



“Service companies in innovative environments: The case of Spanish science parks”

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Service companies in innovative environments: The case of Spanish science

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According to the Instituto Nacional de Estadística of Spain, services are the most important sector in the Spanish economy, representing 67,27% of GDP and 71,88% of the total employment (INE, 2009). Innovation has become one of the most important ways of improving processes and products. Nowadays it is also in the service sector. In fact, annual budget assigned to innovative activities is increasing each year. In this context, the establishment and creation of science parks emphasises R&D activities, creating the appropriated environment to build up an innovative atmosphere. In this context, using the data available at the Asociación de Parques Científicos y Tecnológicos de España (APTE), we analyze the importance of the service sector in science parks. Attending to the APTE's classification, we identify five typologies of companies referred to the service sector, namely: technology transfer offices, business incubators, training centres, IT services and consultancy services. Data is analyzed from two perspectives: individually (each park), and regionally (parks grouped according to the Spanish's political and administrative regions), focusing especially to IT companies. Our results show that nearly 50% of the companies allocated in science parks come from the service sector, corroborating the importance of this sector in those innovative environments.

Topic - Service Innovation

[Introduction]

Science parks (SP) as innovative environments

- SP promote the competitiveness and culture of innovation of their associated business and knowledge-based institutions.
- Science parks as seedbeds of innovation.
- SP as a tool for regional development policy.

Services Innovation - Knowledge Intensive Services Business (KIBS)

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Science Parks

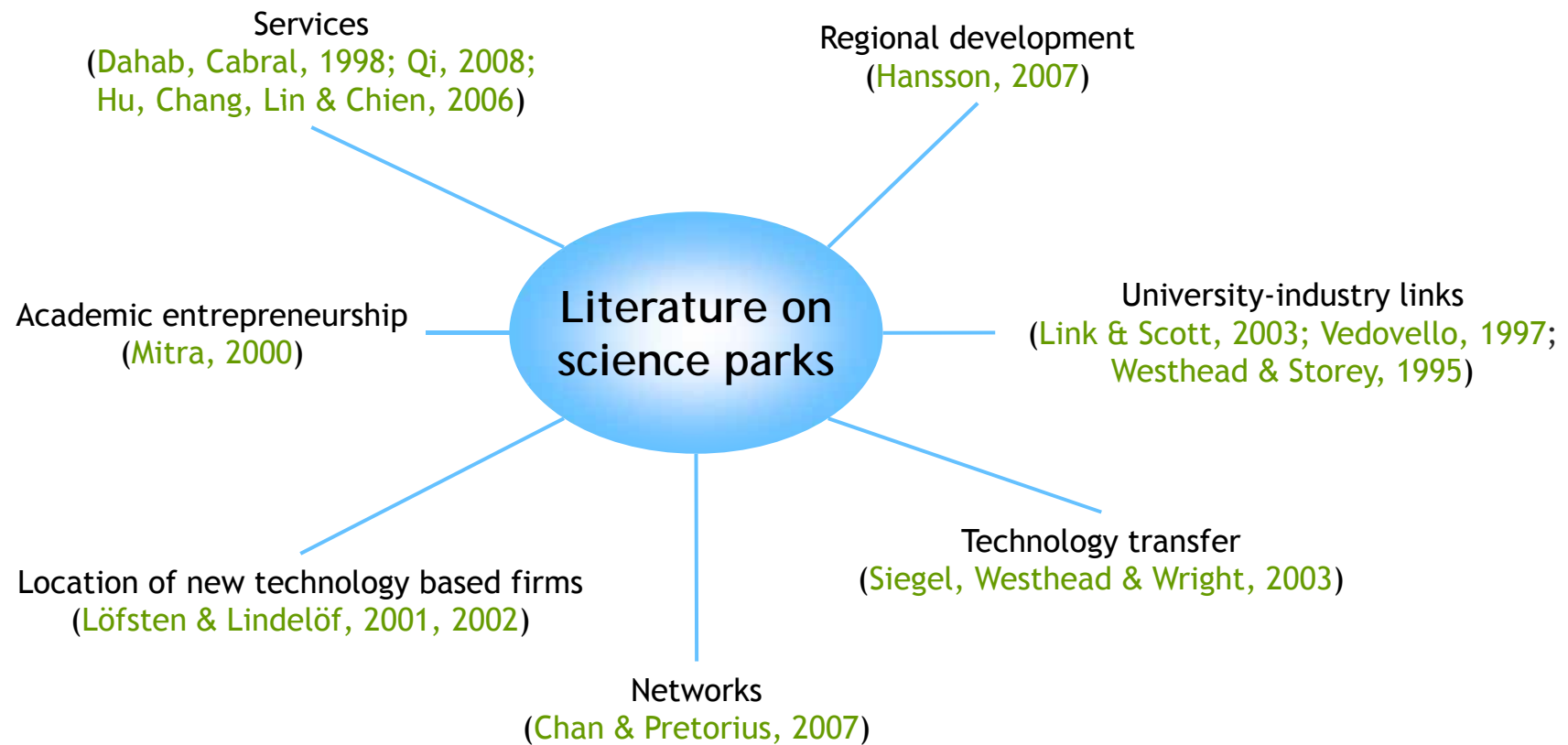
A science parks is...

