



Addis Ababa University

College of Business and Economics

Department of Public Management and Policy

The Impact of Ethiopian Intervention Economic Policies on Cost Efficiency in State Owned Enterprises:

**Application of a Data Envelopment Analysis Approach on Ethio-Telecom from 2007 to
2015**

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May 2019

Addis Ababa, Ethiopia

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A Thesis Submitted to Department of Public Management and Policy of Addis Ababa University in partial fulfillment of the requirements for the Degree of Masters in Public Management and Policy (MPMP)

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APPROVED BY BOARD OF EXAMINERS

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DECLARATION

I, the undersigned, declare that this Thesis is my original work; prepared under the guidance of Filmon Hadaro (PhD). All the sources of materials used for this thesis have been dully acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Name

Signature and Date

ENDORSEMENT

This thesis has been submitted to Addis Ababa University, College of Business and Economics, Department of Public Administration and Development Management for examination with my approval as a university advisor.

Advisor

Signature and Date

DEDICATION

To: My Dad, Nerea Geberemeskel

Acknowledgment

Certainty inspiration and curiosity for knowledge were key points to handle this challenge. Thus, I would like to thank everyone who has offered their generous help and support to accomplish this thesis.

Foremost, I would like to express my deepest gratitude to my advisor Mr. Filmon Hadaro (PhD) for the relentless support of my research, also for his motivation, enthusiasm, and immense knowledge. His guidance helped me in all the time of research and writing of this thesis.

In addition to my advisor I would also like to thank Miss. Dominique Lepore (Ph.D) from University of Macerata and Mr. N. Epicoco (Ph.D), Polytechnic University of Bari for their Immense Scholarly advice and material support on data imputation techniques and DEA model respectively.

My parents and friends also had enormous support to me and to bearing my thought out in this process. Finally, above and Beyond All, I extend my gratitude to the man upstairs who has Chosen me and always helped me to keep my aspiration come true.

Abstract

The role of government in the economy is contentious issue to date. In due, following EPRDF's announcement of recent massive privatization policy of huge SOE; the issue again becomes argumentative. Thus, the researcher tries to evaluate merits and demerits of incumbent massive privatization policy decision by investigating the impact of intervention economic policy on cost efficiency of ethio telecom. Along with, the research has also an objective of identifying sources of efficiency and indicating alternative paths for improvement. The study used secondary panel data of three decision making units for years between 2007 and 2015G.C. To attain these research objectives in ontologically, positivist research philosophy is designed and aligned with research techniques. Moreover, data is collected using cluster sampling techniques. Also, the research employed a non-parametric linear programming model called Cost efficiency Data Envelopment Analysis to analyses impact of intervention economic policy via comparing cost efficiency scores of DMU which are owned privately and operate in a competitive market structure (Vodacom and Sfaricom) with state owned monopoly (ethio telecom). The study has found outputs which depicts that ethio telecom is in efficient by 32% as compared to a benchmark operator —Vodacom. Also, source of inefficiency is aroused from allocative inefficiency as compared to technical efficiency since cost in efficiency which arises from technical inefficiency is only 11% whereas cost inefficiency that arises from allocative in efficiency amounts as high as 32%. Furthermore, slack movements has recommended input adjustment to reduce capital expenditure by 241.9 million USD and employee number by 4,297 whereas to be increase total asset by 7.9 million USD on average to attain 94% cost efficiency realized by Vodacom — which a bench mark operator. Thus, Based on research findings and theoretical triangulation, the researcher extends the following policy recommends; ethio telecom to realize the level of efficiencies achieved by Vodacom and Sfaricom, the government doesn't only has to privatize but also transcend the market from monopoly structure to competitive market structure.

Keywords: Positivist research philosophy, DEA, Cost efficiency, Intervention policy, Monopoly, SOE, Impact, ethio telecom

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List of Acronyms

ETA	Ethiopian Telecommunication Agency
ETC	Ethiopian Telecommunication Corporation
EMS	Ethiopian Message Service
ERS	Efficiency Reference Set
TE	Technical Efficiency
CE	Cost Efficiency
AE	Allocative Efficiency
VRS	Variable Returns to Scale
ICT	Information Communication Technology
CHT	Chunghwa Telecom Company
NTT	Nippon Telegraph and Telephone
MoTAC	Ministry of Transport and Communication
ME	Mixed Enterprise
TRE	Telecommunication regulatory environment

CHAPTER ONE

INTRODUCTION

1. Background of the study

The role of government in the economy has been disputed over time. This factor has been a point of debate in the debates emerging from socialist and capitalist ideological tenets. However, free market tenet has become the leading world economic order after the end of cold war. This dominant economic order has defined the role of government in the economy; to play a “night watchman role”. Market fundamentalist economic thoughts have conversant policies. Though debatable, the new order brought significant economic growth. Hence, the effectiveness of Europe’s capitalist policy outcomes exhibited from 1950 to 1970 was seen as the golden age of neo-classical paradigm (Konicz, 2011).

However, in Africa this economic paradigm had a mixed result; i.e. not in the same way as it has been effective in Europe during its implementation of structural adjustment program (SAP) since 1980’s many African countries like Ghana, Zambia, Angola and Nigeria had failed. Some scholars argued that perhaps “SAPs never intended to assist African development” (Logan, 2015). As a result Africa was a “confused” continent in regard to choosing its path for economic growth and development.

However, at the corners of south East Asia, the rising of tiger economies like Malaysia, Taiwan, Singapore, South Korea, and later on china provided effective alternatives to the neoliberal paradigm which has resulted visible and significant progress in bringing economic and social development – in some countries like Singapore and South Korea, brought established democratic systems.(Winkler, 2017) The results of alternative development path were analogous to results of classical, neoclassical and neo-liberal paradigms in Japan; though not advocated. Unlike to the Neo-liberal development path, developmental state growth model promotes time-bounded, selective and effective government economic intervention within the context of free market economy. Elements of developmental growth path were seen — manly in the aftermath of colonialism many African states implemented elements of development state economic policies.

Countries like Rwanda, Uganda and Ethiopia are employing this path and had registered significant and continues economic growth; as a result, this model is again emerged as point of

debate with regard to its effectiveness as viable economic development policy in Africa. (Gebremariam & Bayu, 2017)

But, some literatures suggest that such interventionist economic development approach has resulted corruption, bad governance and monopoly of power. A study made by (Ioan, 2009) across 135 countries has found that corruption is high when there is government intervention in economy. Thus, interventionist thought is still debatable in many countries which have different political and social contexts.

Ethiopia employs interventionist economic policy. Though debatable; there is no consensus among government, opposition parties, elite citizens and multilateral development partners like IMF and WBG on the success of interventionist developmental state economic policy in Ethiopia. In the last three decades, since EPRDF took power in 1991, the policy is under enforcement. Also the points of debate over this policy has been changing over time. The first point of argument used to emanate workability concern such as questions related to, either this approach can ensure economic growth in general or it fits to Ethiopia's context. This days answers to such question seems to be obsolete since Ethiopia's interventionist economic policy has exhibited economic growth over the past two and half decades¹. The second point of argument is whether or not corruption, hegemony of political power, bad governance and the economic inefficiencies are related to this model. Groups in favor the first point of argument are supporters of incumbent administration whereas the second strand is to opposition political parties and intellectuals affiliated to opposition camp. Considering concerns of the opposition camp; apart from problems described above, they argue against interventionist approach since they assume it will affect the overall efficiency of the economy moreover sectors that could yield a higher benefit from competition such as the telecom sector.

Incumbent government of Ethiopia argues that selective interventionist economic policy on sectors that has been identified as strategic are necessary to fasten economic growth. Moreover, they can be sources of development finance if financial and leadership assistance is provided to expand and generate ransom incomes in their sectors. According to Investment Proclamation No.

¹Ethiopia's economy had registered average economic growth of 10.8% per year in 2003/04 - 2014/15 which is a fold to Sub-saran Africa regional average of 5.4%
doi: <http://www.worldbank.org/en/country/ethiopia/overview>

769/2012 the government is entitled monopoly power to operate in telecom sector. This sector is protected both from local and international competitors.

Telecommunications service was introduced in 1894(Ethiotelecom, 2018)however, Ethiopian Telecommunication Agency was established by Proclamation No. 49/1996:Art.3 as a regulatory body for telecom Services in 1996with the objectives of promoting development of high quality, efficient, reliable and affordable telecommunication services in the country...the agency started its operation by providing a license to Ethiopian Telecommunication Corporation (ETC), which was established by Council of Ministers regulation No 47/1999 as the only incumbent state owned telecom operator enterprises². (Estifanos, 2010)

Despite Ethio telecom's performance doesn't seem to the extant stated in the objective highlighted above since it is characterized by weak service quality and expensive charge. According to Telecommunication regulatory environment (TRE) survey, result shows Ethio telecom is unable to bring the desired service quality, widespread access and affordability which has resulted frustrations of clients (Adam, 2010).

Recently, in a regular meeting of EPRDF Executive Committee which was conducted on June 5, 2018 has announced decisions to privatize greater shares of Ethio Telecom with the intention of assuring better development and continuous growth which would benefit the society at large. (Council of Secretariat of the Office of EPRDF, 2018)

Notwithstanding with the argument on the necessity of partial privatization decision to fasten economic growth —which is contentious in different economic and political ideologies; the scope of this research shall be limited to investigate only one of the rationales for SOE's partial privatization policy shift through measuring the impact of interventionist economic policy on SOE's cost efficiency in the case of Ethio telecom.

In vein with cascading the study on impact of interventionist economic policy to measure SOEs performance from cost Efficiency point of view —which is one of the strong rational why interventionist economic policy is criticized as a manifestation of government failure which provides a reason for recommendation of privatization as an alternative path. In this aspect there are diverging

²As par OECD definition: State owned Enterprises where the state has significant control through full, majority, or significant minority ownership. (For this research context SOEs includes enterprises owned by the central or federal government.) (Price water house Coopers) doi: <https://www.pwc.com/gx/en/psrc/publications/assets/pwc-state-owned-enterprise-psrc.pdf>

research literatures. According to a research which compiled results of 71 studies, where state-owned companies demonstrated comparatively lower efficiency in 56 cases. (Mueller, 2003). Similarly, according to research made by Shirley and Walsh (2000), who surveyed performance difference between SOEs and private corporations of 52 studies in the monopolistic utility sectors, depicts that only five state owned enterprises outperformed private corporations.

On contrary, there are arguments that support ownership does not necessarily affect efficiency. According to Sueyoshi, (1998) efficiency results are not necessarily positive in the property right theory, and his assertion depends upon the type of industry studied. In vein with that (Nellis, 1994) also argued that, efficiency doesn't depend on ownership. Thus, weather a firm is state-owned or privately owned, efficiency can only be achieved as long as the firm operates in a competitive market, given full autonomy to the management to make crucial business decisions based on market signals, and where performance-based compensation is provided.

Thus, this study is aimed at examining the impact of government's interventionist developmental economic policy in terms of cost efficiency in the context of ethio telecom (a state owned monopoly enterprise).With the mere purpose of investigate, empirically measure and evaluate privatization policy from important aspect and cause of privatization decision —Which is cost efficiency.

1.2. Statement of the problem

As it's promulgated in many primordial and contemporary manuscripts; the role of government is to craft and execute policies which can protect, maintain and advance the interest of the public. From this vantage point, different governments employ various political and economic ideologies which suits their context to serve public interest. Similarly, also in Ethiopia, government has employed interventionist economic policy to provide public services using SOE's to serve political, economic and social goal of the polity.

Telecom service is one of essential services which have been provided by Ethiopian government to fasten economic growth. However, this service can be delivered either by private or public. Thus, there are arguments on which ownership — public or private— would serve a public at best.

Due to EPRDFs developmental approach; government is entitled to having strong and selective role in the market. As a result, SOE's performance is expected to have strong influence on growth. In line with this, ethio telecom is also one of major SOEs within which government exercises interventionist economic policy with the intent of mobilizing huge source to finance for expansion of telecom service and other development activities that can insure equitable development distribution on non-profitable market edges or neglected areas. However, according to (Adam, 2010) the public sector is the loser by holding the inefficient enterprise which operates in vertically integrated monopoly market structure... these are manifested by current poor service penetration, low quality of service and high cost of broadband access.

To the best of researcher's knowledge, the government privatization policy decision didn't take sufficient study and time. Since decision was swift & unscheduled officially, the issue isn't discussed in open platform with a panel of experts or a public didn't provide any strong and scientifically evident reason and criteria for privatization decision. Moreover, decisions was not participatory, transparent and open to the public and made by a party which only consists four national Parties. Apart, decision didn't utilize cost efficiency as a decision parameter for a government to make privatization decision. Specially, to show the current position of ethio telecom with reference to cost efficiency parameter. So this research will help the decisions to be more informed and complete from economic criteria of privatization decision in general and cost efficiency dimensions in particular. Thus, this research shall investigate and measure interventionist policy as to cost efficiency criterion.

