
To what extent do different sectors ‘socialize’ innovation differently? Mapping cooperative linkages in knowledge intensive business industries in the Ottawa region

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The point of departure

- Growing number of studies on the social dimension of innovation (Freel & Harrison, 2006; Tödting et al., 2006; Diez, 2006; Dahlander & McKelvey, 2005;...)
- The role of 'proximity' in cooperative relationships to sustain innovation processes (Asheim & Coenen, 2005; Crevoisier, 2005; Kotschatzky et al., 2001...)
- Territorial innovation models: regional innovation system, innovative milieu, regional cluster...acknowledge to different degrees that firm's innovation is embedded within collaborative networks and in the their regional economy (Cooke, 2007; Crevoisier, 2006; Belussi, 2005; Wolfe & Gertler, 2005...)

The (not so) 'new' debate...but the new 'shift' in the study of the geography of cooperation\1

- **There is a need to analyze the geography of collaborative at different scales i.e. region, national, global**

'To understand technological change it is crucial to identify the economic, social, political and geographical context in which innovation is generated and disseminated. This space may be local, national or global. Or, more likely, it will involve a complex and evolving integration at different levels of local, national and global forces(Archibugi & Michie, 1999)'

'To develop a more comprehensive approach to understanding [innovative cooperation] , it will be necessary to consider failures as well as successes, non-localized as well as localized learning, and different modes of integration, both locally and globally...On this basis, it would be possible to develop a more discriminating account of the conditions that enable some regions to adapt and generate certain forms of knowledge, more successfully than others (Hommen and Doloreux, 2005)

The (not so) 'new' debate...but the new 'shift' in the study of the geography of cooperation\2

- 'There is a need for a qualitative shift away from work which focuses on particular scales as the locus for understanding innovation, towards that which gives more credence to relationships operating between and across different scales (Bunnel & Coe, 2001; 570)
- 'What is often missing is a clear differentiation of these relations as well as their geography (Tödting et al., 2006: 1037)

The 'new' debate

- Understand the role of local versus distant forms of cooperation as mechanisms of knowledge generation and circulation, and their contribution to innovation
- Local and global flows of knowledge may be complementary in the process of innovation (Asheim & Gertler, 2005; Simmie, 2004...)
- Cluster and regional innovation system are open (Asheim & Gertler, 2005; Malecki & Oinas, 2002...)
- The 'local buzz' and 'global pipeline' metaphor (Bathelt et al., 2004)

Objectives of the paper

- How important is cooperation and which are the relevant partners?
- What geographical patterns are characteristics for innovative cooperation and which types of firms are more integrated into regional, national and international innovation systems?
- What significant differences exist with regard to cooperation patterns between high tech manufacturing firms and knowledge intensive service businesses?

Contribution of the paper

- In general, prior studies on innovative have focused attention on regional collaborative links...in selected manufacturing industries and/or different clusters
- In the case of Ottawa, prior studies on cooperation in Ottawa have focused attention on high tech manufacturing firms (Doloreux, 2004), high tech firms in ICT cluster (Madill et al., 2004), life science-biotech cluster (Dalpé, 2004)...
- This paper produce new empirical evidence pertaining to the nature of cooperation in different knowledge intensive sectors (both manufacturing and service) in the Ottawa region, and most importantly to analyze the relative importance of localized versus distant forms of cooperation

Database and survey

- A survey firm who conducted computer-assisted telephone interviews from November 27, 2006 to February 27, 2007
- Canadian Company Directory (Industry Canada) provides the initial list of 394 firms
- High and Medium Tech Manufacturing (116/66 (response rate of 56.8%)) and Knowledge Intensive Business Services (278/106 (response rate of 38.1%))
- The research does not intend to be representative of manufacturing and KIBS firms, but rather concentrate on dynamic industries connected to the leading 'clusters' in Ottawa
- The questionnaire covered the following issues: general information about the firm; innovation activities; innovation cooperation and the types and mechanisms of knowledge exchange

