

Demystifying China's Fiscal Stimulus

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Abstract

China's government economic stimulus package in 2008-09 appears to have worked well. It seems to have been about the right size, included a number of appropriate components, and was well timed. Its subnational component was designed to maximize the impact of the stimulus package on the economy and minimize the potential procyclical elements that are usually built into subnational fiscal mechanisms in federal countries. Moreover, China's massive fiscal stimulus played an important role in the overall recovery of the global economy. Using a simple analytical framework, this paper focuses on two key factors behind the success of the stimulus: investments in bottleneck-easing infrastructure projects and countercyclical nature of subnational spending based on the assumption that well-chosen infrastructure projects could improve business climate and thereby crowd in the private investment. The paper

concludes that the expansionary subnational government spending played a key role in strengthening the overall impact of the stimulus and sustaining growth. It also highlights the importance of public investment quality and cautions about the sustainability of local government financing through the domestic banking system and increases in local governments off balance sheet or contingent liabilities. These lessons may be of particular relevance today for China, as well as other countries, in formulating policy response to another global economic slowdown or crisis, possibly as a result of the Eurozone turmoil. For China, investing in urban infrastructure and green economy, as well as in higher quality and better targeted social services, will be crucial for improving income inequality and inducing a more inclusive growth path.

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DEMYSTIFYING CHINA'S FISCAL STIMULUS

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Introduction

In 2008–09 the world economy experienced the sharpest downturn since the Great Depression. The annual pace of world GDP growth fell from 5.4 percent in 2007 to 2.8 percent in 2008, and output shrank 0.6 percent in 2009. In the advanced economies, economic activity came to a sudden halt in 2008 and fell 4 percent in 2009. Growth in the volume of world trade, which had been increasing by about 9 percent a year before the global recession, slowed to 2.5 percent in 2008 and fell more than 10 percent in 2009, its first decline since 1982.

Economic growth in many emerging and developing economies was adversely affected by the global recession. Despite unprecedented countercyclical fiscal and monetary policies in many countries, their aggregate annual growth fell from 8.7 percent in 2007 to 6.0 percent in 2008 and 2.8 percent in 2009. As of mid-2012, with the U.S. economy recovering only gradually and the sovereign debt crisis in Europe continuing to sap confidence, the global economy remains in distress, with uncertainty about the future still looming large (IMF 2012c).

As a result of a coordinated policy response by the world's largest economies, the global economy seemed to be on a path to recovery in 2010. The recovery has been weak and fragile, however, with global growth slowing from more than 5 percent in 2010 to about 3.5 percent in 2011. Growth in the advanced economies slowed to just 1.5 percent in 2011 and is expected to decelerate further in 2012.

In contrast, growth in emerging and developing economies remained above 6 percent, though it is expected to decelerate in 2012, supporting global growth. These economies accounted for 60–70 percent of overall global growth between 2009 and 2011. Much of this growth came from China, where output rose by about 13 percent a year between 2005 and 2007. Growth slowed to about 9.7 percent in 2008–10 and 9.2 percent in 2011 and is expected to reach just around 8 percent in 2012 as a result of the slowdown in the world economy and tightening of monetary

policy in response to inflationary pressures. Nevertheless, an additional stimulus package may become necessary if the Euro area problems turn into a full-fledged crisis.

The focus of this paper is China's fiscal policy response, which prevented a recession in China and played an important role in the overall recovery of emerging and developing economies since 2008–09. The paper also analyzes China's subnational fiscal response in support of its overall policy response.

China's economy has continued to expand rapidly until mid-2012, driven to a large extent by the development of the private sector. Exports were hit hard by the global crisis, slowing activity sharply during 2008. However, a rapid and sizable countercyclical policy response, as well as quick adjustment in the labor market, helped accelerate growth in 2009, positioning China to play a leading role in the global recovery.

In contrast to what happened in many countries where government stimulus spending crowded out private investment and consumption and the central government's expansionary fiscal policy was mostly offset by the procyclical contraction of expenditure at the subnational levels, China's stimulus generated large multiplier effects on overall output, in part by creating additional demand by encouraging private investment and consumption. The stimulus had significant effects on output at both the national and subnational level, through strong countercyclical subnational expansionary spending that matched the earmarked funds from the center. However, local governments' investments were largely financed from bank borrowing, which may have led to a sharp rise in the local governments' indebtedness and off balance sheet contingent liabilities.

This paper describes China's fiscal stimulus and draws lessons for effective stimuli in China and other large federal countries. Using a simple analytical framework, it focuses on investments in bottleneck-easing infrastructure projects and the countercyclical nature of subnational spending as among the key factors behind the success of the stimulus.

The stimulus package prevented a major deceleration in growth, but concerns remain about its sustainability and the quality of some of its investments. Prudent management of resource

allocation, project selection, and local government finance are crucial for the long-term sustainability and effectiveness of some of the underlying national and state-level projects. The analysis draws some lessons from China's experience—for China and for other countries, both developed and developing. These lessons may be of particular relevance today, as the global economy appears to be on the precipice of another recession as a result of the ramifications of the debt crisis in Europe. The possibility of a sharp rise in oil prices as a result of geopolitical events in the oil-producing countries of the Middle East also looms on the immediate horizon. All of these events are likely to reduce the fiscal space (because of lower economic growth and automatic stabilizers) for a sizable fiscal stimulus in many countries. Policy makers must thus carefully assess their experience with the first round of countercyclical policies in response to the global crisis and draw lessons to ensure maximum efficiency and effectiveness in future efforts they may launch in response to another regional or global crisis.

China's Response to the Global Crisis

In the last quarter of 2008, global industrial production dropped 20 percent (23 percent in advanced economies and 15 percent in developing countries) (World Bank 2009b). Rising fiscal deficit and government debt in the advanced economies led to lower investment levels in developing countries, as a result of wider interest rate spreads and the tightening of international credit. Net private capital flows to emerging and developing economies plummeted from \$700 billion in 2007 to around \$270 billion in 2008 and 2009 before recovering to about \$530 billion in 2010. The capacity of firms to invest declined, as a result of the drop in access to financial resources and the sharp decline in international trade; their propensity to invest plunged, as a result of weak economic prospects, particularly in advanced economies. Limited profit opportunities and high risk reduced new flows of investment, reinforcing the vicious cycles of excess capacity, low demand, and excess capacity.

The Chinese economy was hit hard by the global crisis, mainly through trade and capital flows. GDP of almost all of China's main trade partners fell after the onset of the crisis in the fourth quarter of 2008. China's volume of exports of goods and services declined 10 percent in 2008/09 (China Statistics Yearbook 2011). Market-based investment and confidence declined severely,

particularly in the manufacturing sector (World Bank 2009a). The inflow of foreign direct investment (FDI) also slowed. It fell from \$143.1 billion in 2007 to only \$70.3 billion in 2009, though it recovered sharply in 2010 to \$185.7 (IMF 2012e). It is estimated that some 20–36 millions jobs were lost in China as a result of the sharp decline in export demand in 2008-09. Given China’s strong economic fundamentals, the government was able to speedily implement a sizable stimulus package. In the face of the precipitous drop in exports in the second half of 2008, Chinese authorities used both fiscal and monetary policies to maintain growth. On the monetary side, they cut both the reserve ratio and policy interest rates and removed a number of restraints on domestic bank lending. A gradual appreciation of the yuan against the U.S. dollar, in both real and nominal terms, alleviated some of the inflationary pressures caused by the sizable policy stimulus.¹

On the fiscal side, the initial low public debt level and a large government budget surplus provided the government with the fiscal space to introduce a massive stimulus package. Quantifying the total additional fiscal stimulus is difficult, because some outlays and tax reductions were already programmed before the onset of the global recession, but its scale clearly dwarfed fiscal responses in the advanced economies.