- “A place where newly created firms are concentrated in a limited space. Its aim is to improve the chance of growth and rate of survival of these firms by providing them with common facilities” (European Union, 1990).
- “An organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions by stimulating the flow of knowledge and technology amongst universities, R&D institutions, companies and markets. It facilitates the creation and growth of innovation-based companies through incubation and spin-off processes and provides other value-added services” (IASP, 2002).

Dimensions of science parks (Hansson, 2007)

- Physical location in close proximity to a research institution
- Knowledge and innovation is the core business
- Specialized services in order to help the creation of new high-tech firms

Literature: About science parks



Science parks in Spain

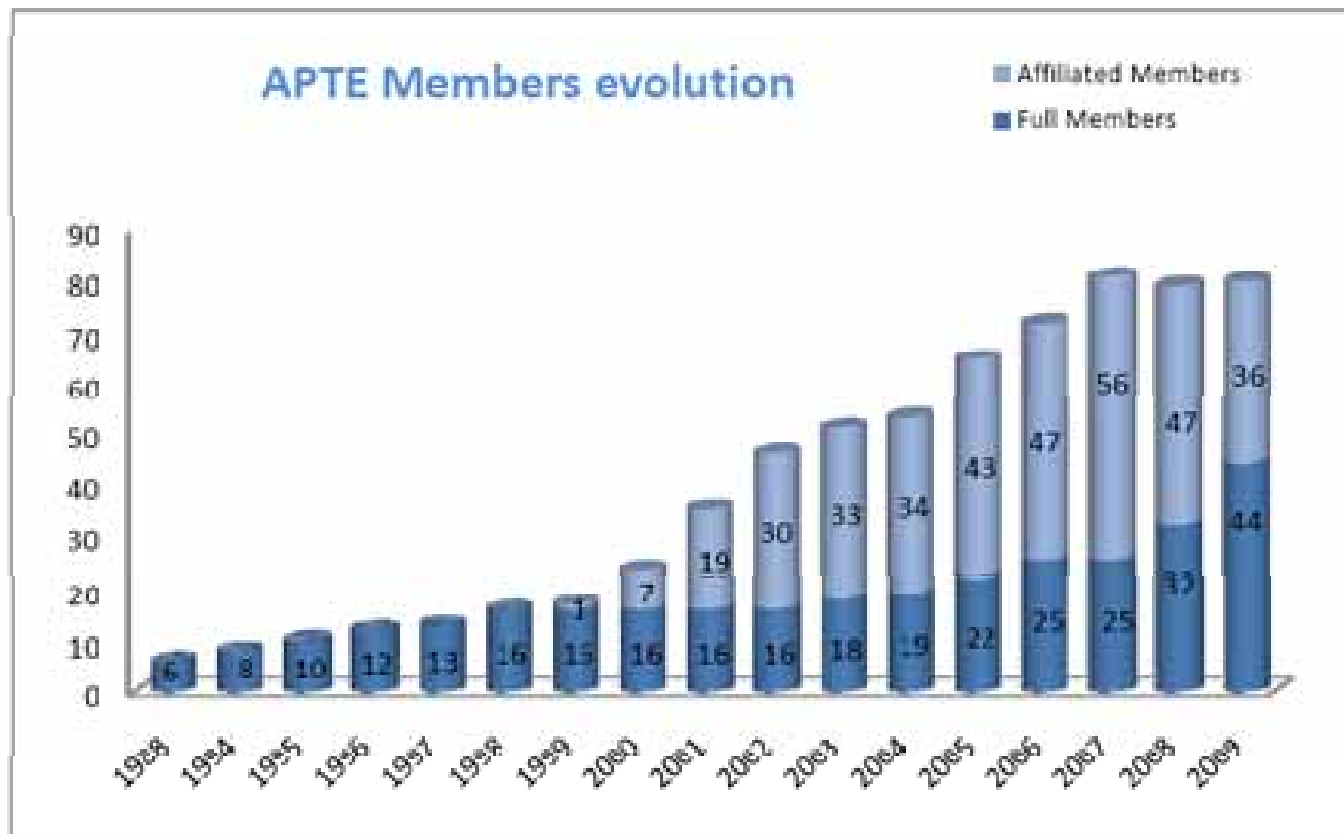
History and evolution

- **Origins (1975-1985)**
Technological changes at an international sphere / Political changes in Spain / Zamudio (Bilbao), first SP in Spain
- **First stages (1985-1992)**
Creation of 8 new SP / Universities and SMEs show poor interest in SP / Creation of industrial districts
- **Development (1993-1997)**
Creation of new SP / Economic difficulties / first universities involving
- **Expansion (1998-2003)**
Active role of universities, governments and private investments / Creation of the APTE (2000)
- **Consolidation and internationalization (2003-2010)**
International recognition, presence and prestige

Science parks in Spain

APTE (Association of Scientific and Technological Parks)

- At the end of 2009, the APTE has 80 members (44 Full members and 36 Affiliated)

