ASSESSMENT OF THE EFFECT OF ROAD PROVISION ON PROPERTY RETURNS.IN BOSSO ESTATE, MINNA, NIGERIA.

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ABSTRACT

The paper assesses the effect on property investment returns, of public capital investment (budgetary expenditures) on road infrastructure in Bosso Estate, Minna (Nigeria) with the aim of establishing the degree of impact of public capital investment on property investment returns. The paper covers an important policy and practice issue regarding the impact of government spending on the real estate industry. The government is keen to know the areas of greater impact of its expenditures and the extent to which the benefits from the effect may go in enhancing or providing funds (through tax) for new

Introduction

Cities are centres of economic activity hence there is a need for convenient delivery of goods and services for the sustainability of city economic activities (Yen et al., 2018). Being a part of Minna Metropolitan, the Bosso Estate neighbourhood will also need the essential accessibility for the best supply of goods and services. The Bosso Estate neighbourhood is a medium density area with mixed-use buildings (residential and corner shops). Nowadays, there is a search for infrastructure that should have effect on almost all sectors of human endeavour (Gibbons et al., 2019). Lieske et al. (2018) cite a good illustration of the effect of road provision on property investment. However, providing this infrastructure requires a lot of capital (Hesse and McDonough, 2018).

In Nigeria, the only source of funding for road provision has been through government budgets, and there are several demands on this funding source (Adebosin et al., 2019). As a result, the government now needs to devise a method for deciding where to make capital expenditures that will provide it access to other funding sources for road provision such as value capture (Roukouni et al., 2018). Value capture, according to Porter and Kramer (2019), is the process of identifying and documenting the rise in property values brought on by specific public capital investments in a constrained benefit region.

Due to higher real estate investment returns, these rising property values have a positive impact on the economy's real estate sector (Jedwab and Storeygard, 2019; Yang et al., 2019). Value added property taxes on rising property values can be used to partially or fully finance public capital investments as a substitute source of funding for roads (Noring, 2019; Grover and Walacik, 2019). Simply put, value capture refers to the rise in value

road infrastructure provision or repair of existing ones as it faces funding challenges in providing new infrastructure or improving existing ones. The before-and-after case method is employed in the study to the increase in property values (rental and sales). The findings demonstrate that once budgetary expenditure (road reconstruction) occurred, property investment returns in the area increased. The findings serve as the foundation for the government's decision to provide more funds for budgetary allocations and expenditures connected to the infrastructure for road provision. The findings also estimate the potential for capturing the rise in returns from real estate investments as a potential alternative funding source through property.

Keywords: *Effect, budgetary expenditures, property, investment returns, road.*

of properties close by that appear to have profited from increased accessibility that comes along with public capital investments.

Some governments have continued to recognize the significance of value capture as a result of value uplift, even though literature has disclosed numerous case study locations and illustrated the outcomes of infrastructure-dependent property value uplift. As an example, the Government of New South Wales altered the term "value capture" to "value sharing" (Yen et al., 2018). As a result, the government will benefit from a portion of the value increase and be able to raise more money to support public projects. Again, despite numerous studies on the effect of road infrastructure on property values, the majority of which focus on rails and roads are mostly on residential properties (Wang et al., 2019; Seo et al., 2019; Yang et al., 2019; Baker and Lee, 2019; Li, Chen, and Zhao, 2019), there is a dearth of research on the impact of road provision on property investment returns.

In order to ascertain the extent of the budgetary expenditures impact on the returns from property investments, this research accesses the effect of road provision expenditures on property investment returns in Bosso Estate Minna. The pattern of property investment returns before-and-after budgetary expenditures is used in the research to detect an increase in property values (rental and sales) as measured by the before-and-after case technique.

LITERATURE REVIEW

The land theory, developed by Alonso and Muth in 1964 and 1969, provides the theoretical foundation for increases in property values caused by greater accessibility. In essence, increased accessibility raises land rents since it gives landowners more accessibility options in terms of travel. Although this theory according to Yen et al., 2018 only applies to unimproved land, it provides the foundation for the general idea that public capital investments in accessibility-related transportation infrastructures, such as road and rail, will result in an upward trend in property prices near the project. According to McAllister (2019), governments all over the world have some types of land taxation in place that provide for indirect benefits from an increase in the property value. This means that in practice, a specific tax is not always necessary for value uplift to be captured for revenue generation purposes.

