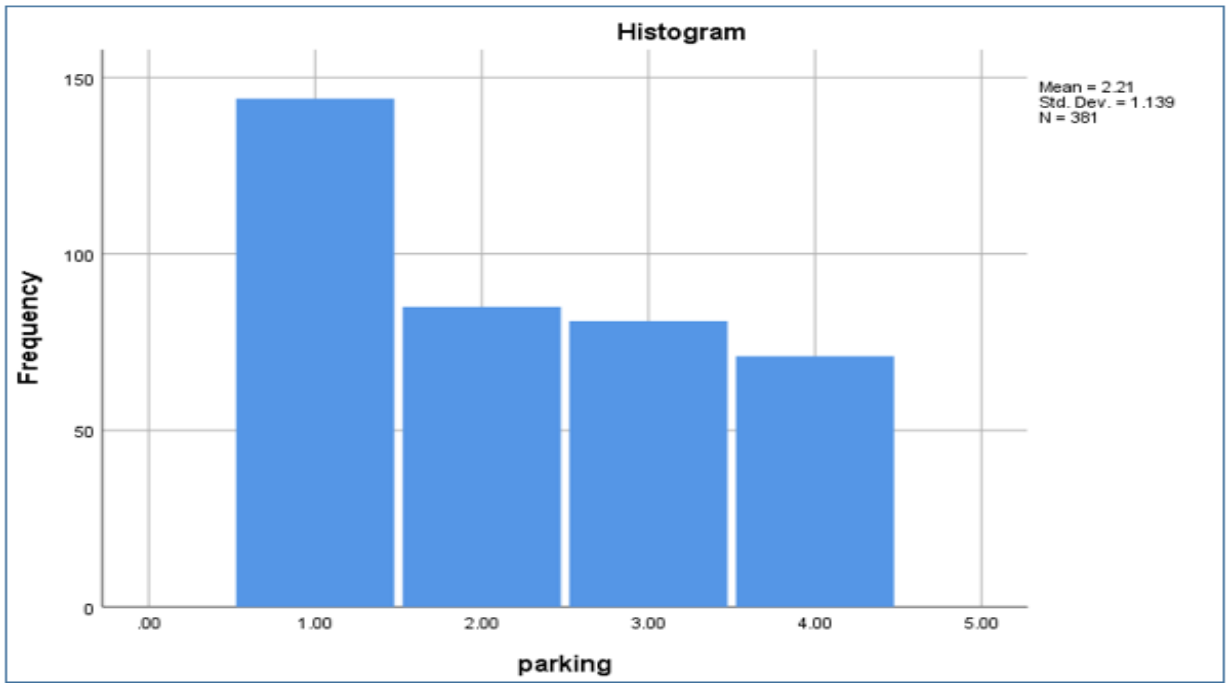


Figure 7: Histogram of importance of parking from customers' view

6. **Distance from Main Streets**

This is also one of the criteria that customers use to evaluate the location quality of a bank to decide the bank of their choice. The surveyed customers were asked to evaluate the importance of this factor and accordingly its rank ranged from most important to unimportant. Its mean rank value is 3.8 almost 4; with this it goes to the important category. Majority of the respondents believe it's important though degree of importance varies. Only 4% of them take it as unimportant. From those who believe it's important, the majority or 344 of them want their bank to be located not more than 250 meters from main streets. Below are result table and histogram of this factor.

Table 6: Result table of importance of streets from customers' view

street

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unimportant	16	4.2	4.2	4.2
	least important	30	7.9	7.9	12.1
	moderately important	93	24.4	24.4	36.5
	important	118	31.0	31.0	67.5
	most important	124	32.5	32.5	100.0
	Total	381	100.0	100.0	

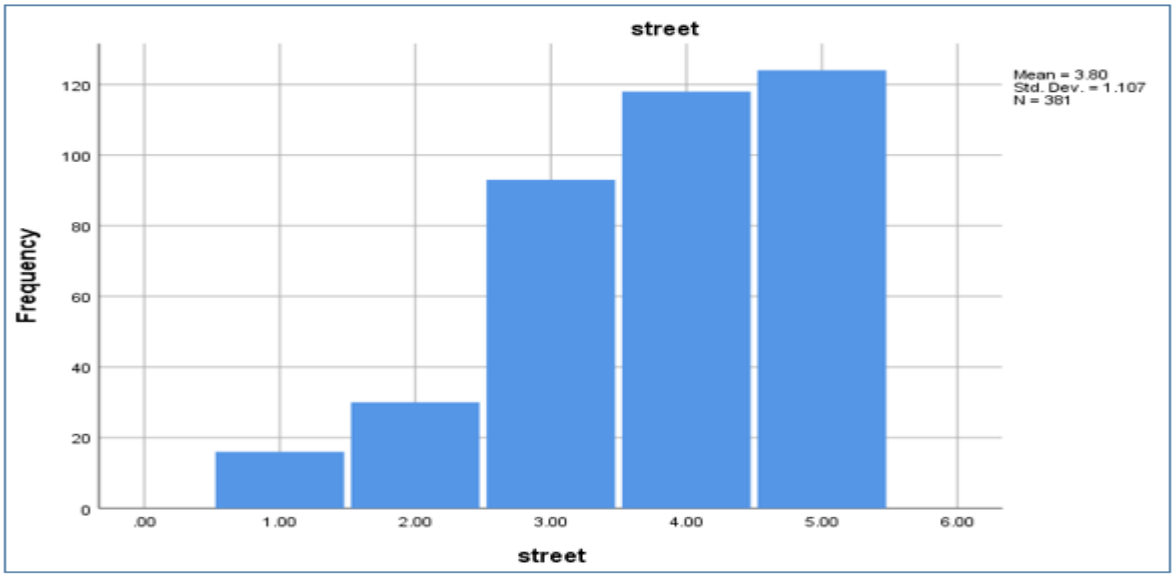


Figure 8: Histogram of importance of distance from street from customers' view

7. **Ease of Access**

This factor encompasses floor of the building, topography of the place etc. Most banks seem to consider this since in most cases bank branches are located in ground or first floor or to the extreme at second floor. But there is no evidence to argue that there are no bank branches that are located in higher floors. However, floor of building is not the only measure of ease of access. Slope is also another measure which represents the elevation characteristics of the place. Most respondents chose first floor and flat topography or lower slope (maximum 20%). Anyway, ease of access as a factor was ranked differently by different customers. Its rank ranged from most important to unimportant. A balanced proportion of the respondents rated it on each level of importance. Its mean rank value is 3.4 which is between important and moderately important category. The results table and histogram are given below.

Table 7: Result table of importance of ease of access from customers' view

easeofaccess

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unimportant	42	11.0	11.0	11.0
	least important	35	9.2	9.2	20.2
	moderately important	109	28.6	28.6	48.8
	important	111	29.1	29.1	78.0
	most important	84	22.0	22.0	100.0
	Total	381	100.0	100.0	

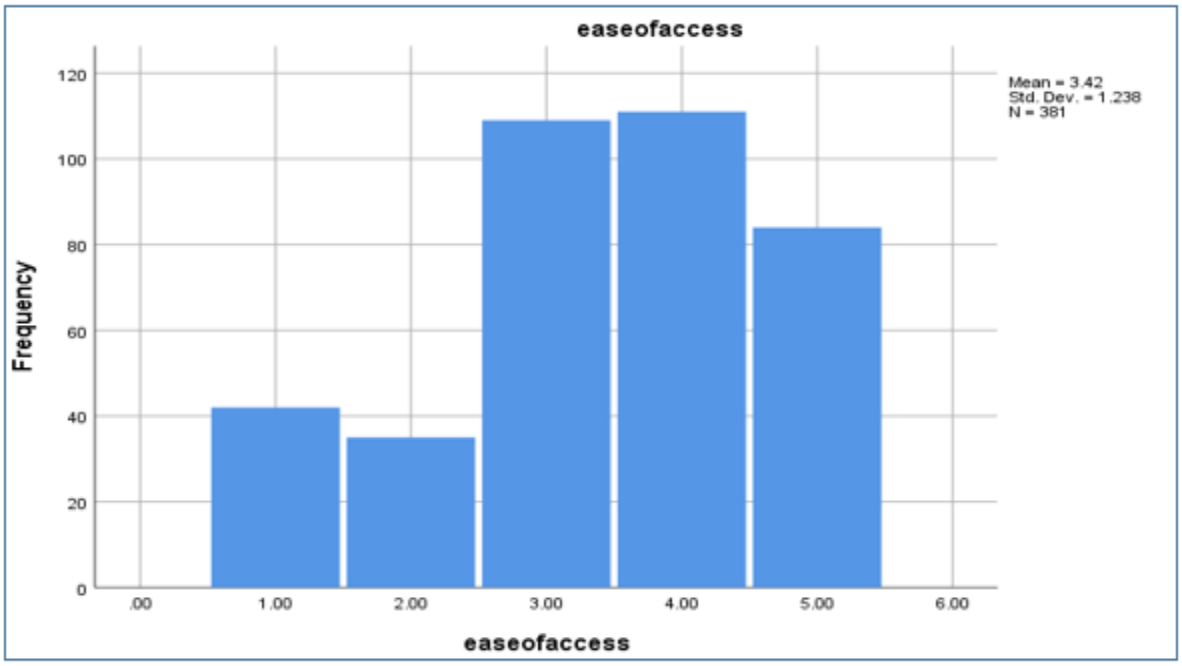


Figure 9: Histogram of importance of ease of access from customers' view

8. **Distance from Major Trade Centers**

Many of the respondents rated this factor as most important. They want to have a bank that has branches in most market areas and/or trade centers. Consequently, they ranked it from most to moderately important. This shows customers need their bank to be as near as possible to trade centers. Majority of them (349 of all) want their bank to be available near major trade centers within 0.5km. About 55% categorized it as most important and about 32% categorized it as important while about 14% of them labeled it as moderately important. This means all agreed on its importance. Its mean rank value is 4.4 which lay between important and most important categories. Below are the result table and histogram of this factor.

Table 8: Result table of importance of trade center from customers' view

tradecenter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	52	13.6	13.6	13.6
	important	121	31.8	31.8	45.4
	most important	208	54.6	54.6	100.0
	Total	381	100.0	100.0	

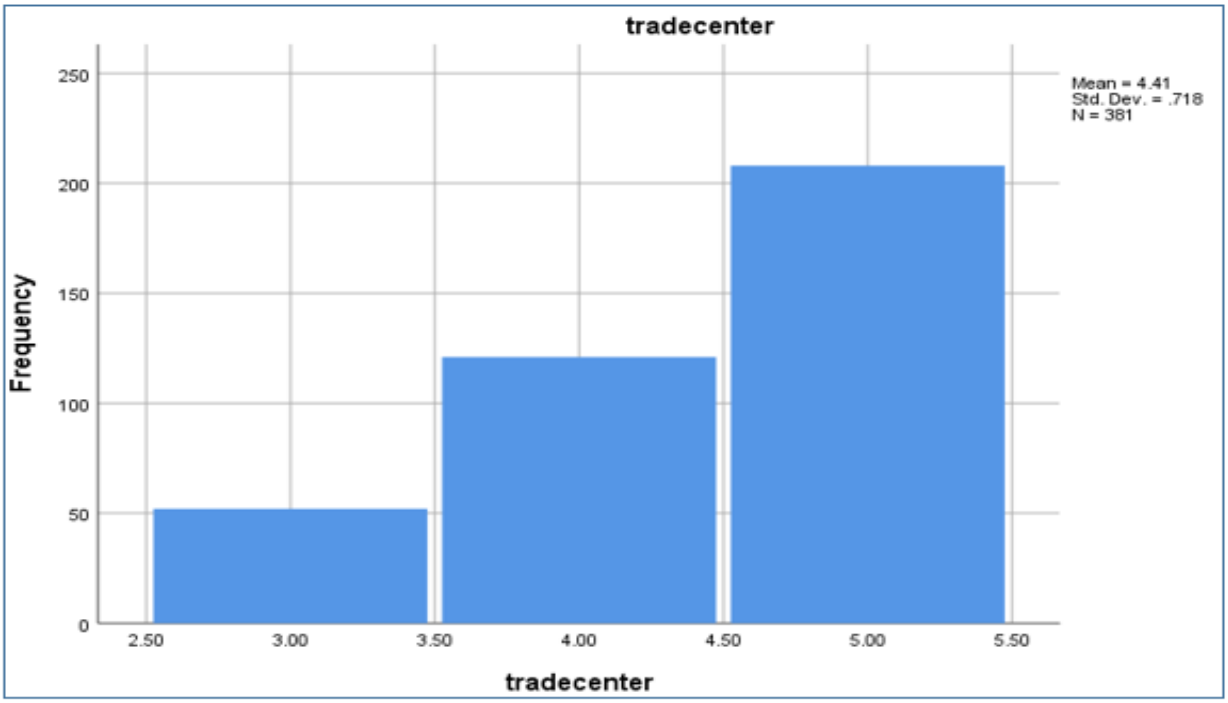


Figure 10: Histogram of importance of distance from trade centers from customers' view

9. **Distance from Hospitals and Health Centers**

The importance of this factor was assessed and found out. Most customers (355 of all) need the bank of their choice to be available near hospitals or other health centers within 300 meters distance. Majority of the respondents i.e. about 68% of all regarded this factor as moderately important and 8% of all as important while 25% of all categorized it as least important. However, none of the respondents categorized it under the two extremes i.e. as unimportant or most important and therefore, the range of the rank falls between moderately and least important. It has got mean rank value of 2.8 which is between the moderately important and the least important categories. The result table and histogram of this factor are given below.

Table 9: Result table of importance of hospitals from customers' view

hospital

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	least important	94	24.7	24.7	24.7
	moderately important	257	67.5	67.5	92.1
	important	30	7.9	7.9	100.0
	Total	381	100.0	100.0	

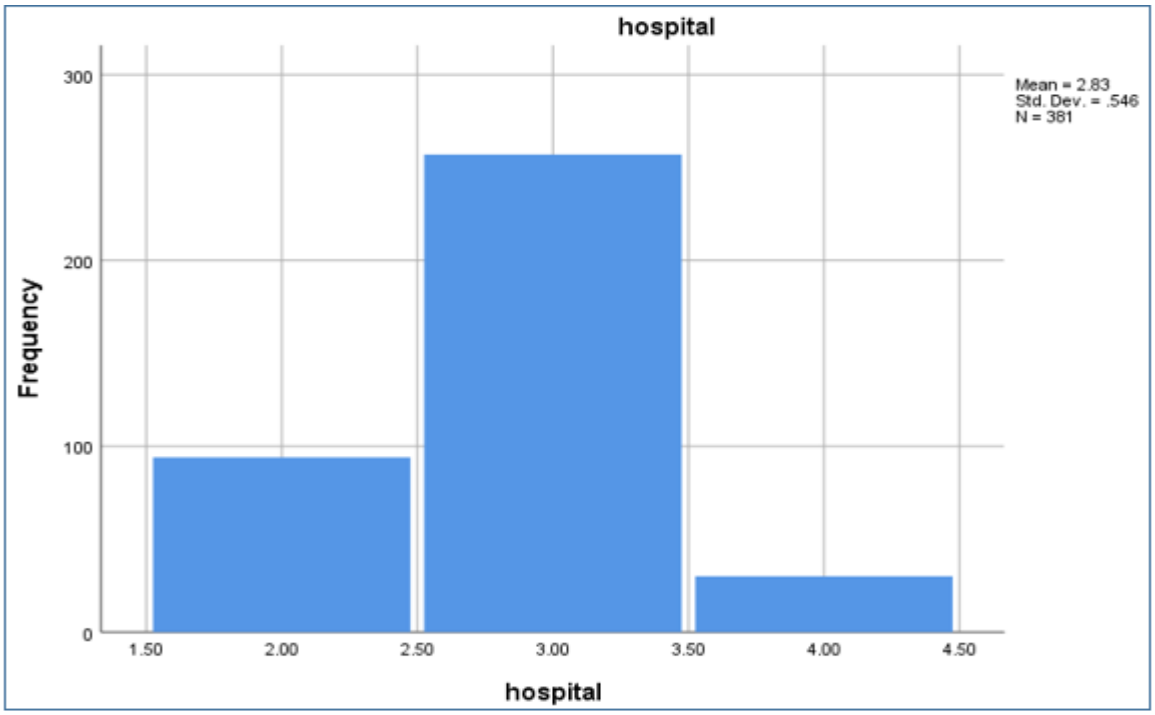


Figure 11: Histogram of importance of distance from hospitals from customers' view

10. **Distance from Hotels and Tourism Centers**

All of the surveyed customers want the bank that they are served to be available near most hotels and other recreation and tourism centers and want it to be within 0.5km distance. Based on this, most of the customers i.e. about 51% of all characterized this factor as most important while about 36% categorized it as important. Whereas the remaining amount which is about 13% believe it is moderately important. Neither least important nor unimportant was linked to this factor. Its rank only ranged between most and moderately important. The mean rank value of this factor is 4.39 and the associated importance level is between important and most important. The result table and histogram are given below.

Table 10: Result table of importance of hotels from customers' view

hotel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	49	12.9	12.9	12.9
	important	136	35.7	35.7	48.6
	most important	196	51.4	51.4	100.0
	Total	381	100.0	100.0	

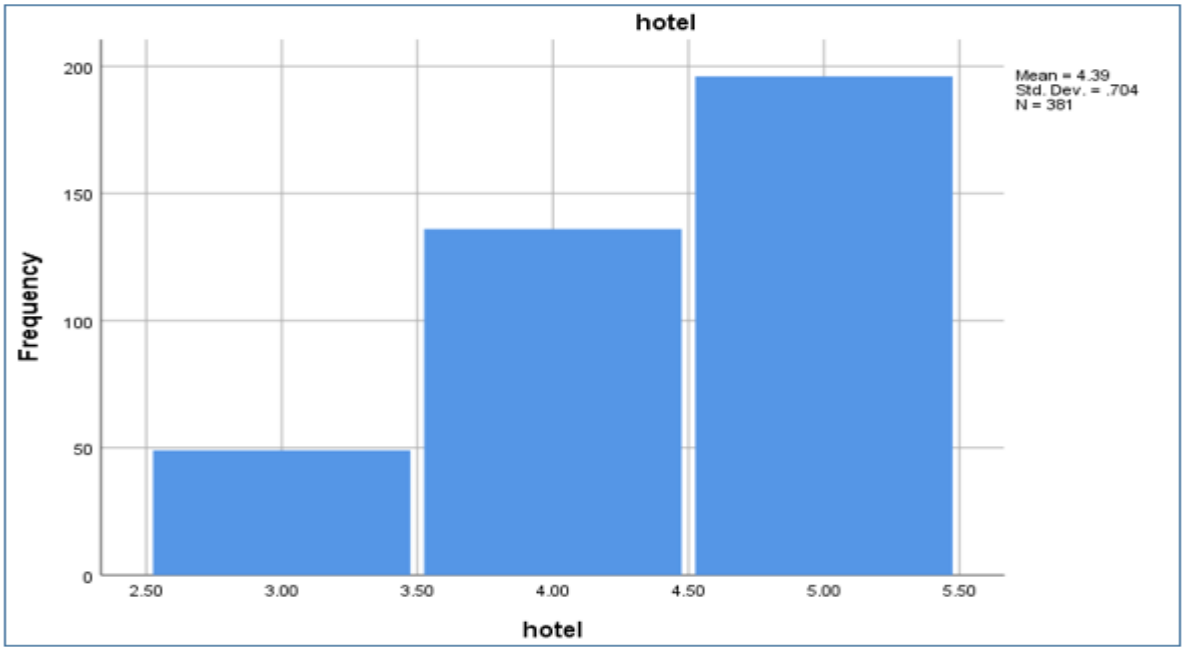


Figure 12: Histogram of importance of distance from hotels from customers' view

11. **Distance from Offices/Major Institutions**

When the importance of this factor was assessed, all respondents agreed on its importance though the level of importance varied. Most respondents want the bank to be available near those offices/institutions within 0.5km maximum distance or not more than that. Its rank ranged between four levels of importance from least to most important. Although 36% of the respondents categorized it as least important, it has got a mean rank value of 3.04 which corresponds to the moderately important category. The result table and histogram are given below.

