IT Outsourcing Destination
Quantifying Australia's Competitive Edge through Benchmarking

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INTRODUCTION

It is now clear that the Information Technology (IT) industry has emerged out of three major sources: growth in information and communications technology (ICT), innovation of knowledge-based goods and services, and globalisation of economic activity. For the purpose of the present study, however, it is considered that the main drivers of the information industry all over the world are: (a) information and communications technology (ICT), (b) foreign direct investment (FDI) in IT/software services, and (c) emergence of IT- Enabled services (ITES). The products of ICT and IT/Software services are well known (Hossain 2003; Houghton 2003). But what exactly is the new ITES?

In simple terms it is the delegation of one or more IT-intensive operations to an external provider, who in turn administers and manages the selected business process based upon defined and measurable performance metrics (Nasscom's Handbook, 2002). For example, services provided either by outsourcing (externally contracted), or outlocating (remote subsidiary) of an offshore business, foreign government or multilateral entity based overseas. In other words, in recent years, Microsoft, some Departments of the US Government and World Bank have outsourced software, accounting, data management and other services to India. It appears that the ITES have recently become the major source of outsourcing destination worldwide. There are three major areas of ITES that are generally considered for outsourcing (Nasscom 2002).

Specialised ITES: medical transcription, legal database processing, online education, etc.
General ITES: contract/call centres, telemarketing, consumer care, technical support, back office operation, and data processing.
Business Process Outsourcing (BPO): contractual services to manage, deliver and operate business processes (Hossain and Kathuria, 2004).

Out of these broad areas, given the Australian information economy infrastructure and the availability of skilled labour force, specialised ITES and BPO, would be the main contenders for expansion. In view of the above, the present paper aims at:

- Investigating the current Australian status of IT outsourcing destination; and,
- Quantifying the economic factors those driving the competitive edge of the ITES in Australia (in order to measure success or otherwise, a new methodology has been developed taking the major factors contributing towards making an economy a 'most preferred destination' (MPD) for the ITES);

The paper has four sections. In section two, Australia's IT outsourcing status will be briefly discussed. Section three presents the various aspects of the term most preferred destination (MPD). Section four discusses a new approach of quantifying MPD in Australia with developing an appropriate methodology. A conclusion will be drawn in section five.

IT OUTSOURCING DESTINATION: AUSTRALIA

In Australia, the information technology industry has been making strong progress over the last decade. This is one of the areas that having fastest growth and innovation in the Australian economy with a sustained average annual growth rate approaching 12 per cent. This is more than 2.5 times the average growth rate of the Australian economy as a whole. The information industry accounts for around 10 per cent of the GDP. The recent record shows, the ICT industry worth about $70 billion and its exports accounted for only $3.3 billion. This sector has been witnessing a trade deficit for some time and currently having more than $14 billion deficit due to its dependence on manufactured imports to meet domestic demand. The information industry in Australia ranked, in terms of infrastructure development, as third in the world after Sweden and the US. For example, almost 10 million people access the Internet and 1.3 million uses the Internet for shopping purposes. The Australian governments (Federal and State) have almost 100 per cent use of ICT based facilities to implement e-governance. The ICT industry absorbs more than 400,000 persons and the employment opportunities has been sustaining over the years. In the initial period, the employment growth rate peaked at about 16.5 per cent in 1994 (AIIA, 2003).

Australia, however, has not been equally successful in the trade front. The immediate down side of the information industry in Australia is having a sustainable trade deficit. The deficit in 2002-03 stood at $14.4 billion. It has grown almost 7.5 per cent per annum since 1993-94. Trade in ICT equipment was in deficit by $13.8 billion during 2002-03, while trade in ICT services was in deficit by $569 million (Houghton, 2003). The major concern now appears to be not surrounding the area of domestic growth, but how to reduce the increasing trade deficit.

