INFRASTRUCTURE FINANCING, DEVELOPMENT EXPENDITURE AND ECONOMIC DEVELOPMENT IN KENYA

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Abstract

Infrastructure and how it is financed, is crucial as it is a catalyst to economic development. Infrastructure bonds have been used by many countries (both developed and developing) to finance infrastructure while others have embraced private sector financing including commercial bank financing since government sector allocations and utilisation coupled with bureaucratic redtapism in accessing development expenditures tend to limit infrastructure financing particularly in developing countries. Development expenditure allocation and utilisation need to be relatively high for adequate financing of activities that spur economic development. Public-Private-Partnerships (PPPs) have been emulated by many countries in which governments at national and county levels have partnered with not only development partners but also with private sector and other partners to accumulate sufficient funds (if they are ever enough) to finance infrastructure. The objective of the study was to establish the relationship between infrastructure financing, development expenditure and economic development in Kenya. For this, infrastructure financing was gauged on development expenditure and on economic development. Additionally government housing expenditure and roads construction expenditure were evaluated against total infrastructure expenditure and then on development expenditure and on economic development. Data for the study variables was obtained from the Economic Surveys of the National Bureau of Statistics for the period 2013 to 2024 inclusive. Descriptive statistics revealed varying ranges between minimums and maximums, average means, small standard deviations and skews to the left and right with normal and abnormal distributions. Correlation analysis revealed that infrastructure significantly influenced economic development. The disaggregation of infrastructure into roads construction and government housing

expenditure revealed that government housing expenditure had insignificant relationship with economic development while roads construction expenditure had more input to economic development. Regression analysis revealed that infrastructure development explained 37.5% of total development expenditure and was significant while development expenditure explained 49.3% of economic development which was also significant. Housing and roads explained 81.6% of construction sector with only roads being significant, housing and roads explained 26.8% of development expenditure with expenditure on roads being significant and the two again (housing and roads) further explained 9.74% of economic development with roads being significant. The study findings reveal the importance of roads infrastructure in fueling economic development. Expenditure on housing does not appear to influence Infrastructure, development expenditure and economic development significantly. These findings imply that although amounts used in the infrastructure sector increases economic development and especially expenditure on roads construction, other areas for government expenditure allocations need to be taken into account when formulating government policies for economic development to be experienced.

Keywords: Infrastructure Financing, Government Housing Expenditure, Roads Construction Expenditure, Construction Output, Development Expenditure, Economic Development

INTRODUCTION

Infrastructure development is defined as the construction of basic foundational services in order to stimulate economic development and to improve the quality of life. Baldwin & Dixon (2008) looks at infrastructure development as a set of services or elements which are ideal for establishing and operationalizing an economy while Rahman, Ismail & Ridzuan (2019) and Lewis (2019) classify Infrastructure investment into two categories which are, economic and social infrastructure. Economical infrastructure majorly contains road and rail transport, sewage treatments, bridges and telecommunications networks while social infrastructure encompases health, education, recreational facilities, prisons and tourism. The measurement of infrastructure development largely depends on the type of infrastructure in question. Rahman et al. (2019) operationalized infrastructure development as the amount of funds spent on road and rail transport, sewage treatments, bridges, telecommunications networks and social infrastructures; health, education, recreational facilities, prisons and tourism and currently Artificial Intellihence (AI). Infrastructure is categorized into three categories by Mutisya & Yarine (2014) as machinery and equipment, buildings, as well as engineering structures. Other non physical infrastructure, has been described as social, environmental, and institutional infrastructure (schools, hospitals,

prisons). They tend to encampus the basic physical infrastructure, which includes transportation infrastructure, water infrastructure, telecommunication infrastructure, as well as energy infrastructure. Another description of infrastructure is real estate development in urban areas which is the systematic process that involves creating, enhancing, or re-imagining physical structures and spaces in urban environments. This encompasses various activities which include land acquisition, zoning analysis, design, construction, and ultimately the management of the developed property. The objectives of real estate development are centered on meeting the demands of a dynamic urban population by providing residential, and commercial infrastructure (Jahan, 2021; Lewis, 2019; Kenya Economic Report, 2013).

Infrastructure development is believed to boost the economy and the industry of a nation and subsequently the society's welfare. This classical thought nonetheless is short of the essential viewpoint of their societal role, that is they are instruments that structure not only social territory but also economically. Transport plans for example are drawn by governments and are aligned to the country's aspirations even though there is inadequacy of resources thus giving rise to the need for bringing on board public sector borrowing in a bid to continue with infrastructure development (Jibir & Aluthge, 2019; Jahan, 2021). Infrastructure is an enabler to a country's economic development which therefore demands government to allocate sufficient funds to finance the economic infrastructural projects. Financing infrastructure is not cheap for economies because it requires not only huge financial allocations but sufficient monitoring to ensure that funds are not misappropriated particularly in developing countries.

Many developing countries allocate infrastructure expenditure from the broader development expenditures which are taken through the beauraucracy in their access and utilization because of competition with recurrent expenditure which although voluminous relative to development expenditure is rarely enough to finance routine activities of government. The many competing demands for development expenditure squeezes the amount that is available for allocation for infrastructure (Assi, Dimson, Goodman & Andersen, 2019). Even with infrastructure development itself the broad scope of its description as education infrastructure, health facilities infrastructure, agriculture infrastructure and mining and extraction infrastructure leave alone allocations set aside for roads, ports and railway line infrastructure is a mammorth to imagine (Garba, 1997; Hoddinott, Bates & Steedman, 1994). In the field of public finances, the issue of potential links between infrastructure spending and expenditure on development and whether the expenditure on infrastructure development significantly spurs economic development has intensely attracted the attention of policy makers. For instance, in Kenya, the aspect of macroeconomic imbalance and the risk associated with it comes as a result of the increase in shares of public expenditure and fiscal deficits in the country's GDP. Such

imbalance has existed and has been expanding despite the fact that the Kenyan transformative transition has significantly improved its fiscal system in recent years hence, creating a legal and institutional basis for sound fiscal policies (Ghartey, 2012). Furthermore, the the public sector contends that the government should also continue focusing on consolidation of medium-term plans and effective fiscal policies to curb domestic demand (Comprehensive Public Expenditure Review, 2017). Some countries have been able to implement infrastructure locally after which they have taken up huge infrastructure projects abroad. This does not however mean that these countries have all their own infrastructures in place. Countries like China finance infrastructure abroad but there are places in their own countries where infrastructure is underdeveloped. The role of the private sector in infrastructure adds stock of private sector investment which is basically on energy, real estate, and social infrastructure which are the biggest draws for private sector players. The government's divestment in roads and airports is likely to spur private participation particularly pension funds institutions as catalysts for not only infrastructure participation but economic development (Hou et.al, 2021; Tsaurai & Ndou, 2019; Kenya Economic Report, 2013).

