

2018 ASIA ECONOMIC FORUM

Seminar 2 on “Economic Competitiveness, Welfare Spending and Budget Sustainability for Greater China and India”

JOINTLY ORGANIZED BY

THE WORLD BANK GROUP

AND

**ASIA COMPETITIVENESS INSTITUTE AT
LEE KUANYEW SCHOOL OF PUBLIC POLICY,
NATIONAL UNIVERSITY OF SINGAPORE**

30 August 2018

Lobby, Oei Tiong Ham Building,
Lee Kuan Yew School of Public Policy,
National University of Singapore

Forum Proceeding

Edited by: Isaac Tan Yang En Cai Jiao, Tracy Dewi Jelina Ayu

In 2019, ACI was ranked 12th globally, 2nd in Asia and 1st in Singapore amongst 94 think tanks worldwide under the “Best University Affiliated Think Tank” category by the Think Tanks and Civil Societies Program at the University of Pennsylvania, USA.

About ACI

The Asia Competitiveness Institute (ACI) was established in August 2006 as a Research Centre at the Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore (NUS). It aims to build the intellectual leadership and network for understanding and developing competitiveness in the Asia region. ACI seeks to contribute to the enhancement of inclusive growth, living standards, and institutional governance through competitiveness research on sub-national economies in Asia. It identifies mitigating issues and challenges for potential public policy interventions through close collaboration with regional governments, business corporations, policy think-tanks, and academics. ACI's three key research pillars include (I) Sub-national economies level competitiveness analysis and city-level liveability analysis; (II) Firm-level competitiveness analysis in 16 Asia economies; and (III) Singapore's long-term growth strategies and public policy analysis.

ACI's value propositions may be encapsulated in its acronym:

Analytical inputs to initiate policies for policy-makers and business leaders in Asia

Capacity building to enable others through improvement in productivity and efficiency

Intellectual leadership to create pragmatic models of competitiveness and inclusive growth

The institute's core research competencies can also be encapsulated in this acronym describing our evidence-based assessments conducted on public policies for **A**SEAN in the context of the rise of **C**hina and **I**ndia.

Vision and Mission

- ACI's over-arching vision is to build up its research credibility with policy impact, contributing as a professional, world-class think-tank.
- ACI's mission is to establish our niche as a leading policy think-tank by identifying competitiveness trends, opportunities, and challenges, as well as promoting competition and synergizing complementarities amongst Asian economies and business corporations.
- ACI endeavours to articulate sound recommendations, entice discourse, and shape agenda in the arena of public policy amongst Asian governments.
- ACI undertakes evidence-based analysis of public policy issues and decisions, in order to provide assessment of their effectiveness as well as economic and societal impact.

Research Initiatives and Collaborations

- I. Identify trends of competitiveness and policy analysis on trade and investment of ASEAN, within the regional context of competition and complementarities with China and India.
- II. Identify competitive strengths and conduct policy analysis on Singapore within the context of regional economies with international benchmarking.
- III. We are regularly releasing three indices on liveability ranking including 64 Global Cities, 100 Greater China Cities, and 17 Shandong Cities.
- IV. We have established an Ease of Doing Business (EDB) Index on Attractiveness to Investors, Business Friendliness, and Competitive Policies for 21 sub-national economies of India and 33 sub-national economies of Indonesia.
- V. We have signed Memoranda of Understanding (MoU) with The World Bank (2015), Enterprise Singapore formally known as SPRING Singapore (2014) and European Central Bank (2014). The MoU between The World Bank and National University of Singapore, coordinated through ACI, was signed in 2016.
- VI. We have signed MoUs with various institutions in Greater China economies, including Institute of Economics at Shanghai Academy of Social Sciences (2019), Institute of World Economics at Shanghai Academy of Social Sciences (2016), Shandong Academy of Social Sciences (2015), Chongqing Municipal People's Government (2015), China Institute for Reform and Development, Haikou (2015), Counsellors' Office of the People's Government of Guangdong Province (LOI, 2014), and Chung-Hua Institution for Economic Research, Taiwan (2015).
- VII. We have signed MoUs with seven Chief Ministers' Offices in Uttarakhand (2019), Andhra Pradesh (2018, 2017 & 2015), Bihar (2015), Chhattisgarh (2015), Madhya Pradesh (2015), Odisha (2015), and Punjab (2015).

- VIII. We have signed a MoU with Committee for Acceleration of Priority Infrastructure Delivery at Coordinating Ministry for Economic Affairs, Indonesia (2016), Indonesia Investment Coordinating Board (2014), Indonesian Agency for Agricultural Research and Development at Ministry of Agriculture (2014), Indonesian President's Delivery Unit for Developing Monitoring and Oversight (2013), and Employer's Association of Indonesia (2013).
- IX. We have signed MoUs with Asian think-tanks and institutions, including Institute of Economic Growth, India (2018), Vietnam Chamber of Commerce and Industry, Vietnam (2016), Centre for Strategic and International Studies, Indonesia (2015), Institute of Strategic & International Studies, Malaysia (2015), Philippine Institute for Development Studies, the Philippines (2015), Thailand Development Research Institute, Thailand (2015), and Central Institute for Economic Management, Vietnam (2015).

About ACI's Research Pillars

ACI has consciously engaged in economic research that has significant relevance to Singapore and the Asian region. Over the years, ACI has focused on our expertise in quantitative competitiveness analysis and simulation, spinning off volumes of research output in the applications of our methodology and regional insight. At this stage, ACI has identified three core research pillars that will guide and define its research efforts moving forward. The three research pillars are as follows:

Pillar I. Sub-national Economies Competitiveness Analysis

ACI engages in systematic and methodical competitiveness analyses of the sub-national economies by using an evidence-based, empirical approach involving a comprehensive list of relevant indicators, which are categorised under multiple layers called the 'environments'. A number of our projects, including competitiveness analyses of Greater China, ASEAN-10, India, and Indonesia, as well as other thematic research projects, were conducted by adopting this common methodology, with potential variations in the specific environments and indicators. ACI's competitiveness analysis of Asian economies goes beyond the usual ranking to offer constructive policy recommendations on how individual member states can improve their rankings vis-à-vis their sub-national or regional peers through the application of the 'what-if' simulation, which provides the projected improvements of each state's ranking whereby the bottom one-fifth of its indicators are enhanced.

Pillar II. Micro-based Firm Level Competitiveness Analysis

Micro-based firm level competitiveness analysis is ACI's second research pillar that has been developed in view of the intrinsic importance of firm-level competitiveness in terms of productivity, efficiency, and governance. In the context of globalisation, mobility of economic activities, and blurring of borders, an understanding of the determinants and dynamics of firm-level competitiveness is paramount, in order for policy makers to adjust and prepare their industries for an increasingly competitive economic landscape. To this end, ACI has partnered with the European Central Bank to carry out research in this area, possessing a solid foundation in firm-level productivity research in the form of European Competitiveness Network database and methodology. ACI envisaged the expansion of Competitiveness Research Network (CompNet) into Asia, thereby pioneering the Asia's CompNet in encompassing 16 economies in Asia.

Pillar III. Singapore's Long-term Economic Growth Strategies and Public Policies Analysis

The third and imminent research pillar focuses on Singapore's long-term economic growth strategies in the context of changing circumstances, future trends, and emerging opportunities for Singapore in the decades ahead. In particular, ACI will take on the task of critically examining Singapore's public policy strengths and areas of improvement by assessing policy successes of the past, identifying new issues to address and the current policy gaps, through a systematic and evidence-based research inquiry using quantitative methodology and empirical data, leveraging on our network of policy experts.

Founding Patron and International Advisory Panel

Founding Patron

Mr George Yeo

Visiting Scholar, Lee Kuan Yew School of Public Policy, National University of Singapore & Former Minister of Foreign Affairs, Singapore

International Advisory Panel

Co-Chairs:

Professor Michael Porter (2006-2010)

Bishop William Lawrence University Professor

Ms Marjorie Yang (2006-2012)

Chairman, Esquel Group

Members:

Professor Kishore Mahbubani

Former Dean, Lee Kuan Yew School of Public Policy, National University of Singapore

Dr Kuntoro Mangkusubroto

Former Head, President's Delivery Unit for Developing Monitoring and Oversight (UKP4), Indonesia

Mr Narayana Murthy

Former Chairman, Infosys Technologies Limited

Mr Philip Yeo

Chairman, Enterprise Singapore

Mr Loh Khum Yean

Permanent Secretary, Ministry of Trade and Industry

Ms Yong Ying-I

Permanent Secretary, Public Service Division

Professor Chan Kam Leung Alan

Former Dean, College of Humanities, Arts and Social Sciences, Nanyang Technological University

Asia Competitiveness Institute

Co-Directors:

Associate Professor Tan Khee Giap (2011 till now)

Professor Tan Kong Yam (2011 till now)

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2018 ASIA ECONOMIC FORUM: SEMINAR 2

Executive Summary

Accounting for roughly over a third of the global population, China and India are playing increasingly influential roles on the world stage. As their economies continue to develop, their governments have the daunting task of ensuring that their constituents' welfare is attended to while also maintaining a balanced budget. Given the sheer size of both countries' economies and population, these implications will have a great effect on Asia as well as the on the international scale.

With this in mind, the Asia Competitiveness Institute (ACI) at the Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore (NUS) and the World Bank Group jointly co-hosted *2018 Asia Economic Forum* from 29-30 August 2018, with its second seminar being on “**Economic Competitiveness, Welfare Spending and Budget Sustainability for Greater China and India**”. At the forum, the ACI team members updated annual competitiveness rankings for the subnational economies of India and China and presented studies on welfare spending and budget sustainability (WSBS) analysis for both countries at the national and subnational level. Additionally, there was also a presentation on ACI's liveability studies for the major cities in the Chinese province of Shandong.

The 2018 Asia Economic Forum began with **Welcome Remarks** from **Associate Professor Tan Khee Giap**, Co-Director of ACI-LKYSPP, and followed by **Opening Remarks** from **Ms Fatouma Toure Ibrahima**, Operations Advisor, Singapore Infrastructure and Urban Development Hub, The World Bank Group. In his address, Associate Professor Tan noted the importance of studies that cover India and China as well as the work ACI-LKYSPP has done in terms of its cost of living indices and as an economic think tank. Following Associate Professor Tan's remarks, Ms Fatouma addressed the importance of knowledge, collaboration and innovation in the ASEAN and Asian context. She emphasized on the inclusiveness on knowledge sharing amongst policy makers across countries especially on policy issues which are global in nature. The issue of sub-national debts ought to be harmonised within the national level and private sector should be enticed as part of the solution solving. When comes to innovation, the World Bank's systematic country diagnostics approach is paramount as it will be difficult for big countries like India and China to have one narrative.

After the welcome and opening remarks, a keynote speech was delivered by **Ms Smita Kuriakose**, Senior Economist, Finance Competitiveness and Innovation, the World Bank Group. Her speech concerned the importance of innovation and the role that governments can play in tailoring policies directed at improving the innovation of firms in their country, which will in turn improve their competitiveness, as well as the challenges that are currently being faced. Ms Kuriakose stressed that innovation can be incremental, pointing out that, in the developing world, innovation for firms can simply mean catching up through technology adoption and innovation. She also mentioned that the number of patents listed under a firm is not necessarily a measure of success, and other factors, such as if the patents are recognised by reputable sources and how cost effective these designs are. She additionally suggested that there is a role for governments to play in funding innovation in fields that are less financially lucrative but have the potential for social good.

The first session of the seminar on “**Sub-national Economic Competitiveness, Welfare Spending and Budget Sustainability of Greater China Economies**”, and was moderated by **Mr Isaac Tan**, Research Assistant at ACI-LKYSPP. The session was split into two presentations, the first was on the annual update of ACI's competitiveness rankings on the economies of Greater China, and the second provided the WSBS analysis on the provinces of Mainland China. The two discussants for both sessions were **Dr He Dongni**, Deputy Director, China Institute for Reform and Development, People's Republic of China, and **Professor Fan Yubo**, Associate Professor, Policy Research Office, Shandong Academy of Social Sciences People's Republic of China.

The **Forum Luncheon Talk** was delivered by **Mr Henry Kwek**, Member of Parliament & Member, Government Parliamentary Committee for Trade and Finance, Republic of Singapore, and he spoke on **“Welfare Spending and Budget Sustainability: The Case of Singapore”**. Mr Kwek elaborated on how the unique characteristics of Singapore has affected how its policymakers approach the notion of welfare provision and its challenges. As such, he described how adjustments have to be made in public policies to accommodate both budgetary discipline as well as the social needs of ordinary residents in Singapore. Among other issues, the Member of Parliament noted how the Singapore government is preparing for its ageing population by changing how policy makers manage the healthcare experience for seniors towards a more cost-effective but community based approach. Mr Kwek concluded his speech by noting that as Singapore moves forward, it is important for policymakers to be guided by fundamental principles which have allowed Singapore to develop into the country it is today.

The forum resumed after lunch with its second session, which was on **“Sub-national Economic Competitiveness, Welfare Spending and Budget Sustainability of India”** and moderated by **Dr Zhang Yanjiang**, Post-doctoral Fellow, ACI-LKYSPP, NUS. This session comprised of two presentations, the first dealt with the annual update of ACI’s competitiveness rankings and simulation studies of Indian states, while the second provided a WSBS analysis of the sub-national economies of India. The discussant for both presentations was **Dr Manoj Panda**, Director, Institute of Economic Growth, India.

The final session of the 2018 Asia Economic Forum was entitled **“Urban Composite Development Index for 17 Shandong Cities: Ranking and Simulation Analysis”** and was moderated by **Mr Tan Kway Guan**, Research Assistant at ACI-LKYSPP. The presentation detailed the methodology and findings of the Urban Composite Development Index which assessed the relative liveability of 17 major cities in the Shandong province of China. Notably, findings point towards wide regional disparities between western and eastern Shandong.

The discussants for the third session were **Ms Sarah Lin**, Urban Specialist, Global Practice for Social Urban Rural and Resilience, The World Bank Group, **Professor Yang Jinwei**, Vice President, Shandong Academy of Social Sciences, People’s Republic of China, and **Mr Wang Kejian**, Chairman, Urban Construction Press, People’s Republic of China. The discussants were appreciative of ACI’s liveability index and commended the team on being able to convert the raw data into meaningful results.

The forum was drawn to a close by **Associate Professor Tan Khee Giap**, Co-Director of ACI-LKYSPP, who alluded to ACI’s future research agenda. Professor Tan thanked the audience and participants of the forum for their views in particular their valuable suggestions during the insightful discussions over the past two days. He also expressed ACI’s interest in conducting studies to other Chinese provinces similar to that of ACI’s collaboration with the province of Shandong. Associate Professor Tan ended his remarks by encouraging the creation of a regional index that tracks the productivity of SMEs in the ASEAN and Asia and invited discussants from these countries to get in touch with ACI-LKYSPP should they be interested.

Welcome Remarks

**Associate Professor Tan Khee Giap
Co-Director, ACI-LKYSPP, NUS**

Good morning,

Madam Jyoti,

Ms Fatouma,

Ms Smita,

Distinguished guests and

Ladies and gentlemen,

In the tradition of the Lee Kuan Yew School of of Public Policy, I shall make only three points. Firstly, this Asia Economic Forum is indeed a big event since we cover 34 provinces of Greater China and 35 states of India, which encompassed nearly half of the world's economy and a third the in terms of population size. A warm welcome to all of you.

The second point is that Asia Competitiveness Institute is an economic think-tank fully funded by Singapore's Ministry for Trade and Industry, and ACI's key performing indicators include policy impact to regional governments. In ACI we do not conduct qualitative research but we do quantitative studies instead. The theme of the forum this year is on welfare spending and budget sustainability. Dr Tilak Abeysinghe, an adjunct associate professor at ACI oversaw the methodology and implementation of this very important topic.

The third point is about objective policy impact of ACI to policy makers, public at large and academia. Yesterday we released the annual ACI Index on Cost of Living, Wages and Purchasing Power for World's 105 Cities. Our research findings were reported widely in press and media today. We heard so much about fake news and sensationalized issues in an irresponsible way. For example, there were news headline worldwide that the cost of living in Singapore is fourth in the world without stating this is referring to expatriates! However, ACI's study does make a distinction between cost of living for expatriates and ordinary residents through different consumption baskets and hence Singapore ranked 54th for ordinary residents amongst 105 cities worldwide.

After the release of ACI's findings were reported in the newspaper today, I was inundated with phone calls from many ordinary residents who said that our study is not accurate. They expressed strongly that "I do not feel that my cost of living is ranked 54th among these 105 cities because money is always not enough". So I asked him to describe his daily lifestyle and he said that he has not more than five beers every night with not more than d smokes a pack of cigarettes a day. Then I said that if you look at this report, in this category on alcohol and tobacco, it is ranked high in Singapore even for average ordinary residents. But if you are to have a life style which is not typical of an ordinary resident that is why the results that we released do not reflect your experience.

During our Prime Minister's recent National Day Rally speech, he urged the public at large to be objective, not be emotional, look at evidence-based studies and do the necessary adjustments according to one's affordability and priority. ACI's empirical study was undertaken with transparency in methodology and data sources, we hope to contribute to the lively debate on cost of living, wages and purchasing power, thank you!

Opening Remarks



Ms Fatouma Toure Ibrahima
Operations Advisor, Singapore Infrastructure and Urban Development Hub,
The World Bank Group

Good morning everyone,

Associate Professor Tan Khee Giap,

Henry Kwek, Member of Parliament,

Distinguished guests,

Ladies and Gentlemen,

Let me start by thanking ACI for the opportunity to collaborate on organising this seminar.

Today is Day Two, and I think it makes sense for me to continue where Professor Tan and Jyoti left it yesterday. Professor Tan made three points yesterday. He talked about the importance of adequate policies. He also mentioned the importance of people in institutions and governance. And he referred to leadership, insisting on dynamic leadership. Jyoti talked about the World Bank Group and its partnership with Singapore. She referred to the twin goals of the World Bank in terms of reducing poverty and sharing prosperity. She also mentioned Asia as a lighthouse of growth in the world economy, which I think is a very important point for the two countries being discussed today. Finally, she referred to the importance of our collaboration with Singapore. This includes the World Bank and its twin institutions: IFC and MIGA.

