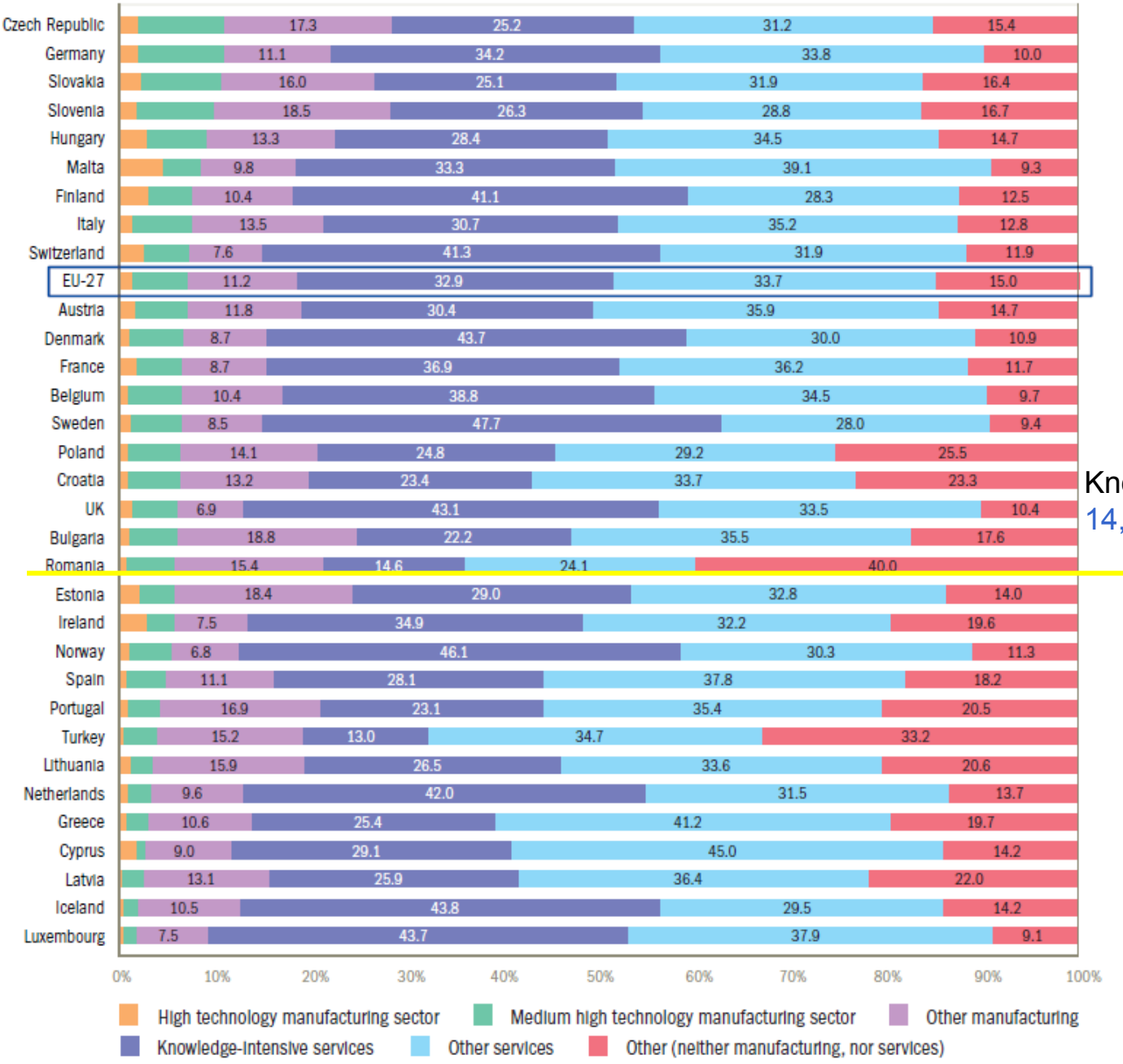
Generarea de noi activităţi economice şi noi ocupaţii ca rezultat al investiţiei in CDI

Author [1]:
Dr. Cristina **Lincaru**, cristina.lincaru@yahoo.de

[1] **National Research Institute For Labour And Social Protection, Bucharest Romania – INCSMPS**

"DEZVOLTAREA INSTITUŢIONALĂ A SISTEMULUI CDI SI PERFORMANŢA ECONOMICĂ "
Bucureşti, 07 – 08 iulie 2010
Loc de desfăşurare: Hotel RIN;
Bucureşti
Secţiunea 6 – Crearea „pieţei cercetării" şi dezvoltarea competiţiei în sistemul CDI;

FIGURE I.3.14 Employment by type – % shares, 2006



Source: DG Research

STC key figures report 2008

*****, A more research-intensive and integrated European Research Area**

Science, Technology and Competitiveness key figures report 2008/2009, European Commission, Pg.82

Knowledge intensive services:
14,6%Ro / 32,9% UE27

Figure III-1b Scientific specialisation at country level, 2003-2005

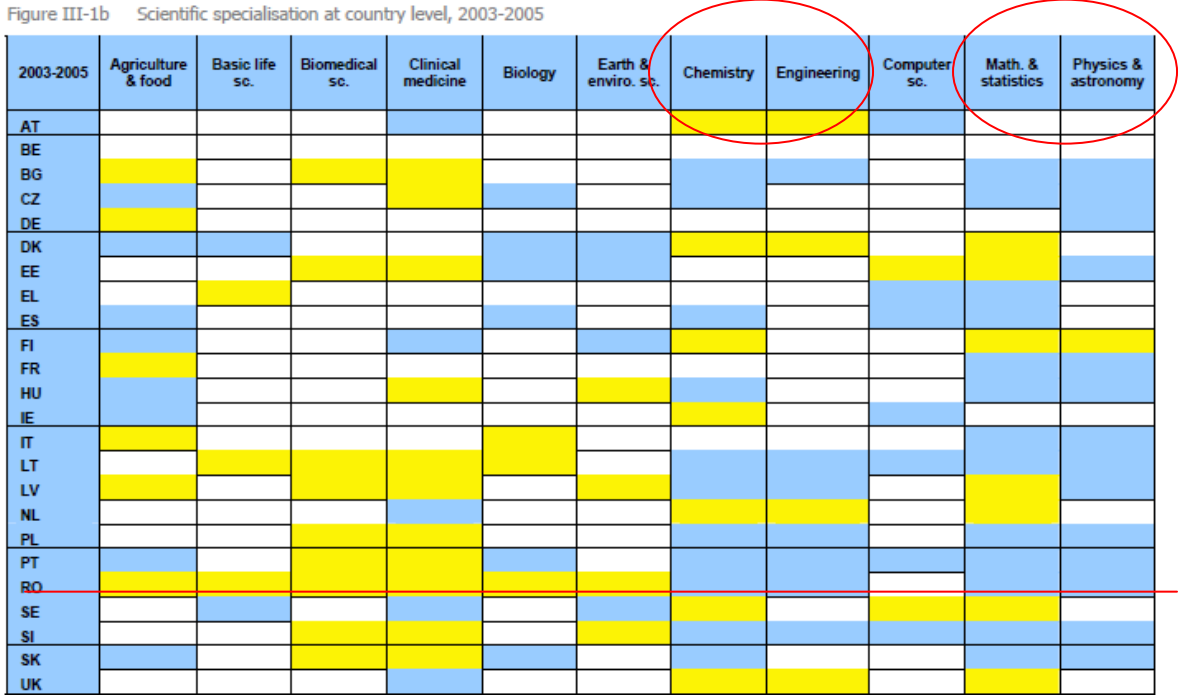
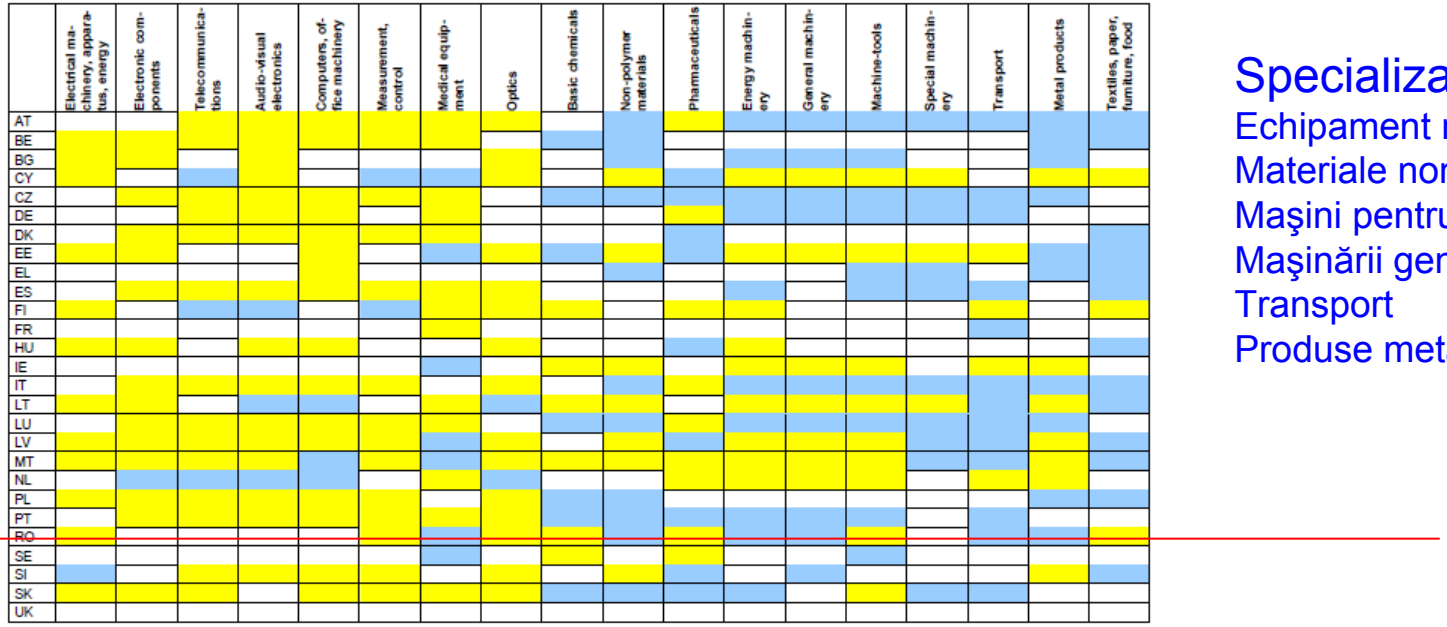


Figure III-9 Technological specialisation at country level, 2001-2003



highly specialised non-specialised specialised around world average

Source: DG Research
Data: EPO patent applications. Calculations: Fraunhofer ISI

Regional Key Figures 2008

Sursa: Exploring regional structural and S&T specialisation: implications for policy
Prepared by
Dr. Viola Peter, Technopolis Group and Rainer Frietsch, Fraunhofer ISI, Europeean commission , European Research Area, pg.26, pg.27