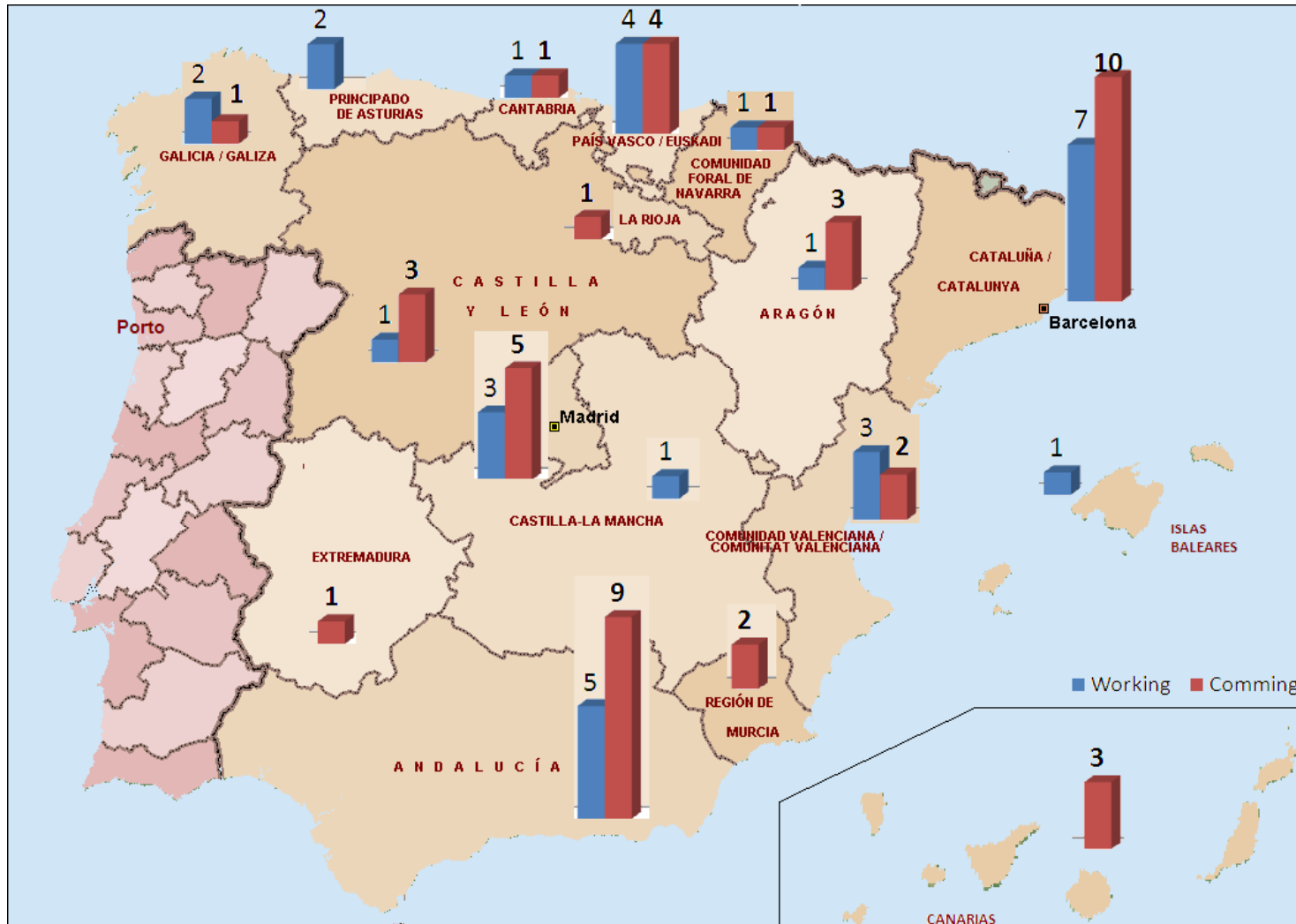


Science parks in Spain

APTE Sectors of activity (by number of firms)



Science parks. Geographic distribution



Methodology. Service Sector definition.

International system of classifications of economic activities

- International Standard Industrial Classification (ISIC Rev, 4)
United Nations Statistics Division 2008
- Statistical Classification of Economic Activities in the EC, Rev. 2 (NACE Rev. 2)
EUROSTAT 2008
- National Classification of Economic Activities in Spain (CNAE 2009)
National Statistical Institute 2009
Spanish version of NACE Rev. 2

	NACE Rev.2	CNAE 2009
sections	21	21
divisions	88	88
grups	272	272
classes	618	619

	CNAE 93 Rev.1	CNAE 2009
Agriculture	16	39
Industry	265	261
Construction	17	23
Trade	79	91
Rest of services	135	215

Methodology. Service Sector definition.

Sections	NACE Rev. 2
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defense; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	Activities of extraterritorial organizations and bodies

Methodology. APTE sectors classification

APTE sectors

- Aeronautics and automotive
- Agro-food and biotechnology
- Business Centers
- Technologic centers and R&D
- Electronic
- Energy and environment
- Training and human resources
- Industrial
- Information, computing and telecommunications
- Engineering, consultancy and advising
- Medicine and health
- Other

Difficulties within this classification

- The source data about companies in Science parks was not CNAE classified
- Not matching in any way the CNAE
- Have different orientations and purposes
- That not allow to distinguish between services and not services companies
- Need to find the CNAE code:
 - 4,510 companies and organizations
 - Sample for each sector

Methodology. Connecting classifications

CNAE 2009

- Each division level is
- Distribution of firms in Spain
- Disaggregation of Services firms

