Riding the Tide of Urbanization: Corporate Investment in Bigger Cities

Abstract

Urbanization has powered China's economic growth in recent decades. Local investment opportunities arise with profound social and economic impacts of rapid urban expansion. In this study, I explore the real effects of cities' spatial expansion on corporate investment decisions and the economic consequences. I find that corporate investment expenditures are responsive to local investment opportunities changes catalyzed by urban expansion. This result is robust to the use of instrumental variable based on geographical characteristics. Leveraging the enriched investment environment, firms also improve their investment efficiency and experience increases in future sales, employment, and firm value. A channel analysis shows that urban expansion influences corporate investment decisions through supplying labor and promoting industry agglomeration. In addition, pursuing urban-expansion investment opportunities should be supported by strong and well-developed market institutions. Collectively, the evidence supports the narrative that firms can grab opportunities for growth when investment environment changes during urbanization.

1. **Introduction**

Urbanization has become one of the engines of China's economic growth since 1988 when land use rights can be leased out for a fixed number of years. As the sole statutory owner and supplier of land in the primary urban land market, the local government captures the price difference between rural and urban land when expanding urban areas. Huge government revenue generated from land urbanization is used to finance infrastructure and boost local economic growth. Therefore, different from western countries in which cities are expanding as a result of the market economy, Chinese urbanization is driven by the government expecting to utilize land revenue for developing economy. China has experienced striking urban growth, and cities have undergone substantial expansion. The rapid expansion in urban areas produced profound social and economic impacts. Would firms quickly respond to a fast-changing environment? Do firms seize the promising new investment opportunities to grow? This paper investigates the effects of urban expansion on corporate investment behaviors.

China's urbanization level has soared over the recent decades. Under the government-controlled land tenure system, local government can raise fiscal revenue by taking land at the city edge at a low compensation fee for farmers and generating high land sales revenue for the city treasury (Wang, Zhang and Zhou 2020). Therefore, government can support large-scale infrastructure which builds foundation for economic growth. The significant economic growth in China since the 1990s has been maintained by substantial government spending and massive infrastructural investment. Additionally, promotion competition across jurisdictions motivates local politicians to expand city areas. By showcasing their achievements, officials adept at orchestrating infrastructure investment and urban development are significantly more likely to be promoted (Chen and Kung 2019; Chen et al. 2021).

Unprecedented Chinese urban expansion not only generates huge land revenue to fuel economic development, but also has profound impacts on corporate investment environment.

Literature has long recognized the influence of economic fundamentals in forming firm investment decisions (Dougal, Parsons and Titman 2015; Bernstein et al. 2022; Adelino, Ma and Robinson 2017). For several reasons, business environment changing during urban expansion can play an important role in determining investment expenditures. Bigger cities can form agglomeration economics by accommodating concentrated population and economic activities (Chinitz 1961; Abdel-Rahman 1990; Alcácer and Chung 2014). Population migrant from the rural area supplies labor to firms, which alleviates labor constraints at the preliminary industrial stage. New firms are attracted to enter the expanded urban area, giving rise to more collaboration chances and firm interactions. Firm investment level would be constrained in small cities lacking suitable opportunities. With concentrated population and firms, urban expansion creates substantial new opportunities to invest in.

I hypothesize that urban expansion can increase corporate investment level and improve investment efficiency. I test this prediction on a sample of Chinese public companies during 2003–2017. The measure of urban expansion is constructed as city-level incremental construction land supplied by the city government divided by city-level GDP. As Chinese government governs urban sprawl mainly through top-down construction land quotas, the amount of cultivated land permitted to be converted to urban uses is determined by allocative land quotas. Incremental construction land refers to newly permitted urban land supplied by the government. Therefore, this measure directly captures the outward expansion of urban areas. The results are consistent with my hypothesis indicating a positive relation between urban expansion and investment expenditures. One standard deviation increase of Urban expansion leads to firms' investment ratio increase by about 5%. I also adopt geographical characteristics unrelated to investment as an instrumental variable to address endogeneity concerns. Using the proportions of land area that is unsuitable for development as the instrument for Urban expansion, I reinforce previous conclusion that firms have more intense investment activities following urban spatial expansion.

By grabbing investment opportunities offered by urban expansions, firms are also more

responsive to growth prospects. Urban expansion improves investment quality and leads to higher investment efficiency. Using Tobin's Q and Sales Growth as the proxies for investment opportunities, I find that urban expansion also enhances firms' responsiveness to investment opportunities. This evidence implies that firms are efficiently taking advantage of investment opportunities introduced by urban outward sprawl. This paper further explores whether firms grow faster during urban expansion. To mitigate the endogeneity concern, I instrument Urban expansion by the proportions of unsuitable land. Sales growth, employee growth and market value growth are used to capture firm growth. The results show that urban expansion has a significantly positive influence on firm growth in the following 1 to 5 years. Firms do create values for their investors and stakeholders by utilizing investment opportunities during urban expansion. All findings consistently imply that firms seize opportunities to grow during urban expansion.

To see the channels through which urbanization influences corporate investments, I test whether urban expansion gives rise to investment opportunities through population and industry agglomeration. Bigger cities can accommodate increasing populations shifting from rural areas to urban areas. Labor inflow induced by urban expansion alleviates corporate labor constraints, improves productivity, and increases investment rates. The findings demonstrate that investment efficiency improves only for cities with higher non-agriculture population growth and firms with stricter labor constraints. The second mechanism is industry agglomeration. As the number and types of firms in local area increase, firms can easily find local business partners that are suitable for specific investment demand. I document that cities being attractive to firms are more likely to form industry agglomeration which increases firm ability to chase investment opportunities. Firms with lower market share benefit more from agglomeration because they can decrease fixed costs by sharing facilities and collaborate to pursue opportunities that cannot be achieved alone. In addition, strong and well-developed market institutions can support firms to pursue urban-expansion investment opportunities. Firms in cities with strong

institutional environment undergo less friction from government, and they can be motivated by market to pursue suitable investment opportunities brought by urban expansion.

My findings are related to several strands of research. The results suggest that, in addition to firm-specific economic factors, local investment opportunity shocks produced by urban expansion shape corporate investment decisions. Prior studies examining the impact of regional factors on investment decisions normally face the endogeneity problem that corporate decisions are correlated with local economic development. The Chinese setting in my study alleviates the endogeneity concern to some extent because different from western countries in which cities are expanding as a result of market economy, Chinese urbanization process is governed by the top-down land use planning system. Political intervention rather than market forces shapes urban sprawl. As political promotion is mainly based on local economic development, motivated by career incentives, local officials strive for land quotas and expect to utilize land revenue for developing economy (Wang, Zhang and Zhou 2020). This paper contributes to how corporate investment responds to exogenous local opportunity shocks induced by urban expansion.

Additionally, this study enriches the literature on the government's role in firms' economic decisions. Since state intervention in economy is prevalent in China, the political environment of firms is important for the understanding of corporate decisions. Previous studies mostly document the dark side of government intervention. Chinese government intervenes in firms' decisions to help accomplish social and political goals such as employment, fiscal health, regional development, social stability, etc., which alters firms' market behavior and leads to economic inefficiency (Gu, Tang and Wu 2020; Chen et al. 2021; Hung, Wong and Zhang 2012). However, this study shows that a proactive local government can also foster firm growth by changing business environment. Local government plays a central role in urban expansion because expansion can generate revenue for them to finance construction projects. Although the rapid urbanization process is driven by political considerations in China, it creates important business opportunities for a wide range of firms that contribute to urban development.

This paper also has implications for the reasons why China's rapid economic development has coincided with rapid urbanization. Taking advantage of enriched local investment environment during urban expansion, firms actively pursue opportunities to grow. My results contribute to the understanding of how firms evolve during the accelerated urbanization process led by the local government. Additionally, firm growth introduces vibrancy to local economy and further contributes to the local economic development. This research provides useful insights into why cities grow in China. Although outward expansion generates social costs and hurts social welfare to some extent (Wang, Zhang and Zhou 2020), city expansion changes the economic fundamentals and provides enriched business opportunities for firms to develop. Concentrated population and firm clustering under urban expansion improve firm operation and further boost local economic growth.

The rest of the paper is organized as follows. Section 2 describes the institutional background and develops hypotheses about how urban expansion influences firm investment decisions. Section 3 discusses the sample and data sources. Section 4 presents my primary empirical results regarding the outward expansion of urban land. Section 5 has analysis of potential mechanisms and section 6 presents additional analyses. Section 7 shows the robustness check of main results and the final section concludes.

2. **Institutional Background and Hypothesis Development**

2.1. Institutional Background

2.1.1 Political Intervention in Urban Expansion

In China, land, as one of the fundamental factors of production and living, is under government's control. China has a unique land use system in which there are two types of land ownership, urban land owned by the state (meaning the local government or some other government agency)

and rural land owned by rural collectives (Chen et al. 2021; Chen and Kung 2019). Constitution gives the state statutory right to expropriate rural land for the sake of "public interest". The state that can represent the "public interest" retains ultimate authority over all land. With the introduction of land leasehold market in 1988, land use rights can be leased out for a fixed number of years varying from 40 to 70 years (Wang, Zhang and Zhou 2020). However, the sale of long-term leases for construction land use rights is limited to the urban land market. Rural land must be first converted to urban land to realize its market value. The state is the exclusive body with the authority to expropriate land from rural households in this process.

To maintain sustainable, healthy, and orderly urban growth, a top-down land use planning system has been established in China. The central government attempts to control the total amount of construction land at the subnational level by setting mandatory land quotas. As a land management tool, land quotas determine how much land can be transferred from agricultural land to construction land during urbanization. The central government determines the land quotas of each province, and each provincial government determines the land quotas of each city in its administrative area. As construction land quota is used as the policy tool for regional development, the allocation is not fully response to the economic changes but determined by some social and political considerations. The overall distribution of construction land is not consistent with economic development. In the National Master Land Use Plan (2006–2010), it's stated that in the Eastern region the total construction-use land is controlled, and the incremental construction-use land is controlled strictly, while in the Central region, the incremental construction-use land is increased to support the development there. China Land and Resources Bulletin (2001) stated that the preferential policies to use land and resources should be used to support Western development.

Urban sprawl expansion is facilitated by regional competition among city leaders. By converting rural land at the city edge to urban land, local government can reap considerable price differential to finance public infrastructure and enhance economic performance. Figure 1 shows

that urban outward expansion is along with growing land conveyance fee. A total of 30,556 square kilometers of rural land was converted into city built-up area in China from 2003 to 2017. City leaders are placed in tournaments in which their promotion evaluation is closely linked to local economic outcomes (Li and Zhou 2005). However, local government budget deficit is prevalent. The key financing mechanism is to generate land-based fiscal revenue to finance infrastructure and boost local economic growth. Land development has huge economic and social impacts. Given that the advancement of a city leader depends on the city's economic performance, economic competition across jurisdictions motivates local politicians to strive for land quotas and expand the city area. Wang, Zhang and Zhou (2020) document that a 1 standard deviation increase in the career-incentive measure leads to 9 additional kilometers of outward expansion. The motivation of city leaders plays an important role in planning urban land development.

2.1.2 Urbanization and Economic Growth

Local government, the sole statutory owner and supplier of land in the primary urban land market, then leases land use rights at a price substantially higher than the land compensation paid to rural households. Although the government must compensate farmers when converting rural land to urban land, the compensation is relatively low compared with its market value (Chen et al. 2021). The calculation of the compensation fees is based only on the average returns of agricultural products grown on the farmland. By China's Land Administration Law, the total compensation fees should not exceed thirty times the average annual value of products generated from agricultural land in the three years just before the conversion. There is a consensus that the compensation is generally far below the market value of the land at the city edge. In some cases, the market value was 500 times greater than the compensation (Wang, Zhang and Zhou 2020). The price differential between rural and urban land arising from the distorted land market generates monopoly rents, easily captured by local governments.

