IT Industry Success in Finland and New Zealand

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INTRODUCTION

At the beginning of the 21st century, information and communication technologies are creating global markets for goods and services. These technologies are impacting on every aspect of our lives, including how people work, communicate, and entertain themselves. Many economists have started to suggest that we may be entering a new era of greater productivity (without inflation) in the "knowledge economy" of the future.

Given the importance of the IT industry in today's global economy, much recent research has focused on the relative success of small countries in fostering IT industries. This research is important because those countries that can adapt and develop new information based industries will thrive and become significant players in the global economy. Those countries that cannot adapt will suffer and may find themselves as producers of low value products for wealthier nations. This article summarizes the factors of IT industry success in small developed countries, focusing on two such countries, Finland and New Zealand.

BACKGROUND

Most of the previous research in this area has compared a reasonably large number of countries. For example, Blanning et al. (1997) examined the information infrastructure of 12 Asia Pacific nations; Dedrick et al. (1995) examined reasons for the success of IT industries in nine small countries from around the world; and Kraemer, Gurbaxani, and King (1992) discussed the diffusion of computing use in nine Asia Pacific nations. Generally, these studies have examined a small range of factors that impact on either the success of a nation's IT industry or its extent of IT usage.

In contrast, Ein-dor et al. (1997) examined only three small countries – Israel, New Zealand, and Singapore. These three countries were of similar size and economic development; however, they were experiencing differing levels of IT industry success. Ein-dor et al.'s (1997) study has been one of the few pieces of research that has examined only a small number of countries in an in-depth manner.

Ein-dor et al.'s (1997) model was largely based on Grossman and Helpman's (1991) macro-economic theory concerning the relationship between technology development, trade, and growth as applied to small open economies. The latter suggested that growth stemmed from endogenous technological progress, as entrepreneurs introduced innovative (intermediate) products whenever the present value of the stream of operating profits covered the cost of product development. Grossman and Helpman (1991) postulated that the best growth path can be attained with subsidies to both R&D and the production of "intermediates" (those products that are used to produce consumer goods). The second-best growth path can be achieved with subsidies to R&D alone.

In order to study IT industry success in accordance with this theory, Ein-dor et al. (1997) considered four groups of variables. These variables are all frequently quoted in the context of industrial success. The variables they considered were as follows:

1. Controlled variables: country size and economic development.
2. Dependent variables - those that define IT industry success.
3. Exogenous mediating factors.
4. Endogenous mediating factors:
    - Domestic IT use.
    - Firm strategies.
    - Government IT policies.
    - Government education policies.

Watson and Myers (2001) adopted the model used by Ein-dor et al. (1997) to compare just two countries, New Zealand and Finland. In that study, the authors considered the same four groups of variables; however, they replaced "firm strategies" with "level of research and development," because the latter appeared to have more explanatory power. The major factors that were considered in the study by Watson and Myers (2001) are represented graphically in Figure 1.

This model was then used to compare and explain IT industry success in Finland and New Zealand. As will be summarized next, three major factors that impact on the development of a successful IT industry were identified: the extent of government IT promotion, the level of re-

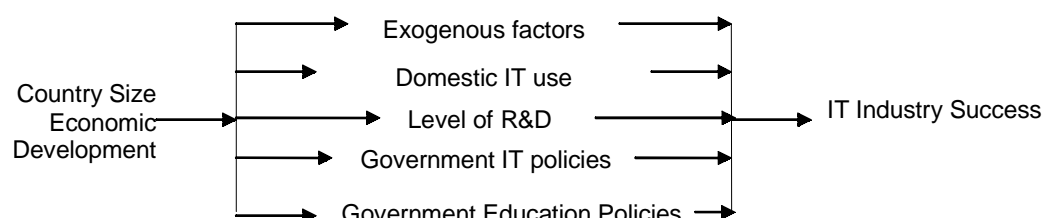*Figure 1. Factors affecting IT industry success (Watson & Myers, 2001)*

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                        ┌──────────→  Exogenous factors  ──────────┐
                        │                                          │
                        ├──────────→  Domestic IT use  ────────────┤
Country Size            │                                          │
Economic ───────────────┼──────────→  Level of R&D  ───────────────┼──────────→  IT Industry Success
Development              │                                          │
                        ├──────────→  Government IT policies  ──────┤
                        │                                          │
                        └──────────→  Government Education Policies ┘
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Table 1. IT industry success (1998)

	Finland	New Zealand
IT Industry Development		
IT Industry Sales (US$ billions)	11,087	2,155
IT Sales/GDP	9.0%	4.1%
Number of Firms in IT	4,200	2,500
IT Firms/Largest Firms	4/50	1/50
IT Industry Employment	5.5% (1997)	2.6% (1996)
IT Industry Success		
IT Exports:		
Hardware (US$ millions)	7,255	175
Software (US$ millions)	488	123
Total (US$ millions)	7,743	298
High Technology Exports (US$ millions) –1997	8,797	428
High Technology Exports/Manufactured Exports -1997	26%	11%
Stock Market Listings:		
Domestically listed IT firms	27	3
Internationally listed IT firms	1	0

Sources: (Computerworld, 1999; Deloitte & Touche Consulting Group, 1998; Ein-Dor et al., 1997; Finnfacts, 1999; Helsinki Stock Exchange, 1999; March, 1999; Nygard & Kunnas, 1998; Statistics Finland, 1999a, 1999b; World Bank, 1999).

search and development, and the existence of an education system that produces IT literate graduates.

COUNTRY SIMILARITIES

Dedrick, Goodman, and Kraemer (1995) define a small country as one that has fewer than ten million people. Finland and New Zealand, with populations of 5.2 million and 4.0 million respectively, are thus considered small countries. The physical size of the two countries is also similar, meaning that their population densities are almost identical.

Finland and New Zealand are remarkably alike in terms of economic development. Both countries entered the 20th century with a heavy dependence on commodity products. Forestry has played the same role in Finland's development as agriculture has played in New Zealand's development. The only real difference between the two countries is that Finland has moved away from its dependence on forestry and has embraced new technologies, whereas agriculture is still a major part of New Zealand's economy (Watson & Myers, 2001).

IT INDUSTRY SUCCESS

Finland's IT industry is far more successful than New Zealand's, as can be seen from Table 1.

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