Value capture from increased accessibility project is one of the ways that governments can create more revenue to help pay for public capital expenditures, but despite this indirect

benefit, they are increasingly looking for methods to capture property value increases and support public capital investments. Given that road provision requires a lot of capital investment, it is typically focused on achieving a particular policy of interest. It serves as a tool for value capture policies (Kyriacou et al., 2019).

Projects like the London Cross Rail and Hong Kong's Metro Rail (MTR) are examples of successful value capture implementations (Mathur, 2019; Mangioni, 2019). The upgraded rail property model refers to the method used by Hong Kong's MTR to finance rail development through the development of real estate along the above stations. The Cross Rail project in London received business rate supplement money from nearby companies. In particular, joint development schemes in India (Mathur, 2019) or London (Sovacool and Yazdi, 2019) have been the focus of an expanding body of literature on value uplift capturing, which also covers new financing schemes and methods such as stamp duty land tax, capital gains tax, business rates, and council tax. With the additional instruments that have been employed in the Indian setting (Funding of Delhi Metro), Mathur (2019) expanded the list.

However, if there is no uplift to be recorded, establishing a value uplift capture measure will be not necessary (McAllister, 2019). For efficient determination of the effect of road provision on property investment returns, this paper focuses on how crucial it is to determine property value uplift. According to Yen et al. (2019), identifying value uplift and capturing it has been a prominent area of attention for numerous studies all over the world. Researchers in the field of land use policy have worked very hard to identify and describe the characteristics of value uplift in order to determine it (Yen et al., 2019).

With the use of geo-spatial property sets of data, which enable an empirical examination of contours in urban land rents, the current researches significantly departs from those of the late 1990s in terms of methodology. Early researchers (McDonald and Osuji, 1995; Cervero and Duncan, 2002; McMillen and McDonald, 2004, Du and Mulley, 2007) started revealing various and, in most cases, positive uplifts of value within heavy and light rail investments by starting with simple pairs or spatial regression techniques in hedonic pricing studies. However, these models were unable to account for the differences in location with respect to neighbourhood. It led to the development of complex models that are based on Lancaster's theory of consumer demand. According to this theory, rather than viewing the commodities as discrete objects, the qualities of the goods have an impact on consumer wants (Lancaster, 1966). Rosen (1974) also offered the theoretical foundation for determining the market clearing prices of items based on those features.

This encouraged the presentation of bid rent concepts as a set of implicit prices in the hedonic model put forth by Alonso (1964) and Muth (1969). In a multi-variation regression model, the hedonic price model often controls for the characteristics of the dwellings themselves and the neighbourhood in order to determine the value of ease of accessibility. Early hedonic models have come under criticisms for the limitation in accounting for the implications of geographical data. It is worthy of mention that endogeneity effects have also grown in importance recently. To address spatial issues, a range of spatial tools have been created and made available thereby improving processing power and analytical opportunities for the availability and quality of geospatial data. Improvements like difference-in-differences models, as demonstrated by Mohammad et al. (2015), also helped with potential endogeneity concerns. Recent study on value uplift has led to the employment of cutting-edge techniques to explore a variety of research problems and larger volumes of data.

The addition of a high-quality set of controllable variables to analyses of crime data (Billings,

2011), the discovery of longitudinal studies using data on repeat purchases (Pagliara and Papa, 2011), strategies for resolving the dependence effects of spatial variables (Cao and Porter-Nelson, 2016), and improved techniques like geographic weighted regression (GWR) (Du and Mulley, 2006; Mulley, 2014) and pseudo panel data are some examples of methodological advancements (Mohammed et al., 2015). When matched pair or GWR studies are used, the heterogeneity of uplift and down lift between geographic areas and stations becomes more apparent.

