### 最近在台灣與加拿大的外國直接投資與 有價證券投資之研究

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**關鍵字**:外國直接投資、國內投資、中小企業、自由貿易協 定、加拿大工業研究援助計書、**減少工作毀滅的經** 

#### 濟復甦

### 中文摘要

本文主旨在以台灣與加拿大為例,探討一項當今的主要 課題:當多國籍公司紛紛朝低成本的新興市場遷徙時,如何 吸收外國直接投資以及如何做有效的國內投資。為使本研究 更具有效性,文中同時引用美國與新加坡的表現作比較分 析,因為前者能主控全球經濟,而後者在世界經濟中被認為 具有「小而重要」的特性。尤其是由於星國戮力執行智慧財 產權的法律與保護智慧財產權已使該國與其他較大經濟體順 利地簽訂自由貿易協定。

本討論聚焦於政府在提供足夠基礎建設支持商業冒險與 經濟成長所扮演的角色。特別深入剖析的三個子題為:(1) 自我封閉經濟體的較佳策略(以加拿大工業研究資助計畫作 為減少工作毀滅復甦的範例);(2)以出口為導向的較小 經濟體的較佳策略(解析這類經濟體應該如何與較大經濟體 聯盟來減少所必須的資金門檻以及增加其成功率);(3) 當外國直接投資被其他地區所吸引時如何提升貿易基地的另 類策略。作者發現當經濟下滑接近谷底時,較大經濟體若將 注意力集中在中小企業將可能有助於其克服工作毀滅復甦的 恐懼。而簽署 FTA 則或可有利於較小經濟體維持比較利益與 競爭力。

### Recent Foreign Direct Investment (and Portfolio Investment) in Taiwan and Canada

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**Key Words**: Foreign Direct Investments, Domestic Investments, Small-to-Medium-Sized Enterprises, SMEs, Free Trade Agreements, Canada's Industrial Research Assistance Program, Job-Destruction Economic Recovery

#### Abstract

In this paper, we study an issue of current relevance – how to boost foreign direct investments and how to make effective domestic investments, during the critical period when multinationals are migrating to lower-cost emerging markets. Our study is by no means comprehensive, but we hope that it may shed some new light to our readers. We will focus mainly on Taiwan and Canada, although when we need benchmark comparisons from other economies, we will cite the performance of the United States and Singapore – the former because of its dominance, and the latter because it has been acclaimed as "small but important". In particular, Singapore's enforcement of law and adequate protection of intellectual property rights has facilitated her signing of free trade agreements with other bigger economies. Our main theme of discussion is the role of the government in providing an adequate infrastructure to support risk-taking for business and economic growth. We then further elaborate along three sub-themes: (1) the better approach for a self-contained economy (citing Canada's Industrial Research Assistance Program as a model for lessening the job destruction recovery); (2) the better approach for an export-oriented smaller economy (explaining how it should join up with bigger economies so as to reduce the required capital threshold and enhance its rate of success); and (3) an alternative approach to boosting trade base when foreign direct investments is attracted elsewhere (through the signing of free trade agreements with other economies). Under a free trade agreement, product exhibitions or Costco-like operations can be done more easily. Business profit can then be capitalized through such promotions. Our paper emphasizes small-to-medium-sized enterprises for their grassroots importance. It seems that paying attention to SMEs may help the governments of bigger economies overcome the fear of job-destruction recovery when the economic downturn is approaching its end, while signing free trade agreements may help smaller economies maintain their comparative advantages and competitiveness.

### Introduction

When we look at the recent economic data for various economies, we find some significant differences as world economies went from red hot to sluggish and then just began to recover again. To illustrate, we compare the gross domestic product (GDP) per capita across Canada, United States, Singapore and Taiwan over a period of 10 years. GDP per capita for United States has gone up steadily due to her constant improvement of productivity, while GDP per capita for Canada has followed a general upward trend (despite some fluctuations from time to time) over the past 10 years. GDP per capita for Taiwan reached US\$14,000 in year 2000 before dropping to US\$12,500, her 1995 level. GDP per capita for Singapore remained robustly above US\$20,000, a level envied by most of her Asian neighbors, though she has so far not been able to relive her peak of US\$25,500 in 1996. The data and trends are shown below in Table 1 and Figure 1 respectively.