Table 11: Result table of importance of big offices/institutions from customers' view

offices/biginstitutions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	least important	139	36.5	36.5	36.5
	moderately important	99	26.0	26.0	62.5
	important	132	34.6	34.6	97.1
	most important	11	2.9	2.9	100.0
	Total	381	100.0	100.0	

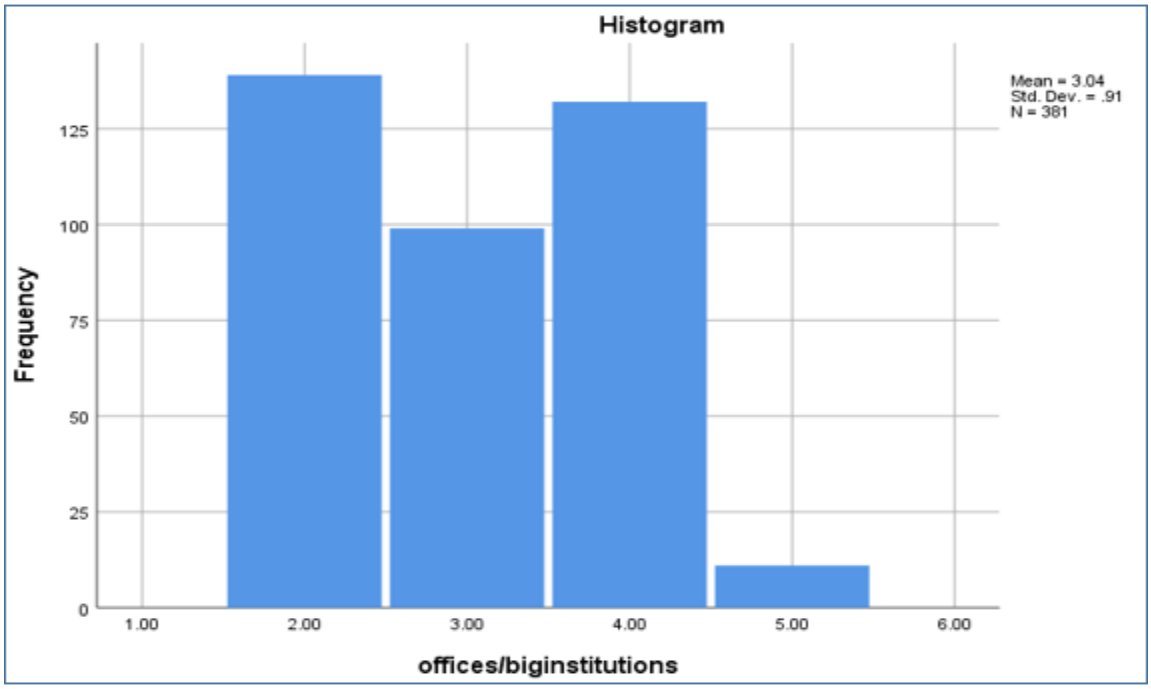


Figure 13: Histogram of importance of distance from offices from customers' view

12. **Beauty of the Building**

This factor as well was assessed to identify weather it is important or not and to determine its level of importance. It was found to be important and the degree of importance varied between most important and least important. Majority of the respondents or about 75% of all categorized it as least important which is of lower rank. The minority of the respondents which are only 5.5% of all labeled it as most important. However, it wasn't labeled as unimportant by any of the respondents. That means all respondents agree on its importance. With a mean rank

value of 2.4, its importance level lays between the least and moderately important category. Its result table and histogram are given below.

Table 12: Result table of importance of beauty of the place from customers' view

beauty

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	least important	285	74.8	74.8	74.8
	moderately important	33	8.7	8.7	83.5
	important	42	11.0	11.0	94.5
	most important	21	5.5	5.5	100.0
	Total	381	100.0	100.0	

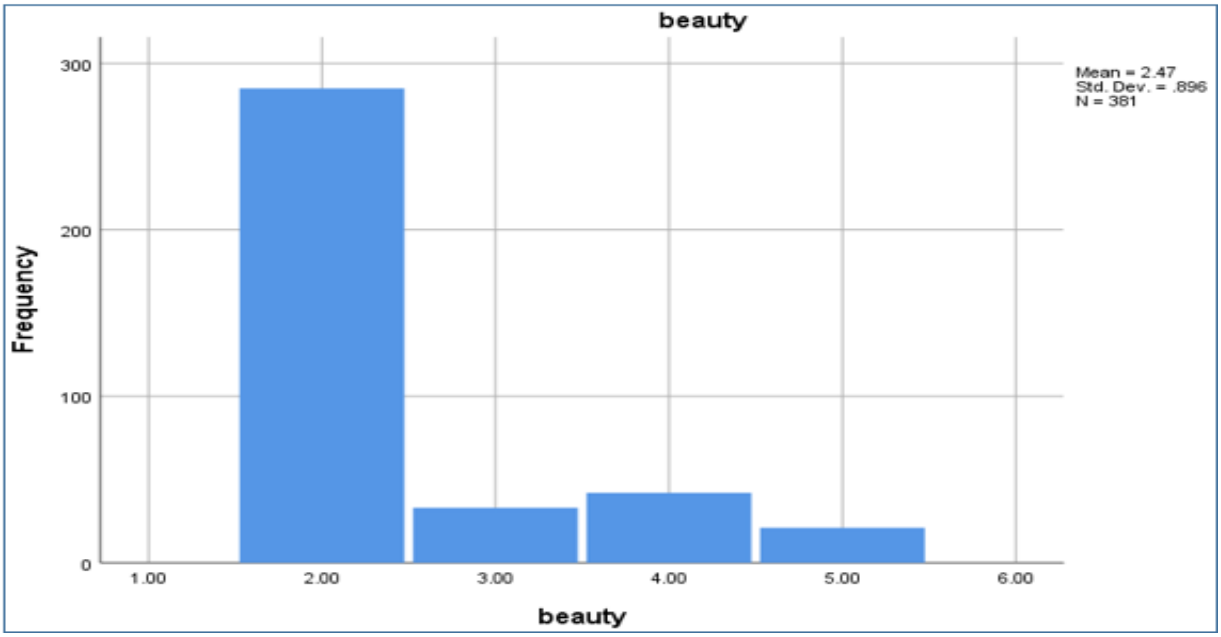


Figure 14: Histogram of importance of beauty of the building from customers view

Summary

The results of the twelve factors that were assessed is summarized as shown in the table given below. The importance of each factor was represented by numbers 1-5 for importance levels from unimportant to most important respectively. Each factor was rated within these varied ranges of ranks by several respondents and the corresponding mark as well varies from 5 to 1.

That means one single factor may get different kinds of ranks/marks by different customers. However the mean of these values was computed by the SPSS software and found to be as shown in the table below. Finally the mean associated to each factor will be taken as the average rank that represents the factor. And the corresponding weight was calculated from the associated mean. Mean, median, and mode are the statistical measures from the SPSS software. The mode is the most redundant number, the median is the central number or the number at the midpoint, and the mean is the average result. The weighted average is an average that takes in to account the varying degrees of importance of the numbers in the data. It is calculated by dividing each mean by the total mean and multiplying the result by hundred. The detail is shown in the table below as follows.

Table 13: Summary table of the twelve factors from customers' view

Statistics													
		proximity	aaccessibility	security	neatness	parking	street	easeofaccess	tradecenter	hospital	hotel	offices/big institutions	beauty
N	Valid	381	381	381	381	381	381	381	381	381	381	381	381
	Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean		4.9816	4.9711	4.9895	4.9186	2.2073	3.7979	3.4199	4.4094	2.8320	4.3858	3.0394	2.4724
Median		5.0000	5.0000	5.0000	5.0000	2.0000	4.0000	4.0000	5.0000	3.0000	5.0000	3.0000	2.0000
Mode		5.00	5.00	5.00	5.00	1.00	5.00	4.00	5.00	3.00	5.00	2.00	2.00
Sum		1898.00	1894.00	1901.00	1874.00	841.00	1447.00	1303.00	1680.00	1079.00	1671.00	1158.00	942.00
Weighted Average		10.73044	10.70782	10.7474	10.59475	4.754636	8.180687	7.366576	9.497965	6.100181	9.447083	6.546811	5.325645

4.2 Managers Responses

The second category of the respondents for the questionnaire in this thesis was the managers' side. This category comprises the decision committee in each district. There is a committee in each district office that discusses and decides on branch matters which include four district managers, four marketing department heads, and twelve marketing department staffs in the four districts which totally sum up to twenty out of which 12 are men and 8 are women. Their age ranged from 32 to 48. They have from 8 to 24 years work experience in the bank.

As stated earlier, all of them were surveyed or census survey was used instead of sample survey since they are very few in numbers. When it comes to the managers and their involved staff, the factors are 16 unlike that of the customers which was 12 since four more factors are added that

only concern to the managers but not to the customers. From the open ended questionnaires, no new factors were identified other than the proposed ones from managers side; not even all the proposed factors were approved by the managers since some of them (proximity and accessibility) were regarded as unimportant. The importance and degree of importance was determined for each of the 16 factors from the managers and staffs outlook. The result of the survey is shown as follows.

1. **Proximity to Residence House**

Assessment was done through questionnaire to investigate the importance of this factor in the eyes of managers. The result proves whether this factor is important or not and how important it is or how much they take it in to account when deciding the branch location. In other words, it shows how much the managers want to make the location of the bank as near as possible to people's resident houses or how much they are concerned about this thing. The response from the manager's side is all the same i.e. unimportant. They are concerned about how close the bank is to trade centers/market areas and other areas on which business activity take place but not concerned how close it is to residence houses and there is no agreed distance for this. 100% of them considered it as unimportant. The result table and histogram of this factor are shown below.

Table 14: Result table of importance of proximity from managers' view

proximity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unimportant	20	100.0	100.0	100.0

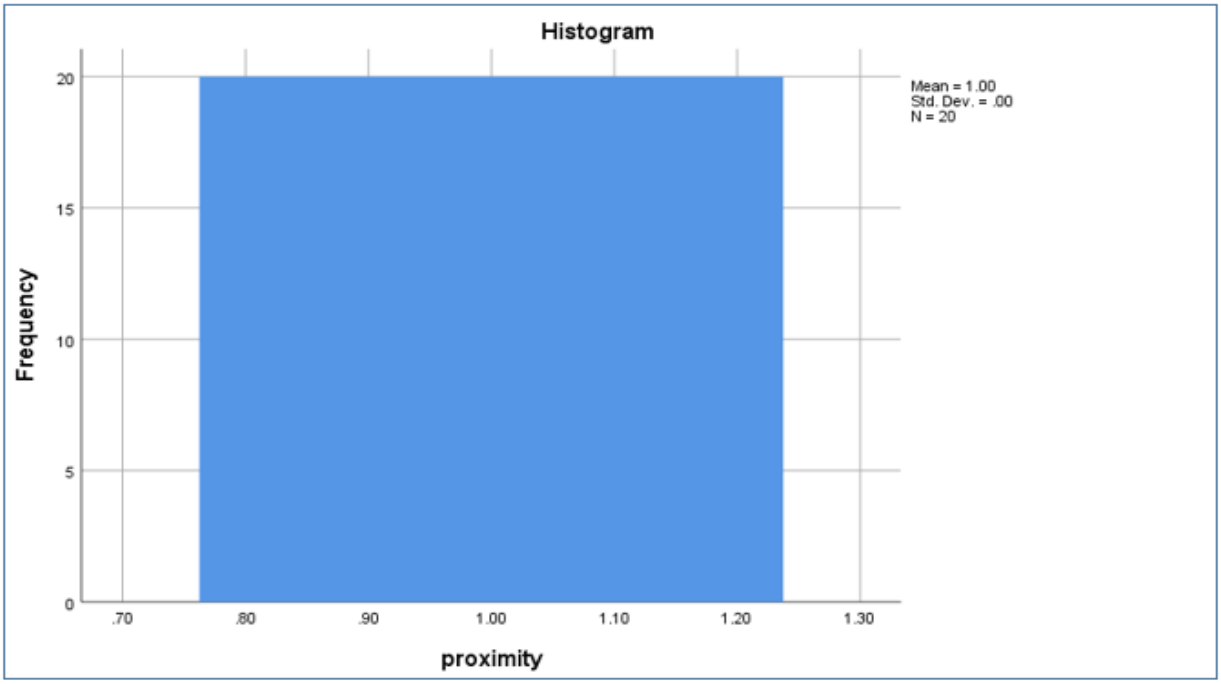


Figure 15: Histogram of importance of proximity from managers' view

2. **Distance from Own Branches**

CBE has more than 500 branches in the four districts under Addis Ababa district only. Many branches may be located very close to each other or aggregated in a single narrow place like in Arat kilo where there are three branches of CBE namely Kidist Maryam branch, Selassie branch, and Arat kilo branch with in very short distance interval while in other places the branches are scares and far from each other. This means more branches can be added in the existing previous branches within short interval of distance in the same locality as far as it's necessary or as far as there is a need. Whereas, some branches may be located far from each other if there is no much user. So it's not the distance that matters, it's the need. 100% of the managers rated this factor as unimportant. Given below are the result table and histogram of this factor.

Table 15: Result table of distance from own branches from managers' view

distancefromownbranches

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	unimportant	20	100.0	100.0	100.0

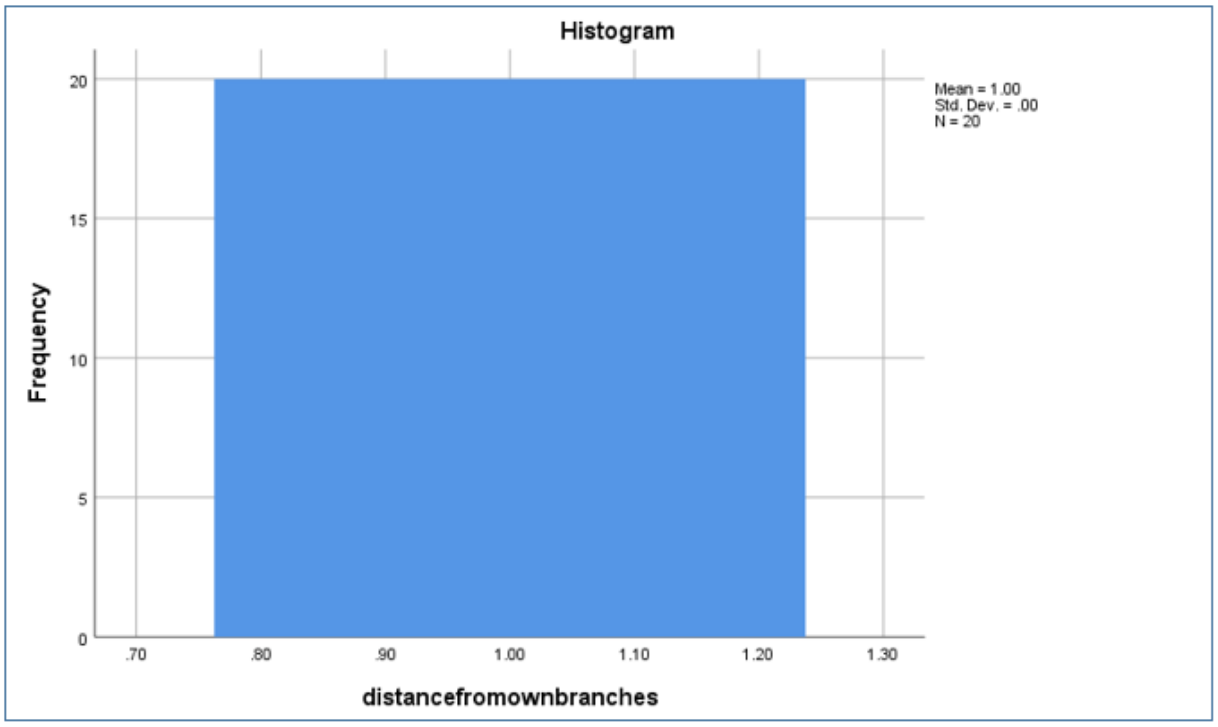


Figure 16: Histogram of importance of distance from own branches from managers view

3. Security

The importance of this factor was assessed and found out. Just like the customers, managers also give a great attention and consideration when they decide where to locate a branch to insure the banks and customers safety. All of them or 100% of the surveyed managers regarded this factor as most important. As the researcher referred from researches done outside Ethiopia, the fulfilment of this criterion is measured by the distance of the prospect place from robber/gangster sites or areas that are more likely to be unsafe. This was also confirmed by the Ethiopian managers in the four districts of A.A and their involved staff. In addition, according to the managers' side, the more a place is urbanized, the more it is secured since there will be strong security due to presence/availability of government bodies or executives. Therefore, opening a branch in metropolis is more secure than opening in country side where the security might be precarious. However, there is no known gangster site in the current study area or there is no evidence of that. Therefore, it can be said that there is no such security issue. Anyways, priority is given to it or they believe it is very necessary even though there is not known unsecured place.

