

Economic Benefit and Effect of Addis Ababa Light Rail Transit on Private Business Firms

A case area study from Ayat station to Stadium station

Authors

Yigzaw Negrew

YOM Institute of Economic Development and Debre Markos University collaborative post graduate program in the department of Project Planning and Management, Addis Ababa Ethiopia. *Cell phone: +251 924 306876, Email: yigzet@gmail.com*

Dawit Wubishet (PHD)

Dawit Woubishet (PHD), Environment and Climate Research Center (ECRC), Ethiopian Development Research Institute (EDRI).

Cell phone: +251911603699 Email: dawitwubishet@yahoo.com

Tsegaye Ginbo

Tsegaye Ginbo, Environment and Climate Research Center (ECRC), Ethiopian Development Research Institute (EDRI).

Cell phone: +251910695336 Email: tsegaye2g@yahoo.com

Highlights

- The study explores the possible effects and benefits of the LRT on the private business firms' overall activity by making comparative analysis of the three periods, pre-implementation, implementation and post implementation of the project.
- The project has significant effect on the private business firms' profitability performance through their revenue performance over the three periods and other factors depending on the periods.
- Overall findings implies that the project adversely affected the firms' activity during implementation period and after the implementation, the firms feel that the business environment became less attractive as compared to the pre-implementation period.
- It is advisable that while implementing such bigger and multi-facial project, firms' interest should be considered in the design as well as output and also the factors that affect population mobility should be minimized as low as possible.

Abstract

Carbon free and alternative transport infrastructure is crucial to address the growing challenges pertaining to rapid urbanization including traffic congestion and mitigate climate change. In this regards, the government of Ethiopia - city of Addis Ababa are striving to address the pressing transport problems and growing challenges by introducing LRT along major lines of the city. Hence, it is important to evaluate the impact of intervention on economic performance of private business firms' along the lines. And this study investigates the effects of the project on private business firms' profitability performance by comparative analysis of the period of pre, during and post implementation of the project through random selection of stations. All private business firms located within the area of 0.04 km² around the stations are considered in the study sample frame. The result indicated that the business activity of firms was affected during the implementation of the LRT project due to the blockage of roads which impeded the accessibility of business to their customers. Accordingly, the revenue performance's positive effect to the business firms' profitability performance has decreased by more than 8% as compared to pre-LRT implementation period. Moreover, performance of business is also affected by their distance to LRT stations which are crossing points from one side of road to other. Specifically, being located outside 100meters from the stations or crossing points, the mean of profitability performance has reduced from -8.89% to -15.24%. This implies accessibility is more important for private business firms. Therefore, designing such investments on transport infrastructure should be in such a way that lower negative impacts and ensure benefits for alongside private businesses while improving the transportation system.

Introduction

In highly complex and cost-minimizing system to link goods and service from producers to customers and for human as well as resource mobilization, transportation is the key sector of an economy [1]. Transport for a Global Economy (TGE) forum also identified that transport is an indispensable part of today's economic activity [2]. This developed network of transport makes possible the existence of cities and trade occurrences [3]. Now days, it is considered as a means to alleviate poverty in the cities which is a major problem in developing countries, particularly in Africa [4].

Being in the same hemisphere of the African countries, economic growth as well as improvement of per capita income are consistent with the major plan of Ethiopia, the Growth and Transformational Plan (GTP) [5]. The focal point for this plan is to achieve middle-income status by 2025 in a climate-resilient green economy; by considering transport sector as one of fundamental pillar of the economy [6].

One of this transformation plan is, the introduction and expansion of modern transport system to urban areas specifically in the capital city - Addis Ababa. And the Light Rail Transit (LRT) has got the first priority than Bus Rapid Transit (BRT) by the federal and city administration for the cities mass transit[7]. This project's first phase has been implemented East-West and North-South axis of the city. These lines which meet around Addis Ababa stadium run from Hayat to Torhailoch and from Minilik II square to Kaliti so as to modernize the existing transportation system, supports the traffic flow and economic activity of these major routes of the city [5].

The existing transportation system was characterized by poor access of the transport service and other facilities, increasing trend of transport price, lack of smooth traffic flow, high rate of traffic accidents and increasing air and noise pollution [8]. Moreover, the public transport (bus, minibus and taxi) covers 46% or 3.56 million trips, private modes hold 9% or 0.7 million trips. The remaining 45% trips are walking which slows down the economic activity and limit mobility [9]. And being the diplomatic capital of Africa and the hub of the Ethiopian economy coupled with the above transportation hindrances are also the main reasons of the mass transit LRT implementation in Addis Ababa [10].

