

Contents	Page
General introduction	1
Chapter 1: Innovation as the expression of firms' evolution capacity	5
Introduction.....	5
1.1 Innovation as an evolutionary process	5
1.1.1 Schumpeter and the "process of creative destruction"	5
1.1.2 Linear vs. interactive model of innovation	8
1.1.3 Innovation, evolution and firms' performance	11
1.2 Innovation as a knowledge-based process	15
1.2.1 Taking the firm as an information system.....	16
1.2.2 Information and the knowledge base of the firm	18
1.2.3 Knowledge-base of the firm and innovation.....	19
1.3 Nature and forms of innovation: towards a continuum approach.....	21
1.3.1 A good/service continuum?.....	21
1.3.2 Innovations of product/services <i>vs.</i> process innovations	23
1.3.3 A broader conception of innovation?	24
Conclusion	25
Chapter 2: Interactions between KIBS and SMEs and impact on innovation capacities	27
Introduction.....	27
2.1 Interactions: between market and hierarchy?.....	27
2.1.1 The "make or buy" approach.....	27
2.1.2 The transaction costs theory	28
2.1.3 The network analysis	30
2.2 The impact of interactions with KIBS on SMEs.....	35
2.2.1 A characterisation of SMEs knowledge-base and innovation activities.....	35
2.2.2 KIBS as complementary innovation assets for SMEs	37

2.2.3	KIBS as co-innovators.....	39
2.3	KIBS innovation capacity and the influence of interactions with SMEs	42
2.3.1	A context of socio-economic and technological changes	42
2.3.2	Exploring the knowledge-base of KIBS.....	44
2.3.3	The impacts of interactions with SMEs on KIBS	45
	Conclusion	47
	Chapter 3: Territorial determinants and evolution capacities of SMEs and KIBS.....	49
	Introduction.....	49
3.1	Proximity and innovation	49
3.1.1	Knowledge spillovers and proximity	49
3.1.2	Proximity, accessibility of information and learning.....	50
3.1.3	Conceptualisation of proximity	51
3.2	Territory and innovation.....	53
3.2.1	The innovation environment and the debated relevance of the territory	53
3.2.2	From industrial districts to learning regions	57
3.2.3	The systemic approach	58
3.3	The impact of territorial determinants on SMEs and KIBS interactions and evolution	60
3.3.1	The specific impact of proximity-based interactions between SMEs and KIBS	61
3.3.2	The influence of the type of regional environment on the evolution capacities of SMEs and KIBS	63
3.3.3	The national innovation system as a determinant of SMEs and KIBS behaviour	65
	Conclusion	66

Chapter 4: Operationalisation of the analysis	67
Introduction.....	67
4.1 From the hypotheses to the key variables	67
4.1.1 The hypotheses to be tested.....	67
4.1.2 The conceptual model.....	68
4.1.3 The variables of the analysis	69
4.2 Structure of the data.....	72
4.2.1 The surveyed regions.....	73
4.2.2 The SME sample	74
4.2.3 The KIBS sample.....	78
4.3 The statistical exploitation procedure	82
4.3.1 The exploratory stage: the segmentation analysis (CHAID)	83
4.3.2 The middle stage: multiple correspondence analysis.....	84
4.3.3 The final stage: path-modelling.....	86
Conclusion	88
Chapter 5: Statistical exploitation of the SME sample.....	89
Introduction.....	89
5.1 Segmentation procedures.....	89
5.1.1 First segmentation.....	90
5.1.2 Second segmentation	91
5.1.3 Third segmentation	94
5.2 Multiple correspondence analysis	96
5.2.1 Contribution to variance explanation	96
5.2.2 The main dimensions of the multiple correspondence analysis	96
5.2.3 Interpretation of the correspondence analysis.....	99
5.3 Path modelling	100
5.3.1 Variables reduction.....	100
5.3.2 Results.....	101
5.3.3 Interpretation.....	104
Conclusion	105

Chapter 6: Statistical exploitation of the KIBS sample	107
Introduction.....	107
6.1 Segmentation procedures.....	107
6.1.1 First segmentation.....	107
6.1.2 Second segmentation	109
6.1.3 Third segmentation	112
6.2 Multiple correspondence analysis	114
6.2.1 Contribution to variance explanation	114
6.2.2 The main dimensions of the multiple correspondence analysis	114
6.2.3 Interpretation of the correspondence analysis.....	117
6.3 Path modelling	118
6.3.1 Variable reduction	118
6.3.2 Results.....	119
6.3.3 Interpretation.....	121
Conclusion	122
Chapter 7: Main findings and policy implications	125
Introduction.....	125
7.1 Interpretation of the key findings	125
7.1.1 Innovation and evolution: what can be learnt from SMEs and KIBS?.....	126
7.1.2 The virtuous circle: between contamination and symbioses.....	127
7.1.3 The territorial component: does space really matter?	129
7.2 Towards an integrated typology of innovation interactions	131
7.2.1 KIBS demand and supply response: Wood's model	131
7.2.2 An integrated typology of knowledge exchanges	134
7.2.3 Examples.....	137
7.3 Implications for policies	142
7.3.1 Innovation: rather a matter of knowledge than of technique?	142

