Research Article

The Use of Value Capture for Transport Projects in China: Opportunities and Challenges

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Abstract: Value capture (VC) could be a useful tool to address the huge demand for public transport infrastructure funding in China. This research identifies the opportunities and challenges faced by VC implementation in China and explains how local governments and local transit agencies dealt with the regulatory barriers. The findings of this research offer insights including: (1) macro environment, regulatory framework, and supportive policy environment provide opportunities to adopt VC projects, while the risk of acquiring land vale cannot be isolated from the global political and economic situations; (2) the regulatory challenges of land transactions and lack of property tax system restrict the application of VC; (3) evidence from the case study of Shenzhen demonstrates that local government may creatively deal with the regulatory challenges to do VC and benefit local community; and (4) institutional capacity is vital to implement VC. The analysis of Shenzhen experience can provide a reference for other Chinese cities to implement VC.

Keywords: Value Capture, Transportation Funding, Macro-economic Factors, Regulatory Framework, Institutional Capacity, China

1. INTRODUCTION

Worldwide countries invest US$1–$2 trillion every year in transport infrastructure to meet the world's demand for mobility and connectivity, and the investment in transport infrastructure rise at a stable annual rate, averaging about 5% between 2014 and 2025 (The World Bank, 2015). Public transport infrastructure is in a great demand because of rapid urbanization and economic growth (Pojani and Stead, 2015). However, traditional government funding (e.g. fares, government funding, and subsidies) for public transport infrastructure is not sufficient to meet this growing demand and innovative funding mechanisms are needed (Medda, 2012; Imran and Pearce, 2013; Verma and Ramanayya, 2014).

The demand for public transport infrastructure in urban areas arises because public

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transport can improve accessibility and amenity and provide an opportunity for agglomeration economies to emerging in the surrounding urban areas (Suzuki et al., 2015). Therefore, public transport investment has tendency to increase the value of the surrounding land and properties, and some of this increase can be captured for building or extending public transport infrastructure (Cervero and Kang, 2011). Value capture (VC) mechanisms have potential to become an innovative funding method for developing public transport infrastructure (Cervero and Murakami, 2009). To date, VC has been utilized successfully in many regions such as Hong Kong, Japan, Singapore, the UK, and the US.

China has adopted VC mechanism recently after receiving policy support from the central government, and some research has focused on the land value uplift (Xu et al., 2016; Pan and Zhang, 2008; Tian, 2006). There is little research systematically analyzing the underlying factors that obstruct or support VC implementation in the context of China. However, VC is a complex process, which needs negotiation and collaboration among the public and private sectors and local community, thus it should be carefully planned in the local context of urbanization, land use regulations, property market and urban planning policy.

This paper aims to identify the opportunities and challenges to implement VC in Chinese cities. This research uses the institutional nature of partnership as a theoretical framework, and selects Shenzhen as a case study to investigate the macro and regulatory environment and institutional capacity for VC related to transportation projects. The paper explores how VC works at the local level in Shenzhen to generate lessons for other Chinese cities.

Section 2 critically reviews literature on VC followed by theoretical framework and the research design for this paper. Section 3 identifies the opportunities and challenges to conduct VC in China from the perspectives of institutional framework, policy environment, macro environment, and regulatory framework. Section 4 uses the Shenzhen as a case study to analyze how to bypass the regulation barriers at the local level and how to share revenues of VC to local community. Final section discusses the opportunities and challenges of VC in Shenzhen, conclude the research and offer some recommendations to other cities in China.

2. VALUE CAPTURE – CONCEPT AND FRAMEWORK

2.1 The Idea of VC

VC can be defined as a mechanism by which the public sector can recoup part or all of the cost of high-quality public transport systems by capturing incremental value increases in nearby land and property (Jillella et al., 2015; Smith and Gihring, 2006). VC concept can be traced back to Henry George's land reform concept in the late 19th century in the US (Batt, 2001). George discovered that gains in property values happened as a result of nearby public investment (Fainstein, 2012). Subsequently, many authors have argued that the state should benefit from the increased value of private lands if land value increase as a result of public actions such as change of land use regulation, an increase in the urban population, and investment priorities (Suzuki et al., 2015; Ingram and Hong, 2012) (see Figure 1). For example, if the construction of a railway leads to value being added in nearby properties, and population growth results in the growth of real estate prices, the increased value should at least be shared between landowners and the government.
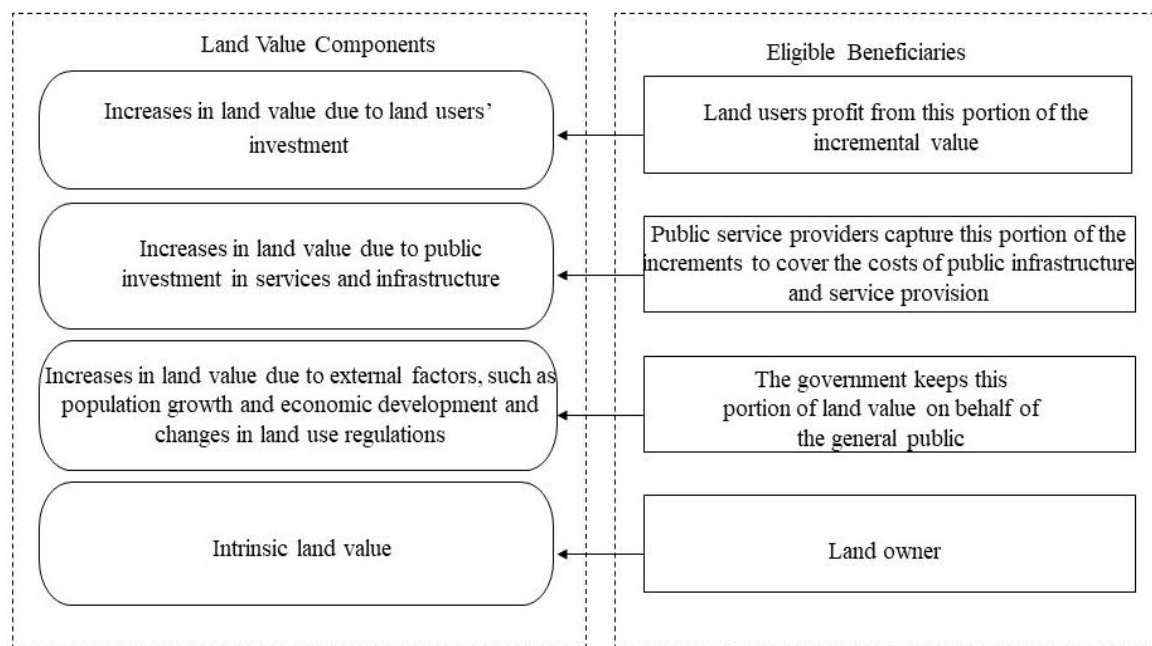
Figure 1. The relationship between beneficiaries and land value (Hong and Brubaker, 2010)

Suzuki et al. (2015) distinguished two types of VC: development-based VC and taxation-based VC. Development-based VC uses direct land and property transactions to capture the increases in value by selling or leasing land or property, air rights, joint property development, land readjustments, and urban redevelopment schemes (Salon and Shewmake, 2011). In this case, transport agencies and private developers plan the land near railway stations, bus stops, or airport terminals for future development of high-density properties such as residential and commercial buildings, and offices. Hong Kong and Japan both have the best practices for this VC instrument. Taxation-based VC refers to charging or levying extra or special taxes or fees on existing development located in "transit investment benefitting areas" to capture the land and property value increases (Walters and Rosengard, 2012). In this situation, the tools such as tax increment financing, special assessments, land or property taxes, and betterment levy often are used (Chapman, 2017). This kind of method is more suitable for a country that has a legislative or regulatory history to support 'special' taxation measures such as Australia and the US (McIntosh et al., 2015).

Both types of value capture mechanisms have different implications for capturing incremental land value in practice. In the case of development-based VC, it can be seen as one-time funding sources which depends on the accuracy of assessment of increases in land and property value. As Salon and Shewmake (2011) pointed out, if the value assessments are correct, then this is a fair system for all stakeholders. However, the expected value can be much higher (or lower) than the realized value, one or another of the stakeholders will be unfairly treated. By contrast, taxation-based VC is a category of continuous funding that can be used to subsidize the ongoing constructing and operating costs of transport infrastructure (Romana and Modelewska, 2009). As the capitalized market value of the public transportation system is revealed, revenues of taxation-based VC instruments are gradually and naturally self-correcting over time (Gielen, 2011). The pros and cons of two categories of VC is shown in Table 1.

