IT Industry Success in Small Countries: The Cases of Finland and New Zealand

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Given the importance of the information technology industry in today’s global economy, much recent research has focused on the relative success of small countries in fostering IT industries. This article examines the factors of IT industry success in small developed countries, and compares two such countries, Finland and New Zealand. Finland and New Zealand are alike in many respects, yet Finland’s IT industry is more successful than New Zealand’s. Three major factors that impact on the development of a successful IT industry are identified: the extent of government IT promotion, the level of research and development, and the existence of an education system that produces IT literate graduates.

INTRODUCTION

At the beginning of the twenty-first 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.

What is not clear, however, is how many countries will be able to adapt and develop new information based industries of their own. In this new global, knowledge-based economy of the future, it is likely that some countries will thrive and become significant players, while others will not. Those countries that cannot adapt will suffer and may find themselves as producers of low value products for wealthier nations.

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 article builds on this earlier work and examines the factors of IT industry success in small developed countries, focusing on two such countries, Finland and New Zealand. We chose Finland and New Zealand for this study because they share many common characteristics, yet Finland’s IT industry is more successful than New Zealand’s (as will be shown below). Using a modified version of the theoretical model suggested by Ein-Dor et al. (1997), this paper suggests factors that may contribute to the differing levels of IT industry success. For the purposes of this study we define IT as computer hardware and software but exclude embedded hardware and software in other products (e.g. washing machines).

With respect to the static or snapshot nature of the data presented here, Kraemer, Gurbaxani and King (1992) argue that the relationship between interventions and their consequences is best revealed by careful, longitudinal study that links together specific policies and actions with particular results. Such study is badly needed and in some limited instances has begun, but to date the best assessments are limited to cross-sectional evaluations of correspondences between policies and economic measures of computer-related activities in given countries (1992, p. 149).

We agree with them that, in the long run, a longitudinal analysis is undoubtedly better for many of the things we are trying to find out. However, the objective of this first study is an exploratory review benchmarking the state of the IT industries in the two countries. We believe that a cross-sectional evaluation is sufficient for this purpose.

The paper proceeds as follows. In the following section the theoretical framework is presented. The research methodology is then described. This is then followed by an analysis of the data relating to the two countries. In this particular section, each country is briefly described and the controlled variables are presented. Then the dependent variables relating to IT industry success are evaluated. The main part of the analysis describes the exogenous and endogenous factors for
each country and, wherever possible, an attempt is made to relate these variables to the differing degrees of IT industry success. The final section is the conclusion.

THEORETICAL FRAMEWORK

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 twelve 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. They were examined in depth to determine those factors that impacted on the development of a successful IT industry in a small country. 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. This research study adopts the approach and model as used by Ein-dor et al. (1997) and compares just two countries, New Zealand and Finland.

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 stems from endogenous technological progress, as far-sighted entrepreneurs introduce innovative (intermediate) products whenever the present value of the stream of operating profits covers 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 which 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 the above 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 which define IT industry success.
3. Exogenous factors.
4. Endogenous factors:
   - Domestic IT use.
   - Firm strategies.
   - Government IT policies.
   - Government education policies.

In our study, we considered the same four groups of variables, however we decided to replace “firm strategies” with “level of research and development,” because the latter appears to have more explanatory power. The major factors that we considered in our study are represented graphically in Figure 1.

This model was then used to compare and explain IT industry success in Finland and New Zealand. More detail concerning the original model can be found in Ein-Dor et al. (1997).

METHODOLOGY

The research methodology involved collecting a range of quantitative and qualitative data about Finland and New Zealand as suggested by the theoretical model, with an attempt to provide as much comparability as possible. Wherever possible, data on the two countries were taken from common sources. The data are presented according to the factors suggested by Figure 1 above. Data for this research was collected from a variety of sources including OECD reports, official government publications, industry surveys, newspaper articles, web sites, and international research companies. All monetary figures used in this paper have been converted to US dollars.

COUNTRIES’ ANALYSIS

The structure of this next section is as follows. First, each country is briefly described and the controlled variables are presented. Then the dependent variables relating to IT industry success are presented. The main part of the analysis describes the exogenous and endogenous factors for each

![Figure 1. Factors Affecting IT Industry success (adapted from Ein-Dor et al., 1997)](image-url)