On my end, I am going to focus on three points on knowledge, collaboration, and innovation.

On knowledge, I am going to pause a little bit and discuss a conversation we had with young students. We had a group of students at the office on Tuesday from US universities, and we made our presentation on

what the World Bank was about and which countries we were serving. They were surprised to see that we serve all countries and that we have an important footprint in countries like China, India, and Indonesia. That brings me to the importance of knowledge. For the work that we do at the World Bank, finance is essential, but knowledge is equally critical. Given our global footprint and the work that we do with countries, it is crucial that we put ourselves in a position where we can share knowledge. We share knowledge across countries, but we are also working on global issues. We are working on climate change, digital technology, trade, and other issues that cannot include or exclude countries. The issue of inclusiveness, when it comes to knowledge sharing and partnering at the local, national, or international level, is important.

That brings me to my second point, which is collaboration. Collaboration between the ASEAN countries, as we discussed here yesterday, is a good example of the importance of working at country, regional, and global levels. And the same is true within countries. The issue of subnational debt that will be discussed today is important. The opportunities for development for us at the World Bank, we believe, are the highest when all partners are involved. And that includes the private sector. Our work with the private sector is going to the next level in an effort that we call “maximising finance for development”. This is an effort that the World Bank, as a group, is trying to push forward to help countries achieve their developmental objectives. We have always been doing it, it is not new. But today we are going to be more systematic about it. We are working with new tools. For example, in Indonesia, we are working with the government to make an InfraSAP, which means that we are working with the government to create a roadmap for development. This is partnership and collaboration at different levels.

My third point is about innovation. We often get approached in the work that we do by institutions and policymakers, and they wonder if they are well-equipped to address today’s issues. This is something that we see in an exercise that we do at the World Bank, which is called systematic country diagnostics. We did one for India, and I am going to quote one of our directors. The director said that it is very difficult for a country like India to have one narrative, meaning to have one story that can capture the diversity, complexity, and challenges of a country. And I think the same is true for China, and that the same is true when we come to the subnational level. We need to be innovative. My colleague, Smita, will discuss this in further details.

I would like to conclude by saying that if you really want to get results in an evolving environment, knowledge, collaboration, and innovation is the key and that is why a forum like this one is so important.

Thank you very much.

Keynote Speech



Ms Smita Kuriakose
Senior Economist, Finance Competitiveness and Innovation, The World Bank Group

ROLE OF INNOVATION POLICY IN INCREASING COMPETITIVENESS

ASIA ECONOMIC FORUM SINGAPORE



SMITA KURIAKOSE

30 August 2018

Innovation & Entrepreneurship are vital to increasing competitiveness

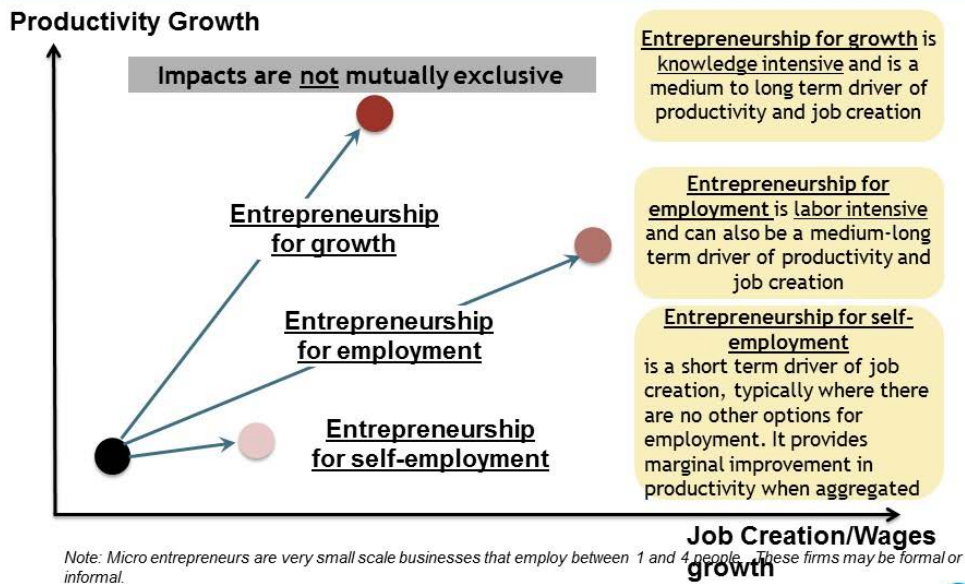
- The bulk of cross-country differences in income per capita are explained by differences in productivity: *"...Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker...."* Paul Krugman
- Innovation is one of the main drivers of productivity - the engine of creative destruction (Schumpeter) - key source of **productivity and competitiveness**
- Who creates jobs? Entrepreneurs – and some more than others
 - ✓ New firms are found to have the highest job creation rate – even after controlling for size
 - ✓ High growth firms are responsible for largest employment and sales growth

Innovation

- *An innovation is the implementation of a new or significantly improved product, or process, a new marketing method, or a new organizational method in business practice: (Oslo Manual)*
 - *New to the world*
 - *New to the country*
 - *New to the firm*
- Innovation is one of the main drivers of productivity - the engine of creative destruction (Schumpeter) - key source of productivity and competitiveness
- *At the firm level*
 - Introduction of a new or improved product
 - Introduction of a new or improved process
 - Introduction of a new or improved technology

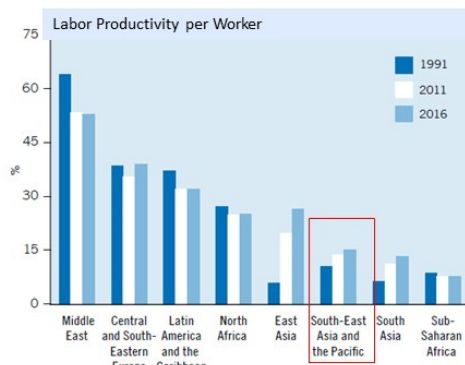
2

ENTREPRENEURSHIP CAN BE FOCUSED ON EITHER GENERATING GREATER PRODUCTIVITY OR SUPPORTING JOBS CREATION (AND BETTER WAGES)



3

EAP Challenges & Regional Strategy



Source: ILO, *Global Employment Trends 2012*

• Continuing on growth trajectory and avoiding the 'middle income' trap

- EAP labor productivity to attract and retain investments is relatively low
- High disparity among EAP countries with regards to business environment (as measured by the Doing Business reports)

4

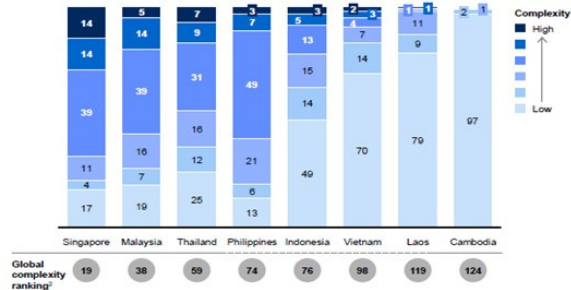
EAP Challenges & Regional Strategy

Diversifying production from raw commodities and rising value added in products and production process

- Public support for innovation, entrepreneurship, and building supply chain are ineffective, patchy, and poorly run
- Policy distortion and bad industrial policy undermine competitiveness and innovative conduct of entrepreneurs

Only Singapore and Malaysia rank among the world's top 50 countries for the economic complexity of their exports

Economic complexity¹ of exports
% distribution across complexity levels

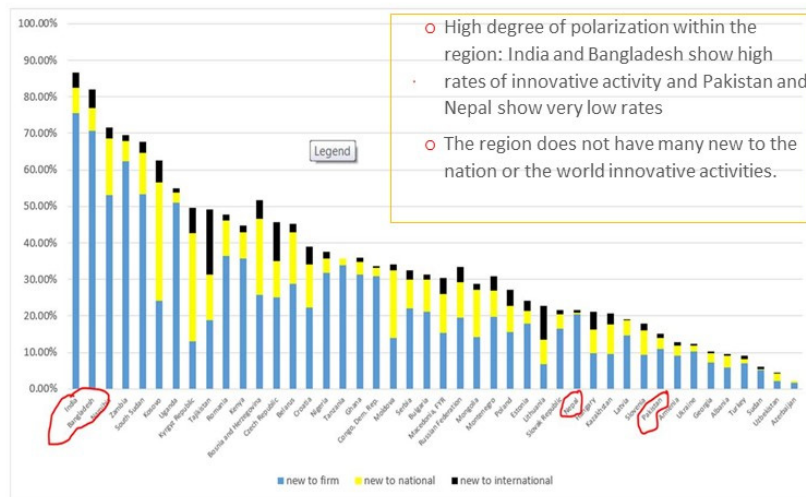


¹ Economic complexity considers the country's diversification of exports and the ubiquity of those exports (i.e., the number of countries that export that product). Data are based on averages of 2001–07, but experts suggest complexity distribution in ASEAN countries remains directionally consistent in 2014. The most complex products are in machinery, chemicals, and metals, while the least complex products are raw materials and commodities, wood, textiles, and agricultural products.
² Ranking out of 124 countries indexed. Brunei and Myanmar not included in index.
NOTE: Numbers may not sum due to rounding.
SOURCE: Jesus Felipe et al., "Product complexity and economic development," in *Structural change and economic dynamics*, 2012; McKinsey Global Institute analysis

Source: McKinsey Global Institute, *Southeast Asia at the crossroads: Three paths to prosperity*, 2014

5

SAR Challenges

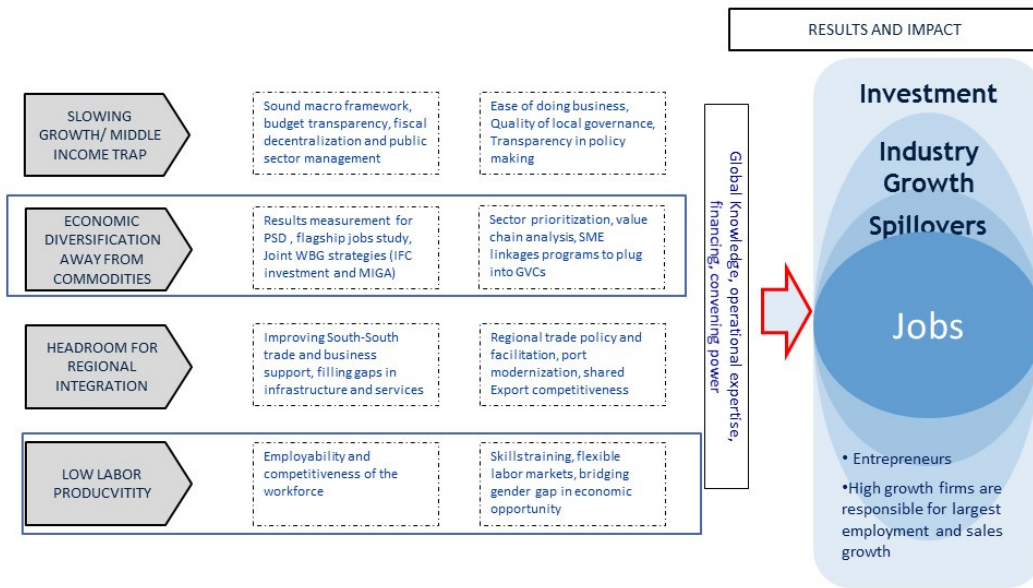


- High degree of polarization within the region: India and Bangladesh show high rates of innovative activity and Pakistan and Nepal show very low rates
- The region does not have many new to the nation or the world innovative activities.

Source: World Bank Enterprise Survey Data

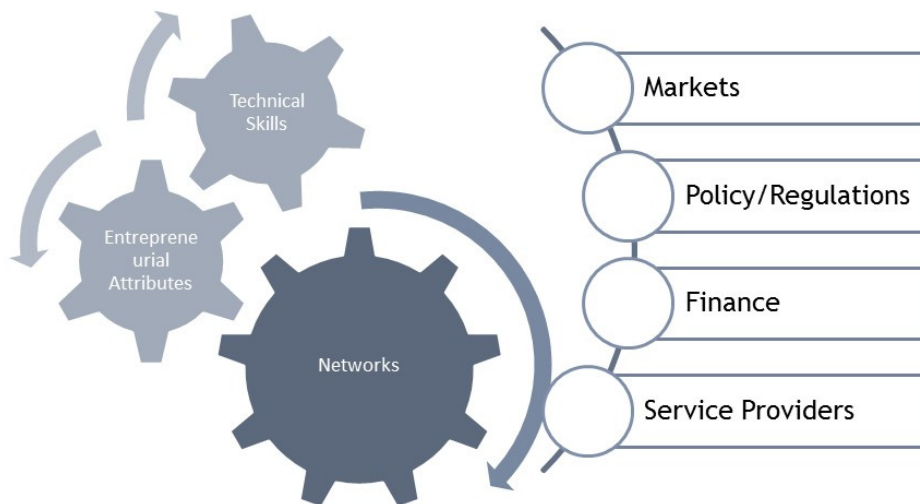
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Innovation is key to unlocking the opportunities to growth



7

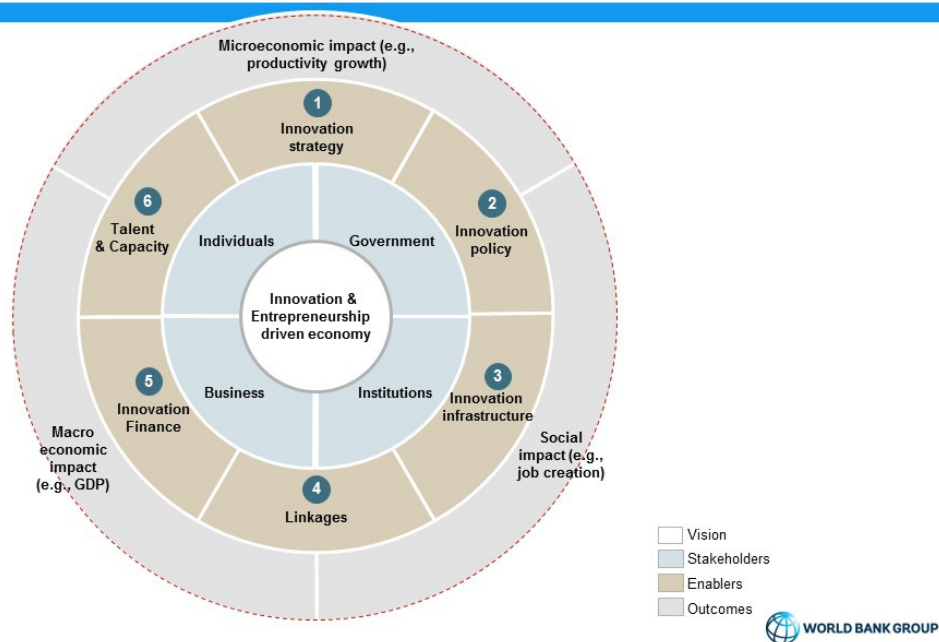
Innovation Policy Framework



Innovation and Entrepreneurship Ecosystem Mapping

8

A FRAMEWORK FOR THE INNOVATION AND ENTREPRENEURSHIP ECOSYSTEM

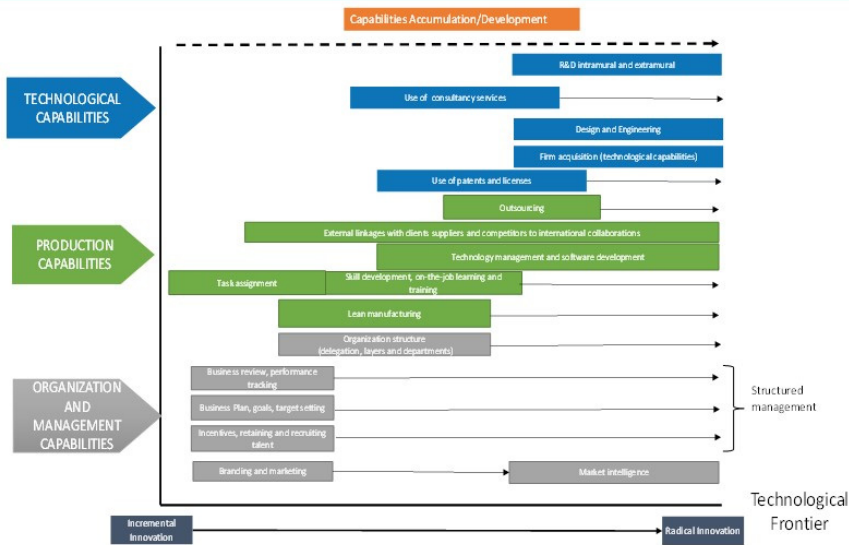


WHY SUPPORT FIRMS?

