Patterns of Innovation Capabilities and City Regions:

Evidence from the Statistics Canada Innovation Survey in Services

By

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Outline

- Aim of the paper
- Contribution of the paper
- Data
- Results
- Tentative conclusion

The aim of this paper

1. To explore complementarities and substitutions between various types of innovation activities in order to see how KIBS firms mix different types of innovation activities to develop or improve their goods and services.
2. To explore heterogeneities in the determinants of KIBS firms to choose between six types of innovation activities related to the development and improvement of goods and services.
3. In doing this exploration, a special attention is paid to differences related to city regions and industries in which KIBS firms operate.

Innovation capabilities

- To explore these issues, we rely on the concept of innovation capabilities of firms to develop or improve their products and production processes.
- The innovation capabilities are not equivalent to the new or improved products and production processes realized. Indeed, innovation capabilities refer to the capacities of firms to combine and integrate knowledge and resources into a problem-solving mode leading to the development or improvement of their products and production processes.
- Differences in combinations of innovation capabilities represent differences in patterns of innovation capabilities that this paper attempts to explain by using various variables, including location and industries.

Defining innovation in services

- Scholars disagree as to how to define and measure innovation in services.
- Most empirical studies have assimilated innovation in services to innovation in manufacturing industries, and as a consequence have defined and measured innovation narrowly in terms of technological innovations.
- Drejer (2004), Hipp and Grupp (2005) and Freel (2006), to name a few, have all argued for a broader view of innovation in the case of services.
- Without discarding technological innovation, this paper aims to contribute to the advancement of knowledge by adopting a broader view which takes into account six innovation capabilities that are instrumental in developing or improving technological innovations.

Contribution of the paper

- Prior studies on innovation activities have focused attention on R&D.
- The other innovation activities and the question of how firms mix different innovation activities have received much less attention.
- This paper aims to fill this gap by looking at a sample of knowledge-intensive-based service firms operating in engineering consulting services, computer system design and management consulting services in order to shed light on how they mix six innovation activities to develop and/or improve their goods and services.

Contribution of the paper

- While prior studies have examined the determinants of innovation activities in separate models, this paper uses a Multivariate Probit model to reflect the fact that in practice, firms consider simultaneously the contribution of different innovation activities.
- The Multivariate Probit model includes six equations estimating six innovation activities

The six innovation capabilities included in this paper refer to:

1. Internal R&D linked to new or significantly improved products (goods or services) or processes,
2. External R&D activities which are R&D activities performed by other firms or organizations,
3. Acquisition of equipment and machinery specifically purchased to implement new or significantly improved products (goods or services) or processes,
4. Acquisition of other external knowledge such as patents, non-patented inventions, licenses, know-how, trademarks, software and other types of knowledge from others for the development of new or significantly improved products (services or goods) and processes,
5. Internal or external training for your personnel directly aimed at the development and /or introduction of new or significantly improved products (goods or services or processes), and
6. Internal or external marketing activities directly aimed at the development and /or introduction of new or significantly improved products (goods or services or processes).

KIBS Industries

- The literature on the knowledge based economy as well as studies on innovation all attribute a central role to knowledge in the development of innovation and innovation capabilities
- Studies on innovation tend to suggest that knowledge becomes highly idiosyncratic at the firm level and that industries differ significantly with respect to their knowledge base and knowledge absorptive capabilities and, therefore, their innovation capabilities (Malerba, 2002; Abreu, Kitson and Savona, 2006).
- Industries that rely heavily on professional knowledge like KIBS firms provide a very interesting terrain to test this hypothesis.
- The three industries included in this study are characterized by high proportions of highly qualified staff that provides a range of specialized project-based solutions which are often co-produced with their clients.
- At the same time, the three industries differ significantly regarding the role of hard technologies, which is less important in management consulting and more important in system engineering.
- In this paper, industries were measured with a series of binary variables defined as follows:
  - **Engineering services (NAIC=54133)**
  - **Management consulting services (NAIC=54161)**
  - **Computer system design services (NAIC=54151)** .

Metropolitan agglomerations

- **Hypothesis**: large metropolitan centers foster the emergence and consolidation of processes that facilitate the generation, transmission and exchange of knowledge, which results in higher innovation propensity in large rather than small or medium sized metropolitan centers.
- Bettencourt et al. (2007) and Orlando and Verba (2006) have found evidence showing that large urban centers are more innovative than smaller ones.
- Orlando and Verba (2006) and Therrien (2005) qualified these findings by pointing out that large metropolitan centers would be more innovative with respect to radical innovations but that smaller metropolitan centers would do well in matter of incremental innovations.
- In this paper we have categorized metropolitan agglomerations in three groups:
  - **Large agglomerations (Large CMAs): >1 million.**
  - **Medium agglomerations (Medium CMAs): between 100 000 and 1 million.**
  - **Small agglomerations (Small CMAs & non-CMAs): <100 000.**

