

**The Global Infrastructure Boom of  
2009-2015:  
Strategic Economic Consequences for  
America, China and the Global Economy**

Eric J. Gerritsen

Working Paper #48

March 2009



| Collaboratory for Research on Global Projects

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**Collaboratory for Research on Global Projects**

Yang & Yamazaki Energy & Environment (Y2E2) Bldg  
473 Via Ortega, Suite 242  
Stanford, CA 94305-4020

<http://crgp.stanford.edu>

## About the Author

**Eric J. Gerritsen** is Principal of Global Internet Advisors, a Silicon Valley-based international strategy consulting firm which helps Internet companies devise revenue strategies in fast-growing international Internet markets, with particular focus on Asia. GIA ([www.globalinternetadvisors.com](http://www.globalinternetadvisors.com)) also publishes a range of websites, including [www.infrastructuredeals.com](http://www.infrastructuredeals.com), an online community for bankers, fund managers, PE investors, consultants, architects and other service providers to the global infrastructure industry.

In response to the financial crisis of 2008 governments around the world have pledged to spend trillions of dollars over the next few years on what is loosely called “infrastructure” and what amounts to the biggest global build-out of physical economic assets in the history of man.

This global infrastructure boom will intensively unfold between 2009-2015 and will transform how the world looks, gets educated, moves goods and services, creates wealth, treats the sick, cares for the poor, powers its homes and businesses, and wages war.

The amounts of infrastructure money about to slosh into the world economy defy imagination: The Obama Administration will spend \$150 billion of its \$787 billion stimulus plan on infrastructure and is expected to add to that; China has pledged \$585 billion and stands ready to do more; India is expected to spend \$500 billion on infrastructure over from now till 2015; the EU \$252 billion; Japan \$129 billion; Canada \$12 billion; Australia \$4.7 billion, Singapore \$13.8 billion; Germany \$42 billion; and so on.

CIBC World Markets estimates total infrastructure spending over the next 20 years at \$35 trillion. Some \$3 trillion of fiscal adrenalin will be injected into the global economy in the next 24 months alone. The only other time in human history when this much money has moved this quickly into the global economy was during WW II and that event of course reset the world order for the next 60 years, with America at the helm.

Depending on how this money gets spent there could be a fundamental change in the global balance of power. Most pre-2008 long-term global economic trendlines need to be thrown out.

This great infrastructure boom will create winners and losers. Losers will squander infrastructure spending on corruption and ineptitude. Winners will create powerful new engines of economic growth for generations to come based on new energy, globally competitive health care, and strong educations.

What then *is* infrastructure? Broadly speaking infrastructure refers to all the stuff that we use day to day but never think about: water from the tap; the road to work; the bridge we cross on the way to work; what happens when we flush the toilet; the energy accessed when we switch on a light, the runways our planes land on.

It also includes very big things that make the global economy go round: airports, sea ports, energy facilities, schools, hospitals and rail links.

Up until very recently economic talk about “infrastructure” was about as interesting as watching concrete dry. Over the last 20 years much faster money was to be made in tech, finance, media, and real estate.

Money from booms in those sectors was primarily to be made via private, free-enterprise economic models – venture capital, private equity, mergers and acquisitions, and IPOs. Government’s role during that era was largely to stay out of the way and when possible deregulate so the market could get on with business.

That era is over and going forward in most cases the voice of government in private enterprise around the world will be loud: market power and financial engineering are out – sovereign power and “real” engineering are in. The power of the “invisible hand” is yielding power to those with the mandate and authority to tax and spend.

Infrastructure spending is the fulcrum upon which the balance will shift.

As a result, economic policy environments will change dramatically from the habits of the last 30 years from creating environments friendly to international capital (tax free zones, free trade zones, corporate tax holidays, bilateral tax treaties) to creating environments where the carpet will be rolled out to sovereign money being spent on infrastructure.