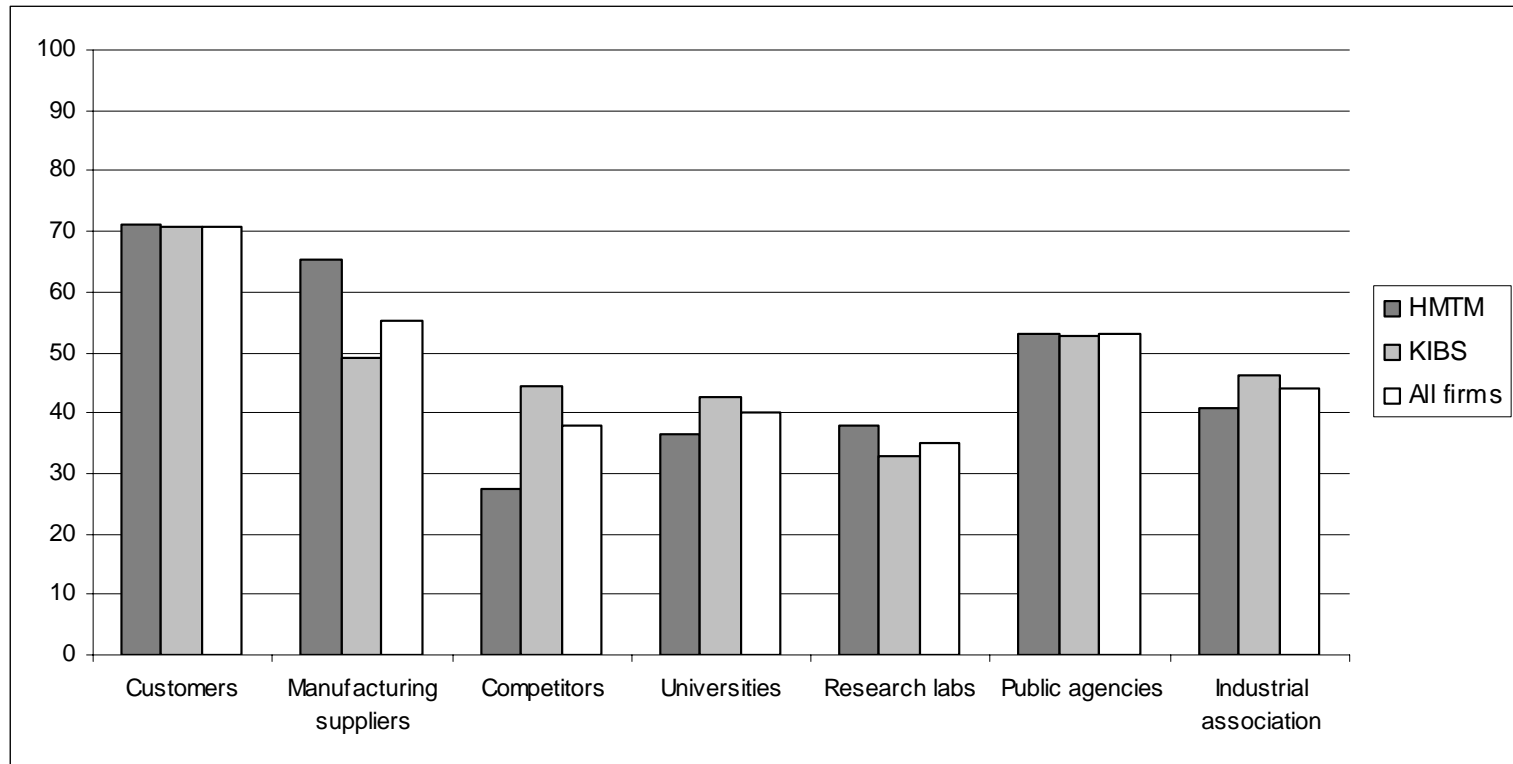
Characteristics of cooperating firms

	HIGH AND MEDIUM TECH MANUFACTURING		KIBS	
	<i>Cooperating firms (n=50)</i>	<i>Non cooperating firms (n=14)</i>	<i>Cooperating firms (N=83)</i>	<i>Non cooperating firms (n=21)</i>
Firms' general characteristics				
Age (years)	17.1	18.2	15.2	19.7
Employees	56.9	36.2	34.0	35.6
Employees with university degree as % of total employment	42.2	38.7	52.1	61.5
Sales (000,000)	3.2	3.4	6.4 ^b	0.931
Exports	42.9	5.0	30.9	41.7
Innovation activities				
Internal R&D	86.0	69.2	79.0 ^a	42.9
External R&D	38.0	14.3	35.0	28.6
Acquisition of machinery, equipment and software	83.7 ^a	35.7	71.1 ^a	38.1
Acquisition of other external knowledge	44.9	23.1	53.8 ^a	14.3
Training	84.0	64.3	72.0	52.4
Innovation types				
New or significantly improved products	83.7	69.2	65.8 ^a	20.0
New or significantly improved services	51.0	38.5	67.5 ^b	42.9
New or significantly improved processes	55.3	8.3 ^a	41.1 ^c	16.7

Note: ^a Significant at the 1% level; ^b Significant at the 5% level; ^c Significant at the 10% level

Source: Ottawa ISRN firm survey, 2007

The occurrence of cooperation/1



Source: Ottawa ISRN firm survey, 2007

The occurrence of cooperation/2