Country	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Canada	19,468	20,143	20,713	21,291	20,414	21,703	23,552	23,021	23,465	27,199	28,679
Singapore	20,977	24,205	25,532	25,529	21,190	20,901	22,768	20,544	20,887	21,184	22,341
Taiwan United States	11,566 26,789	12,446 27,774	13,024 28,983	13,420 30,490	12,225 31,815	13,068 33,218	13,896 34,796	12,549 35,321	12,455 36,209	12,660 37,312	12,784 38,852

Table 1 Gross Domestic Product per Capita, current prices (US dollars)

Data Source: International Monetary Fund's World Economic Outlook Database September 2003



Figure 1 GDP per Capita (current prices)



Data Source: International Monetary Fund's World Economic Outlook Database September 2003

### What economic shocks have occurred to the above economies?

And why do different economies experience different growth at the same time? In choosing Canada, United States, Singapore and Taiwan, we are comparing two bigger economies and two smaller economies to contrast the differences in the economic shocks experienced by economies of different sizes. We believe that our findings can help many countries devise a most suitable approach to boosting their economy effectively based in part on their size and capacity. Capable and bigger economies can usually undergo bigger shocks and still recover with bigger momentum. This view is supported by the GDP data and trends illustrated in Table 1 and Figure 1, where we see that both United States and Canada – the two larger economies – have been generally less affected by the world economic downturn and are still growing strongly. One reason for this phenomenon is that bigger economies tend to be more self-contained and more resourceful. Both Canada and Singapore are popular tourist destinations and both were badly hurt by the spread of the SARS epidemic in 2003. Compared to Singapore however, Canada's economic performance seems to have remained more stable during the world economic downturn. Singapore is a much smaller economy. Otherwise, both countries are approximately equally capable – both are considered to be transparent in their financial information disclosures (one of the key factors for scoring high in corporate governance) and both possess high quality public institutions. These observations are supported by the competitiveness rankings released by the World Economic Forum and reproduced below in Table 2. The significance of such rankings will also be explained briefly.

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	Grow	th Compe (GCI) R	titiveness Lankings	Index	Business Competitiveness Index (BCI) Rankings					
	2000	2001	2002	2003	2000	2001	2002	2003		
Canada	6	3	9	16	11	12	10	12		
Singapore	2	4	7	6	9	9	9	8		
Taiwan	10	7	6	5	21	21	16	16		
United States	1	2	2	2	2	2	1	2		

Table 2 Competitiveness Rankings

Data Source: World Economic Forum's Global Competitiveness Programme

One central idea of the GCI is that the process of economic growth can be summarized with three important broad mechanisms: the macroeconomic environment, the quality of public institutions, and the level of technology. These three mechanisms are what Jeffrey Sachs and John McArthur, the developers of the index, called the "three pillars" on which the process of economic growth rests.

Another key idea underlying the GCI is that, although technological advance is generally seen as the most critical factor in driving sustained high growth for all countries (and certainly the only factor that can sustain growth in the long run), these advances may have different sources for different countries. In particular, for economies that are already technology savvy (close to the technological frontier), the only way to improve technology is to innovate. On the other hand, for countries that are technologically-lagged (far away from the frontier), technological improvements can be achieved partly through innovation and partly by copying or adopting knowledge that has been previously developed by one of the leading economies through technology transfers. Therefore, countries with different potential should adopt different approaches to achieve the most efficient result, especially when fiscal budget imbalances can be a cruel reality. This is an important observation for each economy when devising her strategy to attract more foreign direct investments or to boost her domestic investments.

The BCI builds upon the microeconomic foundations of prosperity. It seeks to explore the underpinnings of a nation's prosperity as measured by its level of GDP per capita. The focus of this index is on whether current prosperity is sustainable, and on the specific areas that must be addressed if GDP per capita is to achieve higher levels in the future. In contrast, the GCI examines the sources of GDP per capita growth, which is more dependent on investment rates and other macroeconomic policies. The GCI and BCI indices are complementary, and make better sense when reported together.

As shown by the competitiveness rankings, Singapore scored consistently higher than Canada over a period of at least 4 years in both growth and business considerations. So, why has its growth in GDP per capita been sluggish compared to Canada's growth? We think that the size of the economy plays a very significant role.