Data

- The data used in this study are the responses of 2625 weighted observations representing innovative service establishments to the 2003 Statistics Canada Innovation Survey on services
- The data analyzed in this paper cover only innovative service establishments operating in engineering services (n of weighted observations = 627 firms), computer system design (n of weighted observations =1514 firms) and management consulting services (n of weighted observations = 484 firms)

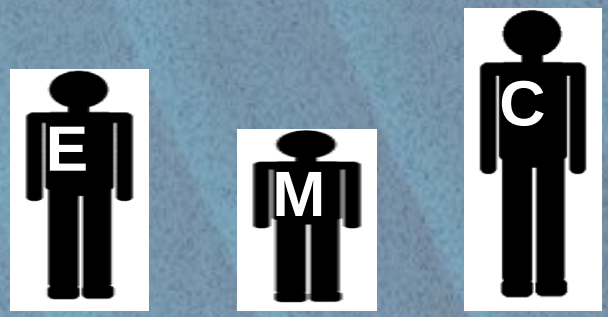
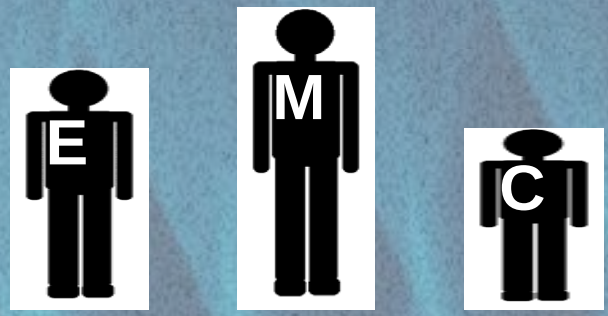
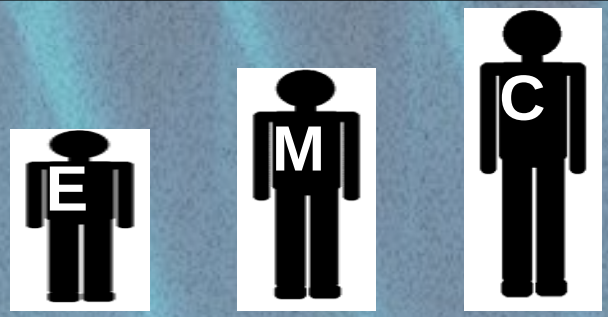
Distribution of the Innovation Activities

According to the Three Selected service industries for the Sub-population of Innovative Establishments

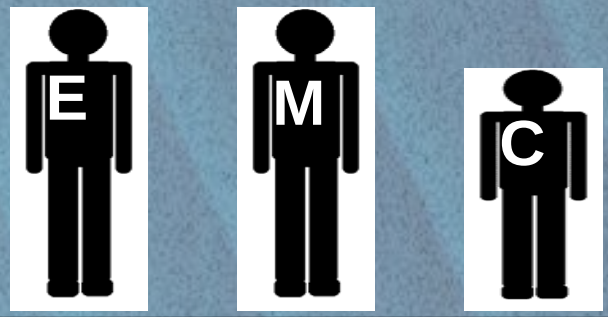
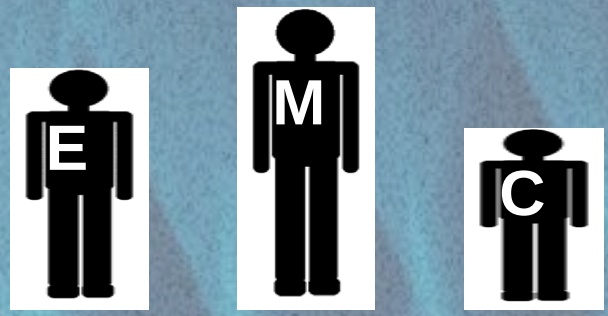
Distribution of the Innovation Activities for the Three Selected service industries for the Sub-population of Innovative Establishments

	All Selected Industries		Engineering Consulting Services [a]		Management Consulting Services [b]		Computer System Design Services [c]	
During the last three years, 2001 to 2003, did your business unit engage in the following activities?								
Innovation Activities	*Used*	*No*	*Used*	*No*	*Used*	*No*	*Used*	*No*
	In % of innovative establishments							
Internal R&D	83.4	16.6	74.6^{+b-c}	25.4	70.9^{-a-c}	29.1	91.0^{+a+b}	9.0
External R&D	27.4	72.6	28.2^{-b+c}	71.8	38.8^{+a+c}	61.2	23.3^{-a-b}	76.7
Acquisition of Equipment & Machinery	66.8	33.2	56.3^{-b-c}	43.7	62.2^{+a-c}	37.8	72.7^{+a+b}	27.3
Acquisition of other External Knowledge	41.9	58.1	$46.1^{=b+c}$	53.9	$44.0^{=a+c}$	56.0	39.4^{-a-b}	60.6
Training	79.2	20.8	82.5^{-b+c}	17.5	86.8^{+a+c}	13.2	75.4^{-a-b}	24.6
Market Introduction of Innovations	73.8	26.2	70.2^{+b-c}	29.8	63.6^{-a-c}	36.4	78.5^{+a+b}	21.5

NOTE: The figures reported in columns 3, 4 and 5 are based on Statistics Canada estimates whereas column 2 and Chi-square tests were produced by the authors.
« a », « b» and « c» refer to the three selected service industries. The signs « + » and « - » indicate that, for each innovation activity considered in the rows, the proportion of establishments that was engaged in this innovation activity is statistically significantly ($p < .1$) greater or smaller for the industry considered in the columns than the other industries according to Chi-square tests. The sign « = » indicates that no significant differences exist between the industries regarding the engagement or not by the establishment on this innovation activity.