Politicians in this new environment will need to prove their mettle and utility to voters by ensuring that some of the staggering amounts of this government infrastructure spending gets to their constituencies in Sacramento, Munich or Suzhou.

Thus, the great infrastructure boom of 2009-2015 has begun, rising from the ashes of the real estate bubble just like it rose from the ashes of the dotcom bubble. America’s finances may be in shambles but its ability to conjure economic bubbles is thriving.

In some ways the rise of the infrastructure economy represents the revenge of bricks and mortar on what was hailed in the 90s as the “New (digital) Economy”. In the heady days of dotcom mania anything physical was doomed – value was instead to be created in digital bitstreams, hatched by 22-year-old Silicon Valley wunderkinder. The new wunderkinder are bureaucrats in Delhi, Beijing, and Washington with infrastructure billions to dole out.

#### *Infrastructure building drives economic system convergence*

An unexpected and surely unintended consequence of the huge amount of infrastructure spending to come over the next few years is that it will spur convergence of economic systems between America, China, and Europe.

In a very strange way communist China, socialist Europe, and capitalist America have all ended up in a similar economic place in 2009 even though they could not have started out in more different places in the 20<sup>th</sup> century.

The credit crisis has ended the era of Anglo-American, Reagan-Thatcher deregulated capitalism and this next period will be a particularly wrenching time for American capitalism.

Cut loose from its Reaganite moorings and firmly under the eye of newly-empowered regulators, social architects, and federal administrators American capitalism heads into a whole new era. Many American companies and individuals will not understand the contours of this new land and founder.

The economic focus of all this wrenching change will be infrastructure spending which is all the more shocking because it was effectively a “Black Swan” event, which is to say – unexpected, with high impact.

### America & China

One of the most dramatic questions raised by the great global infrastructure boom of 2009-2015 will be the question of where China and America come out in the end.

America comes at this boom from the perspective of Obama’s election platform, which promised that America could mend its gas-guzzling ways; invent the cleantech future; provide millions of new jobs; and lead the world economically in the same way that it has done before with cars, computers, the Internet, aerospace, and semiconductors.

China comes at it from the perspective of a country with a bulging wallet looking to situate itself in the best possible way for the 21<sup>st</sup> century. Chinese premier Wen Jiabao called his country's stimulus plan China’s “biggest contribution to the world.” This may well prove to be true for the rest of the world but primarily it is an extraordinary opportunity for China to make faster steps on its path to becoming a superpower.

Beyond political rhetoric the details of American and Chinese infrastructure expenditures suggest very different trajectories and intentions. China’s plan lays out a big, long-term vision of the future; America’s plan appears designed to help survive the current financial crisis. By 2015 the results of each approach will be ready to be seen and judged.

China was fast off the infrastructure starting block last year. By October China was already putting shovels in the ground while Bush sat lame duck and Congress was in shock and denial as the markets plunged.

China was in a position to act so quickly because it had many “shovel ready” projects that had been mothballed when inflation started to become a problem in China in the spring of 2004.

At that time local and provincial governments across the nation were blocked from proceeding with plans for many roads, airports, subway systems and other infrastructure. Now the central government is urging these local and provincial governments to go ahead with their projects.

### Planes, trains, and automobiles

China’s goal in spending all this infrastructure money is to build a world-class system for moving goods and people quickly, cheaply and reliably across great distances in the same way that the Eisenhower highway system did for physical goods in the United States in the 50s and the Internet did for virtual goods in the 90s.

China’s railway plans are astounding. Over the next two years alone China will spend \$88 billion constructing intercity rail lines, the highest priority in its fiscal stimulus plan. This is on top of \$44 billion it spent on rail projects last year.

This railway money includes a \$17.6 billion passenger rail line across the deserts of northwest China; a \$22 billion web of freight rail lines in Shanxi province in north-central China; and a \$24 billion high-speed passenger rail line from Beijing to Guangzhou in southeastern China.

