

Contents

| | |
|--|-----|
| Abstract | i |
| Acknowledgements | iii |
| 1 INTRODUCTION TO THE THESIS | 1 |
| 1.1 BACKGROUND OF THE THESIS | 1 |
| 1.2 PROBLEM STATEMENT | 2 |
| 1.3 Appendix | 8 |
| United States | 8 |
| Germany | 8 |
| UK (England and Wales) | 8 |
| Korea | 8 |
| China | 9 |
| Japan | 9 |
| 2 QUALITY OF PATENT LITIGATION SYSTEM | 16 |
| 2.1 INTRODUCTION | 16 |
| 2.2 STYLIZED FACTS | 17 |
| 2.3 QUALITY ANALYSIS: A TWO-LAYER FRAMEWORK | 20 |
| 2.4 INTERNATIONAL COMPARISON | 21 |
| 2.4.1 Legal standard 1: validity challenges (VC) | 21 |
| Opposition process | 21 |
| Examination capacity | 22 |
| Workload and pendency | 23 |
| Public access to the files | 23 |
| Summary of validity challenges | 24 |
| 2.4.2 Legal standard 2: infringement suits (IS) | 24 |
| Specialized trial courts | 24 |
| Patent judges and experts | 24 |
| Reversal rate | 25 |
| Reliable remedies | 25 |
| Summary of infringement suits | 26 |
| 2.4.3 Legal standard 3: Cost | 26 |
| Summary | 27 |
| 2.5 CONCLUSION AND POLICY IMPLICATIONS | 29 |

| | |
|---|------------|
| 3 OWNERSHIP FRAGMENTATION EXPLAINS OPPOSITION FILINGS IN THE EUROPEAN PATENT OFFICE | 42 |
| 3.1 INTRODUCTION AND BACKGROUND | 42 |
| 3.2 THEORY DEVELOPMENT AND HYPOTHESES | 44 |
| Determinants of opposition filing | 44 |
| Revenue effect and the profit dissipating effect | 44 |
| Ownership Fragmentation and Transaction Cost | 46 |
| Complex vs. Discrete Industries | 47 |
| 3.3 DATA AND VARIABLES | 48 |
| Data source and construction | 48 |
| Dependent variables | 48 |
| Independent variables | 49 |
| Control variables | 49 |
| 3.4 EMPIRICAL DISCRIPTION | 51 |
| 3.4.1 Growth of patent filing and patent opposition | 51 |
| 3.4.2 Descriptive statistics | 51 |
| 3.5 MODEL SPECIFICATION AND EMPIRICAL RESULTS | 52 |
| 3.5.1 Baseline specification and identification strategy | 52 |
| 3.5.2 Separate models by industries. | 53 |
| 3.5.3 Robustness and extensions. | 54 |
| Econometric models | 54 |
| Opposition probability and opposition rate | 54 |
| Fragmentation index | 55 |
| 3.6 CONCLUSION | 55 |
| 4 DO SYSTEM DESIGNS AFFECT LITIGATION FILING ? EVIDENCE FROM PATENT VALIDITY CHALLENGE CASES | 72 |
| 4.1 INTRODUCTION | 72 |
| 4.2 THEORY DEVELOPMENT | 74 |
| 4.2.1 Literature review on determinants of litigation filing | 74 |
| 4.2.2 Research gap in differentiating filing incentives behind opposition and invalidation trials | 75 |
| Cost | 76 |
| Time allowed for filing notice of opposition | 77 |
| Revocation Rate | 77 |
| 4.2.3 Define patent quality based on theories of technological radicalness | 78 |
| 4.3 DESCRIPTIONS OF THE MEASURE, DATA SOURCES, SAMPLES AND SETTINGS | 79 |
| 4.3.1 Invalidation cases and matched samples | 79 |
| 4.3.2 Variables | 79 |
| Measures for patent features | 80 |
| Measures for Patent Owners Features | 82 |
| Measures for technology features | 83 |
| 4.4 Model Specification and Results | 84 |
| 4.5 CONCLUSION | 86 |
| A Appendix | 103 |