	Selected Service industries
Internal R&D	
External R&D	
Acquisition of Equipment & Machinery	

E= Engineering Consulting Services
M= Management Consulting Services
C= Computer System Design Services

	Selected Service industries
Acquisition of other External Knowledge	
Training	
Market Introduction of Innovations	

E= Engineering Consulting Services
M= Management Consulting Services
C= Computer System Design Services

Distribution of the Innovation Activities

According to the CMA Size Categories for the Sub-population of Innovative Establishments

Distribution of the Innovation Activities according to the CMA Size Categories for the Sub-population of Innovative Establishments

	All Selected CMA		Small CMA [a]		Medium CMA [b]		Large CMA [c]	
During the last three years, 2001 to 2003, did your business unit engage in the following activities?								
Innovation Activities	*Used*	*No*	*Used*	*No*	*Used*	*No*	*Used*	*No*
	In % of innovative establishments							
Internal R&D	83.4	16.6	75.0$^{=b-c}$	25.0	77.4$^{=a-c}$	22.6	88.7^{+a+b}	11.3
External R&D	27.4	72.6	26.4$^{=b=c}$	73.6	27.3$^{=a=c}$	72.7	27.5$^{=a=b}$	72.5
Acquisition of Equipment & Machinery	66.8	33.2	81.7^{+b+c}	18.3	54.2^{-a-c}	45.8	73.4^{-a+b}	26.6
Acquisition of other External Knowledge	41.9	58.1	35.1$^{=b-c}$	64.9	36.2$^{=a-c}$	63.8	46.7^{+a+b}	53.3
Training	79.2	20.8	76.0$^{=b-c}$	24.0	72.7$^{=a-c}$	27.3	84.2^{+a+b}	15.8
Market Introduction of Innovations	73.8	26.2	68.3^{-b-c}	31.7	73.0$^{+a=c}$	27.0	75.2$^{+a=b}$	24.8

NOTE: The figures reported in columns 3, 4 and 5 are based on Statistics Canada estimates whereas column 2 and Chi-square tests were produced by the authors.
« a », « b» and « c» refer to the three selected CMAs size which are Small CMAs (Small & non-CMAs), Medium CMAs and Large CMAs. The signs « + » and « - » indicate that, for each innovation activity considered in the rows, the proportion of establishments that was engaged in this innovation activity is statistically significantly ($p < .1$) greater or smaller for the CMA size category in the columns than the other CMA size categories according to Chi-square tests. The sign « = » indicates that no significant differences exist between the CMA size categories regarding the engagement or not by the establishment on this innovation activity.

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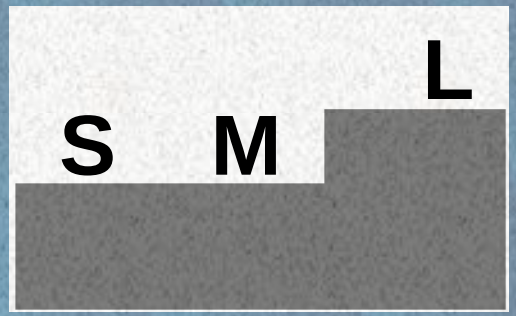
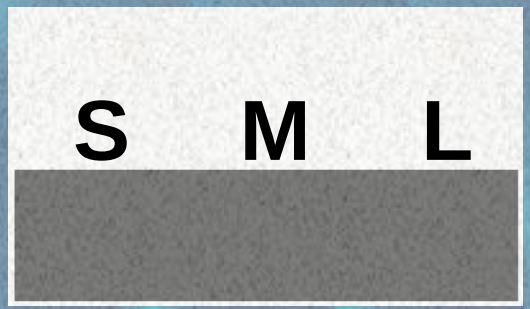
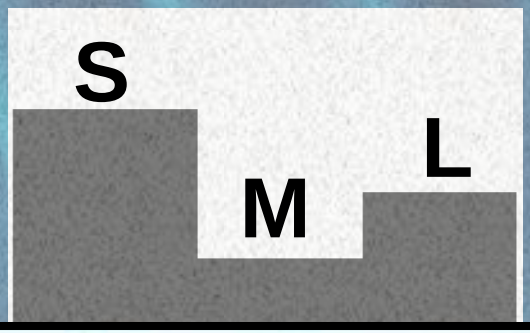
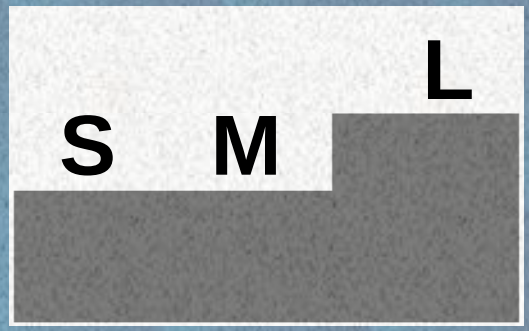
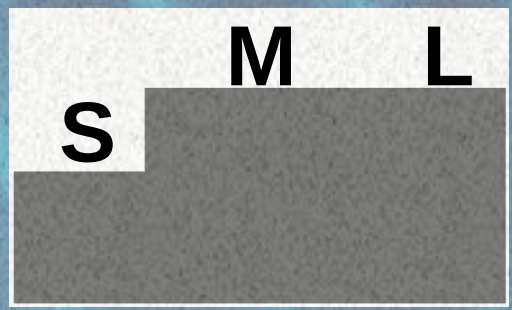
	CMA Size Categories
Internal R&D	
External R&D	
Acquisition of Equipment & Machinery	