- Increasing productivity is pivotal for client countries: heightened interest in how governments can effectively promote TFP growth.
- With SMEs employing a large share of the workforce, and firms in most client countries, systematic support that reap productivity gains for this segment is critical. ---→ to foster greater number of high growth firms.
- *Rationale for Public Sector Support:* Bank lending which is the most common source of external finance for many SMEs and entrepreneurs, are often heavily reliant on traditional debt to fulfil their start-up, cash flow and investment needs.
 - Don't have to look too far: Singapore's robust innovation system
 - EDB and Enterprise Singapore: Connects firms to markets and facilitates innovation at the firm level

10

FIRM CAPABILITIES FOR INNOVATION GO WELL BEYOND R&D

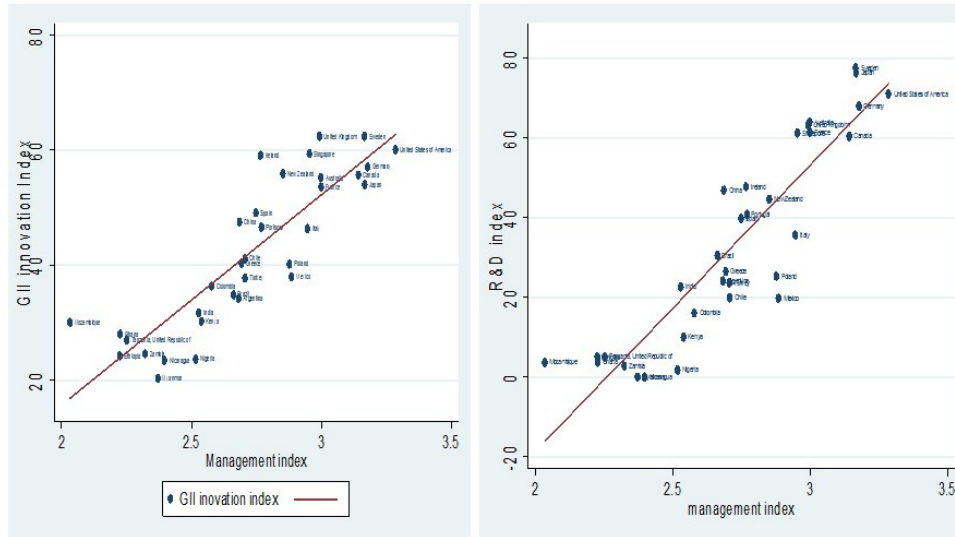


Source: Cirera and Maloney, 2017

11 China New Drivers of Growth: Innovation and new technology revolution



COUNTRIES WITH BETTER MANAGED FIRMS ARE MORE INNOVATIVE, AND R&D AND MANAGEMENT ARE COMPLEMENTARY



Source: Cirera and Maloney, 2017

12 China New Drivers of Growth: Innovation and new technology revolution



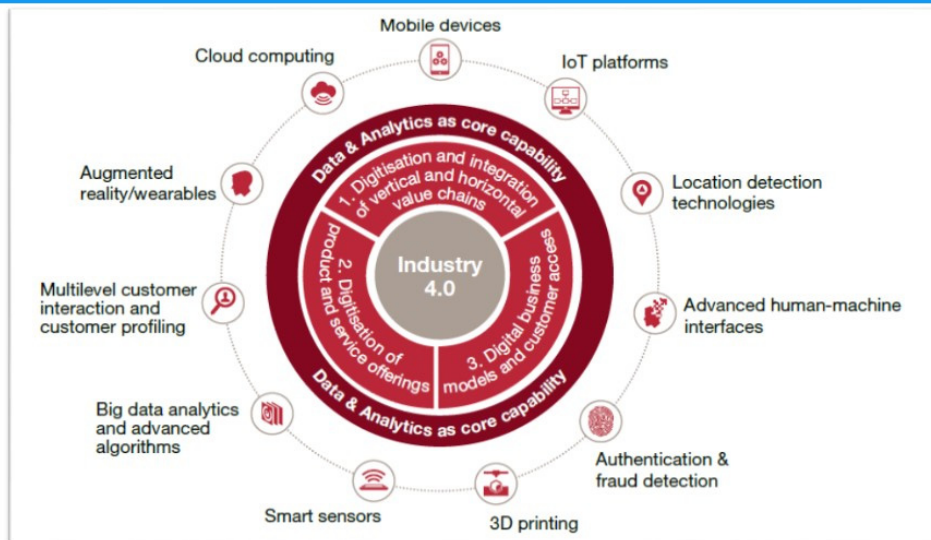
SIX CHALLENGES FOR INNOVATION POLICY...

- Identifying and promoting innovative gazelle firms: 2%-3% of firms responsible for bulk of innovation, productivity gains and employment.
- Improving research outcomes. Only a tiny fraction of patents lead to commercializable products and services.
- Developing skills and creativity that makes the workforce more entrepreneurial and innovative.
- Orienting formal research so as to stimulate innovation in tradable and non-tradable services.
- Extracting more productivity and employment gains from social networking (apps economy); the “sharing economy” (Uber, Airbnb); and medical technologies catering to the aged.
- Harnessing innovation in transport and energy areas and the Internet of Things to “green” cities and increase urban agglomeration economies.

13



INDUSTRY 4.0 IS TRANSFORMING PRODUCTION PROCESSES



Source: PWC 2016

14



“INDUSTRIAL UPGRADING” DEFINED

- Increased involvement of Chinese workers in higher value-added (VA) activities,
 - Resulting in increased labor productivity and return on capital, and productivity-driven growth.
- May take place
 - Horizontally when more working hours are spent in higher VA products/sectors (“inter-product”, or inter-sectorial), e.g. moving from traditional train to high-speed train, or moving from furniture to automobile;
 - Vertically when more working hours are spent in higher VA tasks of the same value chain (“intra-product” or intra-sectorial), e.g. moving from assembly to design of iPad.
- Requires
 - Demand: Creating demand for high-productivity workers;
 - Capacity: Matching the demand with a supply of workers with the required skills and capacity.
- Capacity is often the binding constraint, which requires, among others,
 - Innovation at home and
 - Integration with the global value chains, including integration with neighbors.
- China needs a balanced structure of high-low VA activities; low VA ones may be important to low-income, low-skilled workers.



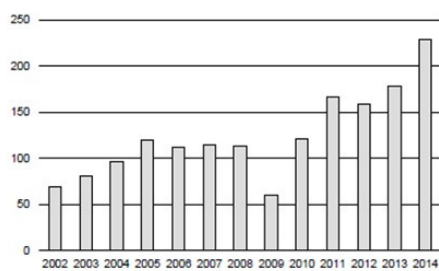
15

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AND CHINA IS AT THE FOREFRONT OF MANY TECHNOLOGIES

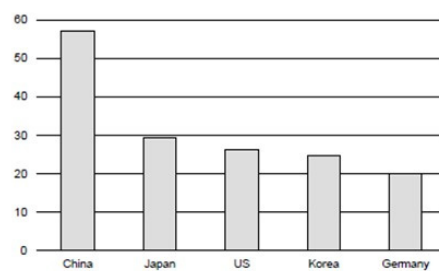
GLOBAL ROBOT SALES RISING STRONGLY

Chart 3: Global sales of industrial robots, in '000 units



FIVE COUNTRIES ACCOUNT FOR 70% OF SALES

Chart 4: Sales of industrial robots by country, in '000 units (2014)



Source: UniCredit 2016

16 China New Drivers of Growth: Innovation and new technology revolution

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BUT CHANGE IS DISRUPTIVE AND ITS DIRECTION UNCERTAIN

- Horizon technologies
 - Internet of Things
 - Wearable computing
 - Self-driving vehicles
 - 4D printing (programmable matter)
 - Synthetic biology (e.g. BioBricks)
- Technology creates multi-order effects which are impossible to predict
 - From Internet to social media
 - From 3D printing to decentralization of manufacturing to changing nature of work
 - From robotics to self-driving vehicles to changing infrastructure landscapes
 - Much innovation is taking place in “traditional” industries such as transportation (e.g., Uber, Lyft) and hospitality (e.g., AirBnB)

Innovation Disruption

TRADITIONAL INDUSTRY	START UP MODEL
Hotel Chains	Airbnb
Taxis	Uber/Lyft
Radio	Pandora/Spotify
Pictures	Instagram
Office Space	WeWorks
Vocational Education	General Assembly
Access to finance	Kickstarter
Phone calls	Skype/Vonage

17 Source: China New Drivers of Growth: Innovation and new technology revolution



Trouble in the Making? The Future of Manufacturing-Led Development

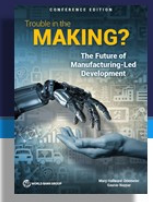


IMPLICATIONS

- Alternatives?
 - Demand for services is growing faster; will continue as incomes rise
 - Many services now share same desirable features as manufacturing – tradeable, scalable, source of innovation and technology diffusion, higher productivity, creating jobs.
- Leapfrogging
 - Is leapfrogging technologies possible?
 - Technology is making entry easier and allowing different business models
 - But within production, skepticism that can use more sophisticated systems if can't master simpler ones
 - Is industrial policy necessary?
 - Riskier – as technologies shift; larger ecosystems matter for success so narrow interventions unlikely to work
 - Window to use older technologies; use to catch up
 - Is industrialization necessary?
 - Countries can move into higher value added services without having industrialized
 - Development strategies should not assume linear progression across activities
 - Pay attention to the jobs and productivity dynamics rather than the sector per se
- Urgency rather than alarmism
 - Complacency is costly; Change is disruptive, but being left behind is more costly.
 - Time of transition. Change is coming – but at different speeds across activities. There is a window to adjust; countries and firms need to take advantage

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KEY MESSAGES

- Manufacturing will remain a part of development strategies, although likely with fewer dual benefits of productivity and jobs
- Some manufacturing industries will remain feasible entry points for less-industrialized countries and drivers of low-skill employment
- New sources of growth -- Services are both increasingly important for the success of manufacturing and themselves a source of dynamic gains and employment
- Urgency rather than alarmism is appropriate
- Need to balance current focus on disruptions with positioning for new opportunities
- Ensure inclusive access to technology – and that technology contributes to inclusive outcomes

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NEW AREAS IN THE INNOVATION SPACE

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Inclusive Innovation

➤ *Inclusive Innovation is any innovation that leads to affordable access of quality goods and services creating livelihood opportunities for the excluded population, primarily at the base of the pyramid and on a long term sustainable basis with a significant outreach.*

• (Ramesh A. Mashelkar and Vinod K. Goel, "Inclusive Innovation: More for Less for Many", 2012).



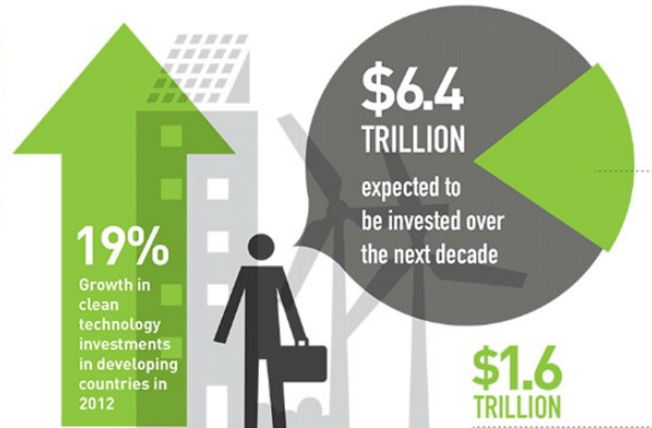
Embrace Infant Warmer: providing low-cost incubators to prevent neonatal deaths in rural areas in developing countries at 1% the cost of a traditional incubator

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Green Competitiveness

THE \$6.4 TRILLION CLEAN TECHNOLOGY MARKET IN DEVELOPING COUNTRIES



\$1.6 TRILLION

ACCESSIBLE TO SMALL- AND MEDIUM-SIZED ENTERPRISES (SMEs)



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SUPPORTING GREEN INNOVATION IN CHINA

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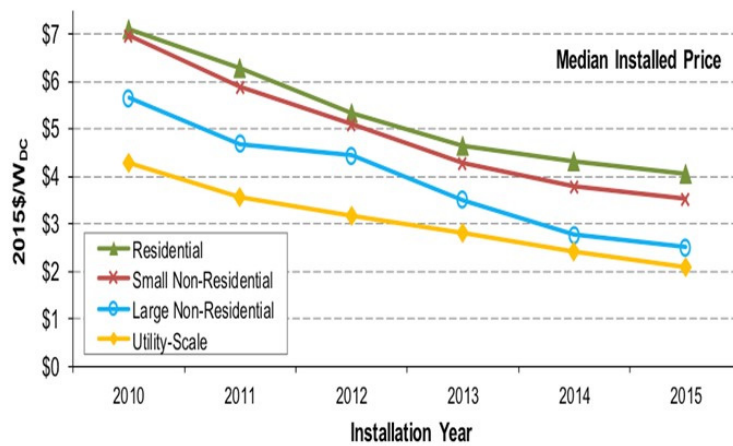
OBJECTIVES OF THE STUDY

- *To contribute to promoting green innovation as a new driver of growth in China by*
 - (i) analyzing the competitive position of China in global green technology markets and overall green technology market trends,*
 - (ii) analyzing the capacity of the supporting regulatory and institutional framework for green energy innovation (focus on Solar, Wind and Energy Storage) in China against international good practice and the global leaders, with a special focus on public support for green R&D and innovation, and*
 - (iii) offering policy recommendations on what China could do to support the expansion of green industries through innovation and transform them into a new driver of growth for China.*

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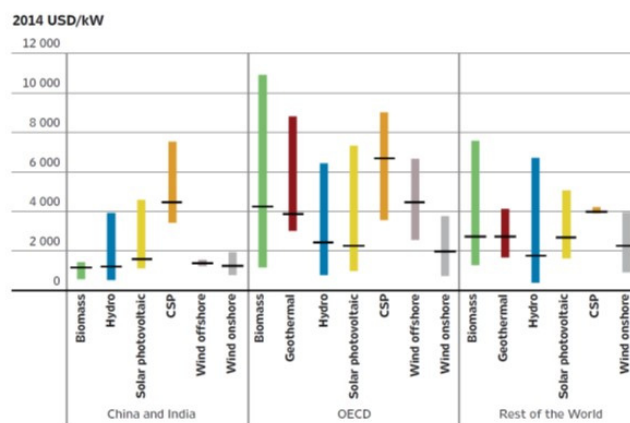
INNOVATIONS HAVE LED TO CONSISTENTLY DECLINING COSTS IN SOLAR PRICES



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FOR RENEWABLES FURTHER COST REDUCTIONS CAN STILL BE EXPECTED IN THE FUTURE



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WHY GREEN INNOVATION ?

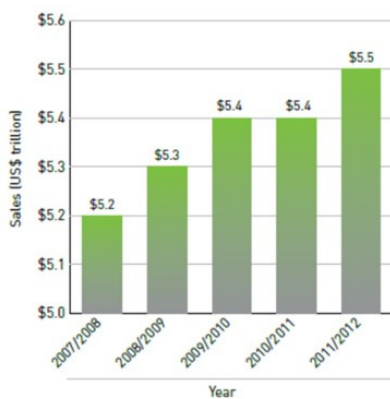
- China's green innovation ambition stems from the alignment of this industrial strategy with other key national priorities; namely meeting growing energy demand, reducing air pollution, and developing new high-tech industries.
- Environmental Challenge: China's rapidly growing economy, population, and energy consumption are all threatening its future environmental sustainability. Its reliance on coal is at the heart of most of China's environmental troubles.
- Economic Challenge: China aims to promote growth in service industries because of their higher value-added to the economy and the potential energy saving and environmental quality benefits associated with a shift away from heavy manufacturing.
 - To facilitate this industrial shift, the government explicitly identified a new set of high-value strategic industries as essential to the future of the Chinese economy

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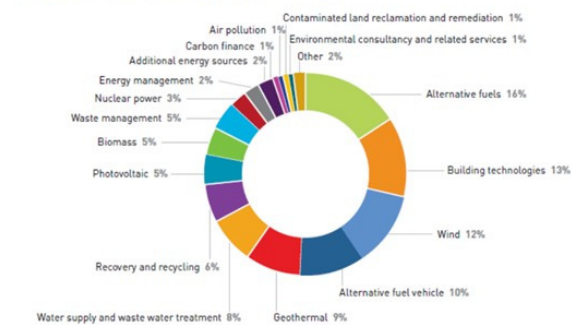
THE GLOBAL MARKET FOR CLEAN TECHNOLOGIES IS LARGE

FIGURE 2.1. Growth in global clean technology sales 2007-2012 (in \$ trillion)



Source: U.K. BIS (2013).

FIGURE 2.2. Global clean technology sales breakdown, 2011/12



Source: U.K. BIS (2013).

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GREEN INDUSTRIES ARE ALREADY A SIGNIFICANT PORTION OF CHINA'S ECONOMY

- The wind power industry alone accounts for over US\$25 billion per year of investment
- China accounted for half of the world's solar power production in 2010
- The overall contribution of emerging green industries to China's GDP could amount to 15% by 2020

• **Source: World Bank / DRC 2013**

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GREEN INNOVATION AS A NEW DRIVER OF GROWTH

- Green innovation can become a new driver of growth by:
 - (i) enhancing productivity in traditional industries by reducing the energy use and lessening the environmental impact,
 - (ii) expanding new green industries, such as renewable energy, clean cars and waste management,
 - (iii) leapfrogging technology developed in existing countries to give rise to new, yet-not-existent industries;
 - (iv) enlarging the service sector that underpins green development such as contract energy management or clean public transport; and
 - (v) reduce climate-related risks and impacts, including floods, excessive temperatures and other extreme weather events and thus increase environmental sustainability of growth.

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ANALYSIS UNDERTAKEN

Analyzed the competitive position of China in select global green technology markets and overall ongoing green technology market trends.

- Analyze changes in market shares of Chinese producers in global green technology markets, with a special focus on select sectors including renewable energy (wind, solar, thermal energy);
- Using the patent data, undertook a citation function analysis of global patenting in technologies related to select green industries to evaluate the level of innovative activity.

Analyzing the capacity of the supporting regulatory and institutional framework for green innovation in China against international good practice and the global leaders, with a special focus on public support for green R&D and innovation

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THE ROLE OF POLICY AND TECHNOLOGICAL ADVANCEMENTS



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KEY POLICY RECOMMENDATIONS

- Increase support for early-stage innovation
- Continue to focus on dynamic cost innovation
- Take a more comprehensive approach to measuring innovation
- Strengthen the political, regulatory and business environment for innovators
- Connect China with global innovation networks
- Improve Market Design to Allow Renewable Energy to Compete
- Focus on performance, not just capacity expansion

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Main messages: Insights for the past

- Policy and reform continuity reduces uncertainty for investment in innovation and is an important determinant for long term growth. Countries with frequent policy reversals are often trapped at middle income levels.
- Continuous investments in human capital would allow a country to stay ahead in the race between skills and technology as wage levels and technology advance further.
- There is still scope for catching up; for instance in e-commerce and other more advanced digital technologies.
- The public and private sector need to invest more in R&D and a dynamic ecosystem for science, technology and innovation and a stronger academic system.
- Supporting firms' internationalization is likely an effective innovation policy. It can include supporting managerial capability upgrading or encouraging mentorship for startups and ICT firms.