Table 16: Result table of importance of security from managers' view

security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most important	20	100.0	100.0	100.0

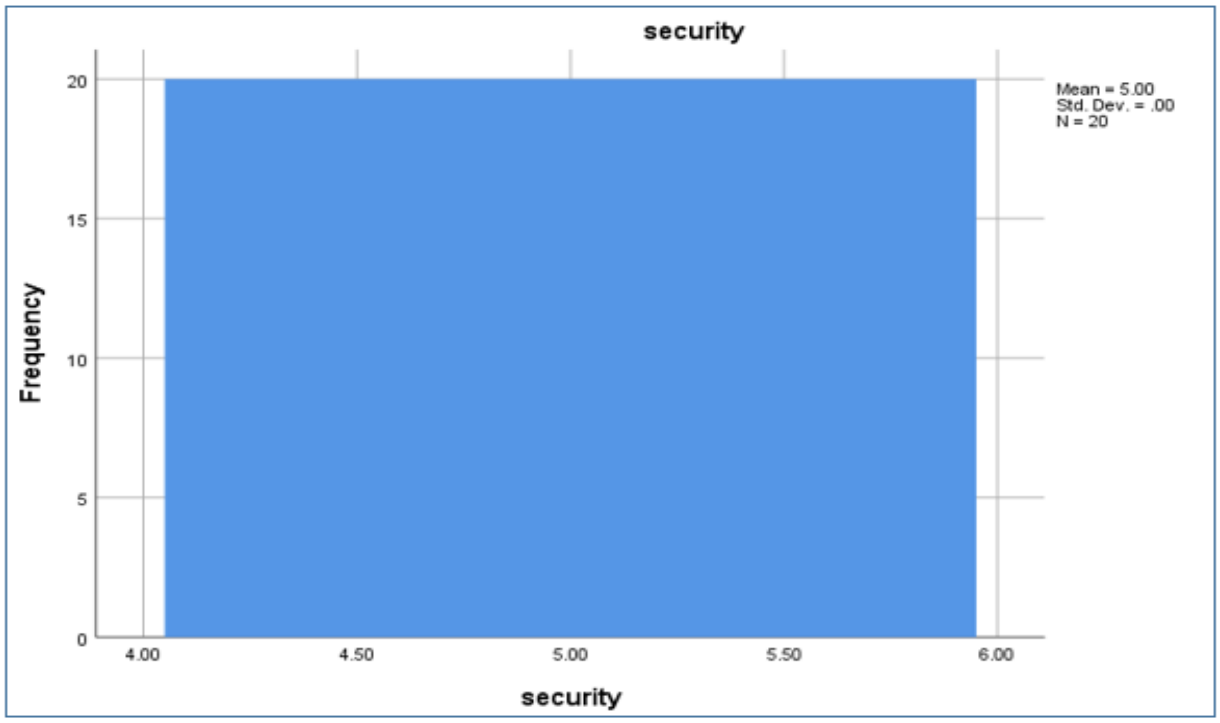


Figure 17: Histogram of importance of security from managers' view

4. **Neatness/Cleanness**

This factor was also assessed to investigate how much it matters in the managers decision regarding branch site or to determine whether it is important or not and also how much it is important. Accordingly, it was found to be important and the importance level ranged from most important to important. 80% of the managers ranked it as important while the rest 20% rated it as most important. The mean rank number of this criterion is 4.2. Given below are the result table and histogram of this factor.

Table 17: Result table of importance of neatness from managers' view

neatness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	important	16	80.0	80.0	80.0
	most important	4	20.0	20.0	100.0
	Total	20	100.0	100.0	

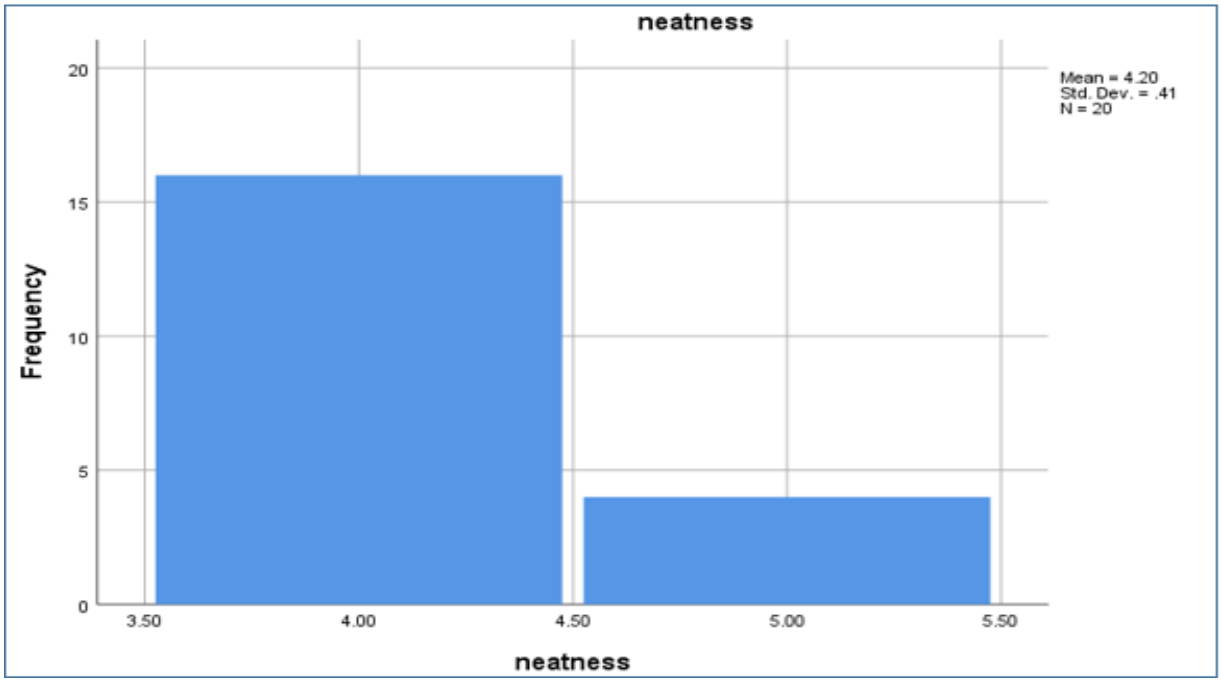


Figure 18: Histogram of importance of neatness from managers' view

5. Parking

The significance of this factor in branch site decision was assessed and found to be significant. All the managers believe that parking matters. Actually, it's not so common in Ethiopia to see areas prepared for parking purpose. People use the edge of the road/street for parking near the building that they get service. These days there are very few parking areas in A.A city. Anyways the managers' side believes the availability of such areas adds value and is taken into consideration. Its level of importance ranged from important to most important and its mean is 4.25 which lay between the important and most important category. Below are the result table and histogram.

Table 18: Result table of importance of parking from managers' view

parking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	important	15	75.0	75.0	75.0
	most important	5	25.0	25.0	100.0
	Total	20	100.0	100.0	

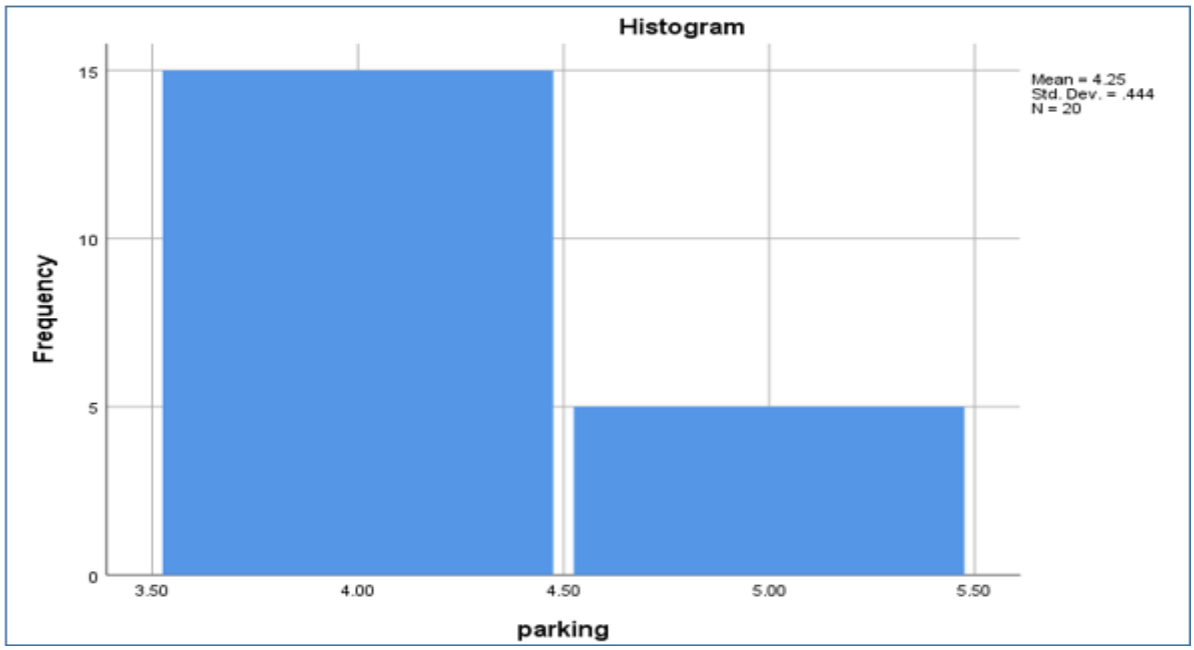


Figure 19: Histogram of importance of parking from managers' view

6. Main Streets

How close should the bank be to main streets was one of the factors that has been assessed. This factor was also investigated like the other factors to evaluate its importance or consideration level in decision making related to branch site. Managers and others those who are involved in the decision stated that this factor has significant consideration in their decision. Majority of them or 75% of them regarded it as moderately important whereas minority of them or 25% of them ranked it as important. The mean rank is 3.25. Given below are the result table and histogram of this factor.

Table 19: Result table of importance of distance from main streets from managers' view

street

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	15	75.0	75.0	75.0
	important	5	25.0	25.0	100.0
	Total	20	100.0	100.0	

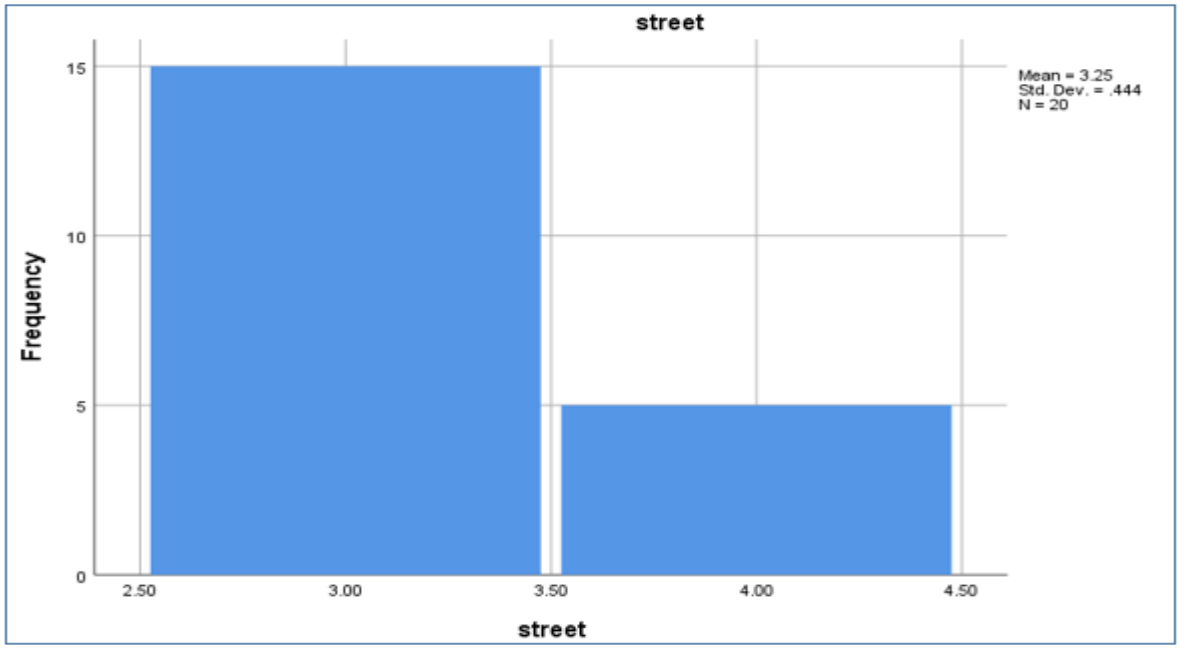


Figure 20: Histogram of importance of distance from streets from managers' view

7. Ease of Access

This factor is a measure of how easy it is to reach or to access the bank. Some bank branches might be located in higher floors of a building, others might be located in a place of higher slope/topography or at the acme of an elevated area that customers have to climb. This factor was assessed and found to be important. It is considered significantly in the location decision. How much it affects the location or how importantly it is considered during the selection of branch site determines its rank. Based on this, it was ranked as important by 50% of the managers and as moderately important by the rest 50%. The mean rank value is 3.5. The result table and the histogram of this factor are shown below.

Table 20: Result table of importance of ease of access from managers' view

easeofaccess

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	10	50.0	50.0	50.0
	important	10	50.0	50.0	100.0
	Total	20	100.0	100.0	

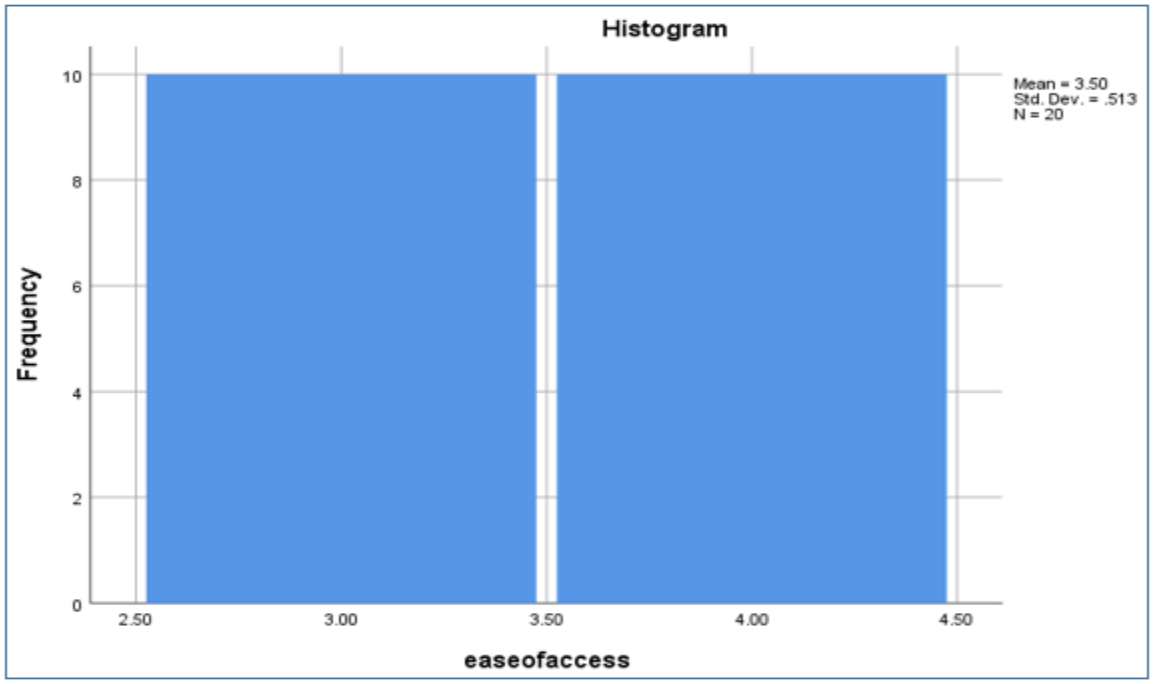


Figure 21: Histogram of importance of ease of access from managers' view

8. Trade Center

This is a measure of how available the bank is in most/major trade centers. If a bank has branches in most and major trade centers or market areas, it is said that it fulfills this criteria. Customers might need a bank near/ around market areas and therefore this factor is measured by the distance of a bank branch from market areas or trade centers. Major trade centers in A.A include for example Merkato, Shola Gebeya, Zero hulet Gebeya, Megenagna, Super markets etc. Managers consider it most significantly in their decision of branch location. 100% of them voted on it as most important factor i.e. the mean rank value is 5 and it corresponds to the most important category. The result table and histogram of this factor are given below.

Table 21: Result table of importance of distance from trade centers from managers' view

tradecenter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most important	20	100.0	100.0	100.0

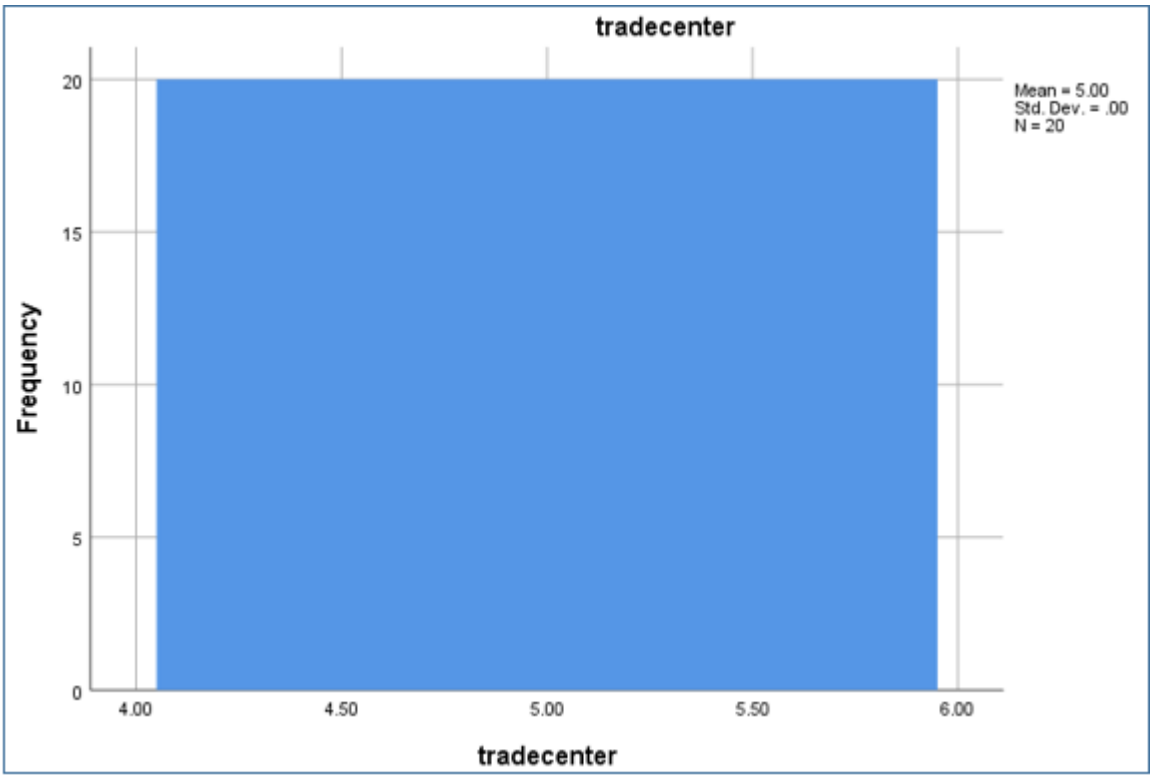


Figure 22: Histogram of importance of distance from trade centers from managers' view

9. Hospital

This is a measure of how a bank is closely available near most hospitals and/or health centers. It is measured by the distance of a bank from most hospitals and health centers. Managers take it in to consideration significantly and how importantly they consider it fixes its value or importance level. 80% of the managers label it as important while the rest 20% consider it as most important factor and its mean value of 3.15. Result table and histogram of this factor are given below.

