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Abstract: This study aims at examining whether or not the LVC can be used as an alternative financing instrument in urban railway infrastructure in Indonesia. The results confirmed that the LVC can be a breakthrough scheme in financing the development of urban railway infrastructure in Indonesia. The most urgent aspect to be prepared by the government to implement the LVC scheme in financing the urban railway infrastructure is the availability of regulations. Also, the approach to developing and executing the plan of LVC needs to be based on an assessment of the cost of the benefit analysis, the land value, the market condition of the location, sustainability, and people's participation in urban railway development. Further detailed research to examine the full potential and the benefits of applying the LVC in financing urban railway infrastructure development is needed as Indonesia faces budget constraints and as we move into a post-pandemic recovery.

Keywords: land value capture; LVC; financial scheme; budget limit; urban railway infrastructures; Indonesia.

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1 Introduction

Urban railway infrastructure development is still one of the long-standing problems in Indonesia (Firdausy, 2019). Although significant progress has been made by the government to develop urban railway infrastructure, the substantial gaps between the demand and supply of urban railway infrastructure still exist. In urban megapolitan Jakarta as the capital of Indonesia, for instance, the MRT Jakarta (2020) annual report recorded that about 72.6% of commuters in the Jakarta-Bogor-Depok-Tangerang-Bekasi (Jabodetabek) area are still using private mode for their transportation. The rest about 27.4% choose the public transportation mode due to many reasons. Due to this problem, the President of Indonesia has placed the development of railway infrastructure as one of priority in his vision for the period 2020–2024. The Government of Indonesia recently plans to develop 247 projects of railway lines, 23 projects for the electrification of signalling systems, nine projects for overflow power transmission, and two projects for an electrical substation (Annisari, 2021; Bappenas, 2019).

To finance the above plans, the Ministry of Finance (2019) of the Republic of Indonesia sets subsidy instruments via public service obligation (PSO) as a financial scheme. This financial option was chosen as it has been implemented when the government developed mass rapid transit (MRT) and light rail transit (LRT) modes. However, as the COVID-19 pandemic is still with us and both the central and local governments have severe fiscal limitations, it is no doubt the subsidy financial instrument is almost impossible to be used as a financial scheme. Thus, better financial schemes need to be sought to realise the urban railway transport development plans.

Of many financial schemes suggested in the literature to finance the development of critical urban railway infrastructure, Walters (2013), Suzuki et al. (2015), Blanco et al. (2016), Das et al. (2021) and OECD (2021), for instance, suggested land value capture (LVC) scheme as one alternative. This alternative involves capturing the increments in land prices generated by urbanisation to finance needed infrastructure and services. This scheme can also help to improve the economic efficiency of investments, contribute to social equity, and serve as a tool for urban growth management and land price control, as well as reduce the uncertainty of private developers about the timing of the project approval and infrastructure provision.

The same suggestion is also given by Fujiyama (2019), Cengiz and Çelik (2019), Berawi (2018), Cervero and Murakami (2009), Murakami (2012), McIntosh (2017), Rodas (2018), ADB (2021), Rehak et al. (2020) and Peterson (2009) to name a few. Cengiz and Çelik (2019) in their empirical studies, for example, found that the implementation of the LVC scheme increased the value of property and land. This scheme has the potential in reducing travel costs (Berawi, 2018). Other studies also confirmed the above findings (Blanco et al., 2016; Loo, 2018; Khasnabis, 2010). These empirical findings further have made the ADB (2021) suggests the LVC scheme as the financing scheme for critical urban railway infrastructure development as it can create a virtuous cycle. It allows cities to fund and roll out over many years a widespread transport network, along with other core infrastructure. The scheme has proven sustainable over years and even decades in funding urban transport networks in Japan, the Republic of Korea, the People's Republic of China, Hong Kong, and Singapore.

However, as the implementation of the LVC scheme in financing the urban railway in Indonesia is not yet undertaken on one hand, and because of the government budget limit in financing urban railway transport, on the other hand, the present study aims to examine whether or not the LVC scheme can be as a breakthrough in financing the urban railway infrastructure development in Indonesia.