The revenue from leasing urban construction land use rights is received as a lump sum payment made at the time of the transaction, officially called the "land conveyance fee" (tǔdì chūràngjīn). The fiscal revenue of local governments consists of two categories: budgetary and extrabudgetary. Land sale revenue is classified as extrabudgetary revenue and local governments are not required to share it with the central government. Since the tax sharing system launched in 1994, tax revenue is reallocated in favor of the central government. Local politicians experience a sharp decline in local revenue while they are still expected to take on the same expenditure responsibilities for the provision of a wide range of public goods and services. Land has become a key source of fiscal revenue for local governments. Because local governments can keep all the proceeds from the sales of land under their jurisdiction as "extra-budgetary revenue", which is deemed an unexpected source of revenue, or windfall (Chen and Kung 2019), there is an increasing reliance of fiscal income on revenue obtained from selling land use rights. Figure 2 displays the level of the land conveyance fee and budgetary revenue from 2003 to 2017. The amount of land revenue is as large as almost 60% of budgetary revenue on average. Land revenue helps local politicians relieve their fiscal stress and fulfill unfunded expenditure mandates.

Cities are getting bigger faster as the increasing reliance of local governments on the land conveyance fee. Rapid urban spatial expansion during the soaring urbanization process provides the first bucket of gold for Chinese industrialization. The significant economic growth in China since the 1990s has been maintained by substantial government spending and massive infrastructural investment. This form of growth is conceptualized as "state-led capitalism" that relies heavily on investments from local governments (Naughton and Tsai 2015). Taking land at the city edge is a key financing mechanism since it generates land sale revenues for the city treasury and the compensation fee for farmland is very low (Wang, Zhang and Zhou 2020). According to China Land and Resources Statistics Yearbook, land-based fiscal revenue generates 35,052 billion yuan from 2003 to 2017 (Ministry of Land and Resources 2017). These land revenues are mainly used for large-scale city construction projects, which have tangible effects on local

economic output. The land conveyance fee generated from land for commercial and residential use is much higher than that generated from industrial land (Wang, Zhang and Zhou 2020). Local governments tend to use industrial land subsidy as a policy tool to attract new firms in desired industries and promote industrial growth. Industrial policies allocating land to industrial use, such as industrial parks (special economic zone) and land-related policies, not only generate future tax revenue but also shape industrial structure, which is crucial for a city's economic growth in the long run.

2.2. Hypothesis Development

In this study, I examine the real effects of urban spatial expansion on corporate investment decisions. In the perfect world of Modigliani and Miller (1958), a firm's investment policy is solely dependent on its investment opportunities as measured by Tobin's (1969) Q. However, in reality, a variety of frictions and distortional forces (such as information asymmetry and agency problems) may prevent firms from making investment optimally, thus making their investment expenditure less responsive to investment opportunities. I focus on the impact of corporate external investment environment on investment decisions. Time-varying location-related factors have been documented to play an important role in determining a firm's investment expenditures (Dougal, Parsons and Titman 2015; Bernstein et al. 2022; Adelino, Ma and Robinson 2017). Cities can generate their internal momentum through endogenous interactions: the knowledge diffusion between a city's workers, technology spillovers between neighboring firms, or consumption externalities between city residents (Dougal, Parsons and Titman 2015). The urban spatial expansion accommodating more people and firms stimulates this kind of city vibrancy, thereby improving investment opportunities.

Expanded urban areas provide the foundation for concentrated population and economic activities. Urban outward expansion can influence firms' investment decisions through the

following mechanisms. The first mechanism is population agglomeration. Labor is a critical input to a firm's production function. The migration of people from rural to urban has been an important impetus for economic development. At the preliminary stage of industrialization, firms commonly face labor constraints. Labor inflow induced by urban expansion alleviates corporate labor constraints, improves productivity, and expands firm scale. Capital expenditure also rises with the employment level. Additionally, an influx of new people with new skills facilitates the dissemination of new ideas. There is knowledge spillover between local social networks. Firms would become more productive and prosperous, leading to enhanced ability to pursue investment opportunities. The effects would be more significant for longer periods.

The second mechanism is firm agglomeration. Government commonly uses industrial land subsidy as a policy tool to attract new firms in desired industries and promotes industrial growth. As the number and types of firms in local areas increase, firms can easily find local business partners that are suitable for specific investment demands. Clustering in the urban area encourages firm interactions, which would spur coordination potential and increase investment rates. They can collaborate to pursue opportunities that cannot be achieved alone. Additionally, firms substantially benefit from clustering by sharing a common large-scale infrastructure. Substantial land revenue is used to construct large-scale infrastructure projects. These infrastructures like roads, railways, airports, water, and electricity are necessary conditions for companies to function. Since infrastructure reduces fixed costs and determines the cost structure, larger cities with a higher number of users of facilities are more efficient and productive. Therefore, the investment opportunities of nearby firms may also improve.

There are limited investment project options in small cities. Firm investment level would be constrained in small cities without suitable opportunities. The dynamic changes during urban expansion give rise to agglomeration economies, which are benefits that come when firms and people locate near one another together in cities. With concentrated population and firms, urban expansion boosts local economic growth and opens up substantial new opportunities for firms.

Therefore, urban spatial expansion is a positive shock to the local investment environment. The enriched business environment shock induces firms to actively take action and grab the chance to grow. I predict that urban expansion increases firm investment level during urban expansion.

H1: Corporate investment ratio is positively associated with urban expansion.

When firms increase investment rate to adapt to the changing business environment, they are likely to blindly undertake some projects with negative present value. It may lead to capital misallocation and result in a reduction in company value. However, I hypothesize that investment efficiency increases during urban expansion. The interactions between people and firms facilitate the diffusion of insights, skills, and technologies. This kind of city vibrancy improves the overall quality of a firm's top management and makes them easier to spot market opportunities. Because there is a growing number of potential investment opportunities when the population and firms agglomerate in bigger cities, firms can find the most suitable project within the broadened options to create firm value. Unlike smaller cities with constrained investable projects, the urban expansion brings a wide range of investment opportunities. I predict that firms can easily find suitable investment projects and enhance the responsiveness of investment opportunities.

H2: Urban expansion increases corporate investment efficiency

Lastly, I hypothesize that firm growth is positively associated with urban expansion. Investment decisions are the primary means by which firms create value for their investors and stakeholders. In fact, in the frictionless Modigliani and Miller (1958) world, investment is the only factor affecting firm value. Firms with limited access to investment projects are seriously constrained in growth. Plenty of investment opportunities arise during urban expansion so that firms can invest efficiently with available positive net present value (NPV) projects. The higher rate of efficient investment during urban expansion, the better firms grow and prosper. Firm growth can be reflected in three aspects: sales, employees, and market value. Seizing chances to

invest efficiently, firms expand their production and recruit more employees. Clustered population and firms in urban areas create sufficient demand and absorb rapid growth. Consequently, firms that invest efficiently during urban expansion would grow faster.

H3: Firm growth is positively associated with urban expansion.

3. Sample and Data Sources

From China Stock Market and Accounting Research Database (CSMAR), I retrieved financial statements, stock market data, and firms' incorporation address data. The city-level data came from a variety of sources. I collected incremental construction land supply data from China Land and Resources Statistics Yearbook. The China Land and Resources Statistical Yearbook issued by the Chinese Ministry of Land and Resources is an informative yearbook reflecting comprehensively the status of land and resources and their administration. It reports detailed government land supply information. Other city-level data such as GDP, population, and city area came from CSMAR. The number of the city's newly registered firms is delivered by the Chinese business registration tracking platform, Qichacha. To measure the institutional environment, I employ a marketization index newly released by the National Economic Research Institute (NERI), providing a province-level marketization breakdown that gauges the extent of pro-market reforms and measures the quality of market institutions.

The measure of firm investment level is computed as capital expenditure minus cash receipts from sales of capital assets, both scaled by total assets at the beginning of the year. It reflects firm payment to acquire, upgrade, and maintain physical assets such as property, plants, buildings, technology, or equipment. Companies invest to increase the scope of their operations or add some economic benefits to the operation. The measure of urban expansion is constructed as city-level incremental construction land supplied by the government (hectare) divided by city-level GDP (100 million). Incremental construction land refers to land newly converted from rural areas to

urban areas. Government land supply is recorded in the statistic yearbook when it has already been sold to individuals or enterprises. It's suitable to be used as the proxy for outward expansion because it means individuals or enterprises are doing urban construction on land used to be owned by rural collectives. To solve the endogeneity of urban expansion, I use the natural logarithm of proportions of land area that is unsuitable for development as an instrument (Saiz 2010; Chen et al. 2016). An area is defined as unsuitable for real estate development if it has a slope larger than 15%. The elevation data is obtained from NASA's Shuttle Radar Topography Mission (SRTM) 90m Digital Elevation Database Version 3.0, which provides a 90-meter resolution Digital Elevation Model (DEM).

The sample period starts in 2003 and ends in 2017, during which the detailed China Land and Resources Statistics Yearbook is available. Table 1 shows the sample selection procedures. From CSMAR, I retrieved the financial statement and stock-market data for 31,512 A-share firm-years during 2003-2017. I first removed 1,643 observations with missing data on city-level control variables. I then exclude 2,060 observations from the financial and real estate industry due to the difficulty in interpreting financial ratios. I dropped 7,093 observations that lacked the data for the firm-level control variables. After deleting 198 singleton observations in the fixed-effect model, I have 20,518 firm-year observations in 249 cities in the final sample. Table 2 shows the industry distribution of the sample, along with the A-share population first retrieved from CSMAR. Except for the financial and real estate industry, my sample industry distribution is in line with that of the population. Table 3 provides the descriptive statistics of the sample. I winsorized all continuous variables at their 1st and 99th percentiles. All variables are defined in the Appendix.

4. Empirical Results

4.1 The Effect of Urban Expansion on Firm Investment

I first investigate whether an increase in urban expansion level affects corporate investment. Urban expansion induces concentrated population and economic activities, giving rise to agglomeration economies that increase firm productivity and investment rates. To test the first hypothesis, investment level is regressed on the urban expansion using the following model:

$$Investment_{i,c,t} = \beta_0 + \beta_1\, Urban\ expansion_{c,t} + Firm\ Controls_{i,c,t-1} + City\ Controls_{c,t-1} + Firm\ fixed\ effects + Year\ fixed\ effects + \epsilon_{i,t}$$

where the dependent variable $Investment_{i,c,t}$ is a firm's investment expenditure in year t, city c and firm i. The variable is measured as cash payments for fixed assets, intangible assets, and other long-term assets from the cash flow statement minus cash receipts from selling these assets, scaled by total assets at the beginning of the year. The interested independent variable is *Urban expansion*$_{c,t}$, city-level incremental construction land supplied by the government divided by city-level GDP.

