



ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
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**THE IMPACT OF THE INTEGRATED HOUSE DEVELOPMENT PROGRAM
/CONDOMINIUM ON THE BENEFICIARIES WELFARE: A CASE STUDY IN
SUMMIT CONDOMINIUM KIRKOS SITE IN ADDIS ABABA**

BY

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**The Impact of the Integrated House Development Program/
Condominium on the Beneficiaries Welfare: A Case Study in
Summit Condominium Kirkos Site**

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Studies**

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Addis Ababa, Ethiopia

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DECLARATION

I, **Atsede Tadele**, do hereby declare that the thesis entitled “ *The Impact of the Integrated House Development Program/Condominium on the Beneficiaries Welfare: A Case Study in Summit Condominium Kirkos Site*”, submitted to the Institute of Agriculture and Development Studies, St. Mary's University in partial fulfillment of the requirement of Masters of Art in Development , is my original work and it has not been presented for the award of any other degree, diploma, fellowship or other similar titles, in any other university or institution.

Atsede Tadele Getahune

Signature _____

Date _____

Place: Addis Ababa, Ethiopia

CERTIFICATION

This is to certify that this thesis entitled “ *The Impact of the Integrated House Development Program/Condominium on the Beneficiaries Welfare: A Case Study in Summit Condominium Kirkos Site*”, is an authentic work of Ms. Atsede Tadele who carried out the research under my guidance. Certified further, to the best of my knowledge the work reported here in does not form part of any project report or thesis on the basis of which a degree or award was conferred on an earlier occasion on this or any candidate.

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ABSTRACT

This thesis attempt to explore the impact of condominium housing on the beneficiaries welfare. The IHDP was launched in 2005 targeting the low and middle income urban household. Among the many condominium sites located here in the capital Addis Ababa this study was conducted in Summit condominium site kirkos site. To select the target population a researcher used simple random sampling technique. A total of 235 households were taken for this purpose. Among the respondents 101 were the beneficiaries of the condominium and who are living in it. The rest 134 questioners were distributed to non beneficiaries of the condominium. The propensity score matching model is used to compare the beneficiaries with the non beneficiaries. This model is choose to account for the selection bias due to differences in observable characteristics. The result shows that the IHDP has a positive impact on the monthly saving and expenditure on education of the beneficiaries. Also it was observed that ownership of consumer durables is high for BCH. On the other hand incidence of sickness, access to basic infrastructures and expenditures on treatment of the ill were comparatively high. Based on the findings the study suggests that government should make sure basic social infrastructures are present in condominium housings and should be built side to side with the houses.

Key words: IHDP, PSM, Welfare, Saving, Health, Education and Households

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ACRONYMS

ATT	Average treatment effect on the treated
BCH	Beneficiaries of the condominium house
CIA	Conditional Independence Assumption
CSA	Central Statistical Agency
GDP	Gross domestic product
GTP	Growth and Transformation plan
HH	Household
IHDP	Integrated House Development program
ISEW	Index of sustainable economic welfare
KL	Kerenel matching
LLM	Local linear matching
MDG	Millennium development goals
MEW	Measure of economic welfare
MSE	Micro and small enterprises
MWUD	Ministry of Work and Urban Development
NBCH	Non beneficiaries of the condominium
NHC	National House Corporation
NNM	Nearest neighbor matching
PASDEP	Plan for accelerated and development to end poverty
PSM	Propensity score matching
UN	United Nations
UN-HABITAT	United Nations Human settlement program
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

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CHAPTER ONE

INTRODUCTION

1.1. Background Of the Study

Many developing countries suffer from endemic poverty, slow economic growth, unequal distribution of income and wealth, low levels of agricultural and industrial investment, and ineffective government services. Compounding and partly giving rise to, these problems are shocks emanating from the world economy. The rapid process of urbanization in developing countries accompanied with lack of adequate and affordable housing is one of the 21st century's main development challenges. Housing is considered as the major development task to reduce urban poverty and improve the lives of slum dwellers and to bring sustainable socio-economic transformation. Half the world's population lives in urban areas (Mekonnen, 2013). Future population growth (more than 80 per cent of it in urban areas) will be concentrated in developing countries. Yet the growth of urbanization in the developing world has not been matched by a commensurate growth in the supply of decent housing. The shortcomings of policy, lack of political will, limitations of housing finance, poor land management in urban areas, lack of security of tenure, and lack of infrastructure and services are just some of the issues that confront citizens and policy-makers in developing countries, and provide a strong theme for research, analysis and action.

Demand for housing remains extraordinarily high in the developing world. Asia, for example, is urbanizing most rapidly and will need to absorb 120,000 new residents every day into its cities. This translates into at least 20,000 housing units per day. Slums are the most visible indicator of poor access to housing and are expected to double in size by 2030. Affordable housing in the right locations though, can bolster economic mobility and ultimately drive GDP growth (UN-HABITAT, 2015s).

In 1984 the urban population of Ethiopia contributed only 11.2 percent to the total population of the country (CSA, 1984). Over the ten years between the two census, the proportion grew to 13.7 percent (CSA, 1999). Despite having one of the lowest proportions of urban population in the world at only 16.7 per cent is rapidly urbanizing at a high annual growth rate of 3.49 per cent. In

the space of seventeen years the urban population more than doubled from 6.4 in 1990 to 13.8million in 2007. The population is very young with 45 per cent under 15 years of age. The combination of high population and urban growth rates coupled with a high prevalence of urban poverty have placed enormous strain on Ethiopian cities. 80 per cent of the population lives in sub-standard slum housing that needs either complete replacement or significant upgrading (UN-HABITAT, 2011)

In 2007, a census conducted by the Ethiopian national statistics authorities the population of Addis Ababa is 3,384,569 million; all of the population are urban inhabitants. For the capital city 662,728 households were counted living in 628,984 housing units, which results in an average of 5.3 persons to a household (CSA, 2008). According to UN everyone has a fundamental human right to housing, which ensures access to a safe, secure, habitable, and affordable home with freedom from forced eviction. It is the government's obligation to guarantee that everyone can exercise this right to live in security, peace, and dignity. This right must be provided to all persons irrespective of income or access to economic resources. The government estimates that the current housing deficit is between 900,000 and 1,000,000 units in urban areas, and that only 30 per cent of the current housing stock is in a fair condition, with the remaining 70 percent in need of total replacement. In Addis Ababa alone, 300,000 units are required to meet the deficit (UN HABITAT, 2011). Using the UN-HABITAT slum definition, 80 per cent of Addis Ababa is a slum with 70 per cent of this comprising government owned rental housing. In response to this challenge, the Ethiopian government outlined an ambitious vision for low-income urban and housing development, formulated as the Integrated Housing Development Programme (IHDP), for all slums to be cleared within ten years' time and for Ethiopia to be a middle-income country by 2025. In the Integrated House Development Program (IHDP) the utilization of housing as an instrument to promote urban development, create jobs, revitalize the local urban economy through MSE development, encourage saving and empower urban residents through property ownership, and develop the capacity of the domestic construction industry is clearly stated. The city Administration has constructed 166,000 houses in Addis Ababa during GTP I, though the target was 150,000. Also, the Ministry of Urban Development, Housing and Construction disclosed that it plans to construct over 700,000 condominiums during the Second Growth and Transformation Plan (GTP II) period (The Federal Democratic Republic of Ethiopia, 2016). Moving from a slum with low infrastructure to an urban complex (Condominium) has its own implication on the living standard of the poor. It has a far more implication on the wealth, health and access to other basic infrastructures. Welfare economics looks at the distribution of resources

and how it affects an economy's overall sense of well-being. With different optimal states existing in an economy in terms of the allocation of resources, welfare economics seeks the state that will create the highest overall level of social satisfaction among its members (Wikipedia).

1.2. Statement of the Problem

The Millennium Development Goals states that by 2020, we should be able to achieve cities without slum. It states that “by 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.” This target fell within the broader goal, “Ensure Environmental Sustainability.”

According to UN-HABITAT(2011) although one could argue that the target in improving the lives of at least 100 million slum dwellers — has been met several times over, the absolute number of those living in slums has increased from 776.7 million in 2000 to 827.6 million in 2010. Much of the progress in upgrading slums has been in Asia, specifically China, while Africa and others have lagged behind. The number of slum dwellers, and subsequently those in need of adequate housing, is expected to rise to nearly 2 billion in the next two decades (ibid).

Generally speaking housing is considered as the major development task to reduce urban poverty and improve the lives of slum dwellers and to bring sustainable socio-economic transformation. Slum areas are characterized by widening income disparity, deepening poverty, overcrowding, deterioration rising unemployment, severe housing shortage, poorly developed physical and social infrastructure and the increasing of slum and squatter settlements. Almost 50 percent of these slums dwellers lives below the poverty line and their hardship are enormous (Mekonnen, 2013). The same things hold true for Ethiopia where urbanization is taking place at alarmingly high rates. The poor people are living in the overcrowded low quality houses mostly government owned kebele houses in many cities including Addis Ababa and towns in Ethiopia which has its own impact on the living standard of people.

Sustained high urbanization and high population growth rates in Ethiopia is expected to cause extra pressure on already failing and deteriorated urban infrastructure, services, and housing stock. The massive housing needs are unlikely to be met by the small scale housing cooperative, government, and upgrading approaches prevailing from the late 1970s until the mid-2000s, especially considering the high demand by the low-income sector of the population for affordable housing (Mahder, 2013). In 2005 the Ethiopian government outlined an ambiguous plan called Integrated Housing Development Plan(IHDP) targeted for low and middle income

urban households. Through this plan the government planned also to achieve urban development, create jobs, revitalize the local urban economy through MSE (micro and small enterprise) development, encourage saving and empower urban residents through property ownership, and develop the capacity of the domestic construction industry. This program has other implications on the living standard of the low and middle income urban household. It allows low-and-middle income households, who typically live in ‘precarious’ housing situations to access improved housing. Thus, the Integrated Housing Development Programme, indeed, is not just a housing programme but a wealth generation programme for low-income households. Among other benefits, ownership of a condominium property can be used as collateral to enable the owner to borrow money in the future for investment (UN-HABITAT, 2010). Increasing access to high quality affordable housing has a profound impact, both for the individual and society at large. As a result it is clear to see that the condominium houses have a far reaching implication on the beneficiaries besides being a shelter and an assessment on these benefits is necessary. After the condominium houses are passed to the beneficiaries the life style of the household changes due to the change of location, social structure, access to different infrastructures, living condition and the like. This calls for a research and in this study the impact of the IHDP on the beneficiaries welfare is analyzed through some indicators of household welfare.

1.3. Research Objectives

1.3.1 General Objective

The ultimate objective of this study is to analyze the economic and welfare impacts of condominiums on the life of those household who are beneficiaries from the Integrated Housing Development Plan(IHDP) in Addis Ababa.

1.3.2. Specific Objectives

Besides the above stated general objective, the study will address the following specific issues:

- To assess the impact of condominium on the beneficiaries monthly saving ,
- Exposure to education,
- To assess the impact of condominium on the beneficiaries health conditions,
- To assess access to school, health institutions, water, electricity, transport and other basic infrastructures

- To assess possession of consumer durables.

1.4. Research Questions

The main research questions that the study aimed to answer were:

- ❖ Does access to condominiums improve the livelihood of beneficiaries in terms of saving, health and education?
- ❖ Is there a change in access to basic infrastructures like water, electricity, health institutions and the like?
- ❖ Does access to condominiums improve possession of consumer durables?

1.5. Significance of the Study

Welfare economics provides the basis for judging the achievements of markets and policy makers in allocating resources. (Timothy, 2002). The Integrated house development program (IHDP) is one of the major development policy focus areas of the current Ethiopian government. It all started in 2005 with a vision to construct 400,000 houses. This program is currently undertaken at a much bigger scale and vision. With this in mind the contribution of this study is attributed to the welfare impacts of the IHDP to the beneficiaries. This will pave the way for better understanding of IHDP and recommend sight full policy measures to improve practice. Besides providing further evidence to findings of prior studies, the study will also identify a few additional factors that are worth for further research and validation. The other contribution of the current research is in relation to practice. The findings of the current study would help policy makers develop and implement improved policies for other sites and to document for the future research.

1.6. Scope and Limitation of the Study

There are plenty of condominium sites here in the capital Addis Ababa. This study was conducted in one condominium site located at Bole sub city, Summit condominium Kirkos site. Bole is one of the 10 sub cities of Addis Ababa, the capital of Ethiopia. This site has a large number of condominiums and most of the residents in this site are the beneficiaries themselves. This was a valuable asset for the study to get a lot of respondents within one area. Most

importantly in these site most of the residents are the beneficiaries themselves unlike the other sites (Kolve and Arada) where most of the residents are renters.

