1. Introduction

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1.1 GLOBALIZATION

Globalization is rapidly changing the conditions for social interactions, economic processes and political agendas. In particular, globalization is affecting economic opportunities and economic competition. As a consequence, it has important impacts on the conditions for economic growth, wealth distribution and social welfare.

In its most general sense, globalization refers to the worldwide integration of humanity and the compression of both the temporal and spatial dimensions of worldwide human interactions. However, it is more often discussed in the more limited sense of the increasing economic integration and economic interdependence of countries. Globalization is the consequence of the deeply intertwined and mutually interdependent evolution of economic, technological and social processes.

The processes of spatial integration of production and technologies started in the earliest days of human history. It is only relatively recently, however, that these processes have had such an impact on the economic, technological and social integration of regions worldwide that the term globalization is warranted. Although a quite modern phenomenon, globalization is considerably older than is generally discussed in the now abundant literature on its size and consequences.

Globalization, in terms of global flows of capital and, thus, of technology, productive capacity and economic power, is at the heart of the capitalist economic system. Hence, the roots of the driving forces of modern economic globalization go back to, at least, the late nineteenth century. The first significant wave of globalization took place in the period 1870–1913, when most of Western and Northern Europe and the USA went through industrialization. It was characterized by rapid expansion of international trade, investment and migration. The second wave of globalization occurred after World War II and reached a peak in the early 1970s. It was interrupted by the 1973–76 energy crisis. The third and present wave of
globalization began in the late 1970s and has been ongoing for about three decades. The pace of globalization processes has been increasing since the mid 1990s.

It is often argued that national borders have decreased in importance and will continue to do so as a result of the global integration of world economies. However, this to a large extent is based on confusions among different processes and logics in global economic development. It is certainly true that globalization has considerably changed the logics of value systems, business models and technological development. For business logics then, and accordingly also for business behaviour, the importance of national borders has continuously decreased. This is a core driving force of capitalist development and hence a key explanation of the evolution of economic globalization and the resulting decreasing importance of national borders for business processes. It is likewise true that the importance of national borders for technological logics, which are closely tied to business logics, has decreased. And, since knowledge and technology are difficult privately to appropriate completely, they have a tendency to diffuse more rapidly and more widely than capital. Hence, they have been a major contributor to economic globalization and, thus, to the decreasing importance of national borders for technological and economic development.

However, this is not the case for political logics. Political logics are, and will always be, geographically constrained by the mission to provide the conditions for wealth generation and welfare distribution among citizens. Hence, as long as national administrative borders remain the basis for policy power, they will remain of key importance for political logics. Although globalization has not fundamentally changed the nature of political geography, it has greatly transformed policy challenges and opportunities. First, it has greatly increased the importance to nations of being internationally competitive, both industrially and technologically. Second, it has dramatically changed and considerably increased the policy challenges related to this competitiveness. Third, in generating a series of fundamental institutional changes in terms of international agreements on policy measures, it has considerably changed the scope of and boundaries to policy measures.

Increases in interactions, mobility and trade across borders are generating increases in overall wealth. However, there are winners and losers in these processes. Global developments do not evolve evenly. They do not distribute evenly either the sources or the outcomes of economic development among continents, nations, regions or citizens. Hence, reaping the benefits of global growth is not automatic; instead, there are fundamental strategic challenges associated with globalization.
1.2 INNOVATION

Globalization increases many different kinds of opportunities. In particular, it enhances the opportunities for wealth generation. Simultaneously, the competition for these opportunities increases considerably. This dynamic competition accelerates the pressures for constant business renewal in order to maintain or increase profitability. Innovation is about exploring new combinations to respond to future challenges. Innovation is essential to economic life, as it is the main determinant of economic productivity and productivity growth in firms, sectors, regions and nations. It is therefore the underlying basis of long-term economic growth. As global competition and opportunities accelerate as a consequence of the rapidly globalizing world, international competitiveness increases in importance for both businesses and nations. Hence, the innovation imperative for wealth creation becomes an essential strategic issue for business firms and public policy.

For business firms, the essential issue is how to continue to be prosperous in evolving and emerging markets. Innovating for business renewal is of fundamental importance for competitiveness. Innovativeness is about internal innovation capabilities and also network relationships, which enable external innovation capabilities to be tapped. Of particular significance are relationships with customers, as innovation is intimately related to the commercialization and sale of new ideas. Innovation networks and markets for innovations are inherently tied to geographies of capabilities and customers. Hence, as globalization is markedly changing geographical structures and resource distributions, this is strongly affecting the locations of business innovation.

For nations, a key challenge is how to maintain or increase standards of living in an increasingly competitive world. In nations and regions where economic renewal and structural change are slow or insufficient, economic competitiveness will gradually decline. Innovation is at the heart of renewal processes. Opportunities for and challenges to innovation have become of paramount importance for national wealth creation and welfare generation. As the geographies of business innovation are rapidly changing due to globalization processes, attracting business innovation investment has become increasingly important for regions and nations. As a result, improving innovation competitiveness has become a major focus of policy for most countries and regions, and international organizations including the European Union (EU), the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN).
1.3 POLICY

As the importance to nations of attracting innovation investments and innovation based businesses has increased, policy competition among countries and regions has emerged. Different policy strategies and measures are being adopted by different governments. Yet, despite the importance of innovation policy for national and regional wealth creation and welfare generation, most governments do not consider it to be a specific policy field. Public policy is inherently embedded in economic and social activities. Hence, policy institutions and measures strongly condition the incentive structures and opportunities for innovation. Policies affecting innovation conditions and the competitiveness of business firms and nations are not restricted purely to the economic area. Policies in most fields have impacts on innovation competitiveness. Innovation policy, therefore, runs through public policy, without necessarily being explicitly addressed either in overall policy making or in relevant policy fields.