In recent years, there has been an intense debate taking place surrounding the issues of "Offshore Outsourcing" vs. "Outsourcing Destination". It has been observed that hundreds and thousands of jobs will be lost if the local business and governments opt for Offshore outsourcing (see Table 1), while more and more jobs can be created if the local IT companies are competitive enough to attract offshore contracts. A recent qualitative study commissioned on the issue of Offshore Outsourcing by the Australian Information Industry Association (AIIA) in 2004 concludes on the issue of outsourcing destination in the following manner:

Table 1 IT industry's qualitative view on offshore outsourcing

Item	Yes	No	Don't Know
Threat to local employment	82	16	2
Good for global competitiveness	65	29	6
Long tern danger to industry development	58	38	4
Proactive strategy to cut expenditure	49	47	4
World class service	37	50	13
Best value for money	31	62	7
Necessary with lean budget	27	70	3

Note: % Respondents (n = 100)
Source: Hollands (2004)

"It is at least 25 per cent cheaper to run a commercial undertaking in Australia than in the United States or Western Europe. Therefore, many industry executives and commentators believe this nation can also become an offshore destination. Respondents said that domestic industry boasted world-class skills and experience to be able to provide a high level of consultancy than the process-oriented programming that has become the speciality of India, Malaysia, and a number of other countries in Central and South America, South East Asia and Eastern Europe. The ability of Australian software developers to solve problems, design and implement complex systems should attract business from North America and Western Europe.

Vertical industry or domain expertise in areas such as financial services, government and health, are suits for the local software services community. Some respondents believed that for all the jobs lost due to offshore competition, it was possible for Australia to create an equal number by providing higher value services, thus increasing the value of the software sector of the economy. The ability of Australia to respond to this challenge and create employment as an offshore destination was the subject of intense debate. Many felt the industry lacked sufficient scale and strength to match the success of India in this arena" (Hollands 2004, p. 8).

The next section presents a detailed description of the term 'most preferred destination' which is frequently referred to IT outsourcing arena.

MOST PREFERRED DESTINATION (MPD)

Background

India and Ireland at this moment are considered as the most preferred destinations for the IT and ITES in the world. There are eight criteria used for this purpose: government support, labour pool, infrastructure, educational system, cost advantage, quality, cultural compatibility and English proficiency. On a scale of high, medium and low, India has a 'low' score for infrastructure and cultural compatibility. Ireland scored 'low' in labour pool but 'medium' in cost advantage. Overall, both countries have been considered as having a status of a 'most preferred destination' (MPD) (Nasscom and McKinsey 2002). Table 2 provides some relevant information of the Indian and Irish industry in 2003.

Table 2 Selected macroeconomic and IT industry performance in India and Ireland (2003)

Parameter	India	Ireland
GDP growth rate (%)	8.2	10
IT share of total exports (%)	18.0	22
Employment in IT sector ('000)	400	130
ICT exports (US$ for India and Euro for Ireland in bl)	9.5	28
Number of companies	5,000	600

Source: Nasscom (2004); Morrissey (2004)

Apparently, it appears that as far as the MPD is concerned, the Australian information industry is not far behind Ireland (Morrissey 2004). However, it is clear that the information industry, in terms of ITES, Australia has not been achieving its full potential. There are many reasons for this unexpected Australian performance in the global context.

It has been observed that the Australian IT and Software industry is heavily oriented towards the domestic market. There were some attempts, however, made in the past to penetrate into the nations of the Asia-Pacific region, but with no immediate success (Rimmer, 2003). In view of the above, the present study attempts to investigate the major factors to gaining competitiveness in the global market.

Past Research

Previous international research on this subject is rather limited. Most of the research has been conducted by the private agencies dedicated to the advancement of the information economy exports covering India and some European nations (www.corbettassociates.com; www.noa.co.uk; www.mckinsey.com). The OECD also conducted some studies in the past, for example, OECD (2001, 2005).

There is a substantial literature on the subject of ICT and information economy in Australia. Both the government and some private institutions have been conducting research in this field (see more in www.noie.gov.au, www.cfses.com and www.aiia.com.au). A sample of relevant recent studies is listed below: NOIE (2000, 2001a, 2001b); Houghton (2003); AIIA (2001); Rimmer (2003); OVUM (2003);

Framework for the Future Steering Committee (2003). It is, however, found out that so far no substantial or a comprehensive study conducted on the subject of ITES in Australia. There is no way to know what the likely contribution of the ITES to exports is.