Welfare economic approaches to the policy process have been criticized by those operating in the public choice tradition, for failing to consider how actual policy choices are made. Thus, even if we were able to understand what optimal policies are, there is no guarantee that the kinds of decision making institutions that we observe in reality will bring them about (Timothy, 2002). Assessing welfare impacts requires comparing what the current situation is and what actually would have been if the policy measures have not been put into practice. Due to this to understand what would have been requires further and detail analysis. Respondent's may not also give appropriate answers for the questions. Also it was difficult to get the owners of the houses who are the direct beneficiaries of the program due to the fact that renting condominiums have become a usual trend.

CHAPTER TWO

LITERATURE REVIEW

2.1. What is Welfare Economics?

Welfare economics looks at the distribution of resources and how it affects an economy's overall sense of well-being. With different optimal states existing in an economy in terms of the allocation of resources, welfare economics seeks the state that will create the highest overall level of social satisfaction among its members. Welfare economics uses the perspective and techniques of microeconomics, but they can be aggregated to make macroeconomic conclusions. Some economists suggest that greater states of overall social good might be achieved by redistributing incomes in the economy. This models the theories behind economic, or allocative, efficiency, suggesting that there exists a point where the social well-being experienced from the allocated resources can hit a maximum, a point considered to be the most efficient. If that point is reached, the economy is functioning in a way that any subsequent changes to raise the feelings of well-being in one area would require the lowering of well-being in another (Nordhaus and Tobin, 1972).

Issues regarding welfare economics may serve as guides during the creation of public policy. Welfare economics includes efforts to establish a minimum quality of living expectation within an area including access to commonly required services and the availability of living-wage jobs or affordable housing(Wikipedia). Welfare economics works in contrast to capitalist ideals. Government intervention regarding economic matters is fully rejected in pure capitalism. Focus is instead put in individual choice, accomplishment and development, as well as the pursuit of personal wealth. The theory behind capitalism supports that the society will experience an associated benefit through the pursuit of personal wealth(ibid).

Nordhaus and Tobin (1972) developed the Measure of Economic Welfare(MEW) to better understand the relationship between economic growth and welfare¹. MEW took national output

¹MEW is calculated by adjusting conventional national income accounts by the factors mentioned above. It is mainly based on a reclassification of expenditures and it therefore requires little additional research. The MEW gives ex-post assessment of the economic performance of an economy over a time period of a year. Although the MEW contains aspects of sustainable development (certain defensive expenditures and the disamenity premium of urbanization), its coverage and its degree of sophistication are quite limited.

as a starting point, but adjusted it to include an assessment of the value of leisure time and the amount of unpaid work in an economy, hence increasing the welfare value of GDP. They also included the value of the environment damage caused by industrial production and consumption, which reduced the welfare value of GDP. MEW can be seen as the forerunner of later attempts to create a sophisticated index of sustainable development. On the other hand the Index of Sustainable Economic Welfare (ISEW), develops MEW by adjusting GDP further by taking into account a wider range of harmful effects of economic growth, and by excluding the value of public expenditure on defense.

Timothy(2002) stated that welfare economics provides the basis for judging the achievements of markets and policy makers in allocating resources. Its most powerful conceptual tool is the utility possibility frontier. This defines the set of utility allocations that can be achieved in a society subject to the constraints of tastes and technologies. Any allocation on the frontier cannot be Pareto dominated and hence would satisfy a rather minimal condition for it to be socially desirable.

According to Frank (2014) condominiums essentially involve fee simple ownership of a specified unit in a housing project and common ownership of certain ancillary spaces, facilities and services. The relationships are similar to a consumer cooperative (including cooperative housing)with the exception that the distinction between individual and common property is assumed to be more clearly defined in the condominium .To improve the lives of people living in slum areas and to promote local economic development, local governments have been implementing urban renewal and upgrading initiatives. One core objective of the renewal and upgrading projects is local business improvement that forms the basis for local economic development (Chamber of Commerce, 2011).

2.2. Housing Conditions around the World

87 % of the world population has access to drinking water. Life expectancy has increased by 21 years since the 1950s. 87% of children are in primary school. The living conditions have improved in the world, but the poorest countries are still staying behind (Rita, 2011). The inequalities between the populations of rich and poor countries cannot be reduced to differentials in income. They also apply to very different living conditions, in particular concerning the access to fundamental goods (drinking water, food, health care, education, House ...). Although much

still has to be done to permit all individuals decent living conditions, the inequalities of accessing these goods seem to decline.

Almost 1 billion people currently live in slums, and this number is expected to grow by nearly 500 million by 2020 – if we're to ensure that no one is left behind in the future development agenda we need to determine whether progress is really reaching these marginalized groups. The scanty information available about the total number of households in the world living in neighborhoods lacking basic infrastructure (water, sanitary waste disposal, roads, energy) and basic urban services (health, education), and having difficulties in accessing employment, indicates that this reduction in 100 million 'slum' dwellers far from solves the problem. The post-2015 agenda should continue a focus on the urban poor – but it should aim to define better the problems they are facing and to focus on more effective solutions (Eduardo, 2015).

Furthermore Eduardo (2014) states that a central concern of the post-MDG's agenda must be the housing sector in developing countries, the main cause of the informal settlements. The root of the problem is that – but for a few exceptions – the formal housing sector (developers that comply with building and land-use regulations) produces fewer houses than needed to satisfy demand. In addition, the houses it produces are unaffordable for many low- and even middle-income populations owing to low income and the underdevelopment of local financial systems. Informal production of houses – outside regulations and mostly sub-standard – is a reality that will pertain in the developing world until the formal sector produces sufficient houses.

Government policies aiming at improving the lot of the poor in cities must focus on expanding the flow of affordable houses as well as improving the living conditions of existing informal settlements – the focus of most government efforts in pursuit of MDG 7. The objective should be to direct more resources to the housing sector and to improve its operations so that households in all income brackets find a housing solution and contribute according to their capacities in the production and financing of their homes.

In the past decade countries as different as Brazil, India and South Africa have expanded their interventions in the housing sector, launching new house-construction programmes in addition to upgrading existing settlements. Governments in the developing world have shown a marked preference for the direct production of houses by public entities to supply the needs of the poor.

Past experiences in the most diverse countries – Argentina, Morocco, and Indonesia among many others show that this approach is insufficient and usually miss-targets public resources.

Other countries have instead focused on leveraging private-sector resources and capacities to expand new housing production through direct one-off subsidies. Early adopters of the policy – Mexico, Chile, Costa Rica – started to reduce the housing shortage in this way, but such policies left out low-income households that could not save enough and did not have regular incomes to qualify for a mortgage loan. These countries resorted to the direct production of houses by public entities to cover the needs of these households, this time better targeting public resources to the very poor.

According to Eduardo (2014) to eliminate sub-standard settlements, the post 2015 agenda should encourage governments to improve the functioning of the housing sector to reduce as fast as possible the current outcome of unmet housing needs alongside the more traditional objective of improving living conditions on existing informal settlements. Fulfilling this expanded goal requires a more complex set of policies and programmes than those currently in use. Three major areas of concern stand out.

- Attract more resources to the housing sector to expand production.

The aim is to mobilise more private-sector resources from investors and households to finance new houses. Countries need to adopt a comprehensive vision of the housing problems affecting all income groups, going beyond low-income groups to include under-served lower-middle- and middle-income households to capture their capacity to pay for part of the costs of housing and target scarce public resources to the very poor.

Each group faces different challenges, so the instruments to support them should differ. In middle-income developing countries this can be accomplished with subsidies targeted to households that are almost capable of accessing private sector financing. In low-income developing countries the programmes should assist the incremental self-construction process that is commonly undertaken by households in the lower-middle and low-income brackets by expanding the supply of serviced land, building materials and technical cooperation.

- Adopt a citywide approach to the upgrading of informal settlements.

Sub-standard neighbour hoods are not confined to areas that have been informally developed. With the exception of a handful of neighbour hoods housing mostly high-income households, cities in the developing world have formal and informal neighbour hoods with varying shortages of infrastructure and services. These shortages have significant impacts on quality of life given that the majority of the services provided by a house to its users come from neighbour hood services. Government programmes concerned only with land invasions or illegal settlements tend to create islands of well-serviced neighbour hoods in seas of urban shortages.

The planned improvement of the infrastructure and urban services of whole areas of cities will contribute not only to improving the quality of life of the poor but also to equalizing the level of services for the whole city.

- Reduce the increase in urban land prices.

The rapid expansion of new house production put pressure on the supply of serviced land, resulting in price increases. Serviced-land prices go way beyond what governments can afford to pay for the building of subsidized houses, and even beyond what middle-income households can afford.

In parallel with expanding house production, governments must adopt measures to mitigate land-price increases. Well-designed and well-implemented land-development plans are essential to guide urban development to expansion areas that are environmentally suitable and easily supplied. Investment in trunk infrastructure (roads, water and sewerage mains) is paramount but requires complementary measures to prevent inefficient speculative behaviour by landowners. Capital-gains taxes and special assessments can capture unearned land-price increases to help defray infrastructure costs. Idle land taxes can prevent the retention of land out of the market for speculative purposes.

A new set of goals to improve living conditions of the urban poor must have the scope and extent required to make a significant dent in the problem. The experience gained in the past decades points us in this direction and it would be foolish not to take that experience into account.

2.3. Housing in Ethiopia

With one of the highest poverty levels in the world, Ethiopia is considered to be one of the most under-developed nations in the world. But within its African boundaries lies a nation filled with a rich culture and heritage. Bordered by Kenya, South Sudan, Sudan, Djibouti, Eritrea, and Somalia, Ethiopia has an estimated 2016 population of 99.4 million, which ranks 14th in the world.

The largest city and capital of Ethiopia is Addis Ababa, or Addis Abeba, which has an estimated population of 3.6 million in the city proper and a metro population of more than 4.6 million. Being as old as two millenniums, its cultures and traditions hold family as a significant part of Ethiopian life, sometimes even surpassing the significance their careers or businesses might have (UN,2015).

According to Manuel (2016) stated that despite its wealth in culture, Ethiopia, unfortunately, does not suffer the same fate economically. With a significantly agriculture-based economy, it is not surprising that in today's technologically thriving world, Ethiopia has one of the lowest incomes per capita. Its reliance on domestic investment restricts foreign investment, which could otherwise account for a comparatively successful economy. However, improvement in agricultural practices has shown a decrease in the level of starvation that the country had been previously accustomed to. The GDP is also increasing, showing a 7% increase in 2014. The composition of the labor force is almost 40%, accounting for another step toward progress. However, only if the conditions of the average Ethiopian get better will the country be able to witness a better tomorrow.

Similarly, the conditions of poverty entail deterioration in health for many of Ethiopia's inhabitants. The most common diseases that cause mortality among many Ethiopians are AIDS, tuberculosis, malaria, and various communicable diseases that occur due to improper sanitation and malnutrition. Most women give birth to children outside of the vicinity of hospitals. Often the mothers are only attended to by an elderly midwife. The mortality rate of mothers while giving birth is high. Various organizations, governmental and non-governmental, seek to improve the deplorable health conditions in Ethiopia. The World Health Organization is working to initiate a healthy Ethiopia. Low literacy levels also support the inferior health conditions. Therefore, it is important to provide the Ethiopians with adequate knowledge regarding common diseases and their appropriate medication and cure. The empowerment of women could also help achieve improvements in the circumstances pertaining to the well-being of Ethiopians.

Ethiopia is a nation that has been beset by hunger and poverty for most of its long history. A land where child starvation and subsequent death have been prevalent for such a long time requires assistance from the more privileged and prosperous nations of the world. It is the responsibility of all members of the peaceful international community to step in with more rigor and determination to empower the Ethiopians. This population has proven to be one of the strongest on the face of the earth, having endured massive hardships. If it is given a little assistance, Ethiopia will be able to build on the strength of its inhabitants in order to increase the strength of the nation itself

The vast majority of Ethiopians live in poorly built, dilapidated and cramped houses which lack even the basic facilities, such as toilets. Only 30% of the current housing stock in country is in a fair condition, with the remaining 70% in need of total replacement. Countrywide access to safe drinking water is 49% countrywide and only 20.7% of the population has access to adequate sanitation (CSA, 2012).

In the capital Addis Ababa, 80% of the houses are in poor condition and below standard. Houses in slum areas are old and dilapidated and too narrow to accommodate families, where the health and dignity of families is compromised. Most families who live in dilapidated homes in slum areas share toilets that are also in very poor condition. 24% of the households do not have any form of toilet facility and 63% use shared pit latrines. 25% of the solid waste generated from the city is left unattended. Poor families do not have toilets at all or use bad toilets that are nearly abandoned.

The rapid process of urbanization in developing countries accompanied with lack of adequate and affordable housing is one of the 21st century's main development challenges. Like most African cities, the spatial, physical and socio-economic condition of Ethiopian cities is by far behind the requirements fundamental to sustain the livelihood of the city. To address the problems, the Ethiopian government is implementing low – cost housing program. Revenue from land lease is main source of financing (Alebel, Berihun, Simon, 2016).