Infrastructure takes time. It is not like making a parotta. Building great cities like those in China requires a lot of planning, and moreover government technocrates must draft a plan and be ready to implement it. Infrastructural projects such as bridges, dams, roads (both rural and urban), airports, ports, waterways, power and healthcare among others requires billions and billions of money (in multiple currencies) which is not available in many developing countries leaving the state of art infrastructural facilities for developing countries wanting (Gruzina, Firsova & Strielkowski, 2021; McCormick, Anderberg, Coenen & Neij, 2013; Imrie, 2021). Additionally housing infrastructure in many countries is also gaining ground. Imrie (2021) and Ofor & Alagba (2019) highlight the significance of real estate development in stimulating economic growth and satisfying housing needs in emerging markets. Urbanization often outpaces real estate development thus leading to an influx in demand for housing and commercial properties. Odhiambo (2022) contends that Real estate development in urban Kenya has seen notable growth, particularly in key urban centers such as Nairobi, Mombasa, and Kisumu. Nairobi, the largest city in Kenya, is at the forefront of real estate development in the region. The surge in commercial and residential projects has been driven by factors such as population growth and a ballooning middle class (Owuor & Mbatia, 2008). Mombasa has also seen remarkable developments focusing on tourism-related, mixed-use, and residential properties. The Mombasa-Nairobi Standard Gauge Railway has been integral in stimulating the development of real estate projects where urban centers have marooned along the railway (Imrie, 2021). Kisumu Port and other associated infrastructure projects have triggered growth in

the city's real estate landscape, responding to the city's dynamic urbanization patterns (Owino, 2016).

Despite these positive developments, challenges such as inadequate mobility infrastructure land tenure complications persist in urban environments across many developing countries such as Kenya (Mutisya &Yarime, 2014). One significant case involves the Tatu City project in Kenya which is a mixed-use development covering various sectors such as residential, commercial, industrial, and recreational spaces. The project faced legal challenges related to land ownership disputes and allegations of irregular land acquisition, impacting its progress and highlighting the need for meticulous due diligence in real estate developments (Owuor & Mbatia, 2008). Hou, Huang & Zang (2021) and Lau, Tiong & Ling (2009) contend that in many developing countries there is wholesale corruption, mismanagement and maladministration. Building a flyover or concrete footbridge in some countries particularly in Africa is unheard of leave alone building infrastructure. In some countrys' places Loggs are used as bridges while make shift structures and metallic tents are used as dwelling houses. This has been attributed to limited funds due to blotted recurrent government expenditure and high poverty levels leaving very little for development expenditure.

Corruption and mismanagement of government resources have been cited in a number of instances (Timsina, Poudel, Manandhar, & Adhikari, 2022) . Poor workmanship in which within a year lots of spots and cracks and digs are found on roads making infrastructure put in place unsustainable. Some countries have no long-term policy on infrastructure development like roads, railways, shipping, telecommunication, electricity and power and this ultra-right government is banking on neoliberal economic policy, shying away from investing in these projects and relegating the responsibility to the foreign sector. The most expensive part of the Economics of infrastructure development is acquisition of land. It depends on how effectively a government can acquire the land where the road, rail or other infrastructure is supposed to pass through. Exact compensation must be provided for people, which if not done, people can claim them through the courts. Draconian laws make it difficult to acquire land for infrastructure use. The high population density in some countries puts pressure on land availability and land use. Black money that moves in many countries and invested in land increases the cost of land which when acquired for infrastructure development makes it expensive. Sometimes foreign investors are not willing to invest in infrastructure because of insecurity, bad politics and heightened corruption. Additionally, land procurement, lethargic court proceedings and anti national NGOs tend to limit land acquisition for infrastructure development (World Bank, 2015; Lidiema, 2018; Dudzeviciute, Simelyte & Liucvaitiene, 2016).

Countries like China have leapfrogged into 21st century with world-class infrastructure. China's investment in every area of infrastructure dwarfs countries like India by a long shot. Politics have adversely impacted infrastructure in many countries as different countries have different political ideologies. For example, China is communist country where land is owned by government not by citizens while India follows parliamentray democratic structure where land is public property. This makes it difficult in India to procure land for infrastructure projects compared to Chinese government where Chinese government can just resettle the citizens somewhere else. This leads to increase in project cost as there is money spent for relocation. Additionally India cannot compete with China because of overpopulation, over dependence on agriculture and lack of proper education meaning lack of skilled people to develop proper infrastructure. In China there is no Opposition to block economically prudent Policies and Programmes. China need not spend money for buying votes as there are no elections in China. Economics and Politics have been singled out as the two main factors that impact infrastructure development (Timsina et. al., 2022; Hoddinott et. al., 1994). China is much more than Beijing, Shanghai and the Great Wall. There is a lot of China beyond the huge dams, railroads and projects. Some villages in China do not have roads or bus services. People in these villages travel for miles to see a doctor or go to school. Many villages are accessed by boats while the railways do not connect them to the country. In India, the Indian Railways was used by politicians as a tool to get elected by giving free stops and free trains which caused systematic problems in the Indian Railways. India has thus ended up lagging behind countries like China, Japan and even the United Kingdom (Matabazi & Irechukwu, 2023).

Another compelling case is the transformation of Tanzania's road sector through public-private partnerships (PPPs). It is apparent that any nation developing its road network focuses on its ability to promote the road sector growth to be leveraged on by trade and the harnessing of regional economies. The feasible PPPs normally attract private investment which in turn becomes a driver for the expeditious development of infrastructure. Within the context of the road sector, PPPs lead to improved network connectivity, and public mobility and additionally facilitate trade and investment. Basically, the very nature of PPP Concessionaires is anticipated to culminate in laying the ground for efficiency in public mobility, trade and investment which is in harmony with the emphasis on reforms and rebuilding mantra in the public sector. Experience in the Sub-Saharan region can be drawn from South Africa where over 300 PPP projects have been implemented since 1994. The South African National Treasury, the body that deals with PPP projects, have established documented procedures in dealing with the PPP projects that guide the process for engagement between a public sector institution and a private party. Under such guidance, the private parties assume substantial financial, technical and operational risk in

the design, financing, building and operation of projects (Matabazi & Irechukwu, 2023). Economies and nations have been financing infrastructure through traditional public funds in various forms whether in taxation regimes or loan grants. History attests that the road sector has been the leading beneficiary of public funds (Vernon, 1966; Lizondo, 1991; Cass, 1965). However, the growing need for financing road development projects has been piercing into the minds of the policymakers and unfortunately the overall national annual income. This state of affairs has culminated in the perpetual straining of available revenues and an inadequate pace for development in the road sector. Again, it is public knowledge that inadequate service condition of public roads has afflicted many countries since their independence (Barro, 1990;) With such deficiencies, they are constrained to rethink the modality for mobilizing capital investment towards road network development. While providing infrastructure through public financing is a core function of the State, PPPs offer options to undertake infrastructure projects in which up-front capital is provided by the private sector and under the agreed concessional structure.

Funding infrastructure is a mammoth particularly in many developing countries. Access to private sector finance permits increased investment in public infrastructure, compared to raising or budgeting additional funds. In reality, the additional public funding is not always available due to strains caused by other competing demands in social sectors as well as runaway infrastructure demands. For this reason, the imperative for the involvement of the private sector in partnering with the public sector should be supported at different decision-making levels by nations (Wolde-Rufael, 2008). The agricultural sector in particular, which accounts for a sizeable contribution to the economy in many developing countries such as Tanzania, is greatly dependent on the reliable and accessible road network. This linkage between agricultural productivity and the condition of the road network is causing downward pressure on governments to fund development and maintenance of road infrastructure (Alfaro, 2003; Ekpo, 2003). To lessen this downward pressure on the government's part, contemporary financing approaches must be thought through, formulated and implemented for the long-term common good. Amidst such harsh reality, and at this historical moment over 62 years since independence, countries like Tanzania are compelled to contemplate and reform ways and means for road project financing with particular emphasis on PPPs. The PPPs are expected to offer a host of benefits to the country which include but are not limited to; financial sustainability, improved public mobility, efficiency and quality, innovation and adaptation, and human capital development.