1.3. Objective of the study

In general, the objective of this research is related to measuring the impact of government interventionist economic policy on SOE. Specifically taking the case of ethio telecom from cost efficiency point of view;—which is one of the reason why government intervention is criticized and considered as a cause for government faller.

Thus, to summarize, the main objective of this research is to assess the impact of government interventionist economic policy on cost efficiency of ethio telecom using a data envelopment approach. In order to achieve the main objective, two specific objectives are designed. The specific objectives of this research are to:

1. Measure the cost efficiency of government's interventionist economic policy on the Ethio telecom

2. Assess the interventionist policy related sources of cost efficiency that contributed/hindered cost efficiency
3. Assess alternative paths for cost efficiency improvement of Ethio-Telecom using cost efficiency decision parameter

1.4. Research Questions

1. What is the impact — magnitude and direction — of intervention economic policy on cost efficiency of ethio telecom?
2. What are intervention policy related sources of cost efficiency in the case of ethio telecom in comparison to privately owned telecom operators in a competitive market?
3. What are alternative paths for cost efficiency improvement and its policy implications?

1.5. Significance of the study

The output of this research is expected to have policy implication. Since government decision is a getaway for fundamental policy shift of interventionist policy if not political ideology; which would result extensive impact in the economy in terms of mobilization of huge development financing resource however divestment of potential revenue economic arms of the government is eminent if not other social, political dimensions on the role of government is considered. Thus, the research would contribute to support and investigate privatization decision by sufficient scientific evidences.

Measurement of interventionist economic policy on SOE from cost efficiency point of view has a policy implication in consideration of rationalizing the relevance of privatization decision for the reason of enhancing cost efficiency — which is one of the founding reasons why privatization takes place and a government to denounce interventionist economic policy.

The other significance of the research with reference of providing scientific measure of current position of ethio telecoms cost efficiency is to support potential privatization decision to put cost efficiency element in to consideration of valuation or bargaining point during a course of buyer selection. In addition, it would help as a bench mark for future comparison of ethio telecom performance with regard to pre and post partial privatization cost efficiency performance.

1.6. Scope of the study

The scope of this research shall be constrained to investigate interventionist policy impact in ethio telecoms case under EPRDF regime — specifically in years between 2007-2015. Besides, result and

discussion part shall be confined to emphasize on interpreting the results with regard to interventionist policy theoretical tenets and discussions with regard to theory and practices of privatization. Methodologically, only cost efficiency is considered as a parameter of evaluating the impact of intervention economic policy. Asides, Data Envelopment Analysis DEA-Cost efficiency analysis will be employed.

1.7. Limitation of the study

One of potential limitations of this research could be missing data. However, this problem has been addressed by employing relevant data imputation mechanism. The other threat to validity is non-parametric nature of the model. Thus, the problem would reduce sensitivity of the model which would result dwindle magnitude of impact.

1.8. Organization of the Study

The thesis is incorporated in five chapters in a manner which insures chorological flow to attain research objectives and assist readers to simply track specific elements of the research during course of reading .The first chapter is an introductory section. While the second chapter focuses on extensive, recent and empirical literature review of the matter under investigation. In the third chapter research philosophy, design and methodology shall be presented. The most important issues such as of data analysis and Interpretation of research output will be materialized on the fourth chapter. Finally conclusion and recommendation of the paper will be covered in the five chapters.

1.9. Operational definitions and vibrations

DEA: Data Envelopment analysis: It is a performance measurement technique which, as we shall see, can be used for evaluating the relative efficiency of decision-making units (DMU's) in organisations.(Brunul University of London, nd.)

Efficient firm: are those that produce a certain amount of or more outputs while spending a given amount of inputs, or use the same amount of or less inputs to produce a given amount of outputs, as compared with other firms in the test group.(Vincová, 2005)

Intervention economic policy: Economic policy where the government has significant role in the economy mainly in two ways; direct provision of public goods and controlling market platform to minimize market failure, defend and maximize the interest of general public welfare.

Decision making Units (DMU): In this research Decision making Units an operating organization which is engaged in Changing inputs in to output through processes to deliver goods or services which have measurable economic value

Efficiency Reference Set (ERS): (Relatively efficient set of unites) is a set of relatively efficient DMU and respective weights which are used as a bench mark to measure performance of in efficient DMU .

CHAPTER TWO

LITERATURE REVIEW

2. Literature review

2.1. Political economy

The term political economy is originated in France at the 17th century. As it's understood political factors and ideologies are crucial in determining economic policies employed and respective outcomes. Thus, this thesis shall provide a spotlight on political economy to have all rounded understanding on economic policy intentions on political objectives and motives of the state in the economy.

In general politics plays major role in crafting the play filed for economy activities. In due it determines the role of the government in the economy; in terms of Stabilizing macro economy, facial allocation, wealth distribution. According to Collinson (2003) political economy is concerned with distribution of power and wealth between different groups and individuals that create, sustain and transform these relationships over time.' Moreover, the interplay between politics and economics is linked at policy adoption stage. Since, policies are kept into effect by relevant institution after different elected political parties who represent versatile public interest made arguments to defend and advance respective interest of their constituencies.

Thus, with regard to distribution role of government, the interplay between politics and economics does not only affect the issue of distributing economic outputs to versatile public interest groups but also involved in managing the issue of cost of development. So, political economy interplay is also exhibited in managing the question of who pays what? In a course of economic growth.

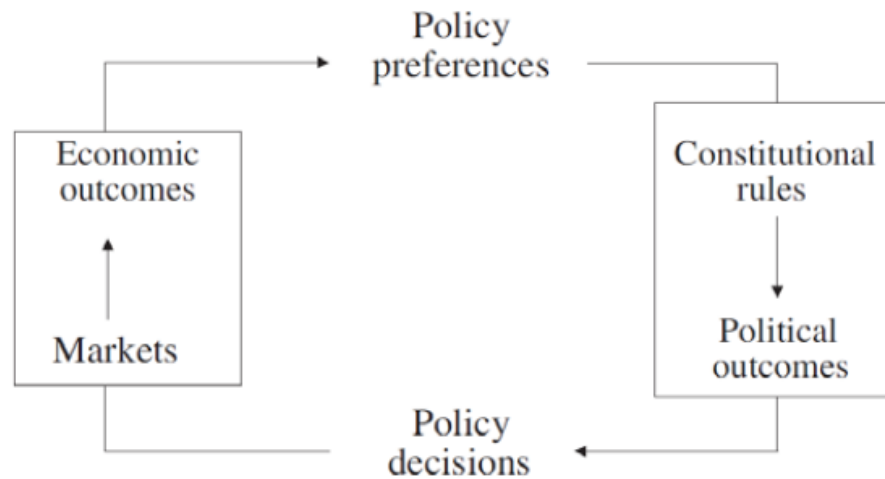
In similar context the interplay between politics and economics is described as “economics examines how rational individuals use the resources at their disposal (capital, labor, land etc) to maximize some utility function (for example, maximizing profits, income or consumption) by producing goods and services and participating in markets. In a similar vein, political economy examines how such individuals maximize their utility through participating in political activity.

Again they have capital and labor (time) at their disposal and they can use these to influence political processes to generate policy outcomes that benefit them (most notably, by generating rents for them)". (Sosa, 2019) however, with regard to primary of function or chronology of cause, the interplay of political economy is contentious. According to Leontyev, (1972) some argues that (political economy) refers primarily to the study of the political basis of economic actions — the way in which government policies affect market operations. For others, the principal concern is the economic basis of political action, the ways in which economic forces mold government policies”

Also other scholars in the field such as Persson, et al., (2003) describe how economic policy interact with markets to shape the policy preferences of specific individuals or groups and how the distribution of those preferences in turn induces economic policy outcomes and performance. Thus, figure 1 shows interplay of how versatile economic policy preferences initiate political interest and how political outcomes determine policy preferences on economic issues in a democratic and liberal political system.

According to Persson, et al., (2003) the interaction between politics and economics in the figure is explained as follows “Citizens and groups in society have conflicting preferences over economic policy. Political institutions sum-up and convert these preferences into specific political outcomes to influence public-policy decisions in the economic domain (the arrows on the right in the figure). Public policies interact with markets and influence the prices of different goods, employment and remunerations in different sectors of the economy, and these market outcomes give feedback to policy preferences (the arrows on the left).”

Figure 1 Interaction of politics and economics on policy preference



Source: Persson, et al *The Economic Effects of Constitutions*, 2003

Literatures taxonomies the characteristics of political economy of different systems in to various groups and subgroups. According to CFI (2015). Types of political economy ideologies are classified in to Liberalism, Marxism, and Economic nationalism. Similarly Akindele et al (2003) has also classified in to Mercantilism, Liberalism (bourgeois) and Marxist. For the purpose of this literature three of them would be succinct to our objective of understanding the political intent, ideological rationale and social base consideration for crafting economic policies.

2.1 Mercantilism

Mercantilism is an economic policy which advocates economic nationalism. It's originated in seventeenth and eighteenth centuries. It considers economy as an integral part of nation building process. Though this economic philosophy does not have a school which has organized academic journals which advocate, defense and advance mercantilist's thoughts. However, their thought went viral in countries like England, Spain, France, Portugal, and the Netherlands due to group of writers who were concerned with the process of nation building appeared in Europe.⁷ (Salvatore, 1995)

Mercantilists have nationalist political view and a zero sum game economic perspective. Since their doctrine is based on the premise that says a nation can regulate its domestic and

international affairs to promote only its own interests. Thus, to achieve this purpose it assumes favorable trade balance in international trade. Moreover, the mercantilists also advocate trade protection and regulation. In other words, tariffs, quotas, and other commercial policies are proposed to minimize imports in order to protect a nation's trade position in international trade. This shows their understanding of international trade as a zero – sum game, in which one country's economic gain was achieved at the expense of another.

Mercantilists advocate for strong and protective role of the government in the economy. “The state is the major player in the economy. Its position is valued with respect to wealth, power and prestige vis-à-vis other states — which is the major concern of mercantilist. Thus the mercantilist holds an organic view of the state, the whole is greater or more important than its parts. It subscribes to and espouses the political determination for economic relation of states. The protectionist principle of mercantilist is based on the need of minimizing dependencies on imported goods since foreign sources are inaccessible during war times and to minimize unemployment since exports boost employment while imports abate”.(Akindele et al 2003)

Thus, the mercantilist's primordial nationalistic political economy has still two basic relevant and sustained contributions to contemporary issues on government role and position in crafting economic policies. The first is, priority to national interest or “Nationalistic” view that is manifested by trade protection, protection of local jobs through abating imports and enhancing exporters that create job opportunities to the nation. The other is advocacy of planned economy as a best means of achieving a national goal.

2.2 Liberal political economy

The other political economy classification is liberal political economy in mid-17 centuries. Liberal political economy is an advocate of freedom, (both individual freedom and market freedom) to insure social harmony and maximization of social welfare. This school of thought was introduced by Adam Smith, who is a pioneer of Liberal Political Economy. In his book which was published in 1776 by the title of “An inquiry into the Nature and causes of wealth of Nations” he elaborated the concept of the invisible hand which is the rationale behind why liberal economic approach is valid in the context of human behavior.

"Every individual necessarily labors to render the annual revenue of the society as great as he can ... He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention ... By pursuing his own interests, he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good." In same vain ... "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest." (Grieve 1983)

In the same fashion, under liberal political economy paradigm government role in the economy is advised to be constrained. According to Shirzad (2016) state should have less or no intervention on economic activities and set no regulation. Since, liberalism mostly focuses on freedom of individuals, democracy, and multi-party system.

However, neo classical liberal political economies are criticized by provision of low level of social welfare and more on individual economic enrichment. Since, it focuses more on increasing individual's role than empowering nation. Moreover, the characteristics of deregulation, low taxation would also squeeze government capacity of redistributive role. Thus, in long run it could result a politics which is captive by a strong market. Some scholars who are against liberal political economy extends their critics to the extent of labeling a system which results anarchy. According to (shirzad 2016), the ultimate goal of liberal political economic system is Anarchy (lack of government) that results state abolishment due to lack of conviction.

2.3 Marxist view or socialist view of intervention

The last political economy theory which is highlighted to contextualize the intent and rationale behind political ideology of economic policy is Marxist political economy. According to Jäger (2016) this political economy is based on economy, society and politics. These three fields are not considered as isolated but as interdependent structures that evolved historically.

Understanding the analysis of class struggle which narrates labor and capital contradiction within the capitalist system is fundamental to the understanding of dynamics within this analysis. To sum up, Marxist views economic issues would drive to political struggle. Thus, politics is both cause and outcome of class struggle.

