

Index

<i>Index</i>	1
<i>List of Tables</i>	7
<i>List of Figures</i>	9
CHAPTER I	12
1.1 Context and research objectives	13
1.2 Structure of the thesis	18
CHAPTER II	20
2.1 Introduction	22
2.2 Knowledge flows: local buzz and global pipelines	23
2.2.1 Regional innovation policy	24
2.3 Brussels: region and agglomeration	25
2.3.1 City benchmarking: Brussels, Berlin and Vienna	27
2.4 Stylised facts	28
2.5 Patent output: key features and trends	32
2.5.1 PATSTAT database and comparison of Brussels at city, regional and international levels	33
2.5.2 Methodology	33
2.5.3 Number of patent applications with at least one inventor located in Brussels	36
2.5.4 Share of patent applications by organisation (company, government non-profit organisation, individual, university)	39
2.5.5 Relative share of top IPC classes	43
2.5.6 Technological proximities within and across industries	45
2.5.7 Patent distribution by the type of innovation	47
2.5.8 Concentration of innovativeness and wealth at the district level	48
2.5.9 Cumulated distribution of the number of patent applications of the top 50 Belgian firms	50
2.5.10 Revealed Technology Advantage (RTA)	50
2.6 Scientific publication output: key features and trends	56
2.6.1 SCOPUS: data and method	56

2.6.2 Methodology	57
2.6.3 Number of scientific publications with at least one author from Brussels.....	59
2.6.4 Share of scientific publications by organisation (company, government non-profit organisation, university).....	62
2.6.5 Relative share of top scientific fields	65
2.6.6 Scientifically Revealed Advantage (SRA)	68
2.6.7 TOP 100 most cited scientific publications by scientific fields	71
2.6.8 Concentration of innovativeness and wealth at the district level	73
2.6.9 Scientific proximities within and across industries by Belgian districts.....	73
2.6.10 Relative specialisation index among Belgian regions	74
2.7 Global knowledge pipelines: contribution to patents and scientific publications at country level.....	76
2.8 SWOT analysis	80
2.9 Conclusion and policy implications.....	82
CHAPTER III	85
3.1 Introduction.....	87
3.2 Stylised facts: Belgium.....	88
3.3 Literature Review	90
3.3.1 The role of regional development	90
3.3.2 Territorial disparities.....	91
3.3.3 Importance of city-agglomerations as innovation systems.....	92
3.3.4 Empirical insights	93
3.4 Data and methodology	95
3.4.1 Data	95
3.4.2 Spatial proximity	95
3.4.3 Basic regression	97
3.5 Findings.....	98
3.5.1 Country level.....	98
3.5.2 Regional level.....	101
3.5.3 Provincial level.....	103
3.5.4 District level.....	105

3.5.5 City agglomeration level.....	107
3.6 Robustness check.....	110
3.6.1 Robustness of the R&D stock elasticity using Two-Step SYSGMM method.....	110
3.6.2 Spatial autocorrelation.....	111
3.7 Conclusion.....	111
<i>Appendix I</i>	<i>114</i>
<i>Appendix I-1 Representativeness of the database</i>	<i>114</i>
<i>Appendix I-2 Descriptive statistic</i>	<i>114</i>
<i>Appendix I-3 Construction of Physical Capital for robustness check</i>	<i>115</i>
<i>Appendix I-4 Fixed and random effects models</i>	<i>116</i>
<i>Appendix I-5 R&D elasticity</i>	<i>119</i>
CHAPTER IV	125
4.1 Introduction.....	127
4.2 Regional differences and spatial reach of patent collaboration networks.....	128
4.2.1 Theoretical background	128
4.2.2 Empirical insights	130
4.3 Data and estimation strategy	131
4.3.1 Database construction.....	131
4.3.2 Basic regression	137
4.3.3 Patenting and patent collaboration as innovative activities of R&D active companies	137
4.3.4 The spatial reach of patent collaboration network involving company-individual ties	138
4.4 Empirical analysis and results	138
4.4.1 The basic regression: Cobb-Douglass production function.....	138
4.4.2 Influence of patenting on output growth by country and regional level.....	139
4.4.3 The impact of patent collaboration networks on output growth at country and regional level.....	141
4.4.4 The impact of the spatial reach of the patent collaboration networks on output growth	142
4.5 Robustness check.....	144
4.6 Conclusions.....	146
<i>Appendix II</i>	<i>149</i>

<i>Appendix II-1 Representativeness of the R&D database</i>	149
<i>Appendix II-2 Co-applied patent networks between different organisations</i>	149
<i>Appendix II-3 Variable definition and descriptive statistics.....</i>	151
<i>Appendix II-4 Tests</i>	152
<i>Appendix II-5 The spatial reach of the patent collaboration networks on output growth</i>	154
CHAPTER V.....	155
5.1 Introduction.....	157
5.2 The composition of networks: variety and spatial reach	159
5.2.1 Invention and innovation	159
5.2.2 The variety in collaborative networks in innovations	160
5.2.3 The spatial reach of collaborative networks in innovation	163
5.3 Data and estimation strategy	164
5.3.1 Database construction.....	164
5.3.2 Econometric framework	166
5.4 Empirical analysis and results	168
5.4.1 Collaboration on innovation.....	168
5.4.2 Network spatial reach on innovation.....	171
5.5 Conclusions.....	174
<i>Appendix III.....</i>	177
<i>Appendix III-1 Variable definition and descriptive statistics</i>	177
<i>Appendix III-2 Robustness check.....</i>	181
<i>Appendix III-3 Tests.....</i>	182
<i>Appendix III-4 Additional data analysis</i>	185
CHAPTER VI	186
6.1 Main lessons of the research	187
6.2 Main limitations of the research	193
6.3 Further research.....	195