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“Sub-national Economic Competitiveness, Welfare Spending and Budget Sustainability of Greater China Economies”



**Presenters from ACI-LKYSPP, NUS (from left to right):
Dr Zhang Xuyao and Mr Mao Ke**



**Moderator from ACI-LKYSPP-NUS (second from right):
Mr Isaac Tan**

Discussants for Session 1:



Dr He Dongni

Deputy Director, China Institute for Reform and Development, People's Republic of China



Dr Fan Yubo

**Associate Professor, Policy Research Office, Shandong Academy of Social Sciences,
People's Republic of China**

Forum Luncheon Talk

“Welfare Spending and Budget Sustainability: The Case of Singapore”



Mr Henry Kwek

Member of Parliament & Member, Government Parliamentary Committee for Trade and Finance, Republic of Singapore

This is a big topic today, welfare spending. Before I start my presentation, I would like to spend a few minutes on welfare spending. Welfare spending is very complex. It is housing, healthcare, and education. Basically, anything that is not military, economic, or infrastructure. It is the bulk of most government’s spending. It is also the reality in which people live in. That is why our government spends a tremendous amount of time thinking about these issues on a daily basis. Today, what I am going to talk about is not just about painting a picture of our philosophy towards welfare spending, but also the outcome, how we are going to adjust to new realities and therefore, whether or not it can be sustainable.

Now the answer to this sustainability question is a lot more difficult, in my view, compared to the past. To paint a context for Singapore, we are a small, open economy, and like what our friend Smita from the World Bank has mentioned earlier, we are living in this period of hyper-competitive globalisation where innovation is so key and the rules have changed completely, with technological upheavals, and also to fundamental geopolitical changes. That is the first part that Singapore is living in. The second part is that we are a society that is staring down a demographic cliff of ageing. We are literally ageing faster than Japan. The third thing is that, as Singaporeans, we are a society with a heightened sense of national identity who aspire for a better life within a more inclusive society.

OUR WELFARE SPENDING MUST MEET THE SOCIAL NEEDS OF TODAY AND TOMORROW

Today

- Good policy outcomes without excessive spending
- Inclusive society that takes care of the needy and our seniors
- A low and progressive tax system for Singaporeans
- Opportunities for improved income and wealth
- Acceptable cost of living

Tomorrow

- Converting the Silver Tsunami into a Silver Dividend
- Equipping our people with tomorrow's technology and skills
- Continuing to tackle inequality, even after three successive generations have been uplifted from poverty

These circumstances are quite different from a few decades ago where, if we want to change our GDP numbers, we can up or dial back on economic inputs, and there was clarity on how we can improve our economic transformation by moving up the value chain. There were clear ways to move forward, and that general sense of economic certainty allowed us to manage our welfare spending because you can decide on what the numbers will grow to and what we can afford on welfare spending. In this new era, to answer the question of welfare spending and sustainability, we cannot just describe welfare policies in isolation, and then project them with steady increments. We need to look at the welfare spending programs to see whether they can meet the baseline expectations of Singaporeans, and also meet the future challenges of the country because if our welfare spending does not meet the needs for a small trading country like Singapore, which also has democratically elected government, the feedback loop is very quick. The feedback loop for us is not just whether or not it is sustainable, but whether or not we can continue to exist as a sovereign country. Perhaps because of this, our country spends a lot of time thinking about these issues.

PRINCIPLES FOR ENSURING WELFARE SPENDING SUSTAINABILITY

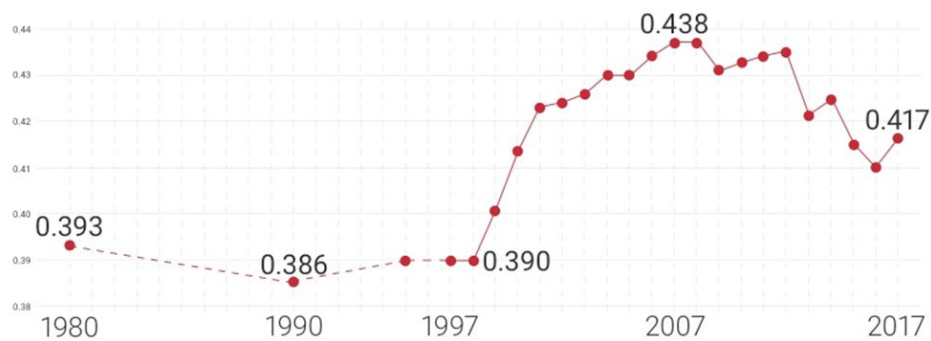
1. Active and tightly interconnected policies that supports personal responsibility and community giving
1. Income redistribution, which creates a sense of togetherness
3. Invest in our people to adjust to technology changes and globalization
4. Achieve the right balance between taxation; risk pooling; and personal responsibility
5. Remain fiscally disciplined, while tapping on our fiscal strengths

Now let us talk about what Singaporeans want. This determines what our welfare spending priorities should be. Our people want a good policy outcome without excessive spending, an inclusive society that takes care of the needy and the seniors, a low and progressive tax system for Singaporeans, opportunities for improved income and wealth within an acceptable cost of living. These are what our people want and what we have been striving to achieve. Now, given this new reality, we also have to think hard about our ageing population. How can we convert that silver tsunami into silver dividends? How can we benefit from ageing rather than just seeing it in dismal terms? How can we equip our companies and people for tomorrow's technology and skills? Smita, today, sketched out the competitive dynamics of the world, and the infrastructure part is important, but the people part is just as important. How do we make sure the people and SMEs keep up with it? And there is also a particular part of the Singapore ethos: we believe that we are a meritocratic country and after three successive generations since independence of uplifting people from the bottom, how can we continue doing this? Because the moral authority of our government depends largely, in my view, on whether or not we can still create a better life for anyone regardless of where they start in life.

Therefore, what I have observed is that our way forward adheres to five key principles. The first thing is active and tightly interconnected policies. That means that welfare policies must be active and working together in unison as a system, not in isolation, but to support personal responsibility and communal support rather than to erode the sense of work ethic. The second part is that, we are dealing with an age of globalisation and rising inequality, we need to do income redistribution because it creates a sense of togetherness that our country is here together. The next thing is that, we need to invest in our people, in technology changes and globalisation. In fact, there is a lot of discussion now, and they are saying that globalisation is good, but what is the challenge and pushback for globalisation is that, can governments allow the winners to compensate the losers in globalisation. Bearing in mind, in economics, there is a concept called loss aversion, which means that if I take one dollar from you but give you one dollar, you actually feel worse off. So in redistribution, and making sure that people see the benefits from globalisation is extremely important. The next thing is that, like any government, we need to always find the right balance between taxation – when do we tax, when do we do risk pooling, and when do we focus on personal responsibility. In every policy that I mentioned, there is always these questions. And the answer to this balance changes on the time and circumstances. Of course, Singapore has been known to be fiscally disciplined, but how can we do so and, at the same time, identify opportunities where we can tap on our fiscal strengths.

Let me now walk you through our current state of affairs before I illustrate how we can meet our current welfare needs by incorporating these five principles. There are studies that show that GDP growth increases inequality. This happens in even some developed countries because the rich somehow find a way to avoid paying taxes, and the middle class pays taxes not only for itself, but also for the poor so the tax burden is mainly on the middle class. For Singapore, we ensure that our economy is both open and competitive. The key idea that we have is that we must make money from the rest of the world to pay our inclusive society within Singapore. Now, the rich are not asked to pay high taxes, so they are happy to pay. The taxes that the rich then pay take care of the poor, and the middle class is able to get more than it sees.

Gini coefficient among resident employed households, before taxes and transfers

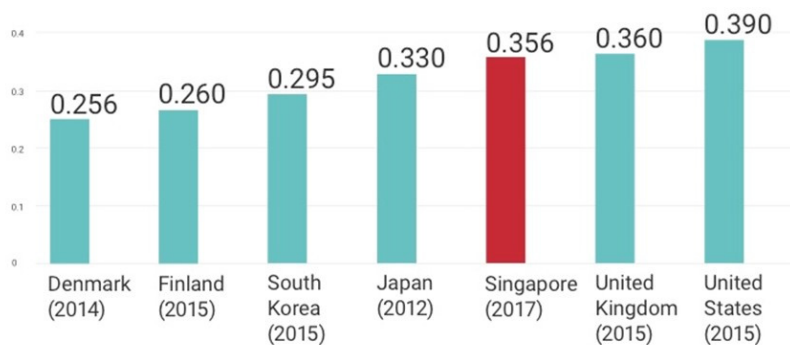


* Resident employed households refer to resident households with at least one working person.
 * Based on equivalised monthly household income from work (including employer CPF contributions), computed using the Square Root Scale. The Gini coefficient for 1980 is a broad estimate.
 Source: Department of Statistics

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International comparison of Gini coefficients, after taxes and transfers (latest available year)



* Singapore's Gini coefficient and the Gini coefficients of other countries calculated by the Organisation for Economic Co-operation and Development (OECD) are all based on the Square Root Scale. Equivalence scales are used to adjust for household size so that the incomes of households of different sizes and compositions are comparable to each other.

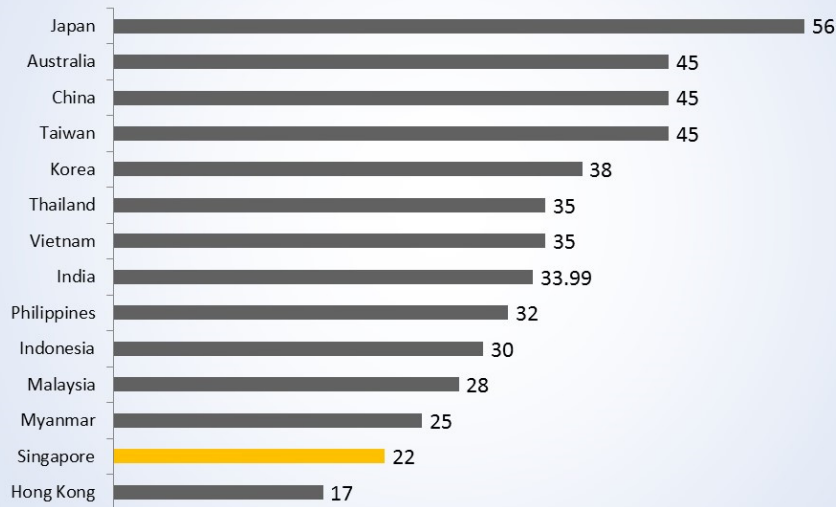
* Singapore's Gini is based on household income from work among resident households with at least one working person. Data on OECD economies is based on income from all sources (which includes non-work income from investments and property) among all households. For further details, please refer to MOF's Occasional Paper on Income Growth, Distribution and Mobility Trends in Singapore which can be downloaded from <https://www.mof.gov.sg/Resources/FeatureArticles/Income-Growth-Distribution-and-Mobility-Trends-in-Singapore>

Source: <https://www.mof.gov.sg/Newsroom/Parliamentary-Replies/before-and-after-taxes-and-transfers-singapore-s-gini-coefficient>

3

Now let's look through some data to illustrate how we implement the results of this inclusive growth. This is a chart of our Gini coefficient. The interesting thing is that, when we have growth in Singapore, our Gini coefficient actually comes down, which means that when we do well economically, we have been able to translate that into a sense of equality. People are familiar with the GDP per capita numbers, the income numbers, but I think it is also important to point out that our growth is able to be inclusive. This is the Gini coefficient after taxes and transfers. It is important that we continue to moderate down from 0.4-something to something much more palatable to our people.

SINGAPORE HAVE RELATIVELY LOW PERSONAL INCOME TAXES COMPARED TO OTHER COUNTRIES



* Based on 2016 rates

%

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SINGAPORE'S PERSONAL INCOME TAXES BRACKETS ARE ATTRACTIVE

Taxable annual income (SGD)	Income tax payable* (SGD)	Effective tax rate
20,000	0	0%
50,000	1,250	2.5%
100,000	5,650	5.7%
200,000	21,150	10.6%
500,000	84,150	16.8%

* Based on income tax rate schedule from Year of Assessment 2017 (i.e. highest marginal tax rate of 22%)

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We have low income tax. Our income tax brackets, it is not just low tax that is important, but the income brackets are also quite attractive. Over 55 percent of Singaporeans do not pay income tax.

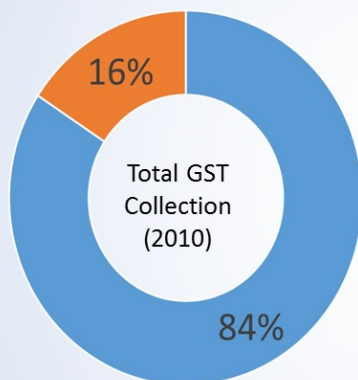
SINGAPORE'S GST/VAT AND CORPORATE TAXES ARE LOW COMPRED TO OTHER COUNTRIES

	GST/ VAT (%)	Corporate Tax Rate (%)
Hong Kong	NA	16.5
Singapore	7	17
New York	<i>(8.875 Sales and Use Tax)</i>	35
Sydney	10	30
Shanghai	17	25
London	20	20
Tokyo	8	23.9
Stockholm	25	22

* Based on 2016 headline rates

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GST largely paid by top earners



“Sixty percent of our population, **the bottom 60% pays 16% of GST.** 16% is paid by 60%, and the remaining **84% is paid from upper-income groups and foreigners.**”

Source: Budget 2011 Debate Round-Up Speech

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OUR OVERALL SYSTEM OF TAX IS PROGRESSIVE

- Top 10% income earners in Singapore contributes 80% of our personal income tax
- Middle income families (41st to 60th percentile) receive \$2 per every tax dollar
- Low-income families (up to 20th percentile) in Singapore receives about \$4 in benefit per every tax dollar
- > \$1.3-\$1.4 that middle-income households received per every tax dollar in UK, US, and Finland.

Our GST currently is now 7 percent, to be increased to 9 percent in the next term of government, but relatively we are okay for GST. For corporate income tax, we are considered low but we also have to watch out for competition. Our GST is largely paid by the well off, as well as non-Singaporeans. Our system of taxation is what you would call progressive. The top 10 percent of income earners in Singapore contribute 80 percent of our income tax. The low income, which is at the 20 percentile level, they get four dollars of benefit for every one dollar they pay. For our middle class, they receive something around two dollars for every dollar of tax that they pay. This is higher than the number you get when compared to the UK, France, Finland, or the US. In that sense, we are able to create more value than we take for a broad majority of Singaporeans. This can be summarised in a Chinese saying that goes “bao di bu fong ding”, which means that you do not cap the top, you let the strong performers perform, but you also uplift the bottom. And by creating value, you have the money to pay for that inclusive society.

OUR FISCAL SYSTEM IS CONSERVATIVE

SINGAPORE'S RESERVES

The reserves refer to net assets of the Government. The Government's assets include physical assets as well as the financial assets invested by the Monetary Authority of Singapore, GIC and Temasek.



Past Reserves

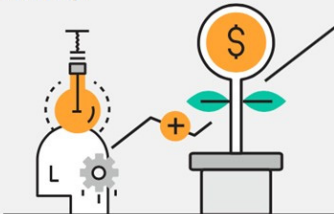
Reserves accumulated during previous terms of Government. To ensure fiscal discipline within each term of Government, the President has to approve any draw on Past Reserves.

Current Reserves

Reserves accumulated during the current term of Government

- No pay-as-you-go approach to funding entitlements
- To fund programs that stretch to the future, we create:
 - Government Trust Funds (e.g. pioneer generation package)
 - Endowment Funds (e.g. education scholarship and bursaries, social assistance)

We also have a very strict fiscal spending rules. We do not have the concept of pay-as-you-go approach for funding and entitlements unlike the US, because we feel that this creates inter-generational inequality, especially when you have an ageing society, that becomes very difficult to sustain. Within our budget framework, we have something called government trust funds. That is to say that if you make a promise that will expand beyond this term of government, you will have to put the money aside. You cannot just promise and then expect the future government to pay. You have to set money aside. There is also endowment funds beyond this, but in general, when we have extra money, we put it aside which we then use for social welfare.

<p>Reserves are a strategic asset</p> <p>which can be used in times of crises to mount a decisive & effective response.</p> <p>In 2008 Global Financial Crisis Singapore reserves were used to back a \$150 billion guarantee for all bank deposits in Singapore.</p> <p>In 2009 Recession The Government drew \$4 billion from the Past Reserves to fund the Jobs Credit Scheme, which subsidised employers' wage bills, and the Special Risk-Sharing Initiative to help viable companies gain access to credit.</p>	<p>Reserves are invested & managed carefully</p> <p>The returns on investments provide an additional stream of income for the Government to spend on the nation's priorities. This helps to secure Singapore's competitiveness by allowing us to make longer-term investments in education, healthcare, transport infrastructure, R&D and other areas to improve our living environment and to grow our economy.</p> 	<p>How does the current generation benefit from the Reserves?</p> <p>Singapore is able to take in money from the investment returns to supplement our Budget.</p> <p>Singapore has a framework that ensures the investment returns are tapped by the Government in a disciplined way, so that the reserves continue to grow with the economy. Under the framework, the Government can spend up to 50% of the long-term expected real returns on the reserves.</p> <p>This is similar to using part of the interest earned from our savings to fund our daily needs, without depleting our savings capital.</p>
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We also have our reserve management system. The essence of it is this: every term of government will start off with a blank slate. In that sense, at the end of a government term, their extra savings go into the reserves. We see ourselves as custodians of the next generation, so stewardship for us it very important. In that sense, this term of government we have extra spending, we can spend it but we cannot touch the reserves unless there are really strong reasons to and we need the president's agreement to do that. Another point is that, when we sell land, it goes into the reserves because we see land as not something we pass down to the future generation but as something that we borrow from the future generation. Therefore, land sales strictly go into the reserves and not operating expense. Then of course you have these reserve. We also have this framework where we can tap on the income of the reserves to fund our needs. Currently the framework is no more than 50 percent of the long term 20 year projected returns for our reserves.