# Why were Canada and the United States able to maintain a more stable level of economic prosperity?

When we make use of the import and export of goods and services (expressed as a percentage of GDP) to show a country's very reliance on international trade, we find that bigger economies (Canada and United States in our example) enjoy more-or-less self-contained domestic markets. When the economy enjoys economies-of-scale and is more self-contained, the government has more leverage to initiate more public or infrastructure construction projects to boost internal demand and add sparkles to the economy, when the economy really needs a boost. Smaller economies, on the other hand, will be less able to adopt a similar approach since much of the required labor and raw material will have to be imported from overseas. If smaller economies issue bonds (and hence worsen their budget deficits) to boost internal demand, they may help boost their neighbors' economies instead of their own economy at the cost of increasing budget imbalances and intergenerational inequality. As we may see from Figure 2, the United States is the most self-contained, followed by Canada and Taiwan. Singapore, on the other extreme, relies very heavily on international trade. If we look at GDP figures, the United States and Canada are of course much bigger than Taiwan and Singapore.

In the next section we will make use of a successful example to illustrate a government initiative for improving its infrastructure to facilitate risk-taking and entrepreneurial pursuits.

We hope the reader will see that bigger economies may



Figure 2 Export & Import of Goods and Services as a Percentage of GDP

Data Sources: International Monetary Fund's World Economic Outlook Database September 2003; Singapore Department of Statistics; Directorate General of Budget Accounting and Statistics Executive Yuan, R.O.C.

enjoy even better economies-of-scale in both capital spending and rates of success when their businesses are aided by such government initiatives. A larger GDP will enable the government to spare more capital for key R&D laboratories, which will then become surrounded by start-ups to capitalize upon the research results. Smaller economies may consider

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partnering with the bigger economies (investing by contributing financial capital or human capital) so as to share the results.

### From Discovery to Innovation – Canada's Industrial Research Assistance Program

The Canadian government is dedicated to enhancing its infrastructure SO as to help Canadian startups and small-to-medium-sized enterprises (SMEs - firms having 500 or fewer employees) receive technological how-how from research laboratories and become more technology-savvy, competitive and capable of excellence. In particular, the National Research Council, Canada's premier science and technology research organization, has an Industrial Research Assistance Program (NRC-IRAP) that aims to provide premier innovation assistance for Canadian SMEs. "As a key enabler within Canada's innovation system, NRC-IRAP provides Canadian SMEs with value-added technological and business advice, financial assistance and a range of other innovation assistance. NRC-IRAP helps SMEs realize their full potential, turning knowledge and innovation into strategic opportunities, jobs and prosperity for all Canadians."

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NRC-IRAP helps SMEs innovate through: technology expertise and advisory services – experienced and skilled Industrial Technology Advisors (ITAs) help to identify and address the technical and research needs of SMEs, as well as their sustainable development issues, at each stage of the R&D development process and the innovation cycle; financial

<sup>-</sup> http://irap-pari.nrc-cnrc.gc.ca/english/main\_e.html

assistance - IRAP provides non-repayable contributions for R&D activities, repayable financial assistance for projects at the precommercialization stage, as well as support for internships; networking - extensive networks link entrepreneurs, players knowledgeable about local sources of financing, R&D institutions and technology brokers, and technology transfer centers; and partnerships - IRAP maintains strong partner relationships with organizations at the regional, national and international level. NRC-IRAP thus encourages economic growth by bridging the gap between fundamental research and applications of the research. With increased profitable application of the results of fundamental research, the country's GDP and social welfare should improve. At times, the gap between research and real application may not be a narrow one, and the government may be the only intermediary with sufficient resources to bridge the gap. Often, this turns out to be an effective and efficient use of public resources, and a lucrative investment for the government as well.

All in all, the NRC-IRAP has achieved remarkable results, helping more than 12,000 Canadian SMEs grow and prosper each year. It is guided by a clear objective and superior prioritization - its role is to achieve excellence and leadership in support of Canadian SMEs to innovate locally and compete globally. The IRAP's annual budget is approximately C\$150M, which it allocates and uses effectively and efficiently as follows: 43% - Non-Repayable Contributions for R&D Activities 20%- IRAP-Technology Partnership Canada (Pre-commercialization Assistance) 16% - Contributions to IRAP Network Members 15% - operations and salaries 3% - Canadian Technology Network3% - Youth Initiatives.