China has nearly finished the construction of a high-speed rail route from Beijing to Shanghai at a cost of \$23.5 billion. The authorities recently disclosed that they had 110,000 workers laboring to finish the route as quickly as possible.

China has already built as many miles of high-speed passenger rail lines in the last four years as Europe has in two decades.

By contrast Obama will spend only \$8 billion for construction of high-speed railways in the United States and \$1.3 billion on ageing Amtrak.

Plans for China’s roads are no less ambitious. China’s Ministry of Transportation announced that 186,000 miles of rural roads would be paved, repaved or otherwise improved this year (2009).

Plans call for 12 major highway routes across the country from north to south and east to west connecting millions of Chinese people to new routes of commerce. The system will stretch 53,000 miles by 2020, surpassing the 47,000 miles of highways in the United States, driving demand for massive amounts of steel, cement, and bulk transportation services.

Strategically, America's economy will only get a short term boost by fixing ageing highways and bridges; China, on the other hand could get a substantial long-term GDP boost by building all these new highways linking prosperous coastal regions to each other and all these cities to its interior.

Other key infrastructure components include airports and mass-transit systems. China is expected to open 40 new airports by 2010 and need 170 urban mass-transit systems by 2030 in the over 100 cities that will have populations over 1 million by then.

And if all that construction isn't enough between now and 2020 it is estimated that another 40 billion square meters of floor space will be built in China over five million buildings – 50,000 of which could be skyscrapers.

### Energy

While the scope of China's investments in rail and road infrastructure are likely to dwarf America's in the 2009-2015 period the most strategically significant developments will take place in energy.

Energy is one of the key areas where there is an expectation that the Obama administration will make good on campaign promises to lead America into a greener and energy independent future.

But a close look at Obama's \$787 billion stimulus plan reveals that not much new is getting spent on this vital issue of both national security and economic competitiveness.

Rather than chart a bold new energy future; most of the \$50 billion included in the stimulus bill for "energy" is designed to patch up current energy inefficiencies, including \$5 billion to weatherize modest-income homes; \$6.4 billion to clean up nuclear weapons production sites; \$11 billion toward a so-called "smart electricity" grid; \$6.3 billion in state energy efficiency and clean energy grants; and \$4.5 billion make federal buildings more energy efficient. One of the few forward-looking expenditures is just \$2 billion in grants for advanced batteries for electric vehicles.<sup>1</sup>

Even if executed flawlessly these energy initiatives will only make the smallest dent in America's total energy position by 2015.

China, generally associated with burning lots of dirty coal, is actually moving aggressively into clean, renewable energy. To meet its target of increasing the percentage of energy from low carbon technologies from 8% in 2006 to 15% by

2020 China is expected to invest an average of \$33 billion annually for the next 12 years.

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<sup>1</sup> [http://crgp.stanford.edu/news/global\\_projects\\_realnews\\_highlights\\_of\\_787\\_billion\\_stimulus\\_plan.html](http://crgp.stanford.edu/news/global_projects_realnews_highlights_of_787_billion_stimulus_plan.html)

This kind of rapid and determined action has resulted in China becoming a leading global producer and investor in alternative energy. China leads the world in terms of installed renewable capacity at 152 gigawatts and in the next year it will become the world's leading exporter of wind turbines.<sup>2</sup>

China is the biggest solar water heater producer and consumer in the world. Both her output and consumption of solar water heaters account for over a half of the world total.<sup>3</sup>

### Healthcare

In health care China is set to make dramatic improvements, announcing recently that it would spend \$123 billion to provide universal health care for its citizens within two years instead of the originally-planned 11 years.<sup>4</sup>

By contrast the central health care piece of Obama's stimulus plan is to provide \$11 billion to encourage health care providers to make use of electronic record-keeping.<sup>5</sup> Universal health care in the U.S. remains a distant goal.

