

# RISIS



RESEARCH INFRASTRUCTURE FOR SCIENCE  
AND INNOVATION POLICY STUDIES

## DOCUMENTATION OF RISIS DATASETS *ClB / Cinnob*

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# Report on the content and technical structure of the *Corporate Invention Board* (CIB) infrastructure (Task 1 of WP6)

## 1 Basic characteristics of CIB

- Name and short description of the infrastructure

The Corporate Invention Board (CIB) database developed by Ifris collect patents applied for from 1986 to 2009 by 2058 large firms with the highest annual R&D investments<sup>1</sup>. It contains 16 224 135 applications of patents of invention<sup>2</sup> (among which 8 218 645 are priority patent applications) and gives information related to applicants and inventors, the patent application filing date, the patent office where the patent was filled, the type of patent, technology field categories, the patent title and abstract, citations to other documents. It also gives the name and country of the large firm to which the applicants of the patent belong to.

- Aim of the database (context of data acquisition)

The Corporate Invention Board (CIB) database has been developed for complementing the “Industrial R&D Investment Scoreboard” produced annually by European Commission’s Institute for Prospective Technological Studies. The industrial R&D Investment Scoreboard<sup>3</sup> 2008 analyses the performances of the 2000 industrial companies (1000 based within the European Union, 1000 outside) with the highest annual R&D investments; it covers 80% of world total private R&D. The corresponding CIB database focuses on the outputs of these R&D investments. It provides, through patent statistics, information on technologies and geographical location of the corporate inventive activities. The CIB project has identified the consolidated portfolios<sup>4</sup> of patents applied for over 20 years (1986-2009) by the large industrial companies from the industrial R&D Investment Scoreboard 2008. The original set of 2000 companies has been enriched with selected Chinese and Indian companies, which results in a total of 2809 corporations. The CIB database

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<sup>1</sup> In this document “large firms” will often be used to mean “large firms with the highest annual R&D investments”

<sup>2</sup> ipr\_kind : PI

<sup>3</sup> <http://iri.jrc.ec.europa.eu/scoreboard.html>

<sup>4</sup> According with Orbis consolidation rules - a threshold of 50,01% of final ownership- subsidiaries’ patents have been consolidated within the corporation’s patent portfolio

includes 8.2 million priority patents, which represent 38.4% of the total number of priority patents applied for across the world between 1986 and 2009. This unique database allows analysing the transformation of global patent portfolios of industrial groups in the last decades.

- Legal name of operating organization

UPEM - IFRIS

- Database location and type of access:

MySQL server at Ifris. It is accessible on site at Ifris at Marne-la-Vallée (France).

## 2 Information on substantive content of *CIB*

### 2.1 Definition and description of observations

- Units and definition of observations (e.g., records on firms or programmes, etc.)

The CIB database gives information related to priority patent applications of large firms i.e. the very first patent application, anywhere in the world to protect an invention. The priority date is used to determine the novelty of the invention, which implies that it is an important concept in patent procedures. For statistical purposes, the priority date is the closest date to the date of invention.

- Number of observations (usually the rows in the database on the main unit of observation)

From 1986 to 2009, the Corporate Invention Board database includes 8 218 645 priority patent applications (number of `appln_id` in table `firm_tls201_ifris`). It includes 8 109 182 priority patents that directly involved an applicant that belongs to a large firm (also shown in table `firm_tls201_ifris`) and 109 463 additional priority patents included in the Inpadoc family of those 8 097 126 priority patents but for which no applicants are part of a large firm. It also includes 8 005 490 non-priority patents i.e. further extension of the large firms' priority patents.

The CIB database includes 2319 large firms (`guo_id` in Table `orb_guo_cor`). 2058 of them had applied for priority patents between 1986 and 2009 (`guo_id` in Table `orb_guo_cor` and `firm_tls001_rappln_id`).

## 2.2 Data acquisition and processing (e.g. data cleaning)

- Where are the data retrieved from (e.g., own survey, public information, etc.)

### *The firm database*

Our first data source is the “Industrial R&D Investment Scoreboard” (2008 edition) that lists the 2000 industrial companies (1000 based within the European Union, 1000 outside<sup>5</sup>) with the highest annual R&D investments. This initial set was complemented with 500 Indian and Chinese firms declaring R&D investments between 1999 and 2009 in the Computstat database and with name of the 500 most important firms as assignees of WIPO<sup>6</sup>, EPO and USPTO patents. Then using the Orbis database edited by Bureau van Dijk Electronic Publishing we defined the global ultimate owner (GUO) for each of the firms and identified all subsidiaries in which one of the GUOs had more than 50.01% of shares in 2008. We ended with a list of 2319 GUO and 168 533 different subsidiaries. Using the data cleaning and harmonizing methodology developed by Magerman et al. (2006), we prepared a list of cleaned GUO and subsidiaries names that was further enriched by adding firm acronyms, firm old names and standardized names from the Pastat database. The final list of firm names contained 316 676 different names. The next issue was to define the home country of the firm. Following the practice of the “Industrial R&D Investment Scoreboard”, the home country of the firm (GUO and all its subsidiaries) was defined according to the location of the GUO headquarters.

At last a classification of firms according to industrial sectors was added. It uses the ICB (Industry Classification Benchmark) classification already included in the Industrial R&D Investment Scoreboard files developed by Dow Jones and the Financial Times Stock Exchange (FTSE)<sup>7</sup>. It classifies each of the firms into 10 industries, 18 super sectors and 41 industrial sectors.

