China's Stimulus Package: What are the Effects?

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INTRODUCTION

Many questions surround the stimulus package that was passed in early November 2008 by the Chinese government and the value of this stimulus package is worth four trillion yuan ($586 billion) over two years. This stimulus package is equivalent to about 16% of China's annual GDP and this stimulus package is new spending, which was not part of its economic plan. The intention of this stimulus package is to fund an array of infrastructure projects such as railways, highways, urban transit systems and other infrastructure projects. However, many economists have claimed that the stimulus package is not as significant as it seems and some of the funds from this stimulus package has already been implemented before the announcement of this stimulus package. According to Sherman Chan, a Sydney-based economist with Moody's, the real size of the package may not be as large as the government has described. He asserts that

> "Some of the measures announced in the stimulus package appear to have been already introduced or even implemented earlier. Hence, the size of this stimulus package—which is expected to be in the form of additional spending—may have been overstated."[1]

Since the implementation of economic reforms in 1978, China has experienced rapid economic growth. Economic growth as measured via the gross domestic product (GDP) grew on average 9.37 percent per year. In terms of economic size, China is surpassed today only by the U.S., Japan, Germany, and France.[2]

In all economies, the expansion of output is the sum of the growth of consumption[3] plus investment plus net exports of goods and services. In the case of China, the expanding investment has attributed to the growth of the China's economy. For China, investment averaged 36 percent of GDP in the first decade of its economic reforms, relatively high by the standard of developing countries generally but not in comparison with China's East Asian neighbors when

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[1] *The World in 2009*, available at http://www.economist.com/blogs/theworldin2009/.

[2] China and France "compete" for fourth place, with the outcome depending on the exact Euro-USD exchange rate (*Statistical Abstract 2005*, p. 203).

[3] In the national accounts, consumption would include personal and government consumption of goods and services.

their investment shares were at their highest. Since the beginning of the 1990s, China's investment rate has trended up. In 1993 and again in both 2004 and 2005, investment as a share of GDP reached 43 percent, a level well above the historic experience of China's East Asian neighbors in their high-growth periods.[4]

In this paper, the authors examine judiciously this proposed stimulus package by the central government of China and the potential economic impacts will also be discussed. Additionally, before delving into this stimulus package, a discussion concerning the investments in infrastructure and its effects on economic growth will be presented since there is an extensive literature in economics concerning the relationship between infrastructure investments and economic growth.

INFRASTRUCTURE INVESTMENT AND ECONOMIC GROWTH

A general consensus exists that investment in public capital can promote economic growth of a region or even a nation. Given the extensive research, improvements in transportation infrastructure not only support regional economic growth by lowering the transportation costs for the users of the transportation system but there are direct benefits such as improvements in travel times, increased reliability, and increased safety in the flows of people and goods. More importantly, as transportation costs are reduced, these resources can be used for other regional programs to enhance the quality of life.[5]

Businesses directly benefit when goods can be shipped more rapidly at lower costs to its markets. Since improvements in transportation infrastructure provide improvements in travel times for individuals, this will enable individuals to benefit from increased employment opportunities as their commuting range has been increased. Consequently, the supply of labor to employers will increase as there will be more potential employees fall within this feasible commuting range.

Solow[6] laid the foundation for growth accounting using the standard neoclassical production function

$$Q_t = A_t f(K_t, L_t) \tag{1}$$

where Q_t is aggregate output, K_t is the stock of physical capital, L_t is the labor force and A_t represents the total factor productivity (TFP), which is Hicks neutral. Consider a Cobb-Douglas production function $F(K_t, L_t) = K_t^{\alpha} L_t^{1-\alpha}$ with $0 < \alpha < 1$. Then, taking natural

[4] All these estimates of the expenditure components of GDP (i.e., consumption, investment, government, and net exports) were from the National Bureau of Statistics of China (2006) which were released in September 2006.

[5] Helling, A.(1997). Transportation and Economic Development: A Review *Public Works Management Policy* 2: 79-93

[6] See Solow, Robert (1957). "Technical Change and the Aggregate Production Function." *Review of Economics and Statistics*, 39:312-320.

logarithms and differentiating both sides of (1) with respect to time t the growth rate of aggregate output is

$$\dot{Y}/Y = \dot{A}/A + \alpha(\dot{K}/K) + (1-\alpha)(\dot{L}/L) \quad (2)$$

Also the growth rates of physical capital and labor are weighted by α and $(1-\alpha)$. Also these weights correspond to the respective shares of rental payments for capital and labor in total income. With available data on α and the growth rates for output, physical capital and labor, TFP growth can be computed from (2) as the residual, which is called the Solow residual.