Sub specializare:

Maşini electrice, aparate, energie
Controlul măsurării
Chimie de bază
Ind. farmaceutică
Maşini unelte
Textile, hârtie, mobilă, alimente;

Specializare:

Echipament medical
Materiale nonpolimerice
Maşini pentru producere energie
Maşinării generale
Transport
Produse metalice

	nr țări	grupe majore	grupe submajore	grupe minore	grupuri unitate (unit groups)	nr. ocupați i
ILO						
1923 the International Conference of Labour Statisticians (ICLS)						
1952 International Classification of Occupations for Migration and Employment Placement (ICOMEP) adoptată la a 7 ICLS	13	9				1727
1954 la 8-a ICLS s+a adoptat lisa grupelor minore				lista		

	similarities /omogenitate					
	nr țări	grupe majore	grupe submajore	grupe minore	grupuri unitate	nr. ocupați i
1957 9-a Conferință Internațională a Statisticienilor a adoptat prima **International Standard Classification of Occupations (ISCO-58) -** publicată în 1958 / Prima ediție		10		73	201	1345
1969 a 11 Conferință internaională a Statisticienilor a amendat şi adoptat **ISCO 68 / a doua ediție**	80	8		83	284	1506
1987 a 14-a ICLS a amendat şi adoptat **ISCO 88**		10	28	116	390	
6 decembrei 2007, .**ISCO 08**		10	43	131	425	

Group of occupations(ISCO-88)

	Total	Grupe majore		grupa majora / Sub-grupe	subgrupa majora / Sub-grupe	grupa minora / Grupe unitate	grupa de baza	Nivelul de pregătire / ISCO nivel de skill
1	Members of legislative, executive, senior officials of public administration, managers	1. Membri ai corpului legislativ, ai executivului, inalti conducatori ai administratiei publice, conducatori si functionari superiori din unitatile	g1		8	33		0
2	Experts with intellectual and scientific occupations	2. Specialisti cu ocupatii intelectuale si stiintifice	g2	4	18	55		4
3	Technicians, foremen and assimilated	3. Tehnicieni, maistri si asimilati	g3	4	54	73		3
4	Administrative clerks	4. Functionari administrativi	g4	2	7	23		2
5	Workers in services and trade and assimilated	5. Lucratori operativi in servicii, comert si asimilati	g5	2	9	23	funcția	2
6	Farmers and skilled workers in	6. Agricultori si lucratori calificati in agricultura,	g6	2	6	17		2
7	Artisans and skilled workers in handicraft, machinery and	7. Mestesugari si lucratori calificati in meserii de tip artizanal de reglare si intretinere a masinilor si	g7	4	16	70		2
8	Operators for installations, machinery and equipment	8. Operatori la instalatii si masini si asamblori de masini, echipamente si alte produse	g8	2	20	70	meseria	2
9	Unskilled workers	9. Muncitori necalificati	g9	3	10	25		1
		fore'e armate	G0	1	1	1		0
				24	*141*	*357*	*18*	*?*
				28	**116**	**390**		

ISCO 88	ISCO 88 (COM)	COR
10 grupe majore;	10 grupe majore;	10 grupe majore;
28 subgrupe majore;	27 subgrupe majore;	27 subgrupe majore;
116 grupe minore;	111 grupe minore;	125 grupe minore;
390 grupe de baza.	372 grupe de baza.	414 grupe de baza.

Sursa ILO, ISCO 88, Geneva 1990

Procesele tehnologice, materiile prime utilizate sau masinile si instalatiile cu care se lucreaza sunt crite

http://www.liraconsult.ro/liraconsult/portal.nsf/AllById/1.21.0

ISCO 88/ ISCED

		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Membri ai corpului legislativ, ai executivului, inalti conducatori ai administratiei publice, conducatori si functionari superiori din unitatile economico - sociale si politice	Total	100	100	100	100	100	100	100	100	100	100	100	100	100
	Universitar (de scurta sau lunga durata)	43,6												
	Universitar de lunga durata		26,0	31,7	37,1	42,1	45,2	44,8	40,7	45,3	45,1	45,8	48,4	50,8
	Universitar de scurta durata (colegii)		16,6	9,9	7,1	5,1	5,1	6,5	10,5	6,5	7,3	8,5	8,0	7,0
	Postliceal de specialitate sau tehnic de maistri	8,4	8,9	9,7	8,9	6,7	6,2	8,2	6,6	5,3	5,7	6,3	5,3	4,2
	Liceal	34,6	34,1	35,3	36,7	33,8	30,2	26,8	30,0	29,5	31,0	30,0	28,0	26,0
	Profesional, complementar sau de ucenici	8,4	8,6	8,0	6,7	8,1	9,3	9,6	9,4	9,4	7,6	7,2	7,6	7,9
	Treapta I liceala	1,7	1,9	2,1	1,0	0,9	1,1	0,8	1,3	1,3	0,9	0,7	1,1	2,1
	Gimnazial	3,1	3,6	3,3	2,5	3,0	2,7	2,8	1,4	2,5	2,2	1,4	1,5	1,7
	Primar (clasele 1 - 4)	0,3	0,3		0,0	0,3	0,1	0,0	0,1	0,3	0,1	0,1	0,1	0,3
	Fara scoala absolvita		0,1					0,3						
Specialisti cu ocupatii intelectuale si stiintifice	Total	100	100	100	100	100	100	100	100	100	100	100	100	100
	Universitar (de scurta sau lunga durata)	93,8												
	Universitar de lunga durata		54,9	73,6	81,4	83,1	85,7	83,4	77,8	83,3	82,6	83,8	87,2	88,2
	Universitar de scurta durata (colegii)		39,3	21,0	13,9	12,6	10,1	12,1	16,9	12,2	13,4	12,9	10,1	9,3
	Postliceal de specialitate sau tehnic de maistri	1,1	0,8	1,1	1,0	0,6	0,9	1,4	1,4	1,0	1,2	1,0	0,8	0,6
	Liceal	4,4	4,6	4,1	3,5	3,5	3,1	2,9	3,4	3,1	2,6	2,2	1,7	1,7
	Profesional, complementar sau de ucenici	0,3	0,3	0,2	0,1	0,0	0,1	0,2	0,4	0,2	0,2	0,2	0,2	0,1
	Treapta I liceala	0,1		0,0	0,1	0,0			0,0	0,1	0,0	0,0		0,0
	Gimnazial	0,2	0,1	0,0			0,0	0,1	0,1	0,0	0,0			0,0
	Primar (clasele 1 - 4)	0,0			0,0									
	Fara scoala absolvita				0,0									
Tehnicieni, maistri si asimilati	Total	100	100	100	100	100	100	100	100	100	100	100	100	100
	Universitar (de scurta sau lunga durata)	5,3												
	Universitar de lunga durata		2,5	5,3	5,7	7,1	7,8	7,4	6,5	8,7	9,2	9,7	11,7	12,9
	Universitar de scurta durata (colegii)		3,3	3,8	3,3	3,7	4,3	4,3	4,1	5,3	5,4	5,6	6,6	6,6
	Postliceal de specialitate sau tehnic de maistri	30,2	30,0	29,8	29,1	28,1	28,5	27,3	26,2	27,1	27,8	27,9	26,2	25,2
	Liceal	55,9	55,8	54,1	55,3	54,8	53,3	53,1	54,4	50,1	49,7	49,1	48,2	48,1
	Profesional, complementar sau de ucenici	5,9	6,3	5,6	5,3	5,0	4,4	6,2	6,7	7,1	6,4	6,3	6,0	5,8
	Treapta I liceala	1,3	1,3	0,8	0,5	0,6	0,8	0,7	0,9	0,8	0,8	0,9	0,6	0,6
	Gimnazial	1,2	1,0	0,7	0,6	0,8	0,7	1,0	1,1	0,7	0,7	0,5	0,7	0,7
	Primar (clasele 1 - 4)	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,1	0,1	0,0	0,0	0,0
	Fara scoala absolvita		0,0							0,0				
Functionari administrativi	Total	100	100	100	100	100	100	100	100	100	100	100	100	100
	Universitar (de scurta sau lunga durata)	3,1												
	Universitar de lunga durata		1,3	2,1	2,7	3,7	4,4	4,6	4,5	6,3	7,0	8,0	8,6	9,0
	Universitar de scurta durata (colegii)		2,6	2,0	1,1	1,2	1,8	2,3	2,9	2,7	2,6	2,9	2,9	2,6
	Postliceal de specialitate sau tehnic de maistri	8,3	9,3	8,3	8,2	9,2	9,9	9,5	8,4	9,2	8,2	8,2	7,3	7,3
	Liceal	66,3	65,1	69,1	69,6	69,1	67,6	66,5	64,3	65,0	65,3	65,0	68,0	67,8
	Profesional, complementar sau de ucenici	10,0	11,1	10,1	11,4	10,1	9,9	12,0	14,5	11,4	11,9	12,2	9,7	9,9
	Treapta I liceala	5,0	4,3	3,4	1,7	2,1	2,5	1,8	2,7	1,9	1,9	1,3	1,5	1,6
	Gimnazial	7,2	6,1	4,8	5,2	4,5	4,0	3,4	2,7	3,4	3,0	2,4	2,0	1,8
	Primar (clasele 1 - 4)	0,1	0,3	0,1	0,1	0,1				0,1	0,1	0,0		
	Fara scoala absolvita									0,0				
Lucratori operativi in servicii, comert si asimilati	Total	100	100	100	100	100	100	100	100	100	100	100	100	100
	Universitar (de scurta sau lunga durata)	1,5												
	Universitar de lunga durata		0,7	1,1	1,4	1,3	1,3	1,8	2,2	2,4	2,6	2,9	2,6	2,9
	Universitar de scurta durata (colegii)		0,9	0,5	0,6	0,5	0,7	0,9	0,9	0,8	0,9	0,9	1,0	1,3
	Postliceal de specialitate sau tehnic de maistri	2,5	2,9	3,6	3,4	3,4	3,4	3,9	3,8	4,3	4,0	4,2	4,1	4,0
	Liceal	46,4	47,7	50,4	51,6	54,5	53,8	51,9	51,0	49,0	50,1	52,0	53,2	52,4
	Profesional, complementar sau de ucenici	22,2	22,5	21,7	22,7	21,6	22,6	23,6	24,6	26,3	26,4	25,7	25,3	24,9
	Treapta I liceala	10,6	9,6	8,8	6,8	6,0	6,2	5,8	5,7	4,9	4,6	4,3	4,2	5,1
	Gimnazial	15,0	14,4	12,7	12,2	11,5	11,1	11,3	11,2	11,3	10,5	9,2	8,9	8,7
	Primar (clasele 1 - 4)	1,7	1,2	1,0	1,3	1,4	0,8	0,8	0,6	0,9	0,8	0,8	0,7	0,6
	Fara scoala absolvita	0,1	0,1	0,1	0,1	0,0	0,0	0,0	0,1	0,1	0,1	0,1	0,1	0,1
Agricultori si lucratori calificati in agricultura, silvicultura si pescuit	Total	100	100	100	100	100	100	100	100	100	100	100	100	100
	Universitar (de scurta sau lunga durata)	0,2												
	Universitar de lunga durata		0,1	0,2	0,2	0,3	0,3	0,2	0,2	0,3	0,3	0,3	0,4	0,4
	Universitar de scurta durata (colegii)		0,2	0,1	0,1	0,1	0,2	0,1	0,2	0,2	0,2	0,2	0,2	0,2
	Postliceal de specialitate sau tehnic de maistri	0,5	0,4	0,6	0,7	0,7	0,7	0,6	0,5	0,8	0,8	0,8	0,8	0,8
	Liceal	6,2	6,5	7,0	7,2	7,7	7,7	8,5	7,7	9,0	9,5	10,1	9,4	9,1
	Profesional, complementar sau de ucenici	9,3	9,9	10,9	12,5	13,7	15,0	17,2	17,2	19,2	20,8	21,2	21,4	21,0
	Treapta I liceala	7,5	7,6	7,5	6,1	5,5	5,3	5,1	6,0	5,4	5,1	4,9	5,2	4,9
	Gimnazial	36,9	36,8	36,6	38,4	39,2	39,3	42,0	43,9	40,6	40,8	42,1	42,9	44,3
	Primar (clasele 1 - 4)	34,6	33,9	32,7	30,6	28,9	27,8	23,8	21,8	21,7	20,1	18,4	17,8	17,3
	Fara scoala absolvita	4,7	4,7	4,4	4,1	3,8	3,6	2,6	2,5	2,8	2,5	2,1	1,9	2,0
Mestesugari si lucratori calificati in meserii de tip	Total	100	100	100	100	100	100	100	100	100	100	100	100	100
	Universitar (de scurta sau lunga durata)	0,4												
	Universitar de lunga durata		0,1	0,1	0,2	0,3	0,3	0,4	0,3	0,3	0,4	0,2	0,4	0,5
	Universitar de scurta durata (colegii)		0,2	0,2	0,1	0,2	0,2	0,2	0,1	0,1	0,2	0,1	0,1	0,2
	Postliceal de specialitate sau tehnic de maistri	2,6	2,6	2,5	2,6	2,2	2,3	2,4	2,3	2,4	2,4	2,6	2,6	2,5