WE ACHIEVE RELATIVE GOOD OUTCOME FOR KEY GOVERNMENT POLICIES

1st in Math, Science, Reading Outcomes
(PISA ranking)

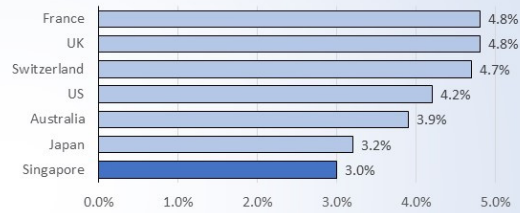
NUS graduates 16th most employable in the world
(Times Higher Education survey)



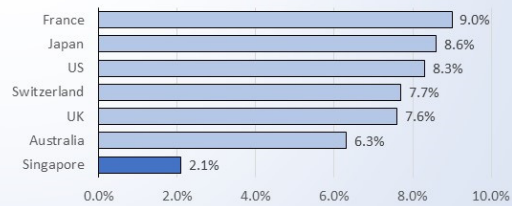
World No.2 for healthcare outcomes
(EIU ranking)

4th Healthiest country in the world
(Bloomberg Global Health Index)

Government Education Expenditure (% of GDP)



Government Healthcare Expenditure (% of GDP)

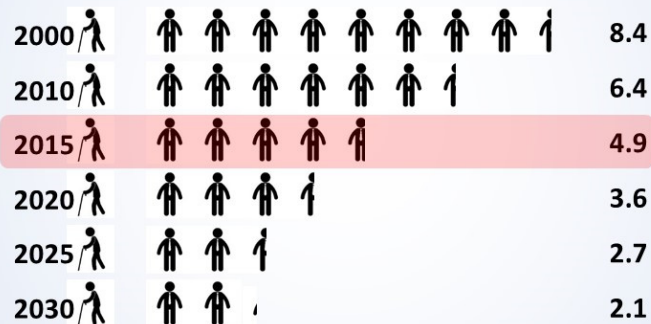


TOTAL FERTILITY RATE (TPR) HAS DECREASED IN SINGAPORE AS WELL AS IN KEY EAST ASIAN CITIES

City	Year	City TFR
Beijing	2010	0.70
Shanghai	2010	0.71
Seoul	2013	0.97
Tokyo	2013	1.13
Taipei	2014	1.16
Hong Kong	2014	1.24
Malaysia (Chinese)	2014	1.41
Singapore	2012 (Dragon Year)	1.29
	2013	1.19
	2014	1.25

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THIS LEADS TO A DECREASE IN NUMBER OF SINGAPOREAN WORKING ADULTS SUPPORTING OUR SENIORS



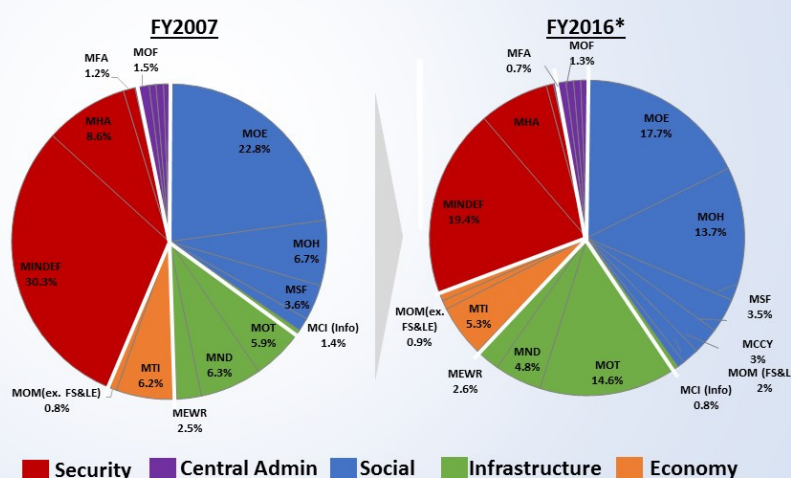
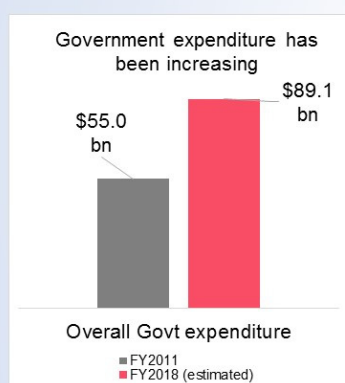
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At the same time, where our policies right now are such that we have relatively good outcomes for the amount of money that we spent. In terms of education, this pie chart is a good test of our education outcomes. We spent 3 percent of our GDP. And then we have a decent healthcare outcome, but with a very small percentage of expenditure on healthcare.

Earlier, somebody was talking about declining fertility rates. Our friends from China were talking about trying to increase the birth rates. I have something to share with our Chinese friends. We have tried to reverse it for a few decades but we have yet to be successful. I, myself, am a shining example of it. I am 42 years old now, and have a five month old baby, my first child. In that sense, this is a phenomenon that is very common in many parts of East Asian cities. We are making progress but there is a hard limit with which we can expect the success to be. This leads to a decrease in the number of Singaporean working adults who can support our seniors. This is the demographic cliff that we are talking about. When I first joined politics in 2010, there were about 6.4 working adults in Singapore per senior citizen but we are getting closer to 3.6 (in 2020). It will get more interesting. But we are not the only country in the world facing this, many parts of the world are facing this, and this is with a TFR of 1.29 compared to lower TFRs in many other countries.

WITH THE INVESTMENTS IN ECONOMY AND SOCIAL SECURITY, GOVERNMENT EXPENDITURE HAS INCREASED

Spending more to educate and care for fellow Singaporeans, and to create opportunities



Source: Ministry of Finance
* Revised FY2016 estimates

OUR SOCIAL AND INFRASTRUCTURE SPENDING HAS INCREASED SIGNIFICANTLY

	FY2007		FY2016	
	\$ terms	% Govt Exp	\$ terms	% Govt Exp
Social	\$11.4b	34%	\$28.7b	40%
Infrastructure	\$4.9b	15%	\$15.7b	22%
Economy	\$2.4b	7%	\$5.0b	7%
Security	\$13.2b	40%	\$19.5b	27%
Central Admin	\$1.2b	4%	\$2.4b	3%

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Now, of course then, we have to spend more on economy. This is the scale in which our budget increased in the last few years. In 2011, it was 55 billion Singaporean dollars, it is not 89 billion Singaporean. It is quite a hefty increase. You can see the mix of social spending. Last time (in 2007) this was being spent on defence and security. You can also see the social spending and infrastructure. Actually infrastructure also serves social needs not just for export needs, it is also for local needs. This amount has gone up a lot. In fact a lot of this has gone up because of the MRT lines that we are building and ramping up internally. This amount is actually on social spending, and we have increased it a lot. This is also housing, as a part of social spending. If you look at this, you can see the numbers shooting up.

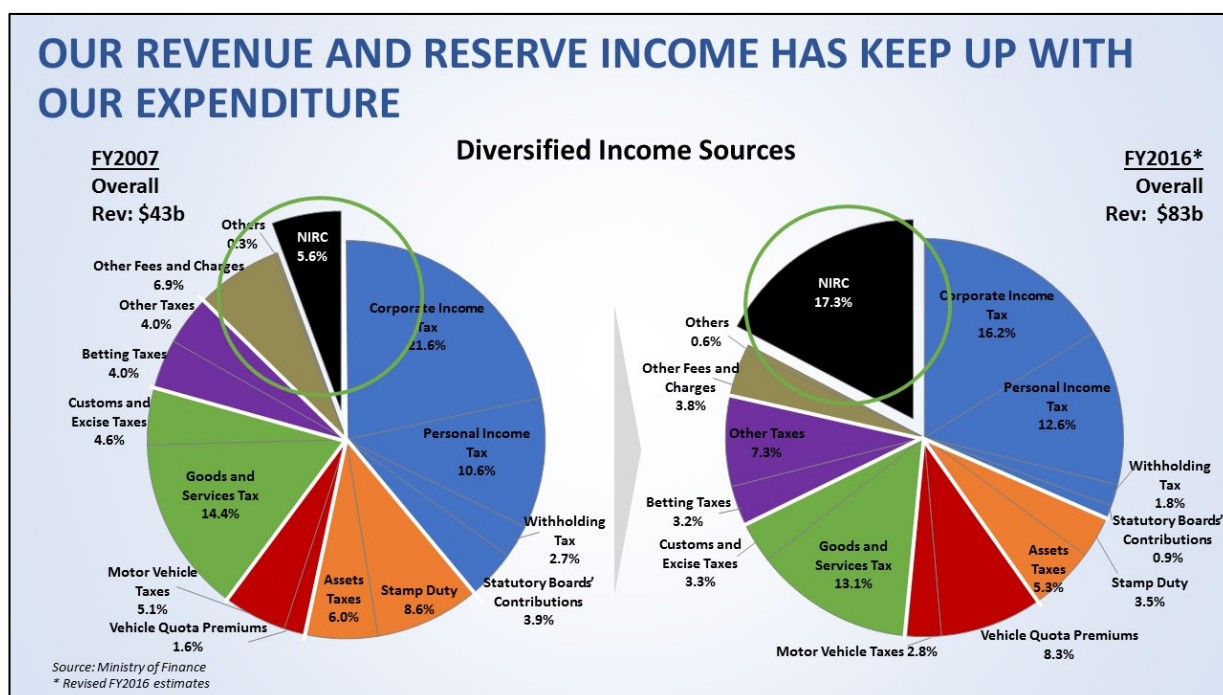
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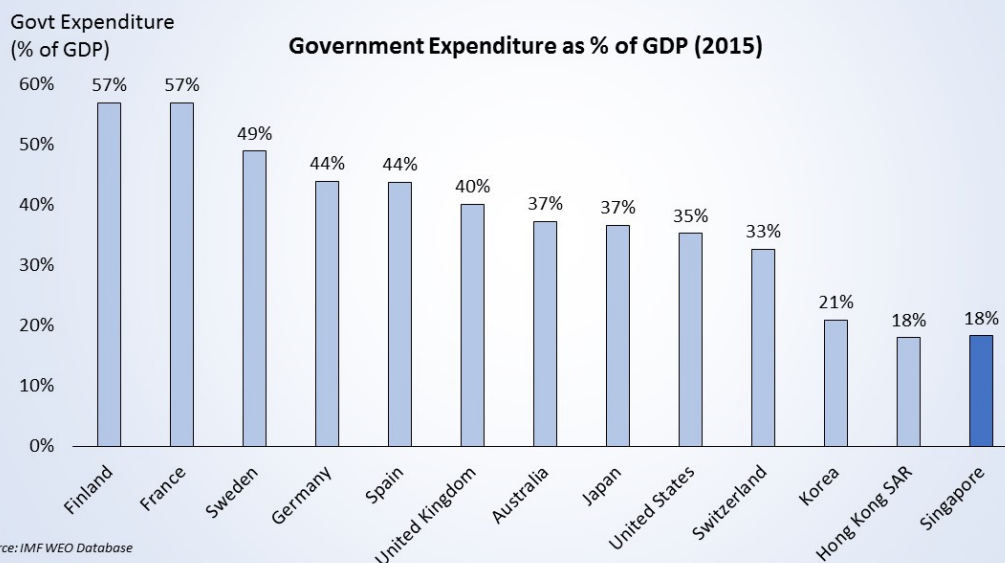
How are we doing with regards to revenue? In terms of revenue, we have been roughly able to keep up because our economy is growing, we are getting more diversified, but also another important component is this black pie, which is NIRC, our reverse income. Remember, when we mentioned earlier about us saving money through our national reserve? Half of our reserve income gets pumped back to our operating budget. This is now the largest contributor of income, even more than corporate and personal income tax.

OUR REVENUE AND RESERVE INCOME HAS KEEP UP WITH OUR EXPENDITURE



Beyond that, it is not just about investing in the welfare of people, the economy must work. We can have the software, but we also need the hardware. We are building on a whole variety of projects connecting Singapore and world. We hope our Malaysian friends will continue to develop it with us, but time will tell. We are also trying to increase the liveability of our place. Of course the people must get a lot of investments, and we have something called Skills Future, which is lifelong learning, and we are helping our people reskill for new jobs. Of course, the ageing tsunami is staring down at us, so the next question is about how sustainable it is.

WE ARE STARTING THIS JOURNEY FROM A STRONG BASE, WITH LOW GOVERNMENT EXPENDITURE



We have a lot of challenges, but we are starting the journey from a strong base because, currently, our government expenditure, as a percentage of GDP, is quite small so there is room for us to adjust and still be sustainable.

THREE EXAMPLES OF POLICY ADJUSTMENTS

1. Turning the Silver Tsunami into our Silver Dividend
 - Investing in our senior's health
 - Redesigning our healthcare system
 - Encouraging our seniors to stay physically and economically active
3. Refreshing our approach to Public Housing
 - Affordable and Sustainable
 - Increase social mixing
 - Strengthen family ties
3. Fighting Inequality Through Education
 - Supporting weaker students
 - Encouraging community to step up

I want to give three examples of how we are trying to adjust our policies to deal with, not just the needs, but also make sure that it is sustainable. The first thing is that we are investing in our seniors' health by rapidly expanding our healthcare system and significantly subsidising our seniors' healthcare cost. Within five years, we have tripled our healthcare spending from 4 billion to 12 billion. Percentage-wise, I believe that is the largest increase in any developed country in recent history. We also made progress, part of that being hardware infrastructure, building more acute care hospitals, community hospitals, specialist hospitals, and polyclinics. But we are also taking this chance to redesign our healthcare system. For example, acute care hospitals are for when people have an accident and need to go in, so we need the best equipment needed

to save people within the golden hour. So we designed it like an FI pit, like when the car comes in, within a few seconds there is a very express process where you fix it up and go. You need that for acute care hospital, but no country can afford putting everyone in an acute care hospital, so after you save their lives, you move them to a community hospital, which still has a good care but for more stable patients. And then you have specialist hospitals like the national cancer centre and national eye centre, which only specialise in one particular disease. So the production system is something equivalent to the Toyota production system: no variation and a constant churn of treating the same type of patient. That is an example of how we design our healthcare system. We have to be mindful of how to achieve sustainability. You cannot pile the same amount of resources into an ageing population or you will get in trouble.

And then, for the older Singaporeans who grew up in a third world country but retired in a first world country, we also have to change the medical financing formula. Basically, for hospitalisation costs, we have set aside 10 billion dollars for what we call the Pioneer Generation package for seniors, and we just announced the Merdeka growth package to help with the baby boomer's generations that did not have as much retirement adequacy as the young people today. We are also making changes for primary and chronic healthcare for the low and middle income groups where many elderly fall under, and we are going to have many significant subsidies.

At the same, we are also redesigning our healthcare system for sustainability, this is the second part. First, they must be in good health. Secondly, it must be sustainable. We are doing so by the three "beyonds", three strategies. Beyond healthcare to health. The buzzword last year was that we have declared a "war on diabetes" because diabetes is the root cause that leads to many not so good healthcare outcomes. At the same time, we are investing a lot of money in helping our people understand health and also get health screenings often, and it is often highly subsidised, so that they know where there are and they can do what is necessary. Better health means less healthcare spending.

The second "beyond" is going beyond hospitals to communities. Hospital care is very expensive, and it is sometimes best to get them to go back from the hospital to their communities and their homes. But to do that, you need to transform your healthcare system. You need to have home-based nursing, doctors who travel to nearby locations. You need to be able to send nurses to houses so that people can recuperate in the comfort of their house, and also for the whole system there will be a lower cost. Because sometimes health outcomes are due to personal habits, our nurses have even developed a reputation of going to patient's houses and raiding fridges, opening up the fridge and seeing what they eat. So that is where we are right now.

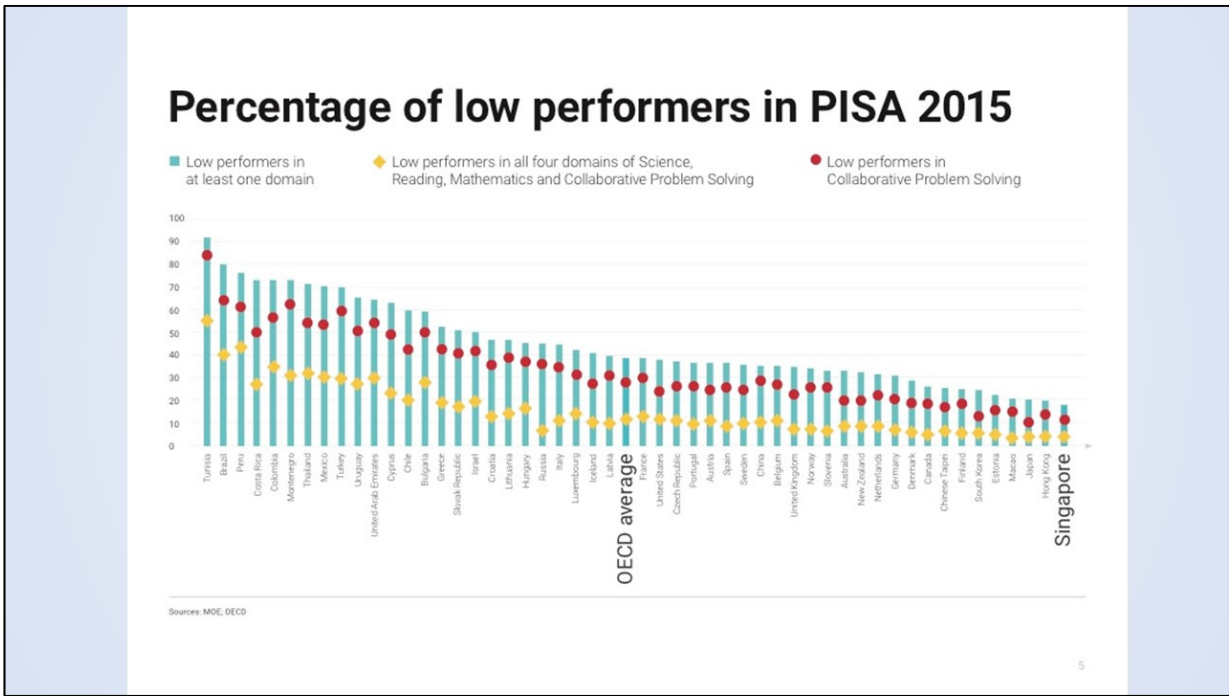
The third "beyond" is going beyond quality to value. This is an effort to retain or increase the quality of care while ensuring value for money. We have a new agency called the Agency for Care Effectiveness to research treatments that can provide the best value for money. For example, three drugs can offer the same result but they have different prices, which one do you choose? Or drugs can be more expensive but it offers better outcomes than cheaper ones, so we need to figure that out. We also try to inject transparency into the medical costs, so we benchmark the cost and then we publish it to share. When my wife was going to deliver, I looked up our MOH's website, and I was able to see, for example, delivery, the average, the 90th percentile or the top ten percentile charges of all hospitals. This allowed me, as a consumer to make the right decision.