Table 22: Result table of importance of distance from hospitals from managers' view

hospital

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	important	16	80.0	80.0	80.0
	most important	4	20.0	20.0	100.0
	Total	20	100.0	100.0	

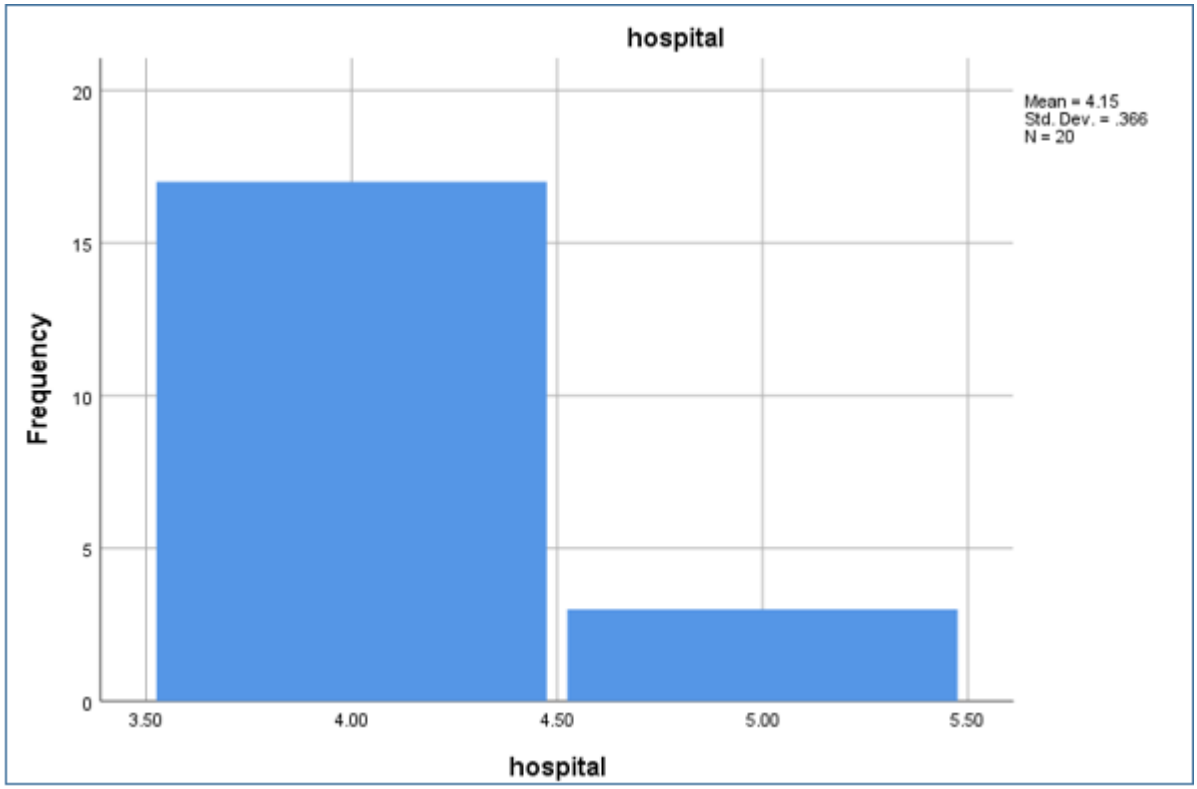


Figure 23: Histogram of distance from hospitals and health centers from managers' view

10. Hotels and Tourism Centers

This shows how available the bank is near most hotels, big restaurants, major cafterias, parkway, and other recreation centers not forgetting tourism centers. It is measured by the distance of the bank from major/most hotels and other recreation centers. There are a lot of such things in the study area. This factor is among the most significantly considered factors during branch site decision because such places are believed to be areas of high business or marketing activities. It got a 100% vote of all the managers. With mean rank value 5, it goes to the most important category. The result table and histogram are shown below.

Table 23: Result table of importance of distance from hotels from managers' view

hotel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most important	20	100.0	100.0	100.0

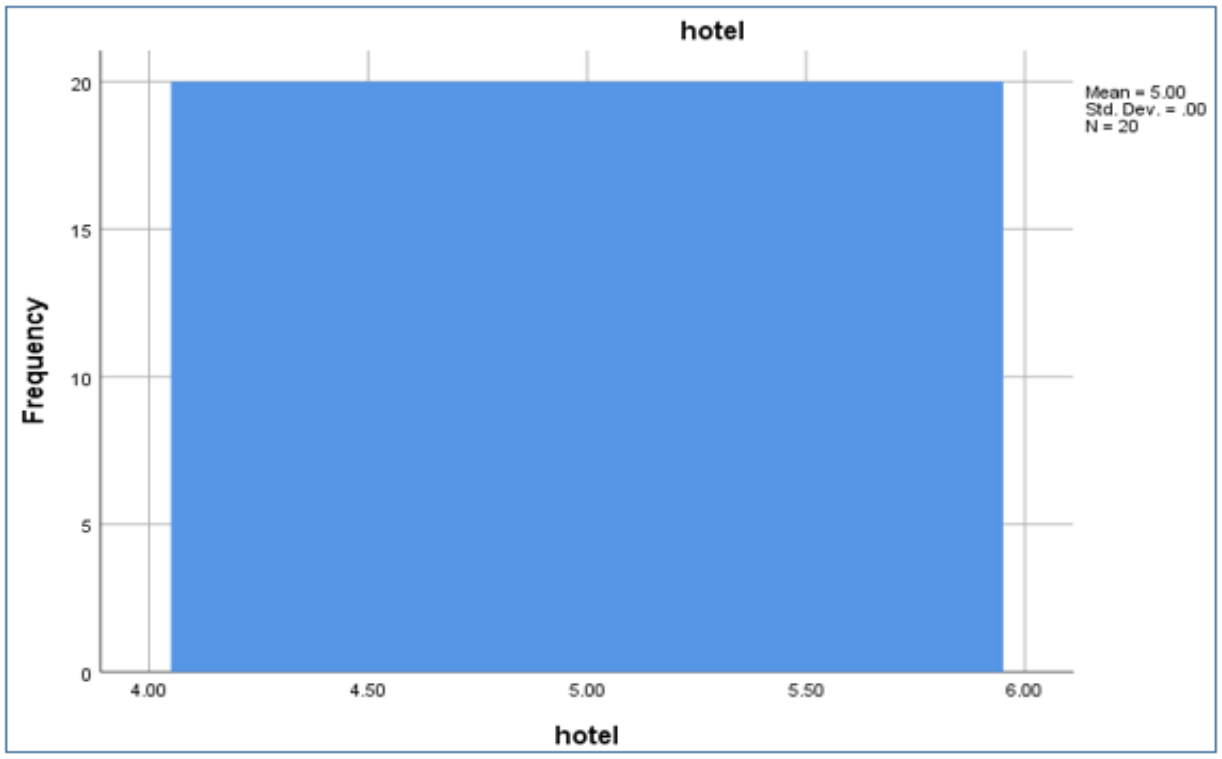


Figure 24: Histogram of distance from hotels and recreation centers from managers' view

11. <u>Office/Major Institutions</u>

This shows how closely the bank should be located to major/most offices to be accessed by the office workers. This factor is also important or it has its own importance level. Managers take account of it during their decision on where to locate a branch. How importantly it is considered was determined by the managers. According to that, 100% of the managers valued it as moderately important. With mean rank value 3, it goes to the moderately important category. Below are the result table and histogram.

Table 24: Result table of importance of distance from big offices from managers' view

office

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	20	100.0	100.0	100.0

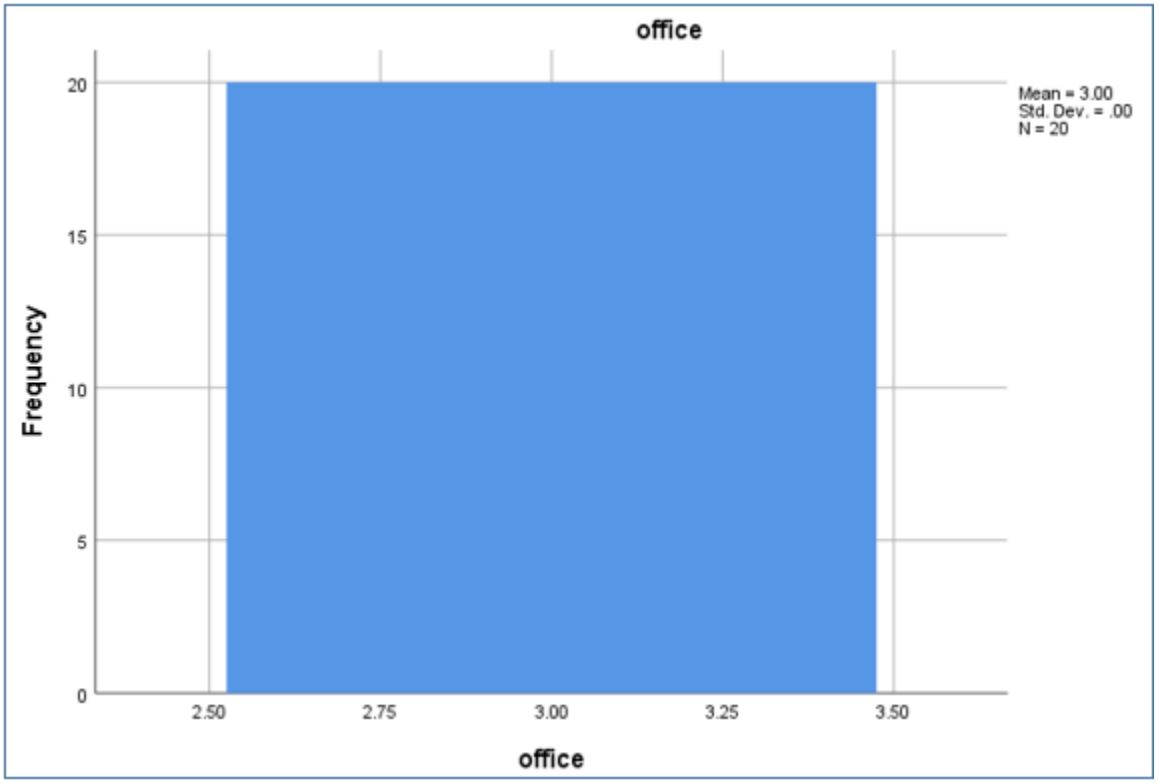


Figure 25: Histogram of importance of distance from offices from managers' view

12. <u>Beauty and Quality of the Building</u>

This shows how beautiful the building or the site is. How significantly it is considered in the decision of branch site was determined by the managers. Besides, its rank ranged from important to moderately important. 85% of the managers labeled it as moderately important while 15% of them valued it as important and its mean rank is 3.15. Actually, there is not an agreed standard/measure of beauty of a building. It depends on the individuals view. But generally, in this study, size, width, and attractiveness are used as measure of beauty and quality of building. When a bank room is very narrow or in a small building, it becomes

crowded and suffocated and is not going to be attractive and convenient from inside and outside. When the building is big with wide rooms, it will have an attractive and relaxed view. The result table and histogram of this factor are given below.

Table 25: Result table of importance of beauty of building from managers' view

beauty

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	17	85.0	85.0	85.0
	important	3	15.0	15.0	100.0
	Total	20	100.0	100.0	

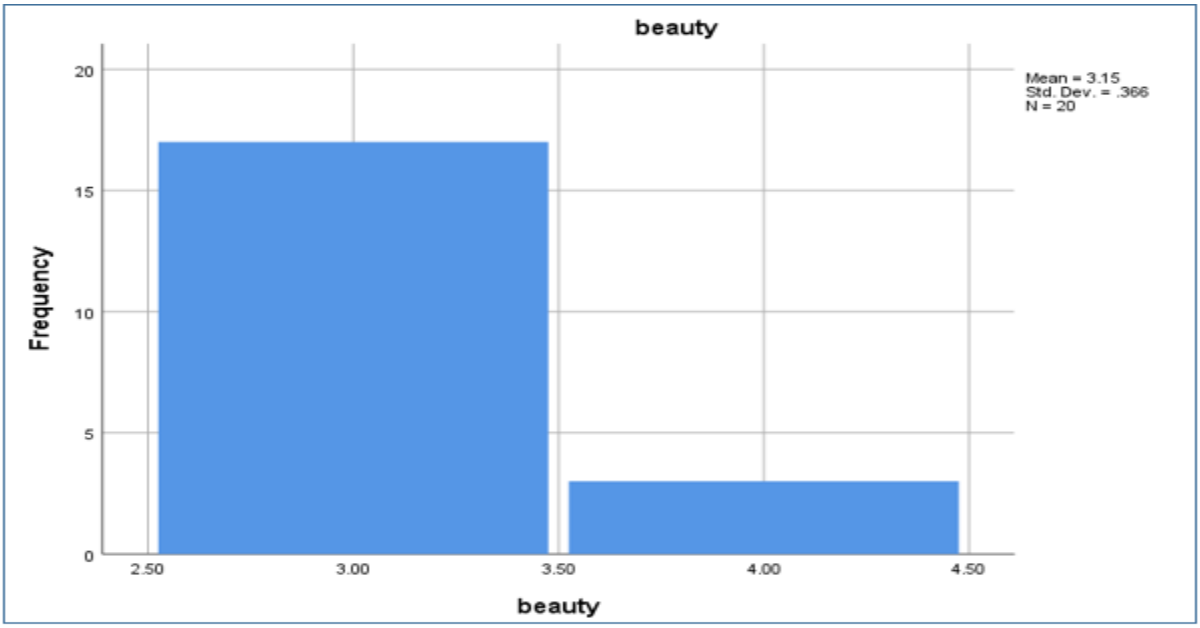


Figure 26: Histogram of importance of beauty of the building from managers' view

13. Population Density

This shows how populated the prospect place is. This is important to avoid the risk of scarcity of user. If a branch is opened in a poorly populated area, the bank will face shortage of customers. This factor is mostly considered during opening a branch in small towns or rural areas since large towns are already densely populated. Anyway, it is one of the outstandingly considered factors by managers in their decision of branch site. 100% of them valued it as most important. Its mean rank is 5 which correspond to the most important category. Below are the result table and histogram of this factor.

Table 26: Result table of importance of population density from managers' view

populationdensity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most important	20	100.0	100.0	100.0

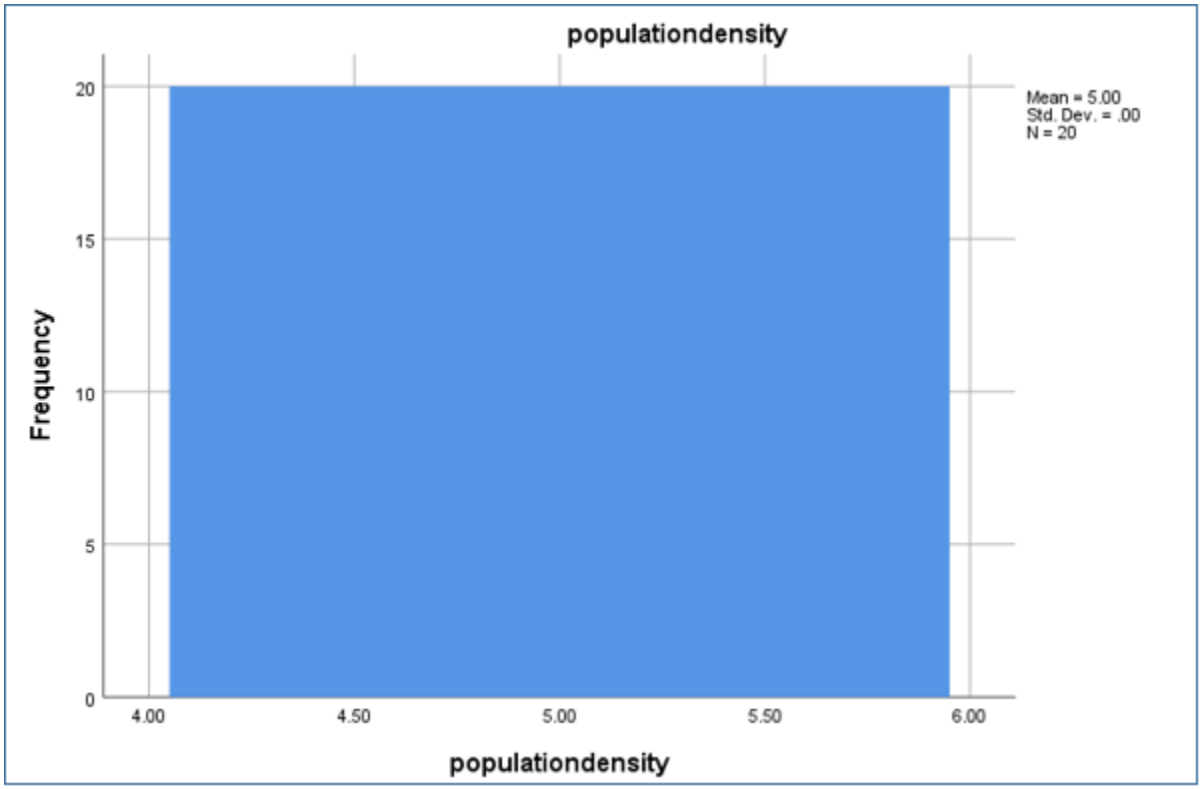


Figure 27: Histogram of importance of population density from managers' view

14. Income level

This shows the economic condition of the resident people living in the prospect area. The income level of the resident people in the area should be optimum enough to deserve a bank branch. If they have low living standard and life style or if they are poor generally, it will be risky for the bank to open a branch there whether they are highly or scarcely populated. This is because even if there is much people, if there is no money, there will be no transaction. Managers consider it most prominently to decide to open a branch in a place. Mostly, this factor is used or considered during opening a bank branch in small towns or rural areas. All the managers/100% of them ranked it as most important. Its mean rank is 5 which belong to the most important category. The result table and the histogram are shown below.

Table 27: Result table of importance of income level from managers' view

incomelevel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most important	20	100.0	100.0	100.0

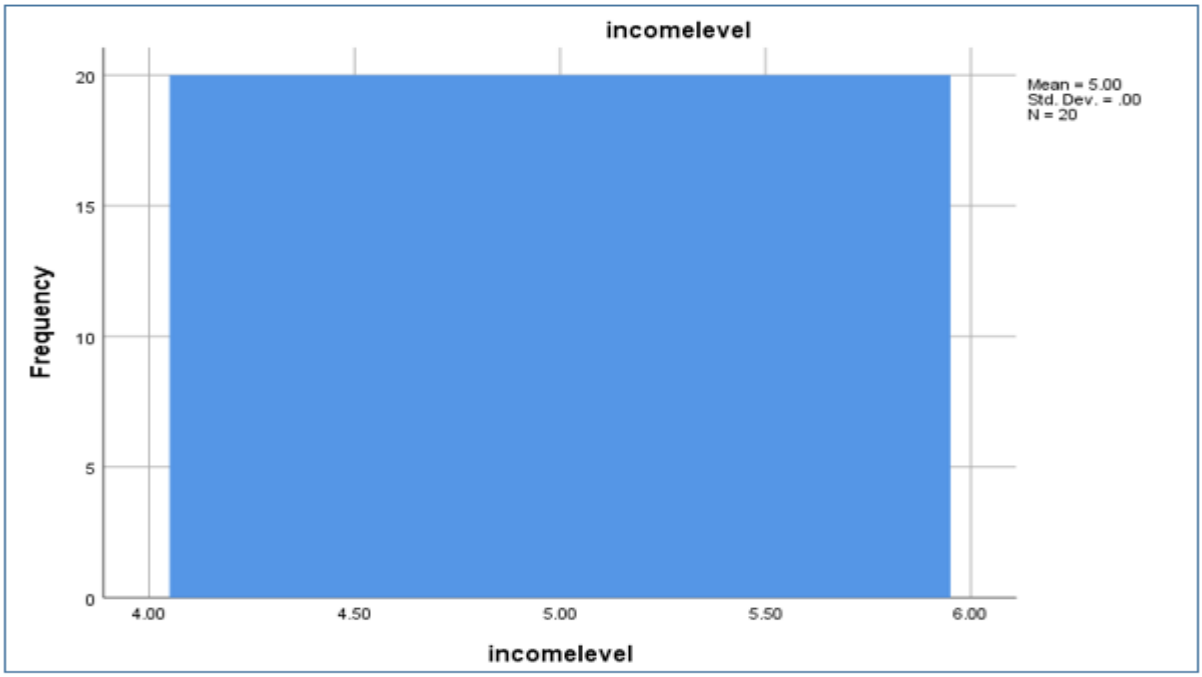


Figure 28: Histogram of importance of income level from managers' view

15. Cost of the Building

This shows the price that should be paid by the bank to own or to rent the building for the branch to be opened there. It is measured in such a way that does cost of the building matter as far as the site or the location fulfills the other criteria or as far as the site is a target location and also how importantly it matters. It was investigated to be among the important factors that are considered in branch decision. Its rank ranged from important to moderately important. 20% of the managers rated it as important whereas 80% rated as moderately important and its mean rank is 3.2. The result table and histogram of this factor are given below.