Fizica
Electricitatea

Studiere in universități a ingineriei electrice

Antichitate electronum/ chihlimbar Xantipa
1775 Alessandro Volta, 1800 pila electrica
1827 Georg Ohm curentul electric si diferenta de potential
1880 **Electrotehnica** sau **electricitate tehnică** a fost introdusa de Werner von **Siemens**
1831 Michael **Faraday** **inducția electromagnetică**
1873 James Clerk **Maxwell** teoria unificată a **electricității şi magnetismului**

Anul 1883

1883 Edison - becul

Istoria electronicii

Începutul noilor industrii

1884 Sir Charles Parsons a inventat turbina cu abur
In 1887, Nikola Tesla a patentat şi **curentul alternativ /motarele de inducție/sisteme plurifazice**

General Electrics (fondată de Edison=

Începutul Educației superioare în domeniu
1882 **Darmstadt University of Technology, Germany** – a început să ofere diplome de ingineri electrici Politehnica
In 1883 Darmstadt University of Technology and introduced the world's first courses of study in electrical engineering

http://en.wikipedia.org/wiki/Electrical_engineering#cite_note-6

becul
dioda
triode, pentode etc….
tuburilor electronice, sufletul electronicii; ele au dăinuit o "eternitate" de circa 50 de ani.

"industria electronică"

Filmul vorbit
Radioul
Telefaxul
Televiziunea
Calculatorul

Monitoare plate /LCD

FPD Industry Timeline: Some Key Events

1968 RCA demonstrates first LCD
1973 First LCD calculators, watches (Sharp and Seiko)
1973 IBM builds plasma display plant
1983 Seiko demonstrates LCD color TV
1986 IBM stops PDP R&D, starts large-format LCD R&D with Toshiba
1986 Sharp starts up large-format LCD R&D
1988 Sharp, IBM/Toshiba announce 14-inch LCD prototypes
1989 IBM/Toshiba form DTI production JV
1991 Sharp, DTI start production
1994 First Gen 2 lines with AKT CVD
1995 Sharp, then DTI start up Gen 3 lines
1996 Samsung becomes third company to start up Gen 3 fab
1997 Samsung shares lg. format lead with DTI
1999 (May-July) First Gen 3-plus fabs start up in Taiwan (CPT, ADT), with collaboration of Japanese producers.
2001 Merged AUO #3 in global share.
2003 FPDS eclipse CRTs in share of world market value; Samsung, Sony form production alliance
2004 Taiwan vies with Korea for global market share leadership.
2005 China production gains significance

Global Knowledge Networks, Competitiveness and Heavy Manufacturing
The Case of Flat Panel Displays

Research Institute of Economy, Trade and Industry (RIETI)
Tokyo
March 24, 2006

Tom Murtha
University of Minnesota and University of Illinois at Chicago
tmurtha@uic.edu
Stefanie Ann Lenway
University of Illinois at Chicago
slenway@uic.edu

clasificare după **tipul de muncă desfășurat**

termenii în care se desfășoară munca

funcția generală lucrătorului

îndatoririle majore/principale care sunt îndeplinite: Explică ce și cum este făcut

ce și cum? **metoda**

materialele

echipamentele

instrumentele

scopul

ISCO 58

7/8 : Craftsmen, Production-Process Workers

- 7-6 Electricians and Related Electrical and Electronics Workers
- 7-61 Electricians, Electrical Repairmen and Related Electrical Workers
- 7-62 Electrical and Electronics Fitters
- 7-63 Mechanics-Repairmen, Radio and Television
- 7-64 Installers and Repairmen, Telephone and Telegraph
- 7-65 Linemen and Cable Jointers
- 7-69 Electrical and Electronics Worker Not Elsewhere Classified

ISCO58

7/8 : Craftsmen, Production-Process Workers

7-6 Electricians and Related Electrical and Electronics Workers

7-61 Electricians, Electrical Repairmen and Related Electrical Workers

specialised

1 7-61.10 Electrician, General.
2 7-61.15 Electrician (Buildings).
3 7-61.20 Electrician (Ships).
4 7-61.25 Electrician (Aircraft).
5 7-61.30 Electrician (Vehicles).
6 7-61.35 Electrician (Stage and Studio).
7 7-61.40 Electrician (Maintenance).
8 7-61.45 Electrical Repairman.
9 7-61.50 Electrical Load Despatcher, Power Station.
10 7-61.55 Electrical Switchboard Operator, Power Station.

residual

11 7-61.90. Electricians, Electrical Repairmen and Related Electrical Workers, Other

7-62 Electrical and Electronics Fitters

12 7-62.10 Electrical Fitter, General.
13 7-62.15 Electrical Fitter (Motors and Dynamos).
14 7-62.20 Electrical Fitter (Transformers).
15 7-62.25 Electrical Fitter (Switchboards).
16 7-62.30 Electrical Fitter (Switchgear and Control Apparatus).
17 7-62.35 Electrical Fitter (Instruments).
18 7-62.40 Electrical Fitter (Office Machinery).
19 7-62.45 Electrical Fitter (Signalling Systems).
20 7-62.50 Electrical Fitter (Elevators and Related Equipment).
21 7-62.55 Electrical Fitter (Motor Vehicles).
22 7-62.60 Electrical Fitter (Refrigeration and Air-Conditioning Equipment).
23 7-62.65 Electrical Fitter (Domestic Appliances).
24 7-62.70 Electronics Fitter, General.
25 7-62.75 Electronics Fitter (Radio and Television Transmitters and Radar Equipment).
26 7-62.80 Electronics Fitter (Medical Equipment).
27 7-62.85 Electronics Fitter (Industrial Equipment).
28 7-62.90 Electrical and Electronics Fitters, Other.

7-63 Mechanics-Repairmen, Radio and Television

29 7-63.10 Mechanic-Repairman, Radio and Television.
30 7-63.90 Mechanics-Repairmen, Radio and Television

7-64 Installers and Repairmen, Telephone and Telegraph

31 7-64.20 Installer, Telephone and Telegraph.
32 7-64.30 Repairman, Telephone and Telegraph.

7-65 Linemen and Cable Jointers

33 7-65.20 Lineman (Electric Power).
Lineman, Electrical, High Tension
Lineman, Electrical, Low Tension
34 7-65.30 Lineman (Electric Traction).
35 7-65.40 Lineman (Telephone and Telegraph).
36 7-65.50 Jointer, Electrical Cables
37 7-65.90 Linemen and Cable Jointers, Other

7-69 Electrical and Electronics Worker Not Elsewhere Classified

38 7-69.20 Assembler (Electrical Equipment).
39 7-69.30 Assembler (Electronic Equipment),
40 7-69.30 Assembler (Electronic Equipment),
41 7-69.40 Sound-Recording-Equipment Operator
42 7-69.50 Public-Address-Equipment Operator
43 7-69.60 Cinema Projectionist
44 7-69.90 Electrical and Electronics Workers Not Elsewhere Classified, Other

ISCO 68

MAJOR, MINOR AND UNIT GROUPS

Major Group 0/1: Professional, Technical and Related Workers

- 0-23 Electrical and electronics engineers
- 0-34 Electrical and electronics engineering technicians

Major Group 7/8/9: Production and Related Workers, Transport Equipment Operators and Labourers

- 8-5 Electrical Fitters and Related Electrical and Electronics Workers
  - 8-51 Electrical fitters
  - 8-52 Electronics fitters
  - 8-53 Electrical and electronics equipment assemblers
  - 8-54 Radio and television repairmen
  - 8-55 Electrical wiremen
  - 8-56 Telephone and telegraph installers
  - 8-57 Electric linemen and cable jointers
  - 8-59 Electrical fitters and related electrical and electronics workers not elsewhere classified
- 8-6 Broadcasting Station and Sound Equipment Operators and Cinema Projectionists
  - 8-61 Broadcasting station operators
  - 8-62 Sound equipment operators and cinema projectionists

