Contents

1 Research on the Capability of Technological Innovation Based on the Maintenance Time of Patent ....................... 1
Yongzhong Qiao
1.1 Introduction ................................................. 1
1.2 Data Collection and Design of Variables .................... 3
1.2.1 Data Collection ........................................... 3
1.2.2 Variables Design ....................................... 3
1.3 Analysis of the Basic Status of Patent Maintenance Times 4
1.3.1 Basic Status of Patents ................................. 4
1.3.2 Analysis of the Maintenance Status of Patents .......... 6
1.3.3 Comparison of Maintenance Status of Patents Owned by Different Types of Owners .................. 8
1.4 Conclusions and Expectation ................................. 10

2 The Analysis to Influencing Factors on the Technological Innovation Based on the Patent Maintenance Time .......... 11
Yongzhong Qiao
2.1 Introduction ............................................... 11
2.2 Data Collection and Design of Variables .................... 13
2.3 Basic Status of Patents ..................................... 13
2.3.1 Data Collection ......................................... 13
2.3.2 Analysis of the General Maintenance Status of Patents ................................................. 14
2.4 Multiple Linear Regression Analysis of the Factors to Influent the Maintenance Time of Patents .................. 15
2.4.1 Regression Results ...................................... 15
2.4.2 Progression Analysis .................................... 16
2.5 Conclusions and Inspiration ................................ 17
3 Comparative Study of the Innovation Ability Based on the Maintenance Status of Domestic Patents and Foreign Patents

Yongzhong Qiao

3.1 Introduction .......................................................................................................................... 19
3.2 Data Collection and Design of Variables .............................................................................. 21
3.3 Comparisons of the Basic Status .......................................................................................... 21
   3.3.1 Comparisons of the Legal Status of Domestic Patents and Foreign Patents .................. 21
   3.3.2 Comparisons of the Status of Fixed-Variable of Domestic Patents and Foreign Patents ... 21
   3.3.3 Comparisons of the Maintenance Time of Domestic Patents and Foreign Patents ........ 22
3.4 Comparisons of the Information of the Patent Applications ................................................. 23
   3.4.1 Comparisons of the Number of Claims of Domestic Patents and Foreign Patents .......... 23
   3.4.2 Comparisons of the Inventors Number of Domestic Patents and Foreign Patents .......... 24
   3.4.3 Comparisons of the Terminated Rate of Domestic Patents and Foreign Patents in Different Technical Fields ................................................................. 25
3.5 Conclusion .............................................................................................................................. 26

4 Empirical Research on the Maintenance Time of Granted Patents in the Performing Operations and Transporting Technological Field in Six Countries

Yongzhong Qiao and Yan Zhang

4.1 Introduction ............................................................................................................................. 28
4.2 Data Sources and Collection ................................................................................................. 30
4.3 Analysis of the Maintenance Time of Granted Patents in the Performing Operations and Transporting Technological Field in Six Countries ............................................................................. 30
   4.3.1 Comparative Analysis of the Average Maintenance Time of Patents Granted in the Performing Operations and Transporting Technological Field in Six Countries ......................................................... 31
   4.3.2 Comparative Analysis of the Legal Status of Granted Patents in the Performing Operations and Transporting Technological Field in Six Countries ................................................................. 33
   4.3.3 The Distribution of Granted Patents in the Performing Operations and Transporting Technological Field in Six Countries in Different Maintenance Periods ...................................................... 35
4.4 Conclusions ............................................................................................................................. 37
## 5 Comparative Study of the Renewal Information of Granted Patents in the Physics Technological Field in China, France and Germany

Yongzhong Qiao and Wanlin Tan

5.1 Introduction ................................. 40
5.2 Data Collection and the Establishment of Database ................................. 41
5.3 Information Analysis of Granted Patents in Physics Technological Field in China, France and Germany ................................. 42
  5.3.1 Analysis of the Claim Number of Granted Patents in Physics Technological Field in China, France and Germany ................................. 42
  5.3.2 Analysis of the Examination Time of Granted Patents in Physics Technological Field in China, France and Germany ................................. 43
  5.3.3 Analysis of the Average Inventor Number of Granted Patents in the Physics Technological Field in China, France and Germany ................................. 44
  5.3.4 Comparative Analysis of the Interval Scale of Granted Patents in the Physics Technological Field in China, France and Germany ................................. 45
  5.3.5 Comparative Analysis of the Abandoned Patents Number in the Physics Technological Field Granted by China, France and Germany ................................. 46
5.4 Conclusions ................................ 48