HMTM	Cust.	Suppliers	Comp.	Universities	Res. Labs	Prod. innov	Process innov.	Serv innov
Customers								
Suppliers	0.799**							
Competitors	0.389**	0.448**						
Universities	0.411**	0.355**	0.386**					
Res. labs	0.427**	0.440**	0.434**	0.708**				
Government	0.609**	0.650**	0.372**	0.522**	0.610**			
Prod. Inno.	ns	ns	Ns	ns	ns			
Proc. Inno.	.0325*	0.350**	Ns	ns	ns	0.378**		
Service. Inno..	Ns	0.242*	Ns	ns	ns	ns	ns	

KIBS	Cust.	Suppliers	Comp.	Universities	Res. labs	Prod. innov	Process innov.	Serv innov
Customers								
Suppliers	0.465**							
Competitors	0.490*	0.454*						
Universities	0.426**	0.264*	0.232*					
Res. Labs	0.319**	0.314**	0.302**	0.696**				
Government	0.639**	0.398**	0.463**	0.582**	0.543**			
Prod. Inno.	0.277**	ns	ns	ns	ns			
Proc. Inno.	ns	ns	ns	ns	ns	0.296**		
Service Inno.	0.242*	ns	ns	0.228*	ns	0.448**	ns	

* Significant at the 1% level, ** Significant at the 5 % level Not significant, ns

Source: Ottawa ISRN firm survey, 2007

Knowledge sources in innovation/1

	HMTM	KIBS
In house R&D	84.8	82.1
Customers	83.8	79.2
Suppliers	57.6	45.3
Universities/research labs	43.9	46.2
Service firms	47.0	45.3

Note: ^a Significant at the 1% level; ^b Significant at the 5% level; ^c Significant at the 10% level

