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Energy and GDP

SINGAPORE – The key attribute of Singapore's uniqueness is that it is a city-state, in a world of generally larger, less urbanized countries. In any comparison or ranking, this fact of high population density and 100% urbanisation skews per capita indicators of wealth and of carbon emissions. In any consistent ranking, Singapore would need to be appropriately compared to other global cities such as London, Amsterdam or Sydney. And even when such comparisons are made, allowances are required for the fact that for most of these cities, actual emissions caused by the cities are associated with electricity that is generated outside city limits.

In Table 1 (below) this is adjusted for by taking into account emissions from end-use (rather than primary fuel combustion). While the study does not include Singapore in its sample, a simple ranking of cities by end-use emissions is given in the table, with Singapore's national per capita emissions incorporated. Singapore, along with London, causes the lowest emissions in per capita terms, in comparison to all the other cities in the sample. Developing country cities like Bangkok and Cape Town, as well as New York and Toronto are higher, at between 10.5 and 11.6 tons. In general, only Denver is an outlier for unique reasons, but all other cities fall quite close around the 10 tons per capita level. Singapore is not inordinately out of range of this sample. More importantly, however, Singapore is the only city in the sample that is a country, and hence is disadvantaged from being able to consider alternative sources of energy which require a large hinterland for location and siting purposes such as hydro-electricity, solar, wind or nuclear.

Bangkok	**10.7**
Cape Town	**11.6**
Denver	**21.5**
London	**9.6**
New York	**10.5**
Toronto	**11.6**
memo:	
Singapore	**9.6**

Table 1. C02/Capita (Tons)

Tilak Doshi

Singapore's national energy policy framework strives to achieve a balance among three often-competing dimensions, namely strengthening Singapore's competitiveness, enhancing energy security, and protecting the environment. The question as to whether 'country competitiveness' is analogously similar to a firm's or corporation's competitiveness is often assumed away, and policy makers in the US, Europe and Japan routinely talk of national competitiveness. Among mainstream economists, there is no consensus on how to measure, explain and predict international competitiveness of countries, and 'perhaps none is warranted'. In assessing the potential impacts of emission mitigation policies on countries, the term 'competitiveness' is used in reference primarily to firms in key internationally competitive industries such as shipping, aviation and oil refining and trading rather than to any concept of an aggregate 'national competitiveness index'.

Singapore's Ministry of Trade and Industry identify six key strategies under Singapore's energy policy framework: promoting competitive markets, diversifying Singapore's energy sources, enhancing energy efficiency, developing Singapore's energy industry, stepping-up international cooperation, and taking a whole-of-government approach.

The presentation will give some comments on each of these strategies in the light of the 3 national policy objectives, namely: strengthening Singapore's competitiveness, enhancing energy security, and protecting the environment. TILAK DOSHI

Biography. Dr Tilak K. Doshi is Principal Fellow and Head, Economics Division at the Energy Studies Institute (ESI) at the National University of Singapore (NUS). Dr Doshi is an industry expert with over 15 years of international work experience in leading oil and gas companies. His previous appointments include Executive Director for Energy, Dubai Multi Commodities Centre; Specialist, Saudi Aramco (Corporate Planning and Sales & Marketing Departments); Chief Asia Economist, Unocal Corporation; Director for Economic and Industry Analysis, Atlantic Richfield Corporation; Consultant, Arthur D. Little Inc.

He received his Ph.D. Economics from the University of Hawaii on a scholarship provided by the East-West Centre. He was one of two candidates which were granted the 1984 Robert S. McNamara Research Fellow award by World Bank, Washington, D.C., and he received a Distinction for MA in Economics by Victoria University of Wellington, New Zealand in 1982.

Inequality and the City

SINGAPORE – Donald will be talking about the phenomenon of rising inequality in Singapore, in the context of a rapidly growing economy. He will argue that the very factors that increase GDP are also the ones that raise inequality, particularly in cities. He will then make the case for why inequality matters, and what governments can do to address the problems raised by inequality. DONALD LOW

Biography. Donald Low is a Senior Fellow and the Assistant Dean for Research at the Lee Kuan Yew School of Public Policy. Prior to joining the School, he served fifteen years in the Singapore government, including stints as the director of fiscal policy in the Ministry of Finance, and the director of the Strategic Policy Office Office at the Prime Minister's Office. He also established the Centre for Public Economics at the Civil Service College to advance economics literacy in the Singapore government. He has written extensively on inequality and social security reform, and the governance and policy reforms that Singapore needs. He is also the co-author and editor of *Behavioural economics and policy design: Examples from Singapore*, a pioneering book on how the Singapore government has applied ideas from behavioural economics in the design of public policies.