As far as financial sustainability is concerned, it is known that governments have been facing limitations in funding road projects for far too long. With the onset of the PPPs, countries

ultimately allow private investors to inject capital, reducing the strain on public finances and enabling the government allocation of funds to other critical social sectors such as health, rural energy education and safe water supply (Sanusi & Owoyele, 2016). In order to understand the financial sustainability of PPPs, it is imperative to consider the very nature of the large-scale infrastructure projects they may be used to facilitate. Regardless of whether the finance comes from the private sector (through a PPP) or the public sector (via traditional financing), funding infrastructure has certain distinct features from the perspective of an investor. Infrastructure investment is generally characterized by large up-front capital intensity during the construction phase, with relatively smaller operational costs. In PPPs, roads or hydroelectric dams, for example, are expensive to design and build, but once their construction is complete, they significantly lower operating and maintenance costs. It cannot be overemphasized that the primary objective of any government is to provide "services or at least build an environment to enable for socio-economic activities" through the availability of various forms of infrastructure (Glimsey & Lewis, 2004; Narayan & Narayan, 2006). Improved public mobility is attained through the PPP's investment in infrastructure, especially roads. The remote and seemingly underserved communities will most likely reap benefits from transport mobility. In essence, public mobility invigorates economies and thereby improves the livelihoods of the community and of the nation. A restrained society is definitely economically degenerative. The interaction among sectors and groups in all forms including, formal and informal, breathes life into societal well-being (Wolde-Rufael, 2008).

Efficiency and quality ensures that PPPs often culminate into enhanced project management. Contractors with expertise in road construction and maintenance, for example, can introduce contemporary technologies and industry best practices (IBP) whilst ensuring high-quality infrastructure. The most important motivation for the use of PPPs as an alternative method for financing and procurement of infrastructure is the potential for long-term gains in terms of efficiency and quality. It is important to note that when deploying PPP to any feasible project and within the appropriate framework and processes, a host of benefits can be realized. The benefits will be consolidated further through achieving an effective system under the desired outcomes in time and value (Wijburg & Aalbers, 2017; Ghartey, 2012; Assi et. al., 2019). For PPPs, the long-term expected cost to the public sector may be lower than with conventional project financing (and/or the expected benefits may be higher). This is the case even after considering the higher cost of capital (financial costs) associated with the private financing that forms part of the PPP. For user-pays PPPs, the efficiency usually result in lower charges to users and reliability of transport infrastructure. Irrespective of the mode of concessionaire, a technical challenge (that is, a project) must be tested through Cost-Benefit

Analysis in the long term. The solution must also be beneficial and valuable in terms of socio-economic outcomes on a wide scale and in the long run. It is at this juncture that the project should be tested as *"PPP feasible"* for the purposes of determining whether the PPP delivery will provide expected efficiency rather than reduced efficiency that may result from cost increases or lower benefits to the society. This is achieved through in-depth Value for Money assessment and monitoring during the PPP concession operational regime. In essence, the PPPs must demonstrate incremental efficiency and cost-effectiveness (Salisu, Raheem & Ndako, 2020).

Innovation and adaptation additionally enhances the performance-based nature of PPP contracts, the concessionaires provide benefits by encouraging innovation and focus on reforms and rebuilding strategies. In this context, it can be argued that when the requirements in a PPP concessionaire are properly designed on performance and deliverables, it is possible to grant the PPP project a certain degree of versatility and adaptability to structure and organize its own means and methods. Therefore, the private sector's ability to innovate will provide an additional source of savings and efficiency. Performance-based contracts are preferred in many instances (that is, there is a prescriptive agreed deliverables, through scope, specifications or requirements, rather than a prescription of the inputs or means of its implementation) (Kenya Comprehensive Public Expenditure Review, 2017; Baharumsiiah & Lau, 2010).

Human capital development focuses on managing and implementing PPP projects which would require skills development not only in physical engineering activities but also in contract administration and management. The need for adequate handling of concessionaires cannot be overemphasized as there is need to embark on the journey to project financing. Within the context of human capital development, the PPP project financing framework often creates a direct influence on generating employment opportunities through the construction and maintenance jobs and indirectly by boosting economies of sectors connected by improvement in mobility and transportation (David & Ampah, 2018; Aziz & Azmi, 2017; Oluwatobi & Ogunrinola, 2011). The public should be enlightened to understand that there is a favourable environment to reform and rebuild the modality for road infrastructure financing. The government's ability to reach out to all sectors increasingly needs support from other financing avenues such as PPPs. The evidence from developed countries such as Turkey, South Korea, Singapore, and UAE on the contribution of PPPs in infrastructure financing is overwhelming and therefore need to do away with being indecisive going forward. Bold and informed decisions must be made with all the caution for public long-term good which calls for weeding off indecision, self-doubt and a defeatist mindset. Any idea or notion is subject to introspection and is conducted with utmost diligence so that everyone is part of the country infrastructure commitment. With country

commitment to transformation through infrastructure it then becomes the direction of taking the step forward, the step that will be flagship to country prosperity. Essentially, the expectations are ripe for transformation and rebuilding along the path of PPP project financing (Baldwin & Dixon, 2008; Tsaurai & Ndou, 2012). Traditional financing has greatly helped many countries to thrive over the years in terms of expansion of road networks and improved standards of roads. However, these gains must be further consolidated by deploying other alternative forms of project financing such as PPPs to accelerate development. In any case, the public interests must be safeguarded to ensure that the road assets under the PPPs serve the intended objectives and are within the framework for cost recovery and transfer of the given concessionaire (OECD, 2023; International Monetary Fund, 2019).

Infrastructure bonds are another option of financing infrastructure. Infrastructure bonds are described as financial instruments issued with the primary aim of attracting investment for long-term development projects essential for a nation's infrastructure. These projects typically include the construction and maintenance of crucial public facilities such as roads, railways, ports, and utilities. Internationally, infrastructure bonds take various forms, including government infrastructure bonds, special-purpose bonds and corporate infrastructure bonds. However, the United States stands out as one of the most developed markets for such bonds, alongside countries like India, Australia, Chile, and Kazakhstan. In the U.S., infrastructure bonds are commonly known as revenue bonds and serve as a crucial means for financing large-scale infrastructure initiatives and facilitating economic development and societal advancement (Lidiema, 2018; Kim & Lee, 2022; World Bank, 2015).

The international context of infrastructure bonds underscores their importance in addressing infrastructure deficits and facilitating sustainable development on a global scale. Governments often establish bond programs as the primary source of funding for infrastructure projects, leveraging the issuance of bonds to finance critical initiatives while spreading repayment obligations over time. Bond funds dedicated to infrastructure investments offer investors the opportunity to gain exposure to a diversified portfolio of infrastructure bonds, providing potential income and capital appreciation (Kenya Comprehensive Public Expenditure Review Report, 2017; Karazijiene, 2015). Infrastructure bonds offer a source of long-term financing specifically designated for infrastructure projects, providing stability and predictability in funding. In contrast, traditional lending often involves shorter terms and may require collateral, limiting its suitability for large-scale infrastructure initiatives. Infrastructure bonds also attract a broader range of investors, including institutional investors like pension funds and insurance companies, diversifying funding sources and potentially reducing reliance on bank loans (Salisu, Raheem & Ndako, 2020). Public-private partnerships involve collaboration

between public and private entities to finance and manage infrastructure projects. While PPPs offer benefits like risk-sharing and access to private sector expertise, they may require complex contractual arrangements and revenue-sharing agreements. Infrastructure bonds provide an alternative financing avenue that allows governments to retain ownership and control over infrastructure assets while accessing capital markets for funding. Additionally, infrastructure bonds can be structured to finance projects that may not be suitable for PPPs, such as fully funded public facilities or projects with uncertain revenue streams (Kim & Lee, 2022; Rahman et. al., 2019).