Source: Ottawa ISRN firm survey, 2007

Knowledge sources in innovation/2

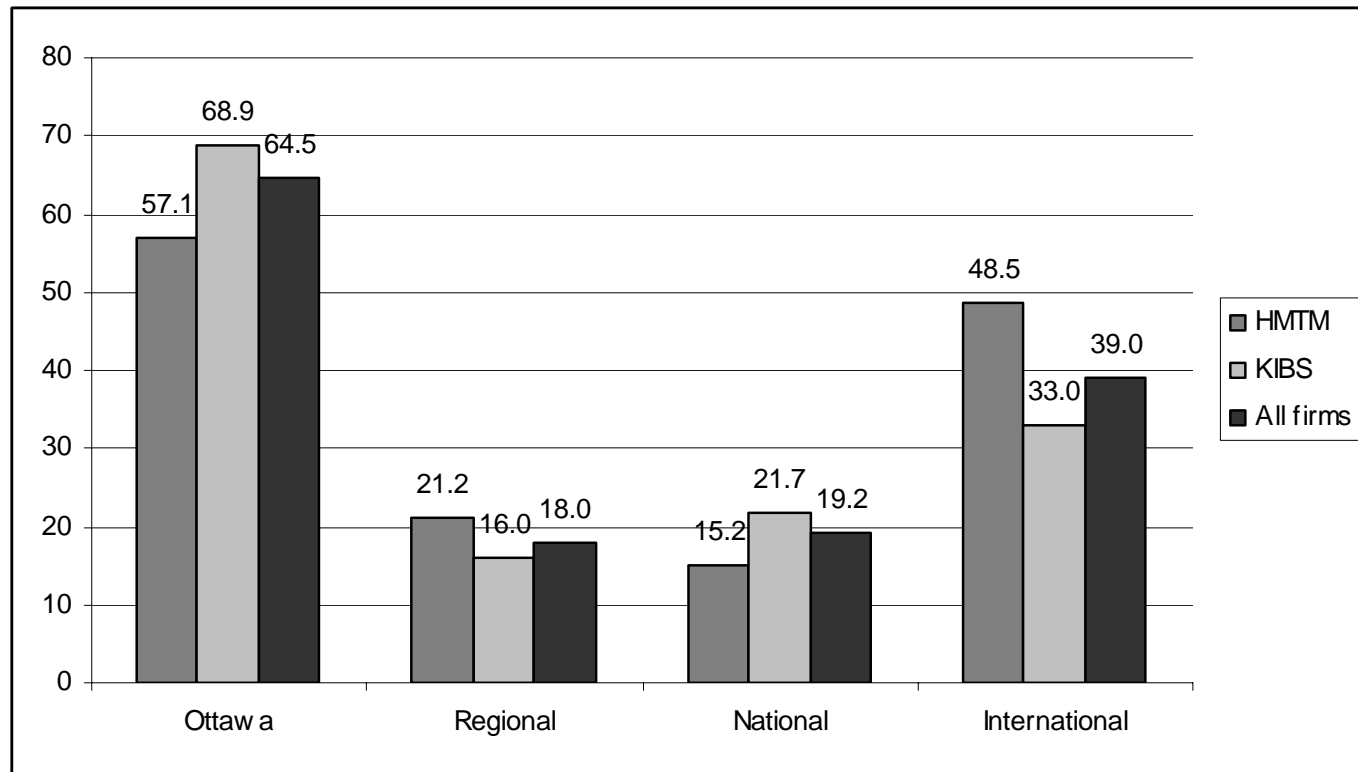
HMTM	In house R&D	Customers	Suppliers	Univ/res.labs	Service firms	Prod. Innov	Process innov.	Service innov
In house R&D								
Customers	ns							
Suppliers	ns	0.356**						
Universities/res.labs	ns		0.328**					
Service firms	ns		0.562**	0.451**				
Prod.innov	ns	ns	ns	ns	ns			
Process innov.	ns	ns	ns	ns	ns	ns		
Service innov.	ns	ns	ns	ns	ns	ns	0.378**	
KIBS	In house R&D	Customers	Suppliers	Univ/res.labs	Service firms	Prod. Innov	Process innov.	Service innov
In house R&D								
Customers	ns							
Suppliers	ns	0.325**						
Universities/res.labs	0.236*	0.195*	0.525*					
Service firms	ns	0.372**	ns	0.487**				
Prod.innov	ns	ns	0.259**	ns	ns			
Process innov.	ns	ns	ns	ns	ns	0.296*		
Service innov.	ns	ns	0.193*	ns	0.309**	0.448**	ns	

* Significant at the 1% level, ** Significant at the 5 % level, Not significant, ns

Source: Ottawa ISRN firm survey, 2007

The geographical distribution of cooperation/1

To what extent are HMTM and KIBS are more embedded locally?