S = Small CMAs & non-CMAs
M = Medium CMAs
L = Large CMAs

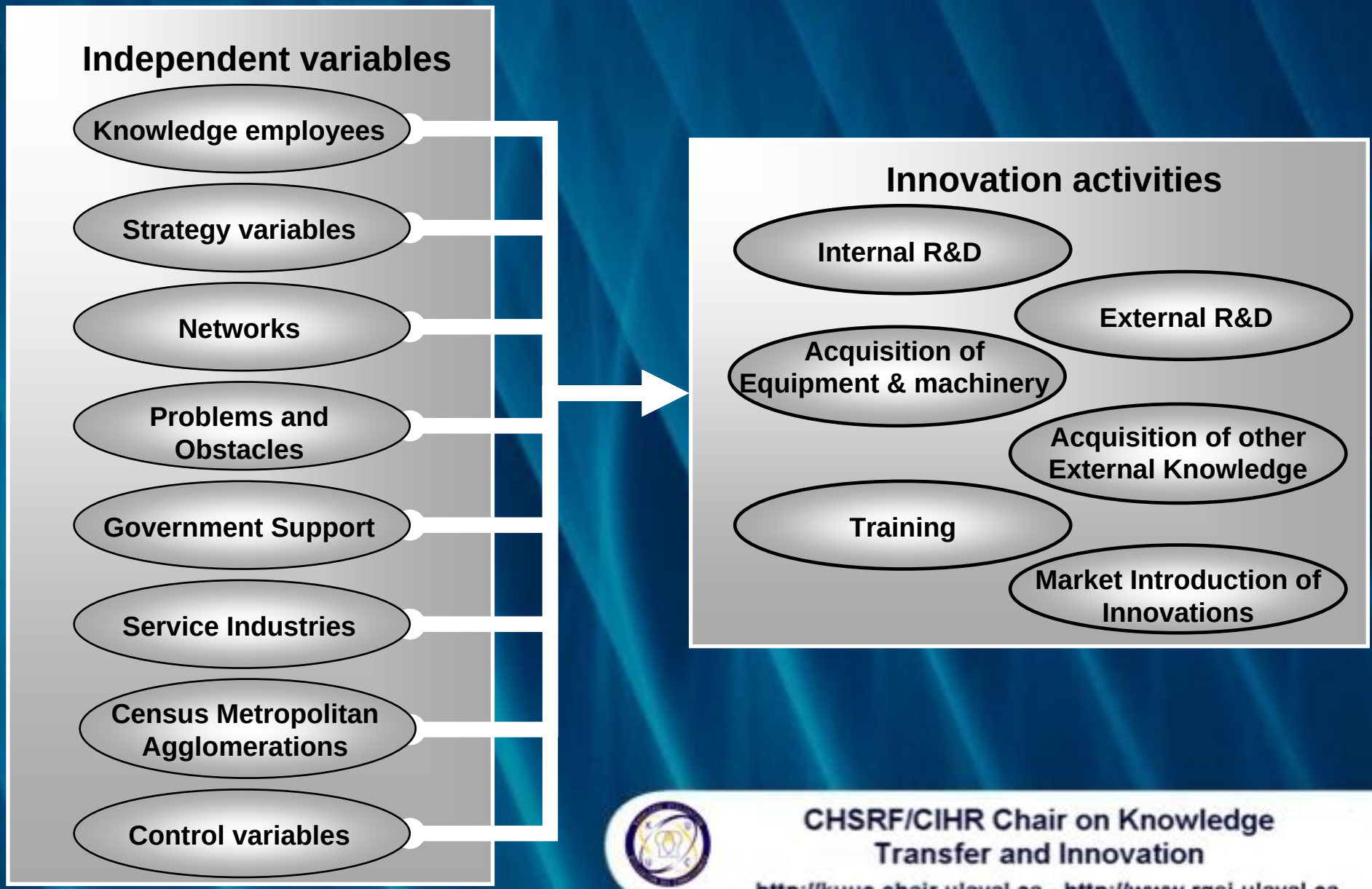
	CMA Size Categories
Acquisition of other External Knowledge	
Training	
Market Introduction of Innovations	