Table 1. Pros and cons of two types of VC

	Pros	Cons
Development-based VC	Quickly create a lot of VC revenues; Potential to contribute to the capital cost of public transport.	No ongoing source of land-based revenues; Potential to excessively rely on the real estate market.
Taxation-based VC	Generate a continuous source of revenue; Revenues are gradually and naturally self-correcting over time based on the market value.	Require an efficient taxation system where has legislative and regulatory support.

Source: adopted from Salon and Shewmake (2011)

2.2 Why Land and Property Value Increases Due to Transport Improvement?

Many studies have demonstrated a positive link between proximity to urban transit rail stations or bus stops and land value (Sharma and Newman, 2018; Cervero and Murakami, 2009; Cervero and Duncan, 2002; Cervero, 1997). These studies identifies three benefits of urban transit investment leading to the land value increases (Baker and Nunns, 2015), which we describe below.

1) Accessibility: Accessibility can improve economic goals (i.e. workers, customers, and suppliers), social goals (i.e. access to jobs, healthcare, education, and shopping), and environmental goals (i.e. energy savings and emission reductions) (Handy, 2002). In this case, improved accessibility is capitalized to the land value, and it is reflected as higher purchase or rent prices for properties.

2) Amenity: Amenity implies the direct feelings related to using the public transport infrastructure. For example, travellers prefer to enjoy their travel with quality stations and stops, as well as good air quality and excellent services. Amenity improvements also bring land value increases. For example, a study of Australia showed that there is a 22% difference in property value with high transit amenity compared with properties with low transit amenity in Perth and Brisbane (McIntosh et al., 2011).

3) Agglomeration: Agglomeration increases the labour force willing to work in the area that leads to improvements in productivity, controlled wages, and higher company revenue (Song et al., 2012). Furthermore, agglomeration is capitalised into land value, through office rents (Drennan and Kelly, 2010). Agglomeration causes high rents for property in proximity to transport infrastructure, especially in CBDs.

Therefore, there is a positive feedback loop between urban public transport infrastructure benefits (accessibility, amenity, and agglomeration) and land value increases, making VC possible. However, there is some indication that proximity to public transport infrastructure may reduce land value, probably because of noise, pollution, and congestion (Debrezion et al., 2011; Carey and Semmens, 2003). To achieve a positive link between public transport and land values, a legislative, institutional and policy environment are important. Institutional environment that supports a particular land use policy, the city's economic environment, and funding availability for transport investment will all affect the accessibility, amenity, and agglomeration to be capitalized in increased land values (Suzuki et al., 2015).

2.3 Institutions of VC

VC is a complex process, involving multiple actors, and can apply different policies and regulations to explore how the value is to be captured, by whom, and in what amounts.

Therefore, an appropriate institutional framework is required for VC to work (McIntosh et al., 2015). This institutional framework may include a clear structure and role of different actors in VC processes, and related government regulations and policies that identifies a clear relationship between urban planning and transportation planning, the land administration system and taxation regulations (Suzuki et al., 2015). In some cases, stakeholders follow the current legislation and prove that existing legislation can be applied for the VC without waiting for the national legislation. So VC behavior can be found at the local level even where there is no national legislation existing (Smolka, 2012).

Suzuki et al. (2015) studied VC in various cities and identified that urban planning (e.g. land use planning and transportation planning) plays a crucial role in making VC successful. Hong Kong's Rail + Property model is a successful value capture model adopted by Hong Kong Mass Transit Railway Corporation (MTRC). This model enables the MTRC to capture the revenue from property development to fund and operate railway services without government subsidies. The MTRC buys the development rights for lands above and around transit stations from the Hong Kong Government by agreement at a 'before rail' market price, meaning the MTRC can acquire lands at a low price. The MTRC, in partnership with selected private developers, can then develop lands and sell developed property projects at an 'after rail' price, thereby capturing the increased land value (Suzuki et al., 2015). The profit from development between the 'before rail' and 'after rail' prices can bridge the funding gap for constructing and developing the projects (Zhao et al., 2012). Under this mechanism, the government enjoys significant capital returns because the Hong Kong Government has a 75% share of the MTRC.

Hong Kong is one of the world's most expensive cities for office rents and residential housing due to the scarcity of land, high population densities and high property values. These factors provide a foundation for R+ P model (Suzuki et al., 2015). In addition, a reason for the success of Hong Kong's VC is that the Hong Kong Government has ownership of urban land, so the MTRC and the Hong Kong Government can profit from most of increases in land value resulting from rail and property development (Cervero and Murakami, 2009). Another reason contributes to the success of Hong Kong's VC is that the MTRC can obtained lands from the government by agreements, ensuring the key position of the MTRC in VC projects. Notably, the Hong Kong Government also focuses on the benefits of local community. In fact, Hong Kong has a relatively sound property tax system, but Hong Kong does not rely on the taxation-based VC, that is, the local community can share the benefit of VC by tax exemption (Hui et al., 2004). Moreover, as the Hong Kong Government is the largest shareholder of Hong Kong MRT, so the government can use revenues from VC to improve the accessibility and amenity of public transport for local community again (Tang et al., 2004).

Some countries have a long history with VC, and they may have passed explicit legislation for value capture. For example, the US has formulated the 'Tax Increment Financing' legislation for VC. Under the state legislation, Tax increment financing is implemented by creating a geographic district and is administered by tax increment financing authority for a period. As new funds are invested by private developers, the property values in the district increase and generate the property tax revenues. The tax increment is diverted to the tax increment financing authority, and is used for the improvement of the district (Chapman, 2017; McIntosh et al., 2017).

In addition, the argument is that identifying who has what role in VC processes is important to VC work. The public sector may play roles as planners, policymakers, and collaborators to make sure VC, from planning to implementation, is reliable and transparent (Jillella et al., 2015). Generally, different levels of governments play their own roles in the VC process. For example, in Sao Paulo, Brazil, the federal government is responsible for

formulating standards for urban planning and transit-oriented development projects in cities. The state and city governments are responsible for rail transit and integrated transport networks across metropolitan areas, while local agencies control part of the urban transport system and land use planning in local level (Suzuki et al., 2015). In the US, VC is administered at the state, regional and city levels, and the federal government is in charge of offering the federal capital share for the costs of construction and land acquisition; thus, the federal government has an indirect implementation role in VC. However, federal policies and plans may affect the costs and zoning plans of transport systems, which are critical to whether VC happens (US Government Accountability Office, 2010).

The private sector usually undertakes responsibility for sharing the costs and risks with the public sector because of profits and revenues. This sharing happens because the private sector can benefit from the accessibility improvement through more potential customers and higher sale or rent for residential units or development projects On the other hand the public sector can benefit from sharing the construction costs of transport infrastructure and lease income (Medda, 2012). In addition, the local community's willingness to participate is a significant factor for the success of VC (Jillella et al., 2015). The opinions of local community concerning transportation issues or feelings about the transportation infrastructure are essential to help shape the process of VC (Smolka, 2012).

The fact is that different countries may have different government structures, different ways to formulate laws, regulations and policies, and different land ownership attributes (i.e. in Japan and the US, there is private land ownership, while in China and Singapore, the land belongs to the state), thus there is no one size legal and institutional framework that fits all thing in the value capture strategy, and we have to analyses the specific value capture mechanism based on case by case.

For the research, we attempt to develop a conceptual framework based on public value management and partnership theories. These theories emphasize collaborative/partnership relationships between different actors that enables VC environment. These theories help in rethinking government role in policymaking, planning and service delivery (O'Flynn, 2007; Moore, 1995). Moreover, these theories can help establish appropriate institutional arrangements and financial arrangements, as well as delivering public goods and services (Hodge and Greve, 2007; Van Ham and Koppenjan, 2001). The research will extend the boundaries of these theories into institutional partnership, financial partnership and social partnership.

However, this paper mainly focuses on the institutional nature of partnership to explore what are the opportunities and challenges to the use of VC for transportation projects in China, and how the institutional environment supports policy and planning tools that help the local government and the local transit agency to conduct VC projects. This paper answers a research question on how the local government and local transit agency address the regulatory challenges to develop VC projects in complex institutional environment. Based on institutional nature of partnership, this paper can provide a useful lens to explore strengths and weaknesses of VC projects using a case study.

This paper selects Shenzhen as a case study. Shenzhen is the first city in Mainland China to pursue the VC projects. It is worth investigating because VC provides a significant funding for the development of urban rail transit in Shenzhen. This research conducted 21 semi-structured interviews with relevant stakeholders (government officials, planners, managers, and experts) in Shenzhen during a field trip in early 2019. This information was supplemented by internally and publicly available documents, metro company reports, and media news on Shenzhen's VC projects. All information and data were first collected in Chinese and then translated in English.