Before this research question is answered, a brief explanation of data sources and methods is given in Section 2. This is followed by results and discussion in Section 3. In this Section 3, there are four results and discussions are addressed. The first relates to the concept of the LVC and what countries implemented the LVC scheme. The second deals with instruments of the LVC scheme and what LVC instruments are applied to develop urban railway infrastructures in Hong Kong. The third is what barriers to adopting the LVC scheme in Indonesia. The fourth is how Indonesia can implement the LVC scheme in urban railway Infrastructure development. Finally, concluding remarks are drawn in Section 4.

2 Data sources and methods

The data source of this study was mainly collected from three sources. The first source was from studies advanced in the literature. The data were used to describe and review the concept of LVC and the experience of the Government of Hong Kong in particular in employing the LVC scheme to develop the urban railway infrastructure. Also, it was used to analyse problems and issues faced in employing financing schemes in developing urban railway infrastructure in Indonesia.

The second source of data was taken from the annual reports of urban railway infrastructure development in two big cities in Jakarta and Bandung, Indonesia. These data were used to describe the development of MRT and LRT in the two cities of Jakarta and Bandung and the problems associated with the development of the urban railway infrastructures in those two cities. The third source was from the authors' knowledge and experiences in taking in urban railway infrastructural development.

All of the above data and information were then analysed by using descriptive methods to address the concept of LVC, problems, and issues related to the implementation of the LVC scheme in urban railway development in Hong Kong, and obstacles in developing urban railway infrastructure in Indonesia and how the LVC scheme can be employed in Indonesia.

3 Results and discussion

3.1 The concept and countries implemented LVC scheme

The results of the review of the empirical studies showed that there are three financing instruments in developing public investment infrastructures. The first is a debt instrument. This could be direct lending to a responsible jurisdiction, a variety of borrowing mechanisms that can complement each other, and full control and the financial risk are born by the public entity. The second is a concession instrument, in which a public entity transfers some or most of financing, construction, and/or operating responsibilities (and risk) to a private partner. The third is the LVC instrument. This scheme is complying to finance the infrastructure by a broader development effort, reducing the impact on the government balance sheet and facilities creation of private economic value in benefiting the location (see for instance, Brealey and Myers, 2003; World Bank, 2019; WRI, 2021).

LVC instrument as the focus of this study is considered a non-traditional financing scheme for public investment in infrastructure. In this scheme, the land is a major factor in the economy. It is land use accompanied by adequate infrastructure that will encourage an increase in economic value and productivity (Brown, 2017; Blanco et al., 2016). Further ADB (2019) introduced 'triple win LVC' which is known as the successful target in applying the LVC scheme. These are: increasing better urban mobility, reducing utilisation of subsidies, and creating additional fiscal space. The basic principle of value capture is about the more accurate approach for the planning of economic corridor development which is connected with public transportation infrastructures. With this scheme, the trust of investors will increase, particularly the certainty of their investment revenue in public projects. Generally, the investors will search for opportunities in optimising their investment, such as lower Capital Expenditure (CAPEX), shortest payback period, and reliable revenue.

In modelling the LVC scheme in financing urban railway infrastructures, the following estimation needs to be done. Concerning the land value, it is ascertained by the relation between supply and demand which occurred inland market, location, physical structure, and environment surrounding certain land. During infrastructure development, most probably that the land use will be changed including its characteristics and having a direct impact on the land price (Berawi, 2018).

In addition, to forecast the land value increase due to a new infrastructure, hedonic pricing model (HPM) needs to be used as proximation. This method is appropriate to estimate the contribution of independent variables from different land value attributes (Seo, 2018; Syabri, 2011; Vaishampayan et al., 2021). However, the HPM has three attribute categories that predicted the effect of land value as shown in equation (1).

$$p = f(L, S, N) \tag{1}$$

Equation (1) shows that land price (p) is a function of the location of the property (L), the physical structure of the property (S), and the environment (N). To estimate land price elasticity, equation (1) needs to be modified into the following model as given in equation (2) (Seo, 2018).

$$\ln p = \alpha + \beta_1 \ln L + \beta_2 \ln S + \beta_3 \ln N + e \tag{2}$$

where

p land price

L location of the property

S physical structure of the property

N environment

E error terms.