In the BFS (Tsai et al., 2015) and the BLS, distinct public transportation terminals have both experienced uplift and down lift (Hess and Almeida, 2007). Although there was an increase in value at various locations across the research areas on average, local contextual considerations prevented investment in public transportation from having a favourable impact on property value. Researchers have examined nearly every significant mode of urban public transportation currently in use, and they have discovered uplift effects for light rail (Billings, 2011; Murray, 2016; Yen et al., 2018), bus way systems (Deng and Nelson 2013; Zhang and Liu, 2015; Stokenberga, 2014), urban ferries (Tanko et al., 2019), bicycle sharing stations (Chu et al., 2019), as well as high speed rail stations (Wang and Gu, 2019; Beckerich et al., 2019). There are variations in the findings of earlier researches. Many studies, however (Tsai et al., 2015; Mulley et al., 2016), come to the conclusion that some beneficial value uplift effects do exist. Numerous more studies, including those by Mohammed et al. (2013), Crocker et al. 2000, Du and Mulley 2007, Knowles and Ferbrache 2016, and Crocker et al. 2007 reported adverse effects from the provision of light rail systems.

Yen et al. (2018) states that the adoption of approaches different from earlier ones that lack the potential to show the complex nature of various factors that could affect the housing market may be responsible for the diverse findings of the researchers. Whether it is for the provision of fresh land for development or for the reorganization of municipal land use, location, like rail infrastructure, also matters (Knowles and Ferbrache, 2016). Due to economic factors and the implementation of light rail, the effect on home prices may also be delayed (Siripanich et al., 2019). Mulley (2014) adds that expectations matter a lot throughout the value uplift phase even though governments are known for either delaying or cancelling projects, which virtually prevents value uplift when projects first start.

RESEARCH GAP

The majority of previous researches have focused on the effect of transportation infrastructure on property values (PVs), with little attention paid to the expenditures (Budgetary Expenditures) of providing the infrastructure (Yakubu *et al.,* 2020). In addition to not focusing on infrastructure costs, effects are always evaluated solely in terms of property values rather than returns on investment.

The cost of providing roads is the focus of the current study rather than the cost of rail systems, which was the subject of the majority of earlier studies except Yakubu *et al.,* 2020. This is because the research area lacks a functioning rail infrastructure and there are many studies that have taken this direction of research. As a result, the current study fills in the three research gaps of costs (budgetary expenses), investment returns, and properties. Understanding how costs of road provision affects property investment returns is crucial because it provides the cost-benefit analysis needed to compare investment returns against costs.

BOSSO ESTATE ROADS

Bosso Estate has eleven (11) internal roads namely Garba Aliyu Road, Roads 1 to 8, Ar-Rayyan Crescent and Last Avenue. The Niger State Government recently reconstructed the roads at the cost of Five Hundred and Seventy Seven Million Six Hundred Thousand (#577,600,000.00) Naira only. It was completed and put into use in 2021. This eased vehicular movements within the estate for both residents and visitors. Bosso Estate is in Bosso Local Government area of Niger State.

RESEARCH METHOD

Data for the study were gathered through the use of both quantitative and qualitative research approaches. Property rental and sales values were quantified through interviews with Tenants, Landlords and practicing Estate Surveyors and Valuers. Budgetary costs for the road were gathered from the Niger State Ministry of Planning and Infrastructural Development in a qualitative manner.

DATA ANALYSIS AND RESULTS

Table 1: Average Property Values before and after Road Construction

PERIOD	BUDGETARY EXPENDITURE, (#)	AVERAGE PROPERTY VALUE, (#)
After	577,600,000.00	250,000.00 p.a
Before	-----	150,000.00 p.a
Difference	-----	100,000.00 ⟶ 66.67% increase

Source: Field work (2022)

Table 1 shows that before budgetary expenditure, average property value in the study area was #150,000.00 p.a but rose to #250,000.00 p.a after the expenditure resulting in 66.67 % increase in property value in the study area.

FINDINGS AND DISCUSSIONS

Descriptively, it was found that in Bosso Estate, budgetary expenditures on road provision have positive effect on property investment returns. This implies that in addition to social benefits, government spending on roads provision also has economic advantages.
In view of the above finding, governments, to can share through property tax, from the economic gains that their spending has brought about.

CONCLUSION

As a way of conclusion, the government needs to first invest more in funding studies of this kind in order to get the most value out of its spending. It should then engage the services of Estate Surveyors and Valuers to capture increases in property values for property tax purposes.