Following the literature (Chen et al. 2011; Badertscher, Shroff and White 2013; Bai et al.2020), I assume that the investment decision in year t is made based on the beginning of year financial status. I attempt to properly benchmark the conditional mean investment rate for a firm by controlling for changing firm characteristics or growth opportunities. I employ the beginning of year Tobin's q as the proxy for investment opportunities. *Tobin's* q_{t-1} is defined as the market value of equity plus book value of assets minus book value of equity minus deferred tax, all divided by book value of assets. SOE_{t-1} is controlled because the state-ownership has a profound influence on capital market. SOE_{t-1} is an indicator variable that equals to 1 if the firm is state-owned with more than 30% public sector ownership, and 0 otherwise. I also control for the natural logarithm of the beginning of year market value of equity ($Size_{t-1}$), the beginning of year ratio of leverage ($Leverage_{t-1}$), and the beginning of year ratio of operating from cash flow ($Operating\ cash\ flow_{t-1}$). To help ensure that local economic growth and population growth don't drive the results, I include the city-level prior year's GDP growth, population, and GDP per capita. All of these

models include firm fixed effects and year fixed effects. The firm fixed effects control for time-invariant omitted firm characteristics and ensure estimates reflect average, within-firm changes in investment over time other than simple cross-sectional correlations. The year fixed effects account for year trend that could simultaneously affect corporate investment.

A potential concern for my main regression is the endogeneity problem. Officials may expand urban areas in response to the increasing investment demand. There may exist reverse causality between expanding urban areas and investment opportunities. To address this concern, I employ an instrumental variable not related to firms' investment opportunities for urban expansion. Following Saiz (2010) and Chen et al. (2016), the instrument, *Unsuitable land*, is the natural logarithm of the proportions of land area that is unsuitable for development. Geographical natural features are considered fundamental for urban development and partly determine the suitability of construction land. An area is defined as unsuitable for development if it has a slope larger than 15%. When there are higher proportions of unsuitable land in the city, it's a natural disadvantage that limits city sprawl. Unsuitable land development is costlier and has adverse environmental impacts. Such geographical characteristics are exogenous and have no direct influence on economic development (Chen and Kung 2016). I instrument *Urban expansion* with *Unsuitable land*, leading to the following first-stage regression:

$$Urban\ expansion_{c,t} = Unsuitable\ land_{c,t} + Firm\ Controls_{i,c,t-1} + City\ Controls_{c,t-1} + Firm\ fixed\ effects + Year\ fixed\ effects + \epsilon_{i,t}$$

The full set of control variables and fixed effects are the same as prior OLS regression. The estimated urban expansion isolates from the effect of investment demand, solely driven by geographic characteristics. The second-stage regression is as follows:

$$Investment_{i,c,t} = \beta_0 + \beta_1\ \widehat{Urban\ expansion}_{c,t} + Firm\ Controls_{i,c,t-1} + City\ Controls_{c,t-1} + Firm\ fixed\ effects + Year\ fixed\ effects + \epsilon_{i,t}$$

Table 4 presents evidence of the effect of urban expansion on corporate investment decisions. Columns (1)-(3) report the results from OLS regression. Column (1) only includes the proxy for urban expansion, which has a significantly positive influence on firm investment level. Consistent with the first hypothesis, it indicates a positive relation between urban expansion and investment expenditure. In terms of economic significance, given that the sample standard deviation of *Urban expansion* is 0.378, the coefficient estimate implies that one standard deviation increase of *Urban expansion* would lead to firms increase investment ratio by 5% (0.378*0.0079/0.06). Column (2) further controls for firm characteristics: investment opportunities, state-own nature, firm size, leverage, and operating cash flow. City-level control variables are added in column (3). The results remain similar to those in column (1). Investment rates increase by 3.65% to 5% during urban expansion.

Coefficients on control variables are consistent with the literature. Investment activities increase with investment opportunities captured by Tobin's Q. SOEs are less actively investing than non-SOEs due to the market insensitivity of state intervention. Firms with larger size and more operating cash flows have the ability to invest more. Debt financing may introduce covenants that cause firms to be more risk-averse and add some constraints to investment rates. Firms are more active in cities with high GDP growth, but less active when cities in the sophisticated stage with more population and high GDP per capita.

Column (4) and (5) use 2-stages least squared estimation, using the proportions of land area that is unsuitable for development as an instrument for $Urban\ expansion_t$. In the first stage reported in column (4), I find that *Unsuitable land* has a significantly negative effect on the extent of urban expansion, after controlling for firm and city characteristics along with firm and year fixed effects. The first stage Cragg-Donald Wald F statistic is 211.79, suggesting that the instrument is strong enough. The results of the second stage estimations in column (5) consistently indicate a positive and significant relation between investment level and urban spatial expansion. Using geographic

characteristics that are unrelated to investment as an instrument, the results reinforce the conclusion that urban spatial expansion induces more intense investment activities.

4.2 The Effect of Urban Expansion on Firm Investment Efficiency

After documenting urban expansion increases firm investment level, this paper examines whether urban expansion leads to investment efficiency. The majority of investment literature employs the sensitivity of investment expenditure to Tobin's Q as the measure of investment efficiency. *Tobin's* $q_{i,c,t-1}$, defined as a firm's market value to the replacement cost of its assets, is calculated as the market value of equity plus book value of assets minus book value of equity minus deferred tax, all divided by book value of assets. I interact Tobin's Q with urban expansion to test how expanded urban area affects investment-Tobin's Q sensitivity:

$$Investment_{i,c,t} = \beta_0 + \beta_1 Urban\ expansion_{c,t} + \beta_2 Tobin's\ q_{i,c,t-1} + \beta_3 Urban\ expansion_{c,t} \times Tobin's\ q_{i,c,t-1} + Firm\ Controls_{i,c,t-1} + City\ Controls_{c,t-1} + Firm\ fixed\ effects + Year\ fixed\ effects + \epsilon_{i,t}$$

For robustness purposes, I use an additional measure of investment opportunities. Sales growth is used as an alternative proxy for firm prospects following literature (Badertscher, Shroff and White 2013; Chen et al. 2011). $Sales\ Growth_{i,c,t-1}$ is defined as the change in the natural logarithm of sales revenue from year *t-1* to year *t*. The interested coefficient is the interaction between sales growth and urban expansion, which captures the incremental sensitivity of investment-to-investment opportunities.

$$Investment_{i,c,t} = \beta_0 + \beta_1 Urban\ expansion_{c,t} + \beta_2 Sales\ Growth_{i,c,t-1} + \beta_3 Urban\ expansion_{c,t} \times Sales\ Growth_{i,c,t-1} + Firm\ Controls_{i,c,t-1} + City\ Controls_{c,t-1} + Firm\ fixed\ effects + Year\ fixed\ effects + \epsilon_{i,t}$$

Table 5 presents evidence from OLS regressions relating urban expansion and investment efficiency. Column (1) and (2) use *Tobin's* q_{t-1} to measure investment opportunities. The

interaction between *Tobin's* q_{t-1} and *Urban expansion*$_t$ is significantly positive. The magnitude of coefficient in column (1) without control suggests that the association between investment and growth opportunities rises 18.9% (0.0028*0.378/0.0056) for one standard deviation increase in urban expansion. Column (3) and (4) use *Sales Growth*$_{t-1}$ as the alternative measure to capture investment opportunities. The results consistently support that urban expansion leads to investment efficiency. This evidence implies firms are taking advantage of growth opportunities introduced by urban outward sprawl. Firms increase their investment efficiently, which leads to more responsiveness to growth prospects.

4.3 The Effect of Urban Expansion on Firm Growth

The evidence presented so far implies that increasing urban expansion encourages investment activity and enhances investment efficiency. Investment decisions are the primary means by which firms create value for their investors and stakeholders. In fact, in the frictionless Modigliani and Miller (1958) world, investment is the only factor affecting firm value. A lower rate of investment could limit the firm's ability to grow (Bai et al.2020). As firms actively grab opportunities introduced by urban expansion, firms would grow faster during city sprawl. Since firm growth is vulnerable to omitted confounding factors, I adopt the instrumental variable *Unsuitable land* to estimate *Urban expansion*. As the geographic characteristics given by nature are unrelated to firm growth, the concern of confounding factors influencing both urban expansion and firm growth is alleviated. I first estimate city spatial sprawl using the proportions of land area that is unsuitable for development:

$$Urban\ expansion_{c,t} = Unsuitable\ land_{c,t} + Firm\ Controls_{i,c,t} + City\ Controls_{c,t} + Firm\ fixed\ effects + Year\ fixed\ effects + \epsilon_{i,t}$$

To test the hypothesis that firm growth is positively associated with urban expansion, the following regression with the same set of control variables and fixed effects is conducted:

$$Growth_{i,c,t+l}=\beta_0 + \beta_1 \widehat{Urban\ expansion}_{c,t} + Firm\ Controls_{i,c,t} + City\ Controls_{c,t} + Firm\ fixed\ effects + Year\ fixed\ effects + \epsilon_{i,t}$$

I use sales growth, employee growth, and market value growth to proxy firm growth. Given the lasting and profound impact of urban expansion, I examine the effect of current urban expansion on firm growth from year *t* to year *t+5*, and the parameter *l* ranges from 0 to 5. Different from investment decisions influenced by the year beginning financial status, firm growth is related to current year prospects so that I use control variables in the current year. The matrix of *Firm* $Controls_{i,c,t}$ includes firm-level controls: *Tobin's* q_t, SOE_t, $Size_t$, $Leverage_t$, and *Operating cash flow*$_t$. City-level characteristics, *GDP* $growth_t$, $Population_t$, and *GDP per capita*$_t$ are controlled in *City* $Controls_{c,t}$. This model includes firm fixed effects and year fixed effects as before.

In table 6, the dependent variable is *Sales* $Growth_{t+l}$, the change in the natural logarithm of sales revenue from year *t-1* to year *t+l*. Column (1) reports the first stage IV estimation results similar with the results in table 4. Proportions of unsuitable land have negative and significant effects on urban expansion. Column (2) - (7) report the second stage IV estimation results. Because the incremental construction land supply data is only available from 2003 to 2017, observations decrease when the horizon parameter *l* increases. The influence on *Sales Growth* in year t is insignificant, which means that the investment cannot generate sales immediately. The effect is progressively stronger over year *t+1* to year *t+4*, and begins to diminish in year *t+5*, indicating the effects are decreasing after climbing to a peak in year t+4. It is consistent with the hypothesis that investment during urban expansion increases firm value and firms grow faster once they can access opportunities to satisfy pent-up demand.

Table 7 presents evidence of the effect of urban expansion on corporate future employee growth. The dependent variable is *Employee* $growth_{t+l}$, the change in the natural logarithm of employee payment from year *t-1* to year *t+l*. The first stage IV estimation results are reported in table 6. This table reports the second stage IV estimation results. The results are consistent with

Sales growth$_t$. Urban expansion doesn't have a significant impact on employee growth in year *t*, but the influence on employee growth in year *t+1* to year *t+4* is significant and increasingly stronger. Table 8 presents the results of *Market value growth*$_{t+l}$, the change in the natural logarithm of the market value of assets, which is the market value of equity plus book value of assets minus book value of equity minus deferred taxes. As a comprehensive measure of firms' business scale, *Market value growth*$_{t+l}$ reflects the profitability of sales and investor expectations about future growth. Urban expansion has immediate effects on firm's market value in year *t*, and the effects are increasingly strengthened until year *t+4*. All results consistently imply that firms seize investment opportunities catalyzed by urban expansion to grow.

5. Potential Mechanisms

5.1 The Mechanism of Urban Expansion –Population Agglomeration

Urban expansion guarantees the land demand of population growth. Urban population size is increasing as more people shifting from rural to urban can be accommodated. Land urbanization is accompanied by population urbanization. At the preliminary stage of industrialization, firms commonly face labor constraints. Labor inflow induced by urban expansion alleviates corporate labor constraints, improves productivity, and increases investment rates. Under this mechanism, firms in cities attracting more people more actively increase investment and improve investment efficiency. Firms with tight constraint on labor obtain more benefits from urban expansion. Their investment is more likely to increase productivity and responsiveness to growth opportunities. To test this mechanism, I perform bassline regressions in subsamples.