World has seen phenomenal transformation and scientific development over the last half a century. This period is also known as the age of industrial and ICT development in the OECD nations. The early part of the 21st century is dubbed as the information and new economy age or so called 'digital' era. Australia has been enjoying significant growth in the service area over the last half a century. In recent years, the service sector as a whole has been contributing almost 70 per cent of the total GDP, while communication services contribute only 3.2 per cent to GDP (Liews et al 2003; ABS Data). It is expected that the information economy is going to remain as an important part of the service sector in Australia in the future since it has already established a world-class communications infrastructure together with a pool of highly skilled labour force (Alston 2003). It is now widely known that the information economy in Australia, particularly its export sector, has been under performing for sometime, given the resources and opportunity created in this area over the last decade.

A major challenge confronting the scholars working with the information economy is to find out and identify clearly the barriers of growth and limitations in the expansion of the export sector. Lewis et al (2003) suggest that there are two major pre-conditions for achieving greater exports earnings out of the information economy: one, to develop appropriate soft technologies (management and organizational), and two, to adopt successfully the hard technologies such as the Internet.

Houghton (2003) proposed several measures to get the information industry out of its present trade deficit cycle. In particular, Houghton emphasised the importance of attracting *export-oriented* investment. "The challenge for Australian policy makers is to take a more 'fine-grained' view of local capabilities, competitive and comparative advantages that has hitherto been the case, and focus coherent and consistent policy support, *inter alia,* on attracting *export-oriented* investment" (Houghton 2003, p x).

A recent study by the OECD (2005) argues that the Australian telecommunications sector has been performing inadequately, particularly, the area of the fixed-line services. Since the demand for IT products generally is a derived demand and is heavily based on telecommunications services, the lack of competition in this sector adversely affects the IT industry. The OECD study categorically reports that "competition in fixed-line telecommunications should be promoted by strategies designed to facilitate further access by competitors" (p. 2, OECD 2005; www.oecd.org/document/59).

APPROACH

Most Preferred Destination (MPD): Measurement

By conducting a quantitative and qualitative analysis on the factors of MPD, it is possible to establish Australian competitiveness in the areas of ITES and BPO. The MPD approach involves two major components: one, to determine the 'market power' of the economy and two, to determine the competitiveness of the Australian economy. Each of these fronts is briefly addressed below:

Market power

Market power of the industry can be established by analysing the markets of the information technology industry products both domestically and internationally taking three major areas into consideration: market share, ease of market entry and countervailing buyers' dominance. Significant Market Power (SMP) approach developed and adopted by the OFTEL (currently OFCOM) will be explored (Oftel, 2003). This approach allows a company, a business entity or a regulator to determine the extent of competition that exists in a market.

Market competitiveness
Determination of export competitiveness (i.e. outsourcing competitiveness) is the most important aspect of investigating the Australian competitiveness with the ITES products. To address the competitiveness issue three major areas can be analysed: competitive prices, profitability and cost advantage of the Australian information industry. Quantitative models can be developed to analyse the competitiveness issue (see methodology below). The outcome of this analysis will shed light on the Australian comparative and competitive advantage with the exports of ITES and BPO.

Conceptual Framework and Methodology

This part of the paper concerns with the conceptual and methodological aspects of the study. It is now well established that Australia's major weakness in the competitiveness area is the cost disadvantage which in turn affects both pricing and profitability of the export firms (Productivity Commission, 1999). Due to high price and high costs Australia has been falling behind in exploiting ITES and BPO market (Nasscom and McKinsey, 2002). The present study will investigate this fact quantitatively by examining Australian cost-disadvantages in the overall ICT area. The investigation will be concentrated on the determination of optimal prices of the major ICT services to gain competitiveness. Since the telecommunications services (landline, mobile and internet) are considered as the major inputs needed for the establishment of an IT-Enabled services (ITES) industry, it is essential to find out first how to achieve optimal pricing of these services. It appears that there is still a room for achieving further efficiency in pricing of landline (non-prepaid international calls), mobile calls and the Internet charges.

Conceptual Framework
In view of the above, the major goal here is to compare the existing market price of selected ICT services with a benchmark of prices determined by Ramsey pricing principles. The Ramsey pricing will address two major issues:

- What should be the optimal level of prices of ICT products?
- What price level will satisfy both the service providers (operators) and service users (business and household)?