3. VC IN CHINA: OPPORTUNITIES AND CHALLENGES

3.1 Macro Factors

3.1.1 Urbanization, economic growth, and transportation development
The rapid urbanization, economic growth, and transportation demand is a pre-requisite for VC projects. China's first- and second-tier cities have undergone rapid urbanization since China's reform and opening-up policy in 1978 (He et al., 2016). From 1978 to 2016, the Chinese urban population increased from 173 million to 793 million (National Bureau of Statistics of China, 2017). At the same time, the built-up urban areas in China has expanded from 7,438 km^2 to 52,761 km^2. Rapid urbanization and continuous economic growth supported each other. For example, China has maintained an average of 7% economic growth over the last two decades, and reached at US$12,240.4 billion in 2017 (World Economic Forum, 2017).

Urbanization and economic growth in China have increased motorization and ultimately congestion (Wang, 2010). For example, the average speed of cars on main roads in Chinese cities is around 10–15 km/h during a weekday in 2019. Traffic congestion also generates air pollution, and the World Bank study illustrated that in China's large cities, car usage accounts for about 50% of total CO_2 emissions (Darido et al., 2014).

To address motorization and environmental issues, the central government published the *Suggestions on Prioritizing the Development of Urban Public Transport*, emphasizing investment in the urban public transport network in cities across China (State Council, 2012). This document identifies the priority development of public transport system such as rapid transit buses and railway-based transit systems in Chinese cities. To date, 34 cities in China have opened railway-based transit systems, comprising 165 railway lines with a total mileage of 5,033 kilometers (China Urban Rail Transit Association, 2018). Moreover, the central government has called for constructing 2,500 kilometres of metro lines by 2020, and the total mileage of metro systems completed will reach over 6,000 kilometres (State Council, 2017). In 2018, China (excluding Hong Kong, Macao and Taiwan) completed a total investment of 547.02 billion yuan in urban rail transit construction, and the estimated investment in urban rail transit that has been approved to build is 4,268.85 billion yuan (China Urban Rail Transit Association, 2018).

Recently, the State Council (2017) pointed out that based on the previous funding sources (e.g. public private partnership and government funding), a sound capture mechanism for the land value added by the development of urban transport should be established.

3.1.2 Real estate market
Apart from urbanization and economic growth, VC requires strong local property market demand. This is because transportation improvement can only enhance land values where property market demand exists (Suzuki et al., 2015), and when the real estate market is in a downturn, there may be a lack of incentives for real estate investment (Mu and Jong, 2012).

China has experienced remarkable progress in improving the urban housing market in a short period of time. Affected by the reform and opening up policy, the real estate market transformed from a central-planning approach to a market orientation. In 1998, the allocation of welfare housing from the state and stated owned enterprises was officially stopped, and policy where most citizens should buy commercial housing to satisfy their housing demands was instituted (Shi et al., 2016).

A boom in the real estate markets in China has followed accompanied by a rapid rise in housing prices. Apart from a slight downward price adjustment in 2008 due to the shock of the global financial crisis, housing prices in urban China have maintained a strong upward

trend (see Figure 2). However, this phenomenon has caused low-income person, especially young adults and rural to urban migrants, to struggle to meet higher housing prices. In this situation, to develop a healthy real estate market in China, the central government has launched a series of documents and instructions that strongly intervene in the Chinese real estate industry. These policies have required local governments to increase the construction of affordable housing since 2008 (Shen et al., 2018). For example, the State Council (2003) issued the *Notice on Promoting the Sustainable and Healthy Development of the Real Estate Market* to implement the urban housing development system, which mainly focuses on commodity housing and promotes the construction of affordable housing. Then, the State Council (2008) prepared *Several Suggestions on Promoting Healthy Development of the Real Estate Market* to speed up the establishment of a multi-channel system that addresses the housing difficulties of low-income urban families, focusing on low-rent housing and affordable housing.

In this situation, China has entered an era in which VC can be implemented to improve financial defects due to the support of real estate market. In other words, China's real estate market not only has a great price on property, but also focuses on the healthy and sustainable development that can benefit to local community.
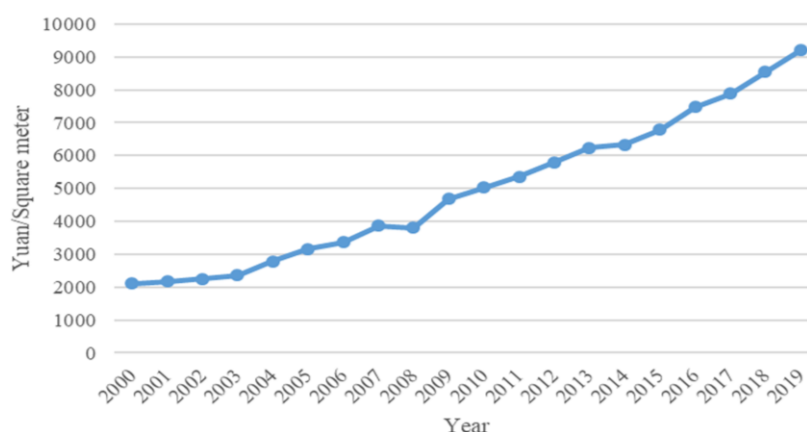

Figure 2. Average price of housing price in China (2000-2019) (Chinese Academy of Social Sciences, 2019; National Bureau of Statistics of China, 2018)

Recently, China has undergone the China–US trade war that brings uncertainties for China's real estate market. The average price of a property in China has not been affected significantly, but the growth rate of housing prices has slowed down. A report of the Chinese Academy of Social Sciences (2019), which stated that housing prices are slightly declines in the first–tier cities such as Beijing, Guangzhou, Shanghai, and Shenzhen. This may be because multinational companies normally located in these cities, and the China-US trade war leads to the withdrawal of foreign capital from the Chinese economics market (PERE News, 2019). In this context, risk of global political and economic situation may influence VC development in large cities of China. This because if the housing price falls, the incremental land value that can be captured will also decrease. On the other hand, risk of global situation may less influence on 2nd and 3rd tiers cities in China.

3.2 Institutional Framework and Policy Environment in China

Traditionally, the State Council is the highest administrative organization of the central government of China. The State Council is responsible for planning national economic

activities, approving and managing urban and rural construction projects, and allocating the tasks to the lower level of governments (Li et al., 2016). With regard to capturing value from transportation, land use, and funding issues, the ministries and administrations are involved as indicated in Figure 3.
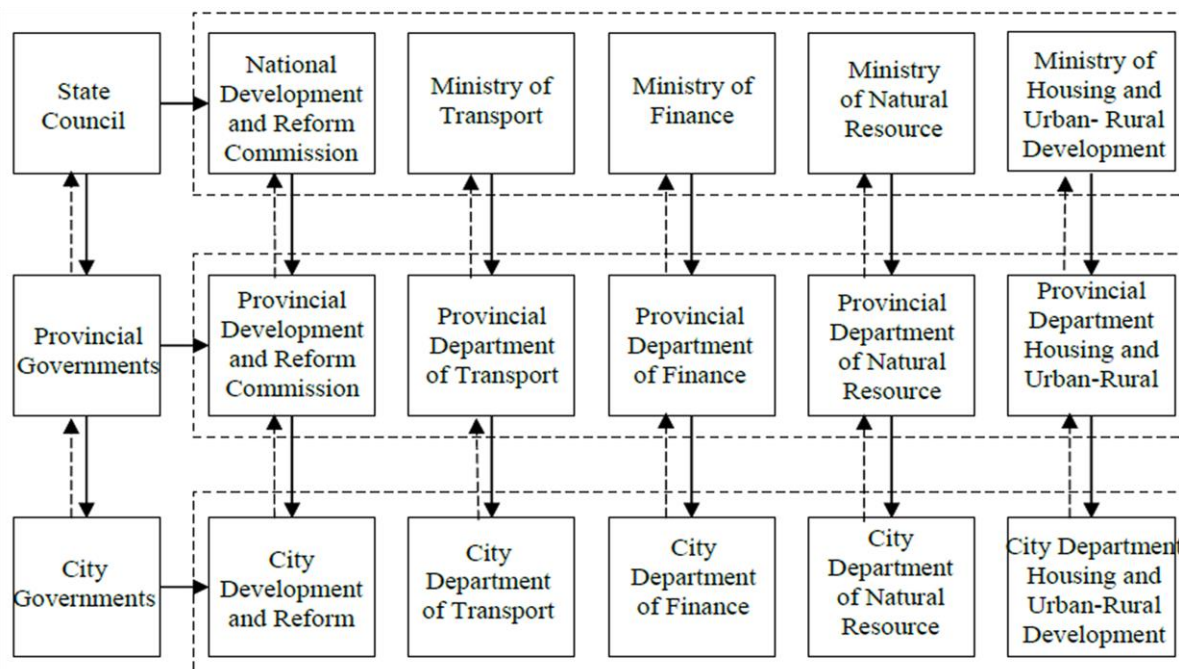

Figure 3. General administrative structure of the building urban transit system in China

However, rights related to administration, finance, and land-use are largely delegated from the central government to local governments, so the decision relating to VC is made by local governments, enterprises, developers and many other land-related interests' groups in China (Qian, 2013). Notably, the provincial and central government's intentions, policies and plans are important variables for local development in China (Ng and Tang, 2004).