Infrastructure bonds function as a means of financing long-term infrastructure projects essential for a nation's development. When a government or private entity plans to undertake a significant infrastructure initiative such as building highways, bridges, or water treatment facilities, it may issue infrastructure bonds to raise the necessary funds. These bonds are typically sold to institutional investors, including pension funds, insurance companies, and credit institutions, who are attracted to the stable returns offered by such investments over the bond's maturity period, which can span decades. The funds raised from the sale of these bonds are then used to cover the costs associated with planning, constructing, and maintaining the infrastructure facility (Chang, Li, Cheong & Goh, 2021; Doh-Nani & Awunyo-Vitor, 2012). In countries like India, infrastructure bonds are commonly issued by banks and other financial institutions to raise funds for development projects. These bonds may be structured as tax-saving instruments or regular income bonds, offering investors opportunities for tax deductions and stable income streams. However, challenges such as the lack of protection against inflation in the Indian market underscore the complexities of infrastructure financing. Despite these challenges, infrastructure bonds continue to play a pivotal role in addressing infrastructure needs and driving economic progress worldwide (OECD, 2023; Kiminyei, 2018).

In countries where infrastructure is dilapidated, roads are cut-off because of broken bridges, buildings are collapsing because of poor workmanship, and legal tussles because of passing infrastructure over illegal land, the key drivers of revival of infrastructure are the Energy Sector with the focus on renewable energy encompassing hybrid projects with storage and with transmission infrastructure to improve grid stability. Thermal power, Green hydrogen, ammonia, and ethanol and nuclear power projects are essential. Countries are constructing SuperHighways, Expressways, Modern Airport Terminals and Standard Gauge Railways as essentials for modernizing infrastructure. Additionally, social and high-tech infrastructure, including modern cities need to spur growth in housing, hospitals, hotels, and schools. Rising investments in semiconductors, data communication technology (ICT), Big-Data Analytics, data centers, electronics manufacturing, and warehouses are catalysts of infrastructure development.

This marks a shift from just "core infrastructure" (roads, airports) to "sizzle" sectors with strong growth potential. Highways and road monetization such as NHAI (National Highways Authority of India) attract high project cost and may call for sourcing funds through publicly listed infrastructure trust bonds to attract both retail and institutional investors. Private investment is crucial in which Experts urge governments to shift from being a developer to focusing on Public-Private Partnerships (PPP) (OECD, 2023; International Monetary Fund, 2019; Krajnekove, Jegelaviciute & Navickas, 2018; Marandu & Ditshweu, 2018; Makoni, 2015).

Foreign Direct Investment (FDI) has been embraced by many countries to finance infrastructure. China opened its economy to Foreign Direct Investment (FDI) in 1969 and was opened up partially in 1991. Today China is the world's second largest economy and has tremendous resources to rapidly build its infrastructure. China also has an added advantage of a single party rule in the entire country and thus there is no opposition to any initiative taken by the president of China. In India, politicians and NGOs run to courts and put spokes to delay implementation of development projects. India has a history of starting infrastructure projects just before the general elections to woo voters (Matabazi & Irechukwu, 2023). Between 1996 and 2013, studies were pursued to clarify impact of infrastructure development and foreign loans on economic development in 36 Africa's Sub-Saharan nations. Countries that spend the public sector borrowing on infrastructure development tend to report a positive effect on economic growth (Matabazi & Irechukwu, 2023). FDI has been used by countries to finance roads and bridges, airports and ports, schools and hospital facilities. The role of Multinational Corporations (MNCs) that expand their operations in host nations and directly contribute to an inflow of foreign direct investment through foreign real estate firms to capture the additional demand they create (Kim & Lee, 2021) tend to influence development of real estate. In a study done in Zimbabwe, Mazikana (2022) sought to evaluate the role of FDI inflows on the growth of the residential real estate sector in Gweru and the findings indicated that political stability, supporting infrastructure, wage rates, tax rates and the size of markets had the most impact. The study determined that FDI had positively influenced the growth of Gweru residential real estate. Evidently, increases in property prices, improvements in investment attraction and improvements in infrastructure and amenities were real.

RESEARCH PROBLEM

Infrastructure is an important tool for influencing economic development in both developed and developing countries. Countries spend huge amount of funds in financing infrastructure. After pumping billions and billions of money in infrastructure, there are stalled projects, broken bridges, roads with multiple potholes, delays in project completion, roads and

buildings on repariant land, abandoned railway lines, demand fluctuations, failed auctions, contract issues, and global trade tensions which are risks that are associated with investment in infrastructure. However, major recent accomplishments have seen the existence of mega infrastructure projects (such as the world's tallest railway bridge, 700-km Samruddhi Mahamarg Expressway) which suggest meaningful progress infrastructure development. From the government perspective Coalition politics, geopolitical tensions, and focus on trade negotiations, low-hanging reforms and major structural reforms (land, labor, privatization) have stalled making it difficult for government to be a catalyst of infrastructure development. Many countries are thus making an effort to improve the climate and make it more friendly for infrastructural development such as having employment-linked incentive (PLI) schemes, deregulation to reduce bureaucratic red tape and putting in place simpler tax laws and competitive state rankings to attract investment (Boldeanu & Constantinescu, 2015; Balemi, Fuss & Weigand, 2021).

Many countries are battered with criticisms with Infrastructure financing being criticized because Airports and subways are waterlogged after 2 hours rain and Collapsing Bridges, bad quality Expressways with numerous patches and Walls that crumble following a slight Earthquake. Shoddy engineering associated with having contractors and labourers who have no knowledge or skill to build modern good quality roads while the government engineers engage in corruption to pass bad quality work as approved (Baldwin and Dixon, 2008; Kia, 2008).

Kenya as Country faces challenges of limited finances for financing infrastructure owed to the many activities that require financing. The role of participation by the Public Sector and the Private Sector by establishing Public-Private Partnerships (PPPs) eminently needs to be leveraged upon while recognizing the role of Development Partners in championing the Country's Economic Agenda. Embracing Resilience and Sustainability in PPPs and other Partnerships aligns well with the global clarion call to promote inclusive, resilient, and sustainable socio-economic development, which is sensitive and responsive to climate change and indeed to Kenya Vision 2030 as well as Sustainable Development Goals (SDGs). Infrastructure Projects can be leveraged on as they tend to be the most effective, efficient, and strategic development special purpose vehicles. The Digital Economy avails opportunities that enable the creation, dissemination, and application of innovative solutions. Big Data Ana-lytics and Industry 4.0 and associated technologies need to be embraced to realize economic development (Oladimeji & Ogunrinola, 2011). Establishing seam-lessly connect networks and fostering dynamic communities within the practice of the project management sphere between practitioners and academia is essential to spur economic development (Acemoglu, 1998). Contributory research interest in Emerging Technologies propelled by Artificial Intelligence

within the landscape of Project Management coupled with participation in Sustainable Development, Security Sector Reforms, Risk and Security Management and the nuanced areas of Terrorism and Violent Extremism are key to fast-tracking economic development since countries need to leverage on peace to take development to the next level (Ofor & Alagba, 2019; Odhiambo, 2022). Construction of roads and bridges including airports and ports cannot be perfectly built in countries torn by war. After all they are blown out by bombs even before they are completed leaving debris and dilapidated structures everywhere thank god Kenya is not a war- torn country