There is huge deficit in supply of houses in Addis Ababa. This will continue to increase with the predicted high population and urbanization growth. Data obtained from Addis Ababa City Administration, shows that the total estimated housing demand would escalate to 475,450 units in 2015. It is this imbalance between supply and demand, exacerbated by very low incomes that lead to affordability problems, and thus, urban residents prefer informal settlements.

The condominium housing program is currently being used in Ethiopia as a way to reduce the housing problem of urban low income people, among others. This method increases the access of the poor households to better quality housing at an affordable price. The program targets only middle and lower income households (Mahder,2013 (MWUD, 2007)). It allows low-and-middle income households, who typically live in ‘precarious’ housing situations to access improved housing(UN-HABITAT, 2010). Through the construction of durable, fully-serviced housing units the program greatly improves their living conditions and their access to basic services. However, though the condominium housing program has become an increasingly important way for lower income people to own houses of good quality, knowledge about the achievement of these programs, specifically the effects of the program on the welfare of the beneficiaries, is partial. The very poor members of society are able to begin to acquire some stability in their lives through the provision of houses. Recognizing those who live with inhuman and unhygienic conditions and providing support to improve the quality of their life .Thus, there is a need for rigorous evaluation of condominium housing programs regarding the welfare effects that can be attributed to the programs.

2.4. Empirical Literature

The concept of using government policy to improve the wellbeing of a country’s citizens may sound like a radical idea to those on the right. But if we return to basic principles, and ask ourselves what a government is actually for, then it seems absurd for it to take any action that is not designed to improve the wellbeing of its citizens. So the big question becomes is it possible to use housing policy to address these issues? Low income households could work less time, save more money, get enough access to basic infrastructure, get enough sleep, spend time with their friends and family and as a result improve their health . High housing costs and poor housing facilities are bad for an individual's wellbeing; in order to deal with these will almost certainly require building more affordable houses for the poor, and in more convenient places. So could increasing the supply of reasonably-priced housing really improve our wellbeing?

Affordable and stable housing has been linked with improving health, education and economic outcomes for families and children. Many studies show that stable housing is both a foundation for well-being as well as a platform for connecting people to services and resources that include

quality health care centers and schools and other facilities. When housing is stable and affordable, families can spend more time and resources on medical care, nutritious food and the like. Homeownership increases housing security to families: it gives more control to owners over their physical surroundings, lowers real monthly payments over time, protects against unanticipated changes in rental costs, and helps build wealth. Homeownership also provides a ready mechanism for families to borrow money and get credit to improve their home, make purchases or invest in education or the financial markets. It is also argued that these benefits are available to all homeowners regardless of economic status (Mahder, 2013).

To live in an adequate shelter means more than a roof over one's head: It means to have a home, a place which protects privacy, contributes to physical and psychological well-being, and supports the development and social integration of its inhabitants – a central place for human life. 'Healthy housing' must, therefore, be a comprehensive concept taking into consideration a variety of factors contributing to the quality of housing and housing environment. A healthy home is not a specially designed house, it is also a residential setting that is capable of fulfilling the expectations of the residents. For the provision of these benefits, housing standards and good practice examples have been gained and accumulated over centuries of housing production, showing that the construction of a 'healthy home' is mostly a question of applying existing knowledge and validated principles (Xavier, 2007).

Kenya is urbanizing rapidly; in 1997, its urban population stood at 20.9% of its overall population of 28.1 million, up from 5.1% at the time of its first census, in 1948. The most pressing issues faced by urban residents have been identified as poverty, unemployment, and access to land, services and energy. These problems have also increased the vulnerability of the poor, who increasingly find themselves living in life and health-threatening conditions. Urban housing development has gone through four distinct phases since Kenya's independence. The first phase saw the public sector heavily involved in housing construction, whilst demolishing squatter settlements that did not conform to the regulations. This top-down strategy continued till about 1990. A second phase started in parallel during the 1970s, initially quite slowly, under the influence of institutions like the World Bank. This focused on both the provision of serviced sites and settlement upgrading. Both types of projects provided a minimum level of infrastructure and services. The first project of this type was the Dandora project in Nairobi, followed by the

provision of serviced plots through the National Housing Corporation (NHC) in other towns in the 1980s (Schilderman, 2004).

With a population of 79 million, Ethiopia is the second most populous country in Africa. It is growing rapidly; the annual growth rate is 2.6 per cent, equating to two- million births per year. Despite having one of the lowest proportions of urban population in the world at only 16.7 per cent is rapidly urbanizing at a high annual growth rate of 3.49 per cent. In the space of seventeen years the urban population more than doubled from 6.4 in 1990 to 13.8 million in 2007(UN-HABITAT, 2011). The population is very young with 45 per cent under 15 years of age. The combination of high population and urban growth rates coupled with a high prevalence of urban poverty have placed enormous strain on Ethiopian cities. 80 per cent of the population lives in sub-standard slum housing that needs either complete replacement or significant upgrading. Ethiopian cities suffer from a high degree of homelessness, environmental degradation, urban decay, a shortage of infrastructure and basic services, and high unemployment (UN-HABITAT, 2010).

Based on the 2007 Population and Housing Census by CSA, in Ethiopia there are 15,103,134 housing units most of which, 12,206,116 units, are found in the rural areas and the 2,897,018 units are found in the towns of the country. Most of the housing units found in the towns, 836,074 units, are in the Oromia region. Out of the housing units found in the country, about 81.5 percent are owner occupied and around 9 percent of the units are rented from private households. In the urban areas, the owner occupied housing units account for about 39 percent and about 40 percent of the urban housing units are rented from private households. The government estimates that the current housing deficit is between 900,000 and 1,000,000 units in urban areas, and that only 30 per cent of the current housing stock is in a fair condition, with the remaining 70 per cent in need of total replacement. According to UN-HABITAT (2011) in Addis Ababa alone, 300,000 units are required to meet the deficit. The housing deficit is set to increase concurrently with the foreseen high population and urbanization growth.

The Urban Development Policy and the Plan for Accelerated and Sustainable Development to End Poverty (PASDEP) strategy, have the objectives of promoting the role of urban areas in the overall national development. The prominent current government approach to solving the low-income housing challenge is the Integrated Housing Development Programme (IHDP), initiated by the Ministry of Works and Urban Development (MWUD) in 2005. The Programme is a continuation of the ‘Addis Ababa Grand Housing Programme’ which supported the endeavors of the Ethiopian Government in their implementation of the PASDEP. The program has multi-

sectoral goals, viz., provision of affordable and low-cost housing, empowering urban residents through property ownership, job creation and income generation, and improvement of quality of the urban environmental, infrastructure development, etc. and the urban renewal programme (Chamber of Commerce, 2011).

The empirical literature presents some evidence that assets positively affect health and psychological well-being in a causal way. More studies find a positive association between assets and health and psychological well-being. By helping people meet unanticipated health care costs and thus encouraging them to seek appropriate diagnosis and treatment, assets can improve health outcomes (Lerman and McKernan, 2008)

Mahder (2013) stated that condominium housing program has positive and quite significant effect on wealth of households approximated by wealth index including housing condition of the households, their access to services, and their use of certain consumer durables. It shows that the program increased the wealth index of participant households as compared to non-participants. Furthermore, the result confirmed that the program has positive and significant effect on one of the dimensions of children's schooling.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Description of the Study Area

Bole is one of the ten sub cities of Addis Ababa. It is the largest among all sub cities with 14 woredas. As of 2011 its population was 328,900 (Wikipedia). Its geographical area cover 122.08 KM2 (Ibid). It is located in the southeastern suburb of the city. It borders with the districts of Yeka, Kirkos, Nifas Silk- Lafto and Akaki Kaliti (Ibid).

This study was conducted on a condominium site located in one of the woredas in this subcity. Summit condominium is located in this sub city woreda 10 it has three sites namely Kolfe, Arada and Kirkos. The largest of the three is Arada. This study has been conducted in the Kirkos site since it is believed that most of the residents living there are believed to be the beneficiaries themselves as compared to the other sites which was a useful asset for this study.

3.2. Data Sources and Data Collection Method

This study used both primary and secondary data . Primary data was collected from both beneficiaries and non-beneficiaries of the housing program. The primary data were collected using questionnaire surveys. This is used to collect information from beneficiaries and non beneficiaries of IHDP. For this purpose structured questionnaires are developed and it administrated that obtaining quantitative data on issues regarding the impact of condominiums on welfare of beneficiaries based on selected indicators. The questioner is composed of questions which are relevant for the study under consideration (see Appendix 1).

Secondary data was collected from different sources such as from the Ministry of Works and Urban Development (MWUD), Housing development Bureau, Central Statistical Agency (CSA) and also various literatures, such as books, journals published and unpublished documents from the libraries and private owners, Internet website and statistics reports from the study area.

3.3. Sampling Technique and Sample Size

In trying to draw the sample of households simple random sampling method is used. Data has been gathered from both beneficiaries and Non-beneficiaries of the IHDP. It is believed that there are 10,000 households in summit condominium site. In Kirkos site of this condominium there are 103 blocks each with an average of 25 houses. Accordingly there are 2,575 households in the site. From these households 101 sample representatives were considered based on a formula provided by Glenn (2005) to determine the minimum required treatment group sample size at 95% confidence level, degree of variability= 0.5 and level of precision (e) = 10%.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is sample size, N is the total number of study population 2,575 Where e is the level of precision

Using the total population of 2,575 and level of precision of 10%, the sample size will be calculated as follows:

$$n = \frac{2,575}{1 + 2,575 (0.10)^2}$$

$$n = \frac{2,575}{1 + 2,575 * .01} = 96.26$$

As a result 101 households from the beneficiaries side were taken while 134 samples were taken from the non beneficiaries. In order to see the impact of a policy treatment on the treated a comparison between the treated and the control/should be made. For that to happen the sample size of the untreated is recommended to be higher. The treated in this case are the ones who received the condominium and the control those who didn't get the lottery.

3.4. Data Analysis Method

3.4.1 Descriptive Analysis

In this study both descriptive and econometrics analysis were employed. due to the nature of some data's gathered descriptive analysis is used. The descriptive analyses used in this study are percentages, tables and statistical tests. In this study since we are studying the welfare impacts of the IHDP on the people who are beneficiaries of the program, the best way to deal with this is to compare it to those people who didn't have that chance. The ideal way to achieve this is to use

Impact evaluation methods like Propensity Score Matching(PSM) model. As a result PSM is used in this research.

3.4.2 Econometric Analysis

3.4.2.1 Impact Evaluation Concepts and Approaches

➤ *Defining Impact and Impact Evaluation*

The term impact is a measure of the tangible and intangible effects (consequences) of one thing's or entity's action or influence upon another. Impact refers to the broad, long-term economic, social and environmental effects of an intervention resulting in anticipated or unanticipated, positive or negative and desired or undesired outcome, at the individual or the organizational level that involve changes in both cognition and behavior (Gregersen *et al.*, 2000). Evaluation is the judging, appraising, or determining the worth, value or quality of research, in terms of its relevance, effectiveness, efficiency, and impact (ibid).

The terms impact evaluation and impact assessment can be used interchangeably. Impact evaluation is intended to determine more broadly whether the program had the desired effects on individuals, households, and institutions and whether those effects are attributable to the program intervention (Baker, 2000). Impact evaluations can also investigate unintended consequences, whether positive or negative, on beneficiaries (ibid). Khandker *et al.* (2010) also argued that impact evaluation is required to quantify the effects of the program on individuals, households, and communities. Impact evaluation is a systematic investigation of whether and how an intervention does has worked/not worked (ibid). In this way, it helps to understand whether the targeted beneficiaries of a given program or project are truly benefiting from the program and not from other factors. Impact evaluation studies depend on knowing how the program or project as intended. Furthermore, the key purpose of an impact evaluation study is to establish causal relationship between the intervention and changes in well-being. In other words, it answers the question whether the observed difference in outcomes between those who participated and had not participated into a program is actually due to the program intervention.

Impact assessment is done for numerous practical reasons: (1) Accountability – to evaluate how well we have done in the past in terms of all the goals and objectives that were set when the project, activity or program was established, to report to stakeholders on the return to their investment, and to underpin political support for continued investment; (2) Improving program design and implementation - to learn lessons from past that can be applied in improving

efficiency of research programs; and (3) Planning and prioritizing - to assess likely future impacts of institutional actions and investment of resources, with results being used in resource allocation and prioritizing future programs and activities, and designing policies, programs and projects (Gregersen *et al.*, 2000).

➤ **Measuring the Impact of Intervention**

Impact evaluations can be carried out *ex ante* or *ex post* (Khandker *et al.*, 2010). *Ex ante* impact studies are conducted before the implementation of a program or project intervention and rely on simulations or other mathematical models to predict likely program or project outcomes given inputs or resources to be used for implementations of the intervention activities. On the other hand, *ex post* evaluations examine the outcomes after the program intervention have been implemented. In other words, *ex post* evaluations measure actual impacts accrued by the beneficiaries that are attributable to program intervention. To establish causality between an intervention and change in a given outcome generally impact evaluation can be classified in to two approaches: quantitative (i.e. survey data collection or simulations- the use of an explicit counterfactual analysis) and qualitative methods (a mixed-methods approach does not use a counterfactual analysis but relies on understanding processes) can be applied (Asian Development Bank, 2006).

