

Introduction

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BOOK OVERVIEW

In the knowledge-based economy, intellectual property rights – and patents in particular – lie at the very heart of firms' strategies for value creation. Academic studies from several domains – for example economics, management, finance and accounting – and managerial practice have extensively documented how patents are having an increasing prominence for firms' decision-making and performance. Patents do not play the only role of legal instruments any longer, but have rather become business tools which are strategically exploited by firms for profit and competitive advantage. The increase in the number of patents filed worldwide over the last two decades and the growth of markets for technologies convincingly confirm this trend.

In this context, however, the rigorous assessment of the economic value of patents and the identification of patent value drivers still represent key challenges for inventors, entrepreneurs, managers and external investors. Indeed, in spite of the growing awareness of the role of patents for innovation development and business success, the issue of patent valuation is still affected by several specific problems, linked to the lack of generally accepted methodologies for the valuation, the difficulties of understanding the potential commercial value of the underlying technologies, the high level of uncertainties characterizing the valuation and the need to involve a combination of economic, legal and technical considerations.

These problems make it hard to determine the value of specific patents and of entire patent portfolios and the overall contribution of patents to a firm value in the different stages of its lifecycle. These shortcomings are critical to several important decisions of managers and financial investors, such as patent portfolio management, patent sale or licensing, patent litigation and innovation financing. Addressing these issues would therefore be important both for practical evaluation problems within patent-related transactions or managerial decisions and for policy analysis

of the development of the markets for technology and the support of financial markets to innovation processes.

Based on these premises, the aim of this book is to provide an original and comprehensive answer to the need for patent valuation of different actors, bridging the gap between the academic and the practitioner-oriented literature on this subject. Starting from the relevance of patent valuation from the strategic, economic and legal perspectives, the book provides a broad review of the existing quantitative and qualitative methodologies for patent valuation, presenting both traditional and advanced cutting-edge techniques. It also highlights that the application of patent valuation methods depends on the purpose of the valuation and on the specific characteristics of the valuation context. It therefore discusses valuation issues in different application contexts, such as patent portfolio management, licensing agreements, IP litigation, IP-backed finance and financial accounting. For each setting, it presents the most adequate methodologies, the critical issues, the main challenges and real valuation examples. In doing that, the book also recognizes that the correct assessment of patent value requires the integration of interdisciplinary experiences and presents different perspectives on what determines the value of patents within a systemic framework.

For all of these reasons, this book is meant to address a large and varied audience, including undergraduate and graduate students dealing with these topics in courses of technology and innovation management or IP management; academic scholars searching for an overview of the most recent advances in patent valuation literature, either for research or teaching purposes; and IP professionals (for example patent attorneys, IP consultants, R&D or IP managers of large companies and SMEs, TTO professionals) who need a comprehensive understanding of patent valuation before making an informed decision.

BOOK STRUCTURE

The book is structured in three different parts. Part I sets the groundwork for the analysis of the valuation issues. It contains four chapters. After an initial introduction on the basic concepts and relevance of patent valuation, the remaining three chapters provide legal, economic and management perspectives on the definition and measurement of patent value.

Chapter 1, by Federico Munari and Raffaele Oriani, introduces the main principles underlying the valuation of patents. It first defines a patent from the viewpoint of valuation. It then discusses the main issues involved in the valuation process, by addressing questions such as: who is going

to benefit from the patent? For what purposes? In what circumstances should patents be valued? It then provides a categorization of patent valuation methods, distinguishing between quantitative and qualitative approaches, and finally introduces the different purposes of patent valuation, discussing the specific requirements of and implications of various methods.

In Chapter 2, Massimiliano Granieri provides an account of patents as intellectual property rights, reviewing law and economics literature on the nature of patents and the underpinning of patent law. Following the main focus of the book, this part will underscore those legal aspects of patents and their usage which should be borne in mind for the proper understanding of valuation methods.

Chapter 3, by Federico Munari and Maurizio Sobrero, reviews the rich and diversified literature in the field of economics and management of innovation which has, over the last twenty years, analysed the issue of how to measure patent value and isolate value drivers. The chapter first illustrates the different approaches adopted to infer patent value and summarise the main results obtained, with particular reference to the widely-observed heterogeneity in the value of patents. It then identifies the different value drivers (at the level of patent/technology; inventor; organisation; localisation, for example) which have been associated with patent value by empirical studies.

In Chapter 4, Maria Isabella Leone and Keld Laursen present the main patent exploitation strategies pursued by firms in the current competitive scenario, by focusing not only on traditional defensive approaches, but also on more open approaches to the strategic management of patents. The rationale underlying the chapter is to understand the main features of these strategies – actors involved, timing, outcomes – which are relevant for the valuation process.

Part II includes three chapters describing the main existing methods for valuing patents, focusing on both financial and non-financial approaches.