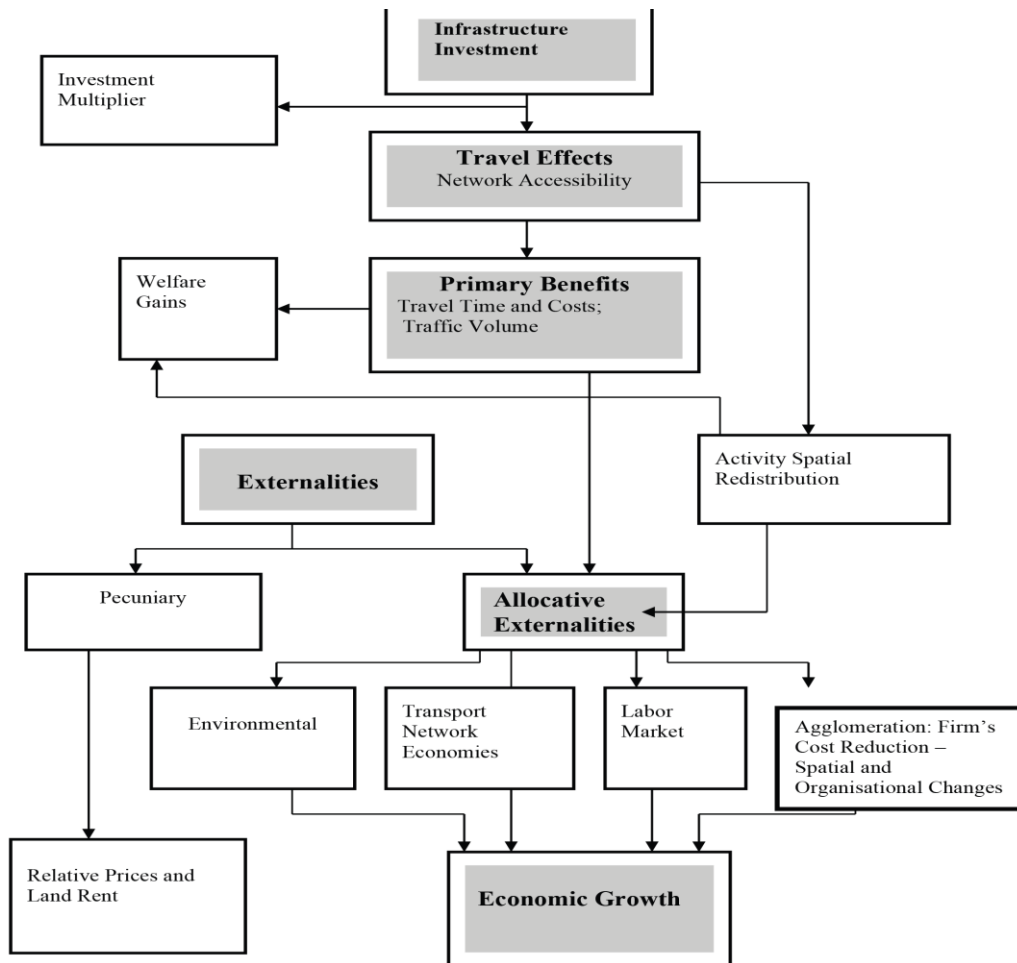
However, during the implementation of this project almost all the existing transport infrastructures would be re-constructed. This the whole transportation change, caused major traffic congestion and disruption in some areas, resulting in considerable losses to businesses

profit; in addition it has affected the mobility of the people and access to business firms along the LRT lines [11].

It is argued that transportation system changes which may affect routine business activity will result in business owner's customer loss and customer who finds alternative businesses during the construction period may not necessarily return once construction is completed [12]. On the other hand transit investments, particularly rail, triggers economic revitalization in central cities and brings positive effect on business activity around the station [13], enhance land and property value [14]. But, in our country being new for such transit line, research related to the LRT effect and its benefit to the private business sector has not yet conducted. Therefore, this study tries to examine the economic benefits and effect of this LRT on private business sector in terms of the firms' activity, profitability performance, working environment and future prospects of the firms'. And the variables of profitability are assumed to be different from zero to affect the firms' profitability performance in the study periods.

The Model

The study has focused on the effect of the transport investment on the private business firms by using model derived from (13) and (17). Transport modal integration opportunities and benefits, the business case would help identify market demands, industry trends, economic viability, potential private partnership opportunities, and an implementation plan. It would provide an objective and comprehensive view of the issue; ultimately, offering the city and the stakeholders a better indication of the intermodal needs (9) Inter-firm externalities can result from better accessibility to local public goods, from the use of shared input factors, from technology and information spillovers, or from access to a wider trained labor market. The components represent labor market imperfections, as they both affect the supply of labor and the participation levels. Improved levels of rail accessibility at the urban level will have an impact on the numbers of people entering the labor market and whether they are prepared to work longer hours. (10)



Framework specifying the linkages between transportation investments and economic impacts [8]

Various business location theories address the different industry types. Many economic activities, such as retail sales and services, depend on access to consumers, while others do not. Central place theory described that a distribution of market centers based on consumer range (the distance that consumers are willing to travel for a certain type of good), while meeting a business's market threshold (the minimum sales volume or customer base required to meet profit goals). When transportation costs fall, central place theory predicts larger and more dispersed market centers as workers and consumers are willing to travel greater distances to access jobs and goods. As a result, in many cities, developments near freeway interchanges have become secondary market centers to central business districts. Likewise, when transportation costs rise, the theory predicts smaller and more concentrated market centers [10].

Supporting the above theories, research on pedestrian safety and movement, accessibility research tends to focus on measuring current levels, not on predicting effects of transportation projects [12].

According to Rodrigue (2009) cited by [13], at constant accessibility/distance, urban density is the determining factor that affects the availability of social opportunities (access to services and goods, employment and social interactions) and economic opportunities (access to customers and suppliers). Accessibility is a function of qualities of transport system (walking distance, travel time) and it is an important indicator of how well public transport and the built environment are integrated to each other (Bertolini et al, 2005) cited by [13]. Many businesses prefer to locate near rail stations to improve access for employees and customers; some employers say that employees who commute by rail are more [14].