ISCO 88	ISCO 08		
MAJOR GROUP 2: PROFESSIONALS			
SUB-MAJOR GROUP 21: PHYSICAL, MATHEMATICAL AND ENGINEERING SCIENCE PROFESSIONALS			
MINOR GROUP 214: ARCHITECTS, ENGINEERS AND RELATED PROFESSIONALS	2151	Electrical engineers	
2143 ELECTRICAL ENGINEERS			
2144 ELECTRONICS AND TELECOMMUNICATIONS ENGINEERS	2152	Electronics engineers	
	2153	Telecommunications engineers	
MAJOR GROUP 3: TECHNICIANS AND ASSOCIATE PROFESSIONALS			
31 PHYSICAL AND ENGINEERING SCIENCE ASSOCIATE PROFESSIONALS			
311 PHYSICAL AND ENGINEERING SCIENCE TECHNICIANS			
3113 Electrical engineering technicians	3113	Electrical engineering technicians	
3114 Electronics and telecommunications engineering technicians	3114	Electronics engineering technicians	
	3522	Telecommunications engineering technicians	
313 OPTICAL AND ELECTRONIC EQUIPMENT OPERATORS			
3139 Optical and electronic equipment operators not elsewhere classified			
MAJOR GROUP 7 CRAFT AND RELATED TRADES WORKERS			
72 METAL, MACHINERY AND RELATED TRADES WORKERS			
724 ELECTRICAL AND ELECTRONIC EQUIPMENT MECHANICS AND FITTERS			
7241 Electrical mechanics and fitters	7412	Electrical mechanics and fitters	
7242 Electronics fitters	7421	Electronics mechanics and servicers	
7243 Electronics mechanics and servicers			
efect de substituţie între domenii — **7244 Telegraph and telephone installers and servicers**	**7422**	**Information and communications technology installers a**	
7245 Electrical line installers, repairers and cable jointers	7413	Electrical line installers and repairers	
Major Group 8 **Plant and machine operators and assemblers**			
8.2. Machine operators and assemblers			
828 Assemblers			
8282 Electrical-equipment assemblers	**3122**	p **Manufacturing supervisors**	sch cre
8283 Electronic-equipment assemblers	8212	p Electrical and electronic equipment assemblers	

ISCO 88 – COR 2010 – *selectie*

PROFESSIONALS
SUB-MAJOR GROUP 21: PHYSICAL, MATHEMATICAL AND ENGINEERING SCIENCE
MINOR GROUP 214: ARCHITECTS, ENGINEERS AND RELATED PROFESSIONA
2143 ELECTRICAL ENGINEERS

ISCO 88

2143 0-23.05 Engineer, electrical
2143 0-23.05 Engineer, electrical/high voltage
2143 0-23.20 Engineer, electrical/electric power generation
2143 0-23.30 Engineer, electrical/electric power distribution
2143 0-23.30 Engineer, electrical/electric power transmission
2143 0-23.30 Engineer, transmission/electric power
2143 0-23.90 Engineer, electrical illumination
2143 0-23.90 Engineer, electrical systems
2143 0-23.90 Engineer, electrical/electric traction
2143 0-23.90 Engineer, electrical/electromechanical equipment
2143 0-23.90 Technologist, engineering/electrical
11

COR 2010

214301 dispecer energetic feroviar
214302 dispecer centrală, hidrocentru, cascadă, dispecerate teritoriale
214303 dispecer reŃea distribuŃie
214304 dispecer reŃele de înaltă tensiune
214305 inginer electroenergetică
214306 radiochimist
214307 subinginer electroenergetică
214308 inginer energetică industrială
214309 inginer termoenergetică
214310 proiectant inginer electrotehnic
214311 proiectant inginer energetician
214312 inginer reŃele electrice
214313 subinginer reŃele electrice
214314 inginer hidroenergetică
214315 inginer centrale nuclearo-electrice
214316 subinginer centrale termoelectrice
214317 inginer exploatare instalaŃii nucleare
214318 proiectant subinginer electrotehnic
214319 proiectant sisteme de securitate
214320 sef tură dispecer energetic
20

2144 ELECTRONICS AND TELECOMMUNICATIONS ENGINEERS

ISCO 88

2144 0-23.10 Engineer, electronics
2144 0-23.40 Engineer, telecommunications
2144 0-23.40 Engineer, telecommunications/telegraph
2144 0-23.40 Engineer, telecommunications/telephone
2144 0-23.90 Engineer, aerospace
2144 0-23.90 Engineer, electronics/computer hardware design
2144 0-23.90 Engineer, electronics/information engineering
2144 0-23.90 Engineer, electronics/instrumentation
2144 0-23.90 Engineer, electronics/semiconductors
2144 0-23.90 Engineer, telecommunications/aerospace
2144 0-23.90 Engineer, telecommunications/radar
2144 0-23.90 Engineer, telecommunications/radio
2144 0-23.90 Engineer, telecommunications/signal systems
2144 0-23.90 Engineer, telecommunications/television
2144 0-23.90 Technologist, engineering/electronics
2144 0-23.90 Technologist, engineering/telecommunications
16

COR 2010

214401 inginer electromecanic SCB
214402 inginer automatist
214403 inginer emisie
214404 inginer montaj
214405 inginer navigaŃie
214406 inginer electronist, transporturi, telecomunicaŃii
214407 inginer electrotehnist
214408 inginer imagine
214409 inginer producŃie
214410 inginer sunet
214411 instructor instalaŃii
214412 instructor linii
214413 revizor siguranŃa circulaŃiei feroviare
214414 subinginer automatist
214415 subinginer electronist, transporturi, telecomunicaŃii
214416 subinginer reglaje subansamble
214417 inginer de recepŃie si control aeronave
214418 proiectant inginer electronist
214419 proiectant inginer de sisteme si calculatoare
214420 proiectant inginer electromecanic
214421 inginer electromecanic
214422 subinginer electromecanic
214423 ofiŃer punte maritim
214424 ofiŃer mecanic maritim
214425 ofiŃer electrician maritim
214426 căpitan secund
214427 ofiŃer de punte/mecanic/electrician aspirant maritim
214428 căpitan port
214429 specialist mentenanŃă electromecanică-automatică echipamente industriale
214430 inginer sef car reportaj
214431 subinginer sef car reportaj
214432 inginer sef schimb emisie
214433 subinginer iluminat tehnologic
214434 inspector aeronautic
214435 inginer proiectant comunicaŃii
214436 subinginer proiectant comunicaŃii
214437 inginer/inspector de specialitate/referent de specialitate/expert în serviciile de
214438 inginer sisteme de securitate
214439 consilier tehnic
214440 inginer iluminare
214441 sef studio RTV
41

TECHNICIANS AND ASSOCIATE PROFESSIONALS
31 PHYSICAL AND ENGINEERING SCIENCE ASSOCIATE PROFESSIONALS
311 PHYSICAL AND ENGINEERING SCIENCE TECHNICIANS
3113 Electrical engineering technicians
3113 TEHNICIENI ENERGETICIENI SI ELECTRICIENI

ISCO 88

3113 0-34.05 Technician, engineering/electrical
3113 0-34.20 Technician, engineering/electrical (high voltage)
3113 0-34.90 Estimator, engineering/electrical
3113 0-34.90 Technician, engineering/electrical (electric illumination)
3113 0-34.90 Technician, engineering/electrical (electric power distribution)
3113 0-34.90 Technician, engineering/electrical (electric power transmission)
3113 0-34.90 Technician, engineering/electrical (electric traction)
3113 0-34.90 Technician, engineering/electrical systems
8

COR 2010

311301 dispecer gestiune uraniu
311302 maistru electromecanic
311303 maistru energetician/electrician
311304 tehnician electro-energetician, termo-energetician
311305 tehnician electromecanic
311306 tehnician energetician/ electrician
311307 tehnician proiectant energetician/ electrician
311308 maistru electrician în construcŃii
311309 tehnician mentenanŃă electromecanică-automatică echipamente industriale
311310 sef/sef adjunct tură staŃie electrică (studii medii)

3114 Electronics and telecommunications engineering technicians
3114 TEHNICIENI ÎN ELECTRONICĂ, TRANSPORTURI, POSTĂ SI TELE-COMUNICAłII

ISCO 88

3114 0-34.10 Technician, engineering/electronics
3114 0-34.30 Technician, engineering/telecommunications
3114 0-34.90 Estimator, engineering/electronics
3114 0-34.90 Technician, engineering/aerospace
3114 0-34.90 Technician, engineering/electronics (computer hardware design)
3114 0-34.90 Technician, engineering/electronics (information engineering)
3114 0-34.90 Technician, engineering/electronics (instrumentation)
3114 0-34.90 Technician, engineering/electronics (semiconductors)
3114 0-34.90 Technician, engineering/telecommunications (aerospace)
3114 0-34.90 Technician, engineering/telecommunications (radar)
3114 0-34.90 Technician, engineering/telecommunications (radio)
3114 0-34.90 Technician, engineering/telecommunications (signal systems)
3114 0-34.90 Technician, engineering/telecommunications (telegraph)
3114 0-34.90 Technician, engineering/telecommunications (telephone)
3114 0-34.90 Technician, engineering/telecommunications (television)
15

COR 2010

311401 maistru aviaŃie
311402 maistru electronică/ transporturi/ postă si telecomunicaŃii
311403 sef formaŃie sisteme radiante (antene)
311404 tehnician aviaŃie
311405 tehnician construcŃii telefonice
311406 tehnician electronică/ transporturi/ postă si telecomunicaŃii
311407 tehnician radiolocaŃii
311408 tehnician turn parasutism
311409 tehnician proiectant electronică/transporturi/comunicaŃii
311410 inspector exploatare postală
311411 tehnician staŃii de emisie radio-tv
311412 tehnician staŃii radiorelee si satelit
311413 tehnician protecŃia navigaŃiei aeriene (comunicaŃii, navigaŃie, supraveghere
311414 maistru protecŃia navigaŃiei aeriene (comunicaŃii, navigaŃie,supraveghere)
311415 sef tură protecŃia navigaŃiei aeriene (comunicaŃii, navigaŃie,supraveghere)
311416 tehnician în serviciile de trafic aerian

313 OPTICAL AND ELECTRONIC EQUIPMENT OPERATORS
3139 Optical and electronic equipment operators not elsewhere classified

3139 TEHNICIENI PENTRU ALTE APARATE OPTICE SI ELECTRONICE

ISCO 88 | **COR 2010**

AFT AND RELATED TRADES WORKERS
72 METAL, MACHINERY AND RELATED TRADES WORKERS
724 ELECTRICAL AND ELECTRONIC EQUIPMENT MECHANICS AND FITTERS