Donald is currently a Vice President at the Economics Society of Singapore, and previously served on the board of the Central Provident Fund. He graduated from Oxford with a double first degree in Politics, Philosophy and Economics, and from Johns Hopkins University with a masters in international public policy.

Donald Low

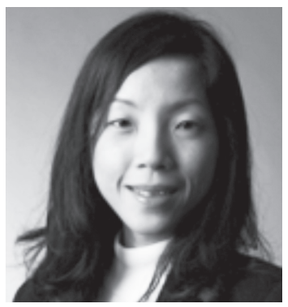
Measuring Economic Performance

SINGAPORE – This presentation will firstly cover some of the reasons why Gross Domestic Product (GDP) is used as an indicator till today and why it has been the primary indicator of success for a country and measurement of wealth creation.

Though GDP is the commonly accepted measurement of economic output, it continues to have a number of known drawbacks.

As the Economic Development Board's (EDB) mandate is to create good jobs for Singapore, our measures include a number of indicators such as Total Business Expenditure, Fixed Asset Investment and Skilled Jobs Creation. These indicators help EDB track the economic outcomes of our work and whether the investments in Singapore are creating the jobs that interest people while also creating new industry cluster groups that are sustainable and will keep Singapore ahead. ELAINE TEO

Biography. Elaine Teo currently serves as Head of Strategic Planning at EDB. The team provides a critical, long-range and big picture perspective to assess Singapore's economic competitiveness and development strategies. Prior to this, Elaine was Head at the Infocomms & Media division at EDB, where she oversaw the development of the IT, Computing and Internet sectors in Singapore. Elaine holds a B.Sc in Electrical Engineering and Computer Science from the University of California, Berkeley.



Elaine Teo

GDP and the City

Seminar and Panel Discussion

Value Lab Asia, Future Cities Laboratory

11 October 2012

9:00 Tea & Coffee

9:30 Welcome and Introduction
Prof. Dr Gerhard Schmitt, Singapore-ETH Centre
Prof. Dr Stephen Cairns, Future Cities Laboratory

9:40 Presentations
Moderator: Dr Max Hirsh, Future Cities Laboratory

'Measuring Economic Performance', Elaine Teo, Economic Development Board
'GDP and Energy', Dr Tilak Doshi, Energy Studies Institute, NUS
'Inequality and the City', Donald Low, Lee Kuan Yew School of Public Policy, NUS

11:30 Panel Discussion
Moderator: Derek Vollmer, Future Cities Laboratory
Dr Tilak Doshi, Donald Low, Elaine Teo,
Discussant: Prof. Dr Henry Yeung, Department of Geography, NUS

12:00 Closing Remarks
12:15 Lunch (by invitation)

(FCL) FUTURE CITIES LABORATORY 未来城市实验室

GAZETTE

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Measuring Progress in Cities

SINGAPORE – Economic 'health' is often evaluated in terms of Gross Domestic Product (GDP) or some derivative, such as GDP growth rate. It has been conventional wisdom for the past seven decades since the concept of a GDP was formulated, that increasing GDP should be correlated with improvements in human economic welfare. While this has substantial theoretical and empirical underpinnings, GDP is prone to misuse as a proxy for well-being, and a number of important non-monetary issues are obscured by this single monetary indicator. Gross Domestic Product, alternatively referred to as Gross Metropolitan or Gross Regional Product at a sub-national level, is simply the market value of all final goods and services produced within a territory over a certain period of time. It is most often computed and reported at the country scale, though increasingly, cities are calculating their own GDP or growth rate in order to communicate their global economic competitiveness.

Some academics make a distinction between economic growth and economic development, but the former is typically considered essential to the latter, and thus most metropolitan or national development strategies centre around promoting GDP growth. The logic is straightforward—an expanding economy should provide expanding opportunities for growth in employment, household income, and other economic indicators that contribute to human welfare. As many critics have pointed out though, not all types of economic growth are desirable. A 2009 blue-ribbon panel led by Nobel Prize-winning economist Joseph Stiglitz declared that government policies have too frequently been declared 'successful' based on an assessment of GDP growth. And as a society reaches a certain standard of living, there is a tendency to emphasize softer, non-monetary metrics such as 'quality of life.' Formally, the marginal utility of an increase in GDP diminishes at higher income levels, suggesting that non-economic factors gain in their relative importance and, at least some economists suggest, further increases in GDP may be associated with a decrease in overall welfare. Since the onset of the 2008 global financial crisis, many development strategies have called for 'sustainable' or 'inclusive' growth, in an attempt to respond to some of these concerns. The challenge, of course, is to clearly define these new terms, and to find convincing evidence that an intervention, whether it is policy, research, or business initiative, actually enhances societal welfare.