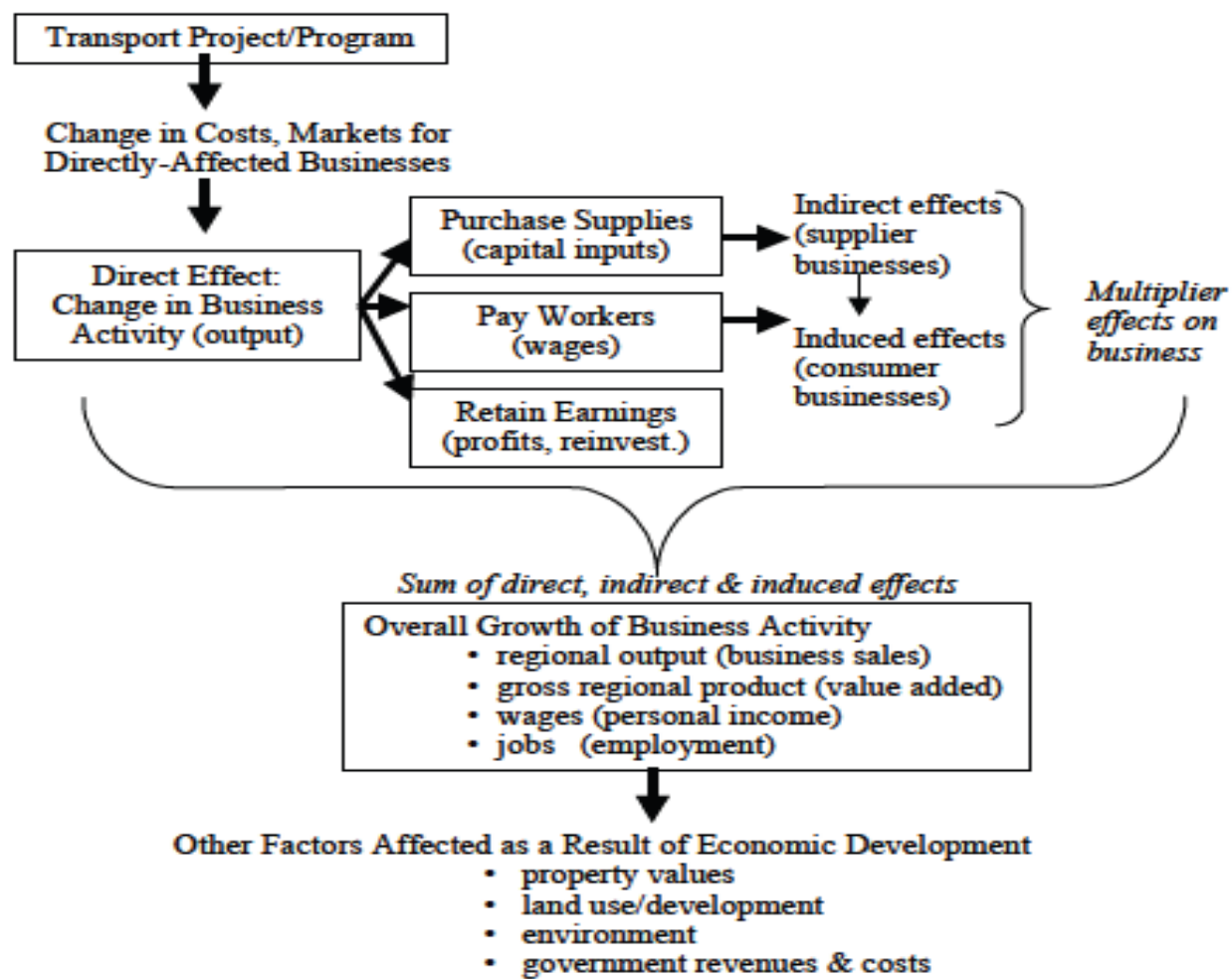


Figure 2.3 A Flowchart Identifying the Economic Impacts Due to Transportation Investments [17]

On the other hand, households and businesses served by the new transportation infrastructure should experience a rise in their land value [15]. A traditional approach to assessing the impact of rail transit investments on land use is to examine how property values vary with distance to a station. Because highways exist as a component of a larger network, their impacts on land value are not as directly measurable as those of rail transit [16].

Moreover, the transportation projects directly affect businesses then the business activities. This change in business firms will bring indirect and induced effects which result multiplier effect on business.

Cities with significant rail systems have a slower rate of per capita congestion growth than cities with small rail or no rail. Traffic volume and congestion are non-linear. On highways, traffic can maintain high speeds over a broad range of traffic densities. However, when densities reach and exceed design levels, speeds drop suddenly. Therefore, it is possible for relatively small reductions in traffic volumes to generate large improvements in speed. Supporting arguments increases in rail trip reduce congestion costs while increases in bus distance increase congestion costs. When major rail systems fail, the congestion level on highways and arterials increases [18]. Combining the two models the study has defined its own model as follows on fig 2.4. The transport project investment cause major changes on the business performance through supplier effect, consumer and labor market. These icons affect the business firm day to day activity or revenue which is ultimately affects the profitability. In addition the cost advantage and convenience of the transportation will have direct and indirect impact on the profitability.