Marxists view on the role of government is based on social base of the ruling class. According to Rosa Luxemburg (1918) the state in its many forms in pre-socialist society is a political expression of class division (largely but not exclusively a division between the working class and the ruling class), which exists to maintain and promote the interests of the rich and powerful, and of a government. However if the government is controlled by the proletariat or the working class the case shall be the opposite. "The State is not "abolished" but It dies out...Socialized production upon a predetermined plan becomes henceforth possible. The development of production makes the existence of different classes of society thenceforth an anachronism. In proportion as anarchy in social production vanishes, the political authority of the State dies out. Man, at last the master of his own form of social organization, becomes at the same time the lord over Nature, his own master — free." (Engels, 1880)

Based on the above notation in socialism which is one of a strong theoretical contribution of Marx the role of government in the economy is strong since the government plays a comprehensive role in almost all economic activities, such as production, distribution, and consumption, of a nation. The rationale for government intervention is highly interrelated to protect and advance the interest of the working class since socialism is a means to reach to communism whereby the importance of government "the necessary evil" dies. The manifestations of socialism are well expressed well in terms of assuring equity and abatement of unemployment and labor exploitation however, it's criticized because of economic inefficiency, lack of innovativeness and competition.

2.4 Intervention economic policy

Intervention of governments were part of many civilizations since primarily the role of rulers was vital to keep peace in a society. However, on one end of the socio-political spectrum, liberal thinkers perceive government intervention as interference or intrusion in citizen's life; on the other end, socialists perceive government intervention as a necessity to establish peace and order,

economic stability, and justice in a society. A literature review reveals that the notion of a government's intervention laid on prominently in three arenas – political, social, and economic.

However, for the purpose of this literature a discourse would only focused on understanding the nature of the relationship between a government and the market. In this vein there are two main ideological perspectives. At the one extreme of ideological spectrum; neo-liberals may seek to reduce the state role to the level of 'protector' of private property rights (Huffman, 2013) Moreover, capitalist perspectives in 17th and 18th which where advocated by capitalist protagonist such as Adam Smith and John Maynard Keynes argued against government intervention in the economy. At the other end of the spectrum, the clearer socialist, neo-Marxist thinkers advocated the government to assume full ownership and control of the economy. However, the justification for government intervention is evolved and constrained to correct market failures and to achieve a more equitable distribution of income and wealth among the citizens in later days. (Waldt, 2015)

To this context George & peter, (1996) argues that government intervention is a prominent feature of capitalism. According to them, "Nowhere has the system of 'nonintervention of the state' ever existed. Everywhere the state has been, and still is, the main pillar and the creator, direct and indirect, of Capitalism and its powers over the masses. The state has always interfered in the economic life in favor of the capitalist exploiter". These scholars also claim that even in a truly laissez-faire capitalist system, the state would still be interfered in the economy through protecting capitalist property rights as well as hierarchical social relationships. In light with these, Polanyi, (1944) notes that even though many ideological proponents of capitalism thunders loud against state intervention (for the benefit of the masses), the fact is that capitalism itself generate causes that leads to the need for such economic intervention"

Depending on political economy ideologies highlighted above, pros and cons of economic intervention is contentious. However, the necessity of intervention is inevitable thus, the crucial question shall be how we determine the intent and the degree of intervention with respect to each political economy ideologies. Keeping this perspective intact, there are basic roles of the government in developing capitalist economies which is much more different from roles of government in developed capitalist economies in terms of intent, level and mechanism of intervention. According to, FAO,(nd) the intent of government interventions should be to

facilitate market competition and help the market achieve national policy objectives — Policies should aim effective workability with the existing capitalist system, not to replacing it. Since government attempts to replace free market systems have often raised the costs due to anti-competitive nature of the market, as a result distorted market price, distorting resource allocations would damaging the economy. Thus, it is generally recommended that governments should play a facilitating rather than a direct role in markets through the government is expected to work on improvement of market and institutional infrastructure and abatement information asymmetry.

However, depending to the context of development level of a country; direct economic intervention may also be important in provision of public and merit goods. Even in terms of assuring development finance in LDC which are not able to collect sufficient amount of finance through indirect intervention like collecting taxes due to poor market and weak infrastructure. Thus, direct intervention is necessary to curb low-level equilibrium trap that emanates from reinforcing causal and effects relations of poor market and low development finance in LDC's.

Government intervenes in many ways; such interventions may include regulatory mechanisms such as policies, laws, regulatory directives and guidelines. It may also intervenes directly through provision of public goods and services via programs and projects. However the level and type of intervention is essential since it's necessary to align government roles with most possible minimum opportunity costs criteria.

Thus, in this regard, the level of intervention may depend on various factors: such as, growth trajectory of the country; demographics – culture groups; historic realities – colonization; the maturity of its democracy(political system); geographical circumstances – size, location, growth hubs, urban-rural settings; and availability of natural resources. According to Waldt, (2015), a country which registered low performance with regard to these factors may require stronger economic protection which leads to government intervention.

2.5 Type of government economic intervention

Government plays different role in the market through intervening in versatile manner which suit to the level and type of a problem, type and maturity of economic system and effectiveness and efficiency of intervention mechanisms. In general, there are two types of economic intervention:

direct and indirect, direct economic intervention is a way which government take part in the market through directly supplying public goods and services or buying goods and services for development program from the private sector. The other type of economic intervention is Indirect; in this approach government intervene in the market by influencing private markets through rule, standards and policies which have incentivizing, discouraging or restricting effect in private firms.

According to OFT (2009) There are costs and benefits associated with all types of Government intervention thus it's vital to choose appropriate tool that can achieve intended economic policy objective with minimal effect on competition, availability of choice (economic servitude) and less effect on market effectiveness and efficiency.... According to the literature, based on the notion of liberal capitalist market economy; types of government economic intervention is divided into traditional instruments and market-based approaches as shown in table 1 below

Table 1 Types of Government intervention

	Traditional instruments	Market-based approaches
Providing public Services	Direct provisions	Competitive tendering User choice
Influencing private Markets	Regulation Tax and subsidy	Trading schemes Self-regulation

2.6 EPRDF's Developmental state growth path and intervention policy

Revolution, civil war , poverty, in effective and efficient utilization of resources and bad governance were well defining terms had been explaining Ethiopia at most if not at all. Ethiopia, over the past 100 years were not able to answer basic political, economic and social questions. According to Yirga, (2015) almost the whole 20th century, Ethiopia was considered as among the most “starved” and “conflict-prone” country in the world. The name of the country was synonymous with famine, poverty, drought, deprivation, and backwardness. It is only since the

last decade of the 20th century were the state marked historic transition from a status of a predatory and quasi-failed state to better performing economies states.

Similarly, other literatures also rearticulate the fact that Ethiopia is registering strong economic performance after a long time low-level equilibrium economic trap. In recent decades the country is becoming more visible to the world in a “half full” perspective and more expounded as a “fastest growing economies.” According to World Bank’s economic review in 2016 the economy has experienced strong and broad based growth over the past decade, average of 10.8% per year in between 2003/04 - 2014/15 compared to the regional average of 5.4% (Alula, 2018)

The reason for such strong economic performance that has been generated in the past fifteen year’s Developmental state model growth approach has played a great role. The core idea of the developmental state model is that the state should set development as a national agenda, accelerate development through extensive regulation of market economy, economic planning and intervention through direct provision of public and merit goods to accelerate and facilitate growth and economic transformation. Thus, ideological underpinning is developmentalist is definition of its role as a missilery who primarily ensuring economic development” (Mkandawire, 2001)

The fundamental cause for state intervention in economic activities does not only emanate from the needs of ameliorated economic performance rather it originates from the level of poverty which does not allow the state to sustain its existence. According to FDRE foreign Affairs and National Security Policy and Strategy document, “Lack of democratization, poverty and backwardness are threats to the national survival of Ethiopian statehood system. With no doubt, the attainment of speedy economic development, democratization and peace is fundamental for survival of the country which is in a state of abject, poverty and backwardness. Moreover, economic policy and the role of the state has to be tuned to address those challenges (Ministry of Information, 2002) Thus, interventionist role of the government in economic has also lagged state servicing and building political mission as it's indicated in the preamble of the FDRE constitution.

The other point of pro-state intervention argument in Ethiopia’s case is lack of sufficient development finance. This argument is strong with reference to one of founding pillars of

developmental state — accelerated growth. In LDCs like Ethiopia where there are primordial and weak markets primary capital accumulation is very low as a result it's difficult for the government to collect taxes to finance infrastructures that are necessary to attract and accelerate performance of private sector in the economy.

Government failure is also another contentious point with regard to government intervention in general. In this scene, many neo-liberal theories, such as agency and public choice theories has presented in depth argument to rationalize the causes to adopt lezis fare theory. On contrary, Market failure has been theoretically criticized and practically exhibited in many African countries during SAP. Thus, the so-called free market-led developmental approach could not address all market failures in developing countries. Furthermore, even in developed countries who instigated this development approach for development management role has been challenged b/c of market failure which resulted 2007 financial crises due to de-regularization. Moreover, US government took interventionist measure to finance investment banks and auto industries. Besides, the “residuals” wealth distribution approach this process — trickle-down economics— has led to divergence of inequality across US. (Stiglthes 2012)

In sum, in Ethiopia, government interventionism through direct provision is aimed to secure development finance that helps to accelerate development activities which create conducive environment for a private sector to operate. Furthermore, it also helps to addressing market failure which have both component and spillover effect. In this vein, in a market system which is characterized by weak and primordial market economy; a market failure would have lesser effect than government failure in both short run and long run life of political economy.

2.7 Intervention through SOE

A State Owned Enterprise (SOE) is a body formed by the government through legal means to take part in commercial activities. Essentially, SOEs are created to undertake commercial activities on behalf of the government (CFI, 2015). Similarly, according to Economic Co-operation and Development (OECD) definition SOEs, are enterprises were the state has significant control through full, majority or significant minority ownership. (PWC, 2015)

In the ownership structure of any SOE the government may assume full or partial ownership of a state owned enterprise, which is usually allowed to take part in specific activities. However, the

name and definition of SOEs are also oftenly varies across countries. Research suggests that there are a wide range of legal forms for SOEs, depending on factors such as:

- The level of government that owns the enterprise (central/federal, state/regional or local).
- The way in which the enterprise was founded.
- The position in the public administration hierarchy.
- The purpose of the SOE
- The status of the SOE if it is in the process of being privatized.

Other variations include: Full, majority or minority ownership by the government. Listing (or not) on a stock exchange. Types of government shareholdings through vehicles such as government pension funds, asset management funds, restructuring corporations and development lenders. State- owned vs State-enabled (for example enterprises which have been granted exclusive rights by the state) as opposed to state-owned. Ibid

Historically, SOE's were flourished since the 1930s and particularly after World War II numerous State Owned Enterprises (SOEs) also called Public Enterprises (PEs) were created in both developed and developing countries to address market deficits & capital short-falls, to promote economic development, reduce mass unemployment and/or ensure national control over the overall direction of the economy especially in developing countries. As a result SOE's were providing capital and technology to strategic areas where the private sector either shied away from or lacked the capacity to invest (such as heavy industries, infrastructure etc). Thus, most governments resorted to PEs to increase capital formation, to produce essential goods at lower costs, to create employment and generally to contribute to economic development of the state which the trend is continued till the early eighties. (UN, 2008)

Even recently SOEs continue to have a major presence in many national economies. In high-income countries, SOE's share of GDP and investment constitute 8%, and 13% respectively. For middle-income countries the corresponding shares are 9% and 17%, while in the so-called Least Developed Countries (LDCs) they are 14% and 28%⁴. PE's also constitute an important source of government revenue in many developing countries (China: 7%, Thailand: 7%, Turkey: 6%)

and regions such as North Africa (Algeria: 60%, Egypt: 12%, Morocco: 4%, Tunisia: 7%), the Middle East (Jordan: 14%, Lebanon:17%, Syria: 24%) and Eastern Europe (Czech Republic: 2%, Hungary: 3%, Poland: 4%, Slovakia: 5%, Slovenia: 3%).In terms of employment, PEs employ 34.3% of the total workforce in Ghana, 25.1% in Gabon, 12.2% in Sri Lanka, 8.1% in India, 7.7% in Kenya and 7.4% in China. (Ibid) Thus in general SOE's are still intact in social, economic and political life of national economies after massive divestment campaign of 1980's and 90's.

2.8 Abolishment of SOE's and consequences of SAP

SAPs, was a program designed by Britton Wood institutions such as International Monetary Fund (IMF) and the World Bank (WB) which were established in 1944 at near end of World War two. These international institutional interventionist bureaucrats designed SAP which had been persuasively and conditionally implemented. However, miss alignment of policy prescription were criticized as “a neo-classical response for non-classical development model” due to consecutive adverse policy effect which has led to economic crisis 1970s in Africa. (Chyniaoka 1995) SAP were imposed as policy prescription which guided economic and social policy framework in most of the Southern world since early 1980s. Even in Africa, more than 34 countries have implemented SAPs. (Dzodzi 1995).