To accommodate the LVC model using betterment property tax, Walters (2013) suggests the tax increment due to a new infrastructure in their land use. The formula for LVC calculation is shown in equation (3). This equation can be referred to as a basic concept of value capture revenue calculation to establish a new one.

$$Value\ capture\ revenue = \Delta * rc * Lt \tag{3}$$

where

Δ incremental rate of land value change

rc value capture rate

Lt the total land value in the tax year.

In the case of Indonesia, the estimation of property tax can use the regulation introduced by the government, namely, district tax, either urban or villages area (Subroto, 2018). It can also use the sales value of the taxable object (Ministry of Finance, 2019).

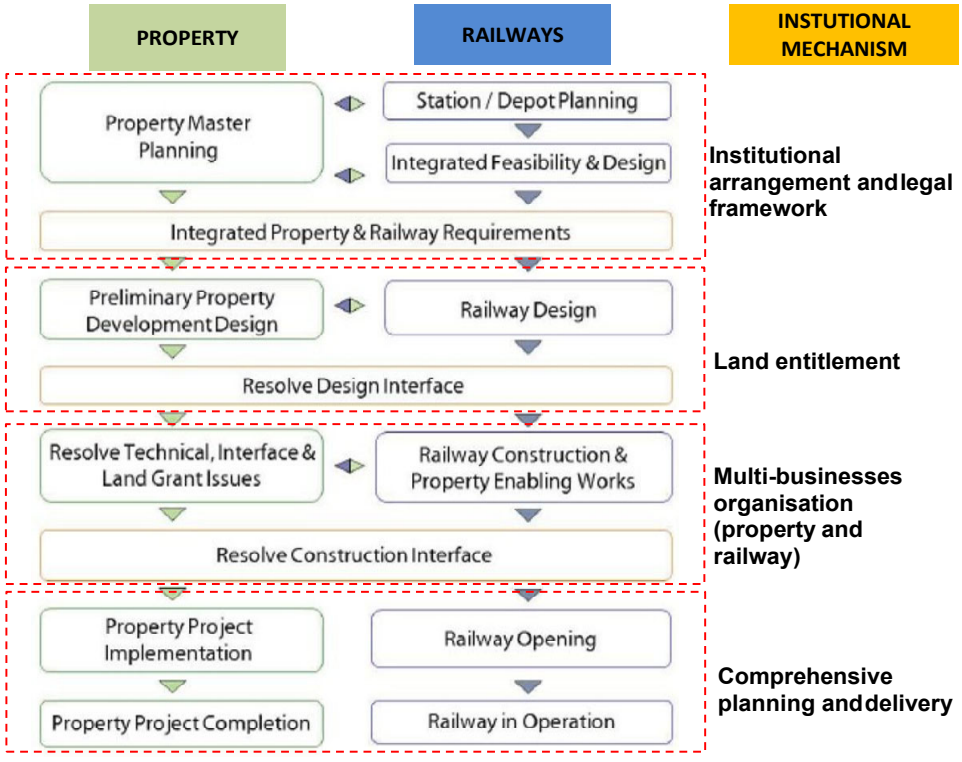
Compared with the countries which have been complied with the LVC financing model with betterment property tax to finance their infrastructure projects, utilising such tax is a kind of mechanism which re-popular in Columbia, including in the UK, France, and India (see Peterson, 2009; WRI, 2020). In these countries, property tax of the LVC model is usually with the range of tax value at about 30% up to 60% from the land value increase.

Many studies have shown that the implementation of the LVC scheme has given economic benefits. Blanco et al. (2016), for instance, in their two case studies in Xalapa (Mexico) and Quetzaltenango (Guatemala) found that fostering the use of LVC can strengthen municipal financial autonomy. Also, it helps to reduce the deficits in the provision of infrastructure and basic services, thereby helping to make the region's cities more competitive and sustainable. Whilst Tang (2018) in his study related to mass transit railway (MTR) in Hong Kong found that the implementation of LVC has made railway service become the backbone of Hong Kong transport. By implementing this scheme, the government does not need to spend the state budget to subsidy this program to operate. The implementation of urban railway transport development under this scheme makes people in Hong Kong rely significantly on railways. The number of daily passenger trips is about 5.8 million or 90% of kind activities of Hong Kong citizens rely on railway service.