Controlling prices has become a major role of regulators dealing with privatized utilities in all the developed nations. In Australia, such a role is played by the Australian Competition and Consumer Commission (ACCC) and although the telecommunications industry has not been fully privatized yet, open competition was introduced in the late 1990s. For example, in mobile phone services, three major firms are competing in the market: Telstra, Optus and Vodafone.

What should be the optimum level of prices under a price control regime? What price level will meet the interest of operators and consumers? These questions need to be addressed by the regulator with prudent economic arguments, theoretically explained by Baldwin and Cave (1999, p. 206). A regulator simply can set prices equal to marginal costs or to average costs and is known as a static approach and can be adopted without major difficulty. However, price setting gets more complicated if an operator is engaged in a multi-service/multi-product business (see Baldwin and Cave, 1999, p. 208). These kinds of businesses present a dilemma to regulators and needs to be addressed under a dynamic framework. In this case, the setting of price is driven by the elasticity of demand for each service or product and is called Ramsey Pricing.

In recent years, the telecommunications regulator in the UK has been practicing Ramsey pricing principle for pricing various telecommunications services and Australia also has been following this initiative. Let us take an example from the mobile phone services. Currently, more than 40 per cent of the Australian population uses mobile phone, compared with only 13 per cent in 1995. As mentioned earlier, there are three firms presently operating in the market: Telstra, Optus and Vodafone. In 1998, Telstra had a market share of 52 per cent, while Optus and Vodafone had shares

of 31 per cent and 17 per cent respectively (Productivity Commission 1999). The mobile phone services revenue increased from $1 billion in 1993 to $3.7 billion in 1998. It is now clear that the mobile services have been expanding significantly over recent years. However, it appears that, a substantial drop in call charges (price) still has not been realised. During 1998 and 1999, for example, prices dropped by only 1 per cent (Productivity Commission, 1999).

Given the present price regime, it appears however that, the telecommunications regulator in Australia has brought a genuine competition to the market place for most telecommunications products (mobiles, Internet services, etc.). Even with these achievements, the industry is believed to be suffering from high retail prices, particularly, in mobile and long distance phone services (Productivity Commission, 1999). There has been no independent study so far attempted to explain the major causes of the relatively high prices in these services in Australia. One of the ways, as stated earlier, of investigating this issue is to make a benchmark of prices by employing Ramsey Pricing principles. The Ramsey Pricing is believed to be the most efficient method of pricing from the viewpoint of economic welfare. However, it cannot be said with certainty that Ramsey pricing is a perfect method for achieving optimal prices for the telecommunications products. Currently, the UK regulator of telecommunications is undertaking a more refined approach to fix and generate further competition in the telecommunications market based on Ramsey (see Oftel, 2003).

Methodology

It must be emphasized first that the following models have been developed initially for an Australian Research Council (ARC) Discovery Grant submission in 2004 (Hossain, Selvanathan and Selvanathan, 2004). A detailed version of the models can be available by contacting the present author after the conference.

Ramsey prices

Bearing in mind the discussion above, one can conclude that economically efficient prices, that is to say Ramsey Prices, embody mark-ups that are inversely related to the price elasticity of demand of services. Such prices would maximise consumer surplus, the willingness to pay by consumers over and above the price they are charged, and allow firms to earn normal profit (Hunter et.al 2001). With this in mind, a demand model for three telecommunications services (landline, mobile and Internet in Australia) has been developed which is also similar to the model developed by .econ for the BT Cellnet in the UK (Hunter et.al 2001).

Under the system-wide framework, the demand equation for commodity i in differentials take the following form:

$$Dq_{it} = \alpha_i + \eta_i DQ_t + \sum_j \eta_{ij} Dp_{jt} \qquad i = 1,2,3,4$$

where the variables,

Dq_{it} is the log-change in consumption of commodity i;

DQ_t is the log-change in real income and

Dp_{it} is the log-change in price of commodity j.

where the coefficients, α_i is a constant term, η_i is the income elasticity and η_{ij} is the demand elasticity of i with respect to the price of j. These demand price elasticities would form a 4 x 4 matrix. When i=j, η_{ij} is the own-price elasticity of commodity i, and When $i \neq j$, η_{ij} is the cross-price elasticity between commodities i and j.