At the time, one of basic objectives of SAP was to address weak management of the public sector that has resulted financial loss of public enterprises and poor public investment choices (Africa's investment and operating costs were typically 50 to 100% above those in Southern Asia), and in costly and unreliable infrastructure. (Heidhues& Obare, 2011)

The main elements of the SAPs were neo-classical/neoliberal features. They emphasized on anti-inflationary macroeconomic stabilization policies, private sector lead and free market economic development approach, controlling budget deficits, privatization of SOE's, eliminating state subsidies on social services etc ... A typical devaluation and trade liberalization that aims to improve the country's balance of payments, control its foreign indebtedness; debt rescheduling and stricter debt management were also regularly part of the prescribed policy set (Heidhues et al., 2004).

Among major elements of SAP deregulation, liberalization (trade and capital account), contractionary fiscal policy—which is pro Austerity and privatization are dominates. However the researcher emphasis on privatization aspect of SAP. However, the researcher would like to provide spotlight investigation on how democratically and openly the programs were implemented to understand the intent of the program. Thus, it's interesting to see selected experiences of privatization of SOE in Russia. 1991 was the time for huge privatization to take place during Yeltsins the so-called reform period, at the moment USSR was in a hostile political and economic situation. According to Klein (2007) this aggressive global neoliberal institutional interventions which was crafted by Washington was the one who was providing ideological and technical backup to Yeltsin... the U.S. government also funded its own transitional experts whose jobs ranged to the level of writing privatization decrees.

Beyond all, the process was secret and not participatory “Once again a group of self-described revolutionaries huddled in secret to write a radical economic program. As per Dimitry Vasiliev, one of the key reformers, recalled, "At the start, we didn't have a single employee, not even a secretary. We didn't have any equipment, not even a fax machine. And in those conditions, in just a month and a half, we had to write a comprehensive privatization program, we had to write twenty normative laws. ... It was a really romantic period." Ibid

Following these, on October 28, 1991, Yeltsin announced the lifting of price controls, predicting that "the liberalization of prices will put everything in its right place." (UN DESA, 2008) The "reformers" waited only one week after Gorbachev resigned to launch their economic shock therapy program ...The shock therapy program also included free-trade policies and the first phase of the rapid-fire privatization of the country's approximately 225,000 state-owned companies within a year. (Klein, 2007)

Similarly in Africa, the global neoliberal institutional interventionists like the World Bank and International Monetary Fund (IMF) has offered loans for many African countries, and in return African countries were forced to implement neo-liberal economic policies (SAP), which has included privatization.

According to Ismi (2004) privatization of SOE is identified as one of four ways in which reforms under SAP have impoverished people and increased economic inequality. These are:

- Destruction of domestic manufacturing leading to massive unemployment of workers and small producers.
- Agricultural, mining and trade reforms have reduced the incomes of small farmers and poor rural communities.
- Volatility of labor market due to privatization measures which has resulted mass layoffs, in return it led to lower wages that deepening the poverty situation.
- Cutting of education and health spending and introduction of user fees for social services which resulted severe increase in the number of poor as well as a deepening poverty.

Thus, the objective and the result of the program were totally opposite and deteriorating. Though in long run SAP intended to improve the economy; in the short run, immediate consequences were deteriorating since it has ignored social aspect of human development; mainly, the erosion of social services, especially among vulnerable groups, families and individuals...generally, in the vast majority of sub Saharan African governments, there is general agreement regarding the social, political and economic tensions, coalitions and conflicts, which were generated due to implementation of SAP. In Zaire, Zambia, and Nigeria, to name a few, adjustment programs has point-up and contributed to de-legitimization of the state, which led to political violence, riots and regime turnover and culminating severe economic dislocation and deterioration.(Rono, 2002)

2.9 Theoretical narrative of pro SOE privatization under neoclassical market economy paradigm

There are different narratives on privatization of SOE's under versatile economy paradigms. However, according to Kim and Chung (2007) There are three main theories which support privatization of SOEs —property rights, public choice, and agency theory, which are based on the organic roots of classical economics; these theories support that existence of superior performance in privately owned enterprises as compared to SOE.

According to Summaries of each theory made by Bozec et al. (2002). The agency theory assumes that managers (Agent) seek to maximize their own advantage rather than owners of the firm or the firm itself. However, managers in private firms are trimmed by a number of external control mechanisms since, agents (mangers) can be easily replaced from the market unlike to

SOE. Since government itself is the only big agent of SOE that can't be easily replaced from the market unlike to the private ones. Also, the property rights theorists also argue that 'property right under state ownerships are poorly defined and valued since the managers have ownership interest. Also possibility for bankruptcy and theft is high due to rent seeking attitudes and lack of strong internal control in SOE managers. Moreover, since, government subsidy is available when SOE's fall, they develop less risk sensitive ways of doing business. Thus, SOE are less inclined to maximize profits. On the other hand, the public choice school underlines problems in the functioning of governments. Managers of the SOEs are more concerned with maximizing their own power, prestige, and the amount of resources under their control.

Vickers and Yarrow (1995) also examined some of the implication of different types of ownership in terms of managerial incentive structures and enterprise performance. They concluded that "ownership matters!!" since changes in structure of property rights are likely to have significant effect upon behavior." Theoretically, SOEs lacks control mechanism and incentive structure (related with management goal). Thus, without the change in ownership structure it is said that gradualism cannot provide the same effect as shock therapy of privatization (Kim, 1999).

2.10 Cost efficiency and SOE's performance

According to neoclassical economic theory, efficiency is mostly affected by market and incentive structure rather than the type of ownership. In other word, regardless of; whether a firm is state-owned or privately owned, efficiency can be achieved as long as the firm operates in a competitive market and if it gives full autonomy to the management to make crucial decisions based on market signals besides provision of performance-based compensation is also vital to enhance efficiency (Nellis, 1994).

However, there are conditions which are susceptible for inefficacy while the enterprise is owned by government. In a case of SOEs, there responsibility to achieve both commercial and social objectives would create inefficient use of resources. Even during times of crisis, when government often shifts its focus to crises, SOE's management entertains full-autonomy to achieve profitability goals. However, the change in behavior does not last when the crisis ends

(Heracleous, 2001). Besides, in efficient performance may also be related to the perception that government is available to back the enterprise when it fails to perform well.

In addition, such attitude would also create rent seeking since their existence is not related to their performance. Moreover, as employees feel that their job security is guaranteed, they may not have the pressure to work very hard like the private employees. As a result, the combination of rent-seeking behavior and reduced productivity will induce higher cost for the SOEs— which increases potential for inefficiency (Li, Lin, and Selover, 2014).

Some empirical literatures reaffirmed the notion that SOE are less efficient than privately owned enterprises. According to Boardman and Vining (1989) a study conducted using correlation between ownership and performance in competitive environment across 500 largest companies outside United States. They discovered that SOEs and mixed enterprises (MEs) had inferior performance compared to private corporations in terms of both profitability and efficiency... efficiency results depicts that, SOEs produced 4.4 percent less sales per employee compared to private corporations. However, according to a study made by Heracleous (2001) discovered a result which shows a superior performance attained under state ownership in the case of Singapore Telecom (Singtel). The efficiency was a result of management freedom to pursue market objective of the enterprise.

However, based on a study made by Wortzel and Wortzel (1989) on privatization of SOEs. They concluded that SOEs were more inefficient compared to private corporations not because of the type of ownership but mostly due to the lack of clear objectives and goals focusing efficiency improvement. Besides, lack of strong control systems which monitor efficacy performance is identified as a cause for inefficiency.

2.11 Ethio Telecom

Telecommunications service has begun in Ethiopia more than hundred years ago and used to be administered under the Ministry of Posts Telephone and Telegraph until 1952. It was later separated from Ethiopian postal service (EMS) and became an autonomous entity under the Ministry by Telecommunication Proclamation No. 131 of 1952. This proclamation established a telecommunication entity called "Ethiopian Telecommunication Board" which has an exclusive

mandate to regulate and operate telecommunication services. Having the same role functions, the name of ETB was later changed to Ethiopian Telecommunication Authority. (Yisak, 2016)

The Ethiopian Telecommunication Authority was working on an exclusive basis as an operator and regulator until the promulgation of proclamation No. 49/1996 (later amended by proclamation No. 281/2002) which established a separate federal telecommunication regulatory entity called Ethiopian Telecommunication Agency (ETA). The government owned operator called the Ethiopian Telecommunication Corporation (ETC) is also established by Council of Ministers Regulation No. 10/1996. While ETA is responsible, inter-alia, to license telecommunication service operator(s), specify technical standards, type approval of equipment, license radio communication equipment and manage and authorize the use of frequencies, ETC is responsible to operate telecommunication services, to repair, assemble and manufacture telecommunications equipment and to render telecommunications training services. Both ETA and ETC are accountable to the Ministry of Transport and communication (MoTAC) which is responsible for policy issues. Ibid

Under the Federal Democratic Republic of Ethiopia, the telecommunications sector was restructured and two separate independent entities namely the Ethiopian Telecommunications Authority (ETA) and the Ethiopian Telecommunications Corporation (ETC) were established by Proclamation (Proclamation No. 49/1996: Art.3). As a continuation of the 2005/06-2009/10 five-year plan. (Danel, 2016)

The telecommunication industry in Ethiopia is currently fully owned by the government. The government owned operator, the Ethiopian Telecommunication Corporation (ETC), provides PSTN, Mobile telephone, Internet and data communication services. Currently, ETC has 7.08 million subscribers, of which 1.2 Fixed, 5.9 mobile and 0.060 Internet. Mobile telephone and internet services are being rendered since 1996 and 1997 respectively. Tele density is 1.55%, 7.7% for fixed and Mobile respectively. The rate of penetration of telecom service of the country is among the lowest being compared with African countries and even among Sub-Saharan African countries. (Taye, 2010)

ETA has started its operation in 1999 with the purpose of having a separate regulatory organ which is found to be necessary to make the telecommunication service more efficient and

reliable. One of the duties and responsibilities of ETA was to license telecommunication service provider. Accordingly, it has issued license for ETC for four services, namely fixed telephone, mobile telephone, Internet and data communication services in July 2002. ETA has also commenced quality control activities and has started evaluating the operator's performance on the basis of the license agreement. (Yisak, 2016)

2.12 Market structure and inefficiency of ethio telecom

In Ethiopia the public monopoly of telecommunication sector and vertically integrated market structure determines access to and use of ICT in the country. The market is characterized by excessive pricing (especially in the broadband and international direct dialing segment), poor service quality, inefficiency, vendor lock-in and the absence of choice that has a detrimental effect on the revenue of incumbent operator and productivity of public and private enterprises...Ethiopia's telecommunications market structure is continued to be state-owned. Due to the older and famous government argument that says "liberalization will not result positive impact in terms of universal access to the poor people because of the profit motives of the multinational operators that are interested to operate only in densely populated areas. "Thus, the monopoly incumbent is the only option for meeting universal service objectives in Ethiopia since access requires massive investment and cross-subsidaries. (Adam, 2010)

However on contrary, Monopoly undermined government revenues and the competitiveness of telecom enterprise in Ethiopia. Estimates show that the ETC loses about 30% of its revenues due to bad quality service on an annual basis. According to Adam,(2010) based on a research made using comparative analysis of countries shows that Ethiopian government is incurring high opportunity loss because of holding vertically integrated monopoly market structure. When ethio telecom is compared with countries that have liberalized the sector, like Kenya and Uganda, shows that Ethiopian government loses tax revenues of at least US\$0.5 billion per year by not opening its telecommunication sector for competition – not to mention the positive impact and opportunity of wider and more competitive access could have brought to the national economy and competitiveness of enterprises. Estimated ETC revenue stands at around US\$460 million in 2009. A four-fold increase in traffic would have brought the revenue to around US\$2 billion a year, which would have generated about US\$0.5 billion in public tax and related revenue a year, in addition to the impact that wider access would have on enterprises and individuals. Ibid

The inefficiency of Ethio telecom as an operator is manifested in different ways especially low revenue collection from subscribers. The government was unable to acknowledge that ethio telecom's inefficiency is actually the result of its own policy on the communication sector. Instead it started to look for a solution elsewhere, by appointing a management firm that offers efficiency and effectiveness on a revenue-sharing basis. However, the main tool against the ineffectiveness of the ethio telecom so far was to change the management and see if that could lead to an efficient state-owned enterprise. This 'tool' faltered in 2006, resulting in three major management reshuffles in the incumbent. Critics argued that the change of senior management would not change the fundamental structural problem of the public monopoly – its inefficiency and ineffectiveness. (Ibid)

However, recently the government announced to take versatile and fundamental reforms to address economic slowdown. Inter-alia, other measures, privatization of ethio telecom is the prominent decision which captures the researcher's interest. Thus, this research evaluate the impact of interventionist policy as to cost efficiency criteria, identify time and magnitude of costs and provide alternative path for ethio telecom to enhance cost efficiency.