Economists continued to study the effects of investments in infrastructure and its impacts on economic growth, and numerous empirical analyses that explore the relationship between investments in infrastructure and economic growth.[7] Following Ratner's seminal article[8], numerous empirical analyses have attempted to estimate the output elasticity of public capital. The topic is important in evaluating the efficiency of fiscal spending versus private investment. Earlier works by Aschauer, Munnell, and Holtz-Eakin[9] started the systematic examination of the effects of investments in infrastructure and its impacts on economic growth of a region or on a national level. Typically, such empirical analysis would follow the general pattern of using output for some area as the dependent variable with private capital, labor, public capital, and a constant for the level of technology. In these studies, the public capital variable would be statistically significant and the work of Ashauer was significant since the production function was the first to incorporate the variable of public capital (or the output elasticity of public capital). Other researchers such as Munnell, Holtz-Eakin, and others began seriously to examine the effects of public capital in the production function. In fact, some empirical analyses have explored the impact of infrastructure investment that used the production function to assess its impacts on technical efficiency or productivity.[10]

Despite the statistical significance of the public capital variable, there has been enormous criticisms against the early works of Aschauer, Munnell, and Holtz-Eakin.[11] There have been

[7] See Aschauer, D.A. (1989). "Is Public Expenditure Productive?" *Journal of Monetary Economics* 23, 177-200. Ashauer concluded that small investments in public capital will have a major impact on GDP, but the time series analysis suffered from methodological issues such as the trend in the data, leaving in the effects of the oil price shocks, and other methodological issues have resulted in a high and implausible elasticity of output on public capital.

[8] See Ratner JB (1983). "Government Capital and the Production Function for U.S. Private Output. *Economic Letter*, 13: 213–17.

[9] See Aschauer, D.A. (1989). "Is Public Expenditure Productive?" *Journal of Monetary Economics* 23, 177-200; Holtz-Eakin, D (1988). "Private Output, Government Capital, and the Infrastructure Crisis." Discussion Paper Series No. 394, New York: Columbia University; and Munnell, A. (1990). "Why Has Productivity Declined? Productivity and Public Investment." *New England Economic Review*, Federal Reserve Bank of Boston, 3-22.

[10] For example, see Demetriades, P.O. and T.P Manuneas (2000). "Intertemporal Output and Employment Effects of Public Infrastructure Capital: Evidence from 12 OECD Economics," *The Economic Journal*, 110, 687-712.

[11] However, Aaron and Tatom refuted these empirical results which imply that rate of return on public investment could be about three times higher than that of private capital. Their main argument was that this estimate was a spurious correlation caused by common trends in variables such as *output* and *capital stock*. In addition, productivity and public capital experienced a sharp change in trend in the early 1970s, which may have led to the higher elasticities reported by Munnell and Aschauer. Subsequently, they removed the trends, taking into account any missing explanatory variables, such as oil price shocks and estimated an elasticity of close to zero. See the Tatom J (1991). "Public Capital and Private Sector Performance." Federal Reserve Bank of St. Louis, pp 3–15 and Aaron H.

three criticisms that were leveled against these early works. First, the common trends in output and public infrastructure data have led to the spurious correlation. The early empirical works often used time series data which were not stationary and this lack of stationarity in the time series to incorporate a trend in the time series which would result in a spurious correlation.[12] The second criticism is attributed to the wide range of coefficients on public capital have caused suspicion that there does not appear to be a consistent coefficient for public capital. The range of coefficient on public capital (or the output elasticity of public capital) has ranged from .03 to .39.[13] The final criticism suggests that causation from output to public capital, not from public capital to output as suggested by the early empirical works.[14]

Secondary effects will also provide economic benefits to a region in which the investments in infrastructure occur. These secondary benefits would be the expansion of businesses because of lower transportation costs which allows for higher profitability and even a greater market share. As a result of these latter improvements, there will be increased employment in the region and higher incomes generated by individuals. Since business opportunities have expanded, regional economic activity would increase as these growing businesses demand more raw materials and other goods from their suppliers. Since regional incomes have increased, the retail and service sector would grow since individuals have more disposable income to spend on goods and services.[15]

When there are substantial investments in infrastructure as a means to promote economic growth, policy-makers are interested how this additional spending will have on economic growth. Despite the good intentions to provide additional investments in infrastructure, national and local governments will need rigorous assessment as to which infrastructure projects should be pursued. However, these empirical approaches mentioned in this section of the paper cannot determine the feasibility of infrastructure investments. That is, policy-makers will need to conduct cost-benefit analysis to carefully assess the costs and benefits of these infrastructure projects and these results will determine which of these projects would be pursued.