Table 9 presents how urban expansion influences investment and investment efficiency through supplying labor. Column (1)-(4) are subsamples divided by city *Population growth,* the change in the natural logarithm of non-agricultural population from year t-1 to year t. *Low*

Population Growth Cities are observations located in cities with below-sample median *Population growth*; *High Population Growth Cities* are observations located in cities with above-sample median *Population growth*. Firms in cities attracting more people in urban areas can substantially alleviate labor supply constraints. An increased number of employees leads to scale production and encourages more investment. However, if there is overdevelopment of urban driven by political factors, it wouldn't attract corresponding population inflow. Such kinds of cities that were built but were never inhabited are called "ghost cities". If urban expansion influences corporate investment through supplying labor, the quality of investment opportunities in "ghost cities" is not improved. Consistent with my prediction, only urban expansion in cities with higher population growth in column (3) and column (4) significantly induces firms to invest and leads to enhanced investment efficiency.

Although firms normally have a labor shortage in the preliminary stage of industrialization, the extent of labor constraints varies between firms. Urban expansion should have a different impact on firms depending on the tightness of labor constraints. The ratio of employee payment is used as the proxy for labor constraints. Firms with a higher level of employee payment ratio would benefit more from urban expansion. Column (5)-(8) in table 9 are subsamples divided by *Employee payment,* cash payment to employees scaled by total assets at the beginning of the year. *Low employee payment Firms* are observations with below-sample median *Employee payment*; *High employee payment Firms* are observations with above-sample median *Employee payment.* Although all firms increase investment rates, only firms being more labor-constrained increase investment efficiency. It implies that population increase during urban expansion opens up suitable investment opportunities for labor-constrained firms so that the sensitivity of investment to growth prospects increases.

5.2 The Mechanism of Urban Expansion – Firm Agglomeration

Along with enriched investment opportunities during urban expansion, more firms are attracted to enter the expanded city, especially when the government launches industrial land policy. Previously, in the small city, firms can only find matched partners to cooperate from other cities. As the number and types of firms in local areas increase, firms can easily find local business partners that are suitable for specific investment demands. More importantly, clusters can help firms to take advantage of synergies and pool resources to increase competitive advantage. They can grab market opportunities that could not be achieved alone. Consequently, cities that are attractive to firms are more likely to form industrial agglomeration which increases firms' ability to chase investment opportunities. Firms with a higher market share can internalize some aspects of agglomeration economies but lower market share firms are more dependent on local external factors. Firms with lower market share benefit more from agglomeration. They can decrease fixed costs by sharing facilities and collaborate to pursue opportunities they cannot achieve alone.

Table 10 presents how urban expansion influences investment and investment efficiency through promoting corporate agglomeration. Column (1)-(4) are subsamples divided by city *Firm entry,* the natural logarithm of the number of newly registered firms. *Low Firm Entry Cities* are observations located in cities with below-sample median *Firm entry*; *High Firm Entry Cities* are observations located in cities with above-sample median *Firm entry.* Cities that are attractive to firm entry can grow a vibrant regional economy and boost investment efficiency. When the number of firms increases, cities can generate endogenous interactions: the knowledge diffusion between a city's workers and technology spillovers between neighboring firms. But if the expanded city area doesn't build up supporting facilities, it is hard to form industrial clusters because firms are reluctant to enter. In cities that are unattractive to firm entry, firms cannot benefit from agglomeration economies. Consistent with my prediction, although firms in all cities increase their investment level during urban expansion, only firms in cities with higher firm entry rates increase investment efficiency. Urban expansion does induce firms to invest more, but firms

can get suitable investment opportunities to grow only when cities attract enough firms and form industrial agglomeration. Resources allocation efficiency is improved when firms cluster.

Sensitivity to agglomeration economies varies across firms. Different from firms with large market share, small market share firms cannot internalize agglomeration economies. They are more dependent on local external factors and benefit more from agglomeration. Column (5)-(8) in table 10 are subsamples divided by *Industry market share,* sales revenue scaled by industry sales (calculated as aggregated sales for firms that share the same one-digit industry code under CSRC industry classification). *Low Market Share Firms* are observations with below-sample median *Industry market share*; *High Market Share Firms* are observations with above-sample median *Industry market share.* Industrial agglomeration is hypothesized to add more value for firms with low market share. They can share large-scale infrastructure to reduce fixed costs and collaborate to grab growth opportunities. The results show that only *Low Market Share Firms* increase their investment rates and lead to investment efficiency. It implies that clustering in bigger cities provides investment potential to low market share firms and increases the responsiveness to investment opportunities.

6. Additional Analyses

6.1 The Effect of Regional Marketization

A sound institutional environment is characterized by a strong legal environment, more supportive policies, and a good local culture for enterprises. Firms in cities with a strong institutional environment undergo fewer frictions from the government, and they can be motivated by the market to pursue suitable investment opportunities. To test the cross-sectional variation of urban expansion on firm investment, baseline results are repeated separately in subsamples of firms in low- and high- marketization indices. I adopt the National Economic

Research Institute Index of Marketization (NERIIM) to measure the institutional environment. The NERIIM provides a systematic annual measurement of market-oriented institution development for each province of mainland China, with a higher value indicating more developed institutional infrastructures. It captures the following five aspects of the institutional environment in China: i) government decentralization, ii) development of non-state sectors, iii) development of product markets, iv) production factor markets, and v) market intermediaries and the legal environment (Fan, Wang and Zhu 2011).

Table 11 presents the cross-sectional variation of urban expansion on corporate investment and investment efficiency. Baseline regressions are repeated in subsamples of firms in regions with low-marketization indices and high-market indices. Column (1)-(4) are subsamples divided by *Marketization,* the provincial-level index measures market-oriented institution developments. Observations in *Low Marketization* are firms located in provinces with below-sample median *Marketization*; Observations in *High Marketization* are firms located in provinces with above-sample median *Marketization.* The results show that investment rates increase for all cities, but only firms located in provinces with higher marketization indices improve investment efficiency. It implies that only firms in the developed institutional environment make investment decisions driven by market forces so that they increase firm value and are more sensitive to investment opportunities. Firms in a weak institutional environment are likely to invest due to government intervention because expanded areas need to be constructed. Although they invest more, urban expansion has no impact on their investment efficiency.

6.2 Spillover Effects of Urban Expansion

As the urban area expanded, the geographic distance between city boundaries declines. The growing investment opportunities in the focal city should have spillover effects on the decisions of firms in neighboring cities. First, the urban expansion also provides a wide range of investable

projects to firms in neighboring cities. Second, the decreased spatial distance saves costs for cross-city investment. Therefore, firms are more likely to chase opportunities in neighboring expanding cities with decreased spatial distance. It is unclear whether such cross-border investments add value to firms as the growth prospects are unchanged in the located city. Although they invest in projects in neighboring cities, the firm development mainly depends on conditions in the city they are located. This section aims to test how much the falling geographic distance between cities contributes to the growth of cross-border investments and whether such investments lead to investment efficiency.

Table 12 presents the spillover effects of urban expansion on corporate investment and investment efficiency in neighboring cities. Column (1)-(2) are baseline regressions in the previous table, reflecting local urban expansion on corporate investment. Column (3)-(4) are regressions reflecting the effects of urban expansion of neighboring cities in the same province. *Province neighbor expansion*$_t$ is the average *Urban expansion* for neighboring cities in the same province. Neighboring cities in the same province share the same institutional environment to some extent. Firms are more familiar with business activities for cities in the same province. The firm investment rates should be more sensitive to urban expansion of the same province's neighboring cities than other cities. Investment level significantly increases when same province neighboring cities expand urban areas, with the magnitude smaller than located city expansion. It demonstrates that cross-city investment activities are rising. But the influence on investment efficiency is insignificant. It supports that firm growth prospects mainly exist in the located city. Investing in projects in neighboring cities doesn't improve the responsiveness to growth opportunities. Column (5)-(6) are regressions reflecting the effects of urban expansion of all neighboring cities on corporate investment. *Neighbor expansion*$_t$ is the average *Urban expansion* for all neighboring cities. As firms are less familiar with the investment environment in cities of other provinces, the coefficient of *Neighbor expansion*$_t$ is significantly positive, but the effects are smaller

than neighboring cities in the same province. Similarly, the investment efficiency has no significant change following neighboring cities' expansion.

7. Robustness Check

To address the endogeneity problem caused by reverse causality that corporate investment drives urban expansion, I use the administratively driven county-to-district conversion (CTDC) as a shock to urban expansion. Administrative division adjustment is an important national regime policy in China to encourage and coordinate economic growth. At present, China's local administrative regions are divided into four levels: provinces, prefecture-level cities, counties, and townships. County-to-district conversion refers to the adjustment of counties or county-level cities into municipal districts of prefecture-level cities. After the conversion process, the converted county-level government loses its independent decision-making powers in terms of fiscal, planning, and economic development policies (Li, Guo and Zhang 2022).

Through forcefully converting rural counties into urban districts in a top-down manner, CTDC has a significant influence on urbanization. The strategy of planning urban development and achieving economic goals through the reclassification of administrative territories has been described as the process of "territorial urbanization" (Kan and Chen 2021). After conversion, the land-related decision-making power hands over to the prefecture-level government. As counties are generally more rural and much less developed than urban districts, by administratively changing territories, the prefectural government controls more land resources for construction use. By changing the use of agricultural land in converted counties, the prefecture-level government can obtain substantial land conveyance fee.

I use the conversion of counties (excluding county-level cities) into municipal districts of prefecture-level cities from 2010 to 2017 as the shock to urban expansion. At the beginning of urbanization, local governments generally implement the city-county merger policy. However,

China's county-to-city upgrading policy has neither promoted economic growth nor achieved the expected goal of urban development. Therefore, the county-to-city upgrading policy was suspended in 1997 (Tian et al. 2020). A new round of county-city mergers started in 2010, after the province-governing-county reform, to prevent the separation of counties and promote the construction of new urbanization. I use the new round of CTDC from 2010 as the shock to urban expansion because prefecture-level cities can get agricultural land from counties for construction usage during the process.

I employ a difference-in-differences approach to compare changes in corporate investment ratio across the cities that occurred CTDC with changes across the other cities during the sample period. To mitigate the concern that the treatment sample is not randomly selected, I use a propensity score matching (PSM) approach to further match cities with CTDC to non-CTDC cities in the year before conversion. The guidelines of prefecture cities for converting counties set standards in terms of non-agricultural population, economic, and industrial structure. Each city with CTDC is matched with a comparable non-CTDC city based on GDP, GDP per capita, non-agricultural population, and the proportion of primary industry. I regress the treatment dummy on these variables in the year before conversion to estimate the probability of being a treatment city. I then match each treatment city to a benchmark city using the nearest neighbor matching technique with replacement. There are 70 county-to-district conversions from 2010 to 2017, and the matching procedure results in a matched sample of 346 city-year observations, 216 of which are treatment city-years and 135 of which are benchmark city-years.

Table 13 presents evidence of the effect of CTDC on urban expansion using the PSM sample. As the prefectural government controls more land resources for construction use after the county-city merger, CTDC is hypothesized to have a significant positive impact on government supply of incremental construction land. The coefficient indicates that *Urban expansion* increases about 35% (0.1176/0.337) among prefectural cities that have CTDC compared to prefectural cities without such conversions. Results show that county-city merger positively influences urban

expansion. Table 14 shows the results of the effect of CTDC conversion on corporate investment decisions. The coefficient of *Treat×Post* is significantly positive in column (1)-(2), demonstrating that investment expenditures significantly increase following cunty-city merger compared with the control group. Column (3) uses *Tobin's* q_{t-1} to measure investment opportunities. The interaction between *Tobin's* q_{t-1} and *Treat×Post* is significantly positive, suggesting the responsiveness of investment to growth opportunities increases in the treatment group after CTDC. Using CTDC as a shock to urban expansion, this robustness check provides complementary support to the main hypothesis that urban expansion drives investment and enhances investment efficiency.