History and current use

Nobel laureate Simon Kuznets developed the concept of a GDP in 1934 as a measure of national income and economic activity. It was quickly and widely adopted as a tool to aid economic stabilization policies following the Great Depression and, subsequently, wartime planning, when production capacity was a primary national concern for countries embroiled in World War II. Over the years GDP as a metric has performed well as a quantitative measure of production, and its use has extended to subnational levels. It is frequently used to facilitate comparisons (see Figure 1) or to benchmark activity in economic subsectors (e.g., value-added from manufacturing) or non-economic sectors, like energy intensity. Computing GDP requires detailed information on economic production, income, or expenditures within a certain territory over a specific period of time. For this reason, it is typically measured by governments, and reported at a national-level quarterly and annually. While adjustments can be made for size by stating GDP in per capita terms, it is nonetheless difficult to adequately compare the urban economies of small states like Singapore to more diversified and expansive economies like the United States. Urban economies of course have little to no agricultural or natural resource production, and derive a significant share of their GDP from property ownership. In 2011, for example, home ownership in Singapore contributed more to GDP than the entire Information & Communications sector of the economy.

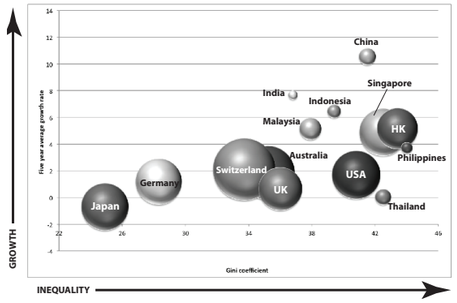

Figure 1. Growth Rates, Inequality and Per Capita Size of Selected Economies. x-axis: inequality expressed as Gini coefficient; y-axis: growth expressed as 5-year average growth rate.

Still, the bulk of GDP in developed and middle-income countries comes from what are primarily 'urban' sectors – industrial activities like manufacturing, and services like retail, banking, and transportation. As Harvard economist Edward Glaeser points out, this 'wealth of cities' is not uniform across a given country, and tends to concentrate in urban areas. It is perhaps for this reason that most major cities have an Economic Development agency to attract inward investment, and why the term 'global city' has emerged. A global city is one that is thought to not be constrained by its geographic hinterlands or by national policies. They are fully integrated into the global economy, and compete for global talent and investment. Consequently, the performance of these global cities is frequently based on some component of their GDP, such as growth of a particular sector. Forward-looking strategies from infrastructure planning to investments in research and development are often justified on the basis of their potential contribution to GDP. Thus, while the rationale for measuring productivity has changed over the years, the desire to report on it is still as relevant as ever.

Critiques

Perhaps the strongest and most persistent critique of GDP as a metric is that it was never intended to be a measure of welfare, though it is frequently used as such. As a single quantitative indicator, it is easy to report, digest, and compare across time and space. But there is much that GDP either masks, misses, or in cases such as expensive health care or security costs, counts as a positive contribution while most in society would views these as negative indicators or 'regrettable' expenditures. The Organisation for Economic Co-operation and Development (OECD) defines welfare or well-being as society's consumption possibilities, command over resources, and non-monetary quality of life attributes. Several economic indicators that are correlated with GDP, such as median household income, employment, and poverty levels, certainly have a bearing on welfare. Moreover, from a policy perspective, the economy is easier for a government to influence and monitor than more subjective criteria, which can vary from person to person. Education, health status, the natural environment, and spiritual well-being are all typically considered as being relevant to well-being. A 2005 poll in the United Kingdom suggested that money and housing contributed about 15% to individuals' perceived well-being, whereas the quality of personal relationships accounted for nearly half.