7137 ELECTRICIENI ÎN CONSTRUCłII
7137 Electricieni în construcŃii 713701 electrician în construcŃii

7241 Electrical mechanics and fitters

ISCO 88

7241 8-51.10 Fitter, electrical
7241 8-51.20 Fitter, dynamo
7241 8-51.20 Fitter, electrical/generator
7241 8-51.20 Fitter, electrical/magneto
7241 8-51.20 Fitter, electrical/motor
7241 8-51.30 Fitter, electrical/transformer
7241 8-51.40 Fitter, electrical/control apparatus
7241 8-51.40 Fitter, electrical/rheostat
7241 8-51.40 Fitter, electrical/switchgear
7241 8-51.50 Fitter, electrical/instruments
7241 8-51.60 Fitter, electrical/elevator and related equipment
7241 8-51.90 Builder, armature
7241 8-51.90 Builder, commutator
7241 8-51.90 Fitter, electrical/refrigeration and air-conditioning
7241 8-51.90 Fitter, electrical/signalling equipment
7241 8-55.30 Electrician, aircraft
7241 8-55.35 Electrician, ship
7241 8-55.40 Electrician, locomotive
7241 8-55.40 Electrician, motor vehicle
7241 8-55.40 Electrician, tram
7241 8-55.40 Electrician, vehicle
7241 8-55.70 Mechanic, electrical
7241 8-55.70 Repairer, electrical equipment
7241 8-55.70 Servicer, electrical equipment
24

COR 2010

7241 Electromecanici montatori si reparatori de aparate si echipamente electrice si en
724101 electrician echipamente electrice si energetice
724102 bobinator aparataj electric
724103 electromecanic reparator obiecte de uz casnic
724104 bobinator masini electrice rotative
724105 electrician aparate măsură-control si automatizare în centrale termoelectrice si nuclearo-electrice
724106 electrician montare si reparaŃii aparataj electric de protecŃie, relee, automatizare
724107 bobinator condensatori pentru instalaŃii electrice
724108 electrician verificări si măsurători electrice în centrale si reŃele electrice
724109 bobinator transformatoare
724110 montator/reglor/depanator de aparataj electric
724111 montator reglor si depanator pentru aparate de măsură electrice si relee
724112 montator reglor si depanator de ascensoare
724113 electrician nave
724114 confecŃioner cablaje auto
724115 electromecanic masini si echipamente electrice
724116 electromecanic staŃie pompare apă-canal
16

7242 Electronics fitters

ISCO 88

7242 8-52.10 Fitter, electronics
7242 8-52.10 Fitter, electronics/prototype
7242 8-52.20 Fitter, electronics/audio-visual equipment
7242 8-52.20 Fitter, electronics/radar
7242 8-52.20 Fitter, electronics/radio
7242 8-52.20 Fitter, electronics/telecommunications equipment
7242 8-52.20 Fitter, electronics/television
7242 8-52.30 Fitter, electronics/medical equipment
7242 8-52.40 Fitter, electronics/computer equipment
7242 8-52.40 Fitter, electronics/data-processing equipment
7242 8-52.50 Fitter, electronics/industrial equipment
7242 8-52.60 Fitter, electronics/signalling equipment
7242 8-52.60 Fitter, electronics/signalling systems
7242 8-52.90 Fitter, electronics/instruments
7242 8-52.90 Fitter, electronics/meteorological equipment
15

COR 2010

7242 Electronisti montatori si reparatori de aparate si echipamente electronice
724201 electrician depanator utilaje calcul
724202 electronist depanator utilaje calcul
724203 plantator elemente electronice
724204 operator în verificarea, întreŃinerea si repararea instalaŃiilor speciale de prevenire si stingere a incendiilor
724205 tehnician pentru sisteme si instalaŃii de semnalizare, alarmare si alertare în caz de incendiu
724206 tehnician pentru sisteme si instalaŃii de limitare si stingere a incendiilor
6

7243 Electronics mechanics and servicers

ISCO 88

7243 8-49.65 Mechanic, electronics/accounting-machine
7243 8-49.65 Mechanic, electronics/business machine
7243 8-49.65 Mechanic, electronics/calculating machine
7243 8-49.65 Mechanic, electronics/office machine
7243 8-52.10 Mechanic, electronics
7243 8-52.10 Repairer, electronics equipment
7243 8-52.10 Servicer, electronics equipment
7243 8-52.40 Mechanic, electronics/computer
7243 8-54.20 Mechanic, electronics/audio-visual equipment
7243 8-54.20 Mechanic, electronics/radio
7243 8-54.20 Mechanic, electronics/television
7243 8-54.20 Repairer, electronics equipment/audio-visual
7243 8-54.20 Repairer, electronics equipment/radio
7243 8-54.20 Repairer, electronics equipment/television
7243 8-54.20 Servicer, electronics equipment/audio-visual
7243 8-54.20 Servicer, electronics equipment/radio
7243 8-54.20 Servicer, electronics equipment/television
7243 8-54.90 Erector, radio aerial
7243 8-54.90 Erector, television aerial
19

7244 Telegraph and telephone installers and servicers

ISCO 88

7244 8-56.20 Installer, telegraph
7244 8-56.20 Installer, telephone
7244 8-56.30 Mechanic, telegraph
7244 8-56.30 Mechanic, telephone
7244 8-56.30 Servicer, telegraph
7244 8-56.30 Servicer, telephone
6

COR 2010

7244 Electromecanici montatori si reparatori de instalaŃii telegrafice si telefonice
724401 automatist
724402 electromecanic SCB (semnalizare, centralizare, blocare)
724403 electromecanic radio-radioficare
724404 electromecanic reŃele cabluri
724405 electromecanic reŃele linii
724406 electromecanic telegrafie, telefonie
724407 electronist telecomunicaŃii
724408 jonctor
724409 linior
724410 montator, reglor, testor aparatură de telecomunicaŃii si instalaŃii de semnalizare, centralizare si blocare
724411 electromecanic electroalimentare
724412 muncitor radioelectronist
724413 electromecanic automatizări si telecomunicaŃii
724414 electromecanic
14

7245 Electrical line installers, repairers and cable jointers

ISCO 88

7245 8-57.20 Cable worker, electric power/overhead cables
7245 8-57.20 Line worker, electric power
7245 8-57.20 Wire worker, electric power/overhead wires
7245 8-57.30 Cable worker, electric traction/overhead cables
7245 8-57.30 Line worker, electric traction
7245 8-57.30 Wire worker, electric traction/overhead wires
7245 8-57.40 Cable worker, telegraph
7245 8-57.40 Cable worker, telephone
7245 8-57.40 Line worker, telegraph
7245 8-57.40 Line worker, telephone
7245 8-57.40 Wire worker, telegraph
7245 8-57.40 Wire worker, telephone
7245 8-57.50 Jointer, cable
7245 8-57.50 Jointer, cable/electric
7245 8-57.50 Jointer, cable/telegraph
7245 8-57.50 Jointer, cable/telephone
7245 8-57.50 Plumber-jointer, electric cable
7245 8-57.90 Cable worker, electric power/underground cables
7245 8-57.90 Wire worker, electric power/underground wires
7245 9-59.90 Layer, underground cable
20

COR 2010

7245 Electricieni montatori si reparatori de linii electrice aeriene si subterane
724501 electrician exploatare centrale si staŃii electrice
724502 electrician exploatare reŃele electrice
724503 electrician montare si reparaŃii cabluri electrice subterane
724504 electrician montare si reparaŃii linii electrice aeriene
724505 electrician montare si reparaŃii echipament electric din centrale, staŃii si posturi de transformare electrice
724506 electrician protecŃie relee, automatizări si măsurători electrice
724507 electrician de întreŃinere si reparaŃii
724508 electrician montator de instalaŃii automatizate
724509 electrician montator de instalaŃii electrice la mijloace de transport
724510 electrician pentru protecŃia catodică
724511 electrician rural
724512 electrician de mină
724513 electrician pentru utilizarea energiei electrice
13

Plant and machine operators and assemblers
8.2. Machine operators and assemblers
828 Assemblers

8282 Electrical-equipment assemblers

ISCO 88

8282 8-53.20 Assembler, electrical equipment
8282 8-53.40 Machine-operator, winding/armature
8282 8-53.40 Machine-operator, winding/rotor coil
8282 8-53.40 Machine-operator, winding/stator coil
8282 8-53.40 Machine-operator, winding/transformer coil
8282 8-53.90 Assembler, electrical components
6

COR 2010

828201 lăcătus-montator masini electrice rotative, transformatoare si aparataj electric
828202 confecŃioner protecŃie dielectrică pentru acumulatori
828203 morar la prepararea materialelor pentru acumulatori
828204 confecŃioner grătare si accesorii pentru acumulatori
828205 confecŃioner plăci pentru acumulatori
828206 preparator lesie pentru acumulatori
828207 montator acumulatori
828208 confecŃioner cabluri si arbori de cabluri
8

8283 Electronic-equipment assemblers

ISCO 88

8283 8-41.70 Assembler, office machinery
8283 8-42.20 Assembler, chronometer
8283 8-42.20 Assembler, clock
8283 8-42.20 Assembler, watch
8283 8-42.40 Assembler, precision instrument
8283 8-53.30 Assembler, audio-visual equipment
8283 8-53.30 Assembler, electronic equipment
8283 8-53.30 Assembler, radio
8283 8-53.30 Assembler, television
8283 8-53.90 Assembler, electronic components
8283 8-53.90 Assembler, hearing aid
8283 8-53.90 Assembler, microelectronics equipment
8283 8-53.90 Machine-operator, winding/filament
13

COR 2010

828301 montator-reglor, depanator aparate electronice, telecomunicaŃii, radio
828302 confecŃioner tuburi cinescop
828303 montator-reglor, depanator de instalaŃii de electronică si curenŃi purtători
828304 montator-reglor, depanator de aparate radio si TV, redresoare si amplificatoare
828305 confecŃioner piese radio si semiconductori
828306 confecŃioner circuite integrate
828307 confecŃioner scală radio
828308 confecŃioner circuite imprimate
828309 montator, reglor, testor tehnică de calcul
828310 confecŃioner lămpi fluorescente
828311 confecŃioner lămpi cu vapori de mercur
828312 confecŃioner lămpi cu vapori de sodiu
828313 confecŃioner becuri
13

Pondere (Total - muncitori) în total efectiv al salariatilor la sfarsitul anului pe categorii de salariati si activitati ale industriei la nivel de diviziune CAEN Rev.1