The third point is that, now that our seniors are healthy and properly supported by healthcare, how can we make sure that they stay physically and economically active. We have done a few things here. Over the last few years we have tightened manpower policies to encourage Singaporean employers to take a harder look at our seniors to see if they can be part of the workforce. We have increased our retirement age from 62 to 67 but it was not just a blanket increase. We changed it so that we can guarantee employment by a company until 62. Beyond that, you can stay with the company, the company must offer you an alternative or compensate you, meaning that they may give you a different job scope, and, if necessary, lower pay. But then, they are obliged to hire you until you are 67. This is a way we try to make sure that our seniors are

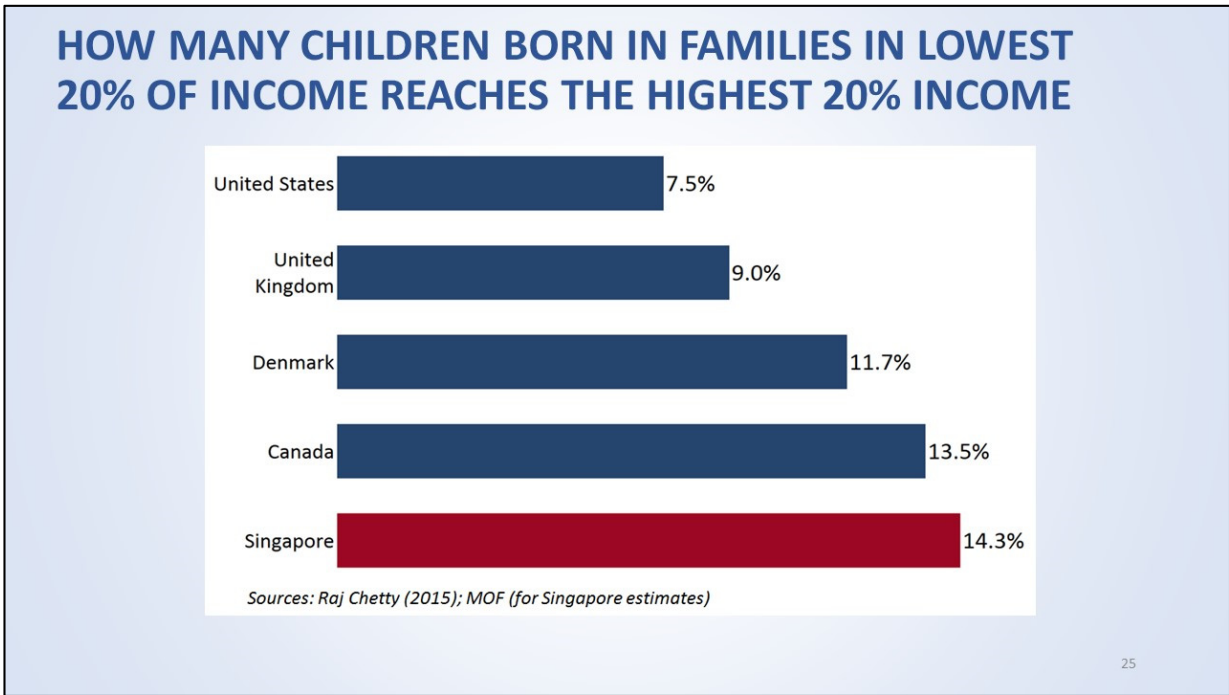
active but not at the expense of competitiveness. At the same time, we also subsidise companies to hire seniors, so the government pays, not the company, with offsets of up to 8 percent to hire elderly workers earning up to 4000 dollars, which comprises about three out of four seniors in Singapore. At the same time, we are doing something called the wage income supplement, so that means we try to stay clear from the minimum wage debate because the minimum wage debate basically says that you have to pay a minimum wage but it excludes a lot of people who are marginally unemployed. So we ask companies to pay a fair wage, and then we subsidise the individual senior's wage, which again is not done by the company. So, this three things, put together, is the beginning of our response to turning this silver tsunami into a silver dividend. Of course, a lot more can be done, we are only at the start of the process.

The second example of adjustments to policy adjustments is about our approach to public housing. Traditionally, Singapore is known for its affording housing policies. Now, how we do our housing policies is, based on the median income of applicants, we determine the housing price. The formula for us is four to five years' worth of annual income to be able to afford a house. This is dramatically lower than the rest of East Asia. We have linked the pricing to income instead of land cost. Most young couples have the means to buy a flat after a few years of work, and then we have subsidies which allow them to upgrade to a bigger flat, and also to resize to a smaller flat. That means, when they resize to a smaller flat when they grow old and the kids are no longer with them, they even get a bonus when they downsize. If they choose to live in the same place, we also allow them to have a way of monetising their equity by having a lease buyback. That means they sell back some of the lease to the government, and we pay them money, and we also give them a bonus. The other aspect that Singapore is well known for is the integration of all different ethnic groups for our public housing policies. Moving forward, we are tweaking with this to meet the future needs. We have having a stronger mix between people of different ages, income – that means different room types. We are trying to couple them closely. We are also building some larger flats to encourage three generational living as well as financial subsidies for young people to stay close to the old or for older people to stay closer to the young. It does not matter which way it goes. We are also putting seniors in the centre of certain new districts. For example, there is a new project, Kampong Admiralty, where we put them in the middle of it. We also subsidise upgrading to prevent ghettos from happening.

So the benefits of these changes in house policies: number one, it reduces the societal costs that arise from ghettos and ethnic enclaves. Two, it lowers the cost of caregiving because families can take care of each other. Three, it strengthens family relationships, therefore reinforcing the personal and familial responsibilities. Four, it prevents the overconsumption of housing by allowing people to move up or down based on their life stages and their needs. Five, at the same time we allow them to tap on the housing equity to fund their own retirement.



Now let me talk about the last set of policies, which is fighting inequality through education. Meritocracy and rising income has uplifted the first two or three generations of Singaporeans. Among OECD counties, among the bottom performers, we have the least amount of low education performers. Not just in math and statistics, but also in the ability to communicate and collaborate.



This is a slide that, as a Singaporean, I feel the most pride in showing, which is that we have a large percentage of people from the bottom 20 percentile able, in their lifetime, make it to the top 20 percentile of income. But after three successive generations of uplifting people, precisely because of the success in doing so, the smaller group of families that remain poor are facing increasing challenges and, paradoxically, our past success makes it harder for us to succeed in the future. Therefore, how are we going to adjust? We are choosing to do so by focusing on education. We have already subsidised our education system a fair bit, but we are also investing in our weaker students to catch up. For example, today we actually spend higher spending per capita for weaker students. Part of it is because of a de facto learning effect by the student-teacher ratio. For

example, for the lower primary school, we have learning support programs in groups of eight to 10 to support the weaker students. In our technical institutes, we have smaller class sizes, sometimes only 20 people are in a class.

For children from needy families, we are also moving upstream to solve the problem. We really have to start from the pregnancy stage. We have a new program called Kidstart, where we build all-around support for students from lower income families. Our social work agencies rope in counsellors, nurses, paediatricians, and educators to provide support for young families from the time of pregnancy. This is very interesting trial. If it is successful, we will definitely want to expand on it.

We also strengthened early detection and intervention in learning disabilities because you can intervene a lot more effectively when you are young, compared to the old. We are also invested in early childhood education. After school environment matters too, so we are also strengthening to support so that by 2020, we will have student care centres in every primary school so that we can provide learning support for people from needy families.

Last of all, we are encouraging the spirit of giving from the community because social capital is just as important in uplifting as compared to government dollars. We have encouraged financial donations to charities by tax deductions. Moving forward, are also trialing tax deductions of donations in kind. We are also encouraging volunteerism in young. Our students do not only have to perform well academically, they also have to do social work, and that is also rewarded in terms of performance.

PRINCIPLES FOR ENSURING WELFARE SPENDING SUSTAINABILITY

1. Active and tightly interconnected policies that supports personal responsibility and community giving
1. Income redistribution, which creates a sense of togetherness
3. Invest in our people to adjust to technology changes and globalization
4. Achieve the right balance between taxation; risk pooling; and personal responsibility
5. Remain fiscally disciplined, while tapping on our fiscal strengthens

To conclude, at the personal level, it is very hard to me, even as somebody who is familiar with the system, to make a predication on the sustainability of our welfare spending, though we starting this next step on a strong footing. The government does not see welfare spending as just mere tax dollars and spend on recurring programs, but rather that they are policies that need to be changed dynamically in a changing world, and these policies must work hand in glove. Will Singapore be financially sustainable? Will Singaporeans be able to learn 21st century competencies? And can our economy transform itself with shifting global trade patterns and technology disruptions? And will we succeed in keeping social cohesiveness? That does not just depend on policies but also on the execution of these policies. It also depends on the people, and how this whole system shapes our social norms, and, as a small country, on external circumstances. I think that our chances are highest when our welfare policies are guided by these clear principles. Thank you!

“Sub-national Economic Competitiveness, Welfare Spending and Budget Sustainability of India”



Presenters from ACI-LKYSPP, NUS (clockwise from top-left):
Ms Melissa Poh, Mr Nirnaya Bhatta, Ms Ridhi Bhatnagar and Ms Jigyasa Sharma



Moderator from ACI-LKYSPP, NUS (first from right):
Dr Zhang Yanjiang

Discussant for Session 2:



Dr Manoj Panda
Director, Institute of Economic Growth, India

“Urban Composite Development Index for 17 Shandong Cities: Ranking and Simulation Analysis”



**Presenters from ACI-LKYSPP, NUS (from left to right):
Dr Zhang Xuyao, Mr Lim Tao Oei and Mr Isaac Tan**

Session 3 (Continued)



**Moderator from ACI-LKYSP, NUS (fourth from right):
Mr Tan Kway Guan**

Discussants for Session 3:



Ms Sarah Lin
Urban Specialist, Global Practice for Social Urban Rural and Resilience, The World Bank



Professor Yang Jinwei
Vice President, Shandong Academy of Social Sciences, People's Republic of China



Mr Wang Kejian
Chairman, Urban Construction Press, People's Republic of China

Closing Remarks and the Way Forward



**Associate Professor Tan Khee Giap
Co-Director, ACI-LKYSPP, NUS**

Again, following the tradition of the Lee Kuan Yew School of Public Policy, I will make three points. The first point is that I think you must give all participants a round of applause for those who persist and continue to persevere till the end of the forum, you are among the best participants! We really appreciate the discussions that we have for this Asia Economic Forum who came all the way from India, China, Vietnam and Malaysia. They read through our papers before arrival, worked on their discussion notes and made insightful comments during lively question and answer sessions notwithstanding their busy schedules, so can we give them another round of applause please!

Secondly, during the course of the Asia Economic forum, we have had good harvests. We had some plans in the pipeline and now it is even clearer to me the purpose of this kind of economic forum. I think that we are very likely to proceed with this kind of urbanization composite index for other provinces in China. We must also speed up our collaboration with the Institute of Economic Growth of India on the topic that we talked about, that is the balanced development of India's Vision 2030.

Finally, with the World Bank, we were talking about how we can work with them on a Productivity Tracking and Management Efficiency (PTM) Index for small and medium enterprises (SMEs), which we have already embarked on with some selected regional economies. I have been assessing the potential of the PTM Index for regional SMEs. As of now we do have commitments to work with East Java province of Indonesia, Vietnam Chamber of Commerce and Industry, Andhra Pradesh and Uttarakhand states of India and Taiwan. Multinational corporations can thus take advantage of the PTM Index as a platform to outsource and invest with SMEs in Asia.

Again, thank you very much for being here today!

Programme

2018 ASIA ECONOMIC FORUM

Seminar 2: Economic Competitiveness, Welfare Spending and Budget Sustainability for Greater China and India

JOINTLY ORGANISED BY
THE WORLD BANK GROUP
&

ASIA COMPETITIVENESS INSTITUTE (ACI) AT LEE KUAN YEW SCHOOL OF PUBLIC POLICY
(LKYSPP), NATIONAL UNIVERSITY OF SINGAPORE (NUS)

30 AUGUST 2018

Dress Code: Business Attire

Venue: Lobby, Oei Tiong Ham Building, LKYSPP, NUS

Time	Programme
0930 – 0955	Arrival of Keynote Speaker, Discussants, Moderators, Presenters and Participants
1000 – 1010	Welcome Remarks Associate Professor Tan Khee Giap Co-Director, ACI-LKYSPP, NUS
1010 – 1020	Opening Remarks Ms Fatouma Toure Ibrahima Operations Advisor, Singapore Infrastructure and Urban Development Hub, The World Bank
1020 – 1050	Keynote Speech Ms Smita Kuriakose Senior Economist, Finance Competitiveness and Innovation, The World Bank
1050 – 1105	Question & Answer Moderator: Associate Professor Tan Khee Giap Co-Director, ACI-LKYSPP, NUS
1105 – 1120	Coffee/Tea Break
1120 – 1305	Session 1: Sub-national Economic Competitiveness, Welfare Spending and Budget Sustainability of Greater China Economies
1120 – 1125	Moderator: Mr Isaac Tan Research Assistant, ACI-LKYSPP, NUS
1125 – 1145	Session 1a: 2018 Annual Update of ACI's Competitiveness Ranking and Simulation Studies on Greater China Economies Presenters: <ul style="list-style-type: none">• Dr Zhang Xuyao Research Fellow and Deputy Director (Research), ACI-LKYSPP, NUS• Mr Mao Ke Research Assistant, ACI-LKYSPP, NUS
1145 – 1205	Session 1b: Welfare Spending and Budget Sustainability of Mainland China Economies Presenters: <ul style="list-style-type: none">• Dr Zhang Xuyao

Time	Programme
1205 – 1220	<ul style="list-style-type: none"> Research Fellow and Deputy Director (Research), ACI-LKYSPP, NUS Mr Mao Ke Research Assistant, ACI-LKYSPP, NUS
1220 – 1235	<p>Discussant 1 for Sessions 1a & 1b: Professor Wu Chung-Shu (TBC) President, Chung-Hua Institution for Economic Research, Taiwan, ROC</p>
1235 – 1250	<p>Discussant 2 for Sessions 1a & 1b: Dr He Dongni Deputy Director, China Institute for Reform and Development, People's Republic of China</p>
1250 – 1305	<p>Discussant 3 for Sessions 1a & 1b: Dr Fan Yubo Associate Professor, Policy Research Office, Shandong Academy of Social Sciences People's Republic of China</p>
1305 – 1335	<p>Question & Answer</p>
1305 – 1335	<p>Forum Luncheon Talk: “Welfare Spending and Budget Sustainability: The Case of Singapore”</p> <p>Distinguished Luncheon Speaker: Mr Henry Kwek Member of Parliament & Member, Government Parliamentary Committee for Trade and Finance, Republic of Singapore</p>
1335 – 1350	<p>Question and Answer</p> <p>Moderator Associate Professor Tan Khee Giap Co-Director, ACI-LKYSPP, NUS</p>
1350 – 1430	<p>Lunch</p>
1430 – 1645	<p>Session 2: Sub-national Economic Competitiveness, Welfare Spending and Budget Sustainability of India</p>
1430 – 1435	<p>Moderator: Dr Zhang Yanjiang Post-doctoral Fellow, ACI-LKYSPP, NUS</p>
1435 – 1455	<p>Session 2a: 2018 Annual Update of ACI's Competitiveness Ranking and Simulation Studies on India's Sub-national Economies</p> <p>Presenters:</p> <ul style="list-style-type: none"> Ms Melissa Poh Research Assistant, ACI-LKYSPP, NUS Mr Nirnaya Bhatta Research Assistant, ACI-LKYSPP, NUS
1455 – 1615	<p>Session 2b: Welfare Spending and Budget Sustainability of India Sub-National Economies</p> <p>Presenters:</p> <ul style="list-style-type: none"> Ms Jigyasa Sharma Research Assistant, ACI-LKYSPP, NUS Ms Ridhi Bhatnagar Research Assistant, ACI-LKYSPP, NUS Associate Professor Tilak Abeyasinghe Visiting Professor, Department of Economics, NUS
1615 – 1630	<p>Discussant for Sessions 2a & 2b: Dr Manoj Panda Director, Institute of Economic Growth, India</p>
1630 – 1645	<p>Question & Answer</p>

Time	Programme
1645 – 1700	Coffee/Tea Break
1645 – 1805	Session 3: Urban Composite Development Index for 17 Shandong Cities: Ranking and Simulation Analysis
1645 – 1650	Moderator: Mr Tan Kway Guan Research Assistant, ACI-LKYSPP, NUS
1650 – 1710	Presenters: <ul style="list-style-type: none"> • Dr Zhang Xuyao Research Fellow and Deputy Director (Research), ACI-LKYSPP, NUS • Mr Lim Tao Oei Research Assistant, ACI-LKYSPP, NUS • Mr Isaac Tan Research Assistant, ACI-LKYSPP, NUS • Associate Professor Tan Khee Giap Co-Director, ACI-LKYSPP, NUS
1710 – 1725	Discussant 1: Ms Sarah Lin Urban Specialist, Global Practice for Social Urban Rural and Resilience, The World Bank
1725 – 1740	Discussant 2: Professor Yang Jinwei Vice President, Shandong Academy of Social Sciences, People's Republic of China
1740 – 1755	Discussant 3: Mr Wang Kejian Chairman, Urban Construction Press, People's Republic of China
1755 – 1805	Question & Answer
1805 – 1815	Closing Remarks and Future Research Agenda Associate Professor Tan Khee Giap Co-Director, ACI-LKYSPP, NUS

END OF SEMINAR 2

Profiles of Speakers, Discussants and Moderators

(in alphabetical order)

Tilak ABEYSINGHE

Tilak Abeysinghe is currently a visiting professor in the Department of Economics at the National University of Singapore. He has been with the Department since 1988. In July 2017 he took up a new offer as the Research Director of the Gamani Corea Foundation, a private Foundation, in Colombo. He also holds an Adjunct position in the Asia Competitiveness Institute, NUS. He served as the Director of the Singapore Centre for Applied and Policy Economics and an Executive Committee member of the Department of Economics. He held other important administrative responsibilities at NUS such as Deputy/Acting Headship, Director of Economics Graduate Program and member of the Faculty Tenure and Promotion Committee. He was also a visiting professor at Kyoto University and Peradeniya University. He coordinated the keenly awaited monthly newspaper column in The Straits Times, "Ask NUS economists". He obtained his PhD in Economics/Econometrics from the University of Manitoba and worked for the United States Agency for International Development (Colombo) before joining NUS in 1988. His research interests lie in a range of theoretical and applied econometric topics that include the Singapore economy, housing affordability, stress and cancer and quantitative health research. He has published in various reputable international journals like Journal of Econometrics and NBER paper series. A major line of his research has been the econometric modelling of the Singapore economy, forecasting and policy analyses. As the coordinator of the Econometric Studies Unit since 1992 he has built a number of econometric models, one of which appears in the Routledge book, The Singapore Economy: An Econometric Perspective. Policy analyses based on these models have appeared in news media frequently. He has supervised a large number of PhD, Masters and Honours students.