REFERENCES

Adebosin, W. G., Toriola, A. K., Salami, L. A., Saula, D. T., & Ayanwole, A. A. (2019). The Effect of Infrastructural Investment on Sustainable Development in Nigeria (1980–2016). *Izvestiya*, 2, 148–163.
Alonso, W. (1964). *Location and land use: Toward a general theory of land rent*. Cambridge, Harvard Univ. Press.

Baker, D. M., & Lee, B. (2019). How does light rail transit (LRT) impact gentrification? Evidence from fourteen US urbanized areas. *Journal of Planning Education and Research*, 39(1), 35–49. https://doi.org/10.1177/0739456X17713619

Beckerich, C., Benoit, S., & Delaplace, M. (2019). Are the reasons for companies to locate around central versus peripheral high-speed rail stations different? The cases of Reims central station and Champagne-Ardenne station. *European Planning Studies*, 27(3), 574–594. https://doi.org/10.1080/09654313.2019.1567111

Billings, S. B. (2011). Estimating the value of a new transit option. *Regional Science and Urban Economics*, 41(6), 525–536. https://doi.org/10.1016/j.regsciurbeco.2011.03.013

Cao, X. J., & Porter-Nelson, D. (2016). Real estate development in anticipation of the Green Line light rail transit in St. Paul. *Transport Policy*, 51, 24–32.

Cervero, R., & Duncan, M. (2002). Transit's value-added effects: Light and commuter rail services and commercial land values. *Transportation Research Record: Journal of the Transportation Research Board*, 1805(1), 8–15. https://doi.org/10.3141/1805-02

Chu, J., Duan, Y., Yang, X., & Wang, L. (2019). The Last Mile Matters: Impact of Dockless Bike Sharing on Subway Housing Price Premium. *Management Science.*

Crocker, S., Dabinett, B., Gore, T., Haywood, R., Hennebury, J., Kirkpatrick, A., Lawless, P., Townroe, P., (2000). Monitoring the Economic and Development Impact of South Yorkshire Supertram. Centre for Regional and Economic and Social Research, Sheffield Hallam University.

Deng, T., & Nelson, J. D. (2013). Bus Rapid Transit implementation in Beijing: An evaluation of performance and impacts. *Research in Transportation Economics*, 39(1), 108–113. https://doi.org/10.1016/j.retrec.2012.06.002

Du, H., & Mulley, C. (2006). Relationship between transport accessibility and land value: Local model approach with geographically weighted regression. *Transportation Research Record*, 1977(1), 197–205. https://doi.org/10.1177/0361198106197700123

Du, H., & Mulley, C. (2007). The short-term land value impacts of urban rail transit: Quantitative evidence from Sunderland, UK. *Land Use Policy*, 24(1), 223–233. https://doi.org/10.1016/j.landusepol.2005.12.003

Gibbons, S., Lyytikäinen, T., Overman, H. G., & Sanchis-Guarner, R. (2019). New road infrastructure: the effects on firms. *Journal of Urban Economics*, 110, 35–50. https://doi.org/10.1016/j.jue.2019.01.002

Grover, R., & Walacik, M. (2019). Property Valuation and Taxation for Fiscal Sustainability–Lessons for Poland. *Real Estate Management and Valuation*, 27(1), 35–48. https://doi.org/10.2478/remav-2019-0004

Hess, D. B., & Almeida, T. M. (2007). Impact of proximity to light rail rapid transit on station-area property values in Buffalo, New York. *Urban studies*, 44(5-6), 1041–1068. https://doi.org/10.1080/00420980701256005

Hesse, M., & McDonough, E. (2018). Ports, cities and the global maritime infrastructure. *(Eds) R. Kloosterman, V. Mamadouh, P. Terhorst, Handbook on the Geographies of Globalization*. Edward Elgar Pub. https://doi.org/10.4337/9781785363849.00038
https://doi.org/10.1016/j.landusepol.2018.02.007
https://doi.org/10.1016/j.landusepol.2019.05.021
https://doi.org/10.1016/j.tranpol.2016.01.007
https://doi.org/10.1287/mnsc.2019.3550