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Pielarie si incaltaminte	9,2	10,0	8,6	9,9	9,4	12,6	10,7	9,9	9,2	9,2	12,4	10,1	12,5	12,5	11,3
Articole de imbracaminte	8,2	8,6	7,4	8,1	8,2	9,0	9,4	11,8	10,1	11,5	13,1	12,6	12,3	12,3	12,6
Produse textile	9,5	10,1	10,5	10,4	10,5	11,1	11,7	11,0	10,7	12,8	15,3	12,9	16,2	16,2	13,8
Extractia si prepararea carbunelui	9,0	9,0	9,2	9,2	11,9	11,3	11,5	11,9	11,7	12,7	12,9	13,4	14,3	14,2	14,5
Prelucrarea lemnului si a produselor din lemn (exclusiv mobila)	11,6	9,5	10,4	10,5	10,4	12,7	11,1	11,1	12,5	13,0	17,2	12,2	14,4	13,9	14,9
Masini si aparate electrice	17,9	18,1	19,9	19,6	19,7	21,3	20,0	19,4	19,4	18,0	19,1	21,7	19,0	17,0	16,4
Mobilier si alte activitati industriale neclasificate in alta parte	11,0	11,0	11,4	11,2	12,1	11,7	13,4	13,8	13,2	13,1	16,6	14,4	15,8	16,3	18,1
Metalurgie	14,0	14,2	13,8	14,2	14,9	15,3	16,3	16,2	16,5	20,0	17,8	16,7	20,0	18,1	19,0
Alte mijloace de transport	18,0	17,8	17,5	18,7	19,3	19,3	20,0	20,7	20,5	19,6	19,3	18,5	20,2	19,8	19,2
Prelucratoare	14,2	14,7	14,9	14,9	16,1	16,7	16,7	16,9	16,5	17,4	19,3	18,5	19,7	19,5	20,4
Constructii metalice si produse din metal	14,6	16,2	16,2	17,2	17,8	19,2	20,0	19,0	20,2	19,9	19,9	19,2	21,5	20,9	20,9
Mijloace de transport rutier	18,0	17,7	19,3	19,4	19,3	19,4	20,3	20,8	20,6	20,7	21,7	21,1	22,6	23,7	21,2
Total	14,2	14,6	14,8	15,0	16,3	16,9	17,0	17,3	17,0	17,9	19,7	19,1	20,4	20,5	21,3
Fabricarea materialelor de constructii si alte produse din minerale nematalice	12,3	12,6	12,6	12,6	14,0	15,3	15,2	14,5	14,5	15,9	17,0	16,9	18,3	18,7	22,2
Extractiva	11,7	11,9	12,0	12,0	14,6	14,2	15,0	15,1	15,2	16,1	16,6	17,6	19,7	22,0	22,3
Alimentara si bauturi	13,3	14,6	15,4	14,4	16,8	17,2	18,7	18,4	18,3	18,9	24,6	21,5	24,0	24,2	23,4
Alte activitati extractive	14,1	15,3	15,2	15,5	15,2	16,8	17,7	17,7	18,1	21,3	19,6	20,1	21,1	23,0	23,8
Extractia si prepararea minereurilor metalifere	10,1	9,8	9,9	10,2	11,6	11,0	10,7	11,0	11,1	11,4	12,9	13,0	13,8	15,6	24,0
Produse din cauciuc si a mase plastice	14,0	14,4	14,9	16,1	16,4	20,0	19,6	19,2	17,7	19,6	21,0	20,1	24,7	23,3	24,1
Celuloza, hartie si produse din hartie	11,2	11,7	12,1	12,9	14,4	17,8	17,7	18,3	17,4	20,2	24,2	20,7	19,6	19,8	24,5
Masini si echipamente (exclusiv echipamente electrice si optice)	18,1	18,6	18,7	18,6	19,8	19,7	20,1	21,4	21,1	22,0	23,0	24,1	23,5	23,3	24,5
Recuperarea deseurilor	17,5	18,9	16,4	17,3	36,2	16,8	21,7	17,4	22,1	22,3	19,7	21,9	22,3	21,5	26,8
Extractia hidrocarburilor si servicii anexe	15,0	15,7	15,8	15,6	17,4	16,7	18,9	18,8	18,9	19,4	19,7	20,7	23,9	26,8	26,9
Productia, transportul si distributia de energie electrica si termica, gaze si apa calda	17,4	17,8	18,2	18,3	20,3	20,7	22,1	22,5	23,2	25,0	25,9	27,0	27,7	29,9	30,6
Energie electrica si termica, gaze si apa	16,6	17,1	17,6	19,5	21,0	21,4	22,2	22,8	23,6	25,3	26,4	27,5	28,5	30,3	31,2
Captarea, tratarea si distributia apei	12,7	14,0	15,0	22,7	23,2	23,5	22,6	23,4	24,9	26,2	27,6	28,6	30,1	31,3	32,5
Prelucrarea titeiului, cocsificarea carbunelui si tratarea combustibililor nucleari	15,5	17,0	16,3	15,8	18,9	17,0	18,9	19,5	20,9	23,7	26,4	27,2	28,5	33,6	34,9
Substante si produse chimice	15,5	17,1	18,3	18,1	20,2	21,1	21,9	23,9	24,6	26,3	28,2	28,7	31,5	32,4	35,6
Aparatura si instrumente medicale, de precizie,optice si ceasornicarie	24,1	20,7	21,7	21,3	22,2	26,2	24,5	27,2	29,3	32,5	33,4	34,6	27,5	34,1	37,1
Produse din tutun	14,0	14,8	15,1	13,0	13,4	16,2	19,0	21,3	22,4	22,2	29,2	37,5	37,0	40,3	37,4
Echipamente, aparate de radio, televiziune si comunicatii	**23,7**	**24,7**	**26,6**	**32,0**	**36,5**	**34,1**	**35,2**	**31,8**	**34,7**	**36,6**	**41,6**	**33,7**	**59,8**	**41,4**	**44,8**
Edituri, poligrafie si reproducerea pe suporti a inregistrarilor	42,4	43,9	40,8	36,9	44,3	55,4	44,4	52,8	48,7	48,9	52,2	57,3	51,2	42,7	52,1
Mijloace ale tehnicii de calcul si de birou	**38,4**	**46,8**	**56,4**	**41,6**	**71,0**	**62,0**	**75,0**	**63,3**	**59,2**	**48,7**	**60,5**	**67,5**	**66,2**	**54,0**	**57,3**

Rezultatele cautarii - Cheltuieli totale din activitatea de cercetare-dezvoltare pe tipuri de programe de

Anul 2008

UM: Mii lei

	Tipuri de programe de cercetare-dezvoltare conform NABS 2007	Surse de finantare pentru cercetare-dezvoltare: **Totale**	Totale - din alte surse	Totale - din fonduri publice	Totale	Totale - din alte surse	Totale - din fonduri publice	Totale - din alte surse	**Totale - din fonduri publice**
0	**Total**	2980674	891130	2089544	100,0	100,0	100,0	29,9	**70,1**
1	**Explorarea si exploatarea pamantului**	26444	7933	18511	0,9	0,9	0,9	30,0	**70,0**
2	**Mediu inconjurator**	168048	75490	92558	5,6	8,5	4,4	44,9	**55,1**
3	**Explorarea si exploatarea spatiului**	2394	29	2365	0,1	0,0	0,1	1,2	**98,8**
4	**Transport, telecomunicatii si alte infrasructuri**	32130	8180	23950	1,1	0,9	1,1	25,5	**74,5**
5	**Energie**	128512	56383	72129	4,3	6,3	3,5	43,9	**56,1**
6	**Productia si tehnologia industriala**	583041	327256	255785	19,6	36,7	12,2	56,1	**43,9**
7	**Sanatate**	214441	77964	136477	7,2	8,7	6,5	36,4	**63,6**
8	**Agricultura**	219321	50578	168743	7,4	5,7	8,1	23,1	**76,9**
9	**Educatie**	8373	2391	5982	0,3	0,3	0,3	28,6	**71,4**
10	**Cultura, activitati recreative, religie si mass-media**	8725	2003	6722	0,3	0,2	0,3	23,0	**77,0**
11	**Sisteme politice si sociale, structuri si procese**	9158	1367	7791	0,3	0,2	0,4	14,9	**85,1**
					din total fonduri				
12	**Promovarea generala a cunoasterii: cercetare-dezvoltare finantata din fondurile generale universitare (GUF), pentru:**	625990	93112	532878	21,0	3,1	17,9		
13	**stiinte naturale si exacte**	160841	2487	158354	5,4	0,3	5,3		
14	**stiinte ingineresti si tehnologice**	249741	55996	193745	8,4	6,3	6,5		
15	**stiinte medicale si de sanatate**	140449	8880	131569	4,7	1,0	4,4		
16	**stiinte agricole**	28179	13369	14810	0,9	1,5	0,5		
17	**stiinte sociale si economice**	31604	11760	19844	1,1	1,3	0,7		
18	**stiinte umaniste**	15176	620	14556	0,5	0,1	0,5		
19	**Promovarea generala a cunoasterii: cercetare-dezvoltare finantata din alte surse decat fondurile generale universitare, pentru:**	899502	184773	714729	30,2	20,7	24,0		
20	**stiinte naturale si exacte**	349016	36219	312797	11,7	4,1	10,5		
21	**stiinte ingineresti si tehnologice**	327058	108374	218684	11,0	12,2	7,3		
22	**stiinte medicale si de sanatate**	66122	15927	50195	2,2	1,8	1,7		
23	**stiinte agricole**	29369	4815	24554	1,0	0,5	0,8		
24	**stiinte sociale si economice**	54899	13667	41232	1,8	1,5	1,4		
25	**stiinte umaniste**	73038	5771	67267	2,5	0,6	2,3		

Sursa date Tempo -online/INS

Cheltuieli totale din activitatea de cercetare-dezvoltare din sectorul întreprinderi, pe categorii de cheltuieli si pe activități CAEN Rev.2 - preturi curente, 2008,