ANALYSIS OF THIS STIMULUS PACKAGE: BENEFITS OF THIS STIMULUS PACKAGE

The preceding section of this paper reviewed some of the literature concerning infrastructure investment and its impacts on economic growth. The general theme in the

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(1990) Discussion of Why is infrastructure important?" In: Munnell A (ed) "Is There a Shortfall in Public Capital Investment?" Federal Reserve Bank, Boston pp 51–63.

[12] First differencing was the remedy applied to eliminate the spurious correlation since it is not economically possible for private or public capital to be correlated with growth in output in that same year. However, there are still conceptual issues concerning the use of first differencing of the data.

[13] Typically these output elasticities of public capital were generally higher for national regions and smaller for states and smaller regions. Despite these differences, there still persists a critical assessment of the methodologies used as well as the issue of the quality of data used in these empirical studies.

[14] For greater details concerning these criticisms, the reader should consult, Munnell, A.H. (1992). "Policy Watch Infrastructure Investment and Economic Growth, *Journal of Economic Perspectives* 6(4), 189-198.

[15] Sloboda, B.W.., and V. W. Yao. (2007). "Interstate Spillovers of Private Capital and Public Spending." *Annals of Regional Science*, forthcoming.

economics literature is that major investments in infrastructure investments will provide a stimulus on the economy which will provide numerous benefits. As mentioned earlier in this paper, the central government of China has proposed a massive stimulus package worth four trillion yuan ($586 billion) over two years. This stimulus package is equivalent to about 16% of China's annual GDP and this stimulus package is new spending, which was not part of its current economic plan by the central government. However, some analysts have concluded that this stimulus package is largely a repackaging of previous economic plans designed to immediately bolster domestic confidence in the economy which has shown some signs of slowing down.[16,17] Robert Zoellick, head of the World Bank, and heads of other international agencies have praised the central government for this stimulus package since it is the right policy to pursue. Given the current account surplus and strong budget position, the implementation of this fiscal policy would provide benefits to its domestic economy as well as the global economy. Given its foreign reserves of $1.9 trillion, China has experienced low domestic debts levels and has maintained a surplus in its budgets in recent years. Also there are several initiatives which will be covered by this stimulus package and these initiatives include

- Rebuild after the Sichuan earthquake;
- Formally loosen lending restrictions on state banks that were being ignored over the course of 2008
- Enhance the nation's transportation network by spending hundreds of billions of dollars over several years in what was already a well-established program.[18]

The proposed stimulus package contains a mixture of investment and consumption-enhancing elements which has impact in such as the transportation infrastructure, i.e., roads, railways and other forms of transportation infrastructure and other forms of infrastructure such as water, budget housing and reconstruction of the areas devastated by the Sichuan earthquake in May 2008.

As mentioned earlier in this section of the paper, this stimulus package has the main goal of enhancing investments in infrastructure as well as investments in other areas. The central government would like to resume its investments in the high speed railway system through central China to Guangzhou. With the development of this high speed railway system, this would improve tourism and leisure in these areas.[19]

While spending on health, education and poverty relief are mentioned in the plan, the emphasis there is on construction too. As an example, the local health clinics or the renovation of schools would be funded from this stimulus plan. Only one of the provisions of this stimulus package is directly linked to social spending, capturing social security, pensions and income support.

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[16] Currently GDP is about 9 percent per annum after achieving a peak of 12 percent in 2007.

[17] NYU professor Nouriel Roubini estimates China needs to grow at 9%-10% per year just to accommodate the 24 million or so people entering its workforce in that time frame. In fact, he suggests that GDP growth of 5%-6% in China would qualify as a recession. He also quotes that "While we're trying to blunt negative GDP numbers, China's trying to stave off a growth rate we can't fathom."

[18] Scissors, D. (2008). "China's Stimulus Package: Repackaged and Misdirected." Memo 2128, The Heritage Foundation.