## 6 The Cross-National Comparative Study of the Maintenance Time of Granted Patents in the Technical Field of Fixed Constructions in Different Countries

Jun Shen and Yongzhong Qiao

6.1 Introduction ................................ 50
6.2 Data Collection and Variable Design ................................ 51
  6.2.1 Data Collection ................................ 51
  6.2.2 Variable Design ................................ 51
6.3 Comparative Analysis of the Maintenance Time of Granted Patents in the Technical Field of Fixed Constructions in the Four Countries ................................ 51
  6.3.1 Comparative Analysis of the Mean Value of Maintenance Time of Granted Patents in the Technical Field of Fixed Constructions in the Four Countries ................................ 52
  6.3.2 Comparative Analysis of the Distribution Trend of Different Maintenance Periods of Granted Patents in the Technical Field of Fixed Constructions in Four Countries ................................ 53
6.4 The Causal Analysis of the Difference of Maintenance Time of Granted Patents in the Technical Field of Fixed Constructions in Four Countries ........................................ 55

6.5 Conclusion ................................................. 56

7 Empirical Research of the Maintenance Time of Foreign Patents Without the Foreign Priority Granted by USA, Korea, Japan and China ........................................ 57
Yongzhong Qiao and Yan Sun

7.1 Introduction .............................................. 58
7.2 Data Sources .............................................. 60
7.3 Data Analysis .............................................. 60

7.3.1 The Distribution of Foreign Patents Without the Foreign Priority ........................................ 60

7.3.2 Comparative Analysis of the Maintenance Time of Foreign Patents Without the Foreign Priority ........ 63

7.4 Conclusion .................................................. 65

8 Research on the Relationship Between Maintenance Time and Examination Time of Patents ........................................ 67
Yongzhong Qiao and Hao Peng

8.1 Introduction .............................................. 67
8.2 Data Sources .............................................. 69
8.3 The Relationship Between the Examination Time and the Maintenance Time of Patents ........................................ 69

8.3.1 Based on the Perspective of the Percentage Variation of the Patent Number ........................................ 70

8.3.2 The Relationship Analysis Between the Maintenance Time and the Examination Time of Patents Based on the Perspective of the Variation of the Patent Number ........................................ 71

8.3.3 The Relationship Analysis Between the Maintenance Time and the Examination Time of Patents Based on the Perspective of the Examination Time within 2–5 Years ........................................ 72

8.4 The Analysis on the Reasons of the Relationship Between the Examination Time and the Maintenance Time of Patents ........................................ 73

8.4.1 The Perspective of the Patent Protection Term ........................................ 74

8.4.2 The Support Perspective of the Patent Policy ........................................ 74

8.4.3 The Perspective of the Patent Market ........................................ 75

8.4.4 The Perspective of the Examination System ........................................ 76

8.5 Conclusion and Enlightenment ........................................ 76
9 Research on the Patent Licensing of the New Generation Information Technology Industry in China
Yongzhong Qiao and Siwen Liu
9.1 Introduction ............................................. 80
9.2 Data Sources and Research Methods .................... 80
9.3 Data Analysis ............................................ 81
9.3.1 The Developing Trends of Patent Licensing in Four Representative Enterprises .......... 81
9.3.2 The Distributions of the Patent Types to Licensing in Four Representative Enterprises .......... 82
9.3.3 The Licensor or Licensee Distribution of Patent Licensing in Four Representative Enterprises .......... 82
9.4 Conclusions ............................................... 84

10 Research on the Technical Fields Distribution of Patents Licensing of Chinese Firms in the Next-Generation Information Technology Industry ............................................. 85
Yongzhong Qiao and Siwen Liu
10.1 Introduction ............................................. 86
10.2 Data Sources and Research Methods .................... 87
10.3 Data Analysis ............................................ 87
10.3.1 The Distribution of the Sections of Technical Fields of Patents Licensing .................. 87
10.3.2 The Distribution of the Classes of Technical Fields of Patents Licensing .................. 88
10.3.3 The Distribution of the Subclasses of Technical Fields of Patents Licensing .................. 89
10.4 Conclusion ............................................... 90