### *The patent database*

We used the PATSTAT-IFRIS database, built on PATSTAT version October 2011 provided by EPO (see report “PATSTAT-IFRIS database” for detailed description).

- How are the data processed in terms of data cleaning (e.g. harmonisation of organization names, etc.)

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<sup>5</sup> The excel file can be downloaded in:

[https://www.dropbox.com/s/bc4crb102m1fpev/2008\\_top\\_1000\\_EU\\_companies.xls](https://www.dropbox.com/s/bc4crb102m1fpev/2008_top_1000_EU_companies.xls)

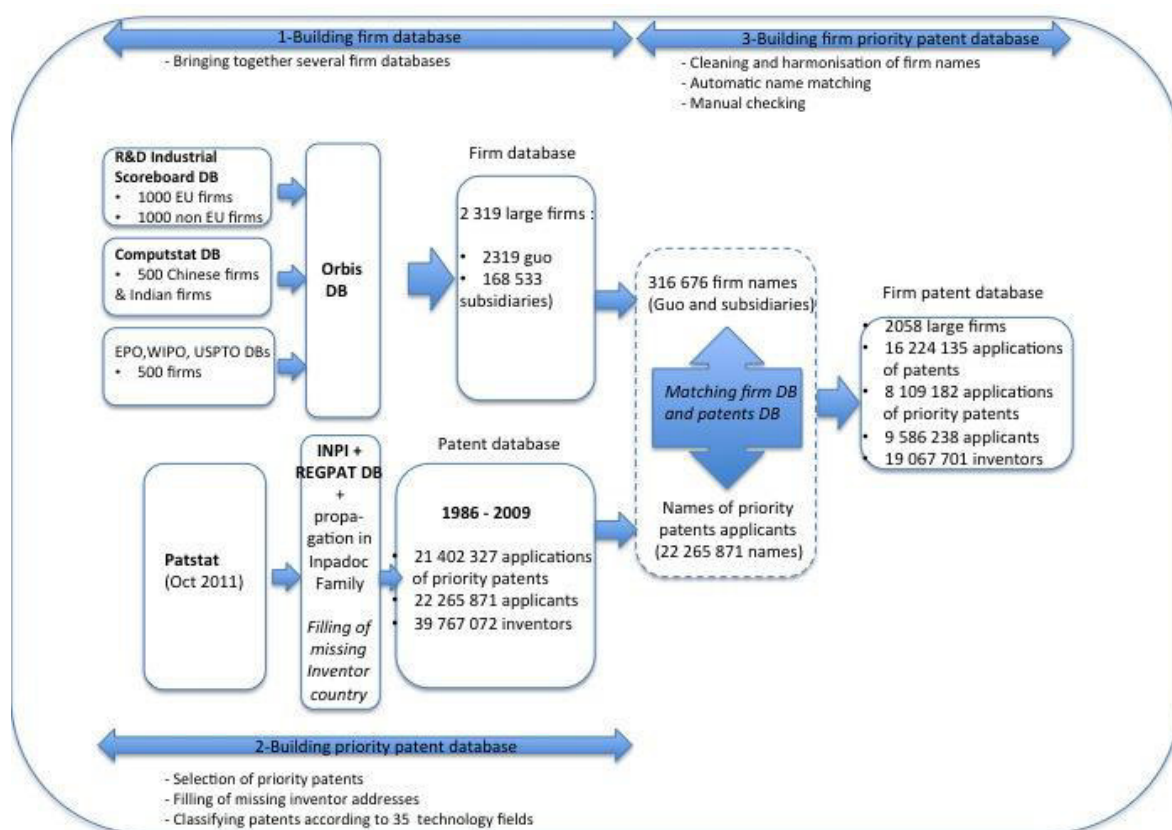
[https://www.dropbox.com/s/f2tfpespqj61v4e/2008\\_top\\_1000\\_non-EUcompanies.xls](https://www.dropbox.com/s/f2tfpespqj61v4e/2008_top_1000_non-EUcompanies.xls)

<sup>6</sup> World Intellectual Property Organization, the international organization that deals with all geographical patent extensions.

<sup>7</sup> Information on the icb can be found in <http://www.icbenchmark.com/>

### *Matching the firm database with the patent databases*

The 316 676 firm names were matched with all the applicants standardized names (doc\_std\_name) of priority patent applications in the Patstat database. Basically matching the firm database and the patent database was carried out in two ways: matching both name (exact spelling and proxy) and firm country of our firm list with Patstat applicant standard name and applicant country when this latter information was present in the Patstat database and only exact firm spelling of our firm list when the applicant country information missed. Manual checking was carried out to discard false retrieved patent.



Schematic view of the CIB database building

### *Identification of "natural persons" among applicants*

We ended with 9 586 238 distinct applicants (distinct key\_applt) and 19 067 701 inventors (distinct key\_inv).

Identification of natural persons (opposed to legal persons) among applicants in the CIB database was carried out by matching the name of the applicants (both person\_name and doc\_std\_name) with a list of natural persons.

If the applicant of the CIB belongs to this list, the field “applt\_type\_person\_name” and/or “applt\_type\_doc\_std\_name” will be filled with “natural\_person”. If the applicant doesn’t belong to that list, the fields “applt\_type\_person\_name” and/or “applt\_type\_doc\_std\_name” are left empty<sup>8</sup>.