The above great success of the implementation of the LVC scheme in the development of the MTR in Hong Kong is because the government has a well-organised plan for their city development along railway lines. In this plan, the railway construction was developed by integrating the government property with the railway. Apart from the

perfect collaboration between two different sectors, both parties worked together and synergically from the initial stage till the final stage. This planning was inspired by the previous similar studies conducted by Tang (2018), McIntosh (2017), Cengiz and Çelik (2019) and Berawi (2018). The detailed synergy of both parties can be seen in Figure 1.

Figure 1 Synergising property vs. railways sector (see online version for colours)



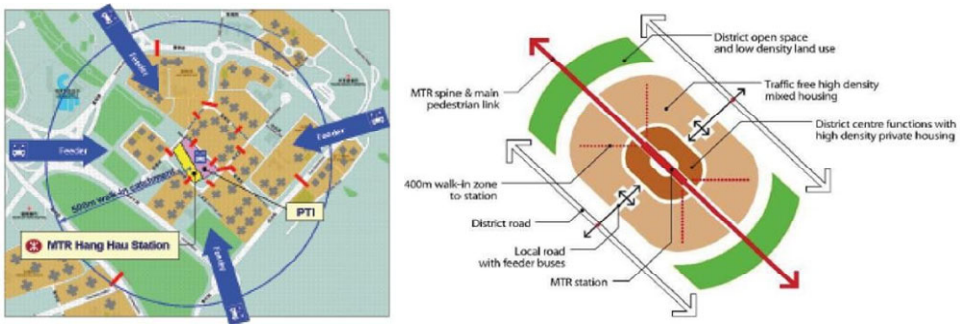
Source: Tang (2018)

The area of the station developed was at a radius of about 500 m. The land-use comparison that has applied between housing units and commercial and office is 42% and 75%, respectively. Figure 2 shows the detail of how the MTR was developed in Hong Kong under the LVC scheme.

In the process of implementing the LVC system above, land use planning and management used the public leasehold system as part of their policy (Tang, 2018; Hui, 2004). Moreover, since 1st July 1997 when the People's Republic of China has given more trust to Hong Kong to try as an independent state, as mentioned under Article 7 of the Basic Law, the policy of land including other natural resources are owned by the government. The Hong Kong Land Department has been appointed to manage all administration of lands, such as issuing leases, handling lease modifications, and arranging the public auction, tenders, and private treaty grants of government land. They are also responsible for private land acquisition, in case to be utilised for public infrastructures, including urban renewal and environmental improvement schemes. On the other hand, the housing authority has a role to operate including maintenance with

their financial independence. In doing their assignment, they collaborate with the government in providing the required land as of design to be rented and sold (Tang, 2018).

Figure 2 Comprehensively planned and implemented TOD development and around a station under the LVC scheme (see online version for colours)



Source: Tang (2018)

3.2 Instruments of the LVC scheme and what LVC instruments applied in Hong Kong

The results of the review of the studies highlighted that the LVC scheme can be grouped into two-based schemes. The first is the tax-based group scheme. Under this based scheme, there are three instruments, namely, land and property tax, betterment levies and special assessment, and tax increment financing (TIF) instruments. The second is the development-based scheme, which is dedicated to capturing benefits and margins from the construction of infrastructure to land value increment (e.g., land selling or renting, air right sale, joint development, and land readjustment) (see Berawi, 2018; Haider and Miller, 2000; Widyahari, 2017). Detailed of the LVC instruments under each group and the description of the instruments were shown in Table 1.

Of the above two group-based schemes, the Government of Hong Kong adopted the tax-based scheme. In this based scheme, the government adopted property tax as the instrument in the implementation of the LVC scheme. This instrument has been implemented a long time ago in financing the development of their infrastructure as well as social services. The reason to adopt the property tax instrument is partly that Hong Kong is a country with prompt economic growth and Hong Kong has a high-density level of residents at about 6,250 per km^2 (Hui, 2004).