Supportive policies also provide the foundation of VC implementation. Especially, the policies from the central government offer a motivation for local governments to conduct VC at local level. The State Council (2017) prepared the *13th Five-Year Plan with Modern Comprehensive Transportation System* as the national-level special plan that indicates the requirements and directions of transportation development for the period of 2016–2020. This Five-Year Plan encouraged the comprehensive utilization of transportation infrastructure and the surrounding space, integrating transportation and commerce, business, exhibitions, and leisure.

In 2017, the *Guidelines on Promoting the Development of Municipal (Suburban) Railways* was jointly published by the National Development and Reform Commission, the Ministry of Transport, and the Ministry of Housing and Urban–Rural Development. This policy focused on exploring innovative investment and financial models for developing rail transit. The regulation encourages railway-related enterprises (transit agency) to construct a comprehensive VC development mechanism through the development of the surrounding property, property leasing and management, and commercial development of stations and depots (National Development and Reform Commission, 2017).

Furthermore, the Ministry of Finance (2019) prepared the *Opinions on Promoting the Normative Development of Cooperation between Government and Social Capital (Private Sectors)*. This document emphasized the invitation of the private sector to participate in the

field of public services is an important decision-making tool for the central government. The document requires that the selection of the private sectors must be achieved by competitive means such as public bidding, invitation bidding, or competitive negotiation.

The role of the community and impact of VC projects on community wellbeing cannot be ignored. Doherty (2004) argued that increase in land value is attributed to community interventions rather than land owners' actions and should be recouped by the public sector and used for public purposes. In other words, the community has a right to receive the benefit of increase in land value in the process of VC. Therefore, the *Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform* in the Third Plenary Session of the 18th CPC Central Committee put forward the notion that "establishing a distribution mechanism for increment land value that needs to consider the State, collective and individual, and rationally improves personal income." (CPC Central Committee, 2013). It is believed that the rational and equitable distribution of land interests should follow the actions of those who have led to the creation of increased land value, thus making sure the increase in land value is distributed to society for citizens to share, as well as ensuring the land and funds needed for urban construction.

Overall, these supportive policy statements not only offer an incentive for local governments to conduct VC, but also indicate a direction for local governments when planning and implementing VC. Local governments can then consider how to address the issues about developing VC as; how, by whom, and what revenues distribution measures should be used.

3.3 Regulatory Framework

3.3.1 Framework for the land commodification

Land use and related policies are critical in VC projects because they are related to land value rises and how to recoup the increased land value (Suzuki et al., 2015). In China, the land use system has experienced continuous reform that provides the implicit possibility of developing VC in China. VC is dependent on the notion that land accrues value and that this value can be monetized and thus captured (Jillella et al., 2015). In China, a dual land system is employed as urban land is state-owned and rural land is collectively owned by local farmers and villagers (Ding, 2003). Before the economic reform and opening-up policy of 1978, stated-owned companies, governments, schools, and joint ventures, etc. could use the state-owned land free for an unlimited period and the Constitution banned land transactions, and thus land had no commodity attributes and no value (Liu et al., 2014).

The land use system in China began to change since 1978, progressing toward land commodification. First, because of the opening-up policy, direct foreign investment increased and thus the demand for land use rose (Jiang et al., 1998). Therefore, the central government developed the land use rights system and allowed foreign investors to use land by leasing (paying up-front fees to rent land) for a specific period. In 1986, the central government established the Department of Land Administration (now called the Ministry of Natural Resource), which is responsible for land policy reform, land allocation and expropriation, land development monitoring, comprehensive land use planning, land law implementation, and other related work (Ho and Lin, 2003). In 1987, the Shenzhen Municipal Government (SMG) conducted three state-owned land transactions through a process of bidding, auction, and listing. This was the first land transaction in China.

After that, the central government prepared a series of legislation and regulations to achieve land reform, making land have value and regulating land markets (see Table 2). The

land can be seen as a valued asset to increase government revenues and to promote urban construction and economic development. In this situation, for lands related to VC development, the transaction must be conducted by bidding, auction, or listing. Theoretically, this kind of land transaction effectively promotes fair and open market competition.

However, at the same time, the land transaction rules create a regulatory barrier that limits the development of VC in China. Rationally, these rules will lead to lands that are not necessarily developed by local transit agencies. In this case, private developers are able to capture the amount of added land value, in turn, the land transaction rules cannot guarantee that local governments and local transit agencies capture an efficient increment land value increases (Xue and Fang, 2015).

Table 2. Laws and regulations of land commodification

Year	Document	Highlight
1988	Constitutional Amendment	Land use rights can be granted and transferred.
1988	Land Management Law	The right to use state-owned lands and collectively owned lands can be transferred, and the state can implement a payment mechanism for using the state-owned lands.
1990	The Provisional Regulation on the Transfer of the Land Rights over State-Owned Land in Cities and Towns	Identifying two levels of the Chinese land market. In the first level, the state is the landowner who gives the land use rights to land users for a specific period through bidding, auctions, or agreement. In the second level, the land use rights can be sold, exchanged, or donated to other land users. The municipal and county governments are responsible for the transfer of land use rights.
2001	Notice on Strengthening the Management of State-Owned Land Assets	To ensure the openness and fairness of land transactions, municipal governments must vigorously promote the bidding and auction of land use rights. If it is really impossible to adopt the bidding or auction method, the arrangement method can be adopted. The results of the agreement are open to the public.
2002	Regulation of Bidding, Auction, and Listing for Transferring State-owned Land Use Rights	Lands for commerce, tourism, residential housing, recreational facilities, and mixed use, etc. should be sold by bidding, auction, or listing.
2004	Land Management Law	Regulates a top-down land use planning system.
2007	Property Law	Lands for commerce, tourism, residential housing, recreational facilities, and mixed use, etc. should be sold by bidding, auction, or listing.

Source: National People's Congress, 1988; State Council, 2001; Ministry of Natrual Resources, 2002; Ding, 2003; State Council, 2007; Tian and Ma, 2009

3.3.2 Lack of a property tax system

As mentioned before, the central government of China promulgated supportive policies for VC implementation through property development and property leasing and management. Unlike some developed countries such as Australia and the US, taxation-based VC has never been considered as a funding tool in China. This because China lacks an effective property tax system at all levels, and thus the role of property tax in the local public finance structure is very limited (Li and Song, 2008). Consequently, many local governments in China have turned to leasing state-owned land for a large lump-sum fee from developers to finance

infrastructure development and capital projects (Tao et al., 2010), resulting in the utilization of development-based VC for developing transportation.

Second, owner-occupied residential property is not included in the tax base for the current real estate tax in China, thus significantly restricting the Chinese government's ability to capture value from the booming housing market (Man, 2012). This indicates that China's current property tax system also lacks a mechanism for capturing incremental increases in property value and the government may miss the opportunity to generate more tax revenue.

Third, house buyers pay taxes and fees during housing transactions but not during the duration of ownership. Therefore, house owners pay property taxes only once, and this rules out the possibility of capturing value through continuous improvement-based taxation in China (Tang et al., 2011).

With respect to the issues in the property tax system in China, the central government has tried to conduct property reforms, and selected Shanghai and Chongqing as the property tax pilots. The two cities were permitted to collect property taxes on newly purchased second homes and luxury residential properties, respectively, in 2011. However, in early 2019, the property tax experiment was considered a failure by the central government and scholars because the collection of property tax had no effect on house prices and local fiscal revenue in Shanghai and Chongqing (First Finance News, 2014). Subsequently, a spokesperson for the National People's Congress of China identified that there is no property tax in the legislative plan of China in 2019.