蒂拉克 阿贝辛哈

蒂拉克·阿贝辛哈现任新加坡国立大学经济系客座教授。他从 1988 年起就在系里任职。2017 年 7 月，他担任了位于科伦坡的私有基金会，伽摩尼·科里亚基金会的研究主任。他同时还附属于新加坡国立大学亚洲竞争力研究所。他曾担任国大新加坡应用与政策经济中心主任及经济系执行委员会委员。他还在新加坡国立大学担任过其他重要的行政职务，如副/代理校长、经济学研究生项目主任、教师任期及晋升委员会委员。他也是京都大学和佩拉德尼亚大学的客座教授。他协调了备受期待的《海峡时报》月刊专栏《询问国大经济学家》。在 1988 年加入新加坡国立大学之前，他在曼尼托巴大学获得经济学/计量经济学博士学位，并在美国国际开发署(科伦坡)工作过。他的研究兴趣包括新加坡经济、住房负担能力、压力和癌症及定量健康研究等一系列理论和应用计量经济学课题。他曾在许多著名的国际期刊上发表论文，如《计量经济学杂志》和美国国家经济研究局系列报告。他的研究方向主线之一是新加坡经济的计量模型、预测和政策分析。自 1992 年任计量经济学研究部门主任以来，他建立了许多计量经济学模型，其中之一收录于劳特利奇出版的《新加坡经济：计量经济学视角》一书中。基于这些模型的政策分析经常出现在新闻媒体上。他还指导了大量的博士生、硕士研究生和本科荣誉学生。

Ridhi BHATNAGAR

Ridhi Bhatnagar is working as a Research Assistant at the Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore. She is currently pursuing a Bachelors of Social Science at NUS where she is majoring in Economics and specializing in Applied and Policy Economics. She is assisting on the projects on Annual Competitiveness Analysis and Development Strategies for 36 States and Federal Territories of India and Welfare Spending and Budget Sustainability. Her research interests include Development Economics and Political Economy.

里德希·巴特纳格尔

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尼尔纳雅·巴塔

尼尔纳雅·巴塔现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所研究助理。他是李嘉诚学者，在李光耀公共政策学院攻读公共政策硕士学位，并领导着该学院最大的学生团体“教育实验室”。除了与跨国政治相关的能源问题外，

他还对亚洲(乃至全球)的教育政策、外国劳动力移民、国际政治经济和定性研究等领域有着浓厚的兴趣。由于其跨学科的性质,他对更广泛的竞争力讨论更感兴趣。在进入李光耀公共政策学院之前,他在美国政府机构世纪挑战集团(MCC)工作了两年,该集团支持尼泊尔政府在道路和能源等关键领域的发展。他在德里大学荣获了政治科学专业的荣誉学士学位。之后,他在波兰华沙大学攻读国际关系硕士学位并在此期间从文化和地理层面探索了欧洲大陆。

FAN Yubo

Fan Yubo, male, doctor of economic, graduated from Northeastern University and Shandong University, associate professor of Policy Research Office of Shandong Academy of Social Sciences.,The main research areas are Environmental Economics, Regional Economics, Development Economics. In recent years, he has published more than 20 papers in newspapers and periodicals above the provincial level, undertaken several National or Provincial Social Science Foundation Projects, and focused on the research of sustainable economic development. Mainly engaged in research the regional development trend of the Yellow River Delta High Efficient Ecological Economic Zone, Shandong Peninsula Blue Economic Zone, Jiaodong Peninsula manufacturing base, Shandong Peninsula urban agglomeration, Jinan urban agglomeration economic circle, etc. Participating in the drafting of major development plans in relevant fields of the Shandong Provincial Government. Many of the development proposals submitted have been adopted by the relevant decision-making departments of provincial government and local governments. At the same time, he participated in the preliminary investigation and drafting and revision work of several major proposals of the Shandong Committee of the Chinese people's Political Consultative Conference.

范玉波

范玉波,男,经济学博士,副教授,先后毕业于东北大学和山东大学,2005年7月至今在山东社会科学院工作。主要研究领域为环境经济学、区域经济学与发展经济学。近年来,在省级以上期刊发表论文20余篇,主持国家及省级课题多项。长期致力于经济可持续发展的研究,并从环境规制与产业发展、空间布局与梯度转移等角度,对中国经济发展方式转变、经济结构转型升级等领域进行分析。跟踪研究山东省有关黄河三角洲高效生态经济区、山东半岛蓝色经济区、胶东半岛制造业基地、山东半岛城市群、省会城市群经济圈等区域发展态势。参与山东省政府相关领域重大发展规划的起草工作,呈报的许多发展建议,相继被省委、省政府及地方政府有关决策部门采纳。同时,参加了省政协多个重大议案的前期调研和起草修改工作。

HE Dongni

Ms He received her BA in economics from Xiamen University and MA in political economics from Nankai University. She also obtained a MBA from Maastricht School of Management and has being PhD candidate in management science and engineering at Northeast University. She was assistant researcher of the Center for Public Policies and the Center for Hainan Reform and Development, vice director of the Center for Emerging Economies, associate research fellow and director of the Center for Economics and assistant president of CIRD. She participated in many of CIRD's important research programmes since 2006 including Policy Research on equalization of Basic Public Services during the Twelfth Five-year Plan period, Goals and Missions of Economic Reform during the 13th Five-year Plan Period, China's second round of opening up with trade in services as a major driver, China-EU FTA—2020: a decisive option for deepening China-EU cooperation by 2020, Research on the Path to Transition of Economic Growth Pattern in China and Co-editor of CIRD's annual reform report of A Decisive Choice to Advance Economic Transition and The Second Round of Opening up. She has published over 40 articles mostly in China's leading academic journals and newspapers.

何冬妮

厦门大学经济学系学士,南开大学政治经济学硕士,荷兰马斯特里赫特管理学院 MBA,东北大学中改院研究生分院管理科学与工程方向博士生。曾任中国(海南)改革发展研究院公共政策研究所助理研究员、海南改革发展研究所助理研究员、新兴经济体研究所副所长、经济研究所副研究员、院长助理、国际经济研究所所长。参与中改院《“十二五”基本公共服务均等化政策研究》、《“十三五”经济体制改革的目标与任务》、《中欧自贸区——2020:深化中欧合作的重大选项》、推进以服务贸易为重点的二次开放》、《“十三五”经济体制改革的目标与任务》、《推进消费主导的经济转型》等多项重大课题和中国改革年度报告的撰写,参与多项国家社科基金等重点课题以及国家相关部委委托中改院的多项课题研究,《转型抉择》、《二次开放》副主编,在《红旗文摘》、《经济研究参考》、《人民日报》、《光明日报》等发表文章40多篇。

Fatouma Toure IBRAHIMA

Fatouma Toure Ibrahima is the Operations Adviser in the Infrastructure and Urban Development Hub in Singapore where the World Bank, IFC and MIGA collocate to generate direct investments and provide technical assistance in infrastructure and related sectors. Fatouma has worked in development for the past 20 years, focusing on financial sector policy, financial system infrastructure, energy project design and implementation, energy sector policies and viability. Prior to joining the Singapore Infrastructure and Urban Development Hub, Fatouma held various positions including:

- Regional Representative for the Public Private Partnership Infrastructure Facility in charge of the West, Central and North Africa Portfolio;
- Senior Financial Sector Specialist and Task Team Leader in the World Bank Africa Energy Group where she led the design and implementation of various country and regional level energy projects;

- Special Assistant to the World Bank Group Vice President and Corporate Secretary and subsequently to the World Bank Group Managing Director and Chief Financial Officer; and
- Financial Sector Specialist in the Middle East and North Africa Region where she managed financial sector and financial system infrastructure projects and made major contributions to the Financial Sector Assessment Program.

法蒂玛·杜尔·易卜拉希玛

法蒂玛·杜尔·易卜拉希玛是世界银行基础设施和城市发展部新加坡地区的运营顾问。该部门由世界银行，国际金融公司和多边投资担保机构共同合作以便为基础设施和相关行业生成直接投资以及提供技术支持。在过去的20年中，法蒂玛一直致力于开发项目，重点关注金融部门政策、金融体系基础设施、能源项目设计和实施、能源部门政策和可行性。在加入新加坡基础设施和城市发展部之前，她曾担任多个职位，包括：

- 担任政府和社会资本合作基础设施建设地区的代表，主管非洲西部、中部和北部的投资组合；
- 担任世界银行金融行业高级专家以及非洲地区任务组长，带领着不同国家和地区能源项目的设计和实施；
- 担任世界银行副行长兼机构秘书长的特别助理及常务副行长兼首席财务官的特别助理；
- 担任中东和北非地区的金融行业专家，管理金融行业和金融系统基础设施项目并且为金融行业评估项目作出贡献。

Smita KURIAKOSE

Smita Kuriakose is a Senior Economist in the Finance, Competitiveness and Innovation Global Practice in The World Bank. With over 15 years of development policy experience, her expertise is in science, technology & innovation policy, skills development, business environment and competitiveness. Her work has covered over 20 countries, leading dialogues in upper middle, middle and low-income countries in Europe and Central Asia, East Asia, Africa and South Asia. Her expertise is in science, technology, innovation policy and skills development issues with the view to promote private sector development in countries. She has led regional flagship publications on innovation and entrepreneurship issues and multi-sectoral operations of both Development Policy and Investment Policy Instruments. In East Asia Pacific, she has led policy dialogue on innovation and entrepreneurship in China, Malaysia, Vietnam and Thailand. Previously, Smita has led the 3-part series regional report on Fostering Entrepreneurship in the South Caucasus: Georgia, Armenia and Azerbaijan and has previously led the regional study on Fostering Technology Absorption in Southern African Enterprises and has co-authored the Europe and Central Asia Regional Study on "Igniting Innovation- Rethinking the Role of Government in Emerging Europe and Central Asia". Most recently she led the analytical work on "Accelerating Innovation in China's Solar, Wind and Energy Storage sectors". Prior to joining the Bank in Washington DC, she worked on the United Nations Link Project and the Poverty Reduction and Economic Management Unit of the World Bank at New Delhi, India where she focused on fiscal and macro policies. Smita holds graduate degrees in Economics from the University of Maryland, College Park in the US and the Delhi School of Economics in India.

斯密塔·库利亚科塞

斯密塔·库利亚科塞是世界银行全球发展实践局“金融、竞争力与创新”部门的高级经济学家。她拥有超过15年的发展政策经验，专长于科学、技术和创新政策，技能开发，商业环境以及竞争力方面。她的工作覆盖了20多个国家，在欧洲和中亚、东亚、非洲和南亚的中高、中等、低收入国家开展对话。她擅长于科学、技术、创新政策和技能发展方面的问题，以促进各国私营部门的发展。她领导了关于创新和创业问题的区域性旗舰出版物以及多部门运作的发展政策和投资政策工具。在东亚太平洋地区，她领导了中国、马来西亚、越南和泰国的创新与创业政策对话。此前，斯密塔曾带领发表了含有三个部分的区域报告系列《在南高加索地区培养企业家精神：格鲁吉亚、亚美尼亚和阿塞拜疆》并领导了促进非洲南部企业技术吸收的区域研究，还共同发表了题为《激发创新——重新思考政府在新兴欧洲和中亚的角色》的欧洲中亚地区研究。最近，她领导了“加快中国太阳能、风能和储能领域创新”的分析工作。在加入华盛顿特区的世界银行之前，她在印度新德里的联合国联系项目(LINK)和世界银行的减贫和经济管理部门工作，重点研究财政和宏观政策。她获得了美国马里兰大学和印度德里经济学院的经济学硕士学位。

Henry KWEK

A member of the Singapore Parliament, Henry is a former management consultant and economic planner. He previously worked in the North American office of McKinsey & Co. where he worked with senior management of global firms from the energy, medical devices, construction, and logistics to develop strategies and manage organisational change. Before that, he was with the Singapore Economic Development Board (EDB) where he promoted and evaluated investment projects for Singapore in the IT and chemical sectors. As a Singapore parliamentarian, he is actively involved in the Government Parliamentary Committees for Finance and Trade and Industry, as well as Culture, Community and Youth. He is a member of the Ministry of Defence's Accord Committee, which maintains public support for national service. Henry actively contributes to public discussions on economic matters such as Asia-Pacific's economic integration, Singapore's economic transformation, and promoting Singapore entrepreneurship. Beyond the economic sphere, he is passionate about seniors-related policy and social work. Henry graduated from Stanford University with a BA in Economics and an MSc Management Science and Engineering.

郭献川

在当上新加坡国会议员之前，郭献川曾担任经济策划员与管理顾问。他曾在管理顾问公司麦肯锡的北美分行任职，帮助国际公司的高级管理人员制定策略与施行改善，经验横跨能源、医疗设备、建筑、物流等领域。在加入麦肯锡之前，他也在新加坡经济发展局任职，评估与强化新加坡在资讯科技与化学领域的投资。

郭献川目前是新加坡的国会议员，活跃于讨论财政与贸工及文化、社区与青年的政府国会委员会。他也是国防社区联系咨询委员会的委员之一。郭献川时常针对经济课题，如亚太区域经济融合、新加坡的经济转型及支持本地创业者等课题，提出意见。除了经济课题以外，他也常针对社会老龄化与建立义工文化等课题提出建议。郭献川毕业于美国斯坦福大学，拥有该大学的经济学学士学位与管理科学工程硕士学位。

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林道维

林道维现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所研究助理。他以社会科学荣誉学士学位经济学专业毕业于新加坡国立大学，专攻应用和政策经济学。在亚洲竞争力研究所，林道维担任“山东省 17 个地级市城市综合发展指数排名与模拟分析”以及“大中华 100 个宜居城市指数”项目的负责人。此外，他还积极参与了全球宜居城市指数、社会福利支出与政府预算可持续性关系、以及印度安得拉邦政府效率评估等研究项目。他的研究领域包括东盟经济、劳动经济学和行为经济学。

Sarah LIN

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莎拉·林

莎拉·林是世界银行全球发展实践局“社会、城市、农村和灾害风险管理”部门的城市专家，在越南、柬埔寨和缅甸从事业务和分析项目。她的重点领域包括提供基本城市基础设施、综合城市规划以及规划和发展限制的制度分析。作为一名经历实际培训的城市规划师，她曾在新加坡市区重建局工作，负责城市最大的公共住宅区榜鹅的城市规划和设计。她获得了康奈尔大学城市和区域研究的学士学位以及剑桥大学发展研究的硕士学位。

MAO Ke

Mao Ke is a research assistant at Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore. He graduated from National University of Singapore with Bachelor of Business Administration with Honours (Distinction) and specialised in Finance and Operations & Supply Chain Management. He is the coordinator of ACI's project on Annual Competitiveness Analysis for 34 Greater China Economies. He is also actively involved in several projects: Welfare Spending and Fiscal Sustainability Analysis; Independent Review and Efficiency Monitoring (IREM) of Real Time Outcome Monitoring System (ROMS) for the Government of Andhra Pradesh (GoAP), India; and Cost of living and Wages for Expatriates and Average Residents for 105 Cities. His research interests cover the fields of financial economics, macroeconomic policy and development economics.

毛可

毛可现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所研究助理。他以工商管理荣誉特优学位毕业于新加坡国立大学并专修于金融以及运营与供应链管理专业。他是亚洲竞争力研究所“大中华圈 34 个经济体年度竞争力分析”项目的负责人。他同时积极参与了各种研究项目，包括“福利支出与财政可持续性的分析”、“印度安得拉邦政府实时监测系统的独立审查和效率监测”和“105 个城市的外籍人士和平均居民的生活成本和工资”。他的研究兴趣囊括金融经济学、宏观经济政策和发展经济学。

Manoj PANDA

Manoj Panda is Director of Institute of Economic Growth, Delhi since November 2012. He is currently a member of the National Statistical Commission. He earlier served as Director of the Centre for Economic and Social Studies (CESS), Hyderabad and as Professor and Associate Professor at the Indira Gandhi Institute of Development Research (IGIDR), Mumbai. He holds a PhD in

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马努基 潘达

马努基·潘达自 2012 年 11 月起担任德里经济增长研究所所长。他目前是国家统计委员会的成员。他曾担任海得拉巴经济社会研究中心(CESS)主任及孟买英迪拉·甘地发展研究所(IGIDR)的教授和副教授。他获得了印度统计研究所的经济学博士学位并曾在美国耶鲁大学进行了一年的博士后研究。潘达博士为包括世界银行、亚洲开发银行和联合国开发计划署在内的几个国际组织执行短期任务。他的研究领域包括宏观经济趋势和前景的监控和分析、可计算的一般均衡(CG E)模型和应用的发展以分析贸易和财政政策方案、建设社会核算矩阵(SAM)、在贫困及人类发展方面的测量问题、宏观经济政策和减贫之间的联系、以及碳排放与经济增长的交互作用及其模式。他曾在多家国际、国内期刊发表研究成果, 编辑出版著作。

Melissa POH

Melissa Poh is a Research Assistant at the Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore. Melissa graduated from the National University of Singapore with a Bachelor's of Arts and Social Sciences (Hons), majoring in Sociology. She is currently involved in the Competitiveness Rankings and Simulation Studies for ASEAN-10 Economies, the Welfare Spending and Budget Sustainability project for ASEAN, and the Competitiveness Rankings and Simulation Studies for India. Melissa's research interests include crime, public policy and inequality

傅炜乐

傅炜乐现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所研究助理。她主修社会学, 以文学与社会科学荣誉学士学位毕业于新加坡国立大学。她目前参与东盟 10 国年度竞争力分析、东盟社会福利支出与政府预算可持续性关系以及印度次国家经济体竞争力排名和模拟研究等项目。傅炜乐的研究兴趣包括犯罪、公共政策和社会不平等等领域。

Jigyasa SHARMA

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金加萨 沙尔玛

金加萨·沙尔玛现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所研究助理。她以经济学一等荣誉学士学位毕业于德里大学。大学期间, 她两度获颁学术优秀奖, 也在学院取得第一名的好成绩。她还以应用经济学硕士学位毕业于新加坡国立大学经济系。在亚洲竞争力研究所, 她参与了很多项目。她是旗舰项目“印度 36 个次国家经济体年度竞争力分析”及“印度 21 个次国家经济体经商便利指数分析”的项目负责人。她还是印度安得拉邦政府效率评估的负责人和首席技术研究员。同时, 她也积极参与了有关新加坡中小型企业生产力追踪和效率监控, 实际有效汇率对于外国直接投资和印度次国家经济体出口方面的影响等项目。她的研究兴趣包括发展经济学、城市经济学、国际经济和政治经济等。

Isaac TAN

Isaac Tan is a Research Assistant at the Asia Competitiveness Institute (ACI), Lee Kuan Yew School of Public Policy, National University of Singapore (NUS). He graduated from the University of British Columbia with a Bachelor of Arts in International Relations in 2015. Isaac has also studied at the University of Sydney. He hopes to pursue further studies in Public Policy and International Organizations. At ACI, Isaac is currently involved in monitoring the trends in the cost of living, purchasing power, and wages of both expatriates and ordinary citizens in different cities.