This list where the type of applicant was defined contains the spellings of natural persons from the two fields: person\_name and doc\_std\_name and has been built by combining: i) a list of inventors that also applied for the patent. These natural applicants are easily retrieved within each patent since their person\_name and doc\_std\_name are included both in the applicant field and in the inventor field, ii) a list of applicants that were not inventor but whose name was identified as a possible candidate for natural person (including graphies such as Roger, John ...) and who applied to less than 100 patents (that latter condition reduces dramatically the presence of legal persons), iii) a list for natural name defined in the project “Nano 2009”. It includes names / surnames identified by Magerman, names / surnames automatically identified in the nano database and a list of names identified manually.

3 406 658 applicants (key\_applt) are tagged as ‘Natural person’ either in the field “applt\_type\_person\_name” or in the field “applt\_type\_doc\_std\_name”.

## 2.3 Information on all variables/indicators

- Description of all variables and/or indicators that are given for the main units of observation (e.g. number of publications, number of patents, etc.)

For each firm (aggregation of the guo and its subsidiaries), the database gives:

- Name of the firm using various spellings (guo\_name, guo\_name\_std, guo\_name\_patstatstd in Table orb\_guo\_corr),
- Acronym of the firm (guo\_acronym in Table orb\_guo\_corr),
- Database id of the firm (guo\_id in Table orb\_guo\_corr and Table firm\_tls0018rappln\_id and Table firm\_tls0018rappln\_id\_group),
- IndexScoreBoard of the firm (IndexScoreBoard in Table orb\_guo\_corr). This is the firm’s id in the Industrial R&D investment Scoreboard,
- Industry Classification of the firm (ICB in Table orb\_guo\_corr). It give the sector of the firm according to ICB categories (see below),
- Country where the firm’s headquarters is located (guo\_etry in Table orb\_guo\_corr),

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<sup>8</sup> In that case, we cannot undoubtedly assess the status of the applicant since our list of natural persons is not exhaustive but it is reasonable to expect a high rate of legal persons.

- Country code where the firm's headquarters is located (guo\_etrycode in Table orb\_guo\_corr) following the international two letter country code (ISO alpha-2),
- Standard Industrial Classification (SIC) codes of the firms (guo\_sic\_core\_code and guo\_sic\_core in Table orb\_guo\_corr). It is the business classification codes that the U.S. government assigns to businesses. SIC coding is used primarily to classify a company's main industry and line of business<sup>9</sup>.

The CIB database lists of firm's priority patents and gives information related to these patents according to the information available in Patstat or added classification (inventors address, applicants address, date of applications, type of patent, patent office, title, abstract, patent family, technology field classification). (see Patstat report for detailed information on patent data)

## 2.4 Sectorial, temporal and geographical coverage

The numbers of patents given in tables shown below are calculated considering the number of priority patent applications (appln\_id) given in table t1s 201 (unless other specifications) crossed with information from other tables (table orb\_guo\_corr for firm's sectors and country and table ipc\_technology\_frac\_ifris for patent technology field).

Information on the sectorial classifications used (e.g., economic sectors, technological fields, organizations types, etc.), and listing of all categories for each classification scheme

### 1) **Sector of firms**

Firms in the CIB database are classified according to industrial sectors using the Industry Classification Benchmark (ICB)<sup>10</sup>. It is an industry classification taxonomy launched by Dow Jones and FTSE in 2005 and now owned solely by FTSE International. It is used to segregate markets into sectors within the macroeconomy. The ICB uses a system of 10 industries, partitioned into 19 supersectors, which are further divided into 41 sectors, which then contain 114 subsectors<sup>11</sup>

The distribution of firms in CIB at the levels of Industry and Sectors of the ICB categories are given below.

Industry	Nber of firms	Nber of first filings
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<sup>9</sup> [http://www.ehow.com/facts\\_7277558\\_primary-sic-code\\_.html#ixzz33qksBG58](http://www.ehow.com/facts_7277558_primary-sic-code_.html#ixzz33qksBG58)

<sup>10</sup> Firms are classified just in one sector

<sup>11</sup> <http://www.icbenchmark.com/>



Basic Materials	241	992 950
Consumer Goods	330	2 123 837
Consumer Services	81	105 594
Financials	58	19 392
Health Care	354	284 444
Industrials	596	2 172 644
Oil & Gas	52	84 868
Technology	532	2 261 313
Telecommunications	27	124 757
Utilities	48	56 755
<b>Total</b>	<b>2319</b>	<b>8 226 554</b>

Number of priority patents (1986-2009) and number of firms by industries

Sector	Nber of firms	Nber of first filings
Oil & gas producers	34	63 822
Oil equipment, services & distribution	17	21 013
Alternative energy	1	33
Chemicals	162	706 265
Forestry & paper	17	12 321
Industrial metals	44	261 327
Mining	18	13 037
Construction & materials	67	133 850
Aerospace & defence	49	82 109
General industrials	51	288 751
Electrical components & equipment	76	522 980
Electronic equipment	103	846 562
Commercial vehicles & trucks	40	76 069
Industrial machinery	154	188 240
Industrial transportation	15	937
Support services	41	33 146
Automobiles & parts	111	891 510
Beverages	10	9 821
Food producers	70	35 863
Household goods	50	87
Household goods	50	114 891
Leisure goods	31	1 003 468
Personal goods	58	68 197
Health care equipment & services	67	66 933
Pharmaceuticals & Biotechnology	5	411
Biotechnology	122	30 107
Pharmaceuticals	160	186 993
Food & drug retailers	9	4 009
General retailers	23	6 816
Media	22	73 357
Travel & leisure	27	21 412
Fixed line telecommunications	21	106 689
Mobile telecommunications	6	18 068