Furthermore, Hui (2004) stated that the kind of annual property tax applied in Hong Kong is divided into two schemes. The first scheme was applied a fixed percentage levied about 5% and charged to landed properties. Under this scheme that was implemented in 1998–1999, the Hong Kong Government earned about US$1.47 billion. The second scheme was by charging 3% for land leases granted and non-renewable land leases extended. Under this rent scheme, the government collected funds of about US$0.56 billion. The example of the LVC scheme implementation in Hong Kong is exhibited in Table 2. As can be seen in this table, by applying the LVC scheme, the price

of land surrounding the station area along with MTR alignment increased by 500% from US$3,000 to US$15,000 per square metre.

Table 1 The instruments of the LVC scheme

Instruments		*Description*
Tax-based scheme	Property and land tax	Tax levied on the estimated value of land or land and buildings combined, with revenues usually going into budgets for general purposes.
	Betterment charges and special assessments	Surtaxes are imposed by governments on estimated benefits created by public investment, requiring property owners who benefit directly from public investment to pay for their costs.
	Tax increment financing	A surtax on properties within an area that will be redeveloped by public investment financed by municipal bonds against the expected increase in property taxes. Mainly used in the USA.
Development-based	Joint development	A well-coordinated development of transit station facilities and adjacent private properties between transit agencies and developers, where the latter usually contribute physically or financially to the construction of the station facilities, as their value will increase thanks to the transit investment. Used in Japan, the USA, and other countries.
	Air right sale	Governments sell development right extended beyond the limits specified in land use regulations [such as floor area ratios (FAR)] or created by regulatory changes to raise funds to finance public infrastructure and services.
Land readjustment		Landowners pool their land and contribute a portion of their land for sale to raise funds and partially defray public infrastructure development costs.
Urban redevelopment schemes		Landowners and a developer established a cooperative entity to consolidate piecemeal land parcels into a single site that they then develop (such as a high-rise mixed-use building) with new access roads and public open spaces. The local government modifies zoning codes increases maximum FARs in the targeted redevelopment areas (typically around rail transit stations) and finances the infrastructure. Mainly used in Japan.

Source: Widyahari (2017)

Therefore, the adoption of the LVC scheme to develop urban railway transport in Hong Kong is a good example that can be learned by the Government of Indonesia. By applying this LVC scheme, the Government of Indonesia does not have to spend a large amount of the state budget. As pointed out by Widyahari (2017) that the LVC scheme is a good opportunity to develop financing schemes for urban railway infrastructure projects in Indonesia. This scheme can be adopted for MRT as well as LRT in Indonesia.

Table 2 Value capture implementation in Hong Kong

Concern items	*Remarks*
Location	Tai Kok Tsui
Land area	5,000 m^2
Tenure	99-year lease commencing from 1 January 1980 (unexpired term of lease remaining 58+ years)
Restriction in title	Industrial 12
Proposed used	Residential 7.5
Before value	
Use group	Industrial
Accommodation value	\$3,000/m^2
Total GFA	60,000 m^2 (5,000 m^2 × 12)
Before value	\$180,000,000 (\$3,000/m^2 × 60,000 m^2)
After value	
Use group	Residential
Accommodation value	\$15,000/m^2
Total GFA	37,500 m^2 (5,000 m^2 × 7.5)
After value	\$562,500,000 (\$15,000/m^2 × 37,500 m^2)
Differential premium	\$382,500,000 (after value – before value)

Source: Hui (2004)

3.3 Barriers to adopting the LVC scheme in Indonesia

As mentioned at the outset, Indonesia has not yet implemented the LVC scheme in developing an urban railway transport system. Of the many barriers to doing this, regulations to support the implementation of the LVC scheme are not yet issued (Widyahari, 2017). In addition to regulations, the ADB (2019) listed five major issues that need to be given attention for Indonesia in implementing the LVC scheme in urban infrastructure development (Table 3).

However, of the above five issues, the ADB (2019) analysed two cities in Indonesia that are the potential to implement the LVC scheme in urban infrastructure development. These two cities are Jakarta – the capital city of Indonesia and the city of Makassar (South Sulawesi Province). Jakarta, for instance, this city has income tax larger than other tax categories, such as vehicle ownership, property ownership, and other levies. Similarly, it is also for the city of Makassar.