Table 28: Result table of importance of cost of the building from managers' view

costofthebuilding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	16	80.0	80.0	80.0
	important	4	20.0	20.0	100.0
	Total	20	100.0	100.0	

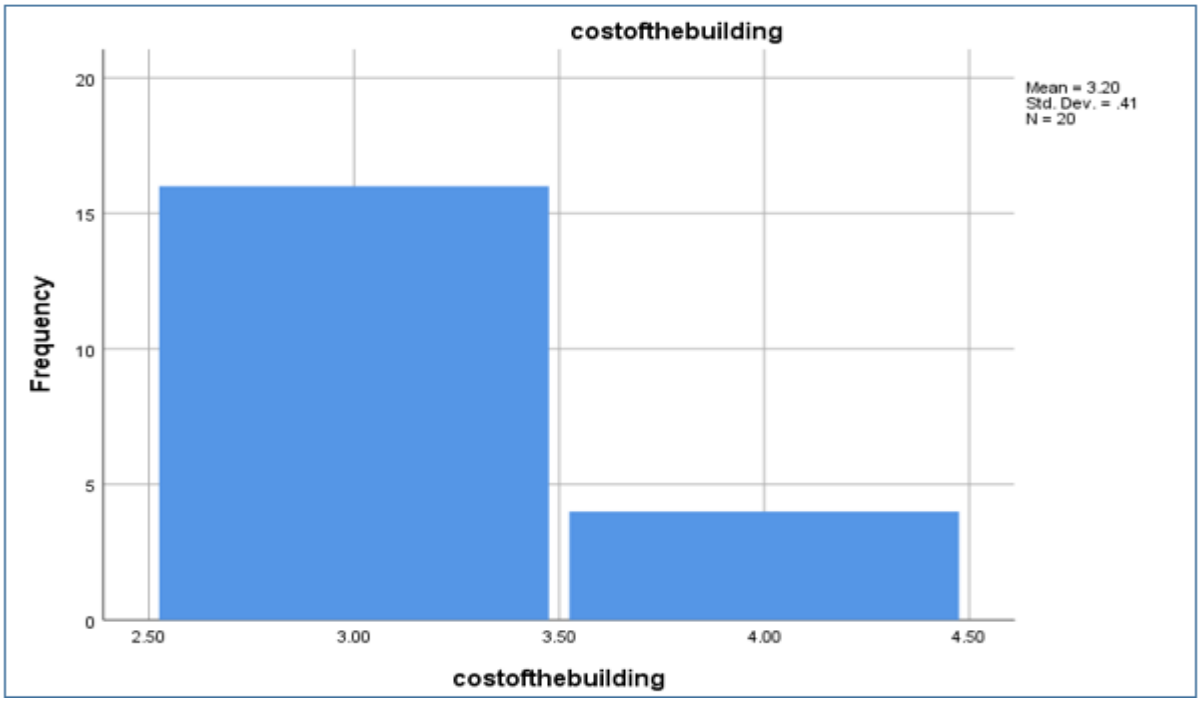


Figure 29: Histogram of importance of cost of building from managers' view

16. <u>Distance from Competitors Branches</u>

This shows the distance between the current bank branches and the branches of any other banks or competitor banks. How far should the bank be from competitors' branches? Based on the foreign research paper that the researcher reviewed, a new bank branch should be as far as possible from competitors' branches or at least 3 km away from them. However, different principle is followed in Ethiopia. The closer the place is to other bank branches, the more suitable it is for a new branch. I.e. CBE district managers try to make the new branch as near as possible to other banks to compute them. The mean rank for this factor is 3.6 which is between important and moderately important category. The result table and histogram are given below.

Table 29: Result table of distance from competitor's branch from managers' view

distancefromcompetetorsbranches

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderately important	8	40.0	40.0	40.0
	important	12	60.0	60.0	100.0
	Total	20	100.0	100.0	

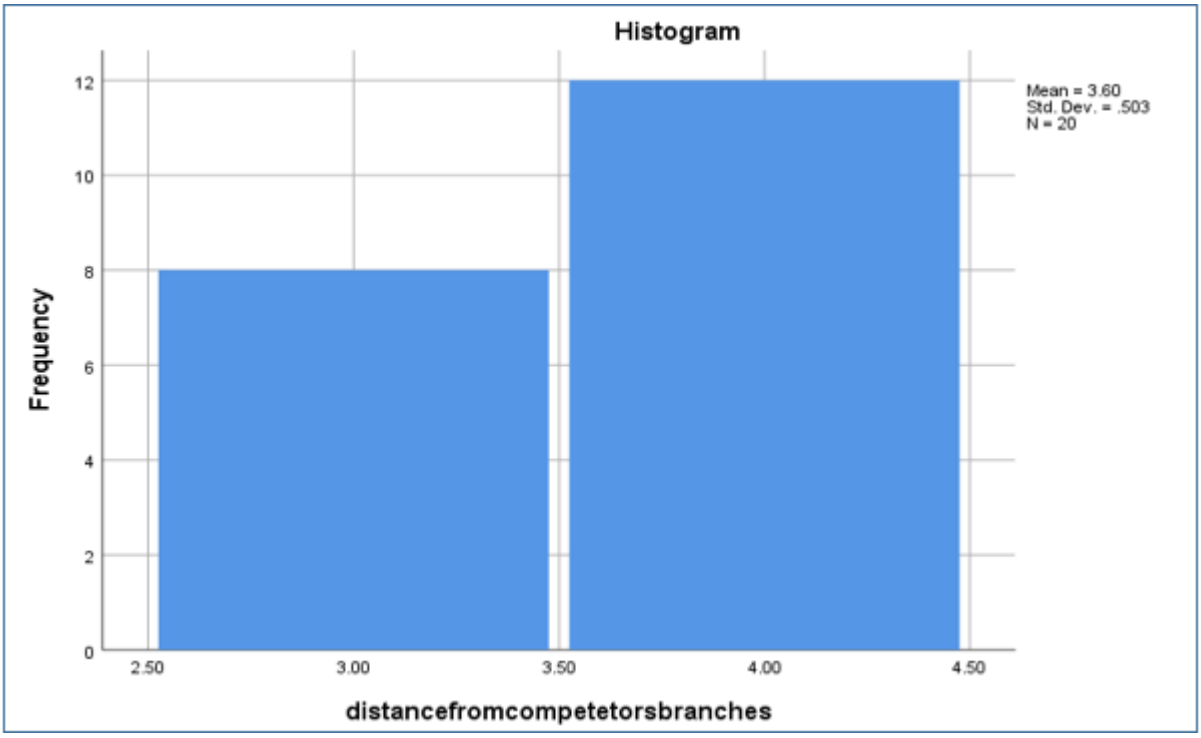


Figure 30: Histogram of distance from competitors' branches from managers' view

Summary

Result of importance of each factor from manager's view is summarized as shown in table 30. As stated earlier, the statistical measurements from the SPSS software are the mean (the average of the data), the median (the middle number of the data), and the mode (the most redundant number of the data). The weight/ weighted average was computed in Microsoft excel by dividing each mean by the total mean and multiplying the result by hundred.

Table 2: Summary table of importance of each factor from manager's view

Statistics																	
		proximity	distancefromownbranches	security	neatness	parking	street	easeofaccess	tradecenter	hospital	hotel	office	beauty	populationdensity	incomelevel	costofthebuilding	distancefromcompetorsbranches
N	Valid	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		1.0000	1.0000	5.0000	4.2000	4.2500	3.2500	3.5000	5.0000	4.2000	5.0000	3.0000	3.1500	5.0000	5.0000	3.2000	3.6000
Median		1.0000	1.0000	5.0000	4.0000	4.0000	3.0000	3.5000	5.0000	4.0000	5.0000	3.0000	3.0000	5.0000	5.0000	3.0000	4.0000
Mode		1.00	1.00	5.00	4.00	4.00	3.00	3.00[a]	5.00	4.00	5.00	3.00	3.00	5.00	5.00	3.00	4.00
Sum		20.00	20.00	100.00	84.00	85.00	65.00	70.00	100.00	84.00	100.00	60.00	63.00	100.00	100.00	64.00	72.00
Weighted Average		1.68492	1.68492	8.4246	7.076664	7.16091	5.47599	5.89722	8.4246	7.076664	8.4246	5.05476	5.307498	8.4246	8.4246	5.391744	6.065712

4.3 Results of the GIS Analysis

Once the factors are identified and their weight is determined, the next step is to subject them in to GIS software for process which is called the MCDA (Multi Criteria Decision Analysis) to identify the suitable place for a new branch or for any future branches. The current study area/ A.A District covers extremely large area from the four directions; East, West, North, and South. It is too wide to collect data from by the researcher to subject it to the GIS process. So Yeka sub city was taken as an example to show how to select suitable area using GIS processes/methods and tools so quickly and cheaply. It's not the whole sub city, its half of it which includes areas from Megenagna northwards incorporating localities part of Megenagna, Gurd shola, CMC, Ayat and the whole of some localities like Wesen, Kara, Yeka Abado condominium, Lamberet, Kotebe, Mesalemiya, etc. The researcher has taken location data of each hospital and other health centers, hotels, big restaurants and other recreation centers, offices and major institutions, buildings, main streets and all the necessary data. After the data collection process, the collected data about the factors were processed in ArcGIS 10.3 version using the MCDA method. ArcGIS is the software on which the analysis is done and MCDA is the method of doing the analysis which involves collecting, standardizing, buffering/distancing, classifying, weighting, and overlaying of the factors/criteria in the form of layer to get their resultant or average result from their specific effect. A free trial version of ArcGIS was used for this study.

However, 8 factors out of 16 were processed and used for the site decision. This is because of many reasons. From the 16 factors, two were considered as unimportant by the managers side and these factors are proximity to residence house and distance from own branch. Since the managers are the one who decide on the site, their judgment on the importance of the factor and the weight they assigned to each factor was taken for the GIS process for the final selection of the site in the overlay analysis. The customers weight and judgment is needed for comparison with that of the managers, to show customers desire incase the managers side considered it in the future decision to increase customer satisfaction, and to identify the gap between managers stand and customers desire. After the two factors proximity and distance from own branch were deducted, only 14 factors were left for the process. But again other two factors were deducted which are income level and population density since these factors are relevantly used in rural areas or small towns and since our specific study area for GIS process is the Yeka sub city which is none of these places and which is found in A.A. city. Now 12 factors are left and there are two additional factors to be avoided from the MCDA. These are cost and beauty of the building. These factors are avoided due to two reasons. One is the researcher can't judge on the beauty and cost of the building. The second and the most important reason is that beauty and cost data is not suitable for overlay analysis. What the researcher can do is only showing the suitable area based on the rest factors leaving the cost and beauty judgment for the managers so that the available buildings in the suitable area which also fulfill the beauty standard and fairness of cost will be selected by the managers.

Now again, as stated earlier, security is measured by the distance of the bank site from insecure places like sites of gang etc. But there is not known/evidenced gang site in this sub city or in A.A as a whole. So there is no need to deal with security in the process. As said earlier also, it's not common to see parking areas in A.A. People Park at the edge of the road most of the time. Anyway there is only one parking area in Yeka sub city near Zefmesh in Megenagna. However, this area falls out of the specific GIS study area in this thesis since the study area is from Megenagna northwards and therefore there is no need to subject it in the GIS process for suitable site identification in this specific area. Finally, the GIS process started with the rest 8 factors and with their respective weight given by the managers. The overlay analysis tool in ArcGIS only processes factors if their weight sums up to 100. But since 8 factors are deducted from the list with their corresponding weight, the weight of the remaining 8 factors will not fill

up 100 and so new proportional weight was given to the factors to imbue 100 for the overlay analysis. Accordingly, the factors with their new weight are given in the table below.

Table 31: Weight table of the eight factors from managers' view

	Neatness	Street	Ease of Access	Trade Center	Hospital	Hotel	Office	Distance from Competitor	Sum
Previous weight	7.076663858	5.47598989	5.897219882	8.424	7.076663858	8.424599832	5.054759	6.065712	53.49561
New weight	13.22834646	10.23622047	11.02362205	15.7480315	13.22834646	15.7480315	9.448818898	11.33858268	100

The way of data collection, processing and creating a map was similar for all factors except for slope. GPS data of each hotel, recreation center, each health center, clinic or hospital, each big institution like collage, university, Embassy, and other big and well known government institution, each major market area, each bank, each waste disposal/dirt site etc. was collected by the researcher using GPS by ground survey. Only the boundary shape file and DEM of Yeka sub city was collected from EMA. Actually, street data was also collected from this organization. However, it wasn't used in this thesis because it was so complicated since it includes every single path. However, only the main streets were needed for the analysis. Accordingly the roads data/ streets shape file that was collected from EMA was left and the researcher has prepared other new main streets data by taking a record of GPS measurement along the main streets (collecting point data and then changing it in to line and again to shape file to use it for the analysis). The researcher prepared a new boundary of the study area from the former one/ by editing the former one since the study area does not include the whole Yeka sub city. Also from the DEM, slope was produced in the spatial analyst tool in ArcGIS.

After the GPS location of each factor except slope was collected by the researcher by ground survey and changed in to shape file format in ArcGIS, distance analysis was done by Euclidean distance theorem from the Arc tool box in such a way that the distance of every point in the study area from each factor is measured. If for example we take the factor neatness, the distance of every point in the study area from the waste disposal sites/ dirt sites is measured. Once the distance is measured, it goes to classification using the classify tool in the Arc tool box in a way that areas or points that have certain distance (within a given range) from the dirt sites are grouped in one category and so on. The same procedure was followed for each factor (for the other distance related factors) even though the distance range and suitability

characteristics differ for each factor. Suitability characteristics in a sense, for example for the factor neatness, the nearest areas are unsuitable and suitability degree increases with distance. However, the reverse is true for the other distance related factors i.e. suitability degree decreases as distance increases. When we come to the slope data that was produced from the DEM, it was differently treated by directly classifying it in to five classes without subjecting it in to distance analysis since it is not related to distance. But after classification, the map forming process is the same to the other factors.

Generally, when one order the software to classify the distance layer in to required classes (five classes in the current case), the ArcGIS software itself produces the classified picture of the study area with five different colors for the five suitability classes. Finally, the user prepares the perfect map by adding some necessary map elements like legend, north arrow, grids etc. in the lay out view where a map is created in ArcGIS. All available maps in this thesis were produced in this way. The rest detail is given below.

1. Neatness

The fixed distance between the bank and the dirty place was taken from the customers since the managers don't have an agreed distance. But majority of the customers chose their bank to be at least 500 meter away from these places. The more the place is distant from dirt sites, the more it is suitable. The classification table and map is shown in table 32 and figure 31 below. The black points at the center are waste disposal sites and the red area encircling them is the unsuitable one since it is the closest area to the black spots/ dirty place. The farthest area from the dirt is the one colored pink and it is the most suitable site according to this single factor. The green diamond shaped points distributed on the map are the currently existing CBE branches. It can be seen that how many of them violate this rule. There are 18 branches of CBE in the study area from which four are located within the unsuitable area.

Table 4: Classification table of neatness

Number	Distance in meters from dirt place	Level of suitability	Representative No-
1	0 – 500	Unsuitable	1
2	500 – 1000	Least suitable	2
3	1000 – 1500	Moderately suitable	3
4	1500 – 2000	Suitable	4
5	>2000	Most suitable	5

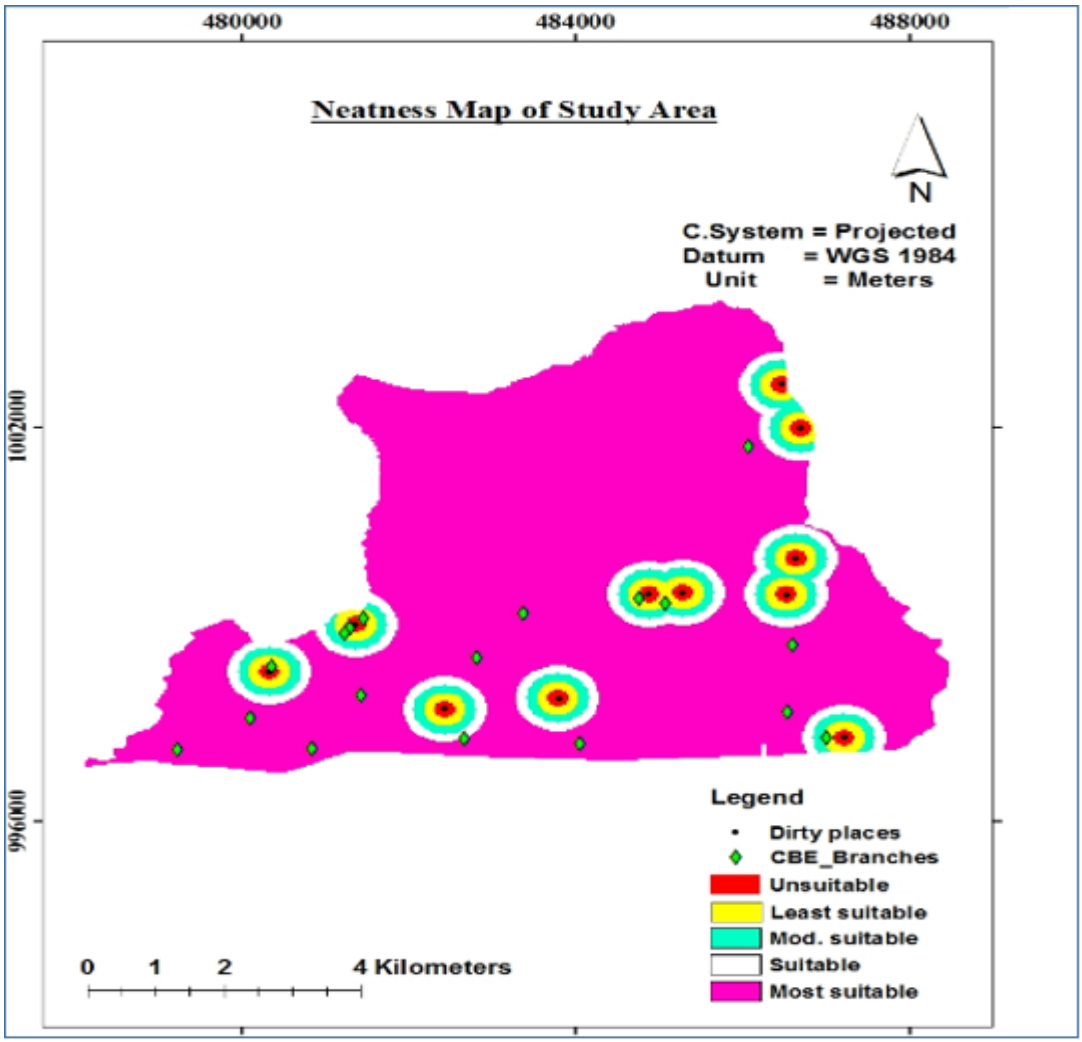


Figure 31: Neatness suitability map of study area

2. Street

How far a place prospected for a bank should be from the street or from main streets was also processed as a factor in ArcGIS. The fixed distance was taken from customers. Most respondents chose their bank to be not more than 250 meter away from main streets. That means up to 250 meter is good but should not exceed this distance that means any place more than 250 meters away from main streets is not suitable for bank site on the basis of this single factor only. The classification is shown in table 33 and the street based suitability map of the study area is shown in figure 32 below. The inner black line in the map which is surrounded by many colors is the main street or interconnected main streets in the study area. If we start from the upper right part of the map (Yeka sub city wereda 14/ Yeka Abado condominium), two streets start from Asra sost and G7 and join in Meskelegna. This joined street is again branched in Gedera square in to two. One branch passes through Ayat and is joined with another street coming from Tsebel ayat condominium area and go togather through CMC, Gurd shola to Megenagna. The other branch passes through Kara but branched in Kara square in to two streets one passing through Wesen and other passing through Kotebe. These two branches meet again in Lamberet bus station and go to Megenagna. The distribution of existing CBE branches is shown in the map. Almost all branches are located along the main streets i.e. in the most suitable area. Based on this single criterion the largest part of the study area fell under the unsuitable class.