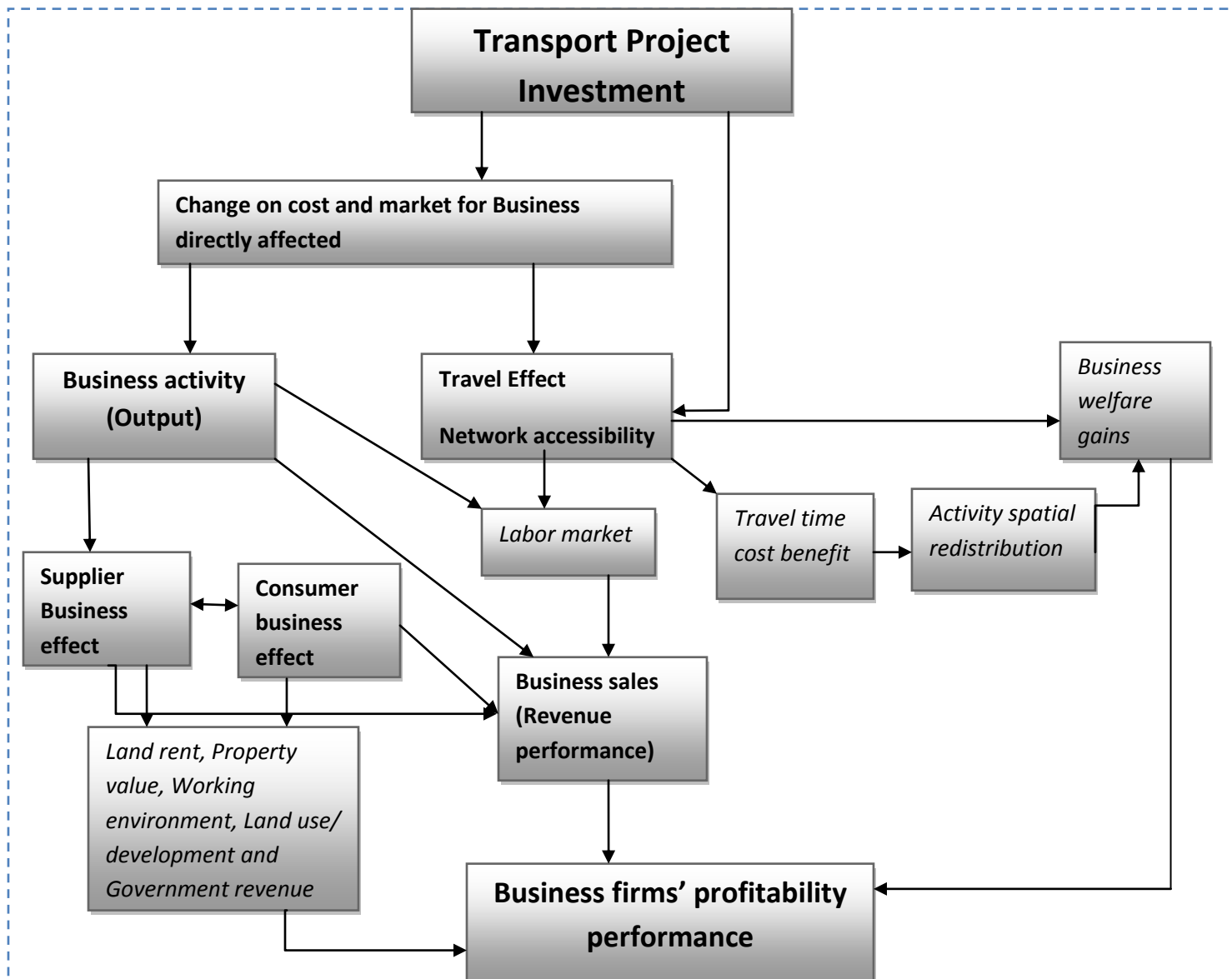


Fig 2.4 the derived study model

Here the economic benefit means any benefit that minimizes the cost and increase business profitability/maximizes the revenue of the business. And also effect means any influence to impact that the intervention brought. The LRT is the intervention which was started the construction in 2012 and being operational in 2015. In this study context the private business sector means that profit oriented privately owned (Sole proprietorships, partnerships, share companies or may be corporations) which are legally established to manufacture, rendering service, distributing and retailing goods. These are the study's population.

Due to the absence of compiled data from wereda's and sub cities about the number of business firms and the difficulty to cover through business survey the whole businesses along the LRT line. A case study area selection and creating geographic clusters were the first steps of sampling. And the random selection identified the east-west line from Ayat to Stadium stations as the study area.

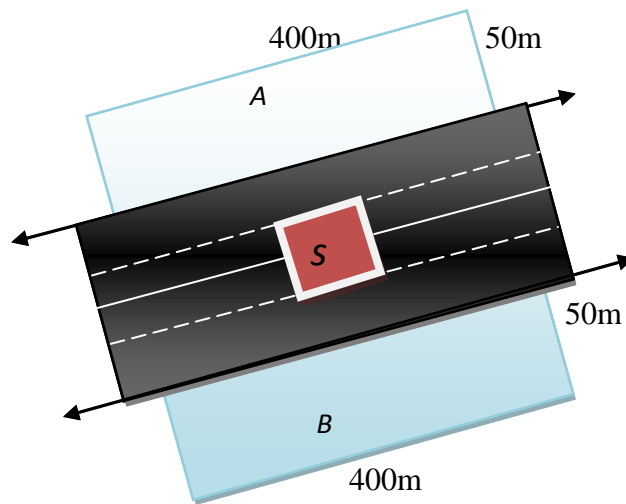


Figure 2.5 cluster area demonstration

As the figure shows, the area A and B are business firms' area while the central part (black color) represents the LRT Line and S indicates a LRT station. Thus, to the right and left side of the line, the cluster will have 400m length and 50m width. This is because, when we go far inside or more than 50m of the LRT line, mostly business firms availability probability will decline and difficult to identify the business firms from the residents. Based on the above demonstration, all the sixteen stations are designed with the help of Geographic Information System (GIS). To estimate the total population of the clusters survey has been conducted [9].

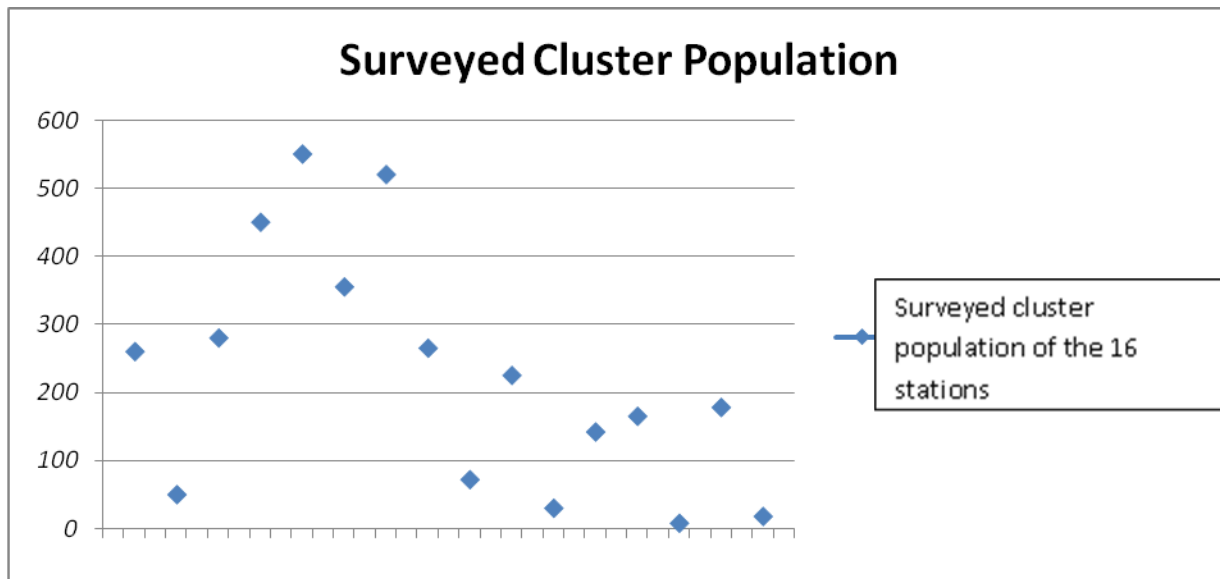


Figure 2.6 Sample distribution

The first category is from 0 to 200, the second category from 200 to 400 populations and the third is from 400 to 600 populations. Thus one cluster selected randomly from each category. Accordingly, Hyahulet 1 station, Lem Hotel and Gurd shola 2 are the randomly selected clusters with the total population of 947. A minimum of 10% population are the sample of the study.