It is difficult to determine whether taxation-based VC would be useful for the situation in China. One the one hand, because of lack of a supportive property tax regulatory framework, China does not have the ability to levy property taxation for achieving VC. On the other hand, because of the failure of the property tax pilots in Shanghai and Chongqing, the central government needs to re-examine whether China's property tax could become the main public revenue source, as is the case in most developed countries in the West. If so, what is the specific implementation plan for China? In this unknown situation, China currently has only limited VC instruments and prefers to use development-based VC, which has been applied in many experimental cities such as Chengdu, Nanjing, Shenzhen, Shanghai, and Wuhan.

4. SHENZHEN CASE

4.1 Macro Factors in Shenzhen

4.1.1 Urbanization, economic growth, and transportation development
Shenzhen is located in the south of Guangdong Province, China, adjacent to Hong Kong. From 1978 to 2017, the urban population of Shenzhen increased from 0.35 million to 13 million and its total gross domestic product (GDP) increased from 200 million yuan to 2.5 trillion yuan. Its urban built-up land increased by 3 km^2 from 1979, reaching 993 km^2 in 2017. (Shenzhen Statics Bureau, 2018). During this time, Shenzhen has implemented a series of favorable and flexible policies to attract investment and thus stimulate economic growth (Yang et al., 2016). For example, in Shenzhen, the policy regarding land use rights, which made land use rights commodities that could be bought and sold through bidding, auction or listing, was the first to be tested in China.

Shenzhen has performed well in its process of urbanization and economic growth. However, the rapid development has caused a shortage of land resources and high population density, similar to Hong Kong. For example, in recent years, the average supply of urban built-up land in Shenzhen has been only 12 km^2. The population density of Shenzhen is as

high as 5,963 people per km^2, which is about 41 times higher than the national average of China (Shenzhen Statics Bureau, 2018). As some interviewees noted that:

> *"Shenzhen learned lessons from Hong Kong because the macro conditions are very similar. Like Hong Kong, Shenzhen has a shortage of land, and high population density, so it advocates to optimizing land utilization." (Planner 1 and official 2, interview, 2019)*

Shenzhen has experienced the negative impacts of motorization such as traffic congestion and air pollution, raising the demand for a good public transit system. In 2007, when the private car ownership exceeded 1 million, the Shenzhen Municipal Government (SMG) issued the *Suggestions on Implementation of Priority Development of Urban Public Transport in Shenzhen*. This policy document determines the goals of rail transit development in Shenzhen: (1) accelerating the construction of a rail transit system; (2) building an urban rail system that is coordinated with land use and the spatial layout; and (3) forming an urban passenger transport system with rail transit as its backbone as soon as possible (Shenzhen Municipal Government, 2007).

Following Beijing, Shanghai, Tianjin, and Guangzhou, Shenzhen has become the fifth Chinese city to own a metro system (36 cities in China now have metro systems). Shenzhen Metro Corporation (SZMC) operates eight lines, with total of 199 stations and 285 kilometres of track (see Figure 4). Five million passengers uses these metro lines everyday (Shenzhen Metro Corporation, 2019).
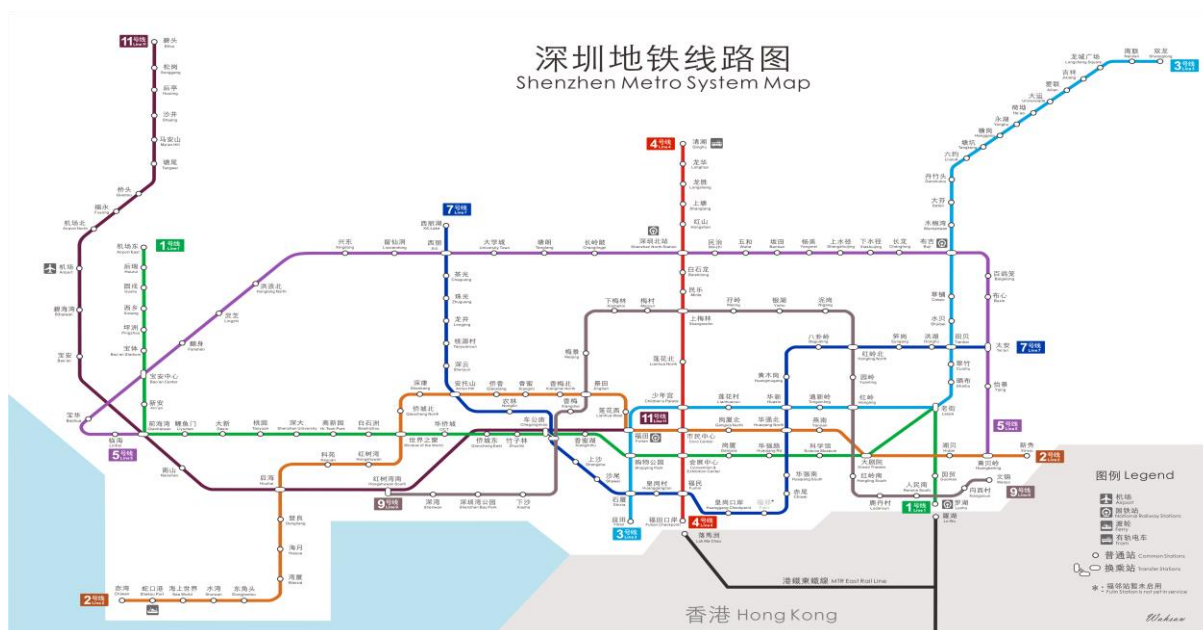

Figure 4. Shenzhen Metro Map (Shenzhen Metro Corporation, 2019)

SZMC was established on 31 July 1998. It is a local state-owned enterprise directly controlled by the SMG; the senior managers are appointed by the SMG.

> *"Hong Kong Government has 75% shares in the MTR, while the SZMC is 100% owned by the SMG." (Official 4, interview, 2019)*

The main businesses of SZMC covers metro construction, metro operation, property development, investment and financing, and resource management and property management.

All shares of the company belong to the Shenzhen State-owned Assets Supervision and Administration Commission, which is the government department that manages government investments in state-owned enterprises.

4.1.2 Real estate market in Shenzhen

Since the commodification of land-use rights, the real estate market has played an important role in facilitating urban development in Shenzhen (Zhang, 2000) . Shenzhen conducted the first land transaction in China before the Constitutional Amendment and it also took the lead in reforming China's housing system. Shenzhen ceased the allocation of affordable housing under a planned economy, and realized the commercialization of housing and affordable housing development, led by the local government.

Based on the decision set by the central government to stop the allocation of affordable housing, the real estate industry has become one of the key industries in Shenzhen and housing prices have increased dramatically. Following the trend of housing prices across the country, Shenzhen's housing market has shown a steady upward trend but with slight declines during the global financial crisis in 2008 and Shenzhen's housing purchase restriction policy in 2011. Moreover, due to the China-US trade war, Shenzhen's housing prices fell slightly again (see Figure 5). As an open economy city, Shenzhen is very sensitive to international political and economic changes. Therefore, stabilizing Shenzhen's housing prices is extremely important, and the central government actively seeks solutions. For example, in November 2019, the central government in collaboration with the Hong Kong Government to formulate a new policy that allows Hong Kong residents to purchase houses in mainland cities of Greater Bay Area (Guangdong Province, Hong Kong, and Macao). This new policy expects to attract Hong Kong people buy properties in Shenzhen and other cities in Guangdong Province. It also provides more housing, living space, education, and job opportunities to Hong Kong residents and may benefit to address massive protest in Hong Kong. However, Hong Kong residents may consider that their capital might has been transferred to mainland China (BBC News, 2019).
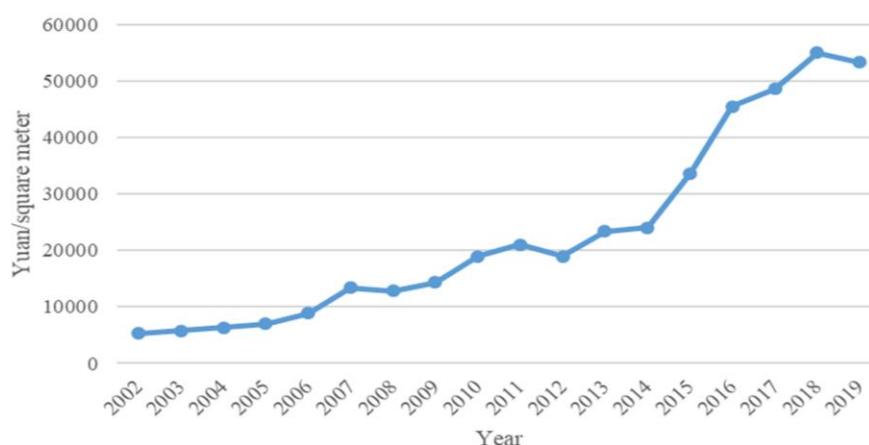