Source: Ottawa ISRN firm survey, 2007

The geographical distribution of cooperation/2

To what extent a particular partners in more locally embedded than another ?

	Ottawa	Regional	Canada	International
<i>High and medium tech manufacturing</i>				
<i>(n=223 collaborations)</i>				
Customers	46.8%	0.0%	6.4%	46.8%
Manufacturing suppliers	47.6%	9.5%	7.1%	35.7%
Competitors	36.0%	12.0%	12.0%	40.0%
Universities	63.6%	4.5%	4.5%	27.3%
Research Labs	64.0%	4.0%	8.0%	24.0%
Public agencies	85.7%	2.9%	2.9%	8.6%
Industrial associations	77.8%	3.7%	0.0%	18.5%
<i>KIBS</i>				
<i>(n=384 collaborations)</i>				
Customers	63.6%	1.3%	9.1%	26.0%
Manufacturing suppliers	68.5%	3.7%	11.1%	16.7%
Competitors	47.0%	13.6%	12.1%	27.3%
Universities	72.3%	8.5%	12.8%	6.4%
Research Labs	77.1%	8.6%	5.7%	8.6%
Public agencies	85.7%	3.6%	7.1%	3.6%
Industrial associations	69.4%	2.0%	12.2%	16.3%

Source: Ottawa ISRN firm survey, 2007

The geographical distribution of knowledge sources

To what extent a particular knowledge source is more locally embedded than another ?

	Ottawa	Regional	Canada	International
<i>HMTM (n=266)</i>				
Customer	47.7%	4.6%	4.6%	43.1%
Supplier	50.0%	13.0%	4.3%	32.6%
Research universities and public labs	68.8%	18.8%	0.0%	12.5%
Consultant firms	78.8%	9.1%	6.1%	6.1%
Commercial R&D	64.5%	6.5%	3.2%	25.8%
<i>KIBS (n=406)</i>				
Customer	58.8%	7.2%	11.3%	22.7%
Supplier	64.8%	9.3%	7.4%	18.5%
Research universities and public labs	78.8%	13.5%	5.8%	1.9%
Consultant firms	82.7%	9.6%	3.8%	3.8%
Commercial R&D	66.0%	5.7%	11.3%	17.0%

Source: Ottawa ISRN firm survey, 2007

Tentative conclusion/1

- Patterns of cooperation in HMTM and KIBS
 - Cooperative firms are more innovative than non-cooperative firms, both for HMTM and KIBS
 - A geographical pattern is visible
 - The results suggest strongly that firms in the Ottawa innovation survey used local and international collaborations which were used more than those associated to provincial and national collaborations
 - Most of the variation in the geographical distribution of cooperators lies in whether the pattern assumes more of a U-Shape (HMTM in general; and customers and suppliers or an inverted J-Shape (KIBS in general, competitors)
 - Most of cooperative links with research and public organizations cooperative are strongly embedded within the region

Tentative conclusion/2

- Ottawa's innovation system
 - High relevance of intraregional and interregional linkages between innovative firms and other firms and public organizations
 - Ottawa as a breeding place for innovation
 - Ottawa as a hub in the Canadian' innovation system
 - Further investigation...
 - how the sources and types of knowledge exchanged and the cooperative links differ across different types of regions?
 - how different regions adapt and generate certain forms of knowledge and to what extent similar – or different- regions connect to each other.

What's next...

- **Qualitative interviews/Theme 1 – Summer 2007**
- **More analysis on the Ottawa innovation survey**
- **Working paper in progress...**
 - **What types of knowledge does your most important collaborator provide to your firm? Sectoral comparison in different Ottawa clusters**