S = Small CMAs & non-CMAs
M = Medium CMAs
L = Large CMAs

Innovation activities

Complementarities, Substitutions and Independencies

Conceptual framework



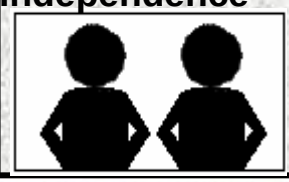
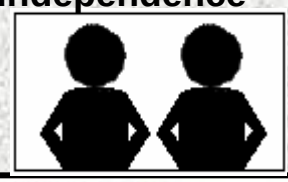
Multivariate Probit regressions' results explaining the innovation activities portfolio

Correlations between disturbances	ε_1		ε_2		ε_3		ε_4		ε_5			
ε_1	.552***	.009										
ε_2	.358**	.056	.368**	.023								
ε_3	.181	.385	.401***	.003	.527***	.000						
ε_5	-.205**	.064	-.085	.641	.188**	.046	.185	.294				
ε_6	.386***	.013	.706***	.000	.209*	.151	.190	.248	.041	.828		
Weighted number of observations	2625											
Log Likelihood	- 793.83											
McFadden [e]	.206											
LR index$_1$ χ^2 (114)	-999.88***	[Compares the unrestricted model to the "naïve" model containing only the intercept for each of the six equations.]										
LR index$_2$ χ^2 (15)	-841.05***	[Compares the unrestricted model to the model forcing the correlations between the equations' disturbances to be equal to zero.]										
LR index$_3$ χ^2 (95)	-932.36***	[Compares the unrestricted model to the model forcing the regression coefficients for each of the 14 independent variables to be equal across the six equations.]										

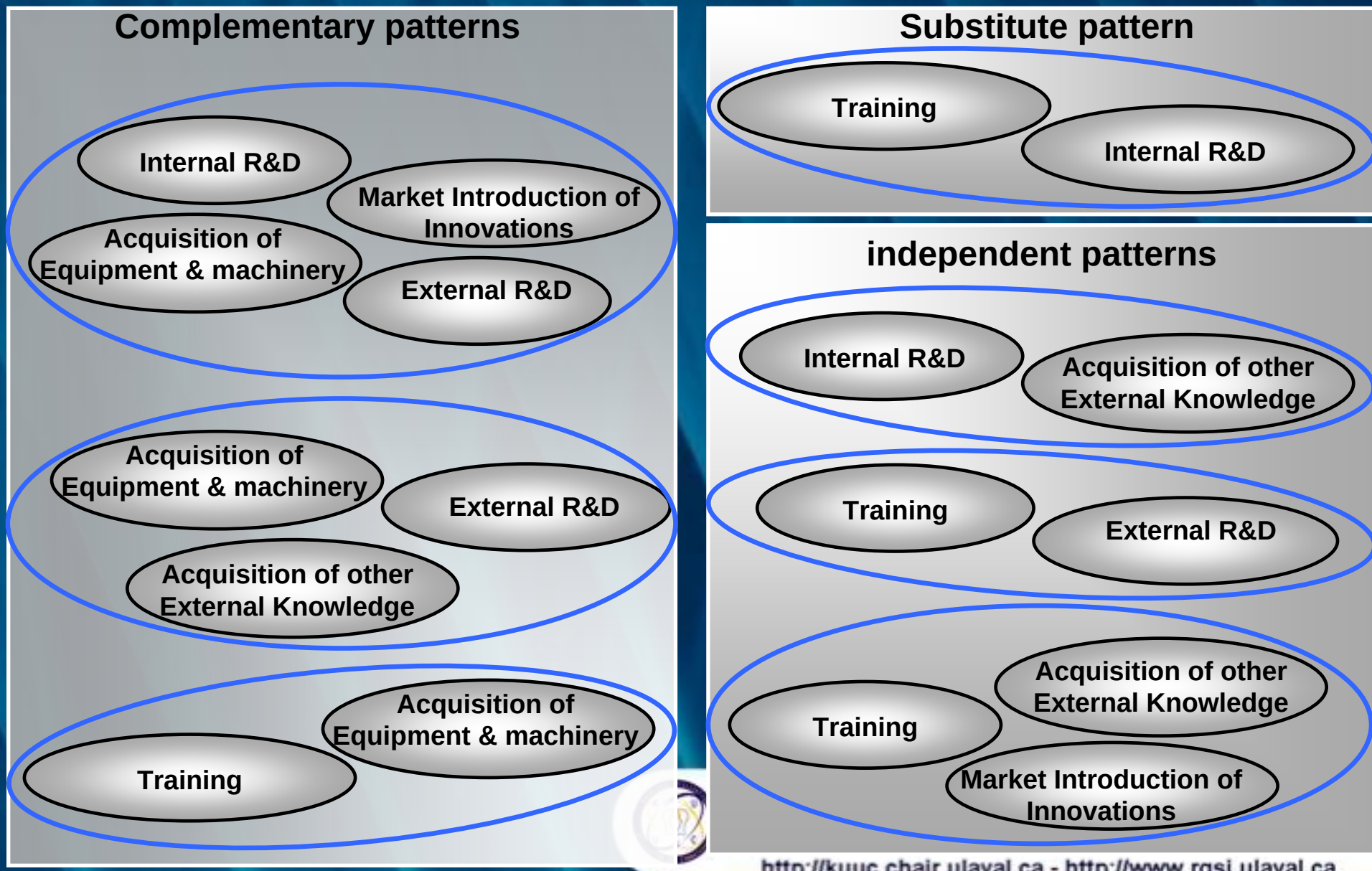
*, ** and *** indicate that the coefficient is significant, respectively, at the 10%, 5% and 1% thresholds.