Figure 5. Housing price in Shenzhen 2002-2019 (Chinese Academy of Social Sciences, 2019; National Bureau of Statistics of China, 2018)

Although such external political and economic uncertainties may influence Shenzhen's real estate market, the housing prices in Shenzhen are still among the most expensive in China. In this case, land sales revenue is still an important source of funding for urban infrastructure development, such as the construction of an urban rail transit network, a high-speed road

network, water supply, gas supply, airport and other infrastructure in Shenzhen. In addition, because of the shortage of land resources in Shenzhen, high housing prices provide strong motivation for real estate developers to carry out urban development projects such as urban renewal and suburban development. Hence, the real estate market in Shenzhen offers an opportunity to develop development-based VC via the Rail + Property model. One interviewee from SZMC stated that:

> *"In fact, Shenzhen's VC was also proposed in the context of the global financial crisis of 2008. Although Shenzhen's housing prices were slightly affected at that time, it was both a challenge and an opportunity. Certainly, I can say that there is no problem in the real estate market environment in Shenzhen. Our housing building is not worried about no person to buy. Shenzhen's job opportunities, salary and urban development have attracted lots of people, so it is well-known that Shenzhen is now an immigrant city."*
> *(Manager in SZMC, interview, 2019)*

4.2 VC Mechanisms in Shenzhen: Developing Institutional Mechanism

Shenzhen is a pioneer in exploring the VC mechanism in China. The first phase of urban rail transit construction was funded by the SMG (70%) and bank loans (30%); the application of VC happened in the second and third phases of urban rail transit construction in Shenzhen. As of November 2017, VC projects under construction have a combined area of 3 million m^3 and seven projects were sold to the real estate market. The areas for sale are about 600,000 m^2 with a price exceeding 44 billion yuan. Since the first VC project was launched in Shenzhen in 2013, the revenues from the VC mechanism have exceeded 25 billion yuan (SZMC, 2018).

4.2.1 VC method: land transaction with special conditions
In the second phase of urban rail transit construction, the SMG and SZMC launched the R+P model for land development. This model basically follows the same practice in Hong Kong but has been formulated according to the land use laws and regulations related to Mainland China. Specifically, the SMG transfers lands by bidding, auction or listing to the SZMC. To ensure that SZMC can obtain land parcels, the SMG sets special conditions for bidding, auction or listing. For example, the special conditions specify that bidders must have the goals of constructing and operating an urban transit rail system with its ancillary facilities and related land use for one or more lines. In this case, the SMG prevents non-metro owing private developers winning the bidding. However, some experts expressed their concerns during interviews:

> *"This method is actually a 1.0 version of Shenzhen's VC, but it has been copied by many cities in China. This method can indeed bypass the existing regulatory restrictions, because there is no clear requirement for land transactions that cannot be carried out under special conditions. However, there is no doubt that this method has undermined market competition."*
> *(Expert 2 and Expert 3, interview, 2019)*

In this institutional mechanism of VC method, the Shenzhen Land and Real Estate Trading Center offers a plan for conducting the land transaction, and the SZMC gives a land use payment to the Shenzhen Municipal Finance Bureau at first. Then the Shenzhen Finance Bureau transfers the payment to the Shenzhen State-owned Assets Supervision and Administration Commission. After receiving land lease payments, the Shenzhen State-owned

Assets Supervision and Administration Commission transfers the payment back to the SZMC as registered capital from the Shenzhen Finance Bureau. Other main stakeholders in this kind of VC method include the Shenzhen Development and Reform Commission (responsible for project approval), the Shenzhen Planning and Natural Resources Bureau (responsible for the adjustment of regulatory planning, construction planning approval, and land supply) and the Rail Transit Office (Responsible for coordination and cooperation) (see Figure 6). Through this process, the SMG not only grants land use rights to the SZMC for free, but it also allows the SZMC to capture most of the incremental land value, and thus the financial status of the SZMC can be improved significantly.

> *"The SMG sets the Rail Transit Office to take charge of coordination and cooperation in the VC process. In order to facilitate communication, the Rail Transit Office is not in the government building, but in the building where the SZMC is located."*
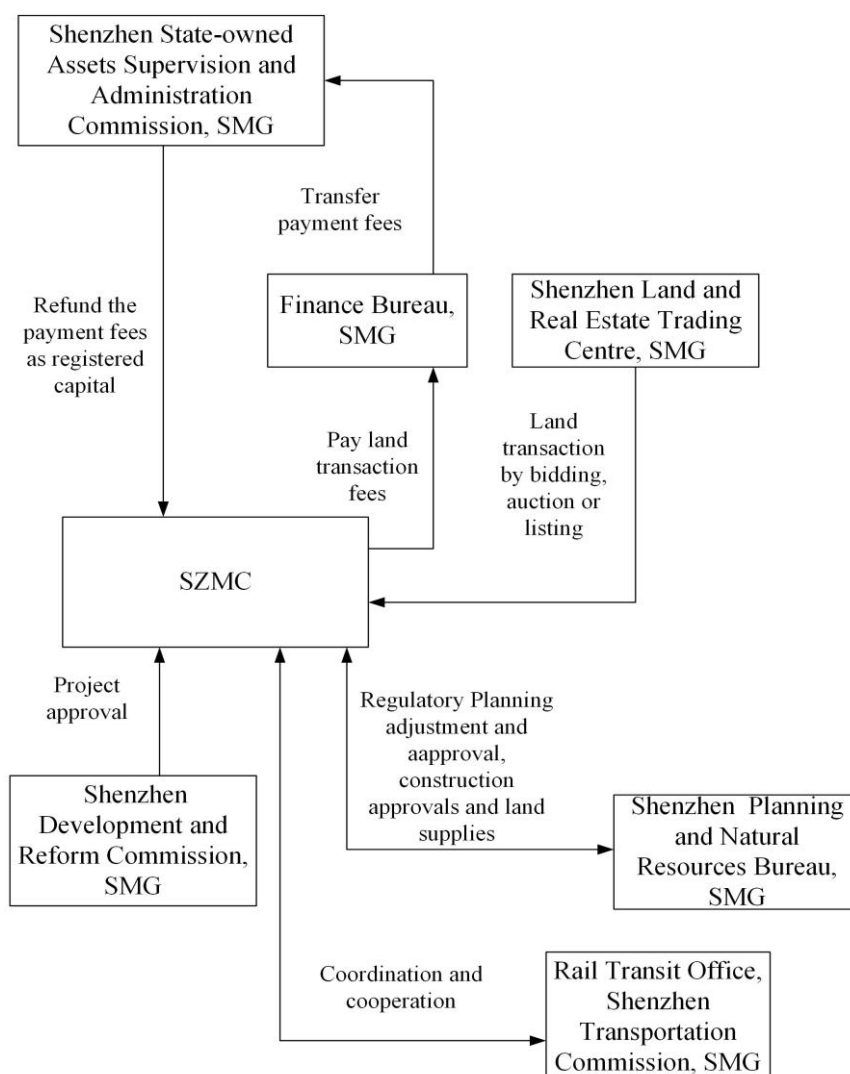

Figure 6. The VC mechanism 1 in Shenzhen (developed based on interview)

4.2.2 VC method: land value as investment capital (LVIC)

Another VC method to be used during the third phase of rail transit construction in Shenzhen. The metro lines to be built under this model are about 244 kilometers and 153 stations, with a

total investment of 144 billion yuan (SZMC, 2018). The SMG plans not to make cash allocations for the third phase of rail transit projects. Instead, it has prepared 5.66 million m^2 of land plots so the SZMC can recoup the costs of construction and operation. One interviewee said during the interview

> *"The SZMC has begun to make a profit. The SZMC has 12 VC projects involving eight land plots are funded by LVIC, and 4 land plots are acquired by bidding, auction or listing with special conditions. It can be said that and most of the contribution of the profit is from the LVIC method" (official 2, interview, 2019)*

Importantly, in 2012, the *Shenzhen Land Management System Reform Overall Plan* was jointly approved by the Ministry of Nature Resources and Guangdong Provincial Government. In this case, with the support of higher-level governments, land value can be considered as investment capital that can be directly put into project development in Shenzhen. Furthermore, to support the SZMC, the SMG prepared the targeted policy entitled *Interim Measures for Land Value as Investment Capital of State-owned Land Use Right in Shenzhen* in 2013. The policy clearly points out that the LVIC has been tested and applied by three companies, including the SZMC, Shenzhen Airport Enterprise and the Special Economic Zone Construction and Development Enterprise (SMG, 2013). It implies that under this institutional mechanism, to better cooperate with the SZMC, the SMG issued this new policy to help and protect the implementation of VC. Specifically, the Shenzhen Development and Reform Commission formulates an annual investment and financing plan at first, and then the Shenzhen Planning and Natural Resources Bureau is in charge of formulating an annual plan for LVIC and conducts the site location. After that, the land use plan for LVIC and the price of land will be identified by relevant governmental departments including the Shenzhen Development and Reform Commission, the Shenzhen Planning and Natural Resources Bureau, the Shenzhen Finance Bureau, and the Shenzhen State-owned Assets Supervision and Administration Commission. Importantly, based on the assessment of land price, the Shenzhen Planning and Natural Resources Bureau, the Shenzhen State-owned Assets Supervision and Administration Commission, and the SZMC sign the tripartite contract for land acquisition rather than through the processes of bidding, auction or listing. It implies that the SZMC can directly get the land for property development. Finally, the SZMC completes the capital registration. Figure. 7 shows the mechanism of the LVIC in Shenzhen.