APTE sectors

- assigned to an APTE sector
- according APTE sectors
- is kept

Comparison of data

- Distribution of firms in Spain vs. firms and other organizations in Science parks
- Distribution of service firms in Spain vs. Science parks

Results. Sample classification (CNAE)

		Activities according to CNAE 2009 (NACE Rev.2)																				
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
		Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas, steam and air conditioning supply	Water supply; sewerage, waste management and remediation activities	Construction	Wholesale and retail trade; repair of motor vehicles and motorcycles	Transportation and storage	Accommodation and food serviaactivities	Information and communication	Financial and insurance activities	Real estate activities	Professional, scientific and technical activities	Administrative and support servactivities	Public administration and defence; compulsory social security	Education	Human health and social work activities	Arts, entertainment and recreation	Other service activities	Activities of households as employers; undifferentiated goods- and services-	Activities of extraterritorial organisations and bodies
APTE sectors	Aeronautics and automotive			8			1	5	2			1		8	1					3		1
	Agro-food and biotechnology	3	1	3		1		7			2			14	1			2				
	Business Centers						9					1	3	8	1					3		
	Technologic centers and R&D								1	1	1			31	1		2			1		
	Electronic			10		3		8			2			7	3							
	Energy and environment			3	6	1	10				1		1	15								
	Training and human resources							1			1	1		6	5	1	16		1			
	Industrial			12			7	11	1		1	2		2	1							
	Information, computing and telecommunications			5			1	3						23							1	
	Engineering, consultancy and advising			1			1				5	1		24	3		2	1		2		
	Medicine and health			8				8			5			7		1		8		1		
	Other	1		9				12	6	4	1		1	7			1					
		Total	4	1	59	6	2	32	56	10	4	42	6	5	138	16	2	21	11	1	11	0