[e] McFadden R^2 is calculated as: 1-[log$L(\theta)$/LogL_0] where LogL_0 is the value of log-likelihood function subject to the constraint that all coefficients except the constant are zero, and log$L(\theta)$ is the maximum value of the log-likelihood function without constraints.

According to Sonaka et al. (1989), McFadden R^2 in the range of 0.2-0.4, are typical logit models. Hence, for example, a same variable might exert a significant positive impact on some protection methods but not on all of them.

	Internal R&D	External R&D	Acquisition of Equip. & M.	Acquisition of other Ext. K	Training
External R&D	Complementary 				
Acquisition of Equip. & M.	Complementary 	Complementary 			
Acquisition of other E. K	Independence 	Complementary 	Complementary 		
Training	Substitute 	Independence 	Complementary 	Independence 	
Market Introduction of I.	Complementary 	Complementary 	Complementary 	Independence 	Independence 

Patterns of innovation activities



Why these complementary and substitution effects?

- In the absence of literature on complementarity, substitution and independence between innovative activities aimed at the development and improvement of products and processes, we are left with an empirical question that can be addressed either at the level of the innovative activities themselves or at the level of the determinants of the innovative activities.
- The results of this part of our study point to the fact that service firms rely on a large number of mixes of innovative activities.
- Why some innovative activities aimed at the development or improvement of products and processes are complementary, while others are substitute or independent remains a question for future investigation.

Determinants of innovation activities

Complementary, substitute and independent

Multivariate Probit regressions' results explaining the innovation activities portfolio

	Internal R&D		External R&D		Acquisition of Equipment & Machinery		Acquisition of other External Knowledge		Training		Market Introduction of Innovations	
Independent variables	Coeff. (β)	P-value	Coeff. (β)	P-value	Coeff. (β)	P-value	Coeff. (β)	P-value	Coeff. (β)	P-value	Coeff. (β)	P-value
Intercept	-.0499	.973	-5.075***	.000	-.648	.551	-2.837***	.004	-2.415**	.078	-.643	.592
Knowledge Employee:												
Knowledge Employees	.012**	.082	.003	.430	.006*	.139	.003	.466	-.002	.962	.004	.442
Strategy Variables												
Knowledge Management Strategies	.174	.463	-.077	.683	.179	.322	.111	.519	.404**	.049	.156	.405
Human Resources Strategies	.283	.344	.335*	.160	-.289*	.154	.365**	.083	.140	.559	-.441**	.067
Niche Strategy	.318	.405	.324	.369	.131	.629	.103	.705	.343	.353	.134	.676
Protection of intellectual property	.211**	.061	.336***	.000	.137**	.058	.165***	.011	.063	.545	.185***	.013
Networks:												
Internal Networks	.212	.285	.115	.483	.102	.426	-.067	.569	.056	.754	.209**	.089
Market Networks	-.101	.649	-.086	.568	.084	.537	.161	.275	.018	.925	-.087	.607
Research Networks	-.141	.437	.102	.552	-.252**	.089	.084	.594	.059	.823	.115	.503
Information Networks	-.253*	.161	.198*	.157	.096	.394	-.139	.265	.163	.262	.010	.949
Problems and Obstacles												
Risk Aversion Obstacles	.253**	.060	.197**	.064	.031	.770	.003	.979	-.069	.653	.064	.599
Regulations and Standards Obstacles	-.227	.278	-.227*	.110	-.112	.425	.098	.477	.115	.523	-.039	.805
Organizational Rigidities within the Firm	-.405	.385	-.017	.964	.641*	.130	-.285	.474	-.345	.463	.209	.702
Government Support:												
Government Support	.131	.249	-.022	.817	.031	.681	.046	.499	.083**	.089	.095*	.188
Service Industries:												
Engineering Services [c]	-.723**	.091	.737**	.026	-.234	.437	.301	.265	.353**	.088	.087	.778
Management Consulting Services [c]	-.749**	.089	1.03***	.005	-.174	.615	.289	.342	.560*	.158	-.277**	.097
Census Metropolitan Agglomeration:												
Small CMA [d]	-.143**	.098	.033	.941	.086*	.125	-.289**	.099	-.289***	.012	-.172**	.098
Medium CMA [d]	-.566*	.168	-.137	.640	-.303**	.077	-.265**	.061	-.564**	.074	.057	.843
Control Variables:												
Subsidiary Firm	-.191	.622	.515**	.091	-.439**	.097	-.359*	.114	.565**	.091	.156	.575
Size	-.286	.257	.057	.734	.130**	.068	.899	.999	.011	.962	.143	.504

NOTE: *, ** and *** indicate that the coefficient is significant, respectively, at the 10%, 5% and 1% thresholds. c The reference category is Computer System Designs Services. d The reference category is Large CMA s (Toronto, Montreal, and Vancouver), Small CMAs refers to small CMAs & non-CMAs.