The Kenya construction sector boasts of roads in form of super-highways, expressways, roads over-and-underpasses, modern airport terminals, computerized ports and affordable housing programme. Financing these infrastructure is not automatic as funds are not sufficient as Government financing is limited by demands for funds by other sectors of the economy. The highest proportion of government expenditure year -in-year-out is recurrent expenditure leaving a very small proportion for financing development activities. Of the development expenditure allocation many development activities requires financing calling for expenditure prioritization. The construction sector fights for funds to be allocated for construction of roads and housing funded by government money especially during the current era of affordable housing. Railroads and other infrastructure facilities are demanders of the same funds. The Standard Gauge Railway (SGR) in Kenya is a beneficiary of infrastructure funds channelled from development expenditure.

This study evaluates infrastructure financing and economic development while recognizing that this financing is nationally fitted within development expenditure. Is development expenditure relative to total government expenditure significant? Out of this development expenditure how much is spent on construction particularly government housing and roads construction? Does government housing expenditure and expenditure on roads spur economic development? This research determines the effect of spending on infrastructure and whether this expenditure spurs economic development in Kenya while recognizing it as a component of development expenditure.

RESEARCH METHODOLOGY

The study sought to determine the relationship between infrastructural financing, development expenditure and economic development in Kenya. Development expenditure and economic development were correlated while the effect of infrastructure expenditure and development expenditure was established and finally infrastructure and economic development was estimated. Infrastructure was measured using Construction output value to total development expenditure and was correlated with development expenditure which was

measured as Development expenditure to total government expenditure. Additionally, development expenditure was correlated to economic development which was measured using natural logarithm of GDP at market prices. Construction expenditure was further disaggregated into government housing expenditure and roads construction expenditure. Government housing expenditure was estimated as Government expenditure on Housing to total construction output while roads construction expenditure was estimated using Roads construction expenditure to total development expenditure. Development expenditure was measured using total development expenditure to total government expenditure. To correlate development expenditure to economic development, GDP at market prices was used and was measured using natural logarithm of GDP at market prices. Data that was used in this study was collected from Economic Surveys published by the National Bureau of Statistics of Kenya for the period 2013 to 2024.

Descriptive statistics on minimum, maximum, mean, standard deviation, kurtosis and skewness were calculated and interpreted. Correlation analysis was done to establish the relationship between the study variables. A series of regression models were run to determine the inter-relationships between the variables and the significance of the independent variables relative to the dependent variables. These analytical techniques have been recommended by Gallagher 1994) and Gallagher & Watson (1984).

The objective was to establish the relationship between infrastructure and economic development while recognizing the influence of development on both to control them. The series of equations are as stated:

$EconDev = \beta_0 + \beta_1 InFr$

Where: EconDev=Economic Development measured as log GDP at market prices;

InFr= Infrastructure Financing as construction output to total development expenditure

β_0 = The intercept; β_1 = coefficient of the independent variable

The study employed a series of regression equations to achieve the objective and also estimated regressions that incorporated development expenditure as a key component from which infrastructure expenditure is allocated.

The first regression estimated the effect of infrastructure on development expenditure.. This regression wanted to find out whether infrastructure is materially significant when compared to development expenditure. Infrastructure expenditure was measured as construction output value to development expenditure. Development expenditure was measured using development expenditure to total government expenditure. The equation was stated as thus;

$$ToDevExp = \beta_0 + \beta_1 ToCONSExp \tag{1}$$

As for this equation ToDevExp was total development expenditure and ToCONSExp was total construction expenditure measured as total construction output value to total development expenditure.

A second regression correlated development expenditure to economic development. Is development expenditure significant to influence economic development or is it too small relative to total allocations and usage by government (total government expenditure)? Here development expenditure was measured using total development expenditure to GDP at market prices.

$$EconDev = \beta 0 + \beta 1TDevExp \tag{2}$$

EconDev was economic development measured as natural logarithm of GDP at market prices TDevExp was total development expenditure.

The third regression established the relationship between government housing expenditure and roads construction expenditure to total construction expenditure. In construction expenditures of government are there other expenditures other than housing and roads and how significant are they? The equation was thus stated as;

$$TCONSExp = \beta 0 + \beta 01GovHsgExp + \beta 2RdsConsExp \tag{3}$$

In which TCONSExp was total construction expenditure, GovHsgExp is government housing expenditure and RdsConsExp is roads construction expenditure. Government housing expenditure was measured using government expenditure on housing to total construction output and roads construction expenditure was measured as expenditure on roads construction to total development expenditure.

A fourth regression equation determined the correlation between government housing expenditure and roads construction expenditure to total development expenditure. Does government expenditure on housing and roads contribute significantly to total development expenditure? Development expenditure in this scenario was measured using total development expenditure to total government expenditure. The other two variables were as measured in the equation 3.

$$TDevExp = \beta 0 + \beta 1GovHsgExp + \beta 2RdsConsExp \tag{4}$$

The fifth regression was estimated and determined the effect of government housing expenditure and roads construction expenditure to economic development. The variables were measured as in equation 2 and as per equation 3 and 4.