The study is based on primary data collected through questionnaire. The questionnaires consisted mostly of closed-ended questions and few open-ended questions. In the open-ended questions, the subjects were required to respond in writing, whereas closed-ended questions had options which were determined by the researcher Burns & Grove 1993 as cited by [9]. The questionnaires were presented in both English and Amharic respondents to use their convenient language.

After the data have been collected, it was organized and analyzed by using STATA for statistical analysis and descriptive analysis for comparative analysis of the three periods in the form of charts and graphs.

Model Specification

[17] States that private businesses' goal is to maximize profit. Profit is defined as the difference between total revenue (TR) and total cost (TC). Profit is maximized when the total revenue increase that is generated by the business or its expenditure of fixed and variable costs are minimized.

$$TR(x) = P*Q \dots\dots\dots(1)$$

Where P is price of goods and service that the firm sells and Q is the quantity of goods and service which are sold to customer at price "P".

$$TC(x) = TFC + TVC \dots\dots\dots(2)$$

Where TFC is the total fixed cost of the firm and TVC is the total variable costs that the firm used to produce the goods and service.

On the other hand, [1] stated that the other external variables also determine the profitability of the firm. Similarly, [19] agreed that like location of the firm, experience of the firm, number of employees, customers visit rate and land and property value of the firm, [19].

$Y = f(\text{location, age, number of employees, customers visit rate, Land and property value})$, where Y is profitability(3).

Therefore, in sum $P = f(TR, TC, \text{Other variables}) \dots\dots\dots 1+2+3$

To construct the linear regression equation, let, the variables in the three clauses X_i , and the profitability is denoted by Y. Then the regression question given as follows.

$$Y = \alpha + \beta_i X_i + \epsilon ;$$

Where Y is profitability of the firm, α is a constant term for the equation, β_i is the vector of parameters to be estimated for X_i which represent the variables and ϵ is the error term of the model.

Dependent Variable	Independent variable
Profitability performance out of 100%	Revenue performance out of 100%
	Variable costs where D=1 if there is increase in the cost while D = 0, otherwise.
	Office ownership where D = 1, if the building/office is rented and D = 0 it is owned by the firm
	Location of the business where D = 1 is if the firm is located outside 100meter of crossing points, otherwise D = 0
	Number of Employees
	Experience of the business in year
	Daily average customer visit

Table 1.1 Dependent and independent variables

RESULTS AND DISCUSSION

The samples response rate is not more than 75% at a given time. But, with time flexibility the response rate is tested to more than 85%. Therefore, the questionnaire distribution was 120% of the samples in order to capture the minimum 10% of the population. Fortunately, 97 questionnaires have been collected with full response which is two samples more from the 10% of the total population of the sample clusters.

The major means of revenue making is during the customers are visiting the firms. Therefore, it is very significant for the firms if there is anything that affects their customers' access. Accordingly, the firms replied differently in the three periods about their customers due to the change of transportation infrastructure. See the graph below.

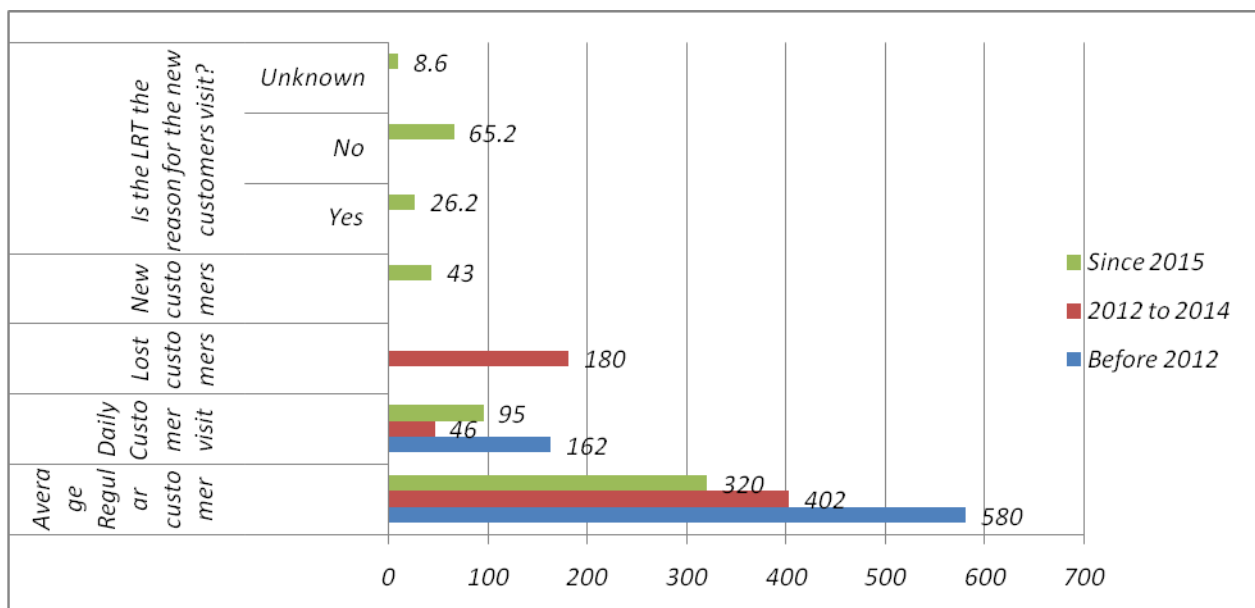


Figure 1.2 Firms' response on their customer profile

Before the project implementation, the average regular customers of each firm was around 580. But, it has declined on average to 402 and 320 in the period of implementation and after implementation, respectively. And when we see the daily visit of the customers, it has fallen sharply in the implementation period and being slowly recovered the implementation period. On the other hand, each firms on average lost around 180 customers during the implementation of the LRT while after the implementation of the LRT each firms are having on average 43 new

customers. Never the less, only 26.2% of the firms agree the LRT is the reason of the new customers coming. Majority of the firms around 65.2% of the total disagree about the LRT to be the reason of the new customers.