Complementary strategies /1

Independent variables	Internal R&D	External R&D	Acquisition of Equipment & Machinery	Market Introduction of Innovations
Intercept	-.0499	-5.075***	-.648	-.643
Knowledge Employees:				
Knowledge Employees	.012**	.003	.006*	.004
Strategy Variables				
Knowledge Management	.174	-.077	.179	.156
Knowledge development	.283	.335*	-.289*	-.441**
Niche Strategy	.318	.324	.131	.134
Protection of intellectual property	.211**	.336***	.137**	.185***
Networks:				
Internal Networks	.212	.115	.102	.209**
Market Networks	-.101	-.086	.084	-.087
Research Networks	-.141	.102	-.252**	.115
Information Networks	-.253*	.198*	.096	.010
Problems and Obstacles				
Risk Aversion Obstacles	.253**	.197**	.031	.064
Regulations and Standards	-.227	-.227*	-.112	-.039
Organizational Rigidities within the Firm	-.405	-.017	.641*	.209
Government Support:				
Government Support	.131	-.022	.031	.095*
Service Industries:				
Engineering Services	-.723**	.737**	-.234	.087
Management Consulting	-.749**	1.03***	-.174	-.277**
Census Metropolitan				
Small CMA	-.143**	.033	.086*	-.172**
Medium CMA	-.566*	-.137	-.303**	.057
Control Variables:				
Subsidiary Firm	-.191	.515**	-.439**	.156
Size	-.286	.057	.130**	.143

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Complementary strategies /2

Independent variables	External R&D	Acquisition of Equipment & Machinery	Acquisition of other External Knowledge
Intercept	-5.075***	-.648	-2.837***
Knowledge Employees:			
Knowledge Employees	.003	.006*	.003
Strategy Variables			
Knowledge Management	-.077	.179	.111
Knowledge development	.335*	-.289*	.365**
Niche Strategy	.324	.131	.103
Protection of intellectual property	.336***	.137**	.165***
Networks:			
Internal Networks	.115	.102	-.067
Market Networks	-.086	.084	.161
Research Networks	.102	-.252**	.084
Information Networks	.198*	.096	-.139
Problems and Obstacles			
Risk Aversion Obstacles	.197**	.031	.003
Regulations and Standards	-.227*	-.112	.098
Organizational Rigidities within the Firm	-.017	.641*	-.285
Government Support:			
Government Support	-.022	.031	.046
Service Industries:			
Engineering Services	.737**	-.234	.301
Management Consulting	1.03***	-.174	.289
Census Metropolitan			
Small CMA	.033	.086*	-.289**
Medium CMA	-.137	-.303**	-.265**
Control Variables:			
Subsidiary Firm	.515**	-.439**	-.359*
Size	.057	.130**	.899

Complementary strategies /3

Independent variables	Acquisition of Equipment & Machinery	Training
Intercept	-.648	-2.415**
Knowledge Employees:		
Knowledge Employees	.006*	-.002
Strategy Variables		
Knowledge Management	.179	.404**
Knowledge development	-.289*	.140
Niche Strategy	.131	.343
Protection of intellectual property	.137**	.063
Networks:		
Internal Networks	.102	.056
Market Networks	.084	.018
Research Networks	-.252**	.059
Information Networks	.096	.163
Problems and Obstacles		
Risk Aversion Obstacles	.031	-.069
Regulations and Standards	-.112	.115
Organizational Rigidities within the Firm	.641*	-.345
Government Support:		
Government Support	.031	.083**
Service Industries:		
Engineering Services	-.234	.353**
Management Consulting	-.174	.560*
Census Metropolitan		
Small CMA	.086*	-.289***
Medium CMA	-.303**	-.564**
Control Variables:		
Subsidiary Firm	-.439**	.565**
Size	.130**	.011

Substitute strategy

Independent variables	Internal R&D	Training
Intercept	-.0499	-2.415**
Knowledge Employees:		
Knowledge Employees	.012**	-.002
Strategy Variables		
Knowledge Management	.174	.404**
Knowledge development	.283	.140
Niche Strategy	.318	.343
Protection of intellectual property	.211**	.063
Networks:		
Internal Networks	.212	.056
Market Networks	-.101	.018
Research Networks	-.141	.059
Information Networks	-.253*	.163
Problems and Obstacles		
Risk Aversion Obstacles	.253**	-.069
Regulations and Standards	-.227	.115
Organizational Rigidities within the Firm	-.405	-.345
Government Support:		
Government Support	.131	.083**
Service Industries:		
Engineering Services	-.723**	.353**
Management Consulting	-.749**	.560*
Census Metropolitan		
Small CMA	-.143**	-.289***
Medium CMA	-.566*	-.564**
Control Variables:		
Subsidiary Firm	-.191	.565**
Size	-.286	.011