The adoption of the LVC scheme in developing urban railway infrastructures in the above two cities becomes important as the development of urban railway transport (LRT) in Bandung, West Java, Indonesia faces financing difficulties. The initial investment of IDR 484 billion (or roughly equivalent to US\$3.5 million) that was spent by PT LEN Industry (Indonesian State Own Enterprise) in 2019 cannot be covered only by revenue from the ticket price. Edgar (2019) argued that the ticket determined by the government cannot be afforded by people and this way does not make sense. They further suggested the following solutions. First, by reducing the ticket price so that it can be affordable for the people to use LRT. Second, by giving government subsidies. Third, by collaborating

with other companies to improve the LRT infrastructure, particularly the inside and outside of the station, and also the interior and exterior of the trains. Fourth, integrating LRT stations with shopping centres and commercial areas to increase the flow of passengers.

Table 3 Public sector commitment readiness analysis

Enabler	*Readiness*	*Requirements*
Whole-of-government approach		Clear contract with the treasury agency under which funds from certain tax revenues will be allocated to debt repayment.
		Strong inter-government consensus and political will.
		If local taxes are involved, a possible issuance of a new local law to secure the political commitment of the local parliament.
The visionary economic master plan		A clear economic zone or corridor strategy is attached to the project's implementation, which also identifies the project beneficiaries.
Long-term land-use planning and regulatory framework		Clear and legitimate land-use planning ('RTRW') for specific purposes.
Integrated urban and transport development		A clear and legitimate transport master plan integrated with land use planning for specific purposes.
		Authorisation for local government to set the property tax and land transaction tax rates, as long as the rates are not greater than the maximum rate set out under the law.
Value capture-oriented tax regime		Clear incremental tax revenue, with the project beneficiaries, identified.
		Multiyear budget commitments to fund the project that will be drawn from the anticipated incremental tax revenue.

Source: ADB (2019)

Table 4 Contribution of MRT Jakarta business revenue

Revenue	*2020 (Rp million)*	*2019 (Rp million)*	*Increase (decrease)*	
			(Rp million)	*Percentage (%)*
Farebox revenue	82,025	191,552	(109,527)	(57.18)
Subsidy revenue	620,801	534,070	86,731	16.24
Non-farebox revenue	382,672	207,608	175,064	84.32
Total revenue	1,085,498	933,230	152,268	16.32

Source: Annual report of MRT Jakarta (2020)

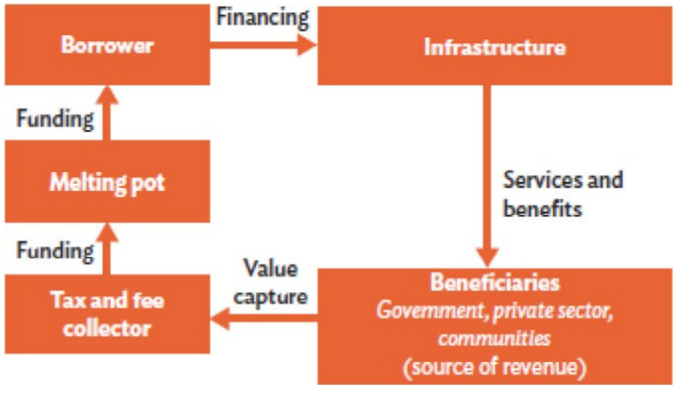
Another example of financing difficulty on urban railway transport is faced by the MRT project in Jakarta. Whilst this project has already been established and in full operation for phase 1 (St. Lebak Bulus to St. Bunderan HI) in 2019, a huge percentage of government subsidy is spent to cover the cost of investment and to optimise the operation of this project. As shown in Table 4, the percentage of revenue proportion between fare

box and non-fare box revenues compared with subsidy revenue is only about 74.85%. This means the contribution of subsidy revenue is still absolutely needed in huge amounts.

The above two examples of non-LVC financing schemes simply indicate the importance of the government subsidy to make the urban railway infrastructure development socially and economically feasible and viable. For this reason, the ADB (2019) suggest the LVC financing scheme. The application of this scheme was argued to improve the number of people using this urban railway transport facility and it will reduce the investment payback period.