Table 5: Classification table of streets

Number	Distance from streets in meters	Suitability level	Representative number
1	62.5	Most suitable	5
2	125	Suitable	4
3	187.5	Moderately suitable	3
4	250	Least suitable	2
5	>250	Unsuitable	1

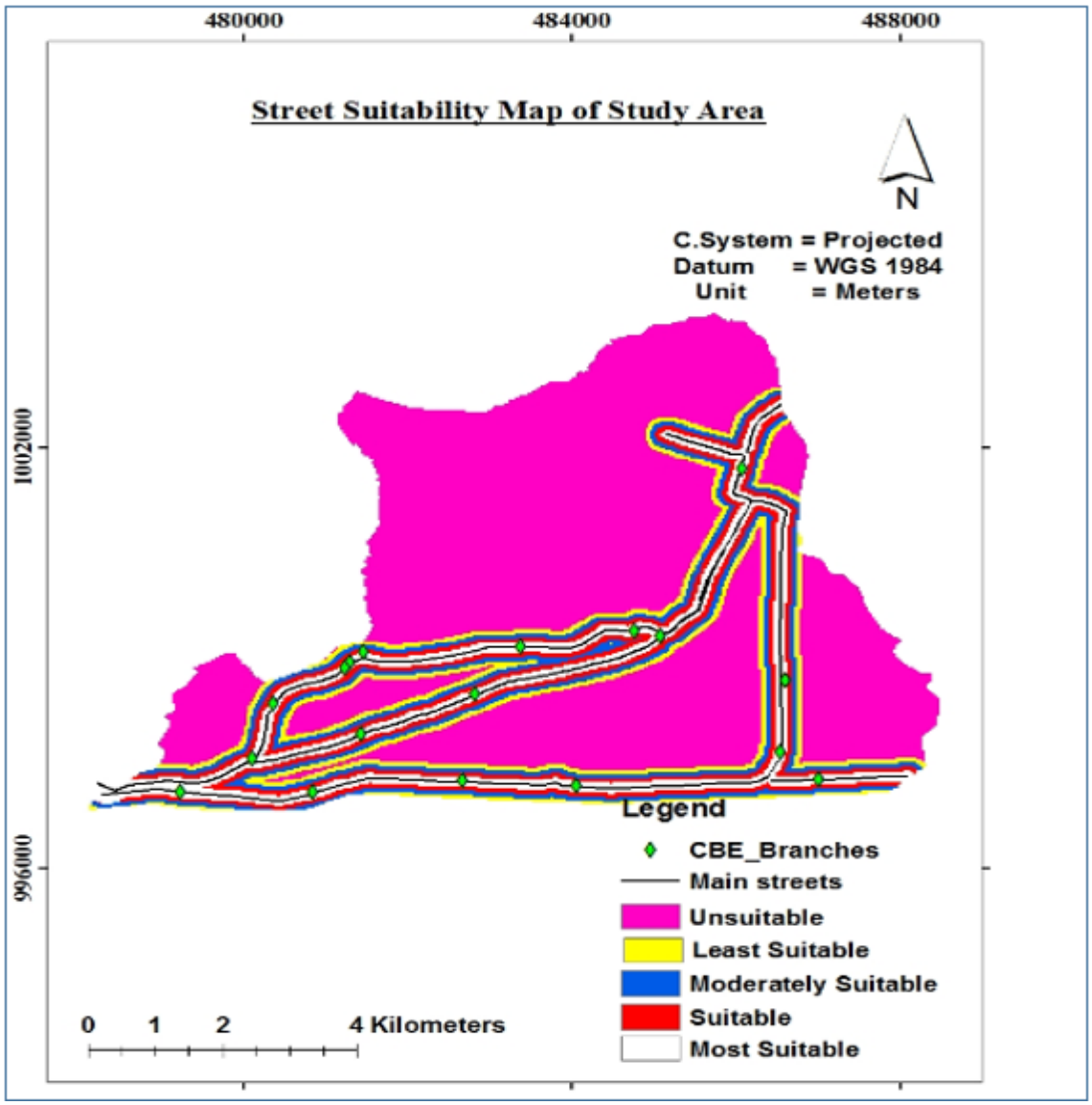


Figure 32: Street suitability map of study area

3. Ease of Access

This factor is measured by topography/slope or/and floor of building. Floor of building is not necessary in the process. Because after the suitable site is determined and available buildings in that region are known, the managers' side can rent a floor for customer service. A factor that was subjected in to MCDA in ArcGIS representing ease of access was slope. Many of the customer respondents chose the lower slope (<20% slope) and so, only slope less than this amount was taken as suitable. Classification table and suitability map are given below.

Table 6: Classification table of slope

Number	Percent slope	Suitability level	Representative number
1	< 5%	Most suitable	5
2	5 – 10%	Suitable	4
3	10 – 15%	Moderately suitable	3
4	15 – 20%	Least suitable	2
5	>20%	Unsuitable	1

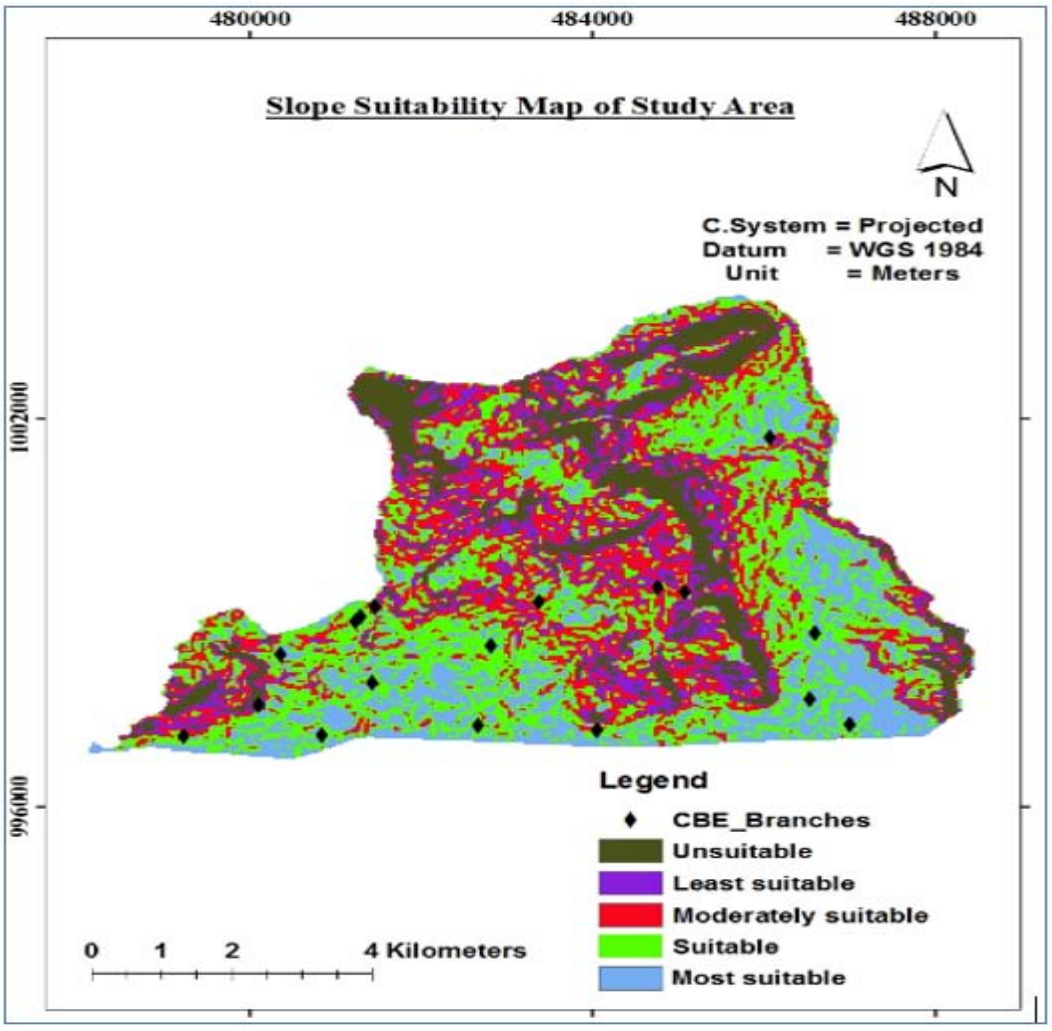


Figure 33: Slope suitability map of study area

4. Trade Center

According to the customer respondents, distance of the bank branch from major trade centers shouldn't exceed 500 meters or 0.5 km. Therefore, the prospect area should be within 500 meters distance from the trade centers. The whole area that falls within this distance is not equally important or equally suitable for a bank location. Actually the whole area within this range is suitable. But the degree of suitability is different. The more the place is close to the trade centers, the more it is suitable. Based on that, places that are more than 500 meter distance from major trade centers were considered as unsuitable. The remaining area or the area less than 500 meter distance is also classified in to four suitability categories from least suitable to most suitable. The fifth category which is the unsuitable one is the area beyond the 500 meter.

There are many major trade centers in A.A. among them are "Merkato", "Shola Gebeya" "Shiromeda trade center", "Janmeda trade center" etc. However, "Zero Hulet Gebeya" is the only major trade center in the current specific GIS study area. In fact, "Shola Gebeya" is also found in Yeka sub city. However it lays on the other half which is out of our study area. The suitability map and classification table of this factor are given below in figure 34 and Table 35 respectively.

Table 7: Classification table of trade centers

Number	Dist. from trade centers in meters	Suitability level	Representative number
1	0 – 125	Most suitable	5
2	125 – 250	Suitable	4
3	250 – 375	Mod. suitable	3
4	375 – 500	Least suitable	2
5	>500	Unsuitable	1

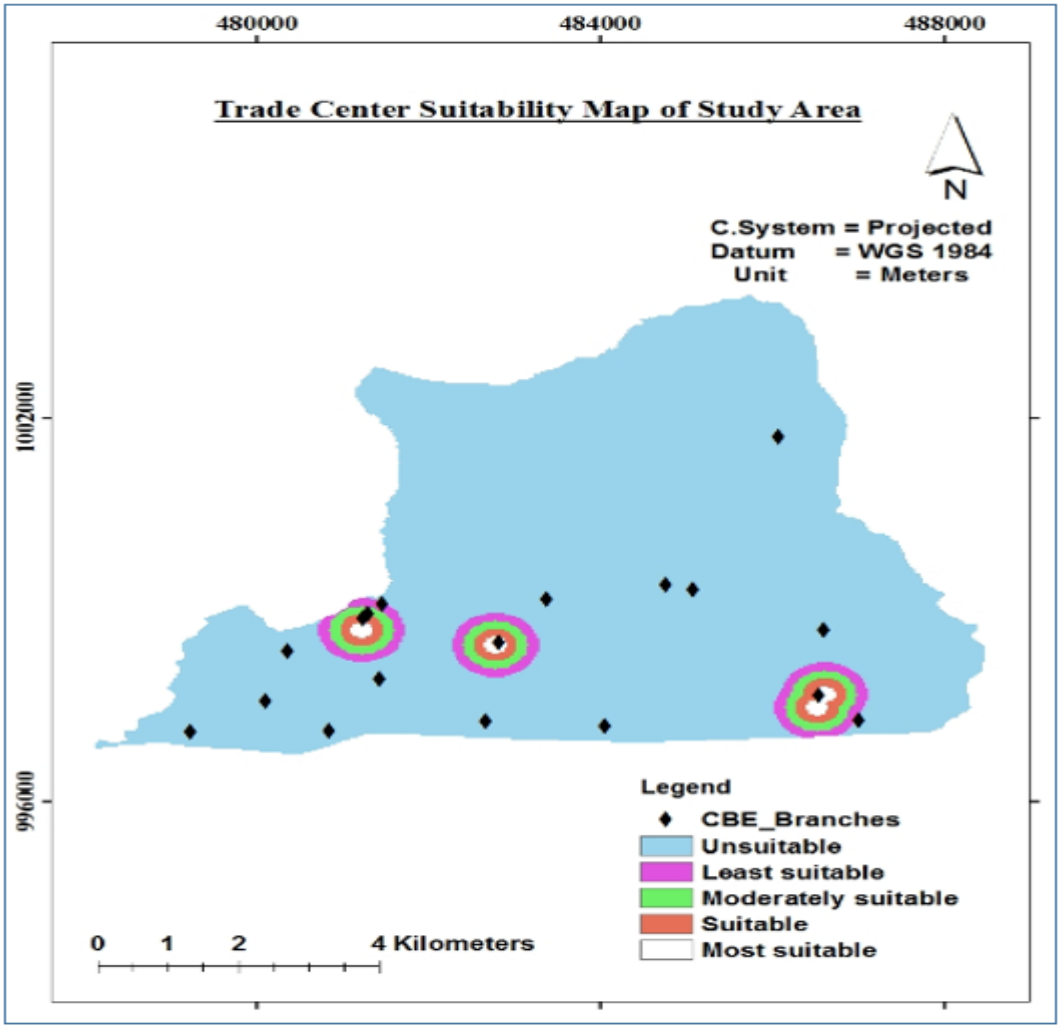


Figure 34: Trade center suitability map of study area

5. Hospitals/Health Centers

According to customer respondents distance of a bank from hospitals or other health centers shouldn't exceed 300 meters. Therefore, places that are more than 300 meters distance from hospitals/health centers in unsuitable for this criteria. The red spots at the center of the circles in fig are health centers found in the study area and the diamond shaped black points are existing CBE branches. There are two branches located in the unsuitable region and six other branches located in the least suitable area. Health centers in the study area include hospitals, clinics, and government health centers. The classification table and suitability map are given below in table 36 and figure 35 respectively.

Table 36: Classification table of health centers

Numbers	Dist. from health centers in meters	Suitability Level	Representative Num.
1	0 - 75	Most suitable	5
2	75 - 150	Suitable	4
3	150 -225	Mod. suitable	3
4	225 - 300	Least suitable	2
5	>300	Unsuitable	1

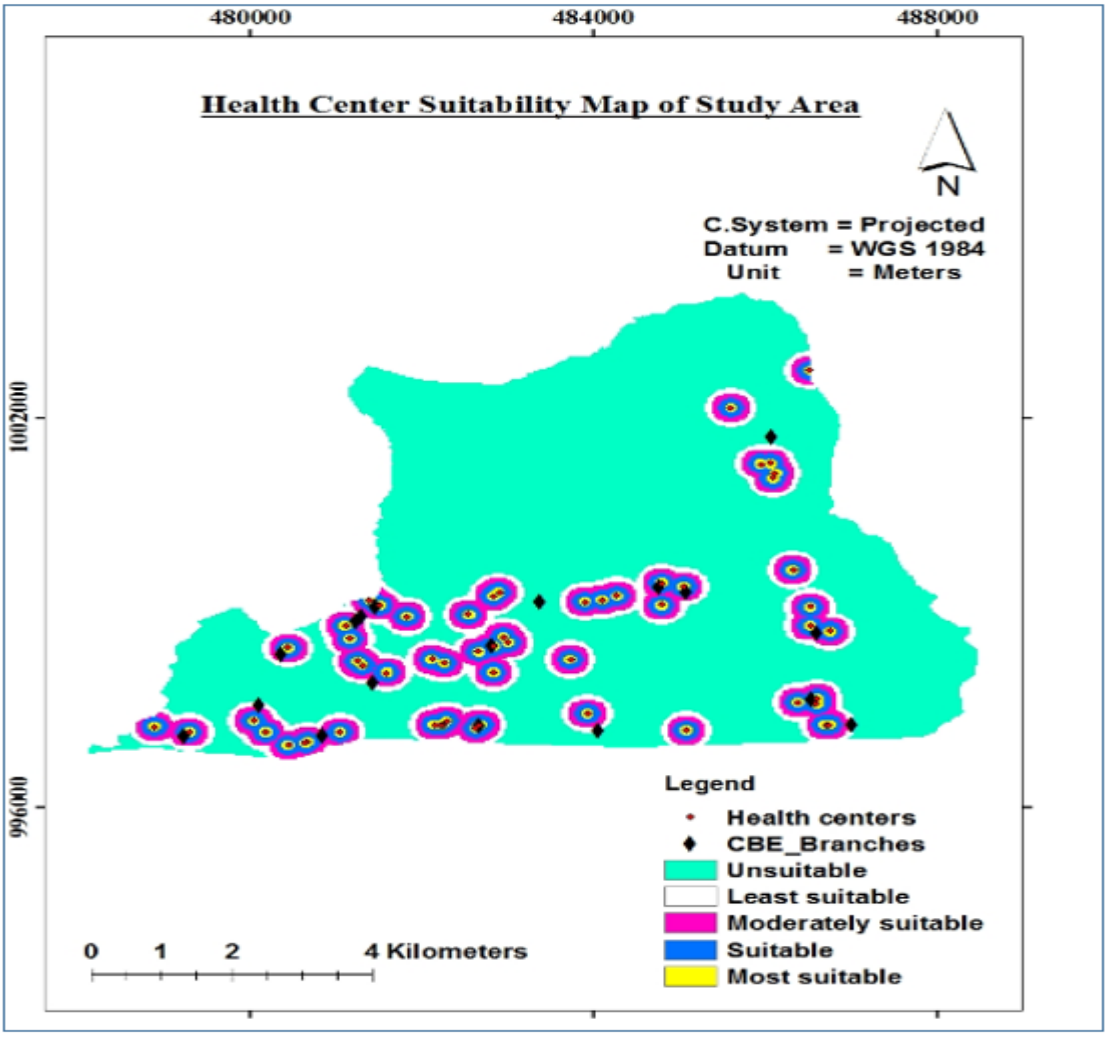


Figure 35: Health center suitability map of study area

6. Hotel

The prospect place for a bank branch should be as near as possible to hotels and other recreation centers. According to customer respondents, a bank shouldn't be more than 500 meters distance from hotels and recreation centers. Therefore, places beyond this limit are considered as unsuitable in this thesis. In the current study area several hotels, big restaurants, modern cafes, etc. are included in this factor. The classification table and the suitability map of this factor are given below in table 37 and figure 36 respectively. The white spots at the center of the circles on the map are the hotels and other recreation centers in the study area. The diamond shaped black ones are existing CBE branches. Actually, there is no bank branch found in the unsuitable area as can be seen in the map/figure 36. However, there is one branch in the least suitable area and also there are two branches in the moderately suitable area. Other three branches are found in the suitable region while the rest twelve branches are found in the most suitable region.