Alike to the firms' customer status during the three periods, the revenue has shown up and down level. During the implementation of the LRT, majority of the firm registered low revenue and very few of them have higher revenue than the other periods. And the firms responded that the revenue has fallen on average by 40.85% during the implementation while after the implementation, it has risen on average by 25.87%. It has been depicted in detail in the bar graph below.

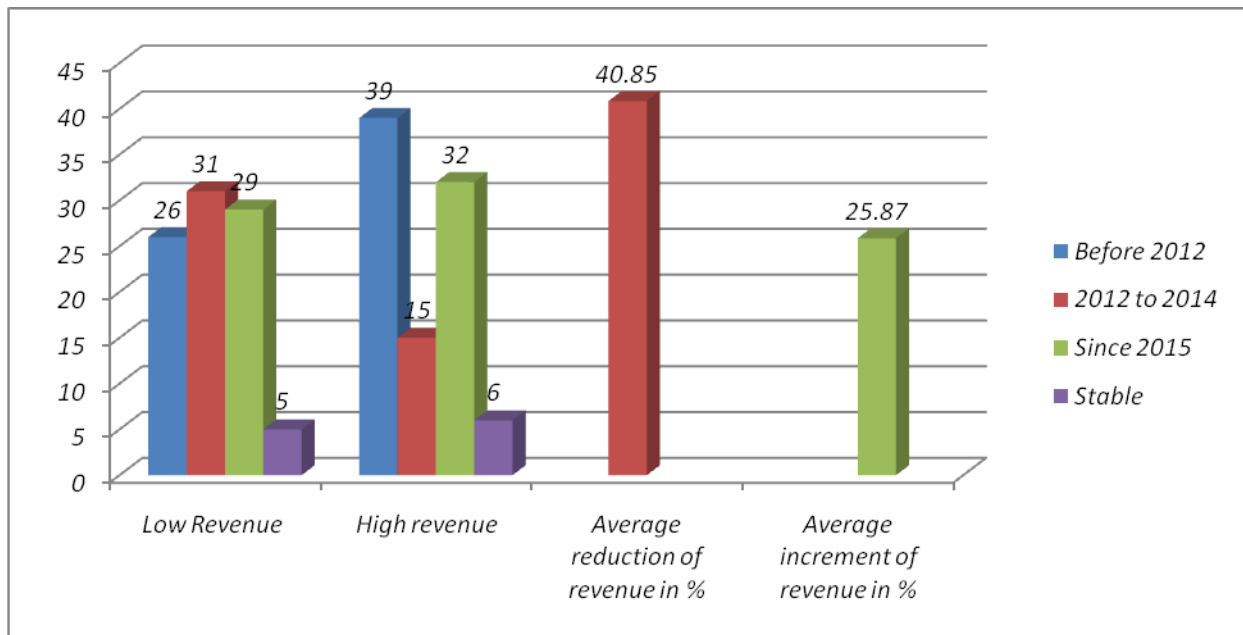


Figure 1.3 Firms response on their revenue performance

More over the profitability trend of firms shows that there was better performance before implementation and the declined performance in the period of implementation, doesn't get much better after the implementation of the LRT. This implies that the revenue decline agrees with the statement of [12] and the after the implementation, the rise of the business firms' revenue may coincide with [13].

The working environment is considered as one element for the firms during their business activity and majority of the firms indicated that in the period of implementation it was less convenient and more of inconvenient. Still after the implementation of the LRT, 51 firms argued that it is inconvenient for their activity. And regarding the traffic flow of the line, 71 of the samples agreed that it is getting improved than the other periods. In contrast during the implementation of the project, it was worse for the line.

On the other hand, the parking space problem was very acute during the implementation period but it was better before the implementation than the other periods. Similarly, the line convenience for pedestrians was better before the implementation of the project. And also the movement of vehicles and pedestrians from one side to the other side of the line was more conducive before the implementation of the LRT. More than 80% of the total firms agreed that it is getting worse after the implementation. Majority of the sample firms agreed that the environment became inconvenient due to the LRT implementation period. On the other hand, most firms confirmed that the LRT implementation was major reason to create more congestion on the traffic flow but after the implementation, it is not a reason for better traffic flow. In contrary to this statement, the parking space and pedestrians facility relatively getting better after implementation due to the LRT.

The model has eight variables including the dependent variable as explained in model specification section. The data of these variables were collected from 97 business firms three periods; pre-implementation, implementation and post-implementation. The regression has also been conducted for each period so that changes and effects can be traced.

Pre-implementation period

Parameter Estimates

Profitability performance	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Variable cost	7.464131	4.609551	1.62	0.109	-1.693546	16.62181
Location	-8.437835	5.102229	-1.65	0.102	-18.5743	1.698633
Office ownership	8.650509	4.986655	1.73	0.086	-1.256352	18.55737

Business Experience		.6935815	.45219556	1.33	0.187	.3433744	1.730537
Revenue performance		.5214236	.0697585	7.47	0.000	.382836	.6600111
Employee no		.2318113	.2586806	0.90	0.373	-.2821027	.7457254
Daily customer visit		.016223	.0218152	0.74	0.459	-.0271168	.0595628

Source: Stata regression result 2016.