Electricity	32	31 450
Gas, water & multiutilities	16	25 305
Banks	23	15 728
Nonlife insurance	8	406
Life insurance	2	91
Financial Services	25	3 167
Software & Computer Services	1	10
Computer services	37	281 239
Internet	11	6 031
Software	150	51 986
Computer hardware	61	1 079 886
Electronic office equipment	15	267 106
Semiconductors	129	343 175
Telecommunications equipment	128	231 880

Number of priority patents (1986-2009) and number of firms by subsectors

## 2) **Technology fields of patents**

Patents are classified according to technology categories. The categories used in CIB are those build by WIPO (see PATSTAT-IFRIS report for detailed information): 5 domains, 35 fields and 401 subfields.

The distributions of priority patent applications from 1986 to 2005 by domains and fields and subfields are shown below.

Domain_code	Domain_name	Number of priority patent applications
TD01	Electrical engineering	3 886 482
TD02	Instruments	1 776 426
TD03	Chemistry	1 539 908
TD04	Mechanical engineering	2 262 804
TD05	Other fields	486 957

Note: a patent can be affected to several domains

Field_code	Field_name	Number of priority patent applications
TF01	Electrical machinery, apparatus, energy	802 990
TF02	Audio-visual technology	939 461
TF03	Telecommunications	648 241
TF04	Digital communication	334 167
TF05	Basic communication processes	203 618

TF06	Computer technology	986 537
TF07	IT methods for management	107 787
TF08	Semiconductors	755 505
TF09	Optics	848 169
TF10	Measurement	535 894
TF11	Analysis of biological materials	48 570
TF12	Control	269 146
TF13	Medical technology	210 372
TF14	Organic fine chemistry	190 462
TF15	Biotechnology	69 484
TF16	Pharmaceuticals	146 889
TF17	Macromolecular chemistry, polymers	272 165
TF18	Food chemistry	40 158
TF19	Basic materials chemistry	261 976
TF20	Materials, metallurgy	278 481
TF21	Surface technology, coating	284 335
TF22	Micro-structural and nano-technology	11 933
TF23	Chemical engineering	228 246
TF24	Environmental technology	155 609
TF25	Handling	283 912
TF26	Machine tools	259 927
TF27	Engines, pumps, turbines	342 854
TF28	Textile and paper machines	363 841
TF29	Other special machines	284 163
TF30	Thermal processes and apparatus	217 356
TF31	Mechanical elements	306 859
TF32	Transport	485 389
TF33	Furniture, games	140 409
TF34	Other consumer goods	157 230
TF35	Civil engineering	205 918

Note: a patent can be attributed to several fields

sfields	Number of priority patent applications	Number of priority patent applications
T01F01	Lighting	40 734
T01F02	Displaying Advertising	59 548
T01F03	Transmission Systems	10 731
T01F04	Transmission Of Digital Inf	281 875
T01F05	Basic Electronic Circuitry	203 618
T01F06	Mechanic Digital Comput	885 330
T01F07	Data Processing Systems	107 787
T01F08	Semiconductor Devices	755 505
T01F09	Optical Elements Systems	395 060
T01F10	Measuring Length Thickness	64 831
T01F11	Mat Analysis by Chem/Phys Prop	48 570

T01F12	Control Systems in General	61 650
T01F13	Surgery-Diagnosis	110 538
T01F14	Cosmetic Preparations	40 519
T01F15	Compounds Of Unknown Constitution	270
T01F16	Medical Preparations	143 179
T01F17	Polysaccharides	4 168
T01F18	New Plants	6 485
T01F19	Disinfectants	29 675
T01F20	Casting and Powder Metallurgy	55 180
T01F21	Apparatus For Applying Liquids	22 684
T01F22	Micro-Structural Technology	9 169
T01F23	Boiling	255
T01F24	Fire-Fighting	3 445
T01F25	Manipulators	23 889
T01F26	Mechanical Metal-Working	2 745
T01F27	Machines Or Engines for + Displacement	1 185
T01F28	Methofs for Clothes	451
T01F29	Soil Working	7 450
T01F30	Steam generation	7 750
T01F31	Fluid Pressure Actuator	14 861
T01F32	Vehicles	372 661
T01F33	Furniture and Dom Equipt	85 047
T01F34	Tobacco	3 424
T01F35	Permanent ways	2 279
T02F01	Cables with Special Electric Properties	54 827
T02F02	Arrangements For Control	99 934
T02F03	Waveguides	19 299
T02F04	Selective Content Distrib	120
T02F06	Speech Anal. Or Synth.	35 720
T02F09	Photograph Apparatus	111 654
T02F10	Measuring Distances Levels	48 638
T02F12	Regulating Non Electric Variables	32 757
T02F13	Dentistry	4 681
T02F14	Use of Cosmetics	38 409
T02F15	Peptides	17 524
T02F16	Therap Activ Of Chem Comp	82 013
T02F17	Treatment Of Rubbers	1 845
T02F18	Treatment of Dough	2 865
T02F19	Repellants	3 259
T02F20	Inorganic Chem	59 297
T02F21	Liquid Application Processes	36 754
T02F22	Nano-Technology	2 902
T02F23	Separation	5 461
T02F24	Protection against Fire and Chemicals	1 510
T02F25	Packaging Machines	14 626