Independence strategies /1

Independent variables	Internal R&D	Acquisition of other External Knowledge
Intercept	-.0499	-2.837***
Knowledge Employees:		
Knowledge Employees	.012**	.003
Strategy Variables		
Knowledge Management	.174	.111
Knowledge development	.283	.365**
Niche Strategy	.318	.103
Protection of intellectual property	.211**	.165***
Networks:		
Internal Networks	.212	-.067
Market Networks	-.101	.161
Research Networks	-.141	.084
Information Networks	-.253*	-.139
Problems and Obstacles		
Risk Aversion Obstacles	.253**	.003
Regulations and Standards	-.227	.098
Organizational Rigidities within the Firm	-.405	-.285
Government Support:		
Government Support	.131	.046
Service Industries:		
Engineering Services	-.723**	.301
Management Consulting	-.749**	.289
Census Metropolitan		
Small CMA	-.143**	-.289**
Medium CMA	-.566*	-.265**
Control Variables:		
Subsidiary Firm	-.191	-.359*
Size	-.286	.899

Independence strategies /2

Independent variables	External R&D	Training
Intercept	-5.075***	-2.415**
Knowledge Employees:		
Knowledge Employees	.003	-.002
Strategy Variables		
Knowledge Management	-.077	.404**
Knowledge development	.335*	.140
Niche Strategy	.324	.343
Protection of intellectual property	.336***	.063
Networks:		
Internal Networks	.115	.056
Market Networks	-.086	.018
Research Networks	.102	.059
Information Networks	.198*	.163
Problems and Obstacles		
Risk Aversion Obstacles	.197**	-.069
Regulations and Standards	-.227*	.115
Organizational Rigidities within the Firm	-.017	-.345
Government Support:		
Government Support	-.022	.083**
Service Industries:		
Engineering Services	.737**	.353**
Management Consulting	1.03***	.560*
Census Metropolitan		
Small CMA	.033	-.289***
Medium CMA	-.137	-.564**
Control Variables:		
Subsidiary Firm	.515**	.565**
Size	.057	.011

Independence strategies /3

Independent variables	Acquisition of other External Knowledge	Training	Market Introduction of Innovations
Intercept	-2.837***	-2.415**	-.643
Knowledge Employees:			
Knowledge Employees	.003	-.002	.004
Strategy Variables			
Knowledge Management	.111	.404**	.156
Knowledge development	.365**	.140	-.441**
Niche Strategy	.103	.343	.134
Protection of intellectual property	.165***	.063	.185***
Networks:			
Internal Networks	-.067	.056	.209**
Market Networks	.161	.018	-.087
Research Networks	.084	.059	.115
Information Networks	-.139	.163	.010
Problems and Obstacles			
Risk Aversion Obstacles	.003	-.069	.064
Regulations and Standards	.098	.115	-.039
Organizational Rigidities within the Firm	-.285	-.345	.209
Government Support:			
Government Support	.046	.083**	.095*
Service Industries:			
Engineering Services	.301	.353**	.087
Management Consulting	.289	.560*	-.277**
Census Metropolitan			
Small CMA	-.289**	-.289***	-.172**
Medium CMA	-.265**	-.564**	.057
Control Variables:			
Subsidiary Firm	-.359*	.565**	.156
Size	.899	.011	.143

Tentative conclusion/1

- What is the impact of size of agglomerations on innovation capabilities?
  - Being located in Large CMAs has a positive impact on 3 innovation capabilities : Internal R&D, Acquisition of other external knowledge, and Training;
  - Being located in Medium CMAs rather than Large CMAs has a negative impact on 4 innovation capabilities: Internal R&D, Acquisition of other external knowledge, Acquisition of equipment and machinery, and Training;
  - Being located in Small CMAs rather than Large CMAs has:
    - ✓ A negative impact in 4 cases: Internal R&D, Acquisition of other external knowledge, Training, and Market introduction of innovations;
    - ✓ A positive impact in 1 case: Acquisition of equipment and machinery.
- In the case of KIBS, overall, these findings suggest that being located in large metroplitain centers has not an impact on all innovation capabilities.

Tentative conclusion/2

- Complementarities suggest that some innovative activities that are interdependent and reinforce each other should be considered jointly instead of separately.
- Conversely, the results show that some innovative activities are independent from each other. Moreover, the results also show that some innovative activities are substitutes for others.
- These results suggest that firms rely on various mixes of innovative activities in order to develop or improve their products and processes.
- Finally, the results also show that there are many important differences in the determinants of the different innovative activities.

Merci pour votre attention

Thank you for your attention

Questions?

Comments?