Chapter 5, by Ulrich Moser and Heinz Goddar, presents the traditional and most commonly used financial methods for patent valuation, describing the cost, market and income approaches. The chapter presents the technicalities of the different methods in detail and critically discusses the pros and cons of each method, specifying the pertinence of each approach in different decision contexts. More specific attention will be devoted to the income approach (in its main variants) since it represents the most analytic and rigorous approach for the valuation.

In Chapter 6, Raffaele Oriani and Luigi Sereno present the real options approach, which is one of the most sophisticated and innovative methods for patent valuation. The basic idea underlying the application of real

options theory to patent valuation is that patents embed several discretionary investment opportunities and forms of flexibility that are similar to financial options traded in financial markets. The chapter thus explains how the methods for the valuation of financial options can be extended to the valuation of patents, emphasizing the opportunities and shortcomings of such an exercise. Accordingly, the chapter also discusses the conditions under which the real options theory can be applied to patent valuation, presenting to this purpose some practical examples of valuation.

In Chapter 7, Nils Omland provides an overview of non-financial valuation approaches based on patent indicators, referring to backward and forward patent citations, family size, scope, ownership and many other factors. The chapter first presents the most important patent-based indicators of value described in the academic literature and subsequently explains how these indicators can be used for patent valuation in practice. Data requirements and necessary adjustments and calibrations of the indicators are discussed and some insights concerning the accuracy of the valuation method are then presented along with some practical applications.

Finally, Part III analyzes the main application contexts in which patent valuation is typically carried out, discussing for each domain the most adequate methodologies to be applied.

Chapter 8 by Martin A. Bader and Oliver Gassmann provides an analysis of the methods that guide the decisions on optimal size, breadth and composition of patent portfolios. The chapter describes the interaction of factual and legal protection strategies and the major dimensions of patent portfolio management. It also gives an overview of value and costs of practicable alternatives of patent protection. It then presents a comprehensive framework for the strategic management of patent portfolios, in order to facilitate its alignment to corporate strategy.

Chapter 9, by Massimiliano Granieri, Maria Isabella Leone and Raffaele Oriani, discusses the application of patent valuation methods within the context of license agreements. In order to better understand the specificities of the licensing context, the chapter first describes the legal and economic structure of patent license agreements and illustrates the different objectives that the two parties (the licensor and the licensee) may have in the negotiation of the agreement. It then presents the main valuation methods applied within the license agreement context, specifically rules of thumb, industry standards and discounted cash flows. Finally, it illustrates how the real options approach can be usefully extended to this context.

In Chapter 10 Paola Valenti discusses how to quantify damages in patent litigation by describing the existing methods for measuring infringement damages and their theoretical rationale. The chapter shows

how economic reasoning can be applied to determine the value lost by the injured party. It then discusses the economic principles that underlie the three elements of patent damages – lost profits, reasonable royalty, and unjust enrichment – and presents a number of approaches that may be used to calculate patent damages.

Chapter 11, by Serena Morricone, analyses the accounting rules for the valuation of patents within the context of financial reporting. It presents the general problems of evaluating patents for accounting purposes, discussing the issues of recognition, measurement and disclosure. After that, it focuses on the main divergences in the accounting valuation of patents between International Financial Reporting Standards (IFRS) and U.S. accounting standards (U.S. General Accepted Accounting Principles).

In Chapter 12 Federico Munari, Maria Cristina Odasso and Laura Toschi illustrate the emerging field of IP finance, analysing how technology-based companies can leverage their patent portfolios to access equity and debt financing, including the related need for a proper valuation of patents. The first part of the chapter describes how venture capital firms evaluate patent portfolios of start-up firms in their investment decisions and also describes the fundamental steps of IP-related due diligence by venture capital investors. The second part describes the main patent-backed financial instruments (patent loans, patent securitization, patent sale and lease-back), analyzing in detail their characteristics, the attributes of potential users, the risks involved and the success factors.

Chapter 13, by Serena Morricone and Raffaele Oriani, analyzes the theoretical and methodological foundations of the relationship between patents and stock market valuation of publicly traded firms. To this purpose, it reviews the main results of the empirical literature and discusses the implications for patent valuation. The chapter summarizes a growing body of literature documenting a significant positive relationship between patent counts and quality and firms' market value. In addition, it discusses the implications of such work for the investment decisions of financial investors and for the job of the investor relators, who are required to effectively communicate the value of patents to the markets.

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In addition to four different research lines (the valuation of patents through real options; VC investments and patent portfolios; IPO and patents; stock market valuation of patents), whose main results are summarized in several chapters of this book, the EVPAT project has allowed the launch of a new Master in Management of Intellectual Property Rights at the University of Bologna, the organization of a series of seminars and workshops on the topics of patent valuation, the organization of two Summer Schools on the Economics and Management of IPRs, held at the Alma Graduate School, Bologna, in June 2008 and June 2009, and the organization, in collaboration with the EPIP Association (European Policy for Intellectual Property), of a conference on 'Measuring the Value of IPRs: theory, business practice and public policy', held in Bologna on 24 September 2009.

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