T02F26	Machine Tools	72 176
T02F27	Piston Machines Or Engines	2 592
T02F28	Repairing Footwear	290
T02F29	Planting	8 499
T02F30	Combustion Apparatus Using Solid Fuel	178
T02F31	Engineering Elts or Units	283 415
T02F32	Railways	16 528
T02F33	Sports and Games	55 541
T02F34	Shirts	917
T02F35	Hydraulic Eng Found Soil-Shifting	4 991
T03F01	Resistors	14 096
T03F02	Info Storage Based Record Carrier	299 320
T03F03	Aerials	34 683
T03F04	Wireless Comm	72 290
T03F06	Static Stores	88 584
T03F09	Photographic Processes	29 775
T03F10	Multivariable Measuring	28 747
T03F12	Regulating Electric Variables	18 435
T03F13	Veterinary	417
T03F14	Organic Chemistry	27 063
T03F15	Apparatus For Enzymology Or Microbiology	9 697
T03F17	Macromol with C-to-C Unsaturated Bonds	78 361
T03F18	Preseving food	3 064
T03F19	Fertilisers	2 836
T03F20	Glasses	24 080
T03F21	Layered Products	93 994
T03F23	Evaporating and extraction and separetion and degaseification	9 492
T03F24	Separating Gases	10 214
T03F25	Labelling Machines	1 953
T03F26	Grinding and Polishing	131 924
T03F27	Machines Or Engines for - Displacement	20 196
T03F28	Production of Brushes	627
T03F29	Harvesting	11 475
T03F30	Combustion Apparatus Using Fluent Fuel	6 088
T03F31	Stroring Distributing Non Solids	9 018
T03F32	Land Vehicles	95 027
T03F34	Corsets	189
T03F35	Other Subjects Building	3 717
T04F01	Magnets	56 955
T04F02	Scanning details of television	7 207
T04F03	Transmission	206 484
T04F09	Apparatus For Processing Exposed Photographic Materials	7 047
T04F10	Measuring Volume Flow	22 675

T04F12	Checking Devices	68 144
T04F13	Blood Vessel Filters	32 762
T04F14	Acyclic or Carbocyclic Comp	77 852
T04F15	Micro-Orga Enzymes Culture Media	39 677
T04F17	Macromol withouth C-to-C Unsaturated Bonds	89 545
T04F18	Dairy Products	2 825
T04F19	Explosives	2 008
T04F20	Refractories	63 969
T04F21	Coating Metallic Material	114 824
T04F23	Separation and Filters	8 863
T04F24	Filtering Gases	941
T04F25	Containers for Storage	66 042
T04F26	Tools Or Benches	33 179
T04F27	Steam Engine Plants	5 155
T04F28	Working Paper	4 227
T04F29	Harvested Produce	5 957
T04F30	Burners	9 232
T04F31	Mechanical Control Systems	5 428
T04F32	Ships	7 886
T04F34	Outerwear	3 457
T04F35	Surfaces for roads and sport grounds	99
T05F01	Capacitors	30 461
T05F02	Details of TV syst	229 134
T05F03	Broadcas Communication	14 323
T05F09	Photomechanics of Surfaces	95 252
T05F10	Weighing	5 408
T05F12	Signalling Systems	34 351
T05F13	Furniture for Patients	5 439
T05F14	Heterocyclic Compounds	62 084
T05F15	Fermentation Or Enzyme-Using Processes	17 629
T05F17	Derivatives Of Natural Macromolecules	380
T05F18	Edible Oils	2 004
T05F19	Organic Dyes	15 231
T05F20	Metallurgy of Iron	50 693
T05F21	Electrolytic Or Electrophoretic Processes	28 204
T05F23	Distillation	13 339
T05F24	Separating by Liquids	78
T05F25	Transport of Storage Devices	49 297
T05F26	Nailing Or Stapling Tools	7 188
T05F27	Cyclic Machines Or Engines	19 830
T05F28	Printing	279 800
T05F29	Horticulture	8 595
T05F30	Grates	181
T05F32	Launching of Vessels	1 265

T05F34	Suspenders	150
T05F35	Bridges	13
T06F01	Electric Switches	51 838
T06F02	Pictorial Communication	119 332
T06F03	Multiplex Communication	52 971
T06F09	Photomecha Prod Of Surfaces	229 862
T06F10	Measuring Vibrations	6 055
T06F12	Traffic Control Systems	45 981
T06F13	Therapy Apparatus	7 731
T06F14	Compounds with Elts Other Than C H Halogen O N S Se or Te	17 920
T06F15	Measur Proc with Enzymes Or Micro-Orga	21 297
T06F17	Inorg Or Non-Macromol Organ Subst	81 205
T06F18	Coffee and Tea	1 807
T06F19	Dyeing Of Inorganics	6 586
T06F20	Metallurgy	75 361
T06F21	Crystal Growth	22 523
T06F23	Regeneration of Filters	177
T06F24	Other Separating	853
T06F25	Handling Thin Material	87 809
T06F26	Percussive Tools	1 540
T06F27	Lubricating Of Machines Or Engines	11 179
T06F28	Mechanical Processing Of Skins Hides Or Leather	81
T06F29	Prod of Dairy Products	488
T06F30	Feeding Fuel To Combustion Apparatus	2 837
T06F32	Weapons on Vessels	819
T06F34	Wigs	265
T06F35	Platforms or refuge islands	16
T07F01	Discharge Lamps	91 869
T07F02	Details of colour television systems	38 591
T07F03	Secret Communication	3 962
T07F09	Holography	5 961
T07F10	Optical Measurements	23 449
T07F12	Educational Or Demonstration Appliances	25 281
T07F13	Medical Containers	5 506
T07F14	Sugars Nucleotides	8 489
T07F15	Micro-Organisms-General	8 559
T07F17	Compositions Of Macromol Comp	145 300
T07F18	Chocolate	4 081
T07F19	Paints and inks	69 514
T07F23	Separating Liquids and Solids	119
T07F24	Separating Combination	492
T07F25	Lifting	48 496
T07F26	Multi-Purpose Tools	2 021