Figure 3 exhibits the cycle of the financing of the infrastructure using the LVC scheme, especially the public transportation system suggested by the ADB (2019). This cycle is argued to have the potential to enhance the incremental economic aspects such as optimum land utilisation. Also, it can strengthen efficiency and economic productivity. Under this scheme, the property tax or any other levies can be imposed to support the sustainability of this project. However, Walters (2013) reminded the planning of financing of infrastructure investment needs to estimate carefully from the beginning. This aims to avoid disputes or being stuck due to the project financing process in the future. Whereas Ministry of Finance (2019) expects that the LVC scheme could increase transportation connectivity. Then it will be affected to improve the level of accessibility to the business centre for one who needs work. In the end, it will be boosted productivity reduce the jobless index, and social friction, as well as avoid wage inflation.

Figure 3 The cycle of financing in infrastructure projects using the LVC scheme (see online version for colours)



Source: ADB (2019)

3.4 How does Indonesia implement the LVC scheme in urban railway infrastructure development?

To implement the LVC scheme in urban railway infrastructure development in Indonesia, lessons learned from the success of the implementation of the LVC scheme in Hong Kong and other countries discussed above are necessary to be given attention by the Government of Indonesia. However, as the LVC scheme has not yet been implemented, the most urgent aspect to be prepared by the Indonesian Government to implement the LVC scheme in financing the urban railway infrastructure is the

availability of regulations made by the President of the Republic of Indonesia (ADB, 2021).

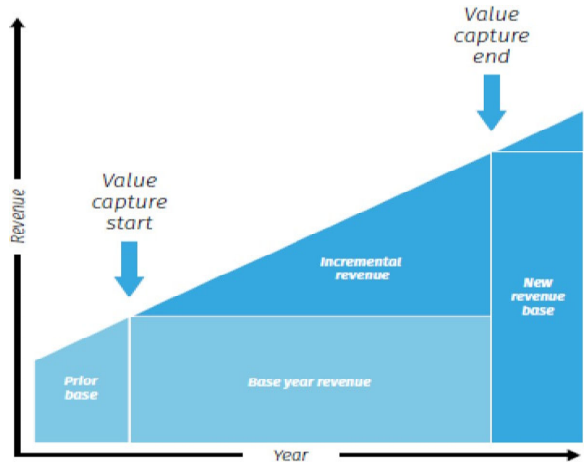
This regulation should include how the gain of land value increases will be managed. Also, the regulation needs to guide institutions to implement the LVC scheme. The current condition of the potential institution to be applied to the LVC scheme is about their capability and knowledge of the LVC scheme. Also, it is about the policy of the borderline of government administration for each region and city, especially when conditions in executing the LVC need to be overlapped with the borderline. Lastly, the coverage authority of the local government in executing the LVC scheme should be detailed and agreed upon by the stakeholders.

Furthermore, as Indonesia now becomes decentralised, the local government in the early stage has to develop a comprehensive plan which includes the reasons for the LVC to be implemented, the analysis of the necessity of urban railway infrastructure for a certain area, and the business model in running the project (ADB, 2021). However, the approach to developing an executing plan of LVC needs to be based on an assessment of what proportion of the land value could be captured for local and strategic contribution as a result of planning decisions. Also, the prerequisites of understanding the market condition of the area are a must. Not only about the region, but also the local area, including some factors that influences land value, demand for residential development, strength and range of services available, market conditions for property markets, retail, office, industrial, and more. The next is understanding the market value itself. It means understanding the difference in development and land values across the region are an important consideration in estimating the potential for land value contributions. This can be grouped based on the market value (lower range, medium-range, or higher range). Finally, there should be an estimation of the contribution of property by its unique characteristics of the region (Widyahari, 2017).

Concerning beneficiaries of the infrastructure investment, Brown (2017) has classified three groups of beneficiaries who gain from infrastructure investment namely, the public in general, direct users of the infrastructure, and property and business owners in the vicinity of the infrastructure. The first and second clusters can be classified as the group which has a direct impact on infrastructure development. They contribute to the development through general taxation and in some cases fares. However, the third cluster enjoys sustained additional value due to the infrastructure presence their benefits as citizens or travellers in the form of unearned income (or value) as a positive externality to which they have not contributed. Brown (2017) also recommends as shown in Figure 4 utilising the value as a deviation, for example, property or land tax before and after infrastructure presence to finance the infrastructure development.