A substantial portion of the stimulus package of 2008-09 was in the form of extra outlays on infrastructure, particularly in the transport and energy subsectors. Some new spending was also allocated to social programs, particularly in health care, and environmental projects, which are viewed as important ingredients for achieving sustainable and inclusive growth in the medium to long term. The central government has been funding part of the measures in the stimulus package. Local governments, as well as state-owned enterprises and banks, have been financing the rest.

A fiscal package of \$586 billion (or 4 trillion yuan)—12.5 percent of China’s GDP in 2008—was implemented to mitigate the impact of the crisis (Box 1). As the world economy fell into recession after the crisis, China’s GDP grew by more than 9 percent in both 2008 and 2009. Consumer prices fell, the government fiscal balance declined to a deficit of 2–3 percent of GDP,

and the current account surplus fell to 5 percent of GDP in 2009 from more than 9 percent in 2008 (table 1).¹

Box 1 China's Fiscal Stimulus in 2008

China's fiscal stimulus amounted to RMB 4 trillion, or about 12.5% of GDP, in 2008. The projects and programs that were underpinned by the stimulus were implemented over a period of 27 months. The stimulus plan included investments of about RMB 1.2 trillion by the central government and nearly RMB 3 trillion of supporting investment projects and programs by the local governments and non-governmental sectors, which to a great extent were financed by supporting loans provided by policy banks and commercial banks. These investments covered livelihood improvements, R&D, environmental protection and other sectors. More than one-third of the resources were allocated to the infrastructure sector:

The composition of the 4 trillion RMB stimulus package							
Housing guarantees	Rural construction	Energy conservation and emissions reduction	Infrastructure development	Social services	Industrial restructuring	Post-disaster reconstruction of Wenchuan	Total (RMB)
0.4 trillion	37million	21 million	1.5 trillion	15 million	37 million	1 trillion	4 trillion

Source: World Bank (2010), Development Research Center for the State Council (2010), and “NDRC reveals details of stimulus package”, China Daily, November 27, 2008.

By mid-2009, the macroeconomic stimulus and other interventions had succeeded in boosting demand for migrant labor. By early 2010, scarcity reemerged in China's labor market, and wages started to climb once again (Giles and others 2012). In 2010, China's exports recovered to precrisis levels, and real GDP grew 10.5 percent, which slowed down to 9.2 percent in 2011 and is now projected to slow down further to around 8 percent 2012 due to the slowdown in the global economy.

The success of China's fiscal stimulus spurred domestic demand and supported the global economic recovery. Strong economic growth in the world's second-largest economy stimulated

¹ The latest IMF data shows a sharp increase in general government gross debt as percent of GDP to 33.5 percent in 2010 before starting to decline to about 26 percent in 2011, though remaining well above its average level of about 17.5 percent in 2008-9.

imports from many countries, in East Asia as well as Europe and the United States. Spillovers from China to the rest of the world have been strong in both the short and long run (Arora and Vamvakidis 2010), and strong trade ties with China contributed to East Asia's resilience to the global financial crisis (Broadman 2010). It was estimated that China's fiscal stimulus was particularly effective in stimulating demand for commodity exports by Australia, (Day 2011). According to an estimate by the International Monetary Fund (IMF), the resilience of the BRIC economies (Brazil, Russia, India, China) during the financial crisis may have added 0.3–1.1 percentage points to growth by low-income countries.

Table 1 Key macroeconomic indicators in China, 2007–12

<i>Indicator</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012 (projected)</i>
GDP growth (annual percentage change)	14.2	9.6	9.2	10.5	9.2	8.2
Inflation, consumer prices (annual percentage change)	4.8	5.9	−0.7	3.3	5.4	3.3
Current account balance (percent of GDP)	10.1	9.1	5.2	5.2	2.8	2.3
General government gross debt (percent of GDP)	19.6	17.0	17.7	33.5	25.8	22.0
General government balance (percent of GDP)	0.9	−0.7	−3.1	−1.5	−1.2	−1.3
Central government fiscal balance (percent of GDP)	6.1	6.1	6.1	6.6	—	—
Local government fiscal balance (percent of GDP)	−5.5	−6.5	−8.3	−8.3	—	—
Total investment in fixed assets (percent of GDP)	51.6	54.8	65.8	69.0	—	—

Source: Authors' compilation based on data from IMF World Economic Outlook April 2012, IMF Article IV Consultation with China July 2012, and China Statistical Yearbooks of recent years. IMF estimates of GDP growth, inflation, and general government gross debt start after 2011; current account balance estimates start after 2010.

Note: — Not available.

Effects of China's Fiscal Stimulus

China's fiscal stimulus helped prevent a drastic slowdown of its economy, which had been growing by double digits for three decades. Had the economy suddenly slowed significantly, latent issues could have surfaced, such as a sharp increase in unemployment which would have undermining the "harmoniousness" of the society

Several recent studies provide a range of estimates of the effects of China's fiscal stimulus. The IMF estimates that it raised China's GDP by 1.5–2.25 percentage points in the first half of 2009

(IMF 2009). Other estimates suggest that it boosted real GDP growth from an annualized low of 6.2 percent in the first quarter of 2009 to 11.9 percent in the first quarter of 2010 (Deng and others 2011). An Inter-American Development Bank study using a multicountry dynamic general equilibrium model simulation suggests that absent the fiscal stimulus, China's GDP would have been 2.6 percentage points lower in 2009 and 0.6 percentage points lower in 2010 (Cova, Pisani, and Rebucci 2010). An input-output analysis shows that with a multiplier of 0.84, the stimulus generated 18–20 million new nonfarming jobs in the first year after implementation of the stimulus (He, Zhang, and Zhang 2009). The same study shows that the multiplier is about 1.1 in the medium run, as fiscal spending leads to higher household consumption and corporate investment.

Calculating the net fiscal multiplier is difficult, because there is no simple way to control the “fiscal experiment” (Barro and Redlick 2009; Christiano, Eichenbaum, and Rebelo 2009). The consensus in the literature is that fiscal expansion through higher spending has larger multiplier effects than expansion via a tax cut. In the short term, an increase in government capital spending has larger multiplier effects than untargeted increases in government expenditure (Ducanes and others 2006).