### Communications

In the all-important Internet sector Obama's stimulus plan will spend \$7.2 billion to help deploy broadband in rural and other unserved areas. But this is much less than the \$44 billion it is estimated it would cost to provide universal broadband coverage across the United States.<sup>6</sup>

Even though it gave birth to the Internet the United States comes a poor 15<sup>th</sup> among advanced countries in terms of broadband penetration. Late in 2008 China surpassed the U.S. to become the nation with the largest numbers of broadband Internet users (80.9 million).<sup>7</sup>

### China and America in their regional context

Beyond the bilateral competition between China and the United States the regional North American and Asia/Pacific dynamic will become hugely important in terms of the economic growth impact of all this infrastructure spending.

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<sup>2</sup> <http://www.researchandmarkets.com/reports/c78465>

<sup>3</sup> [http://www.theclimategroup.org/assets/resources/Chinas\\_Clean\\_Revolution.pdf](http://www.theclimategroup.org/assets/resources/Chinas_Clean_Revolution.pdf)

<sup>4</sup> <http://www.nytimes.com/2009/01/22/world/asia/22beijing.html>

<sup>5</sup> [http://crgp.stanford.edu/news/global\\_projects\\_realnews\\_highlights\\_of\\_787\\_billion\\_stimulus\\_plan.html](http://crgp.stanford.edu/news/global_projects_realnews_highlights_of_787_billion_stimulus_plan.html)

<sup>6</sup> <http://www.websiteoptimization.com/bw/0812/>

<sup>7</sup> InternetWorldStats

China's neighbors in Asia have been furiously at work for the last 20-30 years with exactly the kind of *dirigiste* capitalism and infrastructure building that is now coming to Washington.

Singapore, Hong Kong, Taiwan, South Korea, China, Malaysia, and Japan all have had deep government influence in industrial development policy over the last 20 years or more.

For example, during the decade in the run-up to Hong Kong's handover back to China the then-British Hong Kong government went on what many considered to be a wild, spend-it-all-before-you-leave spree that saw the building of a huge new airport, one of the longest bridges in the world, a new mass-transit system and major land reclamation projects.

Seen from today's perspective these projects look visionary and they have helped maintain Hong Kong's leadership in Asian finance, logistics, and tourism.

Singapore's Changi airport is well-recognized globally as an important piece of infrastructure for the Singapore economy, making it the leading logistics node in Southeast Asia.

In the 90's Malaysia established its "Multimedia Super Corridor" to attract digital media companies. Korea is busy establishing its city of the future, Songdo City, and Japan has used public money extensively since its real estate bubble burst in 1989 to try to reflate the economy (with mixed success).

All of these Asian infrastructure investments – past, present, and future – will connect to China's huge infrastructure investments and drive regional, integrated Asia/Pacific growth at the other end of this crisis.

America may well have a leg up in the energy game via closer energy infrastructure integration with Canada, an energy superpower with the second largest oil reserves in the world, large deposits of natural gas, abundant hydro energy and big potential in biofuels, wind, and nuclear technology.

Crafting a successful energy sourcing relationship with Canada -- including infrastructure investments in pipelines, electric transmission lines, and tar sands development -- should be a high priority for the Obama Administration.

### Speed, corruption and ineptitude

There are serious thinkers who doubt whether infrastructure spending can make any difference at all to bringing the world out of economic crisis, suggesting that

by the time infrastructure projects are identified, contracted, and set into motion the economic crisis will have passed or that corruption will gobble up all this fast-flowing government infrastructure money.

The timing argument is compelling in a standard recession that on average has lasted 8 months since 1970.<sup>8</sup> But the downturn that began in November of 2007 is shaping up to be profound and possibly quite long. With most estimates saying that this downturn will last well into 2010 there will be plenty of time for projects to get underway.

A common criticism of infrastructure spending cites Japan in the 1990's during which time the government there spent heavily on a range of infrastructure projects that did not prevent a recessionary spiral.

There is general consensus that too much of the \$2.6 trillion spent in Japan between 1991-1996 that was spent was spent in rural areas and on not-needed projects that did not excite private investment.