7.3.2	The concept of induced support	143
7.3.3	Some elements contributing to a renewed regional policy agenda.....	145
Conclusion	148	
General conclusion.....	149	
References	153	
Appendix	169	
Appendix A: Basic frequencies of the selected variables	171	
Appendix B: Selected bivariate tests	183	
Appendix C: PROBIT analysis	191	

List of figures

Figure 1.1:	The <i>Schumpeter mark I</i> model.....	7
Figure 1.2:	The <i>Schumpeter mark II</i> model	8
Figure 1.3:	The conventional linear model	9
Figure 1.4:	The chain-linked model	10
Figure 1.5:	The virtuous circle and the vicious circle.....	15
Figure 1.6:	The firm as an information system according to Davis (1974)	16
Figure 1.7:	The firm as an information system according to Le Moigne (1986)	17
Figure 1.8:	A context of expanding knowledge	19
Figure 1.9:	The knowledge pyramid	20
Figure 1.10:	The tangible-intangible dominant continuum.....	23
Figure 2.1:	Possible activities of Institutions of Technological Infrastructure (ITI).....	34
Figure 2.2:	The scientific and technical information system of a SME.....	37
Figure 2.3:	<i>Schumpeter mark III</i> derived from <i>Schumpeter mark I</i>	40
Figure 2.4:	<i>Schumpeter mark III</i> derived from <i>Schumpeter mark II</i>	40
Figure 2.5:	The contribution of KIBS to the innovation capacity of SMEs	41
Figure 2.6:	The place of KIBS in a perspective of socio-economic and technological changes	43
Figure 2.7:	The production process leading to the service output.....	45
Figure 2.8:	The contribution of SMEs to the innovation capacity of KIBS	47
Figure 3.1:	The distance decay function	52
Figure 3.2:	Networking and the external environment of the firm	54
Figure 3.3:	The model of immaterial infrastructure of a territory	56
Figure 3.4:	The mutual contribution of KIBS and SMEs to their innovation capacity: what are the territorial determinants?	61
Figure 4.1:	The conceptual model	69

Figure 4.2:	The surveyed regions	74
Figure 4.3:	The "stat-mix" procedure.....	82
Figure 4.4:	Example of CHAID tree-diagram.....	84
Figure 4.5:	Canonical analysis, $\xi \in W_1$ and $\eta \in W_2$ presenting a minimal angle.....	86
Figure 4.6:	Path modelling – dependent and explanatory variables	87
Figure 4.7:	Path modelling – direct and indirect dependencies	88
Figure 5.1:	"Growth" as a dependent variable	91
Figure 5.2:	"Introduction of innovation" as a dependent variable	93
Figure 5.3:	"Interaction with KIBS" as a dependent variable.....	95
Figure 5.4:	Multiple correspondence analysis of the SMEs sample.....	98
Figure 5.5:	Path modelling: the SMEs sample	103
Figure 6.1:	"Growth" as a dependent variable	109
Figure 6.2:	"Performance of innovation" as a dependent variable	111
Figure 6.3:	"Interaction with SMEs" as a dependent variable	113
Figure 6.4:	Multiple correspondence analysis of the KIBS sample.....	116
Figure 6.5:	Path modelling: the KIBS sample.....	120
Figure 7.1:	KIBS demand and supply response from a spatial perspective	133
Figure 7.2:	The wheel of knowledge interactions implying KIBS and SMEs	135
Figure 7.3:	The "holy trinity" of regional economics according to Storper	146

List of tables

Table 4.1:	Overall structure of the variables	70
Table 4.2	The activities covered by the SME sample	75
Table 4.3:	The seven aggregated SME sectors	76
Table 4.4.:	The sector distribution of each regional sample	77
Table 4.5:	Variables extracted from the SMEs survey	78
Table 4.6:	The activities covered by the KIBS sample.....	79
Table 4.7:	The four aggregated KIBS sectors.....	80
Table 4.8:	The sector distribution of each regional sample	80
Table 4.9:	Variables extracted from the KIBS survey	81
Table 5.1:	Dependent and explicative variables of the CHAID procedures	89
Table 5.2:	Eigenvalues of the correspondence analysis	96
Table 5.3:	Discrimination measures of the correspondence analysis	99
Table 5.4:	Set of dichotomic variables used for the path-modelling.....	101
Table 5.5:	Results of the PROBIT analysis	102
Table 6.1:	Dependent and explicative variables of the CHAID procedures	107
Table 6.2:	Eigenvalues of the correspondence analysis	114
Table 6.3:	Discrimination measures of the correspondence analysis	115
Table 6.4:	Set of dichotomic variables used for the path-modelling.....	118
Table 6.5:	Results of the PROBIT analysis	119