[19] China's stimulus package: Will it work, and what's next? ChinaDaily.com.cn, November 26, 2008.

In fact, not all economists share the belief that this stimulus plan as proposed by the central government in favorable terms. Xia Yeliang, researcher at Foreign Economic Studies Center of Beijing University states that

> "The new plan is actually a classical Keynesian formula. We have tried it in 1998 (after the Asian financial crisis) and we know it works. The difference though is that China at the time needed the entire infrastructure that was built. This time around we must focus on infrastructure and more. The quality of spending is very important and we must make sure it benefits ordinary people most of all."[20]

CRITICISMS OF THIS STIMULUS PACKAGE

Although this stimulus package as proposed by the central government of China has received by many policy-makers from different nations and international organizations throughout the world, this stimulus package has received criticisms concerning the reason behind the implementation of this stimulus package and its impacts in the current global economy.

In fact, some economists have argued that little of this money spurring consumption spending, policy-makers have questioned the plan's chances of releasing the potential of China's huge savings. More specifically, China's savings rate in 2007 was 51.2 percent of GDP, which is a substantial rise from the 37.7 percent rate in 2000.[21]

In fact, some policy-makers have criticized this stimulus package for focusing too much on investment, which already represents a high share of its GDP. In fact, the focus should be on increasing consumption by cutting income taxes. Keep in mind that China has a high savings rate but with a declining confidence in the current economy, investments infrastructure investment would provide the necessary boost in economic growth rather than providing additional tax cuts since the tax cuts would result in the money being saved rather than being spent. Typically, in developing economies there is a greater need for infrastructure development as an avenue for economic growth and the Chinese economy would greatly benefit from additional infrastructure in transportation and non transportation infrastructure projects.[22]

This is not the first time that the central government has implemented a large stimulus package to prevent the economy from contracting. In the 1990s, the Asian financial crisis affected China after the bust of a credit boom in the mid-1990s after the Chinese made some gains in economic growth. Consequently, the central government was forced to restructure state-owned firms as a result of the massive losses in the credit market. Investment and jobs were cut at the same time as exports stumbled. In 1997-98 state owned firms made a net loss of almost 1% of GDP while in 2007 their combined profits were over 4% of GDP. During the Asian financial

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[20] Ibid.

[21] Antoaneta Bezlova, *ECONOMY-CHINA: Misgivings Emerge Over Stimulus Package*, November 27, 2008, available at http://globalgeopolitics.net/wordpress/2008/11/27/economy-china-misgivings-emerge-over-stimulus-package/

[22] In a developing economy investments in infrastructure is also less likely to be wasteful than in developed countries. As an example, Japan built bridges to nowhere during the 1990s in an effort to keep its economy from sagging. See the *Economist*, "Reflating the Dragon," November 13, 2008

crisis the central government implemented policies that allowed the Chinese economy to withstand some additional damage and allow the economy to resume its path of strong economic growth through the next decade.

Some economists agree that this time around it will be harder for the central government to achieve a high level of success with the stimulus package than the stimulus package implemented after the Asian financial crisis. After the Asian financial crisis, the central government had a clear plan for the implementation of the stimulus plan which was mainly constructing highway infrastructure. After the Asian financial crisis in the 1990s, China did not have a well-established highway system; however, since then they have constructed a major highway system.

In fact, the continued rapid economic growth and globalization in the 1990s before the Asian financial crisis has spawned the need for an increase in the demand for reliable highway transportation. To accommodate this economic growth, China has made significant investments in the development of a National Trunk Highway System (NTHS), which should total 35,000 km of toll highways and expressways by 2015 as a means to provide reliable highway transportation.[23] Thus, the central government had clear objectives for implementing a massive stimulus plan during the Asian financial crisis. Interestingly, Wei-hua et al. provided detailed research on China's data of transportation and economic development from the beginning of its reform through the end of 2005. In fact, the results of their research revealed that increases in GDP would influence the development of highway and other transportation infrastructure projects.[24]

In fact, the current stimulus package is not as clear or does not have clearly defined objectives as alleged by some policy-makers. When this stimulus plan was announced in November 2008, it became clear that the 4 trillion yuan, to be spent by the end of 2010 provided some inspiration to international financial chiefs but lacking in detailed objectives. In fact, some economists alleged that only a quarter of the intended plan was actually a stimulus while the remainder at least two-thirds or more had already been planned for.