According to an evaluation of the program by the NRC in 2001-2002, IRAP contributions to client projects were associated with investments that total approximately 12.5 times the IRAP's contributions for all phases of the clients' innovation projects. The firms' own equity made up almost 50% of these investments.

Estimates from the evaluation's socio-economic analysis study also indicated that IRAP provided the public with value for money - IRAP contributions provided a return to the federal government in the form of present and future corporate income taxes valued at approximately 11 times the value of IRAP's contributions. (These data on return to government is based on an economic modeling of 26 individual IRAP client cases, including the modeling of client actual annual revenues, expected future revenues over the remaining innovation life cycle, fixed and variable costs, profits, machinery/equipment depreciation, 33% corporate income tax rate, 6% social discount rate and 38.4% corporate income tax attribution to IRAP.)

Clients also recognize IRAP as the top government technology support program and top external source of information (outside of the firms' supply chain and publicly available information).

Indeed, the IRAP has helped increased the innovation and financial performance of Canadian SMEs in remarkable ways:

• Approximately 12,364 IRAP funded projects culminated in 39,186 new or significantly improved products, services or processes over 1996-2001 – this works out to approximately 3.2 innovations per IRAP funded project.

• Approximately C\$11.3B actual sales revenues are linked to IRAP-assisted innovations. C\$4.2B are attributable to IRAP over 1996-2001 and this is equivalent to 11 times the IRAP's total contributions to client projects during this period.

• Approximately C\$37.6B forecasted future sales revenues are linked to IRAP-assisted innovations. C\$14B are attributable to IRAP during the remainder of the clients' innovation life cycles.

• Approximately 32,600 actual additional jobs are linked to IRAP-assisted innovations

- 12,025 jobs attributable to IRAP over 1996-2001 and this is equivalent to C\$32,000 of IRAP contributions per job created during this period.

IRAP has also provided value and wealth creation for Canada in that approximately 37% of IRAP client innovations are considered 'World Firsts', 66% are 'Firsts in Canada', while 96% are 'Firsts in the Firm'.

What Dr. Arthur J. Carty, the President of the National Research Council of Canada, has pioneered through leading this initiative to bridge the gap between applied research and market blockbusters is the cultivation of a win-win-win combination among research laboratories, entrepreneurial pursuits (often start-ups or SMEs) and the government. It entails a great effort to commercialize and capitalize applied research, and adopting cutting edge technologies so that Canadian businesses do not have to settle for things that work just well enough. Dr. Carty believes that the funding of research is a form of investment, the return of which can be measured in part by the numbers of new companies and new jobs created. In essence, the last mile of an investment in research involves commercializing the research findings to benefit the society and the economy. This is especially beneficial since it is a job-creating economic activity! However, there are many challenges, if not obstacles, too. In particular, small-to-mediumsized businesses do not always have all the resources they need to conduct research and develop a new product. Dr. Carty thinks that for the sake of enhancing efficiency and encouraging risk-taking, the government is the most suitable entity for filling in the missing link.

# **Facilitating Smart Risk-taking through Prudent Policies and Adequate Infrastructure**

Actually, the Canadian experience is not the first time that government leaders see and actualize such a belief. Alan Greenspan, Chairman of the Federal Reserve Board of the United States, contributed to the development of the New Economy in the 1990s by keeping interest rates low and hence facilitating the risk-taking behavior of businesses. Over a period of 10 years, the S&P 500 index has increased drastically, although this was followed by a significant plummet when the highly inflated bubble finally burst. However, if we look at the net effect, we will see that the net increase of the S&P 500 index is truly significant – we measure the difference between the S&P 500 index at the initiation of the bubble (350 points) and the S&P 500 index at the end of the dot.com mania (800 points). Though the peak of 1500 points was not realized again, a significant portion of the growth (450 points, as measured by the differences between the two points) was actually sustained even after the burst of the bubble.

Such a collective risk-taking achievement not only became remembered as the defining feature of the New Economy but also belittled the burst of the bubble and made it seemed like a side-effect. Without the risk-taking initiative (and hence the dot manic), the S&P 500 may still be at its low 1990 level.