CHAPTER THREE

RESEARCH PHILOSOPHY, METHOD AND DESIGN

3 Introduction

Research is not conducted in a vacuum: it is framed within a research paradigm (Henning et al., 2004), since research philosophy provide important assumption that explains the researcher's view regarding how they comprehend a phenomena and researchers role with respect to the specific research. Besides, all layers of the methodologies like strategy, approach and design are intertwine with research philosophy and dependent on each other (Saunders, 2009)

Thus, the intent of this section is to provide and declare philosophical foundations of the research in view of different point of view about the nature of social reality. Also, to justify research methodology, approaches and techniques and to rationalize why they are employed in a coherent manner with respect to the case under investigation. Furthermore, this section is organize in three parts, the first chapter highlights research setting, objective and questions. Secondly, Research Philosophy, approach, techniques and alignment to objectives. At last, the methodology section consists, refined theoretical and mathematical representation of the model and data source.

3.1 Research setting

A unit of analysis of this research is at organizational level. Thus, Ethio telecom is chosen to investigate Policy impact of intervention economic policy as to cost efficiency criteria. The study will be conducted using a secondary data which are gathered from ethio telecoms head office. The founding reason which initiated the researcher to study the case of ethio telecom is, the monopolist nature of incumbent telecom industry and value and volume of the enterprise; besides, policy change in such gigantic SOE would result strong generative or degenerative effect. Thus, the effect of the policy has to be carefully measured and used as an input to alternate decision.

3.2 Research objective

Ethiopia government has employed interventionist economic policy to provide public services using SOE's. Ethio Telecom is one of gigantic SOE that are established based on economic

interventionist tenet and role of the government. However, the government led by Ethiopian revolutionary democratic front has made radical and swift partial privatization policy decision on ethio telecom along with other multinational SOE. Thus the objective of this research is to measure the impact of government interventionist economic policy on SOE in a case of ethio telecom from cost efficiency point of view; —which is one of the reason why a government intervention is criticized for causing government frailer or inefficiency. So this research will help the decisions to be more informed and complete from the vantage of economic criteria of privatization decision in general and cost efficiency dimensions in particular.

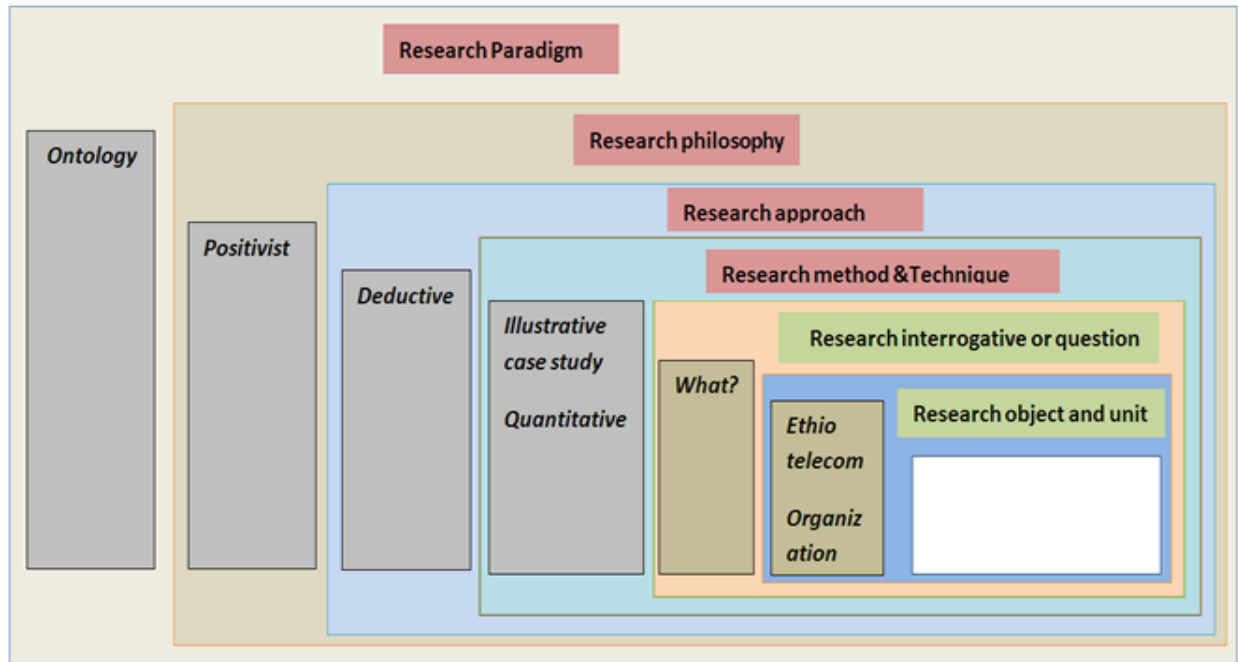
3.3 Research question

In line with the objective highlighted above, specific research questions are designed to generate specific and succinct answers that are able to address general statement of intention of measuring intervention policy impact on cost efficiency of ethio telecom. Therefore, pursued research questions for the present study are as followed, what is the magnitude and directional ramifications (effect) of government interventionist policy on cost efficiency of ethio telecom for the year's b/n 2007 and 2015; What type of costs are inefficient from where they are sourced? Does partial privatization government policy decision is relevance with regard to objective measurement results of cost efficiency?

3.4 Statement of Research Philosophy

In general, a research philosophy is the view in which data is gathered, analyzed and used. The choice of research paradigm is influenced by the context of the researcher country or university in which the researcher is based) as well as factors related to the characteristics of the research problem, the researcher and the research environment (Trauth, 2009) in this view, positivist— which is the philosophical base of this research. This will help for better understanding of the researcher's underlying assumptions, ascertaining the validity of research and to check the appropriate research methods employed.(Myers, 2012)

Figure 2 Methodological framework



Source: Owen compilation

3.5 Positivist research philosophy

Positivism has a long and rich historical tradition. It is also embedded in our society. Even Some describe the relation between positivism and scientificness to the largest extent by saying "knowledge which is not grounded on positivist thought are simply dismissed as un scientific and therefore invalid" (Hirschheim, 1985, p.33).⁴⁶ Positivists believe that reality is stable and can be observed and described from an objective viewpoint (Levin, 1988). In other word, In positivist studies the role of the researcher is limited to data collection and interpretation in an objective way or the researcher does not interfere in the phenomenon being studied.

According to Crowther and Lancaster (2008) positivism relates to the viewpoint that researcher needs to concentrate on facts. In these types of studies research findings are usually observable and quantifiable. Thus. This will help to enhance the research to be repeatable. (Dudovskiy, 2011)

Positivism is based on five main principles of positivism research philosophy can be summarized as the following:

1. There are no differences in the logic of inquiry across sciences.
2. The research should aim to explain and predict.
3. Research should be empirically observable via human senses. Inductive reasoning should be used to develop statements (hypotheses) to be tested during the research process.
4. Science is not the same as the common sense. The common sense should not be allowed to bias the research findings.
5. Science must be value-free and it should be judged only by logic.(Ibid)

Thus in general, as it has been seen previously, the positivist research paradigm underpins quantitative methodology. The realist/ objectivist ontology and empiricist epistemology contained in the positivist paradigm requires a research methodology that is objective or detached, where the emphasis is on measuring variables and testing hypotheses that are linked to general causal explanations (Sarantakos, 2005; Marczyk,etal ,2005).Similarly , according Tulu (2010) to the positivist ontology claiming objective, single, reality that will be studied without any perspective of the researcher and the positivist epistemology advocating the detachment or dualism of the knower and things to be known/studied guide the quantitative methodology which prescribe fixed design which favors the more restrictive option.

Quantitative methodology is concerned with attempts to quantify social phenomena and collect and analyze numerical data, and focus on the links among a smaller number of attributes across many cases. In other word, according to (Neuman, 2003; Sarantakos, 2005) quantitative methodology is a package of data collection techniques focused on gathering hard data in the form of numbers to enable evidence to be presented in quantitative form. (Tulu, 2010)

3.6 Alignment with research objectives

Research philosophy is best fit with research objectives. It's manifested by the characteristics and entente of research questions. The research questions are designed to describe cause and effect r/n and to measure what is the level policy impact on cost efficiency within case study frame, In addition to describe what type of costs are inefficient. Thus, the research interrogative is focuses on what? These objectives are better framed in positivist worldview for the following

reasons. The research philosophy is based on objective reality or ontological paradigm, since it assumes reality is stable and can be observed and described from an objective viewpoint (Levin, 1988). Besides, it's aligned with empirically observed phenomena and quantifiable variables and emphasis is on measuring variables (Sarantakos, 2005; Marczyk, et al ,2005).

3.7 Alignment with research approach

This research is designed in deductive research approach. It starts by looking at theoretical level perspective and discourses on the causal effect relation of economic intervention with regard to efficacy; specifically on cost efficiencies of SOE. Then, it cascaded it to case level through identifying ethio telecom as a SOE DMU under investigation. Subsequently, the research question is developed which specifically aligned with and target the research objective. Finally, appropriate tolls, techniques and data inputs are identified, adopted and crafted to address research question which is aligned to research objective —manly to measure the impact of intervention economic policy on cost efficiency of ethio-telecom.

3.8 Alignment with Research techniques

This research follows case study and quantitative research techniques which are aligned with positivist philosophy and ontological research paradigm. Since its aim is to objectively measure the impact of intervention economic policy on ethio telecom cost efficiency.

According to (Yin, 1994,) A case study is "an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" and it "relies on multiple sources of evidence" Thus it investigates pre-defined phenomena in a way which does not involve explicit control or manipulation of variables...since, the focus is on in-depth understanding of a phenomenon and its context (Cavaye, 1996).

Similarly, this thesis investigates the issue which has been contested; as it's highlighted on the background and research problem sections, Cost efficiency character of telecom SOE which is a manifestation of government intervention were not uniform or differ to the context. Thus, single and illustrative case study shall be best fit to measure the impact of intervention economic policy on cost efficiency with the context of ethio telecom in objective manner.

Case studies typically combine data collection techniques such as interviews, observation, questionnaires, and document and text analysis. Both qualitative data collection and analysis methods and quantitative methods (concerned with numbers and measurement) may be used (Yin, 1994). However, for the purpose of this study, quantitative data collection and analysis will be employed. Since quantitative techniques are relevant to ontologically measure phenomena in its natural setting. During the investigation nonparametric econometric models and cluster analysis will be employed to measure and describe cause and effect of variables.

Thus in general, all the techniques highlighted above aligned with positivist philosophy since, the research is looking for factual knowledge and the researcher is independent of the study while observing reality. Besides, the research intended to describe cause and effect and measure the phenomena as they are.

3.9 Theoretical model

3.9.1 Efficiency

Efficiency is one of a prominent criteria for making good decisions. This concept has been used in different fields inter elite economics and policy evaluation fields. Efficiency can be contextually defined in many ways. However, a definition provided by Sherman - 2006 is more relevant to insight what efficiency mean with respect to economic policy evaluation using DEA.

According to Sherman, Efficiency is defined as the ratio of output to input. More output per unit of input reflects relatively greater efficiency. If the greatest possible output per unit of input is achieved, a state of absolute or optimum efficiency has been achieved and it is not possible to become more efficient without new technology or other changes in the production process. The concept is explained mathematically on the nomenclature highlighted below

$$\frac{\text{weighted sum of outputs}}{\text{weighted sum of inputs}} = \frac{\sum_{i=1}^s u_i y_{iq}}{\sum_{j=1}^m v_j x_{jq}}$$

Where:

v_j , $j = 1, 2, \dots, m$, are weights assigned to j -th input,

u_i , $i = 1, 2, \dots, s$, are weights assigned to i -th output

Based on the concept of efficiency highlighted above, there are different type of efficiency which comes from different sources. Inter alia, technical, allocative, cost, profit and scale efficiencies. However, for the purpose of this research, cost efficacy will be employed using input oriented envelopment analysis of variable returns to scale (VRS).

3.9.1 Method of Data Analysis

This research plans to employ cost efficiency DEA VRC (variable returns to scale) to analyze secondary data collected from telecom operators. In addition, descriptive statistics (mean mode, median and correlation coefficient) is used for both checking existence of correlation b/n input and outputs and to provide descriptive analysis.

3.9.2 DEA Model

DEA is Linear mathematical programming approach which is also known as Data Envelopment Analysis (DEA) was originated by Charnes, Cooper, and Rhodes (1978). In DEA, multiple outputs and inputs are reduced into a single output-input form in which efficiency measure is yielded after necessary calculations are completed with linear programming. Although DEA is frequently used in efficiency analysis its non-stochastic nature prevents researchers to attain comprehensive and sustainable results in many cases.

The other strong feature of this model is, its ability to analyze different Decision making units (DMU) which have variables with different unit of measurement. Moreover, DEA is preferable to measure efficiency which doesn't presume any functional form for production. Erkoc, (2011), similarly, also in cost efficiency, DEA will have no formation of cost function, so that, the frontier is determined by the data in the sample and does not allow for random error. In other words, it assumes that there is no measurement error, no inaccuracies associated with data and no luck or chance that may temporarily affects a bank better measurement performance (Berger and Humphrey, 1997)

3.9.2.1 DEA verities

According to (Hayes, 2005). There are many sources of variation in a DEA formulation so it is important to define the model in use as precisely as possible so that it fits the data being analyzed. Thus, this research employed or accustomed the following verities to evaluate ethio telecom performance in terms of cost efficiency;

Model Orientation: this research employed Input-oriented DEA, where the main target is to minimizing usage of resources given certain levels of output. Since the main purpose is to analyze efficiency performance of ethio - telcom in terms of how minimum cost of inputs can be reduced to produce current level of output.