Estimates of the fiscal multipliers depend on the methodology, period, initial conditions, and controls applied. Models that assume full employment, rational expectations, and some version of Ricardian equivalence are more likely to have near zero or negative fiscal multipliers.²

The size of the multiplier tends to be larger when leakages are minimized, monetary conditions are accommodative, and the country's fiscal position is favorable. In the United States in the past 20 years, multipliers on government spending are estimated to have been between 1.5 to 2.0. Tax cut multipliers, estimated to be between 0.5 to 1.0 (Nallari 2010), are much smaller, because a large share of the tax reduction is often saved rather than spent. In the United States, the marginal propensity to consume out of disposable income in the past three decades averaged

² Ricardian Equivalence (R.E.) is a theoretical economic concept. It suggests that when a government makes an attempt in stimulating the economy by increased government spending financed by debt, the overall demand in the economy remains unchanged. This, according to R.E. concept, is because the public will attempt to save its excess income obtained through the additional government spending in order to pay for future tax increases that will be initiated by the government to pay off the debt. http://en.wikipedia.org/wiki/Ricardian_equivalence

around 0.70, whereas the marginal propensity to consume out of reduction in taxes and tax rebates was only about 0.13 (Feldstein 2009). When separating revenue changes resulting from legislation from other changes, such as those related to changes in prospective economic conditions, it is estimated that a tax cut equivalent to 1 percent of US GDP raises output by about 1 percent within a year, but the magnitude rises in the following periods and reach about 3 percent after three years (Romer and Romer, 2010). A survey of empirical evidence suggests that for the 2008-9 stimuli by the G20, the low set of multipliers was 0.3 for revenue, 0.5 for capital spending, and 0.3 for other spending; the high set of multipliers was 0.6 for revenue, 1.8 for capital spending, and 1.0 for other spending (Spilimbergo, Symansky, and Schindler 2009).² For a sample of 102 developing countries, the one-year government spending multiplier resulting from borrowing from official creditors is estimated to be around 0.4 (Kraay, 2012).

Table 2 Estimates of fiscal multipliers in China and other settings

<i>Entity</i>	<i>Period</i>	<i>Size of multiplier</i>	<i>Source</i>
China	2008 global crisis	Short term: 0.84 Medium term: 1.10	He, Zhang, and Zhang (2009)
United States	Since 1990	Government spending: 1.5–2 Tax-cut: 0.5–1	Nallari (2010)
United States	Since 1980	Tax-reduction and tax-rebate: 0.13	Feldstein (2009)
United States	1950-2006	1% within a year, and up to 3% after three years	Romer and Romer (2010)
G7	Since mid-1970s	High set: 0.6 for revenue, 1.8 for capital spending, 1.0 for other spending Positive spending shock: 1.22 (negative output gap); 0.72 (positive output gap)	IMF Fiscal Monitor (April 2012)
G20	2008 global crisis	Low set: 0.3 for revenue, 0.5 for capital spending, 0.3 for other spending	Spilimbergo, Symansky, and Schindler (2009)
Developing countries	1970-2010	Government spending 0.4	Kraay (2012)

Source: Authors' compilation.

Whether developing or advanced economies have larger multipliers depends on several factors. On the one hand, multipliers may be larger in developed countries because they are better able than developing countries to maintain increased government consumption. Ilzetzki, Mendoza, and Vegh (2011) examined quarterly data on 44 countries (20 high-income and 24 developing

countries) over the period 1960–2007. They find a short-term multiplier of 0.24 in high-income countries and close to zero for developing countries and a long-term cumulative multiplier of 1.04 in high-income countries and 0.79 in developing countries. Partly because of the stop and go nature of increases in government spending in developing countries, an additional dollar of government consumption crowds out some other components of GDP, such as private investment, private consumption, or net exports, in the long run.

On the other hand, the potentially higher marginal economic returns to public investment in human capital and infrastructure in developing countries suggest larger multipliers for public sector spending in developing countries. In emerging markets, where fiscal space is large, the safety net shallow, and infrastructure deficits great, the effects of fiscal policy are greater than in advanced economies (Aizeman and Jinjark 2010).

Why Did China's Stimulus Succeed?

The success of China's fiscal stimulus package suggests that government intervention can bear fruit, in particular in a developing country in which fiscal expenditure is usually procyclical and of limited effect. China's strong fiscal position and vast foreign exchange reserves supported the swift implementation of the massive countercyclical intervention.³ In November and December 2008 alone—the first two months after the announcement of the stimulus package—the State Council allocated Y 120 billion (\$17.5 billion, 0.3 percent of GDP) of central government funds to the stimulus. Deployment of these funds played an important role in maintaining investment from the onset, strengthening the incentives and propensity to invest and preventing the onset of the vicious cycle of lower investment, lower consumption, lower investment. The size and speed of fiscal stimulus were of vital importance, as the investment to GDP ratio in China has exceeded 40 percent for some three decades.

A simplified analytical framework helps explain the success of China's stimulus. A simple equation captures the various components of domestic production:

$$Y = I + C + G + (X - M) = i(G) + c(G) + G + h(G) \quad (1)$$

where Y stands for output, C for consumption, I for investment, G for government spending, and $X - M$ for net export (exports of goods and services minus imports of goods and services). The lower case variables on the right-hand side of equation (1) represent investment (i), consumption (c), and net exports (h) as functions of government spending G .

Government spending (G) is the sum of central government spending (g_1) and total spending by subnational governments (g_2).⁴ Total spending by subnational governments equals $\sum g_j$, where g_j stands for the expenditure of subnational government j , which is a function of a vector of factors, including subnational output, horizontal and vertical transfers, and idiosyncratic characteristics:

$$G = g_1 + g_2 = g_1 + f(g_1) \quad (2)$$

Two factors contributed to the unusually large multiplier effect of China's fiscal stimulus (dy/dg): (a) the large marginal effects of government spending on investment (i'), consumption (c'), and in medium to long run on net exports (h') and (b) the strong countercyclical nature of subnational government expenditures (as reflected by a magnifying power of f' , the marginal effect of an increase in aggregate subnational spending on national output), assuming no significant changes in taxation and fully accommodating monetary policy:

$$\frac{dy}{dg_1} = \frac{dy}{dG} \frac{dG}{dg_1} = (i' + c' + 1 + h')(1 + f'). \quad (3)$$

Large Marginal Effects of Government Expenditure

Investment-centered stimulus programs tend to have larger multiplier effects than income-centered tax incentives. The marginal effect of investment (i') in China has been large.

The stimulus package focused on 10 main areas, including low-income housing, rural infrastructure, water, electricity, transportation, the environment, technological innovation, and rebuilding from several disasters. Infrastructure made up some three-quarters of the stimulus package. The well-chosen infrastructure investments not only finance themselves, refuting the Ricardian Equivalence in the long-run, they also improve the overall investment climate by unclogging bottlenecks and crowding in private investment.