The movements of the S&P 500 index, as well as the stock market indices for Canada, Singapore and Taiwan, are illustrated in Figure 3. From the charts, it is obvious that the net growth of the S&P 500 index is significant and not something that is granted to happen over time. In particular, the Singapore and Taiwan stock indices have fluctuated rather than attained net growth over the same period.

We are convinced that smart risk-taking is the key to sustainable economic growth in the medium and long run. When a government, whether big or small, intends to boost its economy by enriching its infrastructure, there is good wisdom to be learnt from the success of Dr. Carty and his team. Right now, the 19 institutes of the National Research Council and the NRC-IRAP program continue to play a key role. It takes a lot of planning, re-planning and monitoring efforts to ensure that every step is right on track and to ensure that money is wellspent (both in terms of effectiveness and efficiency), especially during an era of fiscal budget imbalances.

# What should a smaller economy do when FDI simply fades away?

We monitored Singapore and witnessed a change. We found that Singapore strived to ride the wave with fast-growing economies by signing timely free trade agreements (FTAs) with as many super growers as possible. So far, Singapore has signed FTAs under the framework of the WTO with New Zealand, Japan, the European Free Trade Association, Australia, and the United States. She has also initiated FTA discussions with Mexico, Canada, ASEAN & the People's Republic of China, New Zealand & Chile, Korea, India, Jordan, and Sri Lanka.

Entitled by such arrangements, Singapore is able to enhance her competitiveness in exporting, since her exports will become tax-free or enjoy lower tax rates under the agreements. Hence, the burden of tax disappears or is lowered, and aggressive sales promotions can be engaged. At the same time, Singapore strives to receive orders from long term business partners and manufacture the products in lower cost countries.

The Singapore government recognized quite early the importance of boosting the survivability of the grassroots, i.e., small-to-medium-sized enterprises (SMEs). While multinational companies are continually looking out for less-expensive work forces and bigger markets, SMEs are more likely to stay in their country and grow. More importantly, in terms of job creations, SMEs are paying about 50% percent of the number of the paychecks in Singapore.

In addition, while a big economy may issue bonds for public construction to stimulate its economy, a smaller economy has to pay more attention to its finances to make its ends meet.

The reason is obvious - a bigger economy enjoys economies-of-scale, both in investments and in returns, on its territory. On the other hand, a smaller economy has to maintain truly sound economic fundamentals, including maintaining a disciplined and balanced government budget, in order to prevent the occurrence of any undesirable effects (such as twin deficits).

This is so because of the lower thresholds for smaller economies.

Hence, smaller economies can do better by investing in excellent research teams to reduce costs and to obtain the benefits of sound research for its SMEs. Full scale research and development is very costly, but by partnering with the research teams in bigger economies for a fraction of the original cost and gaining a share of the research results, smaller economies may try to attain economies-of-scope in fulfilling their entrepreneurial pursuits. For example, South Korea has been quite successful in actualizing such a belief in the business of consumer electronics.

Controlling government expenditure is extremely important since we are in an era when maintaining fiscal policy discipline is by no means easy – the population is aging, medical expenses are rocketing, and the tax base is shrinking. As Figure 4 suggests, many bigger economies are carrying a huge government debt (when considered as a percentage of GDP).

As such, smaller economies should be particularly alert of their financial discipline and should avoid any intentions to follow suit. In this light, it is especially nice to know that Canada's total expenditure on the NRC-IRAP program for 2002-2003 is only C\$792 million.



Figure 4: Net government debt for some bigger economies



And best of all, the income generated during the same period has reached C\$124 million – this is indeed expenditure that has been carefully budgeted for and well spent. In addition, according to a recent issue of *The Economist*, Canada will have a balanced fiscal budget for fiscal year 2004. Certainly, overspending deteriorates the soundness of an economy and may cause many undesirable side effects.

How Can We Boost Cooperation Between Taiwan and Canada? Try Virtual Clusters, if Not Real Clusters Thinking of Harvard Business Professor Michael Porter's Cluster Theory, we cannot help asking ourselves if Taiwan and Canada can form a "virtual" cluster for their mutual benefit. We believe that this idea is both practical and worth considering. Besides, with a joint effort, Taiwan can introduce Canada in a culturally appealing way to the consumers and companies in the entire Greater China area. Indeed, we think that with cultivated attention and care, effective virtual clusters can be established readily. In his article, *Cluster and the New Economics of Competition*, Professor Porter defined what clusters are. He also explained how clusters foster higher levels of productivity and innovation, and laid out the implications for competitive strategy and economic policy.