Table 1.2 Parameters estimate during pre-implementation

This suggested that variable cost has positive effect on the dependent. But, statistically it is not different from zero

The other dummy variable location parameter indicated that when the firm is located outside 100 meter of crossing point or LRT station, the mean value of the performance would be -8.43 on average assuming other factors constant. Unlike the variable cost, this variable had inverse relationship on the performance. The coefficient of office ownership variable where coded as 1 for rent ownership found that it had positive relation to the firms performance and the coefficient indicated that the mean value of the performance approximately 8.65 when the ownership is by rent holding other thing constant. And also it was statistically significant in explaining the mean value the performance at 10% confidence interval.

When we look in to the continuous variables, business experience, revenue performance, daily customer visit rate and employee number had positive effect on the dependent. Among these variables only revenue performance was found to be statistically significant with the t-value of 7.47. This means that the revenue performance resulted approximately 0.46% increase on the profitability performance when it has increased by 1% and this is in line to the principles of [13]

The regression for the 97 observations and 7 independent variables resulted the value of f-calculated 75.51. And the probability of getting this calculated value is zero. This implies that the model overall is statistically significant in explaining the profitability performance. The R-squared also indicated that the explanatory variables explained the dependent more than 85%. The adjusted R-squared also was not far from the simple R-squared which was 84%.

Implementation period

During this period the observation, the variables type and number were identical only the collected cross-sectional data was different. Thus, regression undertaken without constant term to avoid dummy trap. Accordingly, when the data regressed the following result was found.

The sum of square out of the total summation 309524 variation; the model comprises around 69587.0147 variations. This indicates that most variation of the data captured by the data and when the mean square which was adjusted by the respective degree of freedom held the same. Even if the model ability to capture from the total variation has reduced to some extent. On the other way the unexplained variation sum of square has increased. This may imply that during this period, the firms' profitability performance was affected by other additional variables different from the previous period. This is may be due to system change by the infrastructure construction.

Parameter Estimates

Profitability performance	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Variable cost	2.611169	4.733323	0.55	0.583	-6.792404	12.01474
Location	-15.16018	5.177572	-2.93	0.004	-25.44633	-4.874028
Office ownership	8.124161	4.568449	1.78	0.079	-.9518598	17.20018
Business experience	.6989389	.4222567	1.66	0.101	-.1399476	1.537826
Revenue performance	.3924995	.0979863	4.01	0.000	.1978327	.5871664
Employee no	.2257684	.2377598	0.95	0.345	-.2465829	.6981197
Daily customer visit	.0600941	.0257341	2.34	0.022	.0089689	.1112193

Source: Stata regression result 2016.

Table 1.3 Parameters estimate during implementation

In this implementation period, the model has showed a change from the previous period in explaining the firms' profitability performance. The first change was the coefficient and significance levels were increased in absolute value. A firm's location being outside 100 meter, the mean value of the profitability performance was -15.16% holding other variables constant. This value increase has increased by more than 6% in absolute term. And the p-value became almost zero. That means during the construction location was more important.

On the other hand, the revenue performance had indicated a little bit reduction in coefficient magnitude and t-value. During in the pre-implementation period, the parameter coefficient was around 0.52 and t-value around 7.47 while the implementation period it has been around 0.39 and t-value 4.01. This could be said that the revenue had not as powerful as the pre-implementation period. The different variable that was significant in this period was daily customer visit and location. A customer visit increase on the daily visit would increase the profitability performance approximately by 0.06% being other variables constant. And the p-value of the variable is 0.022 which showed it was statistically significant. This might suggest that relatively the customer visit was more important and more effective to make the revenue so that profit. Because, a customer who visited a firm while crossing the infrastructure inconvenience will be more probable to be involved in the transaction than a customer who visit a firm via relatively convenient infrastructure. Office ownership was also statistically significant in this period at 10% significant level.

The regression for the 97 observation and 7 independent variables resulted the value of f-calculated 20.13. And the probability of getting this calculated value is zero. This implies that the model overall is statistically significant in explaining the profitability performance. The R-squared also indicated that the explanatory variables explained the dependent more than 61%. The adjusted R-squared also was not far from the simple R-squared which was more than 58%. Thus, we can say that the overall model significance and fitness in implementation period was good with significant variables of location, office ownership at 10%, revenue performance and daily customer visit. But, the model ability to capture the variation of the dependent variable was declined by more than 20% which suggest us during this period the profitability performance was affected by other variables additionally to the pre-implementation period.

Post-implementation period

During this period the observation, the variables type and number were also identical only the collected cross-sectional data was different. Thus regression undertaken without constant term to avoid dummy trap. Accordingly, when the data regressed the following result was found.

Parameter Estimates

Profitability performance	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Variable cost	10.38874	4.59042	2.26	0.026	1.269073	19.50842
Location	-6.724785	5.076064	-1.32	0.215	-16.80927	3.359701
Office ownership	8.147777	4.957778	1.64	0.104	-1.701732	17.99729
Business experience	.6896257	.4503685	1.53	0.129	-.2051099	1.584361
Revenue performance	.3875869	.0746577	5.19	0.000	.2392664	.5359074
Employee no	.1442001	.1698719	0.85	0.398	-.19328	.4816803
Daily customer visit	-.0074066	.0278695	-0.27	0.791	-.0627743	.047961

Source: Stata regression result 2016.

Table 1.4 Parameters estimate during post-implementation

In this post- implementation period, the model has showed some changes from the previous periods in explaining the firms' profitability performance. The first change was the statistical insignificance of firm's location being outside 100 meter and office ownership. And the second change also the daily customer visit became insignificant and even the sign of the coefficient changed to inverse relationship. The final difference from the previous period was the variable cost significance. It indicated that when the variable cost of the firm is being increased, the mean value of the profitability performance could be approximately 10.38%, being other variables are constant. And p-value was around 0.026 that implies the variable was statistically significant.