T07F27	Cooling Of Machines Or Engines	12 782
T07F28	Threads or Fibers	24 797
T07F29	Husbandry	9 031
T07F30	Air Supply	3 114
T07F32	Marine Propulsion	6 012
T07F34	Headwear	922
T07F35	Landing for helicopters	209
T08F01	Electric Incandescent Lamps	2 363
T08F02	Stereoscopic television systems	5 766
T08F03	Wireless Communication	151 347
T08F09	Devices Using Stimulated Emission	57 979
T08F10	Measuring Temperature	11 405
T08F12	Ciphering Apparatus	8 878
T08F13	Methods For Sterilising	25 587
T08F14	Steroids	962
T08F15	Use Enzymes Or Micro-Organisms To treat solid materials	643
T08F18	Proteins for Food	1 378
T08F19	Natural Resins	143
T08F23	Other Separation	443
T08F25	Opening Bottles	7 155
T08F26	Handles For Hand Implements	2 953
T08F27	Comb Engines In Gen	191 114
T08F28	Crimping of Threads or Fibers	7 715
T08F29	Shoeing Of Animals	14
T08F30	Combustion Chambers	1 223
T08F32	Auxiliaries on Vessel	478
T08F34	Footwear	2 672
T08F35	Draining of roads	1 166
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T09F23	Separation of isotopes	936
T09F24	Treatment of gases	41 174
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T10F13	Electrotherapy	15 194
T10F18	Other Foods	21 450
T10F19	Glue Or Gelatine	59
T10F23	Semi-permeable membranes	14 467
T10F24	Separation of gases	16 857
T10F26	Other Hand-Held Cutting Tools	1 274
T10F27	Mach For Liquids Pumps Piston	69 850
T10F28	Knitting	2 269
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T11F28	Braiding	356
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T15F29	Preparing Grain and Fruit	1 862
T15F30	Heat Exchange	32 060
T15F34	Bookbinding	23 564
T15F35	Locking Safing	11 147
T16F01	Other subjects electricity	1
T16F10	Meteorology	14 702

T16F18	Sugar Juices	50
T16F19	Cracking Hydrocarbon Oils	12 909
T16F23	Crushing and Milling	7 397
T16F24	Furnaces	5 059
T16F28	Marking Inspecting Seaming Or Severing Textile	692
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T21F19	Lubrifiant	14 188
T21F23	Separating Solids and Sorting	18 173
T21F28	Paper Making	23 420
T21F29	Pitching Machines	1
T21F34	Wall Floor Covering	2 937
T22F19	Lubrifiant indexed	9 426
T22F23	Cleaning	722

T22F29	Sugar Production	2
T22F34	Rope non electric cable	2 276
T23F18	Sugar Juices	1
T23F19	Fats	2 376
T23F23	Chemical Processing Of Skins Hides Or Leather	1 086
T23F29	Evaporation Apparatus	5
T23F34	Cooling Or Freezing Apparatus	33 763
T24F18	Sugar	2
T24F19	Fatty Acids	1 031
T24F23	Treating Textile	1 237
T24F29	Cutting of Sugar	42
T24F34	Organs Harmoniums	805
T25F19	Detergent Compositions	27 547
T25F23	Finishing Dressing Tenting Or Stretching Textile	2 026
T25F29	Weapons	1
T25F34	Pianos	672
T26F18	Sugar Synth	253
T26F23	Bleaching	3 411
T26F34	Musical Instruments	569
T27F23	Phase transformation Of Gases	8 524
T27F34	Automatic Musical Instruments	566
T28F23	Drying	12 543
T28F34	Aids For Music	1 632
T29F29	Weapons	6 123
T29F34	Electroponic Musical Instruments	13 364
T30F29	Ammunitions Blasting	5 982
T30F34	Sound-Producing Devices	16 937
sfields	Number of priority patent applications	count(distinct b.appln_id)
T01F01	Lighting	40 734
T01F02	Displaying Advertising	59 548
T01F03	Transmission Systems	10 731
T01F04	Transmission Of Digital Inf	281 875
T01F05	Basic Electronic Circuitry	203 618
T01F06	Mechanic Digital Comput	885 330
T01F07	Data Processing Systems	107 787
T01F08	Semiconductor Devices	755 505
T01F09	Optical Elements Systems	395 060
T01F10	Measuring Length Thickness	64 831
T01F11	Mat Analysis by Chem/Phys Prop	48 570
T01F12	Control Systems in General	61 650
T01F13	Surgery-Diagnosis	110 538
T01F14	Cosmetic Preparations	40 519