China's highly expansionary fiscal policy was supported by expansionary monetary policy. Interest rates were kept low through expansionary monetary policy. Led by government investment, manufacturing companies' fixed investment accelerated year-on-year by 25 percent in January–February 2009, to 35 percent year-on-year in May 2009. By mid-2009, their investments were almost 50 percent higher than they had been a year earlier (European Chamber 2009). Enterprise investments, especially by state-owned enterprises, remained high. The 2008-09 stimulus package aimed to boost rural consumption through the rural household appliance program. Successful implementation of the program resulted in a significant marginal effect on consumption (c'). Domestic consumption in China accounts for just 40 percent of GDP (compared with some 70 percent in the United States). The stimulus rightly placed great importance on boosting household consumption to rebalance the economy. In late December 2008, the State Council issued the "Opinion on Stimulating Circulation and Expanding Consumption," which included 20 measures to invigorate consumption. In January 2009, the government offered rural families rebates of up to 13 percent of the purchase price of large household appliances, such as televisions, air conditioners, washing machines, and refrigerators, up to a certain amount.

The program not only significantly increased rural consumption in household appliances, it also boosted the economy in several ways. First, the increase in rural consumption helped absorb some overstock of enterprises, mitigating the difficulties they faced as the global export market plunged. Second, the purchases helped improve the quality of life of rural households, which contributed to the harmony of society.

The timely implementation of rural health care programs and the strengthening of the urban social safety net minimum livelihood guarantee (*dibao*) were other important parts of the stimulus package. Rural health care programs effectively addressed the concern of precautionary saving. The *dibao* program released poor households' immediate liquidity constraints. Both efforts increased domestic consumption and may have reduced household saving in the future (Bank of England 2011).

The increase in government spending in infrastructure can help strengthen China's comparative advantages in niches in the value chain by improving the investment climate and enabling just-

in-time supply, which favors the trade sector and could lead to a positive marginal effect of net exports (h') over the medium-term, though in the short run the marginal effect (h') is likely to be negative due to leakage of part of the fiscal stimulus to foreign markets through imports and decline in exports resulting from the global recession. The contribution of net exports to China's GDP growth in 2009 was dominated by the effect of the stimulus and amounted -3.5 percentage points (a substantial positive growth impulse for the rest of the world) compared with +2.6 percentage points in 2007 and +0.9 percentage point in 2008 (IMF 2012e).

Nevertheless, the overall dynamics of policy reforms of the last few years favor the export sector which could determine the medium- to longer-term dynamics. More specifically, the relocation of the labor-intensive tradable sector of East Asian economies to China and high corporate saving rates in China as a result of its dual-track approach to reform resulted in a significant increase in China's trade surplus in general and with the United States in particular (Lin and Treichel 2012). China's comparative advantages in the international market no longer narrowly concentrate on low-end labor-intensive products. China has a growing share of the market for some technology- and capital-intensive products. In 2009, for example, its trade with the United States included both high-value and low-value items (Kemp 2010). The largest trade surpluses in its total exports of \$295 billion were in computer and electronic products (\$95 billion), miscellaneous manufactures (\$33 billion), apparel (\$26 billion), leather (\$18 billion), and electrical equipment and appliances (\$17 billion). High-value export items include products produced and assembled in China by Western companies as joint ventures with local firms, as well as products designed and built by Chinese companies (for example, Haier in appliances and Lenovo in computers).

Strong Countercyclical Nature of Subnational Government Expenditure

The strong countercyclical subnational government spending in China resulted in exceptionally large fiscal multipliers. This pattern of spending is in contrast to procyclical government expenditures at the subnational levels in most countries.

As in many countries, subnational governments in China are the major public sector employers, responsible for the delivery of most public services. More than 80 percent of total government expenditure is carried out by subnational governments. The countercyclicality of local

government spending drove the large impact on the economy. This is in sharp contrast with the procyclicality of subnational government spending in many advanced economies, such as the United States and the European Union. It is important to note that from a political economy point of view, these “federal” systems, which function within widely different political systems, are not strictly comparable. While the United States is formally a federal country, the European Union, which has a monetary union, does not yet have a fiscal union as decisions about taxes and spending remain at the national level, though some members, such as Germany, have a federal system. China, on the other hand, is a unitary state, even though in several important ways it behaves as a fiscal federalism and its fiscal system shares some of the key features of fiscal systems in federal countries (Bahl and Martinez-Vazquez 2003). In particular, fiscal decentralization has been a fundamental aspect of China’s transition to a market economy, and the country has made substantial progress in moving away from its highly centralized fiscal management system and tax sharing system, though the current fiscal system requires further reforms, particularly in the areas of sub-provincial expenditure assignment, dealing with widening fiscal disparities and intergovernmental transfer system (Shen, Jin and Zou 2012).

Quasi-conventional wisdom holds that at the central government level, fiscal policies are acyclical in industrial countries and procyclical in developing countries (Arreaza, Sorensen, and Yosha 1999; Seitz 2000; Talvi and Vegh 2000). In general, government spending in developing countries closely follows—and hence reinforces—the business cycle, because of imperfections in international credit markets that prevent developing countries from borrowing in bad times and the political economy of the strong incentive to pursue expansionary fiscal policy in good times (Gavin and Perotti 1997; Caballero and Krishnamurthy 2004; Talvi and Vegh 2005). Using a quarterly data set on 49 countries for the period 1960–2006, Ilzetzki and Vegh (2008) document the procyclicality of government spending, establishing a causal relation between output and government consumption in developing countries.

The revenues of subnational governments are strongly procyclical in most advanced economies and developing countries (box 2). Countries whose subnational governments are most constrained by the basic fiscal contract to rely on an inflexible income-elastic tax base often display greater procyclicality (Rodden and Wibbels 2010). The decline in local own-source revenues is often exacerbated by cuts in tax revenues shared with the central government. Stimulus transfers from the central government often fail to fully offset the procyclicality of subnational fiscal position (IMF 2012b). As a result, in the absence of substantial borrowing or

draw-downs of rainy day funds, subnational expenditures are often procyclical. As delivery of key public services is the responsibility of subnational governments, their procyclical pattern of spending can be especially difficult for the most vulnerable citizens, whose need for social services increases in downturns. As expenditures are more decentralized than revenues in many countries, most subnational governments rely on intergovernmental transfers or revenue sharing as an important part of their revenue (Eyraud and Lusinyan 2011). In China, where responsibilities for public services are largely decentralized, the procyclical nature of subnational government expenditure has played a key role in stimulating growth during the post 2008-09 crisis.

Box 2 Procyclicality of subnational government revenue

Subnational governments' own-source revenues are procyclical in most federal countries. The extent to which they are procyclical depends on three features: the income elasticity of provincial revenue sources, the role of the central government in stabilizing regional finances through intergovernmental grants and revenue-sharing schemes, and subnational access to credit markets. Balanced budget requirements in many countries, such as the United States, lead to substantial procyclicality in subnational government spending, with the stringency of a state's rules driving the pace at which it must adjust to shocks (Clemens and Miran 2012; Jonas, 2012).

Several factors affect the procyclicality of subnational government revenue. First, the income elasticity of the tax base varies across economies. In the United States, subnational governments have depended for decades on income and sales taxes for own-source revenue, which closely follow the business cycle (Sorensen and Yosha 2001). In contrast, in Germany, most taxes are shared across levels; Länder (states) have limited "own" taxes, mainly the motor vehicle tax, which is income inelastic (Heppke-Falk and Wolff 2008). Horizontal progressive intergovernmental transfers provide modest relative shift of resources toward states suffering from asymmetric negative shocks, but they do not have an overall countercyclical feature (Rodden and Wibbels 2009).