Results. Services % for each sector

	#Firms in random sample	#Firms of services in random sample	#Firms in Spanish Technological Parks	Firms of services ratio according to random sample	Margin of error	Minimum Services firms estimated in Spanish Technological Parks	Services firms estimated in Spanish Technological Parks	Maximum Services firms estimated in Spanish Technological Parks*
APTE sectors	Aeronautics and automotive	30	20	97	0,667 ± 0,15	50,149	64,699	79,249
	Agro-food and biotechnology	34	27	147	0,765 ± 0,15	90,405	112,455	134,505
	Business Centers	25	16	58	0,640 ± 0,15	28,420	37,120	45,820
	Technologic centers and R&D	38	38	269	1,000 ± 0,15	228,650	269,000	269*
	Electronic	33	20	132	0,606 ± 0,15	60,192	79,992	99,792
	Energy and environment	37	18	231	0,459 ± 0,15	71,379	106,029	140,679
	Training and human resources	32	32	120	1,000 ± 0,15	102,000	120,000	120*
	Industrial	37	18	228	0,486 ± 0,15	76,608	110,808	145,008
	Information, computing and telecommunications	42	36	1142	0,857 ± 0,15	807,394	978,694	1142*
	Engineering, consultancy and advising	40	38	589	0,950 ± 0,15	471,200	559,550	589*
	Medicine and health	38	30	286	0,789 ± 0,15	182,754	225,654	268,554
	Other	42	32	1211	0,762 ± 0,15	741,132	922,782	1104,432
Total	428	325	4510	0,755 ± 0,15	2728,550	3405,050	4081,550	

*Adjusted to real number of firms



Results. Aggregate level comparison

	In Science Parks	In Spain
#Firms	4.510	3.355.830
#Services firms	3.586	2.553.526
services firms ratio	79,530%	76,092%

At the aggregated level:

- We can not appreciate differences in the percentage of service companies located in Science Parks vs. the whole Spanish economy.

Results. Comparing sectors

#Firms	all firms		services firms only	
	In Science Parks	In Spain	In Science Parks	In Spain
Aeronautics and automotive	2,151%	2,158%	1,804%	2,708%
Agro-food and biotechnology	3,259%	1,003%	3,135%	0,312%
Business Centers	1,286%	0,000%	1,035%	0,000%
Technologic centers and R&D	5,965%	0,550%	7,500%	0,722%
Electronic	2,927%	0,187%	2,230%	0,000%
Energy and environment	5,122%	0,597%	2,956%	0,000%
Training and human resources	2,661%	2,302%	3,346%	3,026%
Industrial	5,055%	5,046%	3,089%	0,000%
Information, computing and telecommunications	25,322%	0,874%	27,286%	1,148%
Engineering, consultancy and advising	13,060%	13,446%	15,600%	17,670%
Medicine and health	6,341%	3,796%	6,291%	4,973%
Other	26,851%	70,041%	25,727%	69,440%

Results. Comparing NACE sections

	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas, steam and air conditioning supply	Water supply; sewerage, waste management and remediation activities	Construction	Wholesale and retail trade; repair of motor vehicles and motorcycles	Transportation and storage	Accommodation and food service activities	Information and communication	Financial and insurance activities	Real estate activities	Professional, scientific and technical activities	Administrative and support service activities	Public administration and defence; compulsory social security	Education	Human health and social work activities	Arts, entertainment and recreation	Other service activities	Activities of households as employers; undifferentiated goods- and services-producing activities of households	Activities of extraterritorial organisations and bodies
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Parks	0,9%	0,2%	13,8%	1,4%	0,5%	7,5%	13,1%	2,3%	0,9%	9,8%	1,4%	1,2%	32,2%	3,7%	0,5%	4,9%	2,6%	0,2%	2,6%	0,0%	0,2%
Spain	0,0%	0,1%	6,6%	0,4%	0,2%	16,6%	24,1%	7,0%	8,7%	1,5%	2,0%	3,6%	12,2%	4,1%	0,0%	2,2%	3,8%	2,2%	4,8%	0,0%	0,0%

Conclusions

Analysis of the distribution of services firms in Science parks

- Despite some methodological limitations we have been able to achieve some knowledge about the typology of services located in Science parks
- The kind of services located in SP:
 - Provide advanced services to other firms in the park (like engineering consultancy linked to some sectors)
 - Are research centers mainly linked to the university
 - Are developing and bringing to market new services (some of them are university spin-offs)
 - Are explicitly transferring knowledge through educational activities
 - Are giving support services to firms in the park (Business centers, administrative support, legal and accounting)
- This finding confirms the role of SP concentration stimulating the creation and development of Knowledge Intensive Business Services (KIBS)
- Some refinements to the methodology can be done to provide more fine information

**AMA
SERVSIG**
INTERNATIONAL SERVICE
RESEARCH CONFERENCE

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Thank you

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