

The Competitive Advantage of Regions and Nations

Technology Transfer
Through Foreign
Direct
Investment

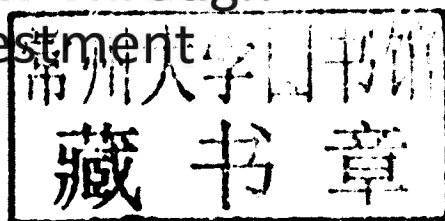


BORIS RICKEN
AND GEORGE MALCOTSIS

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Foreign Direct Investment

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GOWER

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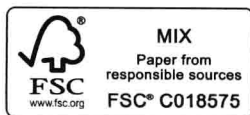
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Preface

There is little doubt that technology is of crucial importance for the competitiveness of companies, regions and entire economies. Technology is a determining element for firms and nations to increase productivity, to compete and to prosper. Today we see many developed and prosperous countries that were quite poor only about some decades ago:

- In Asia, Singapore and Korea have managed to increase their gross domestic product (GDP) by approximately six times since 1980.
- The Chinese economy has grown at an annual rate of approximately 10 per cent over the same period.
- In Latin America, Chile's economy has achieved an average annual increase of 4.3 per cent per year over the last 30 years.
- In Eastern Europe, Hungary has increased its GDP per capita from US\$3,190 in 1990 to US\$12,400 in 2009. Over the same period, the Polish GDP per capita has grown from a mere US\$1,600 to US\$11,100.

This impressive economic progress cannot be explained by increases in capital or a growth in the supply of labour alone. Rather, it is to a considerable degree driven by the acquisition and usage of new technologies such as machinery, management practices, or production techniques, all contributing to the overall productivity of an economy.

However, there is still a large gap in the technological advancement of nations. On the one hand, industrialized economies such as the United States, Japan, Germany or Switzerland are at the forefront of developing new technologies and applying these. Large shares of GDP in these countries are dedicated to research and development (R&D) of new products or process technologies. On the other hand, many emerging economies in Asia, Africa, Latin America and Eastern Europe have not yet developed their own R&D capacity. They rely on the transfer of existing technology from other countries in order to increase their productivity and competitiveness. One major channel

of this transfer is foreign direct investment (FDI). Empirical studies have found positive and significant technology spillovers stemming from inward FDI. One of the major reasons is that FDI usually takes place by multinational corporations (MNCs), which exhibit a high ratio of R&D.

The importance of technology transfer via FDI implies that countries cannot simply sit and wait until new technologies arrive in their domain. Rather, companies, regions and nations need to systematically manage the identification, assessment, attraction, absorption and application of new technologies. In this book we want to provide a step-by-step guide on how to manage this entire process of technology transfer in foreign direct investments. The target audience of this book therefore consists of the following groups:

- Managers employed at *investment promotion agencies*. Almost every country has at least one such agency and several have subnational local development agencies. The World Association of Investment Promotion Agencies (WAIPA) alone brings together over 250 investment promotion agencies. This book wants to provide managers of these agencies with the relevant concepts and methods to identify, assess, attract and absorb foreign technologies through FDI.
- Managers of *government bodies* such as investment boards, ministries of economics or ministries of science and technology, active in the field of foreign direct investment and technology transfer. This book wants to support them in setting the appropriate policies and measures suitable to facilitate the economic and technological development of their country.
- Managers working in *companies* active in the field of foreign direct investment, such as local competitors, suppliers, clients, joint venture partners, or wholly owned subsidiaries of multinational enterprises. Especially in emerging markets, firms strive to absorb new technologies, knowledge and practices in order to gain a competitive advantage. This book aims to provide these managers with a deeper understanding on the determinants of a MNC's decision on an FDI project as well as on the processes and mechanisms of technological spillovers to local companies.
- Managers being employed at *international organizations*, development banks and technology transfer intermediaries, for

example the World Bank, Asian Development Bank, European Bank for Reconstruction and Development (EBRD), United Nations Conference on Trade and Development (UNCTAD), United Nations Industrial Development Organization (UNIDO) etc. targeting issues of economic development, FDI and technology transfer

- *Students* in programmes related to economic development, international economics, investment promotion, FDI and technology transfer. This also includes certificate training programmes targeting career professionals in the public or private sectors related to foreign direct investment.
- *Researchers* and scientists active in the field of economic development, international economics, international management, foreign direct investment, technology management and technology transfer.

As the target audience of this book primarily consists of managers and students, we have focused on providing concepts and methods applicable in practice. Although theoretical considerations are presented here, our aim has been to keep the presentation of theories and the state of literature relatively short. Also, we have sought to follow an interdisciplinary approach on the topic, integrating concepts and methods from economics on the one hand and the business and management literature on the other hand.

We especially want to thank DIAS (the Direct Investment Advisory Services) and the International Institute of Investment Promotion in Switzerland for supporting this book project. In addition, we want to thank the students participating in the module Technology Transfer and FDI of the M.Sc. Investment Promotion and Economic Development Program offered by Edinburgh Napier University and DIAS for their input to this book.

In order to further advance this book, we are happy to hear comments, critical remarks and feedback.

Boris Ricken and George Malcotsis
Zürich and Baden, Switzerland, April 2011

List of Abbreviations

APCTT	Asian and Pacific Centre for Transfer of Technology
APEC	Asia-Pacific Economic Cooperation
BATNA	best alternative to a negotiated agreement
BOI	Board of Investment (Thailand)
CAGR	compound annual growth rate
CAPEX	capital expenditure
CAST	Chinese Academy of Space Technology
CBERS	China–Brazil Earth Resources Satellite Programme
CORFO	Chilean Economic Development Agency
CRM	customer relationship management
CSIR	Council of Scientific and Industrial Research (India)
DCF	discounted cash flow
DIAS	Direct Investment Advisory Services
DST	Department of Science and Technology (South Africa)
EBRD	European Bank for Reconstruction and Development
EU	European Union
FDI	foreign direct investment
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GNP	gross national product
HICOM	Heavy Industries Corporation of Malaysia
IASP	International Association of Science Parks
ICAMT	International Centre for the Advancement of Manufacturing Technology (Bangalore)
ICSID	International Center for Settlement of Investment Disputes
ICT	information and communication technology
IDA	Industrial Development Agency (Ireland)
IPA	Investment Promotion Agency
IPR	intellectual property rights
IMF	International Monetary Funds
JV	joint venture
MNC	multinational corporation
NESDP	National Economic and Social Development Plan (Thailand)
NIPE	National Institute for Space Research (Brazil)

OECD	Organisation for Economic Co-operation and Development
pa	per annum
PPP	purchasing power parity
R&D	research and development
SEB	Skandinaviska Enskilda Banken
SOFI	Swiss Organisation for Facilitating Investments
SWOT	strengths, weaknesses, opportunities, threats
TRIPS	trade-related aspects of intellectual property rights
UNCTAD	United Nations Conference on Trade and Development
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNIDO	United Nations Industrial Development Organization
WAIPA	World Association of Investment Promotion Agencies
WEF	World Economic Forum
WTO	World Trade Organization
WWEA	World Wind Energy Association

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