Determining the counterfactual (what would have happened had the project never taken place or what otherwise would have been true) is at the core of evaluation design (Baker, 2000; Khandker *et al.*, 2010). To accomplish this problem using several quantitative methodologies there are two broad categories: experimental designs (randomized) and quasi-experimental designs (nonrandomized) (Baker, 2000; Khandker *et al.*, 2010; Asian Development Bank, 2006).

Randomization is a method, in which the selection into the treatment and control groups is random within some well-defined set of people. Experimental designs works by randomly allocating the intervention among eligible beneficiaries, the assignment process itself creates comparable treatment (program group) and control groups (non-program group) that are statistically equivalent to one another, given appropriate sample sizes (Baker, 2000). while In non-experiment design matching methods or constructed controls, in which one tries to pick an ideal comparison that matches the treatment group from a larger survey. Non-experiment design uses statistical techniques to construct the counterfactual(Asian Development Bank, 2006). Quasi-experimental (nonrandom) methods can be used to carry out an evaluation when it is not

possible to construct treatment and comparison groups through experimental design (Baker, 2000).

3.4.2.2 Propensity Score Matching Model

Policy evaluation inquires about determining the effectiveness of a particular intervention (Baum, 2013). In economic policy analysis, we rarely can work with experimental data generated by purely random assignment of subjects to the treatment and control groups (ibid).

The key concern is finding similarity to compare the treated individuals with non-treated individuals (Baum, 2013). Comparing with a single measure we can gladly compute a measure of distance between the comparable groups but with multiple measures defining (balancing) similarity will be difficult to consider those dimensions at once (ibid). The propensity score matching method resolves the matching problem by reducing the multiple dimensions into a single dimension using that of propensity score calculated for an individual comparable unit (e.g. household for all treated and untreated) (Baum, 2013). That score is defined as the probability that a unit in the full sample receives the treatment, given a set of observed variables (Baum, 2013). *“The goal of propensity score analysis is to balance two nonequivalent groups on observed covariates to get more accurate estimates of the effects of a treatment on which the two groups differ”* Luellen *et al.*, 2005.

Luellen *et al.* (2005) also argued that propensity score analysis is a comparatively recent statistical innovation that is useful in the analysis of data from quasi-experiments (non-experimental). Therefore, in the absence of an experiment, Propensity Score Matching (PSM) Model is used to compare treatment effects across participant and matched nonparticipant units, with the matching conducted on a range of observed characteristics (Khandker *et al.*, 2010). The average treatment effect of the program is then calculated as the mean difference in outcomes across these two groups (ibid). From the character of this observational data in this study, PSM were used to find out the outcome of IHDP intervention between BCH and NBCH. PSM Model assumes that selection bias is based only on observed characteristics; they cannot account for unobserved factors affecting participation (ibid).

PSM constructs a statistical comparison group that is based on a model of the probability of participating in the treatment T conditional on observed characteristics X, or the propensity score: $P(X) = \Pr(T = 1|X)$ (Khandker *et al.*, 2010).

According to Khandker *et al.*, (2010) let Y_i represent the outcomes to household i . For participants, $T_i = 1$, and the value of Y_i under treatment is represented as $Y_i(1)$. For nonparticipants, $T_i = 0$, and the value of Y_i can be represented as $Y_i(0)$. If $Y_i(0)$ is used across nonparticipating households as a comparison outcome for participant outcomes $Y_i(1)$, the average effect of the program might be represented as follows:

$$D = E(Y_i(1) | T_i = 1) - E(Y_i(0) | T_i = 0) \dots \dots \dots \text{Equation (1)}$$

$$D = E(Y_i(1) | T_i = 1) - E(Y_i(0) | Y = 0) + [E(Y_i(0) | T_i(0) | T_i = 1) - E(Y_i(0) | T_i = 1)] \dots \dots \dots \text{Equation(2)}$$

$$D = ATE + [E(Y_i(0) | T_i = 1) - E(Y_i(0) | T_i = 0)] \dots \dots \dots \text{Equation (3)}$$

$$D = ATE + B \dots \dots \dots \text{Equation (4)}$$

In the equation where D is expected difference between two groups, ATE is the average treatment effect $[E(Y_i(1) | T_i(0) | T_i = 1)]$, namely, the average gain in outcomes of participants relative to nonparticipants, as if nonparticipating households were also treated. The ATE corresponds to a situation in which a randomly chosen household from the population is assigned to participate in the program, so participating and nonparticipating households have an equal probability of receiving the treatment T . The term B , $[E(Y_i(0) | T_i = 1) - E(Y_i(0) | T = 0)]$, is the extent of selection bias that crops up in using D as an estimate of the ATE .

Because one does not know $E(Y_i(0) | T = 1)$, one cannot calculate the magnitude of selection bias. As a result, if one does not know the extent to which selection bias makes up D , one may never know the exact difference in outcomes between the treated and the control groups. The basic objective of a sound impact assessment is then to find ways to get rid of selection bias ($B = 0$) or to find ways to account for it.

To overcome the selection bias and to work with PSM two key necessary assumptions for identification of the IHDP effect were made. Rosenbum and Rubin (1983) call the combination of the following two assumptions together the assumption of strong ignorability.

Assumption of Conditional Independence/Unconfoundedness: Given a set of observable covariates X that are not affected by treatment, potential outcomes Y are independent of treatment assignment T . If Y_i^T represent outcomes for participants and Y_i^C outcomes for nonparticipants, conditional independence implies

$$(Y_i^T, Y_i^C) \perp T_i \mid X_i$$

It implies that uptake of the program is based entirely on observed characteristics (Rosenbaum and Rubin, 1983). Conditional independence assumption (CIA) is for a given set of observed covariates, participation assignment is independent of potential outcomes (Caliendo and Kopeing, 2008)

Assumption of Common Support/Overlap: The common support or overlap condition: $0 < P(T) < 1$. This condition ensures that treatment observations have comparison observations “nearby” in the propensity score distribution (Heckman, LaLonde, and Smith 1999 cited in Khandker *et al.*, 2010). Treatment units have to be similar to non-treatment units in terms of observed characteristics unaltered by participation; thus, some non-treatment units may have to be dropped to ensure comparability (Khandker *et al.*, 2010). In other words for each value for X, there is a positive probability of being both treated and untreated (shown on figure 4).

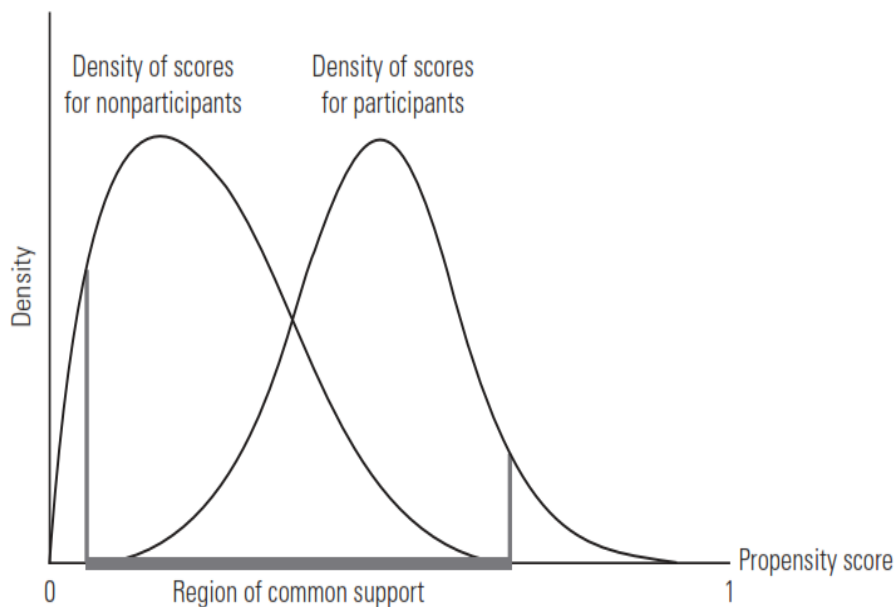


Figure 1: Example of Common Support

Source: Khandker *et al.*, 2010.

➤ **Procedures of Propensity Score Matching Model**

There are about five basic procedural steps of application of PSM for estimating the impact of program intervention.

Step 1: Estimating the Propensity Score

The first step is estimating the propensity score in PSM model. When estimating the propensity score, two choices (model to be used and variable to be included in the model of program participation (function) for estimating propensity score) have to be made (Calinedo and Kopeing, 2008). Implementing propensity score matching needs choosing a set of variables that convincingly satisfy the conditional independence assumption (CIA) that requires the outcome variables(s) must be independent of treatment conditional on the propensity score (Calinedo and Kopeing, 2008). On the other hand, omitting important variables can seriously increase bias in resulting estimates (Heckman *et al.* (1997); Dehejia and Wahba(1999)). The propensity score will produce valid matches for estimating the impact of an intervention when all relevant information to participation and outcomes is observed by the researcher (Baum, 2013). While Khandker *et al.*, 2010 support this idea Propensity Score Matching (PSM) is useful when only observed characteristics are believed to affect program participation. Variables that only persuade simultaneously the participation decision and the outcome variables should be included (Calinedo and Kopeing, 2008). Generally variable choice must be done by considering both economic theory and empirical evidence (Calinedo and Kopeing, 2008).

The first step to deal with propensity score matching model is to estimate a probit/logit model which will be used in estimating the propensity score to each household (Khandker *et al.*, 2010). A propensity score is a conditional probability of a household being assigned to a particular treatment given a set of observed covariates used to predict the person's condition (Rosenbaum and Rubin 1983). Propensity score matching is used to reduce selection bias by equating groups based on these covariates. The propensity score is a suitable single-index balancing score to identify matching partners (Rosenbaum and Rubin, 1983). Like all probabilities, a propensity score are limited between 0 and 1.

For this study, a logit model was used to estimate the predicted probability of participation into IHDP. The dependent variable was coded as 1 if household is a beneficiary (BCH) and zero otherwise. More specifically, the logit model was specified as follows (Gujarati, 2004):

$$P_i = E(Y = 1 | X_i) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} \dots + \beta_k X_{ki} + U_i)}} \dots \dots \dots \text{Equation (5)}$$

Where, P_i is the probability of participation into IHDP (the probability of being a beneficiary of condominium (BCH)), $Y = 1$ if a household is member of BCH and $Y = 0$ otherwise, β_0 is the

intercept term in the regression equation, β_k 's are regression coefficients to be estimated in the model, X_{ki} is set of explanatory variables that are expected to influence both participation into and outcomes of IHDP, and U_i is an error term.

$$1 - P_i = E(Y = 0 | X_i) = \frac{1}{1 + e^{Z_i}} \dots \dots \dots \text{Equation (6)}$$

Where: $Z_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} \dots + \beta_k X_{ki} + U_i$

$1 - P_i$ is the probability of not being a beneficiary of condominium (NBCH)

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i} \dots \dots \dots \text{Equation (7)}$$

$P_i / 1 - P_i$ is simply the **odds ratio** in favor of participation of IHDP: - the ratio of the probability that a family will participate in IHDP to the probability that it will not participate in IHDP.

Step 2: Choice of Matching Algorithm

This is the second step in PSM, contains choosing a matching algorithm. The aim of matching which is to find the closest comparison group, to match thus participant with non-participant on the bases of propensity score and to calculate detail program intervention different matching criteria can be used (Khandker *et al.*, 2010). The choice of a particular matching technique (algorithm) may affect the resulting program estimate through the weights assigned (ibid). Calinedo and Kopeing (2008) also argued that all matching estimators contrast the outcome of a treated individual with outcomes of comparison group members, i.e. they differ not only in the way the neighborhood for each treated individual is defined and common support problem is handled but also with respect to the weights assigned to theses neighbors. Here below are some of frequently used matching algorithms.

Nearest Neighbor Matching (NNM): One of the most frequently used and the most straightforward matching estimator, where each treatment unit is matched to the comparison unit (comparison group is chosen as a matching partner for the treated individual) with the closest propensity score (Khandker *et al.*, 2010; Calinedo and Kopeing, 2008). The user can choose the number n nearest neighbors in doing matching usually $n=5$ is used (Khandker *et al.*, 2010). Matching can be done with replacement (the same non participant can be used as a match for different participants) or without replacement (ibid).

