Economic Growth and Infrastructure Investments in Energy and Transportation: A Causality Interpretation of China's Western Development Strategy

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Infrastructure development was China's national policy priority in the 1980s and continued through 2000s. The Western Development Strategy (WDS) launched in 2000 entailed infrastructure development in different sectors, including transportation, energy and telecommunications. Under the WDS, both the central and local governments had devoted resources to the construction of major infrastructure projects, exemplified by airports, highways and railways, telecommunications facilities, pipelines, as well as electricity generation and transmission.

Despite the large investments made in energy and transportation since 2000, there is no empirical evidence on the causal relationship between the expansion of these infrastructures and economic growth in China. Using data from the pre- and post-WDS periods during 1991-2012, this paper aims to answer the following questions, "Were the large investments in energy and transportation infrastructure effective in fostering economic growth? Or did economic growth promote these infrastructure developments?" These questions are of academic as well as policy interests in connection to the vital role of infrastructure investment on economic development.

We conduct panel data analysis for China's 30 provinces in the Western and non-Western regions to examine the causal relationships among economic growth, energy investment and transportation infrastructure expansion. Our empirical investigation divides the sample into the pre-WDS period of 1991-2000 and post-WDS period of 2001-2012. We use a simple production capacity constraint model to meaningfully interpret the causality results on how gross domestic

product (GDP), energy investment and transportation infrastructure may move with each other. Our findings show the absence of capacity constraint in the pre-WDS period but not the post-WDS period, suggesting the WDS was implemented in dealing with the capacity constraints through infrastructure investments. In addition, our causality results also suggest two challenges in China's quest for sustainable growth. First, energy and transportation capacity constraints are found to exist in the post-WDS period, implying that China should continue its infrastructure investment. Second, these constraints are unsynchronized, suggesting the need to improve the coordination in investment planning for the energy and transportation sectors. Since other Asian countries, including Cambodia, India and Vietnam, also face similar challenges, our recommendation of coordinated infrastructure expansions also applies to these countries.