T01F15	Compounds Of Unknown Constitution	270
T01F16	Medical Preparations	143 179
T01F17	Polysaccharides	4 168
T01F18	New Plants	6 485
T01F19	Disinfectants	29 675
T01F20	Casting and Powder Metallurgy	55 180
T01F21	Apparatus For Applying Liquids	22 684
T01F22	Micro-Structural Technology	9 169
T01F23	Boiling	255
T01F24	Fire-Fighting	3 445
T01F25	Manipulators	23 889
T01F26	Mechanical Metal-Working	2 745
T01F27	Machines Or Engines for + Displacement	1 185
T01F28	Methofs for Clothes	451
T01F29	Soil Working	7 450
T01F30	Steam generation	7 750
T01F31	Fluid Pressure Actuator	14 861
T01F32	Vehicles	372 661
T01F33	Furniture and Dom Equipt	85 047
T01F34	Tobacco	3 424
T01F35	Permanent ways	2 279
T02F01	Cables with Special Electric Properties	54 827
T02F02	Arrangements For Control	99 934
T02F03	Waveguides	19 299
T02F04	Selective Content Distrib	120
T02F06	Speech Anal. Or Synth.	35 720
T02F09	Photograph Apparatus	111 654
T02F10	Measuring Distances Levels	48 638
T02F12	Regulating Non Electric Variables	32 757
T02F13	Dentistry	4 681
T02F14	Use of Cosmetics	38 409
T02F15	Peptides	17 524
T02F16	Therap Activ Of Chem Comp	82 013
T02F17	Treatment Of Rubbers	1 845
T02F18	Treatment of Dough	2 865
T02F19	Repellants	3 259
T02F20	Inorganic Chem	59 297
T02F21	Liquid Application Processes	36 754
T02F22	Nano-Technology	2 902
T02F23	Separation	5 461
T02F24	Protection against Fire and Chemicals	1 510
T02F25	Packaging Machines	14 626
T02F26	Machine Tools	72 176
T02F27	Piston Machines Or Engines	2 592

T02F28	Repairing Footwear	290
T02F29	Planting	8 499
T02F30	Combustion Apparatus Using Solid Fuel	178
T02F31	Engineering Elts or Units	283 415
T02F32	Railways	16 528
T02F33	Sports and Games	55 541
T02F34	Shirts	917
T02F35	Hydraulic Eng Found Soil-Shifting	4 991
T03F01	Resistors	14 096
T03F02	Info Storage Based Record Carrier	299 320
T03F03	Aerials	34 683
T03F04	Wireless Comm	72 290
T03F06	Static Stores	88 584
T03F09	Photographic Processes	29 775
T03F10	Multivariable Measuring	28 747
T03F12	Regulating Electric Variables	18 435
T03F13	Veterinary	417
T03F14	Organic Chemistry	27 063
T03F15	Apparatus For Enzymology Or Microbiology	9 697
T03F17	Macromol with C-to-C Unsaturated Bonds	78 361
T03F18	Preseving food	3 064
T03F19	Fertilisers	2 836
T03F20	Glasses	24 080
T03F21	Layered Products	93 994
T03F23	Evaporating and extraction and separetion and degaseification	9 492
T03F24	Separating Gases	10 214
T03F25	Labelling Machines	1 953
T03F26	Grinding and Polishing	131 924
T03F27	Machines Or Engines for - Displacement	20 196
T03F28	Production of Brushes	627
T03F29	Harvesting	11 475
T03F30	Combustion Apparatus Using Fluent Fuel	6 088
T03F31	Stroring Distributing Non Solids	9 018
T03F32	Land Vehicles	95 027
T03F34	Corsets	189
T03F35	Other Subjects Building	3 717
T04F01	Magnets	56 955
T04F02	Scanning details of television	7 207
T04F03	Transmission	206 484
T04F09	Apparatus For Processing Exposed Photographic Materials	7 047
T04F10	Measuring Volume Flow	22 675
T04F12	Checking Devices	68 144

T04F13	Blood Vessel Filters	32 762
T04F14	Acyclic or Carbocyclic Comp	77 852
T04F15	Micro-Orga Enzymes Culture Media	39 677
T04F17	Macromol withouth C-to-C Unsaturated Bonds	89 545
T04F18	Dairy Products	2 825
T04F19	Explosives	2 008
T04F20	Refractories	63 969
T04F21	Coating Metallic Material	114 824
T04F23	Separation and Filters	8 863
T04F24	Filtering Gases	941
T04F25	Containers for Storage	66 042
T04F26	Tools Or Benches	33 179
T04F27	Steam Engine Plants	5 155
T04F28	Working Paper	4 227
T04F29	Harvested Produce	5 957
T04F30	Burners	9 232
T04F31	Mechanical Control Systems	5 428
T04F32	Ships	7 886
T04F34	Outerwear	3 457
T04F35	Surfaces for roads and sport grounds	99
T05F01	Capacitors	30 461
T05F02	Details of TV syst	229 134
T05F03	Broadcas Communication	14 323
T05F09	Photomechanics of Surfaces	95 252
T05F10	Weighing	5 408
T05F12	Signalling Systems	34 351
T05F13	Furniture for Patients	5 439
T05F14	Heterocyclic Compounds	62 084
T05F15	Fermentation Or Enzyme-Using Processes	17 629
T05F17	Derivatives Of Natural Macromolecules	380
T05F18	Edible Oils	2 004
T05F19	Organic Dyes	15 231
T05F20	Metallurgy of Iron	50 693
T05F21	Electrolytic Or Electrophoretic Processes	28 204
T05F23	Distillation	13 339
T05F24	Separating by Liquids	78
T05F25	Transport of Storage Devices	49 297
T05F26	Nailing Or Stapling Tools	7 188
T05F27	Cyclic Machines Or Engines	19 830
T05F28	Printing	279 800
T05F29	Horticulture	8 595
T05F30	Grates	181
T05F32	Launching of Vessels	1 265