Caliper and Radius Matching (CM and RM): When the closest neighbor is far away NNM faces the risk of bad matches, to avoid such bad matches and to rise matching quality imposing a threshold or “tolerance level” on the maximum propensity score distance (caliper) (Khandker *et al.*, 2010; Calinedo and Kopeing, 2008). “*Applying caliper matching means that an individual from the comparison group is chosen as a matching partner for a treated individual that lies within the caliper (‘propensity range’) and is closest in terms of propensity score*” Calinedo and Kopeing (2008). A possible drawback of caliper matching is difficult to know a priori choice for the tolerance level is reasonable (Smith and Todd, 2005). Dehejia and Wahba (2002) suggest a variant of caliper matching (to use not only the NNM within each caliper but all of the comparison members within the caliper) which is called radius matching.

Stratification or Interval Matching (SM or IM): This method works by creating partition the common support of the propensity score into a set of different intervals (strata) and to calculate the impact within each interval by taking them the mean difference in outcomes between treated and control observations (Khandker *et al.*, 2010; Calinedo and Kopeing, 2008). This method is also known as interval matching, blocking and sub classification (Rosenbaum and Rubin, 1984). How many strata should be used is also the question to be answered on this method.

Inverse Probability Weighting: We consider the setting in which there is a binary or dichotomous exposure. Thus, we assume that there are two possible treatments (e.g., active treatment vs. control treatment). The potential outcomes framework assumes that each subject has a pair of potential outcomes: $Y_i(0)$ and $Y_i(1)$, the outcomes under the control treatment and the active treatment, respectively, when received under identical circumstances. However, each subject receives only one of the control treatment or the active treatment. Let Z denote an indicator variable denoting the treatment received ($Z = 0$ for control treatment vs. $Z = 1$ for active treatment). Thus, only one outcome, Y_i , is observed for each subject: the outcome under the actual treatment received. The observed outcome is equal to $Y_i = Z_i Y_i(1) + (1 - Z_i) Y_i(0)$. Thus, Y_i is defined to be equal to $Y_i(0)$ if $Z_i = 0$, and to be equal to $Y_i(1)$ if $Z_i = 1$.

For each subject, the effect of treatment is defined as $Y_i(1) - Y_i(0)$: the difference between the two potential outcomes. The *average treatment effect* (ATE) is defined to be: $E[Y_i(1) - Y_i(0)]$, with the expectation taken across the population of interest. The ATE is the average effect, at the population level, of moving an entire population from control to treated.

If treatment were assigned at random, we would have that $E[Y|Z = 1] = E[Z Y(1) + (1 - Z) Y(0) | Z = 1] = E[Z Y(1) | Z = 1] + E[(1 - Z) Y(0) | Z = 1] = E[Y(1) | Z = 1] = E[Y(1)]$. The last equality holds because, under randomization, treatment assignment is independent of the potential outcomes: $(Y(1), Y(0)) \perp\!\!\!\perp Z$. Similarly, $E[Y(0)] = E[Y | Z = 0]$. Therefore, under randomization, one has that $E[Y_i(1) - Y_i(0)] = E[Y | Z = 1] - E[Y | Z = 0]$. Thus, randomization provides an unbiased estimate of the average treatment effect. However, in an observational study, we have that, in general, $E[Y(1) | Z = 1] \neq E[Y(1)]$. Thus, in an observational study simply comparing outcomes between the two treatment groups does not necessarily yield an unbiased estimate of the average treatment effect (Peter and Elizabeth, 2015).

Step 3: Checking for Sufficient Overlap and Balancing Tests

The third step of PSM application is checking the common support is sufficient. It is known that region of common support needs to be defined where distributions of the propensity score for treatment and comparison group overlap (Khandker *et al.*, 2010). Comparing the incomparable must be avoided, i.e. only the subset of the comparison group that is comparable to the treatment group should be used in the analysis (Dehejia and Wahba, 1999). The major goal in measuring the effect is to ensure that participants and nonparticipants are compared in the same economic environment and the same individual lifecycle position (Calinedo and Kopeing, 2008). Sampling bias still will occur when some of the nonparticipant observations may have to be dropped because they fall outside the common support (systematically different in terms of observed characteristics from the retained nonparticipant sample); these differences should be monitored carefully to help interpret the treatment effect (Khandker *et al.*, 2010).

Step 4: Assessing Matching Quality and Estimate Treatment Effect

This step is the fourth step to deal with PSM with having sub-steps.

Step 4.1: Assessing the Matching Quality

The main idea of assessing matching quality is of all approaches is to compare the situation before and after matching and check if there remain any difference after conditioning on the propensity score (Calinedo and Kopeing, 2008). To work with PSM, the treatment and comparison groups must be balanced in that similar propensity scores are based on similar observed X which is called balancing tests (the balancing property) (Khandker *et al.*, 2010). The distributions of the treated group and the comparator must be similar, which is what balance implies (ibid). In other word balancing tests constructed to check whether, within each quantile

of the propensity distribution, the average propensity score and mean of X are the same, they are not necessarily observationally similar if misspecification exists in the participation equation (ibid). As a measure of matching quality tests standardized bias and t-test are suggested by Rosenbaum and Rubin (1985). Joint significance, pseudo- R^2 (Sianesi, 2004) and stratification test (Dehejia and Wahba, 1999, 2002) are the other tests for assessment of matching quality (Calinedo and Kopeing, 2008).

After calculating the propensity score using the function estimated (the logit model), the average treatment effect on the treated calculation is the next step in implementing PSM. One of the difficulties in implementing propensity score matching in calculating the average treatment effect on the treated is the fact that there is no clear guideline to select the best matching method out of the many alternatives available for the purpose (no definitive way to choose among them). Existing literature indicate that there are only theory based recommendations or rely on simulations (Coca-Perraillon and Burlington, 2006). To select which method is preferred, triangulation of the results from different matching method using matching quality has been used. Khandker *et al.* (2010) supports the triangulation of results of the estimated program effect. Accordingly, to see whether the estimation is robust or not can be revealed by comparing results across different matching methods.

Appropriate literature sources suggest three criteria to assess matching quality – i) equal means test (insignificant means difference among all explanatory variables after matching between treated and control groups), ii) low pseudo- R^2 , and iii) large matched sample size. Therefore, these three criteria were used based on trial and error method to assess the best matching methods suitable for the available data has been chosen from different matching estimators as per the matching quality strength, namely, the decrease of pseudo- R^2 , balancing test (Rosenbaum and Rubin (1985) standardized bias reduction difference ≥ 20) (highest balancing test) and by the largest number of matched observations.

Step 4.2: Calculation of Treatment Effects (the Average Treatment Impact)

The Propensity scores calculated used to match untreated units to treated units and at the end estimating the impact of the intervention/IHDP with the matched sample and calculating standard errors were carried out. Average treatment effect is equal to the mean difference in outcomes over the common support, weighting the comparison units by the propensity score distribution of participants (Khandker *et al.*, 2010). Average Treatment impact (effect) on

Treated (ATT) as a mean difference in outcomes across the two groups was done to find the difference outcome of treated and control.

Step 4.2.1: Estimating Standard Errors with PSM: Use of the Bootstrap

Estimated variance of the treatment effect should include the variance due to the estimation of the propensity score, the imputation of the common support and in the case of matching without replacement also the order in which the treated individuals are matched (Calinedo and Kopeing, 2008). While this is a problem in determining standard errors and testing statistical significance of treatment effects makes to be not a straightforward thing to do (ibid). In empirical literatures for estimation of standard errors there are approaches that are frequently used; one way to deal this problem is use of bootstrapping (popular method to estimate standard errors in case analytical estimates are biased or unavailable) (ibid).

Bootstrapping is a nonparametric approach that permits one to avoid the theoretical calculation complication for evaluating the distribution of a statistic based on random resampling with taking the current sample (the value of the independent and dependent variables) as representative of the population and estimates of the sample as true values (Shmidheiny,2012; Guan, 2003).

Each bootstrap draw comprises the reestimation of the results including the first steps of the estimation (propensity score, common support, etc.) by repeating the bootstrapping R times leads to R bootstrap samples and R estimated average treatment effects (Calinedo and Kopeing, 2008). The distribution of these means approximates the sampling distribution (and thus the standard error) of the population mean (ibid).

Step 5: Sensitivity Analysis

This is the last and the fifth step in PSM. In the applied evaluation literature, checking the sensitivity of the estimated results is becoming increasingly important topic (Calinedo and Kopeing, 2008; Luellen *et al.*, 2005). Sensitivity analysis tests aids to verify whether the hidden bias affects the robustness (strong and healthiness) of the estimated result due to unobserved confounders (covariates) (Keele, 2010).

If there are no unobserved cofounders (covariates) and all the relevant covariates included, the estimates of treatment effects based on matching are unbiased (Keele, 2010). During matching in the adjustment of cofounders may fail to account for some relevant covariates. To check whether

this relevant covariates (which is violation of the strongly ignorable treatment assumption) one can conduct sensitivity analysis for the matching estimates (ibid). This is hidden bias resulted from when covariates is significantly related to treatment assignment and outcome but has not been measured and included in PSM (Luellen *et al.*, 2005). Rosenbaum's bounding approach of sensitivity analysis provides analysts with a method to assess how robust findings are examined for hidden bias due to an unobserved confounder (Rosenbaum, 2010).

The method of sensitivity analysis has been developed by Rosenbaum (2002) to assess if one's estimated based matching is robust to the possible presence of an unobserved cofounder, the key assumption for matching based analyses (Keele, 2010). Rosenbaum's method of sensitivity analysis relies on the sensitivity parameter γ (gamma) that measures the degree of departure from random assignment of treatment and it's performed by `rbounds` package (ibid). Sensitivity analysis computes the range of possible inferences for several values of γ and asks how hidden biases of various magnitudes might alter conclusions of the study by displaying the degree of departure from random assignment of treatment (Rosenbaum, 2002).

In a randomized experiment, randomization of the treatment make certain that $\gamma = 1$ (implies that the odds ratio of treatment is the same and the study is free of hidden bias/there is no hidden bias) while γ is unknown for observational study (Keele, 2010). We use γ as a measure of the degree of departure from a study that is free of bias; one uses several different value of γ to show how inferences might change if hidden bias were present (ibid). So that we can try several value of γ and see if the conclusion of the study change. The first step is selecting a series of values for γ one might use value between 1 and 6 or often the value between 1 and 2) (Keele, 2010). Thus values will be used to adjust the finding; we can do the sensitivity analysis by p -value and see how the p -value increases for increasing values of γ and also see how the magnitude of the treatment effect changes with an increasing (ibid).

3.5. Variable Selection and Definition

“A *treatment* is a program, policy, or intervention which, in principle, may be applied to or withheld *from any subject under study*” Rosenbaum, (2005). In our case it refers to participation in IHDP or beneficiaries of the condominium.

Outcome variables: - “is a variable measured after treatment may have been affected by the treatment” Rosenbaum, (2005).

Covariate (confounder): "is a variable measured prior to treatment and is not affected by treatment" Rosenbaum (2005). In our case the variables used to find the function for calculating propensity score and they are called in different ways throughout the paper like control variables, confounders, explanatory variables.

Dependent Variable: Beneficiaries of the condominium house is the dependent variable and is coded as 1 if BCH and 0 for NBCH.

A *household* consists of one or more people who live in the same dwelling and also share meals or living accommodation, and may consist of a single family or some other grouping of people. The household is the basic unit of analysis in many social, microeconomic and government models (Wikipedia).

3.5.1. Selection of Covariates

As already stated, variables which are likely to influence impacts on outcomes variables of interest have been selected and used in the present study. More specifically, the study picked the following variables to estimate logit model for estimation of propensity scores:

Respondents Sex ; female or male (Female = 0 and 1 = male). It was found out that most of the beneficiaries in this study are females.

Household head Age : The age of the household head in years as a discrete variable.

Hypothesized that when household head age increase the greater the chance of winning the lottery increase

Family size : Household size in numbers. The study hypothesized that family size increases the greater expense on education and treatment.

Household head Education : this variable is expressed in terms of year of schooling (for example 17 for a Bachelor holder, 13 for Diploma and the like).

Hypothesized that when the education of the household head increase the participation of IHDP increases

Household head marital status: 0 = if married and 1= if single.

Monthly income: the total monthly income of the respondents was aggregated.

3.5.2. Outcome Variables

Monthly saving: the average monthly saving of the two groups is compared as one of the welfare indicators.

Expenditure on education: this is based on the assumption that household will invest more on education if there is stability regarding house. Households with a better income can send their children to places where they can get the best education and for themselves also.

Expenditure on treatment (if ill): this is to cross check our hypothesis that states the incidence of sickness will decrease for BCH. The incidence of sickness was though high for BCH and more expenditures were incurred than NBCH.

This are our main outcome indicators, in addition ownership of consumer durables and access to basic social infrastructures were also compared.