Number of Inputs: this DEA model is designed in a way which includes multiple number of inputs which are total asset, total number of employees, capital expenditure.

Returns to scale: This research utilizes DEA cost efficiency II model, which assumes Variable returns to scale VRC since ethio telecom is a monopoly, theoretically, it anticipated to entertain marginal revenue which is always below the demand curve, and the price will always be above the marginal cost at equilibrium. (Lumen, nd.) In addition, due to monopolistic nature of the market, a firm would produce of produces less output and chargers a higher price. Similarly. “Imperfect competition, government regulations and constraints on finance” firms can’t be run at optimal scale. (Coelli et al., 2005:172) 63 Therefore, the company operates increasing returns to scale. Moreover, a monopoly can’t be the same with other DMU’s which operate in a competitive market. Thus, when all DMU’s are not operating at full scale, it’s recommended to use VRS. Banker, Charnes and Cooper (1978) also suggested variable return to scale (VRS) when one of the DMU’s doesn’t operate at full capacity and to segregate or confined technical efficiency from Scale efficiency. The dual form of the above problem as:

$$\begin{aligned}
 & \text{Min } \theta \\
 \text{St } & \theta y_i \leq Y_i, \\
 & \theta x_i \leq X_i, \\
 & \theta \leq 1 \text{ and } \theta \geq 0
 \end{aligned}$$

Where X is $m \times n$ input matrix, Y is $s \times n$ output matrix, θ is an $n \times 1$ vector of constant and θ is a scalar. The value of θ obtained will be the efficiency score for i-th firm DMU.

3.9.3 Cost Efficiency Model

Cost efficiency is a composition of both technical and allocation efficiencies of DMUs. (Shahooth etel, 2006). It tells us to what extent cost of target DMU can be reduced while

producing the same level of output relative to other DMU's. In other word, it describes how much target DMU is cost efficient with respect to best practice frontier which is the gap b/n target DMU (ethio telecom) and other best practice DMU.

Similarly, According to Shahooth, etal) cost efficiency is defined as efficiency that can be achieved when the firms find a combination of inputs that makes them able to produce the desired outputs at minimum cost. CE is the product or mixture of the technical and allocation efficiencies. (Ibid) To calculate cost efficiency in both cost minimization and revenue maximization, price information of all input variables are essential. The Cost-DEA was adopted to calculate cost efficiency for ethio telecom is from Sueyoshi (1997). It is shown as:

$$\begin{aligned}
 \text{Min } C_k &= \sum_{i=1}^m p_i x_i \\
 \text{s.t. } - \sum_j \lambda_j X_{ij} + x_i &\geq 0, \quad i = 1, \dots, m \\
 \sum_j \lambda_j Y_{rj} &\geq Y_{rk}, \quad r = 1, \dots, s \\
 L &\leq \sum_j \lambda_j \leq U \\
 \lambda_j, x_i &\geq 0, \quad j = 1, \dots, n; i = 1, \dots, m
 \end{aligned}$$

Where the sum of λ_j is restricted by its upper ($U \geq 1$) and lower ($0 \leq L \leq 1$) bounds; and p_i is the input price for the i^{th} input variable. Since p_i and x_i are incorporated, an optimal X_i^* , minimizing the total cost of C_k^* . Consequently, the level of cost efficiency is determined by C_k^*/C_k

3.9.4 DEA conditions

According to Shahooth, etal (2006) Any DEA model should keep some conditionality's to get meaningful output which are relevant for interpretation. The following list provides each property along with its descriptions.

Positively property: Generally, the DEA formulation requires that the inputs, and outputs Variables be positive (greater than zero).

Isotonicity property: It is required that the functions relating inputs to out puts have mathematical property called isotonicity which means that a linearity of input results and outputs which assumes input are used to produce output.

Number of decision making units: A general rule is that three DMUs are required for input and output variables used in the model in order to insure sufficient degrees of freedom for a meaningful analysis.

Homogeneity of DMUs: DEA assumes relatively homogenous environment. That is all entities included in the evaluation set (ERS) should be have the same number of inputs and outputs in positive amounts.

3.9.5 Definition of variables and descriptions

On previous studies different input and output variables have been used to measure cost efficiency in telecom enterprises. Sueyoshi (1994) employed operating revenues as the output, mainlines, investment and the total number of employees as the inputs to examine the efficiency of the telecommunication industries in 24 OECD countries. Similarly, Sueyoshi (1998) employed total operation revenue as the output; total asset, total access lines and total employees as input variables. He also adopted total operating expenses as another output variable to explore the cost efficiency of NTT.

However, for the purpose of understanding the impact of intervention policy, the research adopted inputs and outputs variables which was first identify by Sueyoshi (1996) and used again by Chao-Chung and Chung-Chi (2007) to investigate the impact of privatization decision (policy intervention) on CHT. This study, the total asset (measured in NT\$ thousand), total number of employees (unit: people), and capital expenditure (unit: NT\$ million) are regarded as input variables; fixed communication network (unit: NT\$ thousand), and non-fixed communication network (unit: NT\$ thousand) are regarded as output variables. Also let P_1 = owner's equities/total assets, P_2 = total labor cost/employee, and P_3 = depreciation cost/capital expenditure be the input price of total assets, employee cost, and capital expenditure be the input variables, respectively.

Table 2 Definition of variables

Variables	Measurement	Input – Output	Price
Operating revenue	USD \$	Output	
Total asset	USD \$	Input	Owner’s equities/ total assets
Total number of employees	Head count	Input	Total labor cost/employee
capital expenditure	USD \$	Input	Depreciation cost/capital expenditure

3.9.6 Data source and collection samples

In this study balanced panel data of three telecom operators in Africa; namely, ethio telecom, safari, videophone for the period 2007-2015. The sources of data is comprehensive annual report of ethio telecom, Kenya safari and Vodacom South Africa under sections of statement of financial position and profit and loss. These, institutions are selected based proximity on number of subscribers, commutative nature of the market, level of development and data availability to form relative efficiency set of comparison with ethio telecom.

The sample size in DEA is not determined in similar way as econometric due to its non-parametric nature. Also, type and number of inputs and DEA orientation are essential considerations to determine number of DMU’s. However, according to Shahooth, etal (2006), In order to insure sufficient degrees of freedom for a meaningful analysis. Thus, this analysis used three DMU’s as per recommendations made by Shahooth. Thus, the sample size of this research shall be limited to three.

CHAPTER FOUR

RESULTS AND DISCUSSION

4 Introduction

This chapter analyzes and discusses the impact of intervention economic policy on cost efficiency of ethio telecom using comparative cost efficiency analysis. The analysis is conducted using DEA cost efficacy — a Non-parametric linear programming model which is discussed under methodology section. Analytical framework is design in a way that is able to embrace and discuss issues in line with research objectives. Thus, result and discussion is structured in three parts. The prime sub section analyze and discuss DEA results of ethio telecoms relative cost efficiency in comparison to best performer DMU's using average and standard deviation. Second part provides decomposition analysis of cost efficiency to identify sources and respective magnitudes from where efficiency arouses. Moreover, the discussion triangulates results with the impact of intervention policy. The third part would identify and recommend alternative paths to enhance cost efficiency using Slack movement indicator. Similarly, result discussions of this part are also in line with implications of intervention economic policy.

Highlighting summary of procedures employed would be essential here to revitalize understandings of analysis and discussions. To measure intervention policy impacts on cost efficiency of target company; identifications of a population within which comparable companies are existed is done based on competitive nature of the market in which they operate and private ownership structure. Thus, it analyzes based on comparison between SMU's which are privately own and operate in a competitive market and a monopoly SOE.

In addition, number of subscribers are considered as a selection criteria to minimize impacts of scale efficiency (efficiency that arises from economies of scale) on cost efficiency. However, for the purpose of generalization of results and to limit the researcher involvement in data selection, randomized cluster sampling is employed as probability sampling technique as advised in positivist pregame (Chirkov,2015). Furthermore, cluster sampling is used to enhance sampling efficiency since sample sizes of DMU's are small as three though the size is recommended as sufficient enough for DEA analysis. (Shahooth, etal, 2006) Besides a population, which is

characterized by homogeneity with internally heterogeneous groupings also, forced the researcher to use cluster-sampling technique.

Then after comparisons are made with incumbent SOE (ethio telecom) which operates in a monopoly market. Furthermore, Number of DMU's are fixed to three based a minimum criteria as referred in Shahooth, etal (2006)

Consecutively, Data envelopment analysis (DEA) cost efficiency model will be deploy to measure the impact of intervention economic policy on cost efficiency of ethio telecom with reference to efficiency score of Vodacom and Sfaricom. Besides, sources of cost efficiency will be identify and measured using prices of all input variables. Finally, results will be interpreted and discussed in three sections as highlighted in the first paragraph.

Cost efficiency impact of intervention policy is measured using a linear programing software called DEA max 7.11. This has been chosen as it's advised by industry practitioner and scholars since it is only designed for DEA models. Moreover, it is user friendly and open source.

4.1 Cost Efficiency Analysis

This section of analysis shows what amount of minimum cost of input is possible to produce their respective level of output. This can be measured based on cost efficiency score (θ^*) which ranges from 0 to 1. The lower value shows less effect whereas values near to one shows higher cost efficiency. Thus, going forward efficiency score would be expressed in terms of distance from $\theta^*= 1$.

As highlighted on the previous chapter; $P1 = \text{owner's equities}/\text{total assets}$, $P2 = \text{total labor cost}/\text{employee}$, and $P3 = \text{depreciation cost}/\text{capital expenditure}$ be the input price of total assets, employee cost, and capital expenditure be the input variables, respectively. In the case of this research employment cost, total asset, capital expenditure are inputs used and operating revenue is consider as output of Ethio telecom, Vodacom and Sfaricom to measure the impact of government intervention policy on cost efficiency of ethio telecom.

Since the objective of this research is to understand how government policy of intervention impacted on ethio telecom cost efficiency as compared to similar privately owned DMU's which

operates in competitive market. The analysis and interpretation is constrained discussions on measuring impact with reference to best performer (cost efficient) DMU's frontier or benchmarks among Vodacom South Africa , Sfaricom Kenya and ethio telecom, Ethiopia's cost efficiency score. Also, in some case percentages can be used interchangeably with scores.

Looking at the cost efficiency score of Ethio telecom, Vodacom and Sfaricom in years between 2007 and 2015; ethio telecomm has scored a minimum cost efficiency score which is 0.2667(26%) in 2007 and a maximum 1.00 (100%) in 2011. The cost efficiency which ranges from 26% to 100% indicates that ethio telecom has operated at 74% cost inefficiency as compared to its benchmark performance in 2011. However with reference to a performance of relative DMU(Vodacom) in 2007, ethio telecom has incurred 60% higher cost of inputs related to employment, capital , asset are used to generate operating revenue of 372,065,346.70 USD as compared to a bench mark cost efficient performance of 86% achieved by Vodacom. Thus, considering similar input variables; the operator in South Africa which is owned privately and operates in a competitive market reduced cost of inputs by 86% whereas incumbent monopoly SOE (ethio telecom) has reduced cost of inputs only by 26% to generate respective level of operating revenue of each operator in 2007.

A lower score in cost efficiency is due higher costs on total asset, capital and higher number of employment which amounts 822.4, 62.1 and 27.7 million USD respectively. Thus, if ethio telecom would reduce costs on total asset and capital expenditure to 498.2, 40.2 million and number of employees by 4,586 cost efficiency could have been reach as high as 86% which is registered by Vodacom.

On contrary, in 2011 cost efficiency score of ethio telecom was $\theta^* = 1$; this implies, ethio telecom was as efficient as Vodacom. In terms of standard interpretation, it means, ethio telecom is used relatively minimum amount of inputs; as a result, minimum possible costs of inputs are incurred. However, this doesn't tell efficiency of ethio telecom in absolute terms. Moreover, the results in 2011 is not cost efficiency character which represent the entire cost efficiency performance; since ,efficiency score dispersion from the mean(standard deviation) is higher as high as 0.23 compared to Sfaricom's deviation of 0.13 and Vodacom's 0.05.

Furthermore, despite of fundamental theoretical arguments on the impact of government intervention on SOE; This analysis tests the theory through deductively designed research approach and using formulated research questions which intends to provide insight on the impact of intervention economic policy by comparing cost efficiency scores of DMU which are privately owned and operate in a commutative market with SOE which operates in a monopoly market structure.