Economic geography in an era of global competition poses a paradox. What is a cluster? According to Porter's definition, clusters are geographic concentrations of interconnected companies institutions particular and field. in а Clusters encompass an array of lined industries and other entities important to competition. They include, for example, suppliers of specialized inputs such as components, machinery, and services, as well as providers of specialized infrastructure. Clusters also often extend downstream to channels and customers and laterally to manufactures of complementary products and to companies in industries related by skills, technologies, or common inputs. Finally, many clusters include governmental and other institutions such as universities, standards-setting agencies, think tanks, vocational training providers, and trade associations that provide specialized training, education, information, research, and technical support.

In theory, geographical location should no longer be a source of competitive advantage.

Open global markets, rapid transportation, and high-speed communications should allow any company to source anything and everything from any place at any point in time. But in practice, geographical location remains central to competition. Today's economic map of the world is characterized by what Porter calls clusters: critical masses in one place of linked industries and institutions – from suppliers to universities to government agencies – that enjoy unusual competitive success in a particular field. According to Porter's observation, the most famous examples of clusters can be found in Silicon Valley and Hollywood, although other clusters dot the world's landscape. The success of Taiwan's Science-Based Industrial Park is another vivid evidence of the cluster theory.

Porter explained how clusters affect competition in three broad ways: first, by increasing the productivity of companies based in the area; second, by driving the direction and pace of innovation; and third, by stimulating the formation of new businesses within the cluster.

Geographic, cultural, and institutional proximity provide companies with special access, closer relationships, better information, more powerful incentives, and other advantages that are difficult to tap from a distance. The more complex, knowledge-based, and dynamic the world economy becomes, the more this is true. Competitive advantage lies increasingly in local things – knowledge, relationships, and motivation – that distant rivals cannot replicate.

Canada has actually adopted the cluster theory in devising Industrial Research Assistance Program (IRAP). To her stimulate community-based innovation, IRAP developed and implemented a cluster strategy to achieve the growth of a significant concentration of innovative companies around various nuclei of R&D facilities. For example, the following clusters have been built across Canada (in general, clockwise): Ocean Engineering (Newfoundland), Bioactives (Charlottetown), e-Business/Software (New Brunswick, Sydney), Life Sciences (Halifax), Aluminium (Chicoutimi), Biopharmaceuticals/Materials (Montreal), Aerospace (Ottawa, Montreal), ICT/Life Sciences (Ottawa), Medical Technologies (Winnipeg), Sustainable Urban Infrastructure (Regina), Fuel Cells (Vancouver), Astronomy (Victoria & Penticton), and Nanotechnology (Edmonton). When we dot the above clusters on a Canadian map, such as the one shown in Figure 5, we find that the clusters are uniformly spaced out across Canada and are rooted for long-term and sustainable growth.





Map Source: Natural Resources, Canada - The Atlas of Canada

Smaller economies like Taiwan can take full advantage of Canada's experience by sending her own domain experts to join the Canadian teams and contribute to, share and capitalize upon the research results. Alternatively, Taiwan may form a virtual network with Canada by making use of Internet technology to facilitate parallel teams for cooperation and competition. Actually there is already a successful graphic chips company (ATI / Yeh Tien) established by Taiwanese in Canada. Hence, further cooperation and division of labor between these two economies is a real possibility that can be further explored.

# What Else May be Done to Further Promote Trade and Investment between Taiwan and Canada?

Costco-type warehouses are a constant showcase of U.S. products, shopping style, and customer service quality. In particular, Costco sells some 1,400 items of American products ranging from daily necessities in bulk quantities to high-tech products with sophisticated features to vitamins and health-care products, thus ensuring that customers can enjoy economies of scale and scope on their shopping trips. Both Taiwan and Canada may consider starting Costco-like operations in each other's countries, especially since there is a critical mass in Canada who will appreciate Taiwanese lifestyle, and vice versa. For example, Taiwan's fruits and gourmet food and Canada's seafood and gourmet food can be promoted to each other's economy using this approach.