Further it was felt that too much of that money was spent on roads and bridges and not enough on promising new technologies or companies that could create longer-term economic growth.

Corruption looms as a major possible reason why infrastructure spending may not work as an economic stimulus. An egregious example of this in the United States was Boston's Big Dig, which the independent Ward Commission said promoted "*a culture of malfeasance and political corruption that resulted in the most costly and sub-standard public works project in the history of the United States.*"

Originally proposed with a completion date of 1995 and a cost of \$2.2 billion the Big Dig ballooned to cost over \$15 billion. Further, the Ward Commission judged that "*corruption was a way of life in Massachusetts; sub-standard construction was the norm; and political influence, not professional performance, was the prime criterion for doing business in the Commonwealth (of Mass.).*"

In China, where *guanxi* rules there is a real risk that vast sums to be spent on infrastructure could also be squandered. Global anti-graft watchdog Transparency International ranks rates Chinese 72nd out of 180 countries on its Corruption Perception Index.

Further complicating the potentially beneficial effects of global infrastructure spending is the effect of "Buy America" and similar protectionist provisions that other countries may attach to their spending commitments, putting a damper on world trade generally.

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<sup>8</sup> National Bureau of Economic Research, 2008

## The Big Picture

Depending on which way these infrastructure projects unfold, the central economic premise around which the global economy now turns – that China can count on export-derived growth based on U.S. demand and that the U.S. can count on an endless supply of Chinese cash to fund its deficits – may break.

Right now there is a stasis in U.S./China relations whereby China's need for America's consumers trumps its need to diversify its massive treasury horde into alternative investments. For the time being this works politically for everyone.

But if as a result of this huge domestic infrastructure spending China's domestic economy comes to life – aided by much better internal transportation links for goods and services – arguably this stasis comes unglued.

China is moving quickly to spur that domestic demand, including this month (2/09) establishing 150,000 stores in the Chinese countryside to offer rural residents easy access to safe consumer goods, creating 775,000 new jobs by 2010.

Nothing says this is the only way things could unfold. Social unrest in China could force a different outcome. But right now the most likely scenario is that China gets stronger as a result of the coming infrastructure boom.

Central to this thesis is the fact China is paying for its infrastructure improvement with money that it already has. The United States will need to print that money or borrow it from China and Japan. So China could come out of this round with much stronger infrastructure, a much better looking balance sheet than the U.S., and an expanded domestic consumption economy.

For America the risk of getting its infrastructure spending wrong is huge in terms of debt and competitive positioning. Even China won't have enough money to lend to America to give it a second try. However, if it gets a couple of things right, say education and renewable energy, America may well secure its economic leadership position for another two generations.

For China this infrastructure spending is a golden opportunity to complete its peaceful rising and take a seat at the table of economic superpowers and make good on the hard work of the Chinese people since Deng began China's "socialism with Chinese characteristics" experiment in the early 1980's.

For both countries the stakes could not be higher.

Paradoxically, America and China will need each other more and need each other less over the next few years as both focus intensely on getting their economies through this treacherous period.

China currently has deep pockets but it has taken 20 years of export-fuelled success to fill those pockets. If demand from the United States and Europe stays flat for multiple years and China's internal demand does not catch fire China is in a bind, with huge social pressures building every year. A generation raised on Deng's edict that "to be rich is glorious" will not understand if it is asked to defer their desires.

In a positive scenario both countries could take their economic games to the next level and set the stage for tremendous wealth generation potential for the whole world. Or, one or both could fail to successfully spend all this infrastructure money and create a dangerous economic asymmetry (if one fails and the other succeeds) or a devastating double global economic blow if they both fail.

In summary, infrastructure spending globally over the next two years is set to dramatically alter the fundamental economic and strategic positions of the key global players, in particular China and America.

For investors and entrepreneurs this infrastructure boom represents a once-in-a-lifetime opportunity to profit from vast global government spending. It also represents the single best place to take economic shelter from the current financial crisis.