Undoubtedly, Shenzhen has become a pioneer and experiment city again, seeking to implement innovative VC mechanisms in China. Theoretically, this method helps the SZMC not have to raise high land transfer costs, at the same time, the SMG allows the SZMC to hold all of the incremental land value. In the interviews, some interviewees also highlighted the advantages of LVIC, for example:

> *"This method protects the market competition mechanism, that is, no longer takes special conditions to bid, auction or list. Moreover, this method saves costs including land use fees and time." (Planner 1, interview, 2019)*

> *"[...] By contrast, LVIC only needs to assess the land value and complete the tripartite contract, so the SZMC can think about the overall layout of the property development earlier without any concern, and the efficiency is higher." (Planner 4, interview, 2019)*
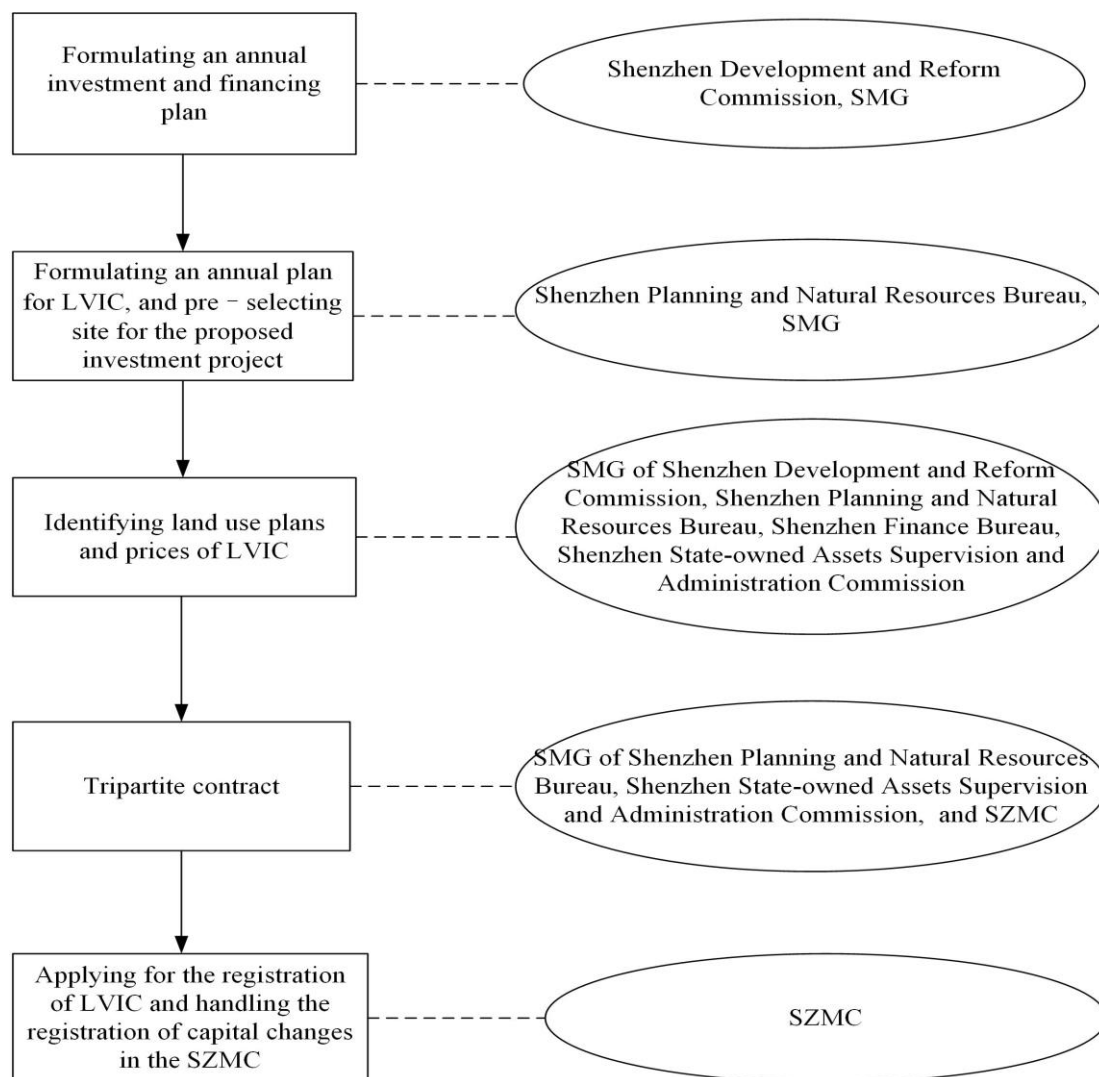
Figure 7. The VC mechanism 2 of LVIC (developed based on interview)

In addition, the SMG emphasizes the combination of building affordable housing and applying the VC mechanism in Shenzhen. The SMG has attempted to distribute the captured land value increase to local citizens. Through the provision of affordable housing, local citizens, especially low-income people, can lower the cost of buying homes. For example, in the Qian Hai Depot Project, as the first VC project in Shenzhen and in Mainland China, the SMG requested that the SZMC build 12,363 units of affordable housing, covering an area of 134,765.63 m^2 (SZMC, 2018).

> "The effectiveness of Shenzhen VC is not only reflected in economic benefits, but also in social benefits. Shenzhen Metro (SZMC) has built about 30% of the affordable housing in Shenzhen for the municipal government (SMG), solving the housing needs of low-income and young people." (Expert 2, interview, 2019)

Moreover, as mentioned before, China lacks a property tax system and thus local citizens will not be charged ongoing taxes for living in these affordable housing units, even in commercial housing. In this situation, some local citizens can enjoy a better quality of life without paying extra costs.

5. DISCUSSION AND CONCLUSION

This paper aims to identify opportunities and challenges to implement VC in China. By using the institutional dimension of partnership as a theoretical framework and Shenzhen as a case study, the paper explores the macro factors (such as urbanization trend, economic growth, transport development and the real estate market); China's regulatory framework (such as land commodification and property tax system) and wider policies in general and Shenzhen in particular has implemented.

5.1 Macro Environment

This paper shows that Shenzhen translated Hong Kong's VC mechanism in their local context and currently leading VC debate in China. Shenzhen has similar urban characteristics to Hong Kong such as high population density, the scarcity of lands, and good economic performance (see Table 3).

Table 3. Urban Characteristics in Shenzhen and Hong Kong

Characteristics	Shenzhen	Hong Kong
Population (million)	13	7.5
Population density (people per km^2)	5963	6777
Area (km^2)	2050	1111
Urban built-up area (km^2)	993	270
GDP	2.42 trillion yuan	2.40 trillion yuan

Source: Census and Statistics Department of Hong Kong, 2018; Shenzhen Statics Bureau, 2018

On the one hand, Shenzhen and Hong Kong's urban density and built-up area are conducive to the construction of their respective urban rail transit systems, which can tackle the problems of congestion and accessibility in both cities. In addition, the ease of travel has been improved by offering high-quality of metro stations and public services. By using an urban rail transit system, economic agglomeration generated by Shenzhen and Hong Kong's high urban densities can translate to higher property prices. These conditions offer a foundation for increasing the land and property value close to transit stations and for conducting VC.