### A New Investment (Outsourcing for R&D) Model for the Short-Medium Run for Smaller Economies

By contributing domain experts or funding capital to internationally renowned research teams, smaller economies may reduce their risk and enhance their rate of success. At the same time, the reduced required capital expenditure effectively lowers the investment threshold while still allowing the smaller economy to take full advantage of the economies of-scale of research performed by bigger economies. This strategy is especially useful in the short run. For example, sending Taiwanese researchers and helping to fund the MIT Media Lab, and obtaining the rights to capitalize the Lab's research findings, is more feasible and less costly than establishing a similar competing laboratory in Taipei.

In the long run, a smaller economy may develop a handful of special clusters in industries that are to its comparative advantage. However, this will be a long shot since doing so requires huge capital investment. Moreover, international-scale salary will have to paid in order to attract the needed critical mass of quality human capital from all over the world. The necessary human capital may also be developed domestically, although this may take a longer period of time.

Of course, a compromised approach may be carefully devised to fully reflect the comparative advantage of a particular economy for the chosen horizon.

### Conclusion

In most established economies, consumers have to face today's economic downturn. They are also worried about the forthcoming economic recovery since it may be the so-called "job destruction recovery". As we all know, many jobs have gone to low-cost emerging markets where human capital are both in abundant supply and very affordable. Although a McKinsey report, *Who wins in off-shoring*, argues that "\$1 previously spent in the United States, now off-shored to India will bring as much as \$0.67 savings and returns to the United States and create new value from reemploying US labor for as much as \$0.46," the re-hired labor will have to be more competitive in order to qualify for the higher level jobs, especially where multinational companies are concerned. The McKinsey view is shown below in Figure 6.

For the ordinary labor force, the government will have to create opportunities for them.



Figure 6 The Real Economics of Offshoring

<sup>1</sup>Estimated based on historical US reemployment trends.

We have seen that many of the hiring opportunities for the ordinary labor force reside in small-to-medium-sized enterprises (SMEs). Canada's National Science Council has developed a successful model to help fund, advise, support, measure and communicate with new entrepreneurial pursuits - the jargon "from idea and discovery to capitalization" explains it all. We think that the limited amount of government expenditure is used prudently, effectively and with a vision - SMEs are more likely to survive and prosper if the government helps with funds and advise them well. When many of the major economies are bearing sovereign debts, we cite Canada's Industrial Research Assistance Program as a successful model - the net income generated from the program will help the program generate new fuel for itself. Use money and use it wisely. Create jobs and make them last. Ensuring that money is used wisely requires serious progress checks rather than prohibitions on risk-taking, while enabling created jobs to stay requires the firm to be competitive.

For smaller economies, especially economies that experience difficulties making ends meet, paying for a ride may be a suitable approach for the short term. It is possible to conditionally share the results of new research by joining up with research teams in the bigger economies, either by paying a portion of the financial capital or by contributing research manpower. For example, South Korean companies aggressively join leading US research institutions and universities via all channels to support and harvest new research, and then apply them quickly to their product design. Today's Samsung and LG, among various other Korean firms, have their products displayed in all the major US chain stores, since their products embrace the newest technology and are priced competitively. They made smart and affordable investments in order to share frontier technology and they have harvested handsomely.

Singapore, another smaller economy, paved her way slightly differently, by signing free trade agreements with some major bigger economies, under the WTO framework. By doing so, Singaporean companies regain some competitive advantage due to the removal of some tax burden. Singapore was able to do so because it has enforceable laws to protect the intellectual property rights of other economies, and because it has maintained friendly relationships with the major economies in her neighborhood. Singapore's agile and keen efforts paved and extended her economic competitiveness to a certain degree.

As we all know, short-term strategies usually differ greatly from long-term strategies, and each economy faces a very different and unique economic situation. The recommended strategies for self-contained economies versus export-oriented economies are also very different. It is both a science as well as an art to devise a fitting strategy to boost foreign direct investments or to maintain the heat for domestic investments. In any case, the government has to spend public funds prudently, maintain fiscal discipline, and keep her tax base from shrinking, by maneuvering her policy mixes carefully and with a vision. Otherwise, the fairness, effectiveness and sustainability of her policies will be seriously questioned.

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