Tourism places are also considered as recreation centers. Many people may come there to visit from outside or inside of the country. Anyway, they may need money for tourism fee or for purchasing a lot of traditional things found there. It's obvious that a bank branch is needed nearby. However, there wasn't any tourism center in our current GIS study area.

Table 8: Classification table of hotels and other recreation centers

Number	Distance from hotels in meters	Suitability	Rep. number
1	0 – 125	Most suitable	5
2	125 – 250	Suitable	4
3	250 – 375	Moderately suitable	3
4	375 – 500	Least suitable	2
5	>500	Unsuitable	1

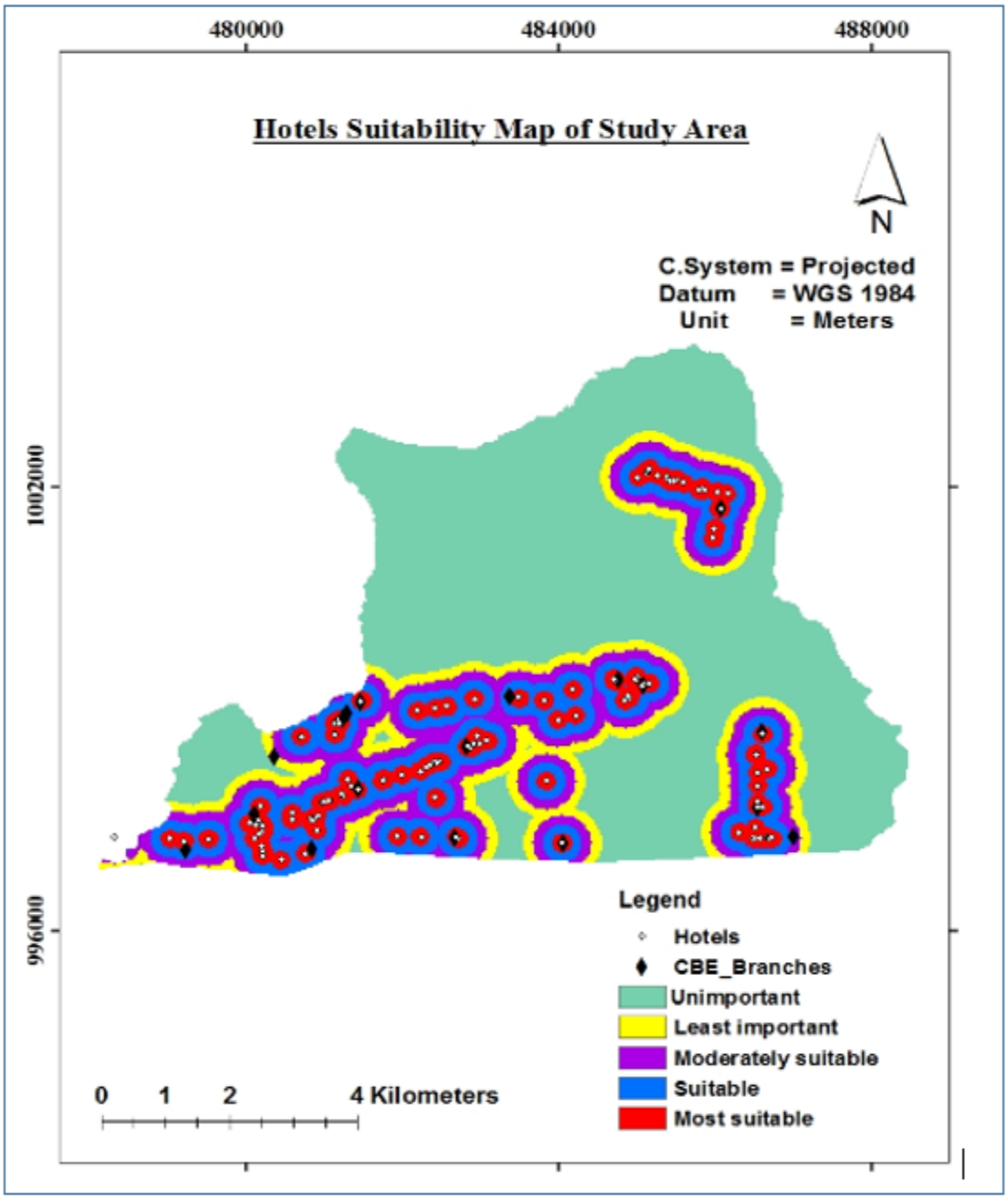


Figure 36: Hotels suitability map of study area

7. Offices/Major Institutions

Like the most factors this factors suitability region was determined by the customer respondents to be 500 meters. They want their bank to be available near major offices and institutions within 500 meters. These institutions include colleges, universities, Embassies,

large government organizations and etc. The suitability map and classification table of this factor are given below in figure 37 and table 38 respectively. The red points at the center of the circles are offices/major institutions in the study area and the black diamond shaped points are existing CBE branches in the study area. Only two CBE branches lay in the least suitable region while the rest lay in areas from moderately to most suitable. The largest portion of the study area fell under unsuitable zone.

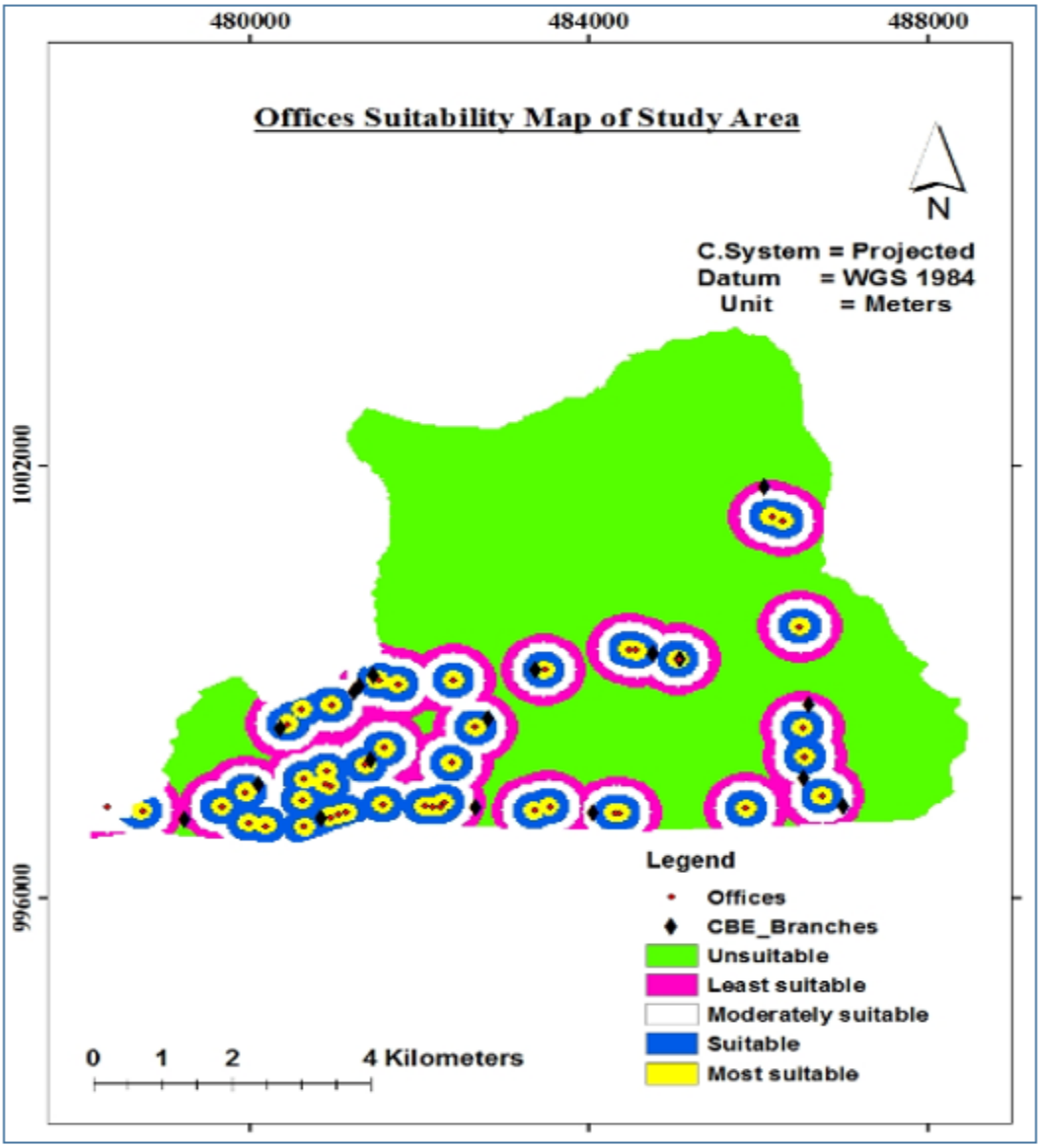


Figure 37: Office suitability map of study area

Table 9: Classification table of offices/major institutions

Number	Distance from offices in meters	Suitability level	Representative number
1	0 – 125	Most suitable	5
2	125 – 250	Suitable	4
3	250 – 375	Moderately suitable	3
4	375 – 500	Least suitable	2
5	>500	Unsuitable	1

8. Other/Competitor Bank Branches

This factor is managers concern only. The managers' side doesn't have an established fixed distance for all the factors. They use assumption based distance and believe the bank branch should be located as near as possible to other/competitors branches. The researcher tried to know the probable distance range though there is not exact fixed number. The managers said that the probable distance is most likely 500 meters to the max from competitors' bank location. Based on this number, classification table and suitability map are made as shown in table 39 and figure 38 below. There are different banks in the study area as the researcher found during the field survey based data collection time. Among them are Dashen bank, Abyssinia bank, Nib bank, Birhan bank, Abay bank, Enat bank, Hibret bank, Awash bank, Oromiya bank, Oromiya hibret sira bank, Wegagen bank, Buna bank and etc.

Table 10: Classification table of other/competitor banks

Number	Distance from other banks in meters	Suitability level	Representative number
1	0 – 125	Most suitable	5
2	125 – 250	Suitable	4
3	250 – 375	Mod. suitable	3
4	375 – 500	Least suitable	2
5	>500	Unsuitable	1

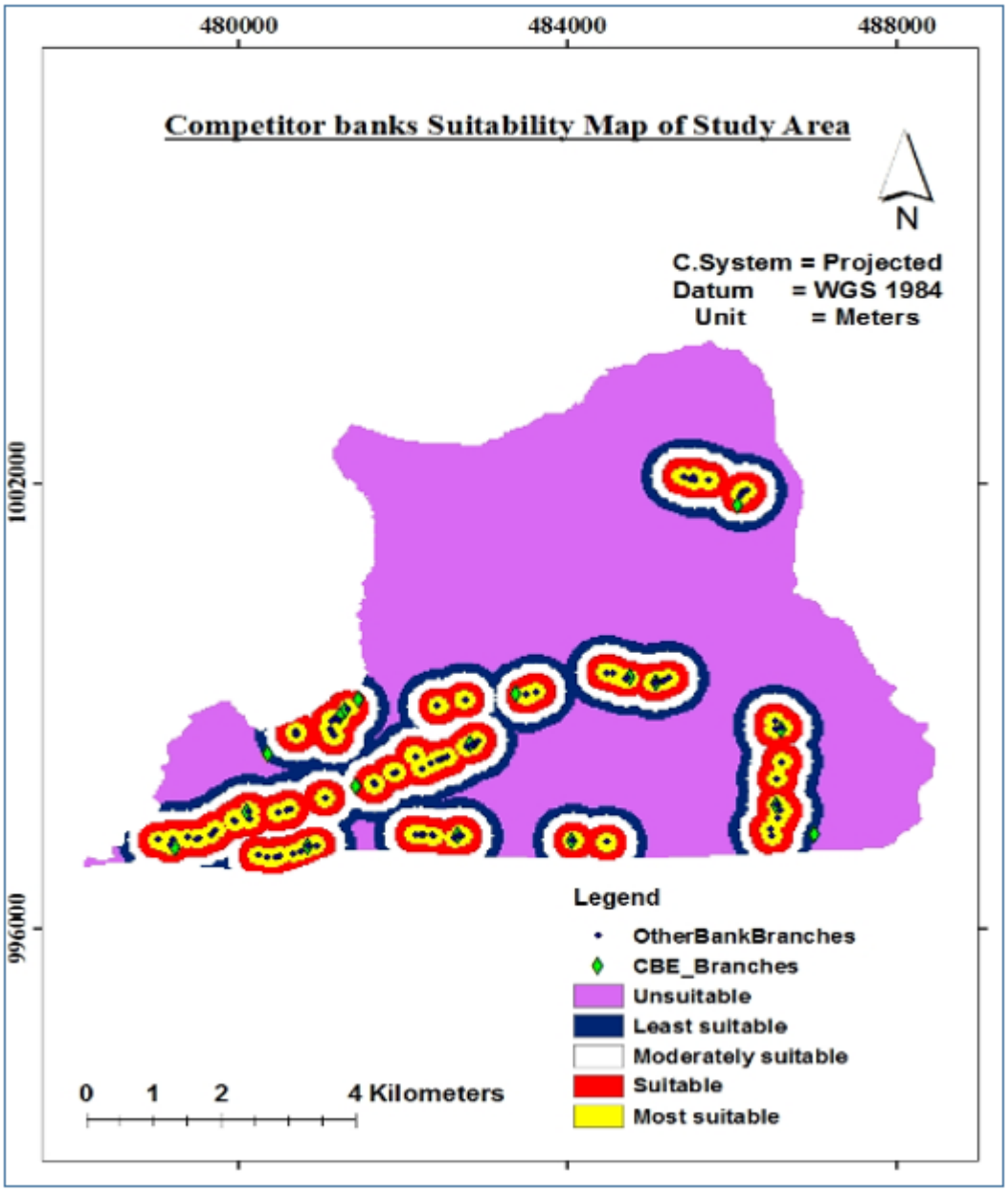


Figure 38: Other banks suitability map of study area

As shown in the above map in figure 38, the black points at the center are other bank branches and the diamond shaped green points are CBE branches. There is no CBE branch lying on the unsuitable area. But there are two CBE branches that lie in the least suitable area. Also there is no CBE branch laying on the moderately suitable area or the region colored white. Four branches are on the suitable region while the rest of the branches which are the majority (14 of the 18) lay in the most suitable area.

The Final Overlay Analysis Result

Each factor has been processed separately and suitability of each place has been evaluated based on each factor separately. One place might be suitable for bank based on one factor and might not be suitable based on another factor. The final suitable place is identified by overlaying each of these factors with their respective weight (managers' weight) in ArcGIS software (ArcGIS 10.3 for this thesis) in the overlay tool. Accordingly, the 8 factors that have been subjected to the MCDA process were overlain after the distance analysis and classification process and finally the suitable place for bank location in the study area was identified and prioritized according to its degree of suitability. The final suitability map is given in figure 39 below. The small points distributed in the map are CBE branches. It's possible to see on what area of suitability they lay. As we can see from the map, most branches lay in the suitable and moderately suitable areas. Only one branch lay in the least suitable area. However, no branch lay in the two extremes i.e. in the most suitable and unsuitable areas. The most suitable area is the one colored red but it's not that much visible because it's extremely small area. The largest portion of the study area falls under the least suitable region. The area coverage of each suitability class was calculated from the ArcGIS from the counts of each class. Generally, the study area is 41.6 km^2 and the area of each suitability class is given in table 40 below. Map of available buildings in the study area is also given in figure 40 below.

Table 11: Suitability level and area coverage of the study area

Number	Suitability level	Area coverage in KM^2
1	Unsuitable	10.1159
2	Least suitable	21.9320
3	Moderately suitable	7.9544
4	Suitable	1.6044
5	Most suitable	0.0009
Total		41.6077

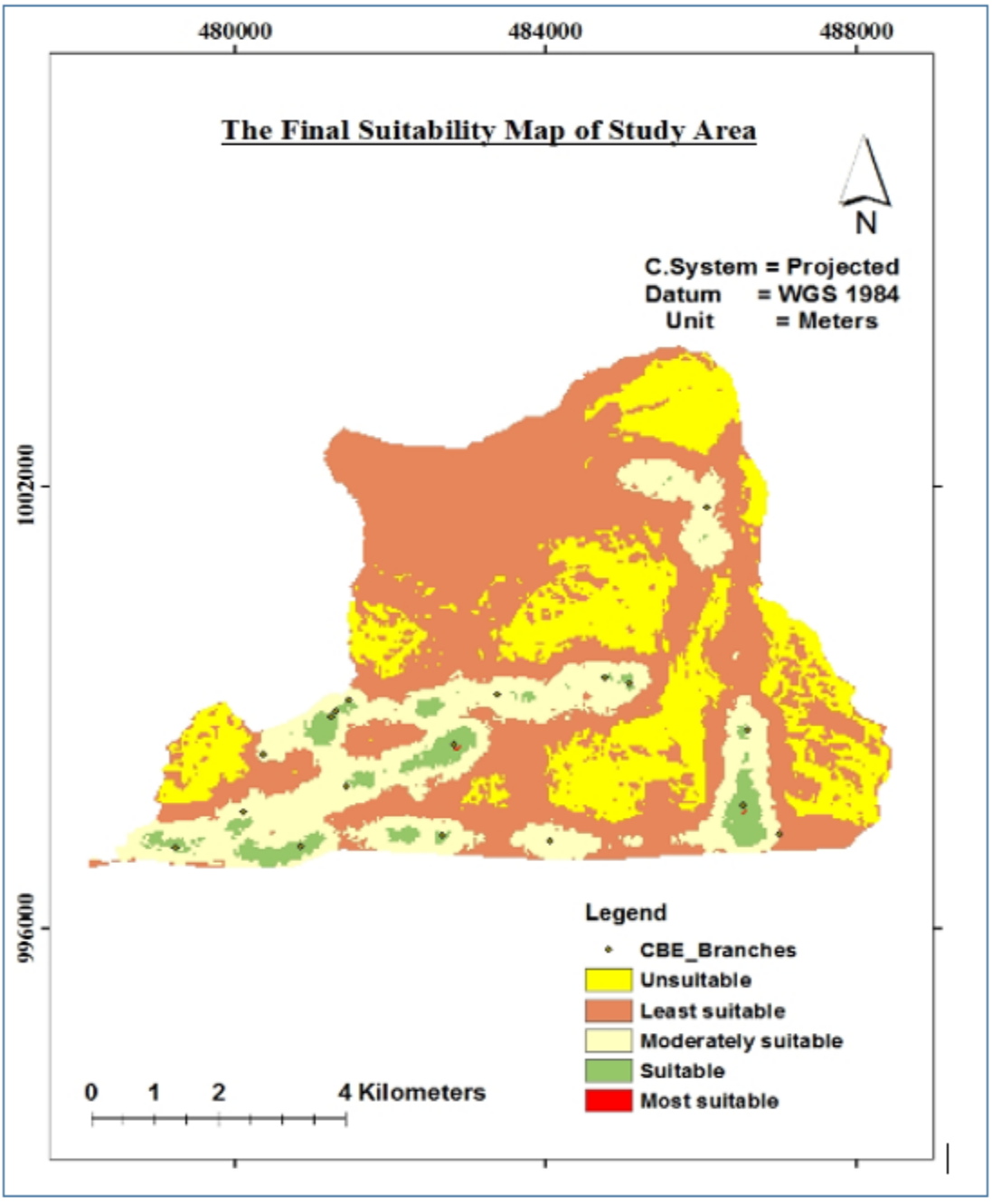


Figure 39: The overall suitability map of the study area

There are several big and beautiful buildings in each region of suitability. But managers can select buildings that are found in the suitability region of their interest which is expected to be of the highest/higher suitability class.