$$EconDev = \beta 0 + \beta 1GovHsgExp + \beta 2RdsConsExp \tag{5}$$

RESULTS AND DISCUSSIONS

Trend Analysis

Graph 1: Trend Analysis of Infrastructure Components and Economic Development
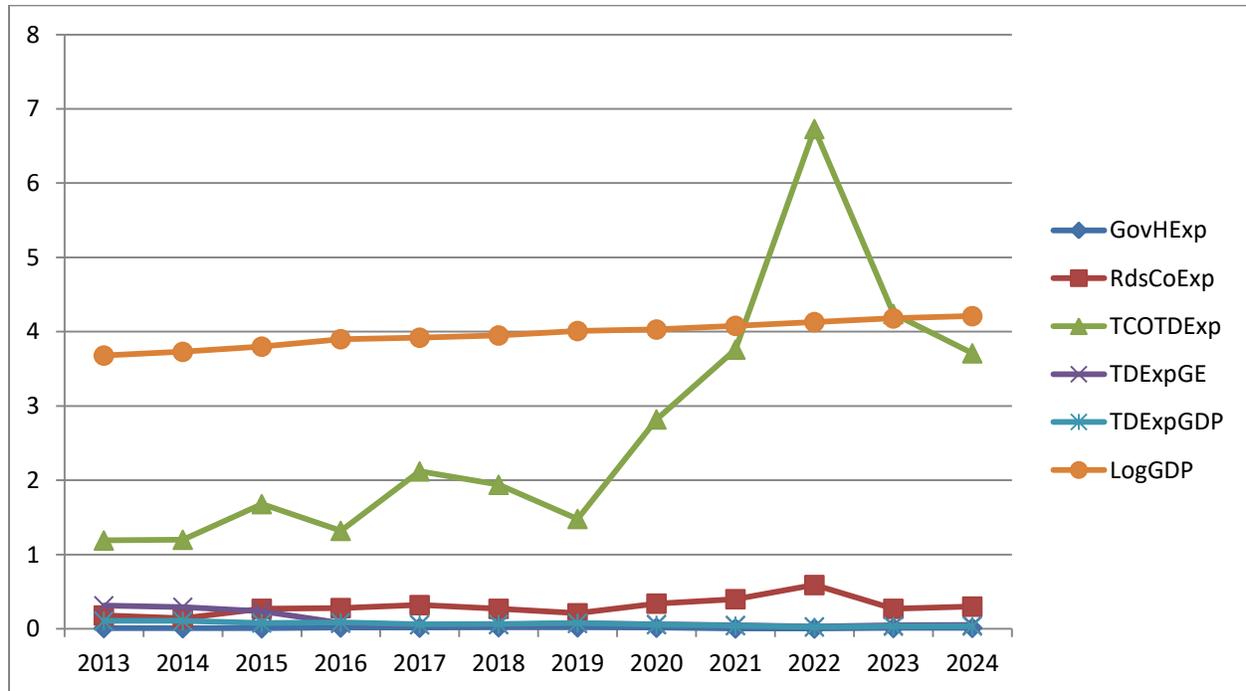
The graph indicates that GDP was fairly high but increased marginally. Total development expenditure when measured as a proportion to GDP was almost constant lying flat on the horizontal axis. Measuring total development expenditure to total government expenditure does not appear to change the scenario much as the ratio is slightly higher at the beginning of the study period after which it lies flat on the curve of development expenditure to GDP. The possible explanation is that development expenditure is quite low with the highest amount of government expenditure being recurrent expenditure. Total construction expenditure to development expenditure is quite high and increased (though fluctuated) only to decrease in the last three years of the study period. Roads construction expenditure increased marginally from 2023 to 2024 with the expenditure performance being better than development expenditure to total government expenditure or development expenditure to GDP at market prices. Government expenditure on housing was minimal with a flat curve on the horizontal axis meaning minimal expenditure by government on housing.

Descriptive Statistics

Table 1: Descriptive Statistics (N=72)

	Min	Max	Mean	StdDev	Skewness	Kurtosis
EconDev	3.68	4.21	3.968	0.173	-0.286	-0.882
TCONSExp	1.187	6.725	2.678	1.669	1.407	1.92
GOvHsgExp	0.0045	0.0224	0.013	0.006	0.182	-1.056
RdsConsExp	0.141	0.587	0.297	0.115	1.408	3.226
ToDevExp/GExp	0.029	0.312	0.111	0.104	1.371	0.105
ToDevExp/GDP	0.023	0.106	0.064	0.028	0.168	-1.805
GDP(market prices)	3.68	4.21	3.968	0.173	-0.286	-0.882

The data was for the period 2013 to 2024 (inclusive) and established the minimum, maximum, mean, standard deviation, skewness and kurtosis of the variables of the study. The variables for economic development, total construction expenditure, government housing expenditure, roads construction expenditure, total development expenditure and economic development were estimated. The values for economic development were minimum (3.68), maximum (4.21), mean (3.968), standard deviation (0.173) and skewness and kurtosis of (-0.286) and (-0.882) respectively. The variation was not too big but the negative skewness value means that the observations are skewed to the left while the -0.882 means that the data observations are normally distributed. Data observations for construction expenditure showed a minimum of 1.187, a maximum of 6.725, a mean of 2.678 and a standard deviation of 1.669. Construction expenditure was quite high including its average with relatively big variations. The positive skewness value denotes that the data observations is skewed to the right while the kurtosis value of 1.92 reflects normal distribution. Government housing expenditure had a minimum of 0.0045, a maximum of 0.0224, a mean of 0.013 and a standard deviation 0.006 which denotes that the values were not too high and these values did not vary significantly. The positive skewness value shows that the data is skewed to the right and the kurtosis value of -1.056 shows that the data observations are normally distributed. Roads construction expenditure had a minimum (0.141), maximum (0.587), mean (0.297) and a standard deviation (0.115) showing that the lowest was quite low but the maximum was quite high with an average mean but low variation. The positive skewness is an indication that the data observations are skewed to the right and the kurtosis value of 3.226 ($-1.96 < x < +1.96$) reveals that the data observations were not normally distributed. Total development expenditure to total government expenditure values estimated a minimum of 0.029, maximum of 0.312, mean of 0.111 and

standard deviation of 0.104 which reveals a low average with average variation. The positive skewness value shows that the data observations are skewed to the right and the kurtosis value of 0.105 denotes that the data is normally distribute. Development expenditure to GDP at market prices showed minimum, maximum, mean and standard deviation of 0.023, 0.106, 0.064 and 0.028 revealing almost constant values with low average and little variation. The positive skewness value is an indication that the data observations are skewed to the right while the kurtosis value of -1.805 (-1.96<x<+1.96) is an indication that the data observations are normally distributed. The GDP at market prices had a minimum of 3.68, a maximum of 4.21, a mean of 3.968 and a standard deviation of 0.173 meaning high minimum, small range between the minimum and maximum values, high mean and low variation of the data observations. The negative skewness means that the data observations are skewed to the left and the kurtosis value of -0.882 shows that the data observations are normally distributed.

Table 2: Correlations

	EconDev	GovtHsgExp	RdsConsExp	TCONSExp	ToDevExpGE	ToDevExpGDP
EconDev	1	-0.430*	0.5923**	0.762*	-0.863**	-0.9184**
GovtHsgExp	-0.430*	1	-0.393*	-0.49*	-0.3096*	0.2136*
RdsConsExp	0.5923**	-0.393*	1	0.863**	-0.6224**	-0.7816**
TCONSExp	0.762*	-0.49*	0.863**	1	-0.573*	-0.8868*
ToDevExpGovExp	-0.8630**	0.3096*	-0.6224**	-0.573*	1	0.8011**
ToDevExpGDP	0.9184**	0.2136*	-0.7816**	-0.8868*	0.8011**	1

*10% significance level; **5% significance level

The correlations in table 2 show the inter-relationships between and among the variables. Evaluated on the basis of 5% significance level Economic development had an insignificant negative relationship with government housing expenditure (p=-0.430*) and also an insignificant positive relationship with total construction output (p=0.762*). Roads construction expenditure was significantly positively associated with economic development (p=0.593**), while total development expenditure to government expenditure and total development expenditure to GDP at market prices were significantly negatively associated with economic development with correlation values of (p=-0.863**) and (p=-0.9184**) respectively. Government housing expenditure was insignificantly negatively associated with roads construction

expenditure (p=-0.393*), negatively but insignificantly associated with total construction expenditure (p=-0.49*), insignificantly negatively associated with total development expenditure to total government expenditure (p=-0.3096*) and insignificantly positively associated with total development expenditure to GDP at market prices (p=+0.2136*). Roads construction expenditure was positively and significantly associated with total construction expenditure (p=0.863**), significantly negatively associated with development expenditure to total government expenditure (p=-0.6224**) and negatively significantly associated with total development expenditure to GDP at market prices (p=-0.7816**). Additional total construction output and total development expenditure to total government expenditure were negatively but insignificantly associated (p=-0.573*) and also insignificantly negatively associated with total development expenditure related to GDP at market prices (p=-0.8868*). Total development expenditure to total government expenditure was significantly positively associated with total development expenditure to GDP at market prices.