8. Conclusion

China's rapid urbanization process is the most important driver of economic growth. Depending on the government-controlled land tenure system, local government reaps the price differential when converting rural to urban areas. Therefore, the government can support large-scale infrastructures which build the foundation for economic growth. Motivated by local economic growth, local officials actively convert rural land to urban land. Urban expansion has profound social and economic impacts. Although increasing city size causes pollution and damage to the ecosystem, local investment opportunities arise when the population and companies agglomerate in urban areas. Based on the literature on corporate investment decisions, I examine an important yet underexplored factor shaping firm investment behavior in China- local investment opportunities change during urban expansion.

The results show that firms increase investment rates during urban expansion. Grabbing growth opportunities improves investment efficiency and fosters firm growth. Urban expansion gives rise to investment opportunities through population and industry agglomeration. Population migrant from rural areas supplies labor to firms. The investment efficiency is

improved for cities with higher non-agriculture population growth and firms with tighter labor constraints. Firm agglomeration saves fixed costs and promotes collaboration. Firms in cities with higher firm entry rates and firms with low market share achieve investment efficiency. Additionally, the quality of investment is supported by a strong institutional environment. Urban expansion also has spillover effects on neighboring cities. Firms in neighboring cities also increase investment level, but it is not efficient because the located business environment stays unchanged.

My findings demonstrate positive externalities of urban expansion for corporate investment. City outward expansion is known to generate social costs (e.g., pollution, lengthy commuting) and hurts social welfare (Wang, Zhang and Zhou 2020). In this paper, the results suggest that local investment opportunities arise when the population and companies agglomerate in urban areas. In addition to firm-specific economic factors, local investment opportunity shocks produced by urban expansion shape corporate investment decisions. As the urban expansion is under government control in China, the findings shed light on the bright side of political intervention. This study also has implications for why China's rapid economic development has coincided with rapid urbanization. Through investigating how firms evolve during the rapid urbanization process, this study shows that cities with concentrated population and firms do host firms to pursue investment opportunities. Taking advantage of an enriched local investment environment during urban expansion, firms actively pursue opportunities to grow and introduce vibrancy to the local economy.

Appendix A: Variable Definitions

Firm Variables	
Investment	Capital expenditure minus cash receipts from sales, scaled by total assets at the beginning of the year.
Tobin's q	The market value of assets (market value of equity plus book value of assets minus book value of equity minus deferred taxes) divided by book value of assets.
Sales growth	The change in the natural logarithm of sales revenue from year t-1 to year t.
SOE	Indicator variable equals to 1 if the firm is state-owned, in which the public sector owns more than 30%, and 0 otherwise.
Size	Natural logarithm of the market value of equity.
Leverage	Total debt scaled by total assets at the beginning of the year.
Operating cash flow	Cash flow from operating activities scaled by total assets at the beginning of the year.
Employee growth	The change in the natural logarithm of employee payment from year t-1 to year t.
Market value growth	The change in the natural logarithm of market value of assets from year t-1 to year t, which is market value of equity plus book value of assets minus book value of equity minus deferred taxes.
Employee payment	Cash payment to employees scaled by total assets at the beginning of the year.
Industry market share	Sales revenue divided by industry sales (aggregated sales for firms sharing the same one-digit industry code under CSRC industry classification).
City Variables	
Unsuitable land	Natural logarithm of the proportions of land areas that are unsuitable for development. An area is defined as unsuitable for development if it has a slope larger than 15%.
Urban expansion	City-level incremental construction land supplied by the government (hectare) divided by city-level GDP (100 million).
GDP growth	The change in the natural logarithm of GDP from year t-1 to year t.

Population	Natural logarithm of population (10 thousand).
GDP per capita	GDP divided by the population.
Population growth	The change in the natural logarithm of non-agricultural population from year t-1 to year t.
Firm entry	Natural logarithm of the number of newly registered firms.
Marketization	National Economic Research Institute Index of Marketization (NERIIM). The provincial-level index measures market-oriented institution developments, with a higher value indicating more developed institutional infrastructures.
Neighbor expansion	The average *Urban expansion* for neighboring cities.
Province neighbor expansion	The average *Urban expansion* for neighboring cities in the same province.

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Figure 1: Land Revenue, Urban Expansion, and GDP

This figure shows the trend of land conveyance fee, incremental construction land area, and GDP during the period 2003 to 2017. Land conveyance fee and incremental construction land data were collected from China Land and Resources Statistics Yearbook, and GDP data were obtained from China Statistics Yearbook.

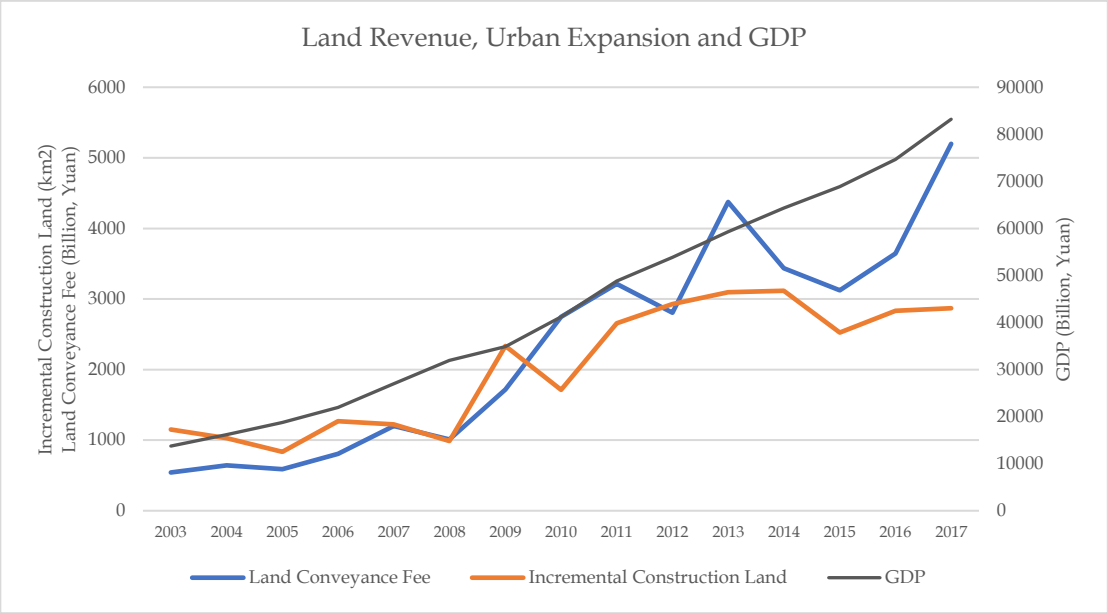

Figure 2: Fiscal Dependence on Land Revenue

This figure shows the budgetary revenue and land conveyance fee, which is the major source of extra-budgetary revenue from 2003 to 2017. The source of budgetary revenue data is WIND. Land conveyance fee data were obtained from China Land and Resources Statistics Yearbook.

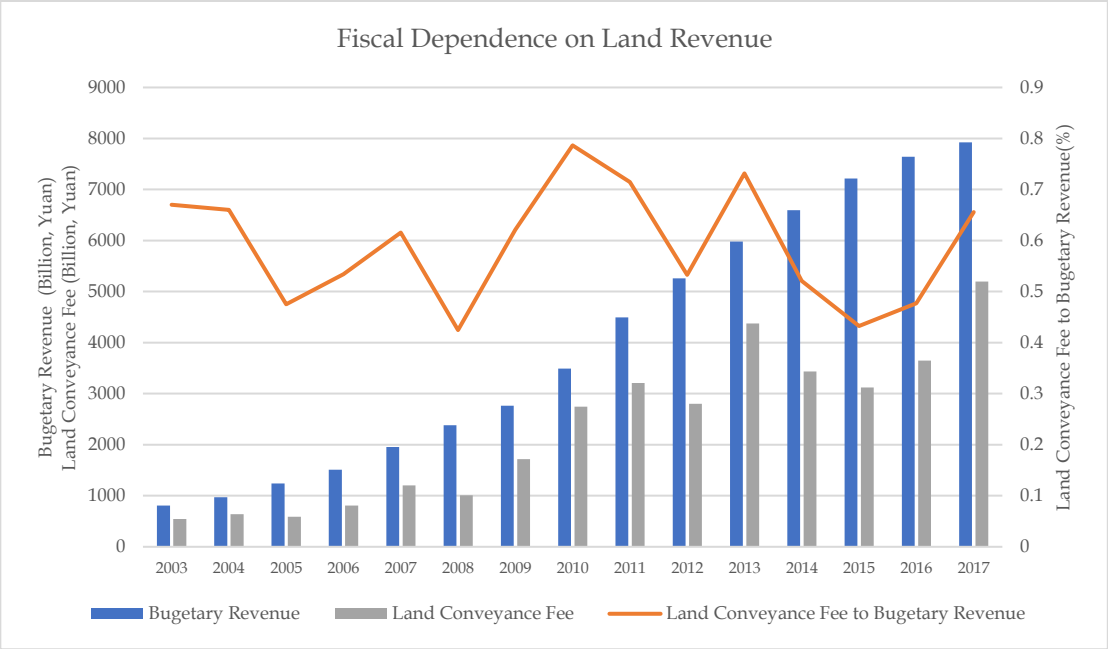

Table 1: Sample Selection

This table presents the sample selection process.

	Number of firm-years
Initial sample from CSMAR database (2003-2017, A share-listed firms)	31,512
Less	
Observations with missing data on city-level variables	(1,643)
Observations from the financial industry and real estate industry	(2,060)
Observations with missing data on other variables	(7,093)
Singleton observations in the fixed-effect model	(198)
Final sample for the main test	20,518

Table 2: Sample Composition by Industry

This table presents the distribution of sample observations by industry. I use CSRC industry classification, assigning one-digit codes to sectors.

Industry	Sample		A-share	
	Frequency	Percent	Frequency	Percent
A. Agriculture	370	1.8	709	1.65
B. Mining	533	2.6	956	2.22
C. Manufacturing	13,409	65.35	26,940	62.64
D. Utilities	858	4.18	1,443	3.36
E. Construction	560	2.73	1,070	2.49
F. Retail & Wholesale	1,448	7.06	2,334	5.43
G. Transportation	861	4.2	1,423	3.31
H. Accommodation & Catering	118	0.58	172	0.4
I. Info Svc & Software	1,032	5.03	2,467	5.74
J. Finance	0	0	859	2
K.Real estate	0	0	1,940	4.51
L.Leasing & Commerc.	246	1.2	524	1.22
M. Scientific Research	87	0.42	328	0.76
N. Environmental	211	1.03	460	1.07
O. Resident services	38	0.19	64	0.15
P. Education	7	0.03	30	0.07
Q. Health & Social work	32	0.16	73	0.17
R. Sports & Entertainment	198	0.97	452	1.05
S. Conglomerates	510	2.49	761	1.77
Total	20,518	100	43,005	100

Table 3: Descriptive Statistics

This table presents the summary statistics for the main variables in the regression models. The sample consists of 20,518 firm-year observations. All variables are defined in the Appendix. Continuous variables are winsorized at their 1st and 99th percentiles.