4.4 Discussion and Interpretation of the Findings

As the aim of this thesis is to identify the factors that affect bank location in Ethiopia/Addis Ababa and to determine their importance level, several factors have been considered and their degree of importance has been evaluated by the two categories of samples of this study namely customers and managers. Accordingly, most of the factors that were shared by both sides (managers and customers), though the degree of importance varies, were found to be important. The rest four factors that are managers concern only were also found to be important except one which is distance from own branches. The factors were evaluated as follows.

Proximity to residence house is one of the factors that concern to both managers and customers. Almost all customers ranked it as most important although the managers rated it as unimportant. Most customers consider the distance of the bank from their home or they choose a bank near their home. However, managers focus on places where business activities take place than worrying about how close it is to living houses and as a result a big gap is created between managers attention to the factor and customer needs of proximity.

The other factor under investigation was the distance from own branch and its mean or average importance level by the managers was 1 which represents unimportant. I.e. how evenly are the branches distributed to cover all places doesn't matter. If it is necessary many branches may be aggregated in a single narrow place while in other places no branch might be opened if the place doesn't fulfill the other criteria specially the market one. However, almost all of the customers that were surveyed prefer the bank of their choice to have branches in little distance interval to access it almost anywhere. But if the managers consider it as unimportant and keep giving it no attention, it will risk the accessibility, the factor that was ranked as most important from the customers' side and given a mark 5 which represents the higher rank. Again there is a big gap between managers and customers side.

Security was also the other factor evaluated and characterized as most important factor. It was rated as most important by all the managers and even by the customers since the mean or the average result given is 5 and 4.99 respectively. Therefore, both sides of the respondents agree on the significance and on the rank of this factor.

The fourth one was neatness or cleanness of the place or the surrounding area. Both sides of the respondents agreed on its significance though the degree of significance varies a little. Managers labeled it as important while customers considered it as most important.

Parking was the other factor that was assessed to determine its importance. Both sides of the respondents agree that it is important. However, the managers' side gave it a rank number 4 which represents 'important' while the customers side gave it rank number 2 which represents least important. The managers' attention to this factor is more than the customers' expectation.

Distance of the place from main streets was also one among the other factors for evaluation. It was given different rank which is 'moderately important' by managers and important by customers.

The other one is ease of access. It was assessed to be found important. The intensity of its importance from customers is so close to that of managers which is 3.4 and 3.5 respectively. This shows the managers considered this factor well and full filed this criterion a bit more than customers' expectations.

Distance of the bank branch to trade centers or was also one of the factors under investigation and its significance was proved to be most important by the managers with 100% vote while customers ranked it as important. Though the degree of importance differs a bit, both agree on its importance. Here also managers fulfilled customers' needs above expectation on this aspect.

Distance of the bank from health centers was also one among others that were in evaluation. Both respondents believe it's important. The mean rank given to this factor was 2.8 and 4.2by customers and managers respectively. This shows the managers held its importance more than customers' anticipations once again.

Distance of the bank branches from hotels was also evaluated and found to be important and given a mean rank of 4.38 by customers. However, managers outstandingly consider it more than customer's wishes. They approved its rank to be most important and gave it rank number 5 with 100% vote.

Distance of the bank branches from major offices/large institutions or availability of branches near these institutions was also one of the factors. It was discovered that this factor is also important both for managers and customers. Both sides of the respondents regarded it as moderately important. Here the managers' consideration and the customers' expectations fit perfectly. The other factor that was under study was beauty of the place or the building. This factor was given mean rank of 3.15 by managers while it was given mean rank of 2.47 by customers. Anyway, managers fulfilled this criterion more than expectation of the customers.

Population density and Income level of the resident people in the prospect area were also among the factors under investigation. These are among the factors that only managers concern about especially in small towns and rural areas. They were found to be most important and were given a rank number 5 by all the managers.

Cost of the building on which to open the branch, was also studied and found to be a significant factor. It was labeled as moderately important by the managers. Customers were not involved in the evaluation of this factor since it's not their worry.

And finally, the remaining factor which is distance from competitors branch was examined to check on its importance and next its rank. Customers weren't involved in this because this is the managers business. Subsequently, this factor was rated as important. In other studies or literatures published outside the country, it is stated that the current banks branch should be at least 3kms away from competitors' branch. However, the managers in this study take it differently in their decision i.e. they prefer a place near to other bank branches for their new branch.

When we come to the validation, this study is new in Ethiopia i.e. there is no previously published similar research work or article on this topic to compare this study with. However, the reliability of this study can be validated practically with the ground truth.

It is remembered that, according to the GIS analysis, the study area was divided in to five regions based on their suitability level for bank location. It is also shown in figure 39 that one out of the eighteen CBE branches in the study area was located in the least suitable region. The manager and the IT department head and staffs (since they can access the performance measure of branches from the computer system) in east district head office confirmed the reliability of the result of this study. It was confirmed by them that the branch around Ayat square and the branch around Kara aloe (Legejida branch and Ayat square branch) are performing best of all branches in the study area. But the two branches lay in the most suitable region from the GIS analysis. They also confirmed that the CBE branch that lay in the least suitable area is a poorly performing branch and branches that lay in the suitable and moderately suitable areas are performing goodly. Only one branch (the Wesen branch) is not performing goodly enough even if it is located in the moderately suitable area. However, it is a newly opened branch and this situation is expected in any new branch until it becomes stable and it might not be related with location issues. With this, the reliability of this study was confirmed.

Chapter 5: Conclusions and Recommendations

The analysis of this study was successfully completed and findings were earned. In summary, from the factors proposed by the literature review, all except the two (proximity and accessibility) are considered in branch location decision by managers. Three of them (population density, income level, and security) are more emphasized and highly considered during opening branch in rural areas while parking, cost and beauty of building, trade centers etc. are more emphasized in towns. No new factor was suggested by both sides of the respondents from the open ended questions except the previously proposed factors from the literature. No factor was also found to be unique to Ethiopia.

5.1 Conclusions

As seen from this study, factors that affect bank branch location are considered and treated differently. Bank location factors in Ethiopia have two main differences from that of the foreigners. These are, in foreign countries, they follow a principle that says a bank branch should be opened in areas where own branch and competitors branch are not available. But in Ethiopia, distance from own branch is not considered and branch is more likely to be opened near competitors branches.

Also, there is a little discrepancy between managers and customers mark given to the factors even if both agree on the importance of most factors. Proximity and accessibility (distance from own branch) are disregarded by managers while they are of primary importance to customers. There are also some factors (neatness and distance from main streets) that are paid relatively lower attention by managers while they are of great value for customers. In general, population density, income level, and security are factors that are highly considered during branch opening in small towns/rural areas while parking and the other factors are mostly for large towns/cities.

From the GIS side, the most suitable sites for additional bank branches on the existing ones are shown on the final suitability map on figure 39. If it is not possible to open the branch in the most suitable site due to some reasons, the second best site is provided as alternative which is the suitable region. If this is again impossible for other reasons, the third best site is given on the map which is the moderately suitable region. Therefore, GIS not only enables us to identify the suitable location for a branch, but also it allows us to prioritize the places according to their degree of suitability. Moreover, existing CBE branches are also evaluated whether they are located in the right place or not and this will help to take appropriate measures on the wrongly

located branches. With GIS mapping, having pictorial representation of the branches location it enables managers to have a mind picture and then an easy control over the branches. Generally, how easily, cheaply, and quickly GIS works with accuracy is shown in this study. In addition, the location factors of a bank in Ethiopia are identified and their degree of importance is provided. And also, the gap between customers desire and managers consideration of the factors is also shown. We have seen the power of GIS in identifying the suitable bank site when used as decision support tool in MCDA method which uses different criteria for investigation.

5.2. Recommendations

Actually, both the managers' and the customers' side agree in the level of importance of most factors. But still, there is some discrepancy and this discrepancy should be reconciled. Managers should know what is most important to customers and should work to fulfil customers' interest to win their choice or to increase customer satisfaction. Therefore, CBE managers, even though they have met customers' needs above expectation regarding most factors, they should work further on proximity and accessibility since these are the leading factors from the customers side while they were paid a little attention by managers.

Also, the way of selecting and deciding on a branch site should be modernized and linked to technologies like GIS than continuing with the manual method which is time taking, tiresome, and exposed to error. As the managers side said, it may take up to three months to study the market and the suitability of the place manually to open a bank branch only even in one locality. This means, to open many branches in many localities will take even much more time than this. But with the use of GIS, it's possible to study the suitability of the place not only for one locality but also even for one sub city or more than that within very short period of time since wide area coverage is one of the advantages of GIS. Generally, those who are involved in the banking industry should consider those factors and use this cost and time effective, wide area covering, and accurate method GIS as DSS to improve their network performance.

Digital data and maps of natural features like rivers, topography, elevations etc. exist in some concerned offices like EMA, GSE, etc. However, business related data like digital data/latitude longitude of banks, factories, hotels, trade centers etc. lack in Ethiopia. That's why the researcher had to collect the data/GPS data of these features by field survey. Therefore, head

offices of sub cities should have such data digitally at least for the major business related features that exist in their territory. This will mitigate the data collection time and burden. With such kind of digitally prepared data, GIS will save even more time and a researcher or those involved in banking industries can work with less effort because once the data is collected, the suitable place can be identified in GIS software within some hours.

The places that are regarded as suitable (from most to least suitable) are recommended for new branches when necessary. Because they are strategic areas for this business since they fulfil almost all of the criteria. Therefore, the researcher recommends these places according to their priority (except the unsuitable one) to CBE district managers of A.A city when they find it necessary to open a new branch within this boundary.

In this study, the researcher tried to show the use of GIS as a decision support tool in the banking industry specifically in branch location. This is the market share application of GIS since it involves examining branch locations and competitors' locations and demographic characteristics to identify areas worthy of expansion. However, GIS has countless applications in banking and other businesses in general which is not dealt in the current study like application of this technology in merger and acquisition, World Bank Economic Statistics, Community Reinvestment Act, ATM machine, mobile banking etc. Future researches shall focus on these and other applications of this technology in business and/or in banking.

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Appendix

Appendix 1: Questionnaires to District Managers and Involved Staffs

I. Opening Questions

1. Age? ……..
2. Gender? .....
3. What is your job title? ……
4. What is your role in the organization? ……..
5. How long have you worked in this organization? ……
6. How long have you held this position? ……
7. How many branches are there in your District? .....
8. How many customers are there totally in your District? I.e. the total number of customers that open a book in different branches of your District? This question is most important of all because it is from this amount that I can determine my sample size. Total number of customers? .....

II. Background Questions

1. Have you ever used Geographic Information System (GIS) when you decide/select a site or location for a new bank branch yet?

   A. Yes B. No

2. Is the final selection of branch site manual or computerized?

   A. Manual B. Computerized

3. Do you think your network performance is well as it is and there is no need to support it with a computer system like GIS?

   A. Yes B. No

4. Does it take too to study the market and select a new branch site manually?

   A. Yes B. No

5. How long does it take? It takes

   A. Above a year B. 6 to 12 months C. 3 to 6 months D. Up to 3 months

6. Does it cost too much to undergo the study manually to select a branch site?

   A. Yes B. No

7. How much does it cost?

   A. Too much B. Medium C. Too little

8. Have you ever made a wrong decision regarding location i.e. open a bank branch in the wrong place due to human error in the manual study or other reasons?

   A. Yes B. No

9. Have you ever encountered a branch with poor performance due to wrong location?

   A. Yes B. No

10. If yes, what measures have you taken to amend it?

    A. Closing the branch? B. Change the place C. Change the staff D. Other remedies

11. Does it cost too much to take the remedies to recover the poorly performing branch due to wrong location?

    A. Yes B. No

12. Does it take too long for the wrongly located branch to recover from its failure and succeed?

    A. Yes B. No

13. Does a poorly performing branch due to location bring a significant financial loss?

    A. Yes B. No

14. How frequently does this situation happen? (Wrongly placed branches)?

    A. Frequently B. Less frequently C. Very rarely

15. Do you think there is a need for alternative technology or computer system to replace the manual study and support decision making by doing the study faster, more accurately, and more cheaply?

    A. Yes B. No

III. <u>Likert Scale Questions to Assess Importance of Each Factor</u>

Given below are two tables. The first table (table one) shows which letter denotes which importance level. Whereas table two has the list of factors that may or may not be important to be considered in bank branch location decision. The third column of table two is open. Please fill it with any of the representative letters in table one according to the level/degree of importance of the corresponding factor.

Table 1: Degree of importance with the representative letters

Degree of Importance of the Factors	**Representative Letter**
Most important	A
Important	B
Moderately important	C
Less important	D
Unimportant	E

Table 2: List of the factors and their degree of importance

Number	**Factors/ Criteria**	**Representative letter**
1	Proximity (near ness) or residence house	
2	Distance from main streets	
3	Distance from parking area	
4	Distance from existing own branches	
5	Distance from existing competitors branches	
6	Distance from offices	
7	Availability of trade centers around	
8	Availability of hospitals/health centers around	
9	Availability of hotels &tourism centers around	
10	Population density of the area	
11	Security of the area	
12	Income level of the resident people	
13	Cost of the building on which to open the branch	
14	Cleanness/ neatness of the place	
15	Beauty and quality of the building	
16	Ease of access (topography/floor of the building	

IV. Feel in the Blank Questions to Deal with the Factors

For the following questions, please put the number/numbers that represent a factor/factors of your choice on the space provided from the factors listed above in table two.

Questions

1. Which of the factors do you think is unimportant in Ethiopia and should be omitted from the list?

   .....

2. Which of the factors are applicable in Ethiopia?

   .....

3. Do you think some factors are unique to Ethiopia? If yes which are these factors?

   .....

4. Which of the factors are used for branch site decision in rural area of your province?

   .....

5. Which of the factors are used for branch site decision in urban area of your province?

   .....

6. Which of these factors have you been taking in to consideration so far while deciding the branch location in your province throughout your service years?

   ……

7. How many km or meters should the bank be at most
   - From trade centers…….
   - From health centers……
   - From recreation centers/hotels……
   - From parking area……..
   - From streets……
   - From own branches……
   - From competitors' branches…….....
   - From residence houses……
   - From major offices/institutions……
   - From waste disposal/dirty sites (minimum distance)……

V. Open Ended Questions to Managers to Extract New Factors

1. What other factors do you think to be considered other than the listed ones in branch location decision, if there are any?
2. If population density is one of the factors you consider for branch location, how much population is enough to open a branch in one locality?
3. If income level of the society is one of the factors you consider for branch location, what income level is sufficient to open a branch?
4. If security of the place is one of your factors, what is your basis to judge that the place is secured or not? How do you measure the security? Is it by the presence of police station and other bodies of law in the surrounding, or by the absence of gangsters and robbers site in the surrounding, or by the location of the place in populated and urbanized area, or other measures of your own? Please explain it.
5. What floor of a building is your maximum to open a branch there for customer service above which you think it is inconvenient for customers?

Appendix 2: Questionnaires to Customers

I. Opening Questions

1. Age? …….
2. Gender? ……...
3. How long have you been served by this bank? …….

II. Likert Scale Questions to Customers to Assess the Importance of Each Factor

Given below are two tables. The first table (table one) shows which letter denotes which importance level. Whereas table two has the list of factors that may or may not be important to be considered in your location based bank choice decision. The third column of table two is open. Please fill it with any of the representative letters in table one according to the level/degree of importance of the corresponding factor.

Table 1: Degree of importance with the representative letters

Degree of Importance of the Factors	**Representative Letter**
Most important	A
Important	B
Moderately important	C
Less important	D
Unimportant	E

Table 2: List of the factors and their degree of importance

Number	**Factors/ Criteria**	**Representative letter of Degree of Importance**
1	Proximity (near ness)	
2	Security of the area	
3	Cleanness/ neatness of the place	
4	Beauty and quality of the building	
5	Distance from main streets	
6	Distance from parking area	
7	Distance from offices	
8	Availability of trade centers around	
9	Availability of hospitals/health centers around	
10	Availability of hotels & tourism centers around	
11	Accessibility (having branches in little distance interval to access it anywhere)	
12	Ease of access (topography /floor of the building)	

III. <u>Feel in the Blank Questions to Customers to Deal with the Factors</u>

For the following questions, please put the number/numbers that represent a factor/factors of your choice on the space provided from the factors given above in table two.

Questions

1. Which of the factors do you think is unimportant in Ethiopia and should be omitted from the list? …….
2. Which of the factors are applicable in Ethiopia? ……..
3. Do you think some factors are unique to Ethiopia? If yes which are these factors? ……..
4. If you are a rural area resident, what do you think about which of the above listed location factors/ location related qualities should be fulfilled by the bank in rural areas to satisfy its customers? Pick only factors that work for rural area……
5. If you are resident in urban area, which of the factors do you think the bank should fulfill in urban to make people chose it and satisfy its customers? Pick only factors that work for urban…….....
6. How much kilometers/meters distance is convenient to you to the bank from
    - From Your home…….....
    - From Trade centers……..
    - Health centers……...
    - From main streets……..
    - From parking area……..
    - From hotels/recreation centers……...
    - From waste disposal/dirty sites……..
    - From major offices and institutions……
7. Within how much KM or meters do you want to access the bank of your choice? .....
8. What slope percent is convenient for you to access the bank? ……

    (Note; lower slope is less than 20% slope, middle 20 – 50% and >50% higher slope.)

IV. Open Ended Questions to Customers to Extract New Factors

1. What other factors do you consider when you decide a bank of your preference?
2. What factors do you think bank managers should consider additionally when they decide location of a branch?