Table 1 : Variable type, name, definition and Label

Type of Variable	Named	Definition	Label
Dependent Variable	Typeofho	A dummy variable that explains whether the respondent is a beneficiary or not	1 if Yes and 0 if not
Explanatory Variable	Gender	Represents the sex of the respondent	0 = female & 1= male
	Age	Age of respondent in terms of years	In years
	Maritalsta	If the respondent is married or not	0=Married & 1= single
	Educatio	Level of education of the respondent in terms of years of education	In years of schooling
	Occupati	If the HH head is in the labor force	0= unemployed & 1= employed
	Monthlyi	The average monthly income of the HH	In Birr
	Familysi	Number of people in the HH	In number
Outcome variable	SAVH	Average monthly saving of the HH	In Birr
	Expenseonedu	Average monthly expenditure on education	In Birr
	Howmuchwasspent	Money spent with in the last 3 months for health treatment	In Birr

Source: Own survey, 2017

CHAPTER FOUR

RESULT AND DISCUSSION

In this study as mentioned earlier both econometric and descriptive analysis are used. In the descriptive analysis detail analysis of the composition, income and other important features of the households in the study is discussed. In the econometric analysis the matching method is used between the beneficiaries and non beneficiaries in order to reach at a logically reasonable conclusion.

This research interprets and analysis the findings gathered mainly from primary source and some secondary sources. The result of the study focuses on findings of the impact of living in a condominium in the beneficiaries welfare. In this study 235 questionnaires were prepared and distributed to selected households. Out of the 235 households 101 are from the beneficiaries while the rest 134 are non beneficiaries. Out of the total 235 questionnaires distributed for the sampled respondents most of them have properly completed the questionnaire and returned on time.

The finding has been presented and analyzed under the following two themes: Descriptive and Econometric analysis

4.1. Description of Sample Households' Characteristics

In this part of the study we will discuss the demographic structure and other important points of the sample respondents. The demographic features of the respondents includes age structure, gender composition, marital status, educational level and household size. The study is conducted in Addis Ababa, Bole sub city, Summit Condominium Woreda 10, Kirkos site. House Holds were selected using simple random sampling from the target population.

When it comes to the beneficiaries the selected households are those who won the lottery and are living in the house. Among the respondents 123 were females while the rest 112 are Male while 121 of these households are married and 114 are single.

The age of the respondents ranges from 21 to 69 and the average family size is 3 and 2 for the beneficiaries and non beneficiaries of the condominium respectively. Below the table shows the general demographic structure of the respondents based on their type of house.

Table 2: Demographic Characteristics by Participation of IHDP

Variables	Category	Participation in IHDP		Total /Frequency
		BCH	NBCH	
Beneficiary of IHDP	Yes			101(42.98%)
	No			134 (57.02%)
Gender	Female	61	62	123 (52.34%)
	Male	40	72	112 (47.66%)
HH head marital status	Married	76	45	121 (51.49%)
	Single	25	89	114 (48.51%)
HH head employment status	Employed	81	127	208 (88.51%)
	Unemployed	20	7	27 (11.49%)
Type of occupation	Own Business	34	27	61 (28.9%)
	Public servant	22	21	43 (20.38%)
	NGO	2	21	23 (10.90%)
	Private co.	23	61	84 (39.8%)

Source: Own survey, 2017

As we can see from the above table most of the respondents in these study are females and on the labor force. A house creates a sense of stability and gives guarantee for people as a result people tend to get married and have children creating an extended family. According to CSA (2007), in Ethiopia the average household size was 4.8 (4.8 in rural and 4.6 in urban) in 1994. In 2007, the household size of the country slightly decreased to 4.7 (4.9 in rural and 3.8 in urban) . Our results are much lower than this figure, this could be due to the fact that the study is conducted in urban area and it shows how the demographic features are changing through time. People tend to have less children than before. The maximum number of family size is 7 and the minimum number is 1.

When it comes to education most of the respondents are diploma holders and less i.e. 51.9%. Bachelor holders account for 43% of the respondents. The highest level of education is Masters

which is 5.1 %. The literacy rate in Ethiopia is 49.1% male literacy rate accounts for 57.2% while females take 41.1% (CIA, 2015). For this study most of respondents are educated which will contribute for the accuracy of the study and the information provided.

Table 3: Summary statistics of some of the variables used in the PSM

Variable	Obs	Mean	Std. Dev.	Min	Max
Gender	235	.4765957	.500518	0	1
Age	235	35.25532	8.186053	21	69
Marital status	235	.4851064	.5008449	0	1
Education	235	13.11489	2.519919	0	17
Occupation	235	.8851064	.3195742	0	1
Monthly income	235	5464.46	3490.208	500	20000
Family size	235	2.625532	1.382193	1	7

Source: Own survey, 2017

Below we will see simple statistics on our major outcome variables based on participation. This includes variations in monthly saving, average monthly expenditure on education and finally expenditure on treatment if there was any illness within the last three months for both the BCH and NBCH.

Table 4: Summary statistics of some of the outcome variables

Variable name	Type of House	No.	Mean	Stand. deviation
Average monthly saving	NBCH	39	851.28	564.70
	BCH	48	1022.92	470.36
Expense on Education	NBCH	25	824	579.71
	BCH	45	912.96	470.27
Expense on Health	NBCH	59	926.54	975.46
	BCH	36	992.78	1458.12

Source: Own survey, 2017

As it can be seen from the above table monthly saving of the respondents vary between the BCH and NBCH. A small difference is observed between the two groups in the above table. The average monthly saving of BCH is 1022.92 while its 851.28 for the NBCH. Among the total population the NBCH take the biggest share but when it comes to the number of households that have a saving account the BCH are larger. This is due to the fact that most of the NBCH live in a rented house which will lower the rate of saving. Urban per capita income declined steadily from a high of about Birr 11800 in 1981 to about Birr 3100 in 2004. Urban per capita income started to recover after 2004 and increased steadily to reach Birr 4100 n 2011, just back to the level reached in 1994 (Asefa, 2014).

When it comes to expenses in education the beneficiaries are paying more for education than the NBCH. Investments in education are the basic ground rules for any society that is trying to escape out of poverty. An educated household has a far reaching impact with regard to how they live, manage and what they can bring for the society. In our case we were able to observe that there is only one government owned primary school in the area as a result some of the residents are forced to send their kids to private schools specially for high school. On the contrary large

percentage of this HH preferred to send their children to the private schools searching for a better quality education.

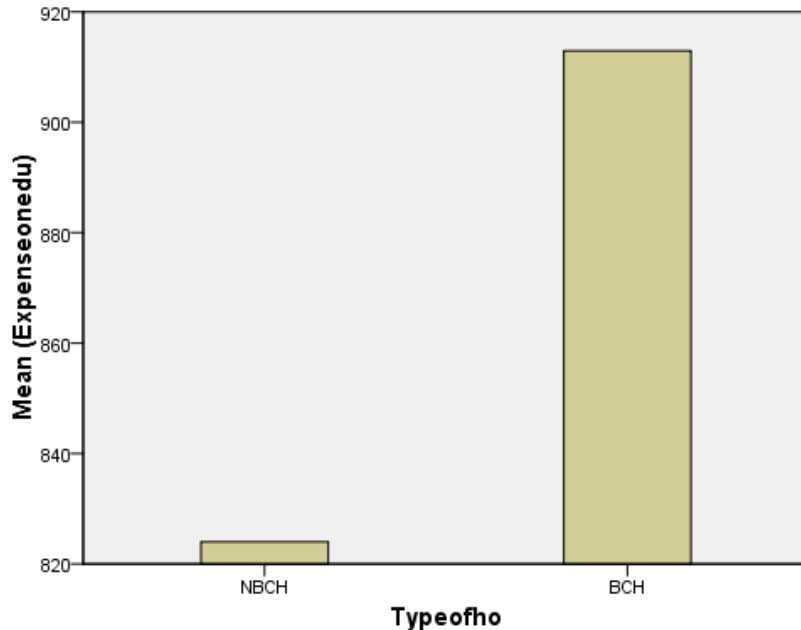


Fig. 1: Mean of monthly expenditure on education for the treated and control

60.9% of the households believe that they live in a poor quality and deteriorating house which is a huge percentage of the total population under the study. Only 39.1% believe that their house is in good situation. This is a huge factor in the households overall welfare. Most Ethiopians live in a house where there are no separated toilets or kitchen. Which is also another factor for the health index of a household.

Only 61.3% and 56.2% percent of the respondents live in a house that has a separate toilet and kitchen respectively. Nearly 40% of the world’s population lacks access to toilets, and the dignity and safety that they provide. Sixty-two per cent of Africans do not have access to an improved sanitation facility -- a proper toilet -- which separates human waste from human contact, according to the WHO/UNICEF(2008) Joint Monitoring Programme for Water Supply and Sanitation.

Sanitation is a cornerstone of public health, improved sanitation contributes enormously to human health and well-being, especially for girls and women. The absence of adequate sanitation has a serious impact on health and social development, especially for children. Investments in improving sanitation will accelerate progress towards the Sustainable Development goals and save lives. As important as sanitation is food safety, which also depends on neatness of kitchens.

In our case subsequently 43.8% of the respondents doesn't even have a separate kitchen partly. Which affects food safety and hence health.

Table 5: Percentage distribution of the incidence of sickness over the last three months

Type of house	Mean	N	Std. Deviation
NBCH	.54	134	.500
BCH	.61	101	.489
Total	.57	235	.496

Source: Own survey, 2017

Among the respondents 43% of them have an incident of sickness over the past three months, which is a significant number. And we can see how much this households have spent for treatment. The table shows this figure separately for BCH and NBCH. It can be seen that the BCH have spent a slightly higher amount of Birr than the NBCH. This is due to the fact that the condominium site is located far from health institutions specially there are no government owned hospitals nearby. There is only one government owned health center which has a very limited capacity. As a result the households have to go to other private hospitals or clinics which cost a huge amount of money as compare to the previous ones. This proves that even though the incidence of sickness for BCH is lower than the NBCH it eventually led to higher expenditure than the NBCH in terms costs incurred to get treatment.

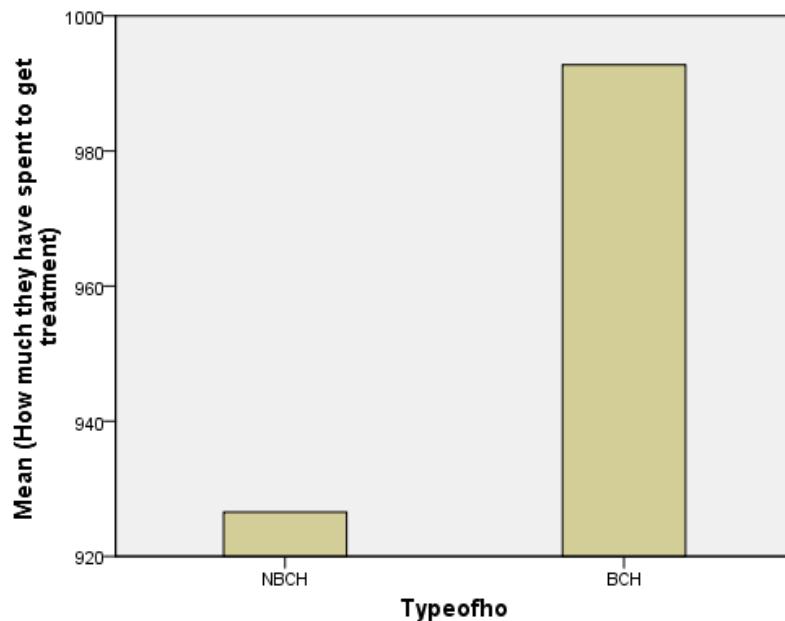


Fig. 2: Mean of three months expenditure on treatment for the treated and control

When it comes to possession on consumer durables like bed, Couch, dining table, cylinder, TV, refrigerator and the like BCH are better (see Appendix 3). This is due to the fact that the HH have better savings than the NBCH which will help them to own or purchase household assets. and most importantly having a house will create a sense of stability which will encourage them to purchase this goods. Fear of movement from place to place creates a certain type of negative implication when it comes to purchasing consumer durables. Lastly this is because of lack of enough own space NBCH are discouraged to purchase this goods in addition to lack of budget. Also regarding the respondents access to school, health facilities, pipe water, electricity, transport and market with the exception of school and health facilities BCH have better access to the stated basic infrastructures (see Appendix 4).

4.2. Empirical Results

Binary logistic regression model were used to estimate propensity scores for matching treated households with control households. In this study participation in IHDP is the dependent variable and it takes vale 1 if the household have condominiums and 0 otherwise. To estimate the propensity scores STATA 14 data analysis software was used.

Before estimation of the logit model, data were checked for the presence of both multicollinearity (see Appendix 4) and heterocedascity using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity (see Appendix 4). Checking the estimation data with a Variance Inflation Factor among the continuous variables (VIF<10) indicates that there is no colinearity among the continuous variables. There was no explanatory variable dropped from the estimated model since no serious problem of multicollinearity was detected from the VIF results.

4.2.1. Propensity Score Estimation

Results presented in the table show the estimated model appears to perform well for the intended matching exercise. The pseudo-R² value is 0.24. A low R value shows that program households do not have much distinct characteristics overall and as such finding a good match between program and non-program households becomes easier.