Jedwab, R., & Storeygard, A. (2019). The average and heterogeneous effects of transportation investments: Evidence from Sub-Saharan Africa 1960–2010. Working paper No. 2019-8, National Bureau of Economic Research. https://doi.org/10.3386/w27670

Knowles, R. D., & Ferbrache, F. (2016). Evaluation of wider economic impacts of light rail investment on cities. *Journal of Transport Geography*, 54, 430–439. https://doi.org/10.1016/j.jtrangeo.2015.09.002

Kyriacou, A. P., Muinelo-Gallo, L., & Roca-Sagalés, O. (2019). The efficiency of transport infrastructure investment and the role of government quality: An empirical analysis. *Transport Policy*, 74, 93–102. https://doi.org/10.1016/j.tranpol.2018.11.017

Lancaster, K. J. (1966). A new approach to consumer theory. *Journal of political economy*, 74(2), 132–157. https://doi.org/10.1086/259131

Li, S., Chen, L., & Zhao, P. (2019). The impact of metro services on housing prices: a case study from Beijing. *Transportation*, 46(4), 1291–1317. https://doi.org/10.1007/s11116-017-9834-7

Lieske, S. N., van den Nouwelant, R., Han, H., & Pettit, C. (2018). Modelling value uplift on future transport infrastructure. In *Real Estate and GIS,* (Eds) R. Reed, C. Pettit, pp. 80–98. Routledge. https://doi.org/10.1201/9781315642789-5

Mangioni, V. (2019). Value capture taxation: alternate sources of revenue for Sub-Central government in Australia. *Journal of Financial Management of Property and Construction*, 24(2). https://doi.org/10.1108/JFMPC-11-2018-0065

Mathur, S. (2019). An evaluative framework for examining the use of land value capture to fund public transportation projects. *Land Use Policy*, 86, 357–364.

McAllister, P. (2019). The taxing problems of land value capture, planning obligations and viability tests: some reasonable models? *Town Planning Review*, *90*(4), 429–451. https://doi.org/10.3828/tpr.2019.28

McDonald, J. F., & Osuji, C. I. (1995). The effect of anticipated transportation improvement on residential land values. *Regional Science and Urban Economics*, *25*(3), 261–278. https://doi.org/10.1016/0166-0462(94)02085-U

McMillen, D. P., & McDonald, J. (2004). Reaction of house prices to a new rapid transit line: Chicago's midway line, 1983–1999. *Real Estate Economics*, *32*(3), 463–486. https://doi.org/10.1111/j.1080-8620.2004.00099.x

Mohammad, S. I., Graham, D. J., & Melo, P. C. (2015). The effect of the Dubai Metro on the value of residential and commercial properties. *Journal of Transport and Land Use*, *10*(1). https://doi.org/10.5198/jtlu.2015.750

Mohammad, S. I., Graham, D. J., Melo, P. C., & Anderson, R. J. (2013). A meta-analysis of the impact of rail projects on land and property values. *Transportation Research Part A: Policy and Practice*, *50*, 158–170. https://doi.org/10.1016/j.tra.2013.01.013

Mulley, C. (2014). Accessibility and residential land value uplift: Identifying spatial variations in the accessibility impacts of a bus transitway. *Urban Studies*, *51*(8), 1707–1724. https://doi.org/10.1177/0042098013499082

Mulley, C., Ma, L., Clifton, G., Yen, B., & Burke, M. (2016). Residential property value impacts of proximity to transport infrastructure: An investigation of bus rapid transit and heavy rail networks in Brisbane, Australia. *Journal of Transport Geography*, *54*, 41–52. https://doi.org/10.1016/j.jtrangeo.2016.05.010

Murray, C. (2016). Land value uplift from light rail. *SSRN, 2834855.* https://doi.org/10.2139/ssrn.2834855

Muth, R., 1969. Cities and Housing. University of Chicago Press, Chicago, USA.