Rising inequality has been a recent topic of heated debate globally, and may be the issue at the heart of criticism of growth-centric policies. Despite headline numbers of positive GDP growth, there is widespread concern in Singapore and elsewhere that the distribution of the fruits of this growth is uneven, and that some efforts to boost growth are succeeding at the expense of a majority of individuals' well-being. Cities or governments that can promise a high rate of return on capital investments are economically competitive, but this growth may be based partially on low wages in the workforce. If wages and salary income grow slower than corporate profits, the result is rising inequality. Per capita GDP aggregates wages and corporate profits and thus should not serve as a proxy for household income, though it is widely used as a measure of standard of living. This issue is just as important across sub-sectors of an economy, e.g., if the growth in retail sector wages is not keeping pace with the high-tech sector, the result is increasing income disparity over time. The prevailing wisdom has been that, as long as the economy is growing, a government will have the means to redistribute some of this expanding wealth to reduce inequality and enhance total societal well-being. There are several indicators already commonly measured, such as household income distribution or government subsidies to households, that can be used to better track progress here but they are not as widely covered as GDP and economic growth.

The other salient issue pertaining to economic growth has to do with its negative externalities, the unintended spillover effects of economic activity that place additional burden on all or a segment of society. The landmark Club of Rome report of 1972 posited that there were limits to growth, due in large part to negative externalities that could not be adequately offset through technology or redistribution of income. Congestion and pollution are two of the most common negative externalities of urban economic activity, and were among the first items that economists, beginning in the 1970s, attempted to subtract from GDP to establish more accurate measures of welfare. Defensive expenditures, particularly health expenditures to compensate for the effects of environmental pollution, are among those expenditures which appear as a 'positive' contribution to society when viewed through the lens of GDP. Climate change offers a global example of this problem of externalities – individual producers do not bear the costs of the greenhouse gas emissions they release into the atmosphere, while vulnerable communities are now having to invest in coastal fortifications and other measures to adapt. Within a city, congestion refers not only to road traffic, but to any condition where the demand for a certain good or service is outstripping demand, leading to higher costs, a decrease in quality, or both. Congested public spaces, for example, do not necessarily cost more, but represent a decrease in utility for the individual consumer. Time lost waiting can be represented as an economic loss in productivity, but in practice it is more likely to cut into an individual's leisure time, and thus a decrease in overall utility. In the presence of income inequality, these externalities are then magnified, since individuals in the lower income strata have fewer means to offset such losses.

Towards metrics of progress and well-being

Decades of research have attempted to identify the productive 'assets' of society, including environmental and social capital, so that their use could be monitored and policies tailored to safeguarding them alongside conventional assets. Yale economists William Nordhaus and James Tobin referred to education and health expenditures as capital investments in their Measure of Economic Welfare in 1972; Japan's Net National Welfare improved on the framework to account for environmental degradation and related health damages. Former World Bank economist Herman Daly and theologian John Cobb Jr. developed the Index of Sustainable Economic Welfare (ISEW) in 1989, going perhaps the furthest to explicitly account for economic gains and losses, including intergenerational losses due to climate change, and imputed gains such as unpaid household labour. The ISEW and its derivative Genuine Progress Indicator have been adapted to a variety of countries and sub-national regions. Empirically, these calculations have demonstrated declines in welfare in the United States by the mid-1970s, and in the United Kingdom by the early 1980s, attributed to an increase in income inequality and declines in leisure time and natural capital that together contributed to declines in quality of life. More recent calculations have shown a similar trend at sub-national levels in the province of Alberta, Canada, and the state of Maryland in the United States. Such hybridized approaches have typically been adopted and used in tandem with conventional metrics. These modifications to GDP, together with similar but narrower efforts at deriving a 'Green GDP', all rely on establishing a singular quantitative measure, expressed in monetary terms that can be reported alongside GDP.

Other methodologies strive to break away from the monetary metric and singular index; examples include ecological footprint analysis and The New Economics Foundation's Happy Planet Index, which merges ecological efficiency with subjective well-being at a country level. Bhutan's widely-referenced 'Gross National Happiness' indicator helps raise the profile of the subjective nature of welfare, but to date has not been copied or adapted by any other government. More recently, the OECD has developed a 'Better Life Index' which attempts to measure subjective well-being across a range of (OECD) countries and allows individuals to weight different categories (e.g., Life Satisfaction, Work-Life Balance). The United Nations recently developed an 'inclusive wealth' accounting methodology to assess the long-run sustainability of an economy, as opposed to short-run point estimates. Rather than provide a single indicator, inclusive wealth accounts are meant to be more detailed and specific, so that they are relevant to policy.

Thus, while it is clear that the concept of GDP will continue to be a useful metric in some applications, there are an emerging number of alternatives and rationales to seek out more specific or context-appropriate indicators of progress. Such indicators may in fact be helpful in communicating progress in a developed economy such as Singapore's, where rapid growth has given way to slower and more strategic development. Subjective well-being metrics require much more public input and participation, but a small upfront investment in this could yield substantial returns.

DEREK VOLLMER

Further Reading

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