Second, intergovernmental grants help dampen the inherent procyclicality of subnational finance, although empirical evidence suggests that they do not fully offset the procyclicality. It is possible that the modest relative income boost associated with national interpersonal tax transfer policy is

completely neutralized by the need for provincial governments to raise taxes or cut expenditures because of flagging revenues. Furthermore, although the central government has deeper pockets, broader tax bases, the advantages of seignorage, greater freedom from institutional constraints, and a wider array of policy tools, the revenue decline can still be sharper than at the subnational level, because of the difference in income elasticity of their taxes sources. The countercyclicality of central government spending and transfers could be limited. Several studies show that central government expenditures are uncorrelated with output fluctuations in most G7 countries and negatively correlated with the business cycle in a handful of countries in the European Union (EU) (Arreaza, Sorensen, and Yosha 1999; Talvi and Vegh 2000; Hallerberg and Strauch 2002).

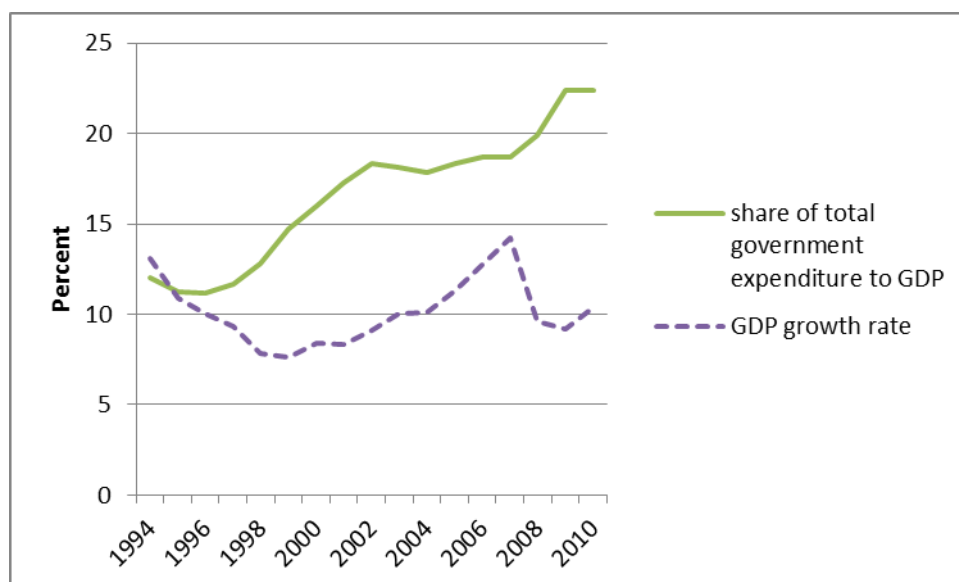
Third, many countries are decentralizing the provision of social expenditures and tightening restrictions on subnational access to credit markets. The existence of balanced budget rules and the golden rule that subnational governments can borrow only for investment purposes limit subnational governments' access to credit markets in economic downturns. Most U.S. states have self-imposed balanced budget rules, and U.S. states engage in less expenditure smoothing or countercyclical interventions than the federal government (Rodden and Wibbels 2009). For many developing countries, access to finance during a recession is impossible without a central government guarantee. Imposing stabilizing rules on federal transfers that protect subnational governments from fluctuations in the business cycle can help the federal government, which normally faces substantially lower interest rate to finance its deficit, to shoulder the full burden of the borrowing and making countercyclical fiscal transfers to states and local governments (Gonzalez et al, 2002).

Source: Review of literature by the authors.

In the past two decades, China's fiscal policy has been largely countercyclical. When economic growth decelerated, the ratio of government expenditure to GDP increased at a faster rate (figure 1). After the Asian financial crisis in 1997-98, China implemented a strong economic stimulus, which lasted until 2002. The government issued an estimated Y 660 billion in bonds to finance infrastructure, in order to relieve the binding constraint on growth. Deflation ended in 2003, and the average annual GDP growth rate increased from 9.6 percent in 1979-2002 to 10.8 percent in 2003-08. Rapid growth led to an increase in government revenue, which allowed public debt to

decline, from about 30 percent of GDP in the 1990s to about 20 percent in 2007. After the global crisis in 2008, government spending increased to almost 23 percent of GDP, up from 18 percent in the boom years. The stimulus increased the resilience of the economy, helping maintain an 8 percent growth rate after the 2008-09 crisis.

Figure 1 Government expenditure and economic growth in China, 1994–2010

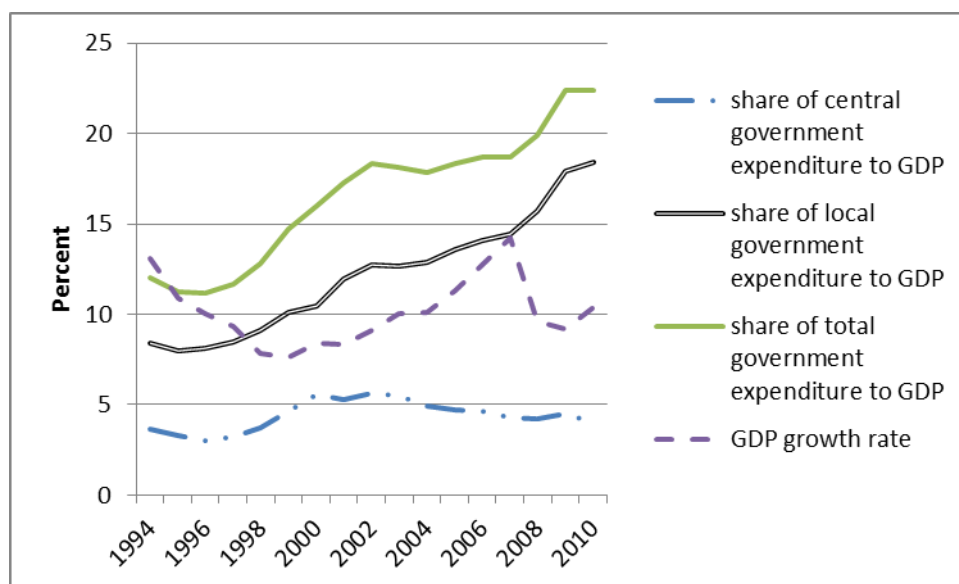


Source: Authors' calculation based on data from China Statistical Yearbook.

The increase in government expenditure in the past few years mainly reflects the increase in subnational government expenditure, which climbed from about 15 percent of GDP to more than 18 percent in 2008-2010 (see figures below). The share of central government expenditure to GDP ratio remained stable at about 4 percent over the same period (figure 2). The strong countercyclicality of subnational government expenditure was a key factor driving the large multiplier effects of the (central) government–announced stimulus. The marginal effect of subnational government spending (f') was exceptionally strong. Some estimates suggest that provincial investment plans launched shortly after the national plan summed to more than Y 20 trillion (Roland Berger Strategy Consultants 2009).