Policy discussions around innovation, innovation policy and national competitiveness still often lack structure and rigour. As a consequence, the challenges and opportunities related to innovation competitiveness, and the options and alternatives for policy are often unclear in much policy debate. And in election campaigns, innovation policies are rarely a major issue, despite their critical importance for welfare generation.

The purpose of this book is to contribute to the development of innovation policy thinking and policy making in a globalization perspective. The focus will be on policy challenges related to maintaining and improving national competitiveness in a globalizing world. As innovation is imperative for long-term national competitiveness, the theme that runs through the contributions to this book is the policy challenges related to innovation.

1.4 OUTLINE

Susana Borrás, Cristina Chaminade and Charles Edquist discuss the challenges of globalization and the strategic choices for policy in Chapter 2. The main message of this chapter is that globalization has increased the importance of innovation policy for national wealth generation, while the conditions for such policy have changed considerably. Innovation policy needs to consider both the rapid changes in global markets and the innovation activities and the specific conditions of each national innovation system.

In Chapter 3 William Aspray, Frank Mayadas and Moshe Y. Vardi analyse the trends in offshoring related to software research and develop-
ment (R&D) and production. Their chapter is based on a study undertaken by a major task force through an initiative of the Association for Computing Machinery (ACM). The study discusses a major difference in globalization patterns from those previously observed, as offshoring is now also affecting key high-technology service industries such as software. The overall conclusion of the authors is that offshoring, like winter, is inevitable – and its consequences can only be countered by ambitious innovation and competitiveness policies.

Thomas R. Howell discusses international trade regulations as key institutions of market formation in a world of globalizing economies in Chapter 4. This chapter addresses the shortcomings of the World Trade Organization (WTO) and other international trade conventions in failing to establish effective regulation of the competition among countries through incentives for business investments and trade. He emphasizes the necessity for policy makers to recognize the world of incentive competition for how it really is rather than how it ought to be.

In Chapter 5 David Audretsch discusses the implications for innovation of the shift towards a service economy, in which ideas, people and knowledge are the key assets. He emphasizes the importance of the entrepreneur penetrating the ‘knowledge filter’, that is, the obstacles to commercializing different kinds of knowledge. He concludes that entrepreneurship performs the function of ‘creative construction’, while globalization is the main force of destruction of old businesses and industries.

Åsa Lindholm Dahlstrand, in Chapter 6, discusses the critical links between the emergence of new technology-based ideas and entrepreneurship generating innovation and growth. Lindholm-Dahlstrand has studied large numbers of new technology-based firms (NTBF) in Sweden, and her chapter focuses on the challenges of reaping the economic potentials of these NTBF. Her main conclusion is that innovation policies should focus on linking innovation, competitiveness, internationalization, entrepreneurship and education.

In Chapter 7 Charles Wessner discusses the key issues and policy challenges generated by globalization. His main conclusion is that innovation is imperative for competitiveness, and policies generating the most favourable innovation conditions are essential for long-term national economic competitiveness. He draws attention to innovation award programmes to improve innovation performance in the USA and in Sweden. He particularly highlights the targeting of and impacts on small business innovation.

Marc Stanley and Christopher Currens in Chapter 8 present the impact logics of the US Advanced Technology Program (ATP) in stimulating innovation. The ATP, which has been in place since 1992, focuses on critical challenges to radical innovation. The authors’ main conclusion, based on
continuous impact evaluations, is that ATP successfully addresses the fundamental challenges of early stage financing of innovation. The ATP logic could thus serve as an inspiration to policy strategies and measures of other countries.

In Chapter 9 Evan S. Michelson discusses the business, policy and social implications of the convergence of nanotechnology. Convergence of technologies at the nanoscale has already started to emerge, but has yet to reach its peak. As nanotechnology probably will bring considerable technological changes for future innovation systems, following and understanding the emerging nanorevolution should be of key importance to innovation policy.

Nicholas Vonortas, in Chapter 10, analyses the impacts of the EU framework programmes for research, technology and development (RT&D) to promote European competitiveness. His chapter is based on an evaluation of past framework programmes, and concludes that they have played an important role in developing the knowledge base of the EU. However, as globalization generates considerable competitiveness challenges for Europe, future framework programmes will have to be more clearly focused on EU competitiveness.

In Chapter 11 Göran Marklund discusses some critical dimensions and targets of innovation policy. He argues that innovation policy needs to be based on a multidimensional focusing on four sets of general formation processes: market formation, business formation, technology formation and science formation. In the EU and Sweden special emphasis should be put on market and business formation, as innovation policy traditionally has tended to focus strongly on inputs, targeting levels of R&D investments.

The final chapter brings the different chapters and lines of thought together in an attempt to draw conclusions. These concern on the one hand critical foci in innovation policy and on the other hand key innovation policy targets.