Variable	Mean	Standard Deviation	Min	P25	P50	P75	Max	Observations
$Investment_t$	0.06	0.069	-0.047	0.014	0.039	0.081	0.366	20518
$Urban\ expansion_t$	0.337	0.378	0	0.106	0.255	0.448	3.884	20518
$Tobin's\ q_{t-1}$	2.572	1.955	0.815	1.359	1.943	3.023	12.61	20518
SOE_{t-1}	0.515	0.5	0	0	1	1	1	20518
$Size_{t-1}$	15.29	1.095	13.005	14.52	15.241	15.963	18.794	20518
$Leverage_{t-1}$	0.555	0.337	0.058	0.329	0.521	0.713	2.3	20518
$Operating\ cash\ flow_{t-1}$	0.055	0.091	-0.252	0.007	0.051	0.102	0.36	20518
$GDP\ growth_{t-1}$	0.123	0.061	-0.142	0.084	0.114	0.161	0.326	20518
$Population_{t-1}$	6.334	0.67	3.322	5.905	6.459	6.839	7.183	20518
$GDP\ per\ capita_{t-1}$	2.075	0.686	0.294	1.553	2.094	2.676	3.094	20518

Table 4: Urban Expansion and Investment Rates

This table presents evidence of the effect of urban expansion on corporate investment decisions. The dependent variable is $Investment_t$, capital expenditure minus cash receipts from sales scaled by total assets at the beginning of the year. $Urban\ expansion_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. Column (1)-(3) report the results from ordinary least squares (OLS) regressions. Column (4) and (5) use 2-stages least squared estimation, using the proportions of land area that is unsuitable for development as an instrument for $Urban\ expansion_t$. All specifications use year and firm fixed effects. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	OLS			IV	
				First Stage	Second Stage
	(1)	(2)	(3)	(4)	(5)
	$Investment_t$	$Investment_t$	$Investment_t$	$Urban\ expansion_t$	$Investment_t$
$Unsuitable\ land_t$				-0.4280***	
				(-14.55)	
Urban expansion$_t$	**0.0079*** **	**0.0067*** **	**0.0058*** **		**0.0310** **
	(5.01)	**(4.33)**	**(3.73)**		**(2.09)**
$Tobin's\ q_{t-1}$		0.0049***	0.0049***	0.0032**	0.0048***
		(13.90)	(13.87)	(1.99)	(13.48)
SOE_{t-1}		-0.0112***	-0.0116***	-0.0389***	-0.0108***
		(-4.27)	(-4.45)	(-3.22)	(-4.06)
$Size_{t-1}$		0.0105***	0.0104***	0.0166***	0.0099***
		(9.89)	(9.77)	(3.36)	(9.07)

Leverage$_{t-1}$		-0.0036**	-0.0038**	0.0017	-0.0039**
		(-2.13)	(-2.24)	(0.22)	(-2.26)
Operating cash flow$_{t-1}$		0.0528***	0.0519***	-0.0030	0.0519***
		(9.58)	(9.41)	(-0.12)	(9.40)
GDP growth$_{t-1}$			0.0534***	0.2030***	0.0497***
			(5.09)	(4.17)	(4.53)
Population$_{t-1}$			-0.0062	-0.1055***	-0.0022
			(-1.63)	(-5.88)	(-0.49)
GDP per capita$_{t-1}$			-0.0105***	-0.2775***	-0.0034
			(-3.16)	(-18.16)	(-0.65)
Constant	0.0569***	-0.1115***	-0.0543*	1.4449***	-0.0953**
	(85.32)	(-7.01)	(-1.77)	(10.20)	(-2.45)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	20518	20518	20518	20453	20453
Adjusted R-squared	0.3091	0.3311	0.3323	0.4996	0.3320
Cragg-Donald Wald F statistic				211.789	

Table 5: Urban Expansion and Investment Efficiency

This table presents evidence from OLS regressions relating urban expansion and the sensitivity of investment rates to investment opportunities. The dependent variable is $Investment_t$, capital expenditure minus cash receipts from sales scaled by total assets at the beginning of the year. $Urban\ expansion_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. Column (1) and (2) use *Tobin's* q_{t-1} to measure investment opportunities. *Tobin's* q_{t-1} is the market value of assets (market value of equity plus book value of assets minus book value of equity minus deferred taxes) divided by book value of assets. Column (3) and (4) use $Sales\ growth_{t-1}$ as the alternative measure to capture investment opportunities. $Sales\ growth_{t-1}$ is the change in the natural logarithm of sales revenue. All specifications use year and firm fixed effects. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	(1)	(2)	(3)	(4)
	$Investment_t$	$Investment_t$	$Investment_t$	$Investment_t$
$Urban\ expansion_t$	0.0013	0.0007	0.0057***	0.0039**
	(0.57)	(0.30)	(3.45)	(2.35)
Tobin's q_{t-1}	0.0056***	0.0042***		
	(14.30)	(10.43)		
$Urban\ expansion_t$ ×*Tobin's* q_{t-1}	**0.0028*** **	**0.0025*** **		
	(3.79)	**(3.32)**		
$Sales\ growth_{t-1}$			0.0064***	0.0006
			(3.58)	(0.32)
$Urban\ expansion_t$ ×$Sales\ Growth_{t-1}$			**0.0115*** **	**0.0129*** **
			(3.30)	**(3.73)**
SOE_{t-1}		-0.0115***		-0.0137***
		(-4.40)		(-5.25)
$Size_{t-1}$		0.0104***		0.0144***
		(9.74)		(13.93)
$Leverage_{t-1}$		-0.0037**		-0.0080***
		(-2.17)		(-4.34)
$Operating\ cash\ flow_{t-1}$		0.0516***		0.0541***
		(9.36)		(9.66)
$GDP\ growth_{t-1}$		0.0532***		0.0545***
		(5.07)		(5.18)
$Population_{t-1}$		-0.0059		-0.0087**

		(-1.56)		(-2.24)
GDP per capita$_{t-1}$		-0.0100***		-0.0098***
		(-3.01)		(-2.92)
Constant	0.0424***	-0.0550*	0.0563***	-0.0857***
	(36.30)	(-1.80)	(79.88)	(-2.77)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	20518	20518	20492	20492
Adjusted R-squared	0.3231	0.3326	0.3132	0.3279

Table 6: Urban Expansion and Sales Growth

This table presents evidence of the effect of urban expansion on corporate future sales growth. The dependent variable is *Sales growth*$_{t+l}$, the change in the natural logarithm of sales revenue from year *t-1* to year *t+l*. *Urban expansion*$_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. The proportions of land area that is unsuitable for development, *Unsuitable land*$_t$, is used as the instrument for *Urban expansion*$_t$. Column (1) reports the first stage IV estimation results. Column (2) - (7) report the second stage IV estimation results. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	IV						
	First Stage	Second Stage					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Urban expansion$_t$	*Sales growth*$_t$	*Sales growth*$_{t+1}$	*Sales growth*$_{t+2}$	*Sales growth*$_{t+3}$	*Sales growth*$_{t+4}$	*Sales growth*$_{t+5}$
Unsuitable land$_t$	-0.4188***						
	(-14.16)						
Urban expansion$_t$		**0.0683**	**0.2991****	**0.5263****	**0.7566*****	**0.9815*****	**0.8072****
		(0.88)	**(2.14)**	**(2.56)**	**(3.14)**	**(3.47)**	**(2.45)**
Tobin's q$_t$	-0.0007	-0.0122***	0.0332***	0.0824***	0.1376***	0.1382***	0.1469***
	(-0.47)	(-6.94)	(10.32)	(19.00)	(23.32)	(19.20)	(18.44)
SOE$_t$	-0.0219*	-0.0263*	0.0114	0.0306	0.0037	-0.0440	-0.0353
	(-1.74)	(-1.89)	(0.44)	(0.89)	(0.09)	(-0.87)	(-0.61)
Size$_t$	0.0183***	0.1338***	0.0946***	-0.0517***	-0.1892***	-0.2694***	-0.3558***
	(3.83)	(24.48)	(9.40)	(-3.77)	(-10.90)	(-12.87)	(-14.41)
Leverage$_t$	0.0021	0.4214***	0.6056***	0.5802***	0.5437***	0.4889***	0.4409***

	(0.28)	(49.26)	(40.15)	(28.24)	(20.95)	(15.88)	(13.14)
Operating cash flow$_t$	-0.0262	0.4741***	0.3826***	0.2787***	0.3641***	0.4742***	0.4783***
	(-1.02)	(16.61)	(7.74)	(4.28)	(4.62)	(5.14)	(4.75)
GDP growth$_t$	0.1822***	0.1665***	0.0715	-0.0050	-0.0981	-0.0742	-0.0378
	(3.60)	(2.88)	(0.63)	(-0.03)	(-0.52)	(-0.33)	(-0.16)
Population$_t$	-0.1495***	-0.0377	-0.0407	-0.1079	-0.0395	-0.0145	-0.1726
	(-8.58)	(-1.53)	(-0.82)	(-1.59)	(-0.46)	(-0.14)	(-1.43)
GDP per capita$_t$	-0.2813***	-0.0680**	-0.2089***	-0.2669***	-0.3171***	-0.1983*	-0.2681**
	(-18.28)	(-2.52)	(-4.26)	(-3.79)	(-3.71)	(-1.89)	(-2.14)
Constant	1.7311***	-1.8216***	-1.0990***	1.6076***	3.2828***	4.1198***	6.6969***
	(12.27)	(-8.45)	(-2.64)	(2.78)	(4.51)	(4.61)	(6.49)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20400	20369	15113	12723	10379	8337	6917
Adjusted R-squared	0.4998	0.2430	0.3176	0.3731	0.4365	0.4988	0.6087
Cragg-Donald Wald F statistic	121.559						

Table 7: Urban Expansion and Employee Growth

This table presents evidence of the effect of urban expansion on corporate future employee growth. The dependent variable is *Employee growth*$_{t+1}$, the change in the natural logarithm of employee payment from year *t-1* to year *t+1*. *Urban expansion*$_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. The proportions of land area that is unsuitable for development, *Unsuitable land*$_t$, is used as the instrument for *Urban expansion*$_t$. The first stage IV estimation results are reported in the previous table. Column (1) - (6) report the second stage IV estimation results. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	IV					
	Second Stage					
	(1)	(2)	(3)	(4)	(5)	(6)
	Employee growth$_t$	*Employee growth*$_{t+1}$	*Employee growth*$_{t+2}$	*Employee growth*$_{t+3}$	*Employee growth*$_{t+4}$	*Employee growth*$_{t+5}$
Urban expansion$_t$	**0.0778**	**0.2748****	**0.4791*****	**0.5586*****	**0.7536*****	**0.7097****
	(1.25)	**(2.51)**	**(2.82)**	**(2.76)**	**(3.15)**	**(2.56)**
Tobin's q$_t$	-0.0126***	0.0102***	0.0460***	0.0964***	0.1027***	0.1071***
	(-8.82)	(4.06)	(12.95)	(19.62)	(17.27)	(16.14)
SOE$_t$	0.0000	0.0208	0.0199	-0.0049	0.0133	-0.0571
	(0.00)	(1.02)	(0.71)	(-0.14)	(0.31)	(-1.18)
Size$_t$	0.1237***	0.1479***	0.0717***	-0.0305**	-0.1061***	-0.2154***
	(27.46)	(18.71)	(6.36)	(-2.09)	(-6.02)	(-10.38)
Leverage$_t$	0.2820***	0.4138***	0.4166***	0.3951***	0.3557***	0.3058***
	(41.11)	(35.07)	(24.75)	(18.30)	(13.75)	(10.92)
Operating cash flow$_t$	0.1711***	0.3182***	0.3090***	0.4184***	0.4548***	0.4582***
	(7.43)	(8.22)	(5.78)	(6.33)	(5.85)	(5.41)

