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Investing in local construction skills: Scenarios for upgrading the built environment with more labor and less material resources

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Abstract

China's cities are desperate for local jobs and resource efficient strategies for upgrading older neighborhoods. In the construction sector, the high degree of standardization dating from before the time of "reform and opening up" invites economies of scale, mobile capital and the fragmentation of labor to a level that together produce a large amount of unsustainable, and irreparable building components and designs. Maintenance and repair of buildings seem more costly than demolition and reconstruction. This is problematic for several reasons: A meaningful engagement of locals in the construction sector is reduced; the high material turnover (demolition and reconstruction) generates environmental problems, resource shortages and price hikes; demolition destroys social ties when residents are relocated during reconstruction; and replacement contributes to the increasing uniformity of cities where place specific urban morphologies are replaced by generic modern designs. The objective of the paper is to explore in which ways and to which degree maintenance and retrofitting of existing buildings would impact local economies. Investing in local construction skills might solve the dilemma partially. The paper reviews international reports concerned about efficiency and quality delivered by the construction sector and summarizes opinions of insiders to the Chinese construction sector regarding the transferability of strategies to the Chinese context.

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1. Introduction

After almost four decades of growth unleashed by the policies of ‘reform and opening up’ China’s construction industry is again at a turning point. Since the 1980s Chinese cities have grown at remarkable speed as they filled up with migrants arriving from the countryside to work in factories newly established with foreign direct investment and later service jobs of a nature previously unheard of in China. Not only the jobs created but also new products—offering greater choices and now being available in stable supply—gave reason for excitement. New products include housing, office and factory premises for the private economy. The boom of the previous decades was one of extensive growth based on greater inputs fuelled by increasing foreign direct investment, increasing migration of underemployed work-age citizens, and more land rezoned for construction. The conditions that sustained this type of extensive growth are fading.

1.1. *New frontiers in the construction industry*

The new frontiers for the economy lie in intensive growth—using little but to great effect. While demand still exists in some sectors, overcapacity in others has become a problem [1]. Subsidies of costs of environmental pollution and resource depletion have been identified as one of the reasons that have caused some sectors to grow to the detriment of ecological and social welfare [2]. Restructuring is ahead. In November 2013, the Communist Party has announced a new policy perspective and vowed to implement measures to slow down economic growth for the benefit of a more equitable economic structure [3]. For the construction sector, this means to make the best of existing buildings.

1.2. *Dealing with obsolescence*

Buildings are about people and material. Both change over time. Unchecked, ageing destroys the values of a building. With time buildings and their components age. Constant maintenance, regular repair of worn and torn parts, upgrades and adaptations of floor plans, machinery and equipment will mitigate threats to safety, health and comfort of inhabitants and users. According to Boussabaine and Kirkham who looked into life-cycle costs of buildings in the UK the investments in a building’s upkeep and adaptation over its entire life will be a multiple of the initial building costs [4]. Rypkema has found that in the US the costs for new construction are made up to equal parts by labor cost and material cost. In rehabilitation projects the share of labor cost rises to 60 to 70 percent [5].

The effects buildings have on their users and their environment have different dimensions of scale. The building stock of a district or a city affects individuals and communities. Material choices pertain to functionality and detail of a component just as they can change eco-systems at the location of resource extraction. How to construct is part of the culture of societies with networks of trade sourcing material, and keeping structures in place where knowledge about design, technical crafts and skills can be passed on from generation to generation. Buildings are financially valuable, absorbing large parts of the income of families, enterprises and municipal budgets.

The continual care a building receives is thus an investment that goes beyond the individual building. Dealing with obsolescence of buildings is more than a physical upgrade. Keeping buildings in good condition is a social and ecological responsibility.

2. Goals and governance of intensive growth

The choice of maintenance, retrofitting and adaptation measures it seems lies in the hands of the owners of real estate. They adjust their buildings according to their preferences. This is only partly true. This section

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