Table 3 Cost efficiency scores based on DEA for telecom operators over the period from 2007 to 2015

<i>State owned Monopoly</i>		<i>Privately owned and operates in a competitive market stature</i>	
1.1	ethio telecom	Safari com	Vodacom
year	Efficiency score θ^*	Efficiency score θ^*	Efficiency score θ^*
2007	0.266703	0.474664	0.86646
2008	0.349018	0.779586	0.90764
2009	0.755881	0.81859	1
2010	0.716911	0.846887	0.927524
2011	1	0.79586	1
2012	0.708101	0.75801	0.871117
2013	0.559173	0.623171	1
2014	0.430496	0.593699	1
2015	0.78878	0.882704	0.898984
Average	0.619451444	0.730352333	0.941302778
SD	0.236210409	0.135828888	0.058547904

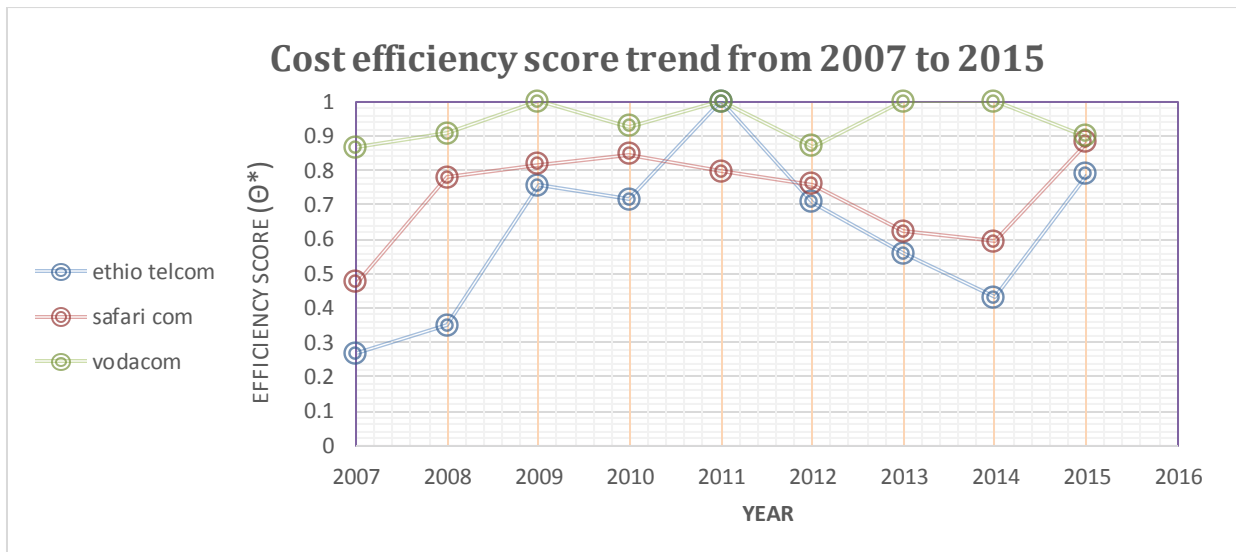
Source: Own computation using

As it's indicated in table 3 cost efficiency score between DMUs which are privately owned and operate in a competitive market has significant variation from ethio telecom — which is SOE and operates in a monopoly market. Average cost efficiency score of Sfaricom and Vodacom which is 0.7303 and 0.9413 are higher by 0.1109 and 0.3218 from ethio telecom's efficiency score of 0. 6194 respectively. This result tells us ethio telecoms performance in terms of cost is

inefficient by 11% and 32% as compared to Safari and Vodacom. In other word, ethio telecom is operating at 68% efficiency to generate average annual operating revenue of 704.9 million USD. Thus, considering Vodacom as a benchmark, ethio telecom costs related to employment, assets and capital expenditure can minimized by 32% if the company could have been operated as efficient as Vodacom.

Furthermore, figure 3 illustrates a yearly trend of efficiency scores of all DMU's to show the impact of government intervention by explaining cost efficiency score trends on yearly bases from 2007 to 2015. Moreover discussions are made to intertwine results with implications of intervention economic policy.

Figure 3 Cost efficiency Score trend from 2007 to 2015



Source: own computation

In general figure 3 shows company's which operates in competitive market are cost efficient than a monopoly SOE. As we look efficiency score trend over the years; ethio telecom has shown significant progress since 2007 and it has scored highest cost efficiency performance in 2011. However, compared to Vodacom and Sfaricom, which are owned privately and operates in a competitive market; ethio telecoms cost efficiency score trend line is at lower position. This implies, ethio telecom has performed less cost efficiently over the years between 2007 and 2015 expect at year 2011.

The reason why ethio telecom has registered a performance which fits to Vodacom is due to higher reduction on employees cost that aroused from restructuring (downsizing) program made by outsourced management team of France telecom. (Tekleberhan, 2011; Ethiopiantimes, 2011) Thus, the result depicts that cost efficiency of incumbent operator has improved due to taking measures which are similar to masseurs taken by privately owned companies which operate in a competitive market. Hence, we can generalize that, improvement in cost efficiency is a result of adopting characteristics of privately owned operates which operate in a competitive markets unlike to characteristics of monopoly state-owned enterprise (SOE).

The other story which the graph tells is vibration of trends over the years. As we look at ethio telecoms cost efficiency score trend in comparison to Vodacom and Sfaricom —which are owned privately and operates in a commutative market; oscillation or variations of ethio telecom cost efficiency line is higher. This implies that, ethio telecom doesn't only have lower efficiency score but also inconsistency in reducing cost of inputs. This may arise due to government interventions to fulfill non business objectives of SOE. Thus, a mix of objectives which arises from state ownership could induce inconsistency of performance in cost efficacy of SOE.

Therefore, based on research outputs and analysis highlighted above, we can generalize that telecom operators (Vodacom and Sfaricom) which are owned privately and operate in a competitive market are 32% and 11% cost efficient than Ethio telecom which is owned by the state and operates in a monopoly market. Moreover, based on efficiency score trends, incumbent sate owned monopoly has not only low cost efficiency score but also inconsistency in cost efficiency performance with reference to privately owned telecom operators in a comparative market.

4.2 Decomposition analysis of cost efficiency

This section is a breakdown version of analysis of the previous section. Analysis and interpretation of this section focuses on identifying sources in cost efficiency through decomposing Cost efficiency scores in to technical and allocative efficiency score to know from where efficiency or in efficiency comes from which is stated as a second research question. In due, discussions in this section triangulate outputs with characteristics of monopoly SOE to show the impact of government intervention policy on cost efficiency in the case of ethio telecom.

Cost efficiency is a composition of allocative and technical efficacy. Technical efficiency tells efficiency that comes from production capacity of inputs whereas, allocative efficiency tales us composition of inputs which can minimize cost of inputs at lower value. Thus cost efficiency can be generated from either of the two sources or both.

In line with interpretation on source of cost efficiency highlighted above, the following table shows decomposed scores of cost efficiency which are allocative, technical efficiency along with aggregate score of cost efficiency.

Table 4 Decomposed Cost efficiency scores (Allocative and technical) based on DEA for all DMU's over the period from 2007 to 2015

	<i>State owned Monopoly</i>			<i>Privately owned and operates in a competitive market stature</i>					
	<i>ethio telecom</i>			<i>safari com</i>			<i>Vodacom</i>		
	Relative efficacy score θ^*								
Year	TE(VRS)	AE	CE	TE (VRS)	AE	CE	TE (VRS)	AE	CE
2007	1	0.266703	0.266703	1	0.474664	0.474664	0.983637	0.880874	0.86646
2008	0.786817	0.44358218	0.349018	0.961436	0.810856	0.779586	1	0.90764	0.90764
2009	0.790507	0.956197731	0.755881	0.923498	0.886401	0.81859	1	1	1
2010	0.8697	0.82431988	0.716911	0.922594	0.917941	0.846887	0.927524	1	0.927524
2011	1	1	1	0.798272	0.996978	0.79586	1	1	1
2012	1	0.708101	0.708101	0.839542	0.902885	0.75801	0.952883	0.914191	0.871117
2013	0.906694	0.616716334	0.559173	0.792521	0.786315	0.623171	1	1	1
2014	0.72605	0.592928862	0.430496	0.689029	0.861646	0.593699	1	1	1
2015	1	0.78878	0.78878	0.597716	1.476795	0.882704	0.898984	1	0.898984
Average	0.897752	0.68859211	0.6194514	0.836068	0.901609	0.730352	0.97366978	0.966967	0.941303
SD	0.1095303	0.237109087	0.2362104	0.132047	0.261209	0.135829	0.0382512	0.050329	0.058548

Source: Own computation based on financial data sourced from each DMU

As we can see table 4 decomposed average cost efficiency scores of ethio telecom shows that allocative efficiency has contributed 0.68 whereas technical efficiency contributed 0.89 to achieve total cost efficiency score of 0.65 in a year b/n 2007 and 2015. This shows, cost inefficiency which arises from technical parts is only 11% whereas cost inefficiency that arises from allocative part amounts as high as 32%. Thus, we can generalize that manly cost

inefficiency of the incumbent monopolistic telecom operator is 32% sourced from allocative inefficiency.

Again the table 4 also depicts comparison of private telecom operators which functions in a competitive market economy has source of inefficiency which is opposite from inefficiency sources of ethio telecom on average. For instance, looking at Sfaricom; from 27% of cost inefficiency 17% is came from technical inefficiency where as 10% of cost inefficiency comes from allocative. This shows additional 7% of cost inefficiency arises from technical inefficiency as opposite to ethio telecom. Similarly, in Vodacom, cost inefficiency which arises from both TE and AE is almost at 3%. However, considering the average scores of sources of cost inefficiency of both Vodacom and Sfaricom, major sources of inefficiency arises from technical inefficiency.

This implies that cost inefficiency in a monopoly state owned telecom operator is sourced from allocative Inefficiency. This is mainly because of inefficient mix of inputs which are labor, capital expenditure and asset to produce a given level of output. As a result ethio telecom clients are required to pay additional 32% on previous price due to allocative inefficiency.

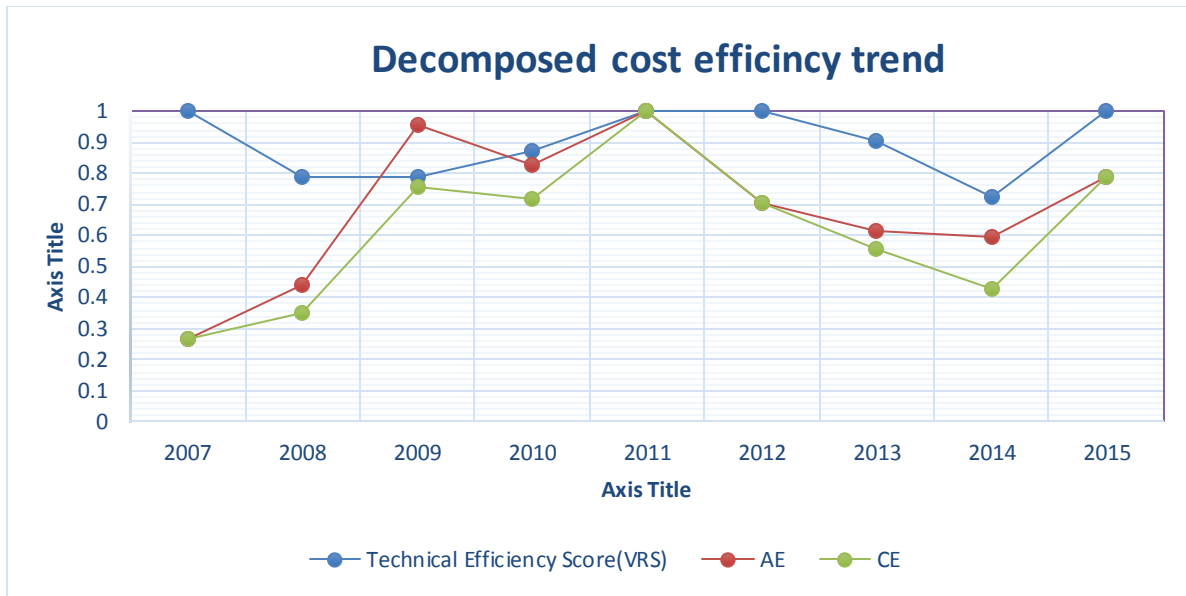
Results on allocative inefficiency of incumbent state owned telecom operator highlighted above strongly reinforce with monopoly economic theory. Specially, in a monopoly like ethio telecom where a monopoly market structure is cauterized by high demand due to lower access to telecom service; a monopoly could raise revenue by just increasing price since it doesn't have a capacity to produce additional outputs, a monopoly will not face price-output tradeoff— as conceptualized from the economic theory of protected monopoly. (Watkins, 2019) .

Furthermore, government ownership could have instigate strong intervention on SOE's operation which would result higher inefficiency in allocation of mix of inputs. This may arises due to multiple objective of SOE. In the case of ethio telecom; as indicated by the owner (government), FDRE's follows developmental state growth model which assume strong state intervention in a market for the purpose of development facilitation. Thus, SOE including telecom will constitute additional social and development objectives like — unemployment reduction and providing source for development finance. As a result of such intervention economic policy, the management of ethio telecoms didn't achieved efficient allocation of inputs mix.