Table 6: Logit results of household program participation

Covariates	Coef.	Std. Err.	z	P>z
Gender	-.9975018	.3756909	-2.66***	0.008
Age	.1015267	.0276427	3.67***	0.000
Marital sta.	-.9719203	.3691837	-2.63***	0.008
Education	-.03184	.0771762	-0.41	0.680
occupation	-.4534273	.5641401	-0.80	0.422
Type of oc	-.4203751	.1373524	-3.06***	0.002
Family size	.2048287	.1564331	1.31	0.190
Monthly inc	.0000356	.0000545	0.65	0.513
_cons	-3.232498	1.423972	-2.27**	0.023

LR chi2(7) = 68.94

Prob > chi2 = 0.0000

Pseudo R2 = 0.2453

Log likelihood = -106.04069

Number of observations = 211

***, ** and * means significant at the 1%, 5% and 10% probability levels, respectively.

Looking in to the estimated coefficients program participation is significantly influenced by four explanatory variables i.e. gender, age, marital status and there employment status. The likelihood of households to participate or to benefit from the IHDP increases specially with their age and if they are employed or not. Households who are public servants and female are more likely to benefit from the program. Again it is important to emphasis that all the variables with weak predictive ability included in the logit regression can be still helpful to minimize bias in estimating casual effect in propensity score matching, since the ultimate goal is to not to predict selection in to treatment but to balance covariates and get closer to the observationally identical non participants.

As stated before, four main tasks should be accomplished before one launches the matching task itself. First, predicted values of program participation (propensity scores) should be estimated for all households in the program and outside the program.

Second, a common support condition should be imposed on the propensity score distributions of household with and without the program. Third, discard observations whose predicted propensity scores fall outside the range of the common support region. And finally sensitivity analysis should be done in order to check the robustness of the estimation (whether the hidden bias affects the estimated ATT or not).

After obtaining the propensity score and checking that the balancing assumption is satisfied, the observations are matched according to their propensity score and the average treatment effect on the treated (ATT), or the impact of the program, using impact indicators are estimated.

In nearest neighbor matching, each treated observation is matched with its nearest neighbor, in terms of propensity score, in the control group.

ATTs are estimated through matching of treated and control observations. These results reflect the differences between beneficiaries and non-beneficiaries. Based on the above stated result from nearest neighbor matching technuie we can see that the IHDP has a positive association between average monthly saving and expenditure on education. Where as on the expenditure on treatment and hence incidence of sickness we can see that IHDP has no impact as regard to this treatment.

Table 7: Matching Quality of Different Estimators

Matching Estimator	Impact Indicator	ATT	Standard Err.	Z-value	P> z
Nearest-neighbor matching	Monthly saving	223.9583	212.5595	1.05	0.292
	Expenditure on Educaion	186.1111	143.9237	1.29	0.196
	Expenditure on treatment	118.6111	258.7965	0.46	0.647
Inverse-probability weights	Monthly saving	208.4472	164.7641	1.27	0.206
	Expenditure on Educaion	89.29561	167.0689	0.53	0.593
	Expenditure on treatment	149.9782	310.7397	0.48	0.629
Propensity score matching	Monthly saving	367.4419	61.57057	5.97	0.000
	Expenditure on Educaion	106.6667	575.6094	0.19	0.853
	Expenditure on treatment	474.44	374.1023	1.27	0.205

Source: Own survey, 2017

4.2.1.1. Factors Affecting Treatments (ATT) Monthly saving of the Households

We can clearly see that the treated (BCH) have a better opportunity for saving than the controlled. The result is statically significant at 1%. This clearly answers our first research question. The ATT as seen above are estimated using three matching algorithms. Nearest neighbor matching is one of the most frequently used and the most straightforward matching estimator, where each treatment unit is matched to the comparison unit (comparison group is chosen as a matching partner for the treated individual) with the closest propensity score (Khandker *et al.*, 2010; Calinedo and Kopeing, 2008). Inverse probability weighting is a stastical technique for calculating statistics standardized to a population different from that in which the data was collected. Inverse probability weighting using the propensity score enables one to obtain unbiased estimates of average treatment effects .Our result based on our three estimators shows that the average monthly saving of HH who are beneficiaries of the

condominium housing program is higher by 223.9583 (according to Nearest neighbor matching) than their counter parts i.e. NBCH. As a result housing has a positive impact towards saving.

4.2.1.2. Factors Affecting Treatments (ATT) Monthly expenditure on Education of the Households

With regard to education the treated have invested more on education and we can see from the above results that the program has a significant impact on education. Houses give more stability so that household can focus on improving what has been missing and investing more on education and other important things. According to Reham and Hala (2015) education is considered an antidote for reducing poverty levels and promoting economic growth, both at the national and household level. In terms of economic factors, the rate of return on education could be high, households may prefer to consume less now and invest in education and obtain increased future earnings. Furthermore, if a household earns low income, families may not be willing to invest in education. Also, households may be forced to invest in education if government spending in terms of physical and human infrastructure in schools are inadequate. In terms of social and cultural factors, several household characteristics as parental level of education, occupation as well as household size and location can influence the extent of household investment in education (Tilak, 2002).

In our case from the result of three matching estimators we can see that BCH are monthly investing more on education 186.1111 (according to results from Nearest neighbor matching). According to our survey the reason for most of the HH for this is in search of a better quality education. On the other hand some pointed out that they are sending their children to private schools because of lacking governments schools in the area.

4.2.1.3. Factors Affecting Treatments (ATT) Expenditure on Health of the Households

Earlier we have seen the frequency of sickness for both the treated and control variables. Based on the data obtained the incidences of sickness was high for the NBCH. Health is influenced by socio-economic factors like whole life course, the neighborhood in which one lives, past socio-economic factors, stress history, diet, income education and many other factors (Himanshu, 2008). In our case most of the NBCH live in a house that doesn't have the basic facilities like separated toilet and kitchen. This has contributed for the higher percentage of the incidence of sickness among the NBCH. Some researchers argue that poverty leads to ill health because poor

Households do not have access quality health care and/or have a strong pattern of deleterious personal behavior that affects their health status (WHO, 2004).

Now the ATT with regard to expense on the treatment of illness within the last three months show that the BCH have payed more than the control. The BCH doesn't have many choice when it comes to nearby health centers. As a result according to the survey most of them traveled to another places to get treatment in private health institutions because of the above mentioned reasons. And some preferred the privates because they believe they give a better health care service than their counter parts. As a result for this households its preference not inadequacy that has made them invest more on health than the previous ones. Based on the propensity score matching BCH have invest more than the NBCH i.e. 474.44 birr in three months. This answers our research question, due to IHDP the incidences of sickness for the BCH is lower while they have payed more to get treatment.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The demand for affordable houses of especially the low and middle income groups is growing over time. To overcome the situation, the city government of Addis Ababa started building low cost housing program in the year 2005. It is a large-scale approach to address the current housing deficit, the poor quality of the existing housing stock, and the future housing needs due to continued urbanization. The program allows the low and middle income households to access improved housing. However, due to population growth with increase urbanization, high cost of construction materials, and shortage of housing finance of the urban poor's are in challenges to condominium house owners.

As this study endeavored to solve the dilemma of whether the impact of the Integrated House Development Program (IHDP) on the beneficiaries welfare is positive or negative taking the case of Summit Condominium Kirkos site ; the result confirms that there is a positive impact of IHDP on monthly saving, access to education(explained in terms of expenditures on education), incidences of sickness, access to basic infrastructure and ownership of consumer durables. On the other hand there is also negative impact on the expenditure on treatment of the ill and some aspects of access to basic infrastructures.

At first in the descriptive analysis of the study we have seen the general demographic composition of the respondents and then proceed to summary statistics of the outcome indicators monthly saving, expenditure on education and expense on treatment of the two groups i.e. the BCH and NBCH. Households with condominiums are found out to own more consumer durables than the NBCH and have better access for pipe water, electricity, market and transport. As a result Some of our research question have been answered in this section.. On the next step followed we have seen that gender, age, marital status and employment status of our explanatory/independent variables have significant effect.

The emperical results show suuport to the findings of the descriptive analysis. ATT with regard to monthly saving and expenditure on education show that the program has positive effect on the two welfare measures. While on the incidence of sickness explained in terms of expenditure on the treatment of the ill show negative impacts.

5.2. Recommendations

Absence of adequate housing in Addis Ababa is related to the increasing number of population, rural urban migration from all over the country, low house construction capacity and poor maintenance of the housing stock of most residents. As a result there is a huge gap between housing demand and supply in the city.

There is no doubt that the IHDP have brought a positive impact on the urban population. This is true due to the fact that it has created enormous employment opportunities starting from its construction. After its passed to the household,s with regard to the welfare impact it has brought and based on our result in this study we can make the following recommendations:-

- Emphasis should be given to reach out for low income households. A special mechanism should be brought to incorporate those sections of the society. Most of the respondents from BCH show that large percentage of them fall under middle income households. While the
- Emphasis should be given to the quality of condominiums when they are built. A continuous assessment should be done on a regular basis. Because of the fact that most of them are deteriorating and lack quality(Suffer from leakage, nitness)
- Basic social infrastructures must be built accordingly. From our results we have seen that BCH have to travel to other distant places in order to get treatment when ill. In our case there was only one government owned health center in which there are no enough health professionals. As a result the beneficiaries have to go other privately owned hospitals which will cost them a lot.
- Also when large condominium sites are built like in our case summit condominium schools which can accommodate students upto Senior high school should be opened. In our case there was only one government owned school which accepts students upto grade 8. After that students have to go far in order to get a government school or have to pay a large sum of money to private schools.
- When trying to evaluate the welfare impacts of the program, only certain indicators of welfare of the households are considered. But, the well-being of households may change in many other ways due to the program. Therefore, much effort should be exerted to assess the impact of the housing program on other welfare dimensions.

References

- Addis Ababa Chamber of Commerce and Sectoral Associations (2011). Assessment of Urban Development Practices on Business Expansion in Ethiopia.
- Alebel, Berihun and Simon (2016). The Impact of Condominium Housing in Addis Ababa: Preliminary Findings.
- Asian Development Bank 2006. Impact Evaluation: Methodological and Operational Issues.
- Baker J.L. 2000. Evaluating the impact of development projects on poverty: A handbook for Practitioners. Washington D.C. World Bank.
- Baum, C. F. 2013. Propensity score matching, regression discontinuity, limited dependent variables. Applied Econometrics, Boston College.
- Biruk, S. (2015), Managing Urban Institutions for Development in Addis Ababa City
- Bjorn, R. (2009), Urban Challenges in Addis Ababa.
- Caliendo, M. and Kopeinig, S. 2008. Some practical guidance for the implementation of propensity score matching. Journal of Economic Surveys 22(1): 31-72.
- Central Statistical Agency (1984), National Population and Housing Census
- Central Statistical Agency (1999), National Population and Housing Census
- Central Statistical Agency (2008), National Population and Housing Census 2007
- Central Statistical Agency (2012), Ethiopia Demographic and Health Survey 2011
- Coca-Perraillon, M., Inc, A., & Burlington, M. 2006. Matching with propensity scores to reduce bias in observational studies.
- Dehejia, R. H., and Wahba, S., 1999. Causal Effects in Non-experimental Studies: Reevaluating the Evaluation of Training Programs. Journal of the American Statistical Association, 94(448): 1053-1062.
- Eduardo, R. (2014), Improving housing policy to help the urban poor: An Expanded Goal for the post-2015 Agenda.
- Federal Democratic Republic of Ethiopia(2016), Growth and Transformation Plan II (GTP II)
- Federal Democratic Republic of Ethiopia (2005), Integrated Housing Development Program, Executive Summary (in Amharic), Addis Ababa.
- Frank, G. Mittelbach (2014). Condominium Housing: Some Social and Economic Implications
- Glenn D. I., (2005). Determining Sample Size.

Gregersen, H., Leeuw, F. and David, C. (2000). Impact assessment of agricultural research: Context and state of the art. FAO, Rome.

Guan, W. 2003. From the help desk: Bootstrapped standard errors. *The Stata Journal*, 3(1): 71-80.

Gujarati, D. N. (2004). *Basic Econometrics* (4th edition). New York, Mac Graw Hill, inc.

Himanshu, S. R. (2008). *Socio-economic Factors and Household Health Expenditure: The Case of Orissa*.

Heckman, J., Ichimura H. and Todd P. 1997. Matching as an econometric evaluation estimator: evidence from evaluating a job training programme. *Review of Economic Studies* 64 (4): 605-654.

Keele, L. (2010). An overview of rbounds: An R package for Rosenbaum bounds sensitivity analysis with matched data.

Khandker, S. R., Koolwal, G.B., Samad, H. A. 2010. *Handbook on impact evaluation: quantitative methods and practices*. The International Bank for Reconstruction and Development / The World Bank.