Regression Equations

The Relationship Between Construction Expenditure and Government Expenditure

To address this objective, the study evaluated the effect of construction expenditure on development expenditure and seeked to determine whether construction expenditure constitutes a significant portion of development expenditure. The bone of contention was whether funds allocated by Government for development expenditure is channelled for infrastructure development and if so whether this amount is significant. Infrastructure expenditure is majorly construction expenditure but how significant is it relative to the total development expenditure and additionally to the total government expenditure? Two sub-regressions were estimated to attain this sub-objective. One was to determine the effect of construction expenditure on development expenditure and the other estimated the effect of construction expenditure on government expenditure. The other sections in the analysis disaggregates infrastructure into government housing financing and roads construction expenditure and evaluates their effects on development expenditure as well as their contribution to economic development.

The Relationship Between Construction Expenditure and Development Expenditure

In estimation of the effect of construction expenditure on development expenditure, the summary results given in Table 3 indicate that the regression model provided a correlation R-value of 0.461 and an R squared value of 0.3749. This has an indication that the construction expenditure was found to have the ability of explaining about 37.49 percent of change in development expenditure.

Table 3: Construction Expenditure and Development Expenditure

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.461[a]	.3749	.3546	2.78986

a. Predictors: (Constant), Construction Expenditure

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	97.859	1	70.769	27.745	.000[b]
	Residual	45.201	18	2.749		
	Total	143.060	19			

a. Dependent Variable: Development Expenditure b. Predictors: (Constant), Construction Expenditure

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.207	.780		.084	.742	-2.451	2.637
	Construction Expenditure	-0.036	3.067	-0.549	2.873	.001	7.412	16.513

a. Dependent Variable: Development Expenditure

The output of ANOVA displayed in Table 3 provided a value of 70.769 being the sum squares of regression with the same mean value. The model gave a sum of squares for residual as 45.201 with mean squares value of 2.749. The model further gave an F – value of 27.745 and a strong p – value of 0.000. This means that the study doesnot accept the null hypothesis that construction expenditure does not have significant effect on development expenditure since the p – value is below 0.05. The coefficient results have shown that construction expenditure influences development expenditure significantly in the Kenyan economy. The value between the two variables provided a coefficient value of -0.036 ($t = 2.873$) and a p value of 0.001). The regression equation is thus stated as;

TDevExp = 0.207-0.036TCONSExp

Where,

TDEVExp is the total development expenditure and TCONSExp is the total construction expenditure and reveals that as construction expenditure increases development expenditure decreases which is an inverse relationship.

Effect of Total Development Expenditure on Economic Development

Government expenditure was evaluated against economic development and thus the study tested its influence on economic development. The summary of model results produced an *R* value of .433 and an *R* squared of .493 as shown in Table 3. This means that development expenditure is likely to lead to change in economic development by a margin of 49.3% with the remaining percentage of 51.7% being explained by other factors not included in the model.

Table 4: Development Expenditure and Economic Development

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.434[a]	.493	.367	2.88628

a. Predictors: (Constant), Development Expenditure

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	113.653	1	85.742	41.731	.000[b]
1	Residual	29.407	18	2.171		
	Total	143.060	19			

a. Dependent Variable: Economic Development

b. Predictors: (Constant), Development Expenditure

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
	(Constant)	4.34	.7840		-.359	.686	-1.845	1.458
1	Development Expenditure	-5.73	3.252	.954	7.451	.000	12.132	19.744

a. Dependent Variable: Economic Development

The analysis of variance findings indicated in Table 4 show a regression sum squares value of 113.653 (Mean square = 85.742) and a residual sum squares of 29.407 (Mean square = 2.171). Development expenditure and economic development model provided an *F* – value of 41.731 with a significance value ($p = 0.000$). This implies that the study should reject the null hypothesis that development expenditure does not significantly affect economic development in Kenya since the error we make by doing so is <0.05. The coefficient results for development expenditure shows that economic development is significantly influenced by development

expenditure as it gave a coefficient value of -5.73 (t = 7.451) supported with a significant p value of .0000. In other words, increasing development expenditure is likely to lead to a reduction of economic development in Kenya.

EconDev = 4.34 - 5.73 ToDevExp

Where,

EconDev is economic development while ToDevExp is total development expenditure. The negative sign of the coefficient of development expenditure possibly implies that spending more on recurrent expenditure could fast-track economic development resulting from the multiplier effect through consumption expenditure.

The Effect of Government Housing Expenditure and Roads Construction Expenditure on Total Construction Expenditure

Expenditure incurred on construction is diverse and tends to have various components. In this study, Construction Expenditure was disaggregated into housing expenditure from government and roads construction expenditure which is also government. The summary results given in Table 5 indicate that the regression model provided a combined correlation R-value of 0.961 and an R squared value of 0.816. This has indication that the two independent variables under study were found to explain approximately 80.6% of variation in construction expenditure in Kenya. This is an indication that there exist other predictor variables not in the model which could be included to improve the model's goodness of fit as 19.4% of construction is explained by other activities other than on housing and roads.

Table 5: Government Housing Expenditure and Roads Construction
Expenditure to Total Construction Expenditure

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.961[a]	.816	.791	1.57567

a. Predictors: (Constant), Housing Expenditure, Roads Construction Expenditure

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	115.383	2	33.511	21.684	.000[b]
1	Residual	27.677	17	3.169		
	Total	143.060	19			

a. Dependent Variable: Construction Expenditure

b. Predictors: (Constant), Housing Expenditure, Roads Construction Expenditure

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-1.22	.827		-1.067	.989	-2.516	1.213
	Government Housing Expenditure	-138.97	8.371	-.671	-1.876	.447	-18.727	8.511
	Roads Construction Expenditure	12.45	6.351	1.431	2.736	.000	5.054	49.120
a. Dependent Variable: Construction Expenditure								

The output of ANOVA gave a regression sum squares of 115.383 and a residual sum squares of 27.677 with mean squares value of 33.511 for regression and 3.169 for residual. The model provided an F – value of 21.684 and a significant value of 0.000. The model thus informs that the government housing expenditure and roads construction expenditure as independent variables were acceptable and fit to determine the level of total construction expenditure of the country. Thus, the study rejects the null hypothesis that government housing expenditure and roads construction expenditure do not significantly influence the country's construction output.

Based on the results, it can be construed that despite predictor variables showing significant relationship towards construction activities by value in the individual tests, only road construction was found to predict construction activities by value significantly when they are grouped together. Road construction expenditure gave a coefficient value of 12.45 ($t = 2.736$, $p = .000$). On the other hand, government housing expenditure was found to have a weak relationship towards construction output as it reported a coefficient value of -138.97 accompanied with a t value of -1.876 and an insignificant p value of .447. Therefore construction activities can be influenced through roads construction as opposed to government spending more on housing.

TConsExp = -1.22 -138.97GovHExp + 12.45RdsCoExp

Where,

TConsExp is total construction expenditure, GovHExp is government housing expenditure and RdsCoExp is roads construction expenditure. The negative constant term of -1.22 means that when nothing is spent on housing by government and no expenditure is incurred in road construction total construction output decreases. Additionally, spending more on housing by government reduces construction output as denoted by the negative coefficient while increasing the expenditure on roads increases the value of Kenya's construction output.

The Effect of Government Housing Expenditure and Roads Construction
Expenditure on Development Expenditure

The study also resolved to test the effect of both government housing expenditure and expenditure on roads on development expenditure. The summary results given in Table 6 indicate that the regression model provided a combined correlation R-value of 0.341 and an R squared value of 0.268. This has indication that the two independent variables studied (government housing expenditure and roads construction expenditure) were found to explain approximately 34.1 percent of development expenditure relative to total government expenditure. This is an indication that there exists other predictor variables not in the model which could be included to improve the model's goodness of fit to explain the remaining 65.9%.