To capture the land value increase, as well as the mechanism of utilising the alternative financing for the infrastructure development, ADB (2021) suggests the schematic of LVC implementation as shown in Figure 5. As shown in this figure, the widening of authority coverage of the local government needs to be given attention to make the implementation of the LVC scheme successful. The local government needs to have full authority to approve the management of the value capture plan. They also need to organise the LVC institutions related to their team members as well as management as LVC executors, signing the financing support agreement with the developers, as the facilitator for public consultation, and as the solution for strategic issues which occur during the execution period.

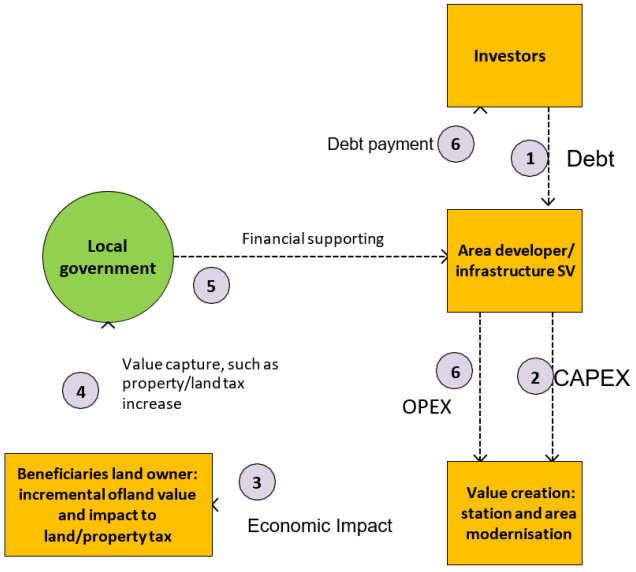
Figure 4 Fiscal-based value capture funding model (see online version for colours)



Source: Brown (2017)

Widyahari (2017) further reminded particularly during the land value valuation stage of the important consideration concerning the characteristic of the land, whether a brownfield or greenfield area. This is partly because the contribution from the brownfield does not as flexible as in the greenfield area. This implies that the contribution value from LVC is different for the type of properties (residential, commercial, or industrial), whether it will build or built on a greenfield/brownfield area, and the type of value (low value, medium value, and high value). Thus, it is important to not only realise the value but also understand the station development concept itself.

Figure 5 The schematic of LVC mechanism implementation (see online version for colours)



Source: ADB (2021)

4 Concluding remarks

The study aims at examining whether or not the LVC can be employed in the financing of urban railway infrastructure development in Indonesia. It was confirmed that the LVC scheme can be the alternative breakthrough instrument in financing urban railway infrastructure development in Indonesia. To realise the implementation of this financing scheme, the Government of Indonesia needs to learn lessons from the Government of Hong Kong in particular and other countries that have been successful in employing this scheme. Two cities of Jakarta (capital city of Indonesia) and Makassar (South Sulawesi province) are potential cities to employ the LVC scheme.

However, to implement successfully the LVC scheme in Indonesia, at least the following two conditions need to be fulfilled. First, there should be regulations issued by the President of the Republic of Indonesia. This regulation should include how the gain of land value increases will be managed. Also, it needs to guide institutions to implement the LVC scheme and the detailed coverage authority of the local government in executing the LVC scheme as Indonesia is no more a centralised government.

Second, the executing plan of LVC needs to be based on an assessment of what proportion of the land value could be captured for local and strategic contribution as a result of planning decisions. Also, the prerequisites of understanding the market condition of the area are a must. Not only about the region, but also the local area, including some factors that influences land value, demand for residential development, strength and range of services available, market conditions for property markets, retail, office, industrial, and more. Also, there should be an estimation of the contribution of property by its unique characteristics of the region.

Finally, further detailed research to examine the full potential and the benefits of applying the LVC in financing urban railway infrastructure development is needed as Indonesia faces public financial constraints on the one hand and as we move into a post-pandemic recovery on the other hand. This study, for instance, can be done in Indonesia's emerging urban economies – whether in the capital or cities such as Makassar (South Sulawesi) or Palembang (South Sumatera).

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