Sursa TEMPO/INS

	Categorii de cheltuieli 2008		
	Total	Curente	De capita
Total	**100**	**86,0**	**14,0**
AGRICULTURA, SILVICULTURA SI PESCUIT	**14,0**	**12,3**	**1,7**
INDUSTRIEA EXTRACTIVA	2,3	1,9	0,4
INDUSTRIE PRELUCRATOARE	**43,7**	**37,4**	**6,3**
Fabricarea autovehiculelor de transport rutier, a remorcilor si semiremorcilor	***11,5***	***10,4***	***1,1***
Fabricarea substantelor si a produselor chimice	*7,0*	*5,7*	*1,3*
Fabricarea altor mijloace de transport	*4,7*	*4,2*	*0,4*
Fabricarea de masini, utilaje si echipamente n.c.a.	*4,3*	*3,3*	*1,0*
Fabricarea calculatoarelor si a produselor electronice si optice	*3,5*	*2,3*	*1,3*
Fabricarea echipamentelor electrice	*3,3*	*3,3*	*0,0*
Industria metalurgica	*1,9*	*1,8*	*0,1*
Industria constructiilor metalice si a produselor din metal, exclusiv masini, utilaje si instala	*1,2*	*1,1*	*0,2*
Repararea, intretinerea si instalarea masinilor si echipamentelor	*1,1*	*1,0*	*0,1*
Alte activitati industriale n.c.a.	*1,0*	*0,9*	*0,1*
Fabricarea produselor farmaceutice de baza si a preparatelor farmaceutice	*1,0*	*0,9*	*0,1*
Industria alimentara	*0,8*	*0,8*	*0,1*
Fabricarea produselor textile	*0,6*	*0,2*	*0,0*
Fabricarea produselor de cocserie si a produselor obtinute din prelucrarea titeiului	*0,6*	*0,5*	*0,0*
Fabricarea altor produse din minerale nemetalice	*0,3*	*0,3*	*0,0*
Fabricarea produselor din cauciuc si mase plastice	*0,2*	*0,2*	*0,0*
Fabricarea produselor de tutun	*0,2*	*0,2*	*0,0*
Fabricarea de mobila	*0,1*	*0,1*	*0,0*
Tabacirea si finisarea pieilor; fabricarea articolelor de voiaj si marochinarie, harnasament	*0,1*	*0,1*	*0,0*
Fabricarea hartiei si a produselor din hartie	*0,1*	*0,1*	*0,0*
Fabricarea articolelor de imbracaminte	*0,1*	*0,1*	*0,4*
PRODUCTIA SI FURNIZAREA DE ENERGIE ELECTRICA SI TERMICA, GAZE, AI	9,7	7,8	1,9
DISTRIBUTIA APEI; SALUBRITATE, GESTIONAREA DESEURILOR, ACTIVITATI	0,0	0,0	0,0
CONSTRUCTII	2,8	2,8	0,0
SERVICII din care:	**27,4**	**23,7**	**3,7**
Cercetare-dezvoltare	***18,9***	***15,8***	***3,1***

Pondere salariați din activitatea de cercetare-dezvoltare - echivalent norma intreaga din sectorul intreprinderi, dupa ocupatie si activitati CAEN Rev.2

(Sursa datelor TEMPO INS)

		Total	Cercetatori	Tehnicieni si asimilati	Alte categorii de salariati
Total		**100**	**54,7**	**18,2**	**27,0**
AGRICULTURA, SILVICULTURA SI PESCUIT		23,7	9,7	6,4	7,6
INDUSTRIEA EXTRACTIVA		3,6	2,3	0,7	0,6
INDUSTRIE PRELUCRATOARE		43,9	26,0	7,4	10,4
	Fabricarea autovehiculelor de transport rutier, a remorcilor si semiremorcilor	***9,3***	***6,5***	***1,5***	***1,2***
	Fabricarea de masini, utilaje si echipamente n.c.a.	***6,0***	***3,9***	***1,5***	***0,6***
	Fabricarea altor mijloace de transport	***4,1***	***3,1***	***0,7***	***0,3***
	Fabricarea echipamentelor electrice	***3,6***	***2,6***	***0,3***	***0,7***
	Fabricarea substantelor si a produselor chimice	***7,0***	***2,2***	***1,0***	***3,8***
	Fabricarea calculatoarelor si a produselor electronice si optice	*2,6*	*1,6*	*0,5*	*0,5*
	Industria constructiilor metalice si a produselor din metal, exclusiv masini, utilaje si instalatii	*1,8*	*1,3*	*0,2*	*0,2*
	Industria metalurgica	*1,8*	*1,3*	*0,3*	*0,1*
	Repararea, intretinerea si instalarea masinilor si echipamentelor	*1,3*	*0,9*	*0,2*	*0,3*
	Fabricarea produselor farmaceutice de baza si a preparatelor farmaceutice	*1,8*	*0,6*	*0,1*	*1,1*
	Fabricarea produselor de cocserie si a produselor obtinute din prelucrarea titeiului	*1,1*	*0,6*	*0,5*	*0,1*
	Industria alimentara	*0,6*	*0,5*	*0,1*	*0,1*
	Fabricarea produselor din cauciuc si mase plastice	*0,8*	*0,4*	*0,0*	*0,3*
	Fabricarea produselor textile	*0,4*	*0,2*	*0,1*	*0,2*
	Alte activitati industriale n.c.a.	*0,7*	*0,1*	*0,2*	*0,4*
	Tabacirea si finisarea pieilor; fabricarea articolelor de voiaj si marochinarie, harnasamentelor si incaltamintei; prepararea si vopsirea blanurilor	*0,1*	*0,1*	*0,0*	*0,0*
	Fabricarea de mobila	*0,1*	*0,1*	*0,0*	*0,0*
	Fabricarea hartiei si a produselor din hartie	*0,1*	*0,1*	*0,0*	*0,0*
	Fabricarea articolelor de imbracaminte	*0,3*	*0,0*	*0,1*	*0,2*
	Fabricarea produselor de tutun	*0,1*	*0,0*	*0,0*	*0,0*
	Fabricarea altor produse din minerale nemetalice	*0,2*	*0,0*	*0,0*	*0,2*
PRODUCTIA SI FURNIZAREA DE ENERGIE ELECTRICA SI TERMICA,		5,9	**4,2**	1,2	0,5
DISTRIBUTIA APEI; SALUBRITATE, GESTIONAREA DESEURILOR, AC		0,1	0,1	0,0	0,0
CONSTRUCTII		1,9	1,4	0,1	0,3
SERVICII din care:		20,9	**11,0**	2,3	7,6
	Cercetare-dezvoltare	13,1	**7,6**	1,6	3,9

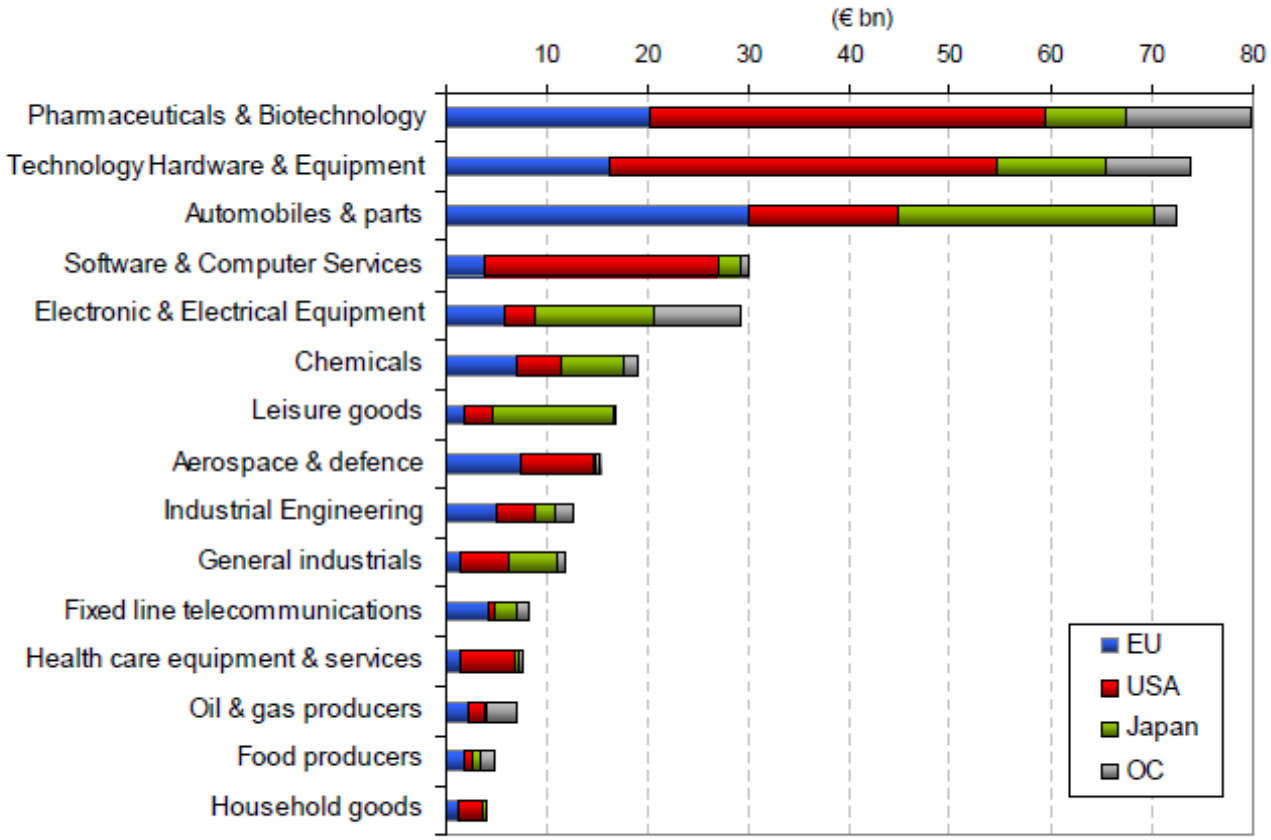
CAEN Rev.1.

A	AGRICULTURA , VANATOARE, SILVICULTURA
B	PESCUITUL SI PISCICULTURA
C	Industrie extractivă
D	Industrie prelucrătoare
E	Energie electrică şi termică, gaze şi apă
F	Construcţii
G	Comerţ
H	Hoteluri şi restaurante
I	Transport, depozitare şi comunicaţii
J	Intermedieri financiare
K	Tranzacţii imobiliare, închirieri şi activităţi de servicii prestate în principal întreprinderilor
L	**Administraţie publică şi apărare**
M	**Învăţământ**
N	Sănătate şi asistenţă socială
O	ALTE ACTIVITATI DE SERVICII COLECTIVE, SOCIALE SI

CAEN Rev.2:

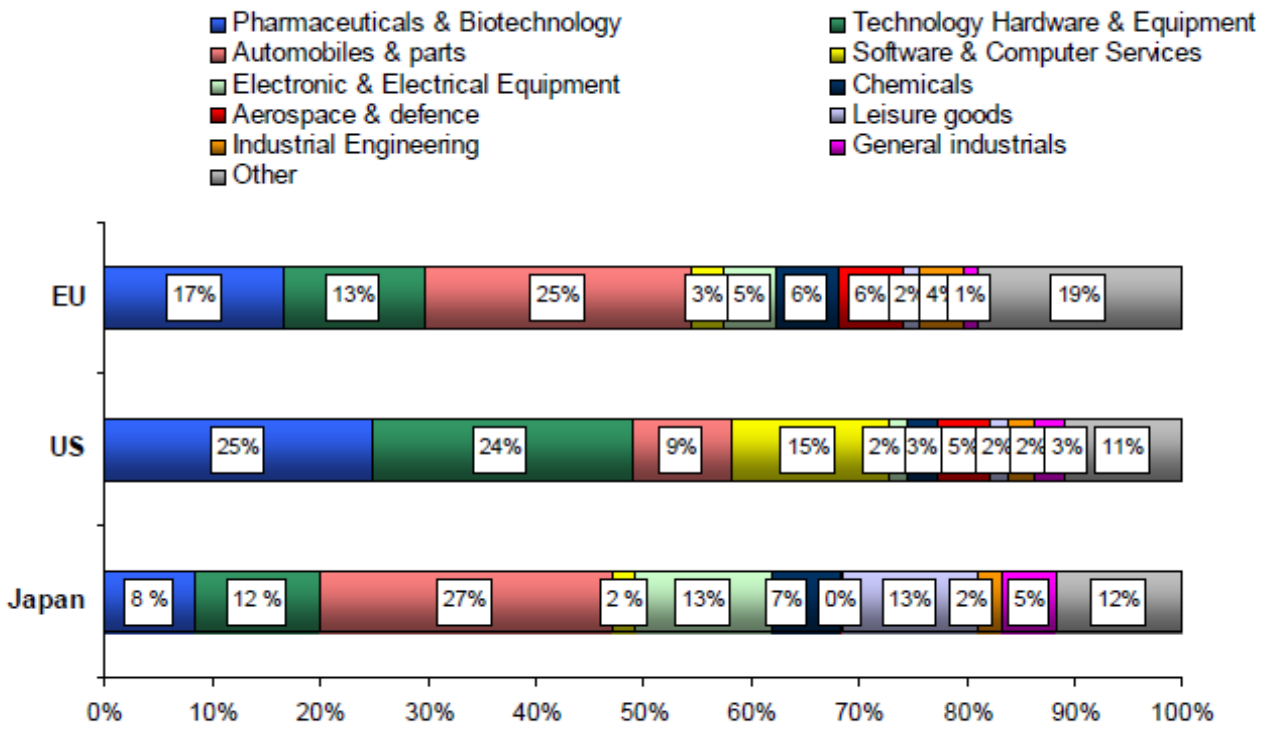
A	AGRICULTURĂ, SILVICULTURĂ ŞI PESCUIT
B	INDUSTRIA EXTRACTIVĂ
C	INDUSTRIA PRELUCRĂTOARE
D	PRODUCŢIA ŞI FURNIZAREA DE ENERGIE ELECTRICĂ ŞI TERMICĂ, GAZE, APĂ CALDĂ ŞI AER CONDIŢIONAT
E	**DISTRIBUŢIA APEI; SALUBRITATE, GESTIONAREA DEŞEURILOR, ACTIVITĂŢI DE DECONTAMINARE**
F	CONSTRUCŢII
G	COMERŢ CU RIDICATA ŞI CU AMĂNUNTUL; REPARAREA AUTOVEHICULELOR ŞI MOTOCICLETELOR
H	TRANSPORT ŞI DEPOZITARE
I	HOTELURI ŞI RESTAURANTE
J	**INFORMAŢII ŞI COMUNICAŢII**
K	INTERMEDIERI FINANCIARE ŞI ASIGURARI
L	TRANZACŢII IMOBILIARE
M	**ACTIVITĂŢI PROFESIONALE, ŞTIINŢIFICE ŞI TEHNICE**
N	ACTIVITĂŢI DE SERVICII ADMINISTRATIVE ŞI ACTIVITĂŢI DE SERVICII SUPORT
O	ADMINISTRAŢIE PUBLICĂ ŞI APĂRARE; ASIGURĂRI SOCIALE DIN SISTEMUL PUBLIC
P	ÎNVĂŢĂMÂNT
Q	SĂNĂTATE ŞI ASISTENŢĂ SOCIALĂ
R	ACTIVITĂŢI DE SPECTACOLE, CULTURALE ŞI RECREATIVE
S	ALTE ACTIVITĂŢI DE SERVICII
T	ACTIVITĂŢI ALE GOSPODĂRIILOR PRIVATE ÎN CALITATE DE ANGAJATOR DE PERSONAL CASNIC; ACTIVITĂŢI ALE GOSPODĂRIILOR PRIVATE DE PRODUCERE DE BUNURI ŞI SERVICII DESTINATE CONSUMULUI PROPRIU
U	ACTIVITĂŢI ALE ORGANIZAŢIILOR ŞI ORGANISMELOR EXTRATERITORIALE

Figure 4. R&D *ranking of industrial sectors and share of main world regions for the world's top 1350 companies in the 2009 Scoreboard*



Note: Ranked by total worldwide R&D investment of the sector.
Source: The 2009 EU Industrial R&D Investment Scoreboard
European Commission, JRC/DG RTD.

Figure 5. *R&D shares of sectors of the main world regions*



Source: The 2009 EU Industrial R&D Investment Scoreboard
European Commission, JRC/DG RTD.

Table 7. Ranking of industrial sectors by overall R&D intensity for the EU, US and Japanese companies in the 2009 *Scoreboard*

Rank	Sector	Overall sector R&D intensity (%)	EU sector R&D intensity (%)	US sector R&D intensity (%)	Japan sector R&D intensity (%)
1	Pharmaceuticals & Biotechnology	16.5	16.1	17	16.1
2	Software & Computer Services	9.6	9.8	10.8	4.5
3	Technology Hardware & Equipment	8.6	13.9	9.7	5.4
4	Leisure goods	6.1	6.2	9.7	5.7
5	Health care equipment & services	6.1	4.6	7.2	5.9
6	Automobiles & parts	4.4	5.3	4.4	3.9
7	Electronic & Electrical Equipment	4.2	4.3	4.1	5.1
8	Aerospace & defence	4.1	6	3.3	5.4
9	Chemicals	2.9	2.8	2.7	3.3
10	Industrial Engineering	2.7	3.2	2.6	2.6
11	General industrials	2.3	2.8	2.1	2.9
12	Household goods	2.2	2.5	2.5	1.2
13	Fixed line telecommunications	1.7	1.7	0.7	2.5
14	Food producers	1.5	1.9	0.7	2.3
15	Oil & gas producers	0.3	0.3	0.2	0.3
	Top 15 sectors	4.0	3.7	5.0	4.1
	Rest of 22 sectors	1.0	0.7	1.5	1.1
	All sectors	3.3	2.7	4.5	3.4

Source: The 2009 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG RTD

The *Scoreboard* is part of the European Commission's monitoring activities to improve the understanding of trends in R&D investment by the private sector and the factors affecting it. It was created in response to the Commission's Research Investment Action Plan29, which aims to help close the gap between the EU's R&D investment and that of other developed economies.

"Investing in research: an action plan for Europe", COM(2003)266, http://europa.eu.int/eurlex/en/com/cnc/2003/com2003_0226en02.pdf.

Table 6. Ranking of industrial sectors by overall one-year R&D growth for the EU, US and Japanese companies in the 2009 *Scoreboard*

Rank	Sector	Overall one-year R&D growth (%)	EU R&D change (%)		US R&D change (%)		Japan R&D change (%)	
			1 year	3 years	1 year	3 years	1 year	3 years
1	Oil & gas producers	15.8	8.9	11.5	23.1	17.9	9.2	8.7
2	Industrial Engineering	14.1	13.2	12.8	18.5	15.1	5.2	5.5
3	Food producers	11.4	9.8	3.6	2.2	8.8	2.8	2
4	Software & Computer Services	9.7	12.9	13.9	9.4	12.1	2.5	2.7
5	Health care equipment & services	9	10.3	11	8.6	13.5	2.9	7.1
6	Pharmaceuticals & Biotechnology	7.7	7.1	11.1	6.9	10.9	9.5	19.2
7	Chemicals	7.5	4.6	2.8	7.3	6.5	10.8	7.2
8	Electronic & Electrical Equipment	7.4	12.5	-3.8	16	12.7	-0.8	5.4
9	Household goods	5.7	9.8	12	3.9	4.8	2.9	4.7
10	Fixed line telecommunications	5.5	12.7	12.9	-15.5	85.5	-0.4	-5.2
11	Technology Hardware & Equipment	4.9	3.0	10.5	3.3	9.2	5.3	5.5
12	Automobiles & parts	4.3	6.6	5	-2.8	-0.2	5.9	6.6
13	General industrials	3.8	1.3	0.7	4.3	6.1	1.2	3.4
14	Leisure goods	2.9	1.4	-13	22.9	11.7	-1.1	0.9
15	Aerospace & defence	1.1	-2	4.9	3.8	11.6	1.2	2.3
	Top 15 sectors	6.3	6.4	6.6	5.8	9.4	3.9	5.5
	Rest of 22 sectors	16.6	26.2	17.6	4.9	9.7	10.8	6.2
	All sectors	7.0	8.1	7.5	5.7	9.4	4.4	5.5

Note: Figures of last year's *Scoreboard* in brackets. The different *Scoreboards* are not directly comparable because of changes in the sample composition.
Source: The 2009 EU Industrial R&D Investment Scoreboard.
European Commission, JRC/DG RTD

The *Scoreboard* refers to all R&D financed by a company from its own funds, regardless of where the R&D is performed. BERD refers to all R&D activities performed by businesses within a particular sector and territory, regardless of the location of the business's headquarters, and regardless of the sources of finance. The sources of data also differ: the *Scoreboard* collects data from audited financial accounts and reports whereas BERD typically takes a stratified sample, covering all large companies and a representative sample of smaller companies. Additional differences concern the definition of R&D intensity (BERD uses the percentage of R&D in value added, while the *Scoreboard* considers the R&D/Sales ratio) and the sectoral classification (BERD uses NACE (the European statistical classification of economic sectors), while the *Scoreboard* uses the ICB (the International Classification Benchmark).

Definitions

1. **Research and Development (R&D) investment** in the *Scoreboard* is the cash investment funded by the companies themselves. It excludes R&D undertaken under contract for customers such as governments or other companies. It also excludes the companies' share of any associated company or joint venture R&D investment. Being that disclosed in the annual report and accounts, it is subject to the accounting definitions of R&D. For example, a definition is set out in International Accounting Standard (IAS) 38 “Intangible assets” and is based on the OECD “Frascati” manual.

Research *is defined as original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding.* ***Expenditure on research*** *is recognised as an expense when it is incurred.*

Development *is the application of research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services before the start of commercial production or use. Development costs are capitalised when they meet certain criteria and when it can be demonstrated that the asset will generate probable future economic benefits. Where part or all of R&D costs have been capitalised, the additions to the appropriate intangible assets are included to calculate the cash investment and any amortisation eliminated.*

3. **R&D intensity** is the ratio between R&D investment and net sales of a given company or group of companies. At the aggregate level, R&D intensity is calculated only by those companies for which data exist for both R&D and net sales in the specified year. The calculation of R&D intensity in the *Scoreboard* is different from than in official statistics, e.g. BERD, where R&D intensity is based on value added instead of net sales.

Monitoring industrial research: **The 2009 EU industrial R&D investment SCOREBOARD**

Joint Research Centre

Directorate General Research

EUROPEAN COMMISSION

© European Communities, November 2009

Multumesc pentru atentie!