GDP growth$_t$	0.0690	0.1163	-0.1022	-0.0097	-0.2264	-0.2604
	(1.33)	(1.30)	(-0.79)	(-0.06)	(-1.20)	(-1.31)
Population$_t$	-0.0246	-0.0783**	-0.1161**	-0.1832***	-0.1231	-0.0671
	(-1.18)	(-2.03)	(-2.10)	(-2.62)	(-1.42)	(-0.66)
GDP per capita$_t$	-0.0454**	-0.1132***	-0.1817***	-0.2650***	-0.2335***	-0.1622
	(-2.08)	(-2.94)	(-3.14)	(-3.70)	(-2.66)	(-1.55)
Constant	-1.6915***	-1.6557***	-0.0927	2.0609***	2.8267***	4.1951***
	(-9.42)	(-5.11)	(-0.20)	(3.45)	(3.85)	(4.83)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17539	15129	12744	10399	8353	6927
Adjusted R-squared	0.2445	0.3223	0.3613	0.4255	0.5011	0.6088

Table 8: Urban Expansion and Market Value Growth

This table presents evidence of the effect of urban expansion on corporate future market value growth. The dependent variable is *Market value growth*$_{t+l}$, the change in the natural logarithm of market value of assets, which is market value of equity plus book value of assets minus book value of equity minus deferred taxes, from year *t-1* to year *t+l*. *Urban expansion*$_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. The proportions of land area that is unsuitable for development, *Unsuitable land*$_t$,, is used as the instrument for *Urban expansion*$_t$. The first stage IV estimation results are reported in the previous table. Column (1) - (6) report the second stage IV estimation results. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	IV					
	Second Stage					
	(1)	(2)	(3)	(4)	(5)	(6)
	Market value growth$_t$	*Market value growth*$_{t+1}$	*Market value growth*$_{t+2}$	*Market value growth*$_{t+3}$	*Market value growth*$_{t+4}$	*Market value growth*$_{t+5}$
Urban expansion$_t$	**0.1696****	**0.3601*****	**0.6292*****	**0.8105*****	**1.0303*****	**0.6502****
	(2.40)	**(2.80)**	**(3.52)**	**(4.09)**	**(4.64)**	**(2.53)**
Tobin's q$_t$	0.0677***	0.0588***	0.0697***	0.0994***	0.0978***	0.1176***
	(41.44)	(19.93)	(18.65)	(20.66)	(17.68)	(19.15)
SOE$_t$	0.0203	-0.0455*	-0.0626**	-0.0375	-0.0116	-0.0641
	(1.48)	(-1.90)	(-2.10)	(-1.08)	(-0.29)	(-1.43)
Size$_t$	0.2138***	-0.0470***	-0.2206***	-0.3950***	-0.4574***	-0.5152***
	(41.57)	(-5.06)	(-18.57)	(-27.68)	(-27.90)	(-26.83)
Leverage$_t$	0.4370***	0.4799***	0.4487***	0.4100***	0.3564***	0.2924***
	(55.86)	(34.65)	(25.31)	(19.39)	(14.81)	(11.28)

Operating cash flow$_t$	0.2105***	0.4523***	0.4137***	0.5360***	0.5015***	0.5140***
	(8.01)	(9.95)	(7.34)	(8.28)	(6.94)	(6.56)
GDP growth$_t$	-0.2030***	-0.1146	-0.0323	-0.1313	-0.0983	-0.0624
	(-3.43)	(-1.09)	(-0.24)	(-0.85)	(-0.56)	(-0.34)
Population$_t$	-0.0029	-0.0078	-0.0131	0.0203	0.0298	-0.1610*
	(-0.12)	(-0.17)	(-0.23)	(0.30)	(0.37)	(-1.72)
GDP per capita$_t$	-0.0576**	-0.1291***	-0.1398**	-0.1441**	-0.1468*	-0.2001**
	(-2.31)	(-2.86)	(-2.29)	(-2.05)	(-1.80)	(-2.06)
Constant	-3.5032***	0.8394**	3.6036***	6.0393***	6.8704***	9.2605***
	(-17.10)	(2.21)	(7.23)	(10.33)	(10.06)	(11.52)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17539	15128	12744	10400	8354	6928
Adjusted R-squared	0.7069	0.5455	0.4874	0.5568	0.5697	0.6186

Table 9: The Mechanism of Urban Expansion -Labor Supply

This table presents how urban expansion influences investment and investment efficiency through supplying labor. The dependent variable is $Investment_t$, capital expenditure minus cash receipts from sales scaled by total assets at the beginning of the year. Column (1)-(4) are subsamples divided by *Population growth,* the change in the natural logarithm of non-agricultural population. *Low Population Growth Cities* are observations located in cities with below-sample median *Population growth*; *High Population Growth Cities* are observations located in cities with above-sample median *Population growth.* Column (5)-(8) are subsamples divided by *Employee payment,* cash payment to employees scaled by total assets at the beginning of the year. *Low employee payment Firms* are observations with below-sample median *Employee payment*; *High employee payment Firms* are observations with above-sample median *Employee payment. Urban expansion*$_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. *Tobin's* q_{t-1} is used to measure investment opportunities. *Tobin's* q_{t-1} is the market value of assets (market value of equity plus book value of assets minus book value of equity minus deferred taxes) divided by book value of assets. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	Low Population Growth Cities		High Population Growth Cities		Low Employee Payment Firms		High Employee Payment Firms	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$Investment_t$	$Investment_t$	$Investment_t$	$Investment_t$	$Investment_t$	$Investment_t$	$Investment_t$	$Investment_t$
Urban expansion$_t$	**0.0051**	**-0.0022**	**0.0074*** **	**-0.0000**	**0.0067****	**0.0038**	**0.0061****	**-0.0058**
	(1.43)	**(-0.41)**	**(2.99)**	**(-0.01)**	**(2.49)**	**(0.99)**	**(1.99)**	**(-1.30)**
Urban expansion$_t$ ***×Tobin's*** q_{t-1}		**0.0040***		**0.0040*****		**0.0013**		**0.0049*****
		(1.92)		**(2.78)**		**(1.11)**		**(3.71)**
Tobin's q_{t-1}	0.0070***	0.0056***	0.0060***	0.0049***	0.0050***	0.0046***	0.0061***	0.0050***
	(6.41)	(4.34)	(8.50)	(6.19)	(7.17)	(5.92)	(10.94)	(7.76)

SOE_{t-1}	-0.0232***	-0.0230***	-0.0122***	-0.0120***	-0.0074	-0.0076	-0.0082*	-0.0078
	(-3.12)	(-3.08)	(-2.64)	(-2.61)	(-1.47)	(-1.50)	(-1.70)	(-1.62)
$Size_{t-1}$	0.0096***	0.0097***	0.0080***	0.0075***	0.0143***	0.0143***	0.0046**	0.0044**
	(3.03)	(3.04)	(3.69)	(3.48)	(7.27)	(7.25)	(2.50)	(2.41)
$Leverage_{t-1}$	-0.0141***	-0.0140***	-0.0018	-0.0013	0.0025	0.0026	-0.0066**	-0.0062**
	(-2.91)	(-2.89)	(-0.53)	(-0.38)	(0.70)	(0.74)	(-2.51)	(-2.36)
Operating cash flow$_{t-1}$	0.0434***	0.0431***	0.0425***	0.0426***	0.0271***	0.0270***	0.0473***	0.0458***
	(2.84)	(2.82)	(4.31)	(4.32)	(2.84)	(2.84)	(5.35)	(5.18)
GDP growth$_{t-1}$	0.0753***	0.0784***	0.0392**	0.0359*	0.0718***	0.0725***	0.0080	0.0080
	(2.72)	(2.83)	(2.05)	(1.88)	(3.67)	(3.71)	(0.39)	(0.39)
Population$_{t-1}$	-0.0259*	-0.0267*	0.0129	0.0135*	-0.0252***	-0.0251***	-0.0073	-0.0080
	(-1.71)	(-1.76)	(1.61)	(1.69)	(-3.67)	(-3.66)	(-0.86)	(-0.94)
GDP per capita$_{t-1}$	0.0095	0.0114	-0.0012	-0.0005	-0.0211***	-0.0209***	-0.0098	-0.0091
	(0.70)	(0.84)	(-0.17)	(-0.07)	(-3.36)	(-3.32)	(-1.39)	(-1.30)
Constant	0.0533	0.0561	-0.1527**	-0.1488**	0.0116	0.0120	0.0401	0.0481
	(0.51)	(0.54)	(-2.38)	(-2.32)	(0.21)	(0.21)	(0.60)	(0.72)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3373	3373	6697	6697	7338	7338	7500	7500
Adjusted R-squared	0.3758	0.3764	0.4128	0.4135	0.3401	0.3401	0.3924	0.3936

Table 10: The Mechanism of Urban Expansion -Corporate Agglomeration

This table presents how urban expansion influences investment and investment efficiency through promoting corporate agglomeration. The dependent variable is *Investment*$_t$, capital expenditure minus cash receipts from sales scaled by total assets at the beginning of the year. Column (1)-(4) are subsamples divided by *Firm entry,* the natural logarithm of the number of newly registered firms. *Low Firm Entry Cities* are observations located in cities with below-sample median *Firm entry*; *High Firm Entry Cities* are observations located in cities with above-sample median *Firm entry.* Column (5)-(8) are subsamples divided by *Industry market share,* sales revenue scaled by industry sales (calculated as aggregated sales for firms that share the same one-digit industry code under CSRC industry classification). *Low Market Share Firms* are observations with below-sample median *Industry market share*; *High Market Share Firms* are observations with above-sample median *Industry market share. Urban expansion*$_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. *Tobin's* q_{t-1} is used to measure investment opportunities. *Tobin's* q_{t-1} is the market value of assets (market value of equity plus book value of assets minus book value of equity minus deferred taxes) divided by book value of assets. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	Low Firm Entry Cities		High Firm Entry Cities		Low Market Share Firms		High Market Share Firms	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Investment$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$
Urban expansion$_t$	**0.0063****	**0.0070**	**0.0043****	**-0.0024**	**0.0066*****	**-0.0002**	**0.0033**	**0.0017**
	(2.20)	**(1.57)**	**(2.12)**	**(-0.89)**	**(3.02)**	**(-0.07)**	**(1.48)**	**(0.54)**
Urban expansion$_t$ ***×Tobin's*** q_{t-1}		**-0.0003**		**0.0034*****		**0.0028*****		**0.0009**
		(-0.20)		**(3.71)**		**(3.03)**		**(0.69)**
Tobin's q_{t-1}	0.0069***	0.0070***	0.0046***	0.0037***	0.0037***	0.0028***	0.0095***	0.0093***