4.2.1 Decomposed cost efficiency trend scores of allocative and technical efficiency

Cost efficiency decomposition trend constitutes allocative efficiency and technical efficiency along with the aggregate cost efficiency trend of ethio telecom. The purpose is to visualize and compare the trends of allocative and technical efficiency with reference to their contribution to aggregate cost efficiency.

Figure 4 Decomposed cost efficiency trend



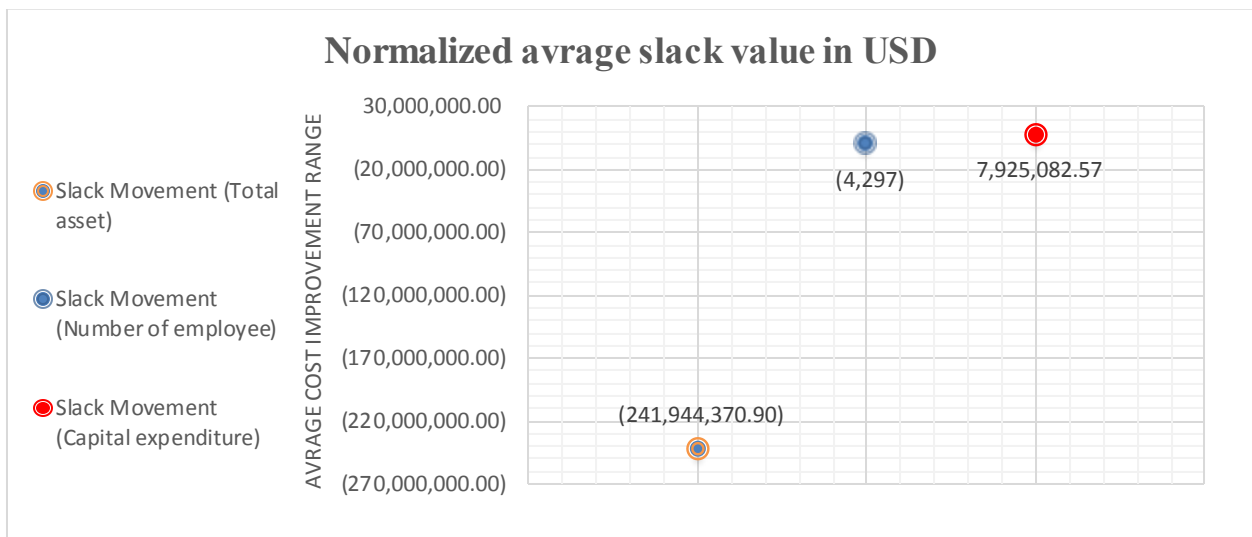
Source: Owen computation

As indicated in figure 4 technical efficiency has contributed higher than allocative efficiency since its efficiency score is near to one relative to allocative efficiency score. Also, as we look the trends, technical efficiency has less perturbation than allocative efficiency since table 4 depicts average standard deviation of technical efficiency is lower by over 50% compared to standard deviation of allocative efficiency which amounts 0.23. Thus, from the above figure we can generalize that technical efficiency has contributed higher value in a constant manner to cost efficiency of ethio telecom than allocative efficiency. In the other way we can conclude that allocative efficiency is unstable and major source of cost inefficiency as compared to technical efficacy.

4.3 Paths for Improvement using slack value indicator

Slack movement is the output of DEA cost efficiency model. It demonstrates, what type of cost arrangements should be instigate to improve inefficient DMU to reach to the level of efficient DMU. In other word, it shows a direction and magnitude that has to be instigated to make inefficient DMU as efficient as relatively efficient DMU. Thus, the following analysis intends to indicate direction and average magnitude of costs which ethio telecom should alter to operate cost efficiently as benchmark DMU. Apart from that, slack movement trends of employment, total asset and capital expenditure are present in this section of analysis.

Figure 5 normalized average slack value in USD



Source: Owen computation

Figure 5 highlighted above shows by how much ethio telecom has to reduce or increase inputs to operate cost efficiently as a benchmark DMU (Vodacom). In line with this interpretation; on average ethio telecom has to reduce capital expenditure by 241.9 million USD and employee number by 4,297 whereas total asset has to be increased by 7.9 million USD.

In other word, ethio telecom can be 94% cost efficient as Vodacom dose if it can reduce cost of inputs by 32% through reducing capital expenditure by 241.9 million USD, employee number by 4,297 and increase total assets by 7.9 million USD.

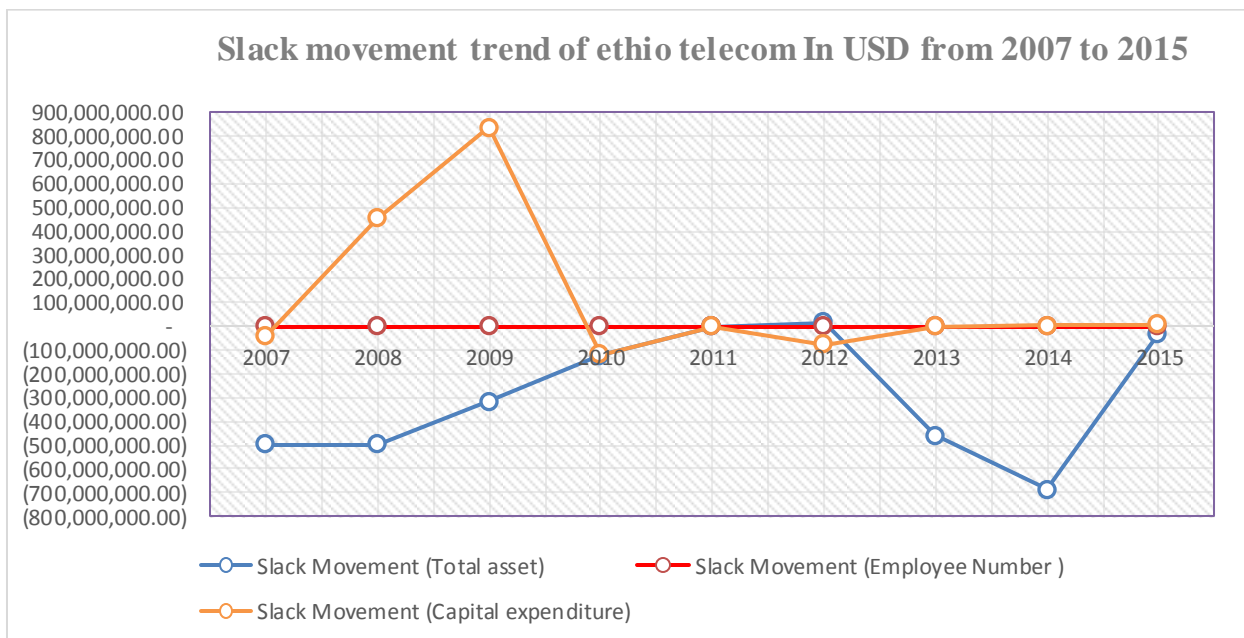
The DEA Slack results which indicates improvement paths, recommended improvement measures which has similar characteristics with private operator in a competitive market. For instance, if we take recommendation of Slack values on employment reduction. It implies efficiency can be improved by

hiring fewer and more efficient employees as opposed to SOE which has a non-business objective of reducing unemployment — due to, mixed interest of the owner (government).

In addition, Slack value indications to reduce capital expenditure may arise from inefficiency that emanates from idleness, depression and underutilization of capital items. Moreover, Slack values also indicated ethio telecom to increase total assets other than capital expenditure since slack results show 241.9 million USD decrement to enhance cost efficiency. Thus, by implication the largest asset value other than capital expenditure is intangible assets which are highly related to operating performance.

In general, assets that have direct impact on operating performance are recommended to be increased whereas inputs that are underutilized are recommended to be decreased. Theoretically, underutilization and low operating performance are characteristics exhibited in a monopoly state owned enterprise. Ref Thus, slack value results indicate improvement in cost efficiency of ethio telecom can be generated through adopting comparative market characteristics.

Figure 6 Slack movement trend of ethio telecom In USD from 2007 to 2015



Source: Owen computation

Figure 6 shows a trend of cost remedial action that makes ethio telecom input costs as efficient as Vodacom. Slack movement in total asset has recommended to increase until 2011. Whereas, capital expenditure and employment number is recommended to reduce until the same year. However in a year 2011 slack value movement indicators didn't recommend any value to

increases or decrease from the actual performance of 2011 due to relative efficiency score of one ($\theta^*=1$).

Conversely, afterwards 2011 all inputs were recommended for alteration. Especially total asset was recommended to be reduced by highest value of inputs in a year between 2012 and 2013, which amounts 358 million USD. Moreover, after 2012 its trend is unstable unlike to employee number and capital expenditure. This indicates inputs related to employment and capital expenditure were used relatively on efficient manner.

In general, efficiency analysis depicts that ethio telecom is in efficient by 32% as compared to a benchmark operator —Vodacom. Also, source of inefficiency is aroused from allocative inefficiency as compared to technical efficiency since cost in efficiency which arises from technical inefficiency is only 11% whereas cost inefficiency that arises from allocative in efficiency amounts as high as 32%. Finally, slack movements has recommended input adjustment to reduce capital expenditure by 241.9 million USD and employee number by 4,297 whereas to be increase total asset by 7.9 million USD on average to attain 94% cost efficiency realized by Vodacom — which a bench mark operator. Moreover, based on discussions made through triangulating sources of cost inefficiency and impacts of government intervention which are characterized by monopoly and state ownership elements are causes for cost inefficiency which has implications on government intervention.

CHAPTER FIVE

CONCLUSION AND RECOMENADATION

5.1 Conclusion

Governments employs various political economies aiming sustainable economic development. Among many theories, this literature would only be constrained to discuss Mercantilism, liberal political economy and Marxism/socialism entangled with their views on government role in the economic sphere. However, special emphasis is given to investigate the impact of FDRE's intervention economic policy on cost efficiency of SOE enterprises in the case of ethio telecom.

A reason which strike the researcher to investigate the impact of intervention economic policy on ethio telecom's cost efficiency is due to a massive privatization program announced by Executive Committee of EPRDF in its regular meeting on June 5, 2018 GC. Such, privatization programs has resulted good and bad out come in different countries. Thus, this research intended to investigate argument objectively from cost efficiency vantage point in a case of ethio telecom. Moreover, it also identifies sources of cost efficiency in addition to indicating alternative paths of cost efficiency improvement for ethio telecom. Therefore, this pare can be considered as a policy evaluation paper as a result of intervention economic policy evaluation.

To attain objectives mentioned above the researcher collected data from two telecom operators (Vodacom and Sfaricom) using cluster random sampling. A panel data is compiled, after data are gathered from ethio telecom, Sfaricom and Vodacom statement of profit and loss and statement of financial position sections of financial statement for the years b/n 2007 and 2015 GC. Then, type two cost DEA which constitute varieties of characteristics such as input oriented and VRS is employed using DEA Max 7.11. Moreover, to assert objectivity of the research ontological research paradigm and positivist research philosophy is used.

Outputs of the research indicates that ethio telecom- which operates in a monopoly resulted an average efficiency score of 0.61 which indicates 32% cost inefficiency as compared to Vodacom's benchmark cost efficiency score of 0.94. Besides sores of cost in efficiency is identified by decomposing cost inefficiency in to technical and locative inefficiency. In this regard, source of inefficiency of ethio telecom is aroused from allocate inefficiency as compared

to technical inefficiency since cost inefficiency which arises from technical efficiency is only 11% whereas allocative inefficiency amounts as high as 32%.

Finally, alternative paths for improvement is recommended using slack values. In this regard, slack movements has recommended input adjustment that reduce capital expenditure by 241.9 million USD and employee number by 4,297 whereas total asset are recommended to increase by 7.9 million USD on average to attain 94% cost efficiency realized by Vodacom which a benchmark operator.

5.2 Recommendation

Based on research findings, this study plots out one important policy recommendations. As indicated in results, intervention economic policy has negative impact on cost efficiency of ethio telecom. Since ethio telecom is cost inefficient as compared to telecom operates which are owned privately function in a competitive market. Manly as compared to benchmark DMU (Vodacom). Thus, recommendation would be to change a market structure from protected monopoly to comparative market structure to promote cost efficiency of ethio telecom.

Thus, as per policy evaluation of the researcher, privatization decisions made at June 5, 2018 by EPRDF's is a half better step since the decision has only fulfil necessary conditions but not sufficient in terms realizing improvements in cost efficiency of incumbent monopoly telecom operator. In other word, ethio telecom to realize the level of efficiencies achieved by Vodacom and Sfaricom the government doesn't only has to privatize but also transcend the market from monopoly structure to competitive market structure. Moreover, allocative inefficiency can be improved by minimizing government intervention in telecom sector and promotion both privatization and competitiveness in a market.

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