Noring, L. (2019). Public asset corporation: A new vehicle for urban regeneration and infrastructure finance. *Cities*, *88*, 125–135. https://doi.org/10.1016/j.cities.2019.01.002

Pagliara, F., & Papa, E. (2011). Urban rail systems investments: an analysis of the impacts on property values and residents' location. *Journal of Transport Geography*, *19*(2), 200–211. https://doi.org/10.1016/j.jtrangeo.2010.02.006

Porter, M. E., & Kramer, M. R. (2019). Creating shared value. In Lenssen G., Smith N. (eds) *Managing sustainable business* (pp. 323–346). Springer, Dordrecht. https://doi.org/10.1007/978-94-024-1144-7_16

Rosen, S. (1974). Hedonic prices and implicit markets: product differentiation in pure competition. *Journal of political economy*, *82*(1), 34–55. https://doi.org/10.1086/260169

Roukouni, A., Macharis, C., Basbas, S., Stephanis, B., & Mintsis, G. (2018). Financing urban transportation infrastructure in a multi-actors environment: the role of value capture. *European Transport Research Review*, *10*(1), 14. https://doi.org/10.1007/s12544-017-0281-5

Seo, K., Salon, D., Kuby, M., & Golub, A. (2019). Hedonic modeling of commercial property values: distance decay from the links and nodes of rail and highway infrastructure. *Transportation*, *46*, 859–882. https://doi.org/10.1007/s11116-018-9861-z

Siripanich, A., Rashidi, T. H., & Moylan, E. (2019). Interaction of Public Transport Accessibility and Residential Property Values Using Smart Card Data. *Sustainability*, *11*(9), 2709. https://doi.org/10.3390/su11092709

Sovacool, B. K., & Yazdi, A. H. (2019). Technological frames and the politics of automated electric light rail rapid transit in Poland and the United Kingdom. *Technology in Society*, *59*, 101190. https://doi.org/10.1016/j.techsoc.2019.101190

Stokenberga, A. (2014). Does bus rapid transit influence urban land development and property values: A review of the literature. *Transport Reviews*, *34*(3), 276–296. https://doi.org/10.1080/01441647.2014.902404

Tanko, M., Cheemarkurthy, H., Kihl, S. H., & Garme, K. (2019). Water transit passenger perceptions and planning factors: A Swedish perspective. *Travel Behaviour and Society*, *16*, 23–30. https://doi.org/10.1016/j.tbs.2019.02.002

Tsai, C. H. P., Mulley, C., Burke, M., & Yen, B. (2015). Exploring property value effects of ferry terminals: Evidence from Brisbane, Australia. *Journal of Transport and Land Use*, *10*(1). https://doi.org/10.5198/jtlu.2015.562

Wang, L., & Gu, H. (2019). Impact of HSR Station on the Surrounding Area. In *Studies on China's High-Speed Rail New Town Planning and Development,* (pp. 87–111). Springer, Singapore. https://doi.org/10.1007/978-981-13-6916-2_3

Wang, W., Zhong, M., & Hunt, J. D. (2019). Analysis of the Wider Economic Impact of a transport Infrastructure Project Using an Integrated Land Use Transport Model. *Sustainability*, *11*(2), 364. https://doi.org/10.3390/su11020364

Yakubu, S., Adeyemi, A., Sule, A., & Ogunbajo, R. (2020). The relationship between road infrastructure budgetary expenditures and commercial property investment returns. Case study of Fadikpe area Minna, Nigeria. *Baltic Journal of Real Estate Economics and Construction Management*, *8*(1), 187-196.

Yang, L., Zhou, J., & Shyr, O. F. (2019). Does bus accessibility affect property prices? *Cities*, *84*, 56–65. https://doi.org/10.1016/j.cities.2018.07.005

Yen, B. T., Mulley, C., & Shearer, H. (2019). Different Stories from Different Approaches in Evaluating Property Value Uplift: Evidence from the Gold Coast Light Rail System in Australia. *Transportation Research Record*, *2673*(3), 11–23. https://doi.org/10.1177/0361198118823001

Yen, B. T., Mulley, C., Shearer, H., & Burke, M. (2018). Announcement, construction or delivery: When does value uplift occur for residential properties? Evidence from the Gold Coast Light Rail system in Australia. *Land use policy*, *73*, 412–422.

Zhang, M., & Liu, Y. (2015, January). An exploratory analysis of Bus Rapid Transit on property values: A case study of Brisbane's South East Busway. In *State of Australian Cities National Conference,* 2015, Gold Coast, Queensland, Australia.