11 Research on the Granted Patent Distribution of the Energy-Saving and Environmental Protection Industry in China ............................................. 91
Yongzhong Qiao and Qi Liang
11.1 Introduction ............................................. 92
11.2 Data Source and Industry Classification .................. 93
11.3 The Granted Patents Distribution of the Energy-Saving and Environmental Protection Industry .................. 94
11.3.1 The Overall Features of the Granted Patents ........ 94
11.3.2 The Granted Patents Distributions of the Energy-Saving Industry .................. 95
11.3.3 The Granted Patents Distributions of the Resources Recycling Industry .................. 97
11.4 The Granted Patents Distributions of the Environmental Management Industry .................. 99
11.4.1 The Granted Patents Distribution of Main Fields of the Environmental Management Industry ........ 100
11.4.2 The Domestic and Foreign Granted Patents Distributions of the Environmental Management Industry ........................................... 101
11.5 Conclusions ................................................................. 101

12 Research on the Distribution of Patented Technologies of Energy-Saving Industry in China ........................................... 103
Yongzhong Qiao and Qi Liang
12.1 Introduction ............................................................ 104
12.2 Data Source and Technology Classification ......................... 105
12.3 The Patent Distributions of Main Technologies in the Energy-Saving Industry ......................................................... 105
12.3.1 Technological Innovation Characteristics of the Energy-Saving Industry in China ......................................................... 105
12.3.2 Distributions of Granted Patents in the Technological Fields of Industrial Boiler Design and Manufacturing and Waste Heat and Energy Utilization ........ 106
12.3.3 Distributions of Granted Patents in the Technological Fields of Environmentally Air Conditioning and Heat Pump ......................................................... 107
12.4 Conclusions ................................................................. 109

Yongzhong Qiao and Tiantian Zhang
13.1 Introduction ............................................................ 112
13.2 Technical Field and Data Retrieval .................................. 113
13.2.1 Technical Fields .................................................... 113
13.2.2 Key Enterprises .................................................... 114
13.2.3 Data Retrieval ....................................................... 114
13.3 Data Analysis ............................................................ 114
13.3.1 The Overall Distributions of Granted Patents of Four Technological Fields ......................................................... 114
13.3.2 Distributions of Granted Patents in the Hybrid Electric Vehicle Field ......................................................... 115
13.3.3 Distributions of Granted Patents in the Blade Electric Vehicle Field ......................................................... 116
13.3.4 Distributions of Granted Patents in the Fuel Cell Electric Vehicle Field ......................................................... 117
13.3.5 Distributions of Granted Patents in the Battery Technical Field ......................................................... 118
13.4 Conclusion ................................................................. 119

Yongzhong Qiao and Xuezhong Zhu
14.1 Introduction ............................................................ 121
14.2 The Status Quo of Patent Protection of TCM
   14.2.1 An Overview of TCM Patent Applications
   14.2.2 An Overview of TCM Patent Grants
   14.2.3 TCM International Patent Applications

14.3 The Impact of Patent Protection on the TCM Industry R&D
   14.3.1 The Impact of Patent Protection of TCM
       on the Expense and Social Benefits of TCM
       Institutions’ R&D
   14.3.2 The Impact of TCM Patent Protection on the TCM
       Institution Human Resources
   14.3.3 The Impact of TCM Patent Protection
       on the Scientific/Technical Output of TCM
       Institutions

14.4 The Challenges Confronting TCM Patent Protection
       and the Solutions

15 Study on the Ownership of Inventions-Creations
   by the Government-Funded in China
   Yongzhong Qiao

15.1 Introduction
15.2 The Development and the Defects of the Relevant Policies
   15.2.1 The Development of the Relevant Policies
   15.2.2 The Defects of the Relevant Policies

15.3 The Analysis on the Ownership Mode
   of Inventions-Creations by the Government Funds
   15.3.1 The Analysis of Advantages and Disadvantages
   15.3.2 The Latest Policies and Their Flaws
   15.3.3 Legislative Proposals

15.4 The Impact of the Modes of Ownership on the Amounts
   of Inventions-Creations
   15.4.1 Comparative Between the Amounts of the Service
       Invention Patents and the Government Funds
   15.4.2 Comparative Between the Achievements of NKTRP
       and the Government Funds
   15.4.3 Comparative Between the Achievements
       of NPKBRD and the Government Funds

15.5 Conclusions
Maintenance Time and the Industry Development of Patents
Empirical Research with Evidence from China
Qiao, Y. (Ed.)
2017, XV, 141 p. 37 illus., 36 illus. in color., Hardcover