China's central government authorized a special program of bank loans at extra long-term concessionary interest rates to provide paid-in capital for investment projects and allowed the issuance of corporate debt under the sponsorship of local governments (Naughton 2009). Substantial financing was made possible at the subnational level using local land as collateral with the central government's permission. Put another way, China's fiscal stimulus was financed through local government financial vehicles rather than carried on the central government's balance sheet. The annual reports from the five largest commercial banks show 17.6 percent overall growth in the loan categories likely to have been utilized by LGFVs in 2011 (Wolfe 2012). Since local governments' investments were mainly financed from bank borrowing, one can conclude that the fiscal stimulus in China was financed to a large extent by the central government's expansionary monetary policy, which could lead to inflationary pressures and a real estate bubble.

Figure 2 Central and local government expenditure in China, 1994–2010



Source: Authors' calculation based on data from China Statistical Yearbook.

After the announcement of the stimulus package, local-level governments acted as liquidity-constrained households with strong propensity to spend. They not only tried to spend the resources they had, they also sought to exploit opportunities for getting their favorite local

projects approved by the central government and included directly or indirectly in the national investment plan to receive additional funding from the center (Naughton 2009).

One important reason for the strong expansionary spending at the subnational level is that subnational governments in China rely heavily on value added tax revenue. As this revenue is based on the manufacturer's location, subnational governments have strong incentive to attract investments in order to increase their fiscal revenue. Subnational governments propose a long list of often expensive projects that are "shovel ready." Within a month of initiating the plans for the central government to allocate Y 100 billion for the fourth quarter of 2008, for example, 18 provinces had proposed projects with a total budget of Y 25 trillion (Kan, Wang, and Wang 2009).

Another reason is related to the decentralized authoritarian system in China, in which the central government has concentrated personnel controls over subnational governments (Xu 2008). Subnational government officials, who control the bulk of the Chinese economy, have strong incentives to follow closely the policy directions of the central government.

China followed a very different path from other countries, such as the United States. Following the crisis, President Obama proposed a \$787 billion economic stimulus, but state and local governments in the US cut a wide range of expenditures and abandoned infrastructure projects to scramble to balance their budgets. According to some estimates, the aggregate fiscal expenditure stimulus in the United States, adjusted for the declining fiscal expenditure of the 50 states, was close to zero in 2009 (Aizenman and Pasricha 2010). Although the federal government stimulus prevented a net decline in aggregate fiscal expenditure, it did not push aggregate expenditure above its predicted mean. The Federal Reserve increased its lending, holding \$1.2 trillion (more than 8 percent of 2008 GDP) more in assets on its balance sheet in mid-April 2009 than a year earlier, but the increase only offset a collapse in credit in other parts of the economy. Large grants to the states did not result in an increase in government purchases at the state and local levels. Payments that temporarily increased disposable income did not significantly affect consumption expenditure (Taylor 2011).

In the European Union, expenditures in multitiered fiscal systems are often procyclical. Although national automatic stabilizers may help smooth taxes, consumption, and output over the business cycle, the Stability and Growth Pact, which limits independent borrowing by subnational government, pulls subnational fiscal policy in the opposite direction. Comparative empirical research emphasizes the role of national tax transfer systems in cushioning asymmetric regional shocks, but little is known about the cyclicalities of subnational fiscal policy.

In China, the tax reforms of 1994, which strengthened the central government's fiscal capacity, played a key role in laying the ground for a stimulus package during a crisis. The reforms gradually increased the share of total government revenue to GDP and the share of central government revenue to total government revenue (box 3).

Box 3 Tax reforms in China

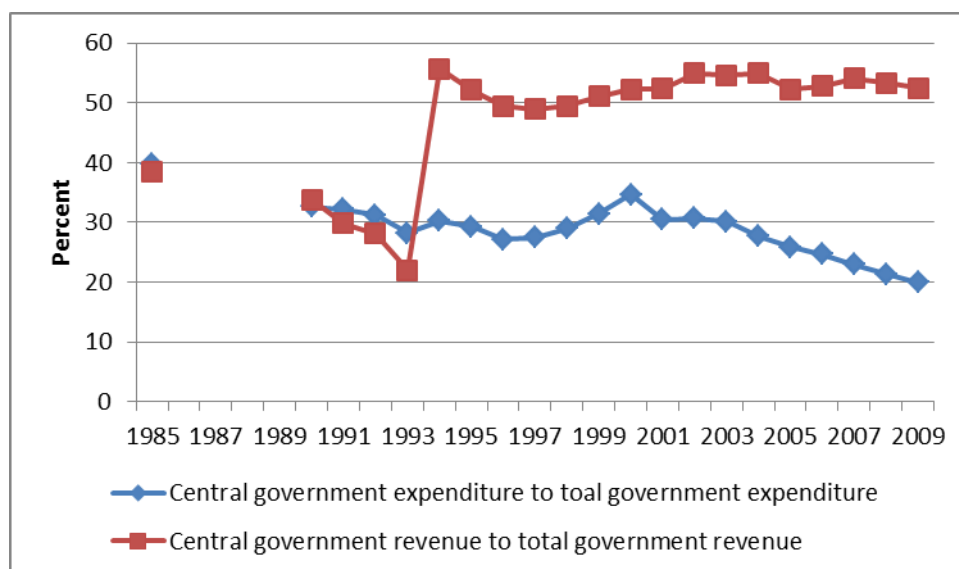
From 1980 to 1993, China adopted the fiscal contracting system, which decentralized tax administration. Subnational governments had strong incentives to retain fiscal revenues and develop their localities by imposing the lowest taxes possible on enterprises. As a result, the ratio of total government revenue to GDP declined, as did central government revenues relative to total government revenues. The 1994 tax reform replaced the discretion-based revenue-sharing system with a more rule-based fiscal assignment system, allowing the central authorities to reassert themselves more actively and to use fiscal policy for redistribution (Dollar and Hofman 2008). Before the reforms, the share of central government expenditures was roughly in line with its share of revenues; after the reforms, central government revenues to total government revenues rose sharply, more than doubling, from about 22 percent in 1993 to 56 percent in 1994 and hovering around 50 percent in recent years. The share of central government expenditures to total government expenditures declined from about 30 percent to 20 percent.

Source: Huang and Luo 2008.

Fifteen years after the reform, China has become much more decentralized. The central government raises more than 50 percent of revenue but accounts for only 20 percent of expenditure (figure 3). Subnational governments receive less than 50 percent of tax revenues in

the form of transfers from the central government but account for about 80 percent of total budgetary expenditures and are responsible for providing most public services. This has important implications for the provision of social services, for land values, and for the domestic banking system (IMF 2012e). Regarding land values, there is a strong incentive by the local governments to use land sales as a major source of financing their investments, the property markets. Therefore, reforming both the local government finances and the domestic banking sector should be high priority areas for the policy makers in China.

Figure 3 Ratio of central government to total government revenue and expenditure in China, 1985–2009



Source: Authors' calculation based on data from China Statistical Yearbook. Data is not available for 1986-1989.