It is assumed that income and prices are predetermined for the estimation of the demand equations. Commodities i and j are linked to one another through the cross-price elasticity η_{ij}. For

example, the equation representing the demand for landline (i=1) would be linked to the equation for the demand equation for mobile-off peak calls (i=3) through the cross-price elasticity (η_{13}).

In other words, the demand for landline services in Australia depends on per capita income, its own call charges and the call charges of substitute services. Once the Ramsey prices are known, they can be compared with the existing market prices and a conclusion can be drawn in terms of efficient price levels. In other words, the gap between the existing price and the estimated optimal price via Ramsey method can be established.

Cost efficiency

To investigate the cost efficient operation of a firm, it is a common practice to identify the cost efficient frontier of the group of firms producing the same product and then identify the firms which are operating above the cost efficient frontier (Baldwin and Cave, 1999). The cost function can be estimated from cross-sectional data or time series data or panel data. A parametric function can be estimated using statistical methods. To estimate a cost function, information on output, total cost and input prices will be needed. There are a number of functional forms used to specify the cost function. One such function is the *translog cost function* given by the following equation:

$$ln(C) = \alpha_0 + \sum_{i=1}^{n} \alpha_i ln(p_i) + \frac{1}{2} \sum_{j=1}^{n} \sum_{j=1}^{n} A_{ij} ln(p_i) ln(p_j) + \sum_{i=1}^{m} \beta_i ln(q_i) +$$

$$+ \frac{1}{2} \sum_{i=1}^{n} \sum_{j=1}^{m} B_{ij} ln(q_i) ln(q_j) + \sum_{j=1}^{n} \sum_{i=1}^{m} \Gamma_{ij} ln(p_i) ln(q_i)$$

Where $ln(C)$ is the (natural) logarithm of total cost, $ln(p_i)$ is the logarithm of the input price for input i, $ln(p_i)$ is the logarithm of the output quantity i, and α_i, β_i, A_{ij}, B_{ij}, Γ_{ij} are estimated parameters.

Measuring productivity

Productivity is a technical relationship between output and inputs (for example, labour and capital) in the production process. Productivity measures are used to establish how efficiently the growth of an industry is achieved. Productivity can be measured in various forms. One simple form of measuring productivity is the single-factor productivity where output is expressed as per unit single input. For example, labour productivity is measured as output per hour or per some time frame. However, in real life there needs to measure a multi-factor productivity where output is expressed as per combined unit of inputs. For example, output per combined unit of labour, capital and energy (Selvanathan and Selvanathan, 2004)

This will need an estimation of production function in its most general mathematical form:

$$Q = f(x_1, x_2, x_3 \ldots)$$

where Q = quantity of output; x_1, x_2, x_3 etc. = factor inputs (such as capital, labour, energy. There are several ways of specifying this function such as additive production function, Cobb-Douglas production function, Constant elasticity of substitution production function (CES).

Currently, we are in the process of collecting relevant Australian information for applying to these models. Once all the data are available, a trial run of the models will begin in early 2006. We expect to produce three separate papers on the results of Ramsey pricing, cost efficiency and productivity during 2006.

CONCLUSIONS

There is no doubt that Australia has modernised the ICT sector and gained huge improvement in productivity by utilising the technologically efficient ICT over the last decade (OVUM, 2003). Despite this, unfortunately, the economy has made little progress in the exports of ITES and BPO, although considered as having a huge potential. The present research focuses very directly on the issues of Australian potential in these areas and shed light on how to gain competitiveness as a major world player of the exports of these products. It is hoped that the outcome of this research, eventually, will shape the Australian information economy well into the twenty-first century.

At present, the major concern in the ICT trade area is the ongoing deficit. A sustained trade deficit has been adding more challenges to Australia's already poor current account performance over the years. A legitimate concern arises now in the business and academic community about this deficit. The present research through its policy prescriptions to the government, industry and business will show the ways of bringing the ICT trade out of deficit and the sector's potential to create further jobs in export-oriented activities.

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