Table 6: The Effect of Government Housing Expenditure and Roads
Construction Expenditure on Development Expenditure

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.341[a]	.268	.232	3.16475

a. Predictors: (Constant), Government Housing Expenditure, Roads Construction Expenditure

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	116.623	2	53.431	20.426	.000[b]
	Residual	26.437	17	4.129		
	Total	143.060	19			

a. Dependent Variable: Development Expenditure

b. Predictors: (Constant), Government Housing Expenditure, Roads Construction Expenditure

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	0.296	.654		-.068	.952	-1.656	1.354
	Government Housing Expenditure	-5.482	6.148	-.527	-.796	.435	-19.327	7.341
	Roads Construction Expenditure	-0.596	8.092	1.314	2.567	.009	6.054	39.224

a. Dependent Variable: Development Expenditure

The output of ANOVA gave a regression sum squares of 116.623 and a residual sum squares of 26.437 with mean squares value of 53.431 for regression and 4.129 for residual. The model provided an F – value of 20.426 and a significant value of 0.000. The model therefore contends that government housing expenditure and roads construction expenditure as independent variables were acceptable and fit to influence the level of development expenditure of the country. This could be an indication that the joint effect of all the predictor variables used in the study is significant in influencing the county's development expenditure. Thus, the study rejects the null hypothesis that government housing expenditure and roads construction expenditure in Kenya do not significantly influence the country's development expenditure.

Based on the results on coefficients, it can be construed that despite predictor variables showing some significant relationship towards the amount of development expenditure in the individual tests, only expenditure on roads construction to predict incurrence of development expenditure significantly when they are grouped together. Roads construction expenditure gave a coefficient value of -0.596 ($t = 2.567$, $p = .009$). On the other hand, government housing expenditure was found to have a weak relationship towards the country's development expenditure as it reported a coefficient value of -5.482 with a t value of -0.796 and an insignificant p value of .435.

TDevExp = 0.296 -5.482GovHExp -0.596RdsConsExp

Where,

TDevExp is the total development expenditure, GovHExp is government housing expenditure and RdsConsExp is the roads construction expenditure. The equation reveals that when no expenditure is incurred on government housing and one is incurred on roads construction there is a unit increase in development expenditure of 0.296. Additionally, there is an inverse relationship between expenditure by government on housing and on roads construction and total development expenditure.

The Effect of Housing Expenditure and Roads Construction Expenditure on Economic Development

The study estimated the effect of disaggregated variables of government housing expenditure and roads construction expenditure and their influence on economic development. The summary results given in Table 7 indicate that the regression model provided a combined correlation R-value of 0.115 and an R squared value of 0.0974. This has indication that the two independent variables under study (government housing expenditure and roads construction expenditure) were found to explain approximately 9.74 percent of variation in the economic development of the country as measured using GDP at market prices. This is an indication that

there exist other predictor variables not in the model which could be included to improve the model's goodness of fit.

Table 7: Effect of Government Housing Expenditure and Roads Construction Expenditure on Economic Development

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.115[a]	.0974	.0613	1.56940

a. Predictors: (Constant), Government Housing Expenditure, Roads Construction Expenditure

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	97.412	2	44.251	21.684	.000[b]
	Residual	45.548	17	2.119		
	Total	143.060	19			

a. Dependent Variable: Economic Development

b. Predictors: (Constant), Government Housing Expenditure, Roads Construction Expenditure

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.865	.617		-1.076	.875	-1.387	1.703
	Government Housing Expenditure	0.404	4.209	-.627	-.926	.467	-20.817	6.532
	Roads Construction Expenditure	0.912	7.042	2.423	3.716	.012	6.154	37.206

a. Dependent Variable: Economic Development

The output of ANOVA gave a regression sum squares of 97.412 and a residual sum squares of 45.548 with mean squares value of 44.251 for regression and 2.199 for residual. The model provided an F – value of 21.684 and a significant value of 0.000. The model therefore reveals that the government housing expenditure and roads construction expenditure as independent variables were acceptable and fit to determine the economic development of the country as measured using the GDP of the country at market prices. Thus, the study rejects the

null hypothesis that government housing expenditure and roads construction expenditure do not significantly influence country's economic development.

Based on the results on coefficients, it can be construed that despite predictor variables showing some significant relationship towards economic development in the individual tests, only roads construction expenditure was found to influence GDP at market prices significantly when they were put in the same regression model. Roads construction expenditure gave a coefficient value of 0.912 ($t = 3.716$, $p = 0.012$). On the other hand, government housing expenditure was found to have a weak relationship towards economic development as it reported a coefficient value of 0.404 accompanied with a t value of -0.926 and an insignificant p value of 0.467.

EconDev =3.685 + 0.404GovHousgExp +0.912RdsConsExp

Where,

EconDev is economic development, GovHousgExp is government housing expenditure and RdsConsExp is roads construction expenditure. The constant term of 3.685 reveals that with no expenditure on housing and on roads by government the country experiences significant economic development. Any increase in government housing expenditure and increase in roads construction expenditure leads to an increase in economic development. Therefore spending on housing construction and on roads construction by government is expected to fast-track economic development.

CONCLUSIONS

Infrastructure and infrastructure financing is important to every economy as it makes it possible for the economy to offer goods and to extend services to its people. This study was keen on determining whether infrastructure financing influences economic development in Kenya. The results from the descriptive statistics revealed that the means were not materially significant and data observations were mainly skewed to the left. Most of the data observations were also normally distributed. Correlation analysis showed that there were significant relationships between most of the variables. The regressions revealed that there were significant influence of construction output to development expenditure and that construction expenditure explained 37.5% of development expenditure. Development expenditure significantly determined economic development as it explained 49.3% of economic development meaning that the other 50.7% can be explained by other factors not incorporated in the model. Housing expenditure financed by government and roads construction expenditure explained 81.6% of construction output with 18.4% being explained by other factors with only the road construction expenditure being significant (the government housing expenditure component was

not significant). Government housing expenditure and roads construction expenditure were able to explain 9.74% of economic development meaning that 90.26% of economic development was as a result of other factors other than government expenditure on housing and roads construction expenditure. Only road construction had a significant influence on economic development (government housing expenditure was not significant). The results should be interpreted while bearing in mind that published data is diverse and use of different data could led to different results. Future researches can use aggregates of total housing expenditure (including maintenance and work-in-progress) by both public and private sector (including development partners) and total road construction costs (including road maintenance and work-in-progress) by public sector, private sector and development partners. The scope of future studies could encompass the financing of infrastructure of rail, airports, water, energy, agriculture, health care and education and the role of green bonds in financing infrastructure in Kenya. These categories of infrastructure can be correlated with parameters such as economic development, foreign direct investment (FDI) and public debt and control variables of macroeconomic variables (inflation, interest rates and foreign exchange rates) included in the analytical models to make the analysis robust. Additionally, Government technocrats in liaison with the National Bureau of Statistics (NBS) and Government Printers need to publish the requisite data at the appropriate level of detail to enable those who want to use it for Data Accumulation in International Reports (such as by IMF and Word Bank) for country rating or for research and other purposes to be able to obtain it. As for policy there is need to increase expenditure on housing and on roads to fast-track economic development.

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