On the other hand, like Hong Kong, Shenzhen has an extremely strong and booming real estate market. A strong real estate market can help attract private developers to cultivate real estate plans around the rail transit station and improve the feasibility of the project (Tang et al., 2004). Cervero and Murakami (2008) argued that the integration of real estate market and urban transit rail development is theoretically sound, socially desirable and economically attractive in Hong Kong. Likewise, if without the booming real estate market, Shenzhen would lack capacity to learn from the successful experience of the Hong Kong's Rail + Property model as low property prices cannot support the efficient funding return. Nevertheless, the real estate markets are easily impacted by the global political and economic risks. As mentioned earlier, Shenzhen and major mainland cities' property prices have been influenced by the China–US trade war. Similarly, the trade tension between China and US and the massive protest in Hong Kong already impacted the economic situations and outlook of Hong Kong. For example, Hong Kong MTRC as a major real estate developer, and its stock

value dropped approximately 3.4% at Hong Kong stock exchange (CNN News, 2019). Thus, it is necessary to realize that the global risks of political and economic situations may significantly damage the stable and healthy real estate market.

Not surprisingly, cities in China which are now exploring VC mechanism are all major cities such as first-tier cities and provincial capital cities with large population, high urban densities, good performance of GDP, huge demand for transportation, and strong real estate markets. These macro factors generate a favorable environment for VC initiatives at local levels. However, VC cannot be isolated from the global political and economic challenges, and the Chinese central and local governments should actively incorporate and address such risks using effective mechanisms, policies and regulations in their policy documents.

5.2 Regulatory Framework and Institutional Capacity

5.2.1 The property tax system
There is no doubt that the VC experiment of Shenzhen has achieved some successes, but there are still some challenges and barriers to translate VC in the context of China. Because of the lack of an efficient property tax system, VC instruments in China are limited. In the case of Shenzhen, the municipal government did not consider a taxation-based VC method. A debate has emerged as to whether the establishment of a property tax system would improve the current socio-economic situation of China. On the one hand, according to the experience of Western developed countries such as the US, local governments use most of the property tax to pay for education, public security, and the public environment, so that the surrounding environment of the district improves. People are also willing to pay such taxes for the benefits they can obtain. Hence, establishing and levying taxes for land added-value in areas benefiting from the development of a transportation system is reasonable (Zhao et al., 2010).

In China, local communities have enjoyed living improvements tax-free for a long time. Even in an open city like Shenzhen, the local government may be afraid of touching the property tax issue, avoiding opposition from the local community. The central government also expresses this attitude to property tax, following a top-down approach, with legislation first, full authorization next, and proceeding step by step (China News, 2018). Hence, no city in China is currently exploring a taxation-based VC method. However, like Hong Kong, this situation can bring great benefits for taxpayers, which is vital for the success of VC. Of course, this situation carries an underlying risk. Specifically, in the case of Shenzhen, the current VC methods excessively rely on its real estate market. Theoretically, when the real estate market is sluggish, the income from VC will fall accordingly (Hui et al., 2004). The dependence of income on market conditions may create unstable financial pressure on the government. In this situation, the land use system ideally has the capacity to impose taxes efficiently and effectively. Nevertheless, the property tax experiment in Shanghai and Chongqing were failures. This regulatory barrier will take a long time to solve in China, and central and local governments need to rethink what means of taxation are rational in the context of China. If this issue could be addressed, China could increase the number of VC instruments and have more options when planning a VC strategy.

5.2.2 Bypassing land transaction regulations: building institutional capacity
Based on the *Property Law* and the *Regulation of Bidding, Auction, and Listing for Transferring State-owned Land Use Rights*, the lands for commerce, tourism, residential housing, recreational facilities, and mixed use, etc. should be sold by bidding, auction, or listing. This means that land acquisition of VC cannot adopt Hong Kong's style (i.e., by agreement). The ideal situation would be that, like Hong Kong, the transit agency is a key

body in the VC project, and the government and the transit agency enjoy most of the benefits from recouping the increased land value. In the case of Shenzhen, the SMG used bidding, action or listing with special conditions to ensure that the SZMC could win the transaction. This method has been used by other Chinese cities such as Chengdu, Nanjing, and Nanchang. Theoretically, transferring land use rights through open bidding, auction or listing can promote transparency and competitiveness land transaction, thus guaranteeing the local government's land revenues. Some local governments set special conditions for bidders to help the promotion of VC, indicating that local governments have delayed market competition to some extent and has paid more attention to the capacity and experience of bidders. This is a controversial practice, especially as China is now strongly promoting a market economy. However, the reality is that bidding with special conditions is useful for VC development in China, at least in the short-term.

Importantly, building capacity of local institutions is critical for designing and implementing VC mechanism. Initially, the SMG manages land transactions by restricting bidders other than the SZMC. In this case, even though the VC projects has been implemented, they lack the real land value because no bidding and auction were undertaken to ensure the transparency and competitiveness of land transaction. Recently, the SMG and the SZMC try to explore another innovative LVIC method that will consider land value as investment capital to implement VC projects. The LVIC method implies that the SMG and the SZMC mobilize land resources through institutional innovation and create an enabling environment to bypass barriers to land transactions. A targeted policy was specially prepared for supporting the LVIC instrument. Moreover, this method can avoid the huge cost of land acquisition for the transit agency, as well as increasing the capital of the transit agency. It improves legitimacy and transparency as local government could assess land value as per the market before signing the contract with the SZMC. However, the problem appears as the LVIC method has not been covered in the regulatory framework at either the national or local levels. Considering different institutional capacities among other cities across China, local governments should carefully examine their institutional capacities.

In summary, Shenzhen's experience moves from copying the Hong Kong's VC model to build their own capacity that include contextual factors in managing their VC projects. The case study of Shenzhen offers insights into considering how both local government and local transit agency can improve institutional capacity to help VC become successful and more rationality.

5.3 Policy Implications and Future Study

This paper concludes that the institutional nature of partnership plays an important role in creating an environment to enable VC initiatives in China. Specifically, the opportunities of a favorable macro-environment, and supportive regulations and policies help Chinese cities are implementing VC projects. However, the VC mechanism in Chinese regulatory framework such as land transaction method is creating a barrier to VC. Lacking a property tax system also leads to limited access to VC instrument. The case of Shenzhen implies that local governments and transit agencies can circumvent current regulations and successfully implement VC, as well as providing the revenues of VC that local communities can enjoy in some form in China. In order to facilitate the use of VC in China, we offer some policy implications.

1) The success of Shenzhen's VC projects is related to regional contexts which impact on urbanization, rapid economic development, transportation demand, and the

support of the real estate market. Other Chinese cities should carefully consider their institutional capacity before launching VC projects. Perhaps, the central government should prepare pre-requisite targets such as GDP, population, urban density, public transport patronage, and strength of local real-estate market, for the use of VC in development projects. It can benefit to local governments to assess the macro-economic situations, avoiding the VC failures. Moreover, governments policies should incorporate the risks emerged from the global political and economic situations in order to ensuring a stable environment to implement VC.

2) The central and local governments should prepare regulatory framework to operationalize the VC concept. Recently, although some governments have introduced the regulations and policies of land transaction, all levels of governments have not yet formulated a set of standardized and systematic regulations and policies for VC development in China.

3) Building institutional capacity is important to implement VC mechanism successfully. Institutional capacity can be developed by considering and incorporating local factors and realities in VC mechanism. This may include establishing new units, supportive regulations, procedures and human resource capacity.

4) The Chinese governments should develop a mechanism to redistribute the benefits of VC projects in local communities. For example, VC projects generates benefits for the community, including reduced travel time, increased employment, environmental health benefits, property value increases. In Hong Kong, besides these benefits, Hong Kong Government advocates the gain in revenues should be returned to the local community instead of subsidizing the developers. In the case of Shenzhen, besides the improved accessibility, amenity, and economic agglomeration can be enjoyed by local communities, the SMG has also paid attention to affordable housing. The SMG has transferred this responsibility to the SZMC, and the SZMC can offer affordable housing by itself or through private developers. However, the combination of VC with affordable housing is only case by case bases without any supportive laws, regulations, and policies. Moreover, the proportion of affordable housing will directly affect the income from the VC projects and thus some local governments in China may give preference to economic benefits to ensure good government performance. In this case, it is important to develop a clear policy and regulatory mechanisms to redistribute the benefits of VC projects to local community.

Overall, this paper develops a better understanding of VC mechanisms in China and discusses opportunities and limitations of VC prospects in Chinese cities. Also, it offers some implications to cities that attempt to adopt and implement VC. The next phase of the research will focus on the financial and social partnerships of stakeholders to understanding the interactions among stakeholders in VC processes in China.

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