Lessons Learned

China's stimulus package appears to have worked exceptionally well. It was about the right size, included the appropriate components, and was well timed. Its subnational component was designed to maximize the impact of the stimulus package on the economy and minimize the potential procyclical elements that are usually built into subnational fiscal mechanisms in large federal countries.

China's system for assigning fiscal revenues and expenditures gives its central government significant control over the country's fiscal resources and creates strong incentives for subnational government to seek resources from the center. Therefore, at the inception of the crisis, with the fiscal buffers built up in normal times, the central government was in a strong position to allocate and leverage fiscal resource to implement a large and speedy countercyclical stimulus.

If the global economy slows down sharply or enters another deep recession—as a result of the crisis in Europe or other events, such as a sudden and large increase in international oil prices—China could consider another large fiscal expansion to avoid a substantial slowdown in its economy. A massive stimulus would support both regional and global growth. Although the debt to GDP ratios at both the central and subnational levels rose markedly in 2008–10, China's fiscal space remains large. Some recent OECD estimates suggest that Chinese policy makers have also begun to relax their fiscal stance. The government debt ratio (including the contingent liabilities of all off-budget entities) dropped substantially in 2011. Some recent estimates suggest that the overall debt ratio could decline to about 44 percent of GDP by the end of 2012 compared with 54 percent in 2010 (OECD 2012).

If well managed, an infrastructure investment-focused plan could once again generate large multipliers in the short run and increase production capacity and the rate of growth of productivity in the long run. Going forward, emphasizing rural infrastructure, as well as urban infrastructure to facilitate sustainable urbanization, which had been impeded due to the strategy of prioritizing heavy industries, to support investment and consumption remains crucial for the rebalancing of the economy (Lin 2012). Due to the rapid urbanization since the 1980s, there is a large gap in the provision of basic infrastructure in urban areas and massive investments are required (World Bank 2012). These investments can continue to finance themselves, thus nullifying the Ricardian equivalence-type effects and avoiding the tax today or tax later dilemma.

The success of China's fiscal stimulus offers several useful lessons for both advanced and emerging economies.

Multipliers Are Larger When Debt Is Lower

The high level of government debt severely reduces the effect of stimulus in many advanced and some emerging economies through its large negative effects on growth. The strong fiscal stance and low level of debt on the eve of the global crisis gave China plenty of scope for decisive action. Fiscal multipliers are larger when the debt to GDP ratio is lower or the fiscal space larger. An IMF estimate suggests that a 10 percent increase in public debt is associated with an annual decline of 0.2–0.3 in per capita GDP growth (Kumar and Woo 2010). Reinhart and Rogoff (2010) posit that GDP growth will be 2 percentage points lower when external debt to GDP is 60 percent or higher and that economic growth rate could be cut by half if public debt reaches a much higher level. Exacerbated by the high debt service burden and the scarcity of resources in the post 2008-09 crisis period new normal (i.e. continued slow growth in advanced economies), the vicious cycle can be self-sustaining. How to leverage the role of the dollar—and to a lesser extent the euro—as an international currency and take advantage of near zero interest rates in their financial markets are among key considerations for the United States and EU countries in stimulating their economies.

Targeting and the Quality of Spending Matter

How the stimulus is targeted (on infrastructure or social safety net programs, for example) and the quality of spending determine the impact and fiscal sustainability of the stimulus. There is less pressing need for infrastructure investment in advanced economies than in emerging and developing economies. But demand exists for certain categories of infrastructure, including upgrades of ailing transport and communications systems and new investments in green infrastructure. Many of these investments are the responsibilities of subnational governments. Providing appropriate incentives to subnational governments on targeted infrastructure investment can be an effective way to boost expenditure at the subnational level, counteracting the procyclical nature of such spending and increasing productivity growth in the long run.

There are massive needs for infrastructure investments in many developing, particularly in Africa. By finding innovative ways to finance these investment needs, Sovereign Wealth Funds (SWFs), particularly the rapidly growing ones held by emerging and high-income (mainly oil exporters) countries, and pension funds could be leveraged to finance infrastructure investments in emerging and developing countries. This mode of financing infrastructure investments would

be an effective way to channel funds from low return investments to higher return investments and thereby contribute to global growth, employment generation, and ultimately social and political stability in poorer countries (Lin 2011b).

The Need to Stimulate the Economy Should Not Drive Investment

Infrastructure investments may not be as productive as hoped for if they are driven mainly by short-term countercyclical considerations or politically motivated incentives. They are best driven by a sound public investment management system, in which the selection and implementation of projects are based on value for money. Ensuring the quality of investment takes time. The dash for shovel-ready projects can undermine the selection process. When projects are prepared in a rush, the incidence of corruption and mismanagement can rise and the quality and value for money of projects can decline. Countries in which governments at both the central and subnational levels have a list of good quality projects are more likely to witness better stimulus effects.

Fiscal Sustainability Should Not Be Jeopardized

A sharp rise in local government debt raises serious concerns about fiscal sustainability down the road. In 2010, China had Y 10.7 trillion in local debt (26 percent of GDP), a 19 percent increase over 2009. In 2009, at the height of the stimulus, China's debt soared by 62 percent, according to the National Audit Office.⁵ Most local stimulus matching funds are financed by commercial loans guaranteed by local governments and made possible by special measures approved by the central government. The central government issues Treasury bonds earmarked for local government use.⁶ The local governments sponsor the issuance of corporate debt, some of which are even qualified as paid-in capital. This increased leverage, however, could have a strong negative effect on growth if the returns on the investments fall significantly below expectation. Future stimulus should be executed mainly through the budget rather than the banking system. Given the massive needs for infrastructure investment at the provincial and municipal levels in China, the current system would need to be reformed to allow local governments to borrow and issue bonds, which would be an efficient way to bring off budget borrowing on budget and help manage the risks emanating from local government borrowing and Urban Development Investment Corporation debts. However, the decision to allow local governments to borrow should be based on proper incentives for local governments to comply with the rules, developing

a comprehensive and transparent information system on their activities, and instituting appropriate sanctions if they breach pre-agreed quantitative and qualitative criteria.⁷

Lending and Investment Must Be Economically Justified

Lending from state-owned banks and investment by state-owned enterprises are driven mainly by the policy directives of the central and local governments; in-depth economic underpinning may be lacking, in particular when decisions are made in haste.

Investment by state-owned enterprises included highly leveraged purchases of real estate. The sharp increase in demand raised real estate prices and may not be sustainable. Residential land auction prices in eight major cities doubled in 2009, controlling for quality variation (Deng and others 2011). When the bubble bursts, the state-owned enterprises—and hence the state-owned banks—will suffer in multiple ways. It is hence more prudent to rely mainly on fiscal measures than on monetary expansion should another round of stimulus be required, even though the size of the resulting multiplier would be smaller.