Lerman, R. and McKernan, S. (2008), *The Effects of Holding Assets on Social and Economic Outcomes of Families; A Review of Theory and Evidence*, the Urban Institute

Luellen, J. K., Shadish, W. R., and Clark, M. H. 2005. Propensity scores: An introduction and experimental test: *Evaluation Review*, Vol. 29, No. 530.

Mahder, H. (2013). *Welfare Impact of the Condominium Housing Program in Mekelle*

Mekonnen, W. (2013). *Addis Ababa Integrated Housing Development Program : A strategy for Urban Poverty Reduction and Sustainable socio-economic Transformation*,

National Planning and The United Nations (2015): *Assessment of Ethiopia's Progress Towards the MDGs*.

Nordhaus, W. D. and J. Tobin (1972). Is Growth Obsolete?, In: *Economic Growth*, National Bureau of Economic Research, General Series No. 96, New York, pp.1-80.

Onno, K. (2006), *Measure of Economic Welfare (MEW)*.

Peter, C. A. and Elizabeth A. S. (2015). Moving towards best practice when using inverse probability of treatment weighting (IPTW) using the propensity score to estimate causal treatment effects in observational studies.

Reham, R. and Hala, A.A., (2015). *Determinants of Household Expenditure on Education: Evidence from MENA Countries*.

Rita, S. (2011). Living Conditions in the World: Inequalities are on the Decline : Observatoire des inégalité.

Rosenbaum, P.R. and Rubin, D.B., (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika* 70(1): 45-55.

Rosenbaum, P. R. 2002. Covariance adjustment in randomized experiments and observational studies. *Statistical Science* 17(3): 286-327.

Schilderman, T. (2004), Integrated Urban Housing Development - experiences from Kenya and India.

Shmidheiny, K. (2012). The bootstrap: Short guides to Microeconometrics: Unversitat Basel.

Sianesi, B. (2004). An evaluation of the Swedish system of active labour market programmes in the 1990s. *Review of Economics and Statistics* 86(1): 133-135.

The Federal Democratic Republic of Ethiopia (2016), Growth and Transformation Plan II (GTP II): Addis Ababa.

Tilak, J.B.G. (2002). Determinants of Household Expenditure on Education in Rural India. National Council of Applied Economic Research. New Delhi.

Timothy, B. (2002). Welfare Economics and Public Choice: London School of Economics and Political Science.

UN-HABITAT (2010). Condominium Housing in Ethiopia : The Integrated Housing Development Program, United Nations Human Settlements Program: Nairobi.

UN-HABITAT (2011). Condominium Housing in Ethiopia : The Integrated Housing Development Program, United Nations Human Settlements Program: Nairobi.

WHO (2004). The Impact of Health Expenditure on Households and Options for Alternative Financing.

WHO/UNICEF joint release (2008). Poor sanitation threatens public health.

Wondossen M. (2014). Income Generation and Job Creation in Public Housing : A Case Study of Selected Condominium Sites in Addis Ababa.

World Population Review (2017). Ethiopia Population 2016, Manuel Dohmen.

Xavier, B. (2007), Inadequate housing and health: an overview: *Int. J. Environment and Pollution*, Vol. 30, Nos. 3/4.

- https://en.wikipedia.org/wiki/Addis_Ababa
accessed on 12/05/2017 06: 00

- <https://en.m.wikipedia.org/wiki/Household>

Accessed on 10/05/2017 12:47

- <https://en.m.wikipedia.org/wiki/welfare-economics>

Accessed on 06/03/2017 04: 20

Appendices

Appendix 1. Questioner

This questionnaire is designed by a postgraduate student of St. Mary's University, Development Economics Department to collect the required primary data so as to undertake a study entitled as **'The Impact of the Integrated Housing Program on the Beneficiaries Welfare: A Case study In Summit Condominium Kirkos Site in Addis Ababa'**. Your responses will be kept confidential and have a great deal of importance increasing the accuracy and reliability of the study so as to draw policy recommendations which may be used as a supportive input for continuing or improving the housing program.

Atsede Tadele

I. Household characteristics:-

1. Gender: Female: 0
Male: 1
2. Age (in years)
3. Marital status: 0=Married
1=Single
4. Educational level (preferable in years).....
5. Condition of activity : 0=Employed
1=Unemployed
6. Occupation type: 0=Self-employed
1=Government
2=privately employed
3=NGO
7. Family average monthly income (Birr per month)
8. Average monthly saving (Birr per month).....
9. Family size in number.....

10. Number of children below 18 years old.....

11. Number of children attending school.....

12. Total school fee per month.....

13. Type of school: Private school= 0

Government school=1

II. Housing condition:-

14. Where are you living? 0=Rented house

1= with family

2= in own house

15. Did you have any information about the condominium housing program when it was started?

1=Yes

0=No

16. Did you apply for a condominium house when the program was first introduced? 1=Yes

0=No

17. If your answer to the above question is 'yes', what was the reason behind that made you apply for the house? (You can choose more than one answer).

- Affordable housing = 0
- Better quality house= 1
- The freedom of having own house= 2
- Better sanitary facilities= 3

18. If you did apply for a condominium house, have you got the house? 1=Yes

0=No

19. If you have got the house you applied for, are you living in it? 1=Yes

0=No

If you are living in a condominium house **of your own**, please reply to the following questions.

20. What is the type of your condominium house? 0=Studio

1=One bedroom

2=Two bedroom

3=Three bedroom

21. How much do you pay, monthly for government for the house?.....

22. How much were you paying, if you were living in a rented house (you can express the payment in interval)?

23. Is the quality of your house in a good condition? 0= Yes
1= No

24. Is there a separate room used as a toilet in your house? 1=Yes
0=No

25. Is there a separate room used as a kitchen in your house? 1=Yes
0=No

26. How do you rate access to the following basic infrastructures in your condominiums compare to when you were living in a rented house

Infrastructure	Very good	Good	Fair	poor
Access to School				
Access to health institutions				
Access to pipe water				
Access to electricity				
Access to Transport				
Access to market				

25. Do you have the following consumer durables?

Consumer durable	Yes	No
Bed		
Couch		
TV		
Refrigerator		
Cylinder		
Electric pan		
Dining table		
Washing Machine		

If you are living in a rented house please answer the following questions

26. How many rooms does your house has?.....

27. How much do you pay monthly for rent?.....

28. Is the quality of your house in a good condition? 0= Yes

1= No

29. Is there a separate room used as a toilet in your house? 1=Yes

0=No

30. Is there a separate room used as a kitchen in your house? 1=Yes

0=No

31. How do you rate access to the following basic infrastructures in your house?

Infrastructure	Very good	Good	Fair	poor
Access to School				
Access to health institutions				
Access to pipe water				
Access to electricity				
Access to Transport				
Access to market				

32. Do you have the following consumer durables?

Consumer durable	Yes	No
Bed		
Couch		
TV		
Refrigerator		
Cylinder		
Electric pan		
Dining table		
Washing Machine		

III. Health

33. Was there any sickness in your household in the last 3 months? 1=Yes

0=No

34. Where did you go for treatment? Hospital= 0

Health center= 1

Clinic=2

35. Is the health institution you went for treatment near to your house? 0= Yes

1= No

36. Have you received enough treatment? 0= Yes

1= No

37. How much was spent for treatment?.....

38. What is your opinion regarding the condominium housing program?

Strength.....
.....
.....
.....

Weakness
.....
.....
.....
.....

39. Do you have any recommendations regarding the housing program
.....
.....
.....
.....

Appendix 2.

Mean distribution of ownership of consumer durables between the treated and control

		Report							
Typeofho		Ownbed	Owncouch	Owncylin	OwnTV	Ownrefri	OwnElect	Ownlaund	Owindinni
NBCH	Mean	.12	.50	.35	.20	.47	.67	.90	.87
	N	134	134	134	134	134	134	134	134
	Std. Deviation	.325	.502	.479	.403	.501	.471	.307	.334
	Sum	16	67	47	27	63	90	120	117
BCH	Mean	.00	.12	.07	.04	.11	.15	.71	.58
	N	101	101	101	101	101	101	101	101
	Std. Deviation	.000	.325	.255	.196	.313	.357	.455	.495
	Sum	0	12	7	4	11	15	72	59
Total	Mean	.07	.34	.23	.13	.31	.45	.82	.75
	N	235	235	235	235	235	235	235	235
	Std. Deviation	.252	.473	.422	.339	.465	.498	.387	.435
	Sum	16	79	54	31	74	105	192	176

➤ (labeled as 0= very good, 1 = good, 2= fair, 3= poor)

Appendix 3.

Mean distribution of access to social infrastructures

Type of ho		Access to school	Access to healthc	Access to pipewat	Access to electr	Access to transp	Access to mark
NBCH	Mean	1.22	1.32	1.34	1.84	1.43	1.33
	N	134	134	134	134	134	134
	Std. Deviation	.529	.608	.662	.758	.653	.572
	Sum	164	177	180	246	191	178
BCH	Mean	1.99	2.28	.90	1.67	1.70	1.36
	N	101	101	101	101	101	101
	Std. Deviation	.781	.750	.520	.801	.729	.593
	Sum	201	230	91	169	172	137
Total	Mean	1.55	1.73	1.15	1.77	1.54	1.34
	N	235	235	235	235	235	235
	Std. Deviation	.751	.822	.642	.779	.699	.580
	Sum	365	407	271	415	363	315

➤ (labeled as 0= very good, 1 = good, 2= fair, 3= poor)

Appendix 4.

Checking for multicollinearity

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	Gender	.849	1.178
	Age	.712	1.404
	Maritalsta	.594	1.684
	Familyysi	.597	1.674
	Typeofho	.738	1.354
	Occupati	.954	1.048
	Monthlyi	.926	1.079

Appendix 6.

Heteroskedasticity test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of Typeofho

chi2(1) = 0.94

Prob > chi2 = 0.3310

Appendix 6.

Correlations'

		Gender	Age	Maritalsta	Educatio	Occupati	Monthlyi	Familysi	Typeofho
Gender	Pearson Correlation	1	.169**	.063	.164*	.290**	.203**	-.031	-.140*
	Sig. (2-tailed)		.009	.340	.012	.000	.003	.634	.032
	N	235	235	235	235	235	211	235	235
Age	Pearson Correlation	.169**	1	-.349**	-.273**	-.211**	.072	.284**	.404**
	Sig. (2-tailed)	.009		.000	.000	.001	.301	.000	.000
	N	235	235	235	235	235	211	235	235
Maritalsta	Pearson Correlation	.063	-.349**	1	.135*	.163*	-.002	-.558**	-.413**
	Sig. (2-tailed)	.340	.000		.039	.012	.973	.000	.000
	N	235	235	235	235	235	211	235	235
Educatio	Pearson Correlation	.164*	-.273**	.135*	1	.188**	.425**	-.126	-.141*
	Sig. (2-tailed)	.012	.000	.039		.004	.000	.054	.031
	N	235	235	235	235	235	211	235	235
Occupati	Pearson Correlation	.290**	-.211**	.163*	.188**	1	.012	-.175**	-.226**
	Sig. (2-tailed)	.000	.001	.012	.004		.865	.007	.000
	N	235	235	235	235	235	211	235	235
Monthlyi	Pearson Correlation	.203**	.072	-.002	.425**	.012	1	.151*	.046
	Sig. (2-tailed)	.003	.301	.973	.000	.865		.029	.509
	N	211	211	211	211	211	211	211	211
Familysi	Pearson Correlation	-.031	.284**	-.558**	-.126	-.175**	.151*	1	.379**
	Sig. (2-tailed)	.634	.000	.000	.054	.007	.029		.000
	N	235	235	235	235	235	211	235	235
Typeofho	Pearson Correlation	-.140*	.404**	-.413**	-.141*	-.226**	.046	.379**	1
	Sig. (2-tailed)	.032	.000	.000	.031	.000	.509	.000	

N	235	235	235	235	235	211	235	235
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** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Appendix 7.

➤ Sensitivity Analysis for average monthly saving

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-
1	1.1e-16	1.1e-16	750	750	700	1000
1.25	1.3e-13	0	750	850	650	1000
1.5	1.2e-11	0	750	900	650	1100
1.75	3.2e-10	0	700	1000	600	1200
2	3.7e-09	0	650	1000	550	1250

➤ Sensitivity Analysis for average monthly expenditure on education

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-
1	5.3e-15	5.3e-15	825	825	725	950
1.25	2.3e-12	0	800	900	675	1000
1.5	1.4e-10	0	750	900	650	1050
1.75	2.5e-09	0	700	950	625	1100
2	2.3e-08	0	675	1000	600	1150

➤ Sensitivity Analysis for expenditure on treatment

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-
1	0	0	700	700	580	875
1.25	1.8e-14	0	650	780	515	1000
1.5	2.4e-12	0	600	850	475	1100
1.75	7.8e-11	0	550	900	450	1200
2	1.1e-09	0	520	1000	410	1250