The Chinese economy is much bigger now than after the Asian financial crisis, and the implementing of the objective of building more infrastructures will not continue to provide additional growth seeked by the central government. More importantly, economists say that the central government should increase domestic demand but with the low household incomes, increasing domestic demand would be difficult to do. As a remedy, the central government should consider providing tax cuts as a means to revitalize the slowing economy. [25]

Investments in infrastructure, though often a good approach to promote economic growth, do have some disadvantages. More specifically, these investments will require

[23] More than 34,288 km of expressways, 33,522 km of Class I roads, and 231,715 km of Class 2 roads were added to the system between 1992 and 2002, inclusive. In fact, this translates into the development of 18 km of roads per day in China. See Fan, S and C. Chan-Kan, (2005). "Road Development, Economic Growth, and Poverty Reduction in China."Research Report 138, International Food Policy Research Institute, Washington, DC.

[24] Wei-hua, W., Guo-li, O. and L. Chen-yang. (2006). Research on the Development Mechanism of China's Highway, a paper presented at the 2006 International Conference on Management Science and Engineering.

[25] Hewitt, D. "China's Stimulus Package: Questions the Morning After." *Newsweek* , November 11, 2008.

additional energy expended to produce the inputs and to operate and maintain this new infrastructure. What may happen is that current power supply may not keep up with the increase in demand, which could provide shortages of electrical power throughout China.[26]

Even the *China Economic Observer* at Beijing University is pessimistic since they believe that the central government has spent too much on investments in infrastructure with little emphasis on other areas. Because of these massive infrastructure investments, the Chinese private sector was "crowded out" from this investment. Consequently, the economy became wholly dependent on investment. Also the *China Economic Observer* asserts that

> "Increasing domestic consumption became mission impossible and China's transformation to a consumption economy was impeded again," it concluded. "If we let the economic express of China follow the same old tracks instead of reforming it, we will inevitably face a more dire climate in the future."

CONCLUSIONS

The investment stimulus as proposed by the central government of China will not work quickly, but the impacts of these investments will take some time. In the meantime, GDP growth could drop below 7% in the first half of 2009 as exports and housing investment weaken. Despite this decline in GDP in the first half of 2009, many economists believe that this stimulus package will be enough to keep economic growth at 7.5-8% for 2009 while other nations will experience a decline in economic growth for most or all 2009.

Despite the intense scrutiny since the implementation of this stimulus by the central government, the international community should not become overly excited about the potential impacts of this stimulus package. The main objective for this stimulus package is to stimulate domestic demand and other economies should seek this stimulus package as a means to insulate the global economy from the current economic recession.

Ironically, how does the Chinese stimulus package and the recent US bailout plans compare? The US bailout plan of approximately $700 billion is not a typical stimulus plan distributed for use within the United States. In fact, it is an effort focused on a relatively small group of financial companies to prevent a collapse in the financial markets which ripples throughout the rest of the economy. Based on 2008 data, here is how the stimulus measures compare against a few important macroeconomic variables:

[26] Ibid

Economic Indicator	China	United States
Stimulus	$586 billion	$700 billion
GDP	$3.3 trillion	$13.8 trillion
Stimulus/GDP	17.8%	5.1%
National Debt/GDP	18.4%	60.8%
Trade Surplus (Deficit)/GDP	8%	(5.2%)

Source: http://www.fool.com/investing/dividends-income/2008/11/12/chinas-stimulus-vs-americas-bailout.aspx

National debt for the United States is approximately around $10.6 trillion which gives the current debt/GDP figure of more than 75%. More importantly, the budget deficit of the United States is also expected to be over a trillion dollars in 2009, whereas China has been running a massive budget surplus. Given these differences, the central government of China can afford to purse this stimulus plan whereas the United States is not able to afford to purse its bailout plan for the financial sector.[27] Despite these efforts by the United States and the central government of China, their intentions are to prevent a further contraction in the domestic economies as well as spare the global economy from the effects of perhaps a long, deep worldwide recession.

[27]How will the central government of China fund this stimulus package? The Chinese government may decide to buy plenty of US Treasury securities or other form of equity to help fund its stimulus plan. However, for the Chinese government to invest in US Treasury securities would prove to be risky since the stability of the financial markets in the US is rather uncertain. Additionally, the US often relies on foreign governments to invest in the US but with the financial markets in disarray, the foreign nations may be more inclined to invest in their domestic economies especially with the current economic slowdown.