The regression for the 97 observation and 7 independent variables resulted the value of f-calculated 50.39. And the probability of getting this calculated value is zero. This implies that the model overall is statistically significant in explaining the profitability performance. The R-squared also indicated that the explanatory variables explained the dependent variable more than 79%. The adjusted R-squared also was not far from the simple R-squared which was more than 78%.

Thus, we can say that the overall model significance and fitness in implementation period was good with significant variables of variable cost and revenue performance. But, when it is compared to the previous period, it could be said it is an average in model fitness even if it had

only two variables significant where as the previous period were having two and four variables, respectively for pre-implementation and implementation period.

Comparison over the three periods

The major model of this study is multiple linear regressions. But, to compare the intervention effect over the three periods, multinomial logit applied. To do this regression, the three periods data organized together and the profitability performance pre-implementation was given 0 and the implementation period profitability 1 and the next period was assigned as 2. In this way the profitability changed to three categories and the base line was determined to be pre-implementation period. But, in this regression only revenue performance and business experience were significant to be compared. The other variables were statistically insignificant consistently.

Though the rest variables were not workable for comparison, the revenue indicated that the baseline was better to determine the profitability performance. During the implementation period, 1% increase in revenue performance effect was less than by 0.086% from the baseline. And during the post-implementation, its effect was less than by 0.024% from the baseline. And regarding the business experience, the implementation and post-implementation periods had more effect than the baseline. A 1year increase in the business experience had better impact by 0.15% and 0.23%, respectively than the baseline.

Conclusion and recommendation

Conclusion

The business firms in the sample are more of goods and service distributors and renders. And next to this the hotel, cafe and restaurants are the dominant type of firms. The study found that Most of the firms are not so optimistic to assume that business will be better and better once they faced acute fall of their business in the LRT implementation period.

During this period there was the whole system change of the infrastructure so that the firms have been affected highly. Due to this change the factors affecting the profitability performance were a little bit different from the other periods. And also during this period the location of the firm and customer visit were important variables to affect the performance.

On the other hand, the revenue performance of the firm was a consistent variable to affect the profitability over the three periods. But, the effect was not as much as the pre-implementation period. Even if the location is insignificant in post-implementation period, its effect on the performance of profitability was more than any other variables especially during the implementation period. The firms with closer location to crossing points and LRT stations, had better performance. And regarding the accessibility issue after the construction of the LRT the firms feel more inconvenience of the parking space, crossing points and pedestrian facility.

Recommendations

Based on the study finding I would like to recommend that during such bigger infrastructural change, the stakeholder should be consulted first and involved their interest. In addition, since the whole system change affect the whole activity, each projects should be implemented separately so that the firms can have options to operate their business even for the next phases of the LRT. Not only this during this construction period, the firms' accessibility by their customers should be maintained as much as possible. This is because; most of the firms are customer oriented and generate their revenue through customer to firms' communication.

During this study some variables were significant in some period and in some period not. Thus, further study on the firm's profitability determinant should be studied especially with the real figure of the profit. In addition to this, revenue was the only consistent variable to affect the profitability performance so that further study and investigation on the firms' revenue determinants should be conducted.

On the other hand, the working environment of the firms should be designed more attractive in terms of parking space, pedestrians' road and crossing points in order to be the firms to be more accessible by their customers. Here in post-implementation period most of the firms are not satisfied and assume that no visible opportunity is created by the intervention. Thus, the government or concerned body should make the business environment more conducive by solving the problems mentioned above.

Acknowledgement

We are very delighted to thank the business firms included in the study for their response even if time taking interview was conducted. Without their willingness, the data collection will be impossible. And also we would like to thank YOM Institute of Economic Development for their support and constructive comments during the study. Finally, it is our honor to thank the anonymous reviewers for their constructive comments.

References

1. T. Donna Chen, Dr. Kara Kockelman, Dr. Katie Larsen and Brice Nichols(2013), *The Economics of Transportation Systems*
2. P. J. Zhou, Kahn Ribeiro, S., S. Kobayashi, M. Beuthe, J. Gasca, D. Greene, D. S. Lee, Y. Muromachi, P. J. Newton, S. Plotkin, D. Sperling, R. Wit(2007), *Transport and its infrastructure in Climate Change*.
3. Wendell Cox(2012), *Developing Africa toward Customer Oriented Urban Transport Policy*.,
4. MoFED(2010), *Growth and Transformation Plan (GTP) 2010/11-2014/15*.
5. FDRE(2011), *Ethiopia's Climate-Resilient Green Economy Green economy strategy*
6. Addis Ababa City Planning Project Office (2012), *Transportation challenges in a booming city Coordination of the mass transit network and urban development in Addis Ababa Addis Ababa City*
7. United Nation Economic Commission for Africa(2015), *Inclusive Green Growth in Ethiopia*.
8. MRC
9. David J. Forkenbrock,Shauna Benschoff,Glen E. Weisbrod(2001), *Assessing the Social and Economic Effects of Transportation Projects*.
10. C.R.Kothari(2004), *Research Methodology methods and techniques, second revised edition*
11. David Banister (2007), *Quantification of the Non transport Benefits Resulting from Rail Rail Investment*.
12. Todd Litman, Mike Skene and Shawna Fitz Gerald(2002), *Light Rail Economic Opportunity Study*,
13. David J. Forkenbrock,Shauna Benschoff,Glen E. Weisbrod(2001), *Assessing the Social and Economic Effects of Transportation Projects*.
14. Fantahun Tesfaye Demdime (2012), *Integrating Public Transport Networks and Built Environment*

15. *Todd Litman(2012), Rail Transit In America A Comprehensive Evaluation of Benefits.*
16. *Leroy W. Demery, Jr. Michael D. Setty (2008), Rail Transit Systems Worldwide*
17. *Karthik Konduri(2013), Analyzing the Economic Impacts of Transportation Projects.*
18. *Jeffrey C. Arndt, Curtis Morgan, John H. Overman, Terry L. Clower, Bernard L. Weinstein, Michael Seman(2009), Transportation, Social and Economic Impacts of Light and Cummuter rail.*
19. *Andreas Stierwald (2009),Determinants of Firm Profitability*