	(5.80)	(5.19)	(12.25)	(8.61)	(7.65)	(5.20)	(15.18)	(13.36)
SOE_{t-1}	0.0043	0.0043	-0.0122***	-0.0121***	-0.0194***	-0.0189***	-0.0085*	-0.0085*
	(0.57)	(0.57)	(-4.25)	(-4.22)	(-5.55)	(-5.42)	(-1.90)	(-1.90)
$Size_{t-1}$	0.0086**	0.0086**	0.0102***	0.0102***	0.0118***	0.0116***	0.0017	0.0017
	(2.33)	(2.34)	(9.03)	(8.99)	(6.59)	(6.50)	(1.10)	(1.10)
$Leverage_{t-1}$	-0.0037	-0.0037	-0.0037**	-0.0036**	-0.0037	-0.0037	-0.0080***	-0.0080***
	(-0.65)	(-0.66)	(-2.05)	(-1.98)	(-1.40)	(-1.39)	(-3.34)	(-3.32)
Operating cash flow$_{t-1}$	0.0763***	0.0765***	0.0461***	0.0459***	0.0396***	0.0397***	0.0487***	0.0485***
	(3.95)	(3.95)	(8.01)	(7.97)	(4.82)	(4.84)	(6.38)	(6.35)
GDP growth$_{t-1}$	0.0763***	0.0763***	0.0406***	0.0403***	0.0261*	0.0257*	0.0667***	0.0668***
	(2.62)	(2.62)	(3.48)	(3.45)	(1.76)	(1.73)	(4.40)	(4.41)
Population$_{t-1}$	-0.0262*	-0.0263*	-0.0023	-0.0018	-0.0069	-0.0064	0.0071	0.0071
	(-1.80)	(-1.80)	(-0.51)	(-0.41)	(-1.26)	(-1.16)	(1.09)	(1.09)
GDP per capita$_{t-1}$	0.0273*	0.0272	-0.0108***	-0.0102***	-0.0062	-0.0059	-0.0124**	-0.0123**
	(1.65)	(1.64)	(-3.06)	(-2.88)	(-1.20)	(-1.14)	(-2.31)	(-2.30)
Constant	0.0044	0.0043	-0.0716**	-0.0735**	-0.0726	-0.0723	-0.0044	-0.0044
	(0.04)	(0.04)	(-2.03)	(-2.09)	(-1.57)	(-1.57)	(-0.09)	(-0.09)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2081	2081	18997	18997	10483	10483	10473	10473
Adjusted R-squared	0.3380	0.3379	0.3324	0.3329	0.3228	0.3231	0.3871	0.3871

Table 11: Cross-sectional Variation: The Effect of Regional Marketization

This table presents the cross-sectional variation of urban expansion on corporate investment and investment efficiency. The dependent variable is $Investment_t$, capital expenditure minus cash receipts from sales scaled by total assets at the beginning of the year. Baseline regressions are repeated in subsamples of firms in regions with low-marketization indices and high-market indices. Column (1)-(4) are subsamples divided by *Marketization,* National Economic Research Institute Index of Marketization (NERIIM). This provincial-level index measures market-oriented institution developments, with a higher value indicating more developed institutional infrastructures. *Low Marketization* are observations located in provinces with below-sample median *Marketization*; *High Marketization* are observations located in provinces with above-sample median *Marketization*. *Urban expansion*$_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. *Tobin's* q_{t-1} is used to measure investment opportunities. *Tobin's* q_{t-1} is the market value of assets (market value of equity plus book value of assets minus book value of equity minus deferred taxes) divided by book value of assets. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	Low Marketization		High Marketization	
	(1)	(2)	(3)	(4)
	$Investment_t$	$Investment_t$	$Investment_t$	$Investment_t$
***Urban expansion*$_t$**	**0.0073****	**0.0063**	**0.0056*****	**0.0003**
	(2.55)	**(1.53)**	**(2.87)**	**(0.10)**
***Urban expansion*$_t$ ×*Tobin's* q_{t-1}**		**0.0004**		**0.0027*****
		(0.31)		**(2.80)**
Tobin's q_{t-1}	0.0064***	0.0062***	0.0050***	0.0044***
	(7.17)	(5.91)	(12.78)	(9.66)
SOE_{t-1}	-0.0166***	-0.0165***	-0.0098***	-0.0097***
	(-2.74)	(-2.73)	(-3.29)	(-3.26)
$Size_{t-1}$	0.0087***	0.0087***	0.0090***	0.0090***
	(3.35)	(3.35)	(7.53)	(7.51)
$Leverage_{t-1}$	0.0025	0.0025	-0.0057***	-0.0056***
	(0.66)	(0.66)	(-2.97)	(-2.91)
Operating cash flow$_{t-1}$	0.0651***	0.0650***	0.0463***	0.0461***
	(4.77)	(4.76)	(7.63)	(7.59)
GDP growth$_{t-1}$	0.0865***	0.0863***	0.0287**	0.0288**
	(3.88)	(3.87)	(2.18)	(2.18)
Population$_{t-1}$	-0.0209**	-0.0209**	-0.0011	-0.0008

	(-2.02)	(-2.02)	(-0.25)	(-0.18)
GDP per capita$_{t-1}$	0.0083	0.0084	-0.0089**	-0.0085**
	(0.83)	(0.84)	(-2.30)	(-2.19)
Constant	0.0172	0.0177	-0.0655*	-0.0668*
	(0.23)	(0.24)	(-1.78)	(-1.81)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	3887	3887	16516	16516
Adjusted R-squared	0.3194	0.3192	0.3462	0.3465

Table 12: Extension: Spillover Effects of Urban Expansion

This table presents the spillover effects of urban expansion on corporate investment and investment efficiency in neighboring cities. The dependent variable is *Investment*$_t$, capital expenditure minus cash receipts from sales scaled by total assets at the beginning of the year. Column (1)-(2) are baseline regressions in previous table, reflecting the effects of local urban expansion on corporate investment. *Urban expansion*$_t$ is city-level incremental construction land supplied by the government divided by city-level GDP. Column (3)-(4) are regressions reflecting the effects of urban expansion of neighboring cities in the same province on corporate investment. *Province neighbor expansion*$_t$ is the average *Urban expansion* for neighboring cities in the same province. Column (5)-(6) are regressions reflecting the effects of urban expansion of all neighboring cities on corporate investment. *Neighbor expansion*$_t$ is the average *Urban expansion* for all neighboring cities. *Tobin's* q_{t-1} is used to measure investment opportunities. *Tobin's* q_{t-1} is the market value of assets (market value of equity plus book value of assets minus book value of equity minus deferred taxes) divided by book value of assets. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$	*Investment*$_t$
Urban expansion$_t$	**0.0058*** **	**0.0007**				
	(3.73)	**(0.30)**				
Urban expansion$_t$ ***×Tobin's*** q_{t-1}		**0.0025*** **				
		(3.32)				
Province neighbor expansion$_t$			**0.0046** **	**0.0024**		
			(2.25)	**(0.83)**		
Province neighbor expansion$_t$ ***×Tobin's*** q_{t-1}				**0.0010**		
				(1.01)		
Neighbor expansion$_t$					**0.0043** **	**0.0014**

					(2.18)	**(0.51)**
Neighbor expansion$_t$ ×Tobin's q_{t-1}						**0.0013**
						(1.42)
Tobin's q_{t-1}	0.0049***	0.0042***	0.0049***	0.0045***	0.0049***	0.0043***
	(13.87)	(10.43)	(12.16)	(7.69)	(13.89)	(7.89)
SOE_{t-1}	-0.0116***	-0.0115***	-0.0128***	-0.0127***	-0.0118***	-0.0117***
	(-4.45)	(-4.40)	(-4.32)	(-4.28)	(-4.51)	(-4.47)
$Size_{t-1}$	0.0104***	0.0104***	0.0111***	0.0111***	0.0103***	0.0103***
	(9.77)	(9.74)	(9.02)	(9.00)	(9.68)	(9.67)
$Leverage_{t-1}$	-0.0038**	-0.0037**	-0.0046**	-0.0046**	-0.0038**	-0.0038**
	(-2.24)	(-2.17)	(-2.38)	(-2.35)	(-2.24)	(-2.19)
Operating cash $flow_{t-1}$	0.0519***	0.0516***	0.0517***	0.0516***	0.0519***	0.0517***
	(9.41)	(9.36)	(8.20)	(8.19)	(9.40)	(9.36)
GDP $growth_{t-1}$	0.0534***	0.0532***	0.0532***	0.0530***	0.0544***	0.0543***
	(5.09)	(5.07)	(4.50)	(4.48)	(5.15)	(5.14)
$Population_{t-1}$	-0.0062	-0.0059	0.0039	0.0037	-0.0073*	-0.0075**
	(-1.63)	(-1.56)	(0.81)	(0.77)	(-1.91)	(-1.96)
GDP per $capita_{t-1}$	-0.0105***	-0.0100***	-0.0027	-0.0025	-0.0114***	-0.0112***
	(-3.16)	(-3.01)	(-0.72)	(-0.68)	(-3.45)	(-3.39)
Constant	-0.0543*	-0.0550*	-0.1418***	-0.1396***	-0.0448	-0.0425
	(-1.77)	(-1.80)	(-3.80)	(-3.74)	(-1.47)	(-1.39)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20518	20518	16166	16166	20450	20450
Adjusted R-squared	0.3323	0.3326	0.3291	0.3291	0.3320	0.3320

Table 13: County-to-Urban District Conversion and Urban Expansion

This table presents evidence of the effect of CTUD conversion on urban expansion using the PSM sample. The dependent variable is *Urban expansion*$_t$, city-level incremental construction land supplied by the government divided by city-level GDP. *Treat* is the dummy variable equal to 1 if the city has upgraded county to city district during the sample period. *Post* is the dummy variable equal to 1 in the year after CTUD conversion. *GDP growth* is the change in the natural logarithm of GDP from year t-1 to year t. *City population growth* is the change in the natural logarithm of the urban population from year t-1 to year t. *Land area* is the natural logarithm of the city's administrative land area. *Industry structure* is the natural logarithm of the primary industry proportions. All specifications use year and city fixed effects. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	(1) *Urban expansion*	(2) *Urban expansion*
Treat×Post	**0.1176***	**0.1578****
	(1.92)	**(2.88)**
GDP growth		-0.5174
		(-0.89)
City population growth		0.0071
		(0.23)
Land area		-0.9205*
		(-2.11)
Industry structure		0.3325
		(1.46)
Constant	0.5716***	8.4950*
	(39.64)	(2.36)
Year fixed effects	Yes	Yes
City fixed effects	Yes	Yes
Observations	346	318
Adjusted R-squared	0.3397	0.3504

Table 14: County-to-Urban District Conversion and Corporate Investment

This table presents evidence of the effect of CTUD conversion on corporate investment decisions using matched sample. The dependent variable is $Investment_t$, capital expenditure minus cash receipts from sales scaled by total assets at the beginning of the year. *Treat* is the dummy variable equal to 1 if the firm is located in the city which has upgraded county to city district during the sample period. *Post* is the dummy variable equal to 1 in the year after CTUD conversion. All specifications use year and firm fixed effects. The t-statistics are reported in parentheses. Results for the main variables of interest are highlighted in bold.

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

	(1) $Investment_t$	(2) $Investment_t$	(3) $Investment_t$
Treat×Post	**0.0088***	**0.0110****	0.0016
	(1.70)	**(2.13)**	(0.22)
Treat×Post×Tobin's q_{t-1}			**0.0035***
			(1.81)
Treat	-0.0273	-0.0449	-0.0419
	(-0.65)	(-0.99)	(-0.92)
Tobin's q_{t-1}		0.0081***	0.0069***
		(5.67)	(4.42)
SOE_{t-1}		-0.0127	-0.0129
		(-0.89)	(-0.91)
$Size_{t-1}$		0.0056	0.0052
		(1.22)	(1.14)
$Leverage_{t-1}$		0.0004	-0.0001
		(0.08)	(-0.02)
Operating cash flow$_{t-1}$		0.0195	0.0222
		(0.97)	(1.10)
GDP growth$_{t-1}$		0.0553	0.0638
		(1.13)	(1.30)
Population$_{t-1}$		-0.0420**	-0.0420**
		(-2.08)	(-2.08)
GDP per capita$_{t-1}$		0.0311	0.0348
		(1.33)	(1.49)
Constant	0.0789***	0.1903	0.1899
	(3.21)	(1.16)	(1.15)
Year fixed effects	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Observations	1763	1763	1763
Adjusted R-squared	0.3713	0.3969	0.3977