陈仰恩

陈仰恩现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所研究助理。他 2015 年毕业于英属哥伦比亚大学, 获得国际关系文学学士学位。陈仰恩还曾在悉尼大学学习。他希望在公共政策和国际组织领域继续深造。在亚洲竞争力研究所, 他的工作目前涉及不同城市外籍人士和普通公民的生活成本、购买力和工资趋势的研究。

TAN Khee Giap

Tan Khee Giap is a Co-Director of the Asia Competitiveness Institute (ACI) and Associate Professor at the Lee Kuan Yew School of Public Policy, National University of Singapore. He is also the Chairman of the Singapore National Committee for Pacific Economic Cooperation. Upon graduating with a PhD from University of East Anglia, England, in 1987 under the Overseas Research Scheme awarded by the Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom. He joined the banking sector as a treasury manager and served as secretary to the Assets and Liabilities Committee for three years, there after he taught at the Department of Economics and Statistics, National University of Singapore, 1990-1993. Dr Tan joined Nanyang Technological University in 1993 and was Associate Dean, Graduate Studies Office, 2007-2009. Dr Tan has consulted extensively with the various government ministries, statutory boards and government linked companies of Singapore government including Ministry of Finance, Ministry of Trade & Industry, Ministry of Manpower, Housing & Development Board, Civil Aviation Authority of Singapore, Singapore Tourism Board, Trade Development Board, Maritime Port Authority, Ministry of Information, Culture & Arts, Economic Development Board, Ministry of National Development, Media Development Authority, Ministry of Environment and Water Resources, Singapore Design Council, Ministry of Community Development, Youth & Sports, Singapore Press Holdings, Yayasan Mendaki, StarHub, CapitaLand and Great Eastern Life. He has also served as a consultant to international agencies such as the Asian Development Bank, Asian Development Bank Institute, United Nations Industrial Development Group, World Bank Group, World Gold Council, ASEAN Secretariat, Central Policy Unit of Hong Kong, Kerzner International, Las Vegas Sands and Marina Bay Sands. Dr Tan is the lead author for more than 20 books, serving as journal editors and published widely in international refereed journals. He is the associate editor of the journal Review of Pacific Basin Financial Markets and Policies (US) and is on the editorial advisory board of the journal Competitiveness Review (UK). His current research interests include Cost of Living and Purchasing Power Index for World's 105 Cities, Global Liveable Cities Index, Ease of Doing Business Index and competitiveness analysis on sub-national economies of China, India, Indonesia and Association of South East Asian Nations. Dr Tan was Deputy President of the Singapore Economic Society, 2004. He served in the 2002 Economic Review Committee (ERC), served as Chairman of the Task Force on Portable Medical Benefits (PMB), served as the Deputy Chairman of the IPS Forum for Economic Restructuring (IFER) in 2003 and served as a member of the Resource Panel of the Government Parliamentary Committee for Transport and Government Parliamentary Committee for Finance and Trade & Industry and Government Parliamentary Committee for Defense and Foreign Affairs since 2007. Dr Tan is currently an Independent Director of the publicly listed BreadTalk Group, Boustead Singapore, TEE Land and Chengdu Rural Commercial Bank.

陈企业

陈博士曾被英国大学副校长委员会授予海外研究生奖学金，并于 1987 年毕业于英国东英格兰大学，获得博士学位。毕业后，他进入银行业担任财库资金经理，并任职资产与负债委员会的秘书长长达三年。此后，他在 1990 至 1993 年间任教于新加坡国立大学经济学与统计学系。陈博士于 1993 年加入新加坡南洋理工大学商学院，并在 2007 至 2009 年间担任大学研究生院副院长。目前，他任职于新加坡国立大学李光耀公共政策学院，担任亚洲竞争力研究所所长。陈博士也是新加坡太平洋经济合作理事会主席。陈博士广泛地为各政府部门、法定机构及新加坡政府关联企业提供咨询和研讨关于金融、财政、贸易、旅游业、公共住屋、人力资源、电信、宜居城市、创意产业、媒体、社区发展、机场及海港的运作等领域的相关政策及措施。这些部门、机构和企业包括财政部，贸工部，人力部，建屋发展局，新加坡民航局，新加坡旅游局，贸易发展局，海事港务局，新闻、通讯及艺术部，新加坡经济发展局，国家发展部，媒体发展局，环境和水利部，新加坡设计理事会，社会发展、青年及体育部，新加坡报业控股，回教社会发展理事会、星和电信、嘉德置地和东大方人寿等。他还曾为亚洲开发银行，亚洲开发银行研究院，联合国工业发展组，世界黄金协会，东盟秘书处，香港中央政策组，科兹纳国际，拉斯维加斯金沙和滨海湾金沙酒店等国际机构和部门担任顾问。陈博士已撰写了超过二十本书，他是美国《太平洋地区金融市场和政策评论》期刊的副主编，也是英国《竞争力研究期刊》的编辑咨询委员。他目前的研究领域包括世界 105 个城市生活成本和购买力指数，全球宜居城市指数，营商便利指数，和中国、印度、印度尼西亚次国家经济体和东盟十国的竞争力分析。陈博士曾于 2004 年担任新加坡经济学会副主席。他在 2002 年的经济审查委员会 (ERC) 担任便携式医疗福利 (PMB) 工作组主席，在 2003 年担任政策研究院经济重组论坛 (IFER) 副主席，并且自 2007 年起担任国会运输委员会、国会财政及贸工委员会与国会国防及外交委员会的顾问小组成员。陈博士广泛地指导和引领了多家跨国公司的公开上市，尤其是来自中国大陆和台湾的公司。他目前也是新加坡上市公司面包物语、宝德新加坡、腾地有限公司与成都农商银行的独立董事。

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Tan Kway Guan is a Research Assistant at the Asia Competitiveness Institute, Lee Kuan Yew School of Public Policy, National University of Singapore. Kway Guan graduated from the University of Western Australia with a Master of Economics and a Bachelor of Commerce, double major in Economics. He is currently the project coordinator for the Annual Competitiveness Analysis and Development Strategies for ASEAN 10 Economies as well as assisting in the Annual Indices for Purchasing Power, Cost of living and Wages for Expatriates and Average Residents for 105 Cities and the Welfare Spending and Budget Sustainability analysis for ASEAN economies. His research interests include development economics and energy economics.

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陈科源现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所研究助理。他毕业于西澳大学，获得经济学硕士学位以及经济学双专业的商学士学位。他目前负责东盟 10 国年度竞争力分析和策略项目，并协助参与 105 个城市年度外籍人士和普通公民的生活成本、购买力和工资指数的研究以及东盟社会福利支出与政府预算可持续性关系的项目。他的研究领域包括发展经济学和能源经济学。

WANG Kejian

Wang Kejian, born in 1965, is a senior engineer with a MPAM graduate degree from Lee Kuan Yew Public Policy School, NUS. Mr Wang is president of the Urban Construction Magazine; deputy director of the Commercial Network Construction and Development Center of State-owned Assets Supervision and Administration Commission of the State Council, the People's Republic of China. Since 2008, Mr Wang has published more than 200 articles related to the urban construction and social development, such as "China Power", "Building Energy Conservation has a Long Way to Go", "Green Building- the New Coordinates of Urban Construction", "The Development, Protection and Utilization of Traditional Culture in the One Belt and One Road Strategy". Mr Wang was director of the organizing committee of the China Urban Construction Summit from 2009 to 2012, as well as director of the organizing committee of the 2014 Asia-Pacific Urban Construction and Development Summit. In 2007, Mr Wang was named the "Driving Force Of Urban Construction Figures of China". In 2009, he won the "China City Construction Special Contribution Award". In 2010, he was named the "China Urban Construction Figures with Special Contribution".

王克剑

王克剑，出生于 1965 年，高级工程师，毕业于新加坡国立大学，李光耀公共政策学院，高级公共行政与管理硕士学位。担任城市建设杂志社社长、国务院国资委商业网点建设开发中心副主任、中华人民共和国国务院国有资产监督管理委员会规划发展局副局长。自 2008 年起，王先生发表超过 200 篇有关于城市建设与社会发展的文章，例如《中国电力》、《建筑节能还有很长的路要走》、《“一带一路”战略中传统文化的开发保护与利用》。2009 年至 2012 年任职中国城市建设峰会组委会主任，2014 年担任亚太城市建设与发展峰会组委会主任。2007 年获“城市建设推动力人物”，2009 年获“中国城市建设特别贡献奖”，2010 年授予“城市建设特别贡献人物”荣誉。

YANG Jinwei

YANG JINWEI, male, Professor, Vice President, Shandong Academy of Social Sciences, People's Republic of China. Professor YANG is also a Communication review expert of National Planning Office of philosophy and Social Sciences in the field that history of the Communist Party of China. He is a specially invited researcher of the National Association for Party Construction Studies and deputy secretary-general of the National Association for Mao Zedong Philosophy Thought. He is a Distinguished Professor of Ideological and political courses in Shandong University of Finance and Economics, Shandong Institute of Arts, Qingdao Agricultural University, Qingdao University of Science and Technology, Qingdao University of Technology, Shandong University of Science and Technology, Shandong Youth Political College, Binzhou College, Jining Medical College, etc. In 2016, he was awarded the fourth group of "Qilu culture talents" by the Propaganda Department of the provincial Party committee in Shandong province. Professor YANG chaired 3 projects of the National Social Science Fund, and chaired over 50 subjects of the provincial and ministerial. He has published more than 50 theoretical papers in the core newspapers and magazines of China, such as People's Daily, Guangming Daily, People's Forum, Journal of Shandong University, etc. There are 3 books published in the monograph, 20 books edited in chief such as "Research on Innovation of Government Administration in The Blue and Yellow Economic Zone".

杨金卫

杨金卫，男，现任山东社会科学院副院长、研究员，兼任全国哲学社会科学规划办公室党史·党建学科通讯评审专家，全国党的建设研究会特邀研究员，全国毛泽东哲学思想研究会副秘书长，是山东财经大学、山东艺术学院、青岛农业大学、青岛科技大学、青岛理工大学、鲁东大学、山东青年政治学院、滨州学院、济宁医学院等思想政治课特聘教授。2016 年被省委宣传部评为山东省第四批“齐鲁文化英才”。先后主持国家社科基金项目 3 项，主持省部级和省领导交办课题 50 多项，在《人民日报》《光明日报》《人民论坛》《山东大学学报》等全国核心报刊杂志发表专业论文和理论文章 50 余篇，出版个人专著 3 项，主编《蓝黄经济区政府管理创新研究》等著作 20 余部。

ZHANG Xuyao

Zhang Xuyao is a Research Fellow at the Asia Competitiveness Institute (ACI) at the Lee Kuan Yew School of Public Policy, National University of Singapore (NUS). Dr Zhang received his PhD in Economics from NUS in 2016 and obtained his Bachelor (Honors) degree in Applied Mathematics from NUS as well in 2012. During the PhD candidature, he worked as teaching assistant in conducting undergraduate tutorials, such as Microeconomics, Macroeconomics and Managerial Economics. His research focuses on Industrial Organizations, Applied Game Theory, and Public Economics. In particular, he is interested in technology transfers and anti-trust policies. He studies the optimal environmental taxation on the pollution problems in the presence of corruption. He also works on the beneficiary of research joint ventures with technology transfer. He also studies the Qualcomm's anti-trust case in China. At ACI, Dr Zhang is supervising all the Competitiveness Projects (ASEAN, China, India and Indonesia). He is the coordinator for the Welfare Spending and Budget Sustainability project and Shandong Urban Composite Development Index project. He is also the co-coordinator for the project studying the impact of exchange rate on trade at provincial level of Mainland China. Dr Zhang is also working on the methodology of applying the concept of Shapley values to index ranking analysis. This method will subsequently serve as a robustness check to all the competitiveness ranking studies in ACI. Additional projects he is working on include the construction of the Special Economic Development Area index, the construction of Infrastructure index and the Independent Review and Efficiency Monitoring (IREM) of Real Time Outcome Monitoring System (ROMS) for the Government of Andhra Pradesh (GoAP), India.

张续堃

张续堃现任新加坡国立大学李光耀公共政策学院亚洲竞争力研究所的研究员。分别于 2012 年和 2016 年获得新加坡国立大学应用数学系荣誉学士学位和经济学系博士学位。读博期间，曾经担任该大学微观经济学，宏观经济学和管理经济学的助教。其研究领域为产业组织理论，博弈论和公共经济学，尤其对专利授权，技术转让和反垄断方面有更深的研究。研究论文包括：在存在腐败的情况下，政府在治理污染问题时的最优税率；在合资研究中，技术转让的益处；以及高通公司在中国的反垄断案中应采取的专利授权方法。在亚洲竞争力研究所，主要监督东盟，中国，印度和印度尼西亚竞争力研究的项目，同时负责社会福利支出与政府预算可持续性关系的项目，以及山东省 17 个地级市城市发展指数的研究。还协同负责研究汇率对于中国大陆各省份的进出口贸易的影响。也在研究如何把夏普利值应用于指数排名分析中。这个方法将广泛应用于亚洲竞争力研究所所有指数排名的项目。同时，也参与讨论了创建经济发展特区指数，基础设施建设指数和印度安得拉邦政府效率评估等项目。

ZHANG Yanjiang

Zhang Yanjiang is a Postdoctoral Fellow at the Asia Competitiveness Institute (ACI) at the Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore (NUS). Dr Zhang obtained his PhD in urban economics and policies from NUS in April 2018. He obtained his Master's degree in energy and environment economics from Xiamen University (China) in June 2013, and earned his Bachelor's degree from Southwestern University of Finance and Economics (China) in June 2010. Before joining ACI, he worked as research associate in the Department of Real Estate NUS. He has also led or participated in various projects studying topics such as energy planning, green building, rental housing market and housing policies. He also has served as teaching assistant and tutors in NUS, teaching modules such as Research Methodology, Real Estate Economics, and Housing Policy. Yanjiang's research focuses on Housing Economics and Policy, Housing and Land Planning, and Environment Policy. In particular, his PhD dissertation explains how a sellers' stamp duty in the Singapore private housing market removes market liquidity by deterring the selling of individual investors and how it inhibits the effectiveness of later policies aiming to cool down the housing market. After joining ACI, Yanjiang serve as the supervisor for Liveability Ranking and Simulation Studies on World's Major Cities, Supervisor for Coordinated, Innovative and Sustainable Development Index for 17 Shandong Cities, Supervisor for Annual Ranking and Simulation on Liveability of 100 Chinese Cities, Supervisor for Annual Indices for Expatriates and Ordinary Residents on Cost of Living, Wages and Purchasing Power for World's Major Cities. He has obtained the Outstanding Paper Award from the 1st China Urban Economics Scholar Forum which is held jointly by MIT, Chinese Academy of Social Sciences, Peking University, Tsinghua University and other leading institutions. He has published housing policy opinions in Singapore.

张燕江

张燕江博士，目前作为博士后研究员，任职于新加坡国立大学 (NUS) 李光耀公共政策学院亚洲竞争力研究所 (ACI)。张博士于 2018 年 4 月从 NUS 获得博士学位，研究方向是城市经济学及政策。他于 2013 年 6 月获得中国厦门大学能源与环境经济学方向的硕士学位，于 2010 年 6 月从中国西南财经大学经济学基地班获得经济学学士。加入 ACI 之前，张博士在 NUS 房地产系担任副研究员职务。他曾经带领或参与多个研究项目，涵盖能源规划、节能建筑、租房市场、住房政策等领域。在 NUS 就读期间，他曾经为多门课程担任助教和辅导老师，包括研究方法论、房地产经济学和住房政策等课程。燕江的研究兴趣和论文发表领域主要在于房地产经济学和政策、住房和土地规划、环境政策等。他的博士学位论文解释了在新加坡私人住房市场上，卖方印花税是如何通过阻止投资者卖房来削弱市场流动性以及如何削弱后续的房地产降温措施的效果。加入 ACI 后，燕江主要负责监督世界主要城市宜居性及模拟分析、山东省 17 个地级市城市发展指数、中国一百个城市的宜居性年度排名和模拟分析、全球主要城市外派专才和当地居民的生活成本、工资和购买力指数。加入 ACI 后，他的论文在首届中国城市经济学者论坛上获得优秀论文奖，该论坛由美国麻省理工、中国社科院、北京大学和清华大学等知名机构联合举办。他关于新加坡住房政策的评论也有见诸报端。

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