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The birth of edge cities in China: Measuring the spillover effects of industrial parks

From its established status as a high-tech science park in 1988, Zhongguancun has been transformed from a village to [China's "Silicon Valley"](#). Zhongguancun's big success has led many Chinese local governments to embrace 'place-based' investments and support the building of industrial parks (special economic zones, SEZ). In fact, this is a growing global trend. A recent [Economist article](#), reported that there are more than 4,000 SEZs (industrial parks) around the world, ranging from basic export processing zones and science parks to more high-tech economic zones.

The emergence of industrial parks and related industrial clusters are important engines of market development. Robert Zoellick, former president of the World Bank, argued that industrial parks in China have played a big role in promoting economic liberalisation and driving rapid economic growth since the 1980s. In September 2010, Zoellick commented that "Special economic zones were a test-bed for economic reforms, for attracting foreign direct investment, for catalysing development of industrial clusters, and for attracting new technologies and adopting new management practices". According to estimates by academics at the World Bank in 2007, industrial parks in China accounted for about 22 per cent of national GDP, approximately 46 per cent of FDI and about 60 per cent of exports – and generated in excess of 30 million jobs.

Clustering innovation

Industrial parks thrive by clustering industrial activities. This allows firms to share inputs, labourers and technologies, generating productivity gains for local economies. However, the impact of industrial parks on the internal structure of a city is still poorly understood. The recently released working paper "[The Birth of Edge Cities in China: Measuring the Spillover Effects of Industrial Parks](#)" by Siqi Zheng, Weizeng Sun, Jianfeng Wu, and Matthew E. Kahn addresses this gap. The authors have merged geo-coded data, sets in eight major Chinese cities: Beijing, Shanghai, Tianjin, Shenzhen, Wuhan, Xi'an, Dalian, and Chengdu. They focus on 120 national and

provincial level industrial parks in these cities. Their analysis reveals that mayors in China have a strong desire to create productive new urban sub-centres by investing large amounts of RMB for constructing these parks in city suburbs. This paper investigates the localised productivity spillover effects of industrial parks on firms both within and near the vicinity of the parks. The study finds that within-park firms enjoy a 15% TFP premium after the park is introduced. Firms located near industrial parks also benefit from a significant “local” TFP gradient, 1.1 to 1.6 times the “global” TFP gradient generated by the Central Business District (CBD) of a city. Additionally, according to the estimation results, the importance of economic zones in terms of production spillover effects is found to have diminishing returns – old parks have larger spillovers than new ones.

A novel feature of this study is to link the rise of industrial parks to the emergence of new consumer-driven, city clusters. Well-paid industrial park workers seeking to reduce commute costs create demand for new residential communities and retail opportunities that are now emerging close to the parks. The paper illustrates that as distance to a park decreases, the number of housing transactions and the value of house prices tend to increase. In addition, the paper provides empirical evidence of the positive effects of industrial parks on retail activities with the emergence of more up-market restaurants, shops and entertainment places in areas surrounding the parks.

Coordinating growth and productivity

New industrial parks can stimulate economic growth by addressing both a co-ordination problem and a land assembly problem. Firms that seek to co-agglomerate within a small geographic area face transaction costs that may prevent simultaneous co-location. Even if firms can collude and agree to do so, there is no reason to believe that a major city would have a large enough vacant plot of land that would allow them to *simultaneously* execute this plan. In this sense, the emergence of industrial park permits a degree of co-ordination over a much shorter time frame, unimaginable in settings where land markets with pre-existing durable structures and long lags between sales dates. Private firms are attracted into industrial parks because they enjoy the benefits of co-agglomeration economies. The clustering of private firms fosters higher levels of overall productivity, raising jobs and wages in the parks and nearby. Increased market potential, triggered by total income and employment growth in the vicinity of economic zones, creates incentives to build up new residential properties and other consumption amenities including retail shops and restaurants.

The benefits of place-based policies are likely to be localised and heterogeneous. The paper presents new evidence on the heterogeneous spillover effects of different types of industrial parks. Larger spillovers tend to accrue from parks with the following features: a higher level of human capital (skilled labour), a lower proportion of State Owned Enterprises, and a better “fit” with local incumbent industries such as stronger input-output linkages, labour market pooling, and knowledge spillovers.

Trade offs and investment risks

The triumph of industrial parks in China is to be celebrated. But the accumulation of significant capital in industrial parks comes with its own risks. Investing in an industrial park is often a gamble, and agglomeration benefits of parks are required to produce a stream of revenues that will outweigh both the upfront costs of building the park and the opportunity cost of land development at urban fringes. Local governments have paid for place-based projects using debt financing. According to IMF estimates, local-government debt reached 36% of GDP in 2013, double its share of GDP in 2008. This is expected to increase to 52% of GDP in 2019. The popular press has suggested that China's local governments may face a potentially major debt crisis. The likelihood of this downside scenario hinges on whether the gamble of place-based investments pays off and can generate the expected positive economic spillovers.

The paper also models the trade-offs facing mayors trying to situate new parks in specific urban areas. Evidence suggests that mayors locate parks in places that feature greater consumption potential but lower producer efficiency potential. One explanation for this is the influence of the Chinese political system. Chinese mayors face a maximum term limit of eight years. From a mayoral perspective, revenue from residential and commercial land sales can be realized in a lump sum in the short-run, while tax revenue from productive firms is only realised annually, this incentivises the placement of parks in areas with higher consumption potentials.

If we take a broader view, creating new suburban edge cities may not be a panacea for stimulating urban success. Since the 1980s, governments in the US, UK and elsewhere have been promoting 'enterprise zones' to mitigate inequality across and within cities. However, empirical studies focusing on U.S. cities show no significant effects from enterprises zones on the number of establishments that develop in targeted zones (see [Boarnet and Bogart](#), 1996; [Billings](#) 2009). Investors may gladly reap the benefits of tax breaks without being required to produce a measurable boost to employment.

Another example, illustrates that despite pouring considerable money and effort into Iskandar, a special economic zone in Malaysia, built along the Johor Strait and neighbouring Singapore, job-creation opportunities continue to be limited. The zone is now facing a substantial housing glut since the supply of newly constructed housing appears to have raced ahead of actual job creation. Moreover, industrial parks are sometimes featured as enclaves where investors receive tax, tariff, and regulatory incentives, creating distortions within economies. A French study by [Mayer et al.](#) (2012) shows that zone policy has succeeded in enhancing economic activities in the targeted areas but that the cost of displacement is quite high.

Factors for success

As argued by this paper, the success of an industrial park, and the subsequent emergence of a vibrant edge city within its vicinity, hinges on several factors. The success of a park

requires a high degree of synergy with the local economy, a good environment for promoting agglomeration economies, public spending to upgrade transportation infrastructure (roads, port, railways and airports) and the provision of high-quality local public services. These factors are often much more effective in creating clusters of firms than just tax breaks. Many industrial inland Chinese cities that lack these characteristics or are located far from major cities and transport hubs are in real danger of being shut down.