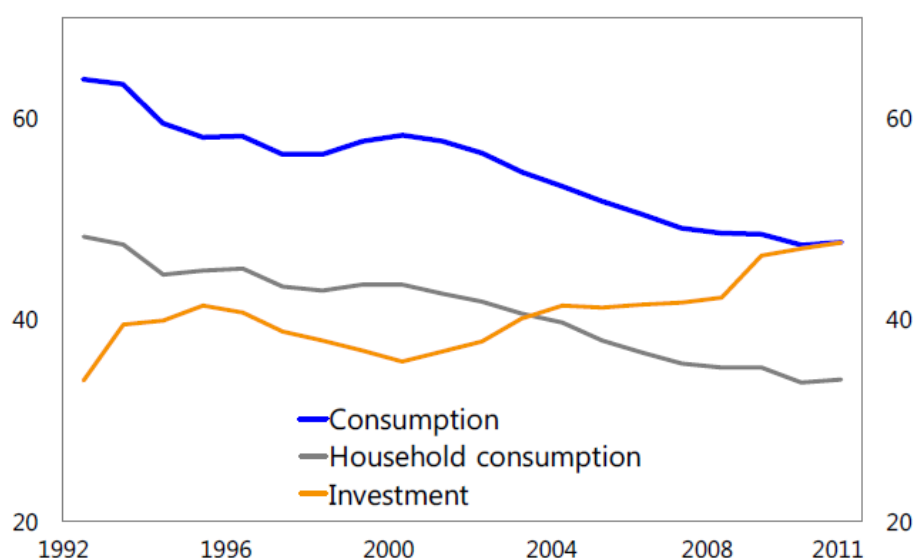
Prudent management of infrastructure project selection, local government finance, and macro resource allocation is crucial for a stimulus to be sustainable and effective in the long term. The strong leverage effect of the central government stimulus on subnational government spending could magnify both the positive and negative effects, particularly as a large share of the money was financed through government-backed bonds. If projects are not well chosen, stimulus investment can only postpone the needed adjustment and result in a spiral that leads to more unneeded investment to absorb the unnecessary supply. Such investments will add to unutilized capacity, which will exacerbate inflation and increase local government debt and to a lower growth. When the incentives to invest are strong, the “fever of investment” can be harmful, as it was in the 1990s.

The Risks Arising from Worsening Income Distribution and Environmental Problems

The decline in external demand in China has been largely compensated for by increases in domestic investment. The evidence so far indicate that household consumption as a share of GDP has continued to decline (Figure 4), though it is possible that the stimulus prevented a potential decline in the level of private consumption. In fact, growth of household consumption (in terms of US dollars) in 2011 has been relatively large compared with other emerging and

with advanced economies (Barnet et al 2012). Nevertheless, improving China's income distribution and inclusiveness of its economy, as well as reforming of its banking system and intergovernmental fiscal system, are critical for substantially stimulating private consumption and growth of domestic effective demand and thereby rebalancing GDP growth over the medium- to long-term. A sudden shift from investment to consumption as the main source of stimulus can add to inflationary pressures, lower output growth, and lead to higher unemployment in the short-run, as it would take time for industries to shift their products away from exports and capital goods towards domestic demand and consumption goods while maintaining high employment.

Figure 4: China's Domestic Demand (as percent of GDP)



Source: IMF 2012 (d)

Therefore, to continue filling the gap in industrial upgrading and to provide a more conducive business environment for productivity growth, increased investments in high priority infrastructure areas is critical. Given China's emphasis on green development, it will need to make massive investments in clean and more efficient energy and in the urban areas, including urban infrastructure in order to improve urban living and reduce urban congestion and sprawl (World Bank 2012). These investments should be coupled with investments in education, health, and social protection, which are equally critical for more balanced, inclusive and sustainable growth of the Chinese economy. Moreover, for a middle-income country like China to catch up

with the high-income countries, a higher level of investment, focusing on innovation and on absorbing more advanced technologies that already exist to lower the costs of development is important (Lin, 2012). Improving income distribution through a more inclusive growth is an efficient way to increase consumption ratio. Delivering more, higher quality and better targeted social services to the underserved rural areas and migrant populations are among the key actions required to improve social and economic inequality (The World Bank, 2012). Financial and corporate sector reforms are also important measures for boosting private consumption (IMF 2012d).

As a sustained recovery of global demand remains uncertain, in particular in the context of the ongoing euro area crisis, export demand weakens across all markets, as witnessed during 2012. China's growth can continue to be fuelled mainly by higher domestic investment, including by subnational and local authorities, focusing on major infrastructure, including green projects, which represent important bottlenecks to growth at the regional and national levels. Private consumption, however, is likely to respond positively to the increased demand and real income. However, in the medium- to long-term, expanding household income and consumption, mainly through expansion of the social protection programs, including health insurance and pension programs, is highly desirable for achievement of the "harmonious society." This change is likely to shift China's economic growth path towards a more balanced trajectory.

Concluding Remarks

China's government economic stimulus package in 2008-09 appears to have worked well. It seems to have been about the right size, included a number of appropriate components, and was well timed. Its subnational component was designed to enhance the impact of the stimulus package on the economy and reduce the potential procyclical elements that are usually built into subnational fiscal mechanisms in federal countries. Moreover, China's massive fiscal stimulus played an important role in the overall recovery of the global economy. Using a simple analytical framework, this paper focuses on two key factors behind the success of the stimulus: investments in bottleneck-easing infrastructure projects and countercyclical nature of subnational spending. The well-chosen infrastructure investments not only could finance themselves in the long run,

through high economic rate of return, but in this case also helped improve business climate and crowded in the private investment and thereby enhanced productivity growth.

Moreover, the unusually expansionary subnational government spending played a key role in strengthening the overall impact of the stimulus and sustaining post crisis growth. The paper also highlights the importance of public investment quality and cautions about the sustainability of local government financing through the domestic banking system and possible increases in local governments off balance sheet or contingent liabilities. These lessons may be of particular relevance today for China, as well as other countries, in formulating policy response to another regional or global economic slowdown or crisis, possibly as a result of the Eurozone turmoil, to ensure greater efficiency and effectiveness of their fiscal interventions.

Finally, improving China's income distribution and inclusiveness of its economy, as well as reforming of its banking system and intergovernmental fiscal system, are critical for substantially stimulating private consumption and growth of domestic effective demand and thereby rebalancing GDP growth over the medium- to long-term.

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Notes

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1. See Corsetti, Meier, and Muller (2012) for a systemic discussion of the real exchange rate response to a spending shock with different exchange rate regimes.
 2. Spilimbergo Symansky, and Schindler provide a comprehensive survey of fiscal multipliers in the literature.
 3. Before the onset of the crisis, China’s overall fiscal balance was –0.9 percent of GDP (compared with –3.2 percent in the United States, excluding the 3.5 percent of GDP in financial sector support); public debt was 13.4 percent of GDP (compared with 63.4 percent in the United States) (IMF WEO, April 2012).
 4. G here is net government expenditure—the difference between total government expenditure and tax revenue.
 5. As of the end of 2010, local governmental debt stood at Y 10.72 trillion. Of this amount, Y 5.48 trillion (51.2 percent) was raised in 2007 and 2008 and used for the continued construction of projects that had begun before 2008 (CNAO 2011).
 6. The central government sponsored and issued Y 200 billion worth of Treasury bonds specifically earmarked for local government use during 2009.
 - ⁷ For a more detailed discussion of China’s intergovernmental fiscal issues see Dabla-Norris (2005)