T05F34	Suspenders	150
T05F35	Bridges	13
T06F01	Electric Switches	51 838
T06F02	Pictorial Communication	119 332
T06F03	Multiplex Communication	52 971
T06F09	Photomecha Prod Of Surfaces	229 862
T06F10	Measuring Vibrations	6 055
T06F12	Traffic Control Systems	45 981
T06F13	Therapy Apparatus	7 731
T06F14	Compounds with Elts Other Than C H Halogen O N S Se or Te	17 920
T06F15	Measur Proc with Enzymes Or Micro-Orga	21 297
T06F17	Inorg Or Non-Macromol Organ Subst	81 205
T06F18	Coffee and Tea	1 807
T06F19	Dyeing Of Inorganics	6 586
T06F20	Metallurgy	75 361
T06F21	Crystal Growth	22 523
T06F23	Regeneration of Filters	177
T06F24	Other Separating	853
T06F25	Handling Thin Material	87 809
T06F26	Percussive Tools	1 540
T06F27	Lubricating Of Machines Or Engines	11 179
T06F28	Mechanical Processing Of Skins Hides Or Leather	81
T06F29	Prod of Dairy Products	488
T06F30	Feeding Fuel To Combustion Apparatus	2 837
T06F32	Weapons on Vessels	819
T06F34	Wigs	265
T06F35	Platforms or refuge islands	16
T07F01	Discharge Lamps	91 869
T07F02	Details of colour television systems	38 591
T07F03	Secret Communication	3 962
T07F09	Holography	5 961
T07F10	Optical Measurements	23 449
T07F12	Educational Or Demonstration Appliances	25 281
T07F13	Medical Containers	5 506
T07F14	Sugars Nucleotides	8 489
T07F15	Micro-Organisms-General	8 559
T07F17	Compositions Of Macromol Comp	145 300
T07F18	Chocolate	4 081
T07F19	Paints and inks	69 514
T07F23	Separating Liquids and Solids	119
T07F24	Separating Combination	492
T07F25	Lifting	48 496



T07F26	Multi-Purpose Tools	2 021
T07F27	Cooling Of Machines Or Engines	12 782
T07F28	Threads or Fibers	24 797
T07F29	Husbandry	9 031
T07F30	Air Supply	3 114
T07F32	Marine Propulsion	6 012
T07F34	Headwear	922
T07F35	Landing for helicopters	209
T08F01	Electric Incandescent Lamps	2 363
T08F02	Stereoscopic television systems	5 766
T08F03	Wireless Communication	151 347
T08F09	Devices Using Stimulated Emission	57 979
T08F10	Measuring Temperature	11 405
T08F12	Ciphering Apparatus	8 878
T08F13	Methods For Sterilising	25 587
T08F14	Steroids	962
T08F15	Use Enzymes Or Micro-Organisms To treat solid materials	643
T08F18	Proteins for Food	1 378
T08F19	Natural Resins	143
T08F23	Other Separation	443
T08F25	Opening Bottles	7 155
T08F26	Handles For Hand Implements	2 953
T08F27	Comb Engines In Gen	191 114
T08F28	Crimping of Threads or Fibers	7 715
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T22F34	Rope non electric cable	2 276
T23F18	Sugar Juices	1
T23F19	Fats	2 376
T23F23	Chemical Processing Of Skins Hides Or Leather	1 086
T23F29	Evaporation Apparatus	5
T23F34	Cooling Or Freezing Apparatus	33 763
T24F18	Sugar	2
T24F19	Fatty Acids	1 031
T24F23	Treating Textile	1 237
T24F29	Cutting of Sugar	42
T24F34	Organs Harmoniums	805
T25F19	Detergent Compositions	27 547
T25F23	Finishing Dressing Tentering Or Stretching Textile	2 026
T25F29	Weapons	1
T25F34	Pianos	672
T26F18	Sugar Synth	253
T26F23	Bleaching	3 411
T26F34	Musical Instruments	569
T27F23	Phase transformation Of Gases	8 524
T27F34	Automatic Musical Instruments	566
T28F23	Drying	12 543
T28F34	Aids For Music	1 632
T29F29	Weapons	6 123
T29F34	Electroponic Musical Instruments	13 364
T30F29	Ammunitions Blasting	5 982
T30F34	Sound-Producing Devices	16 937

Note: a patent can be affected to several subfields

- Information on the temporal coverage used (e.g. annual data from 1990-2010, etc.)

The CIB database covers a period of time ranging from 1986 to 2009

The distribution of priority patent applications from 1986 to 2009 by application filling year is shown below.

Application filling_year	Number of priority patent applications
1986	246 570
1987	264 902
1988	263 912
1989	270 380
1990	285 572
1991	294 736
1992	281 169
1993	296 662
1994	282 952
1995	309 709
1996	313 578
1997	335 507
1998	350 054
1999	363 908
2000	383 527
2001	392 436
2002	391 698
2003	401 079
2004	421 582
2005	432 577
2006	421 750
2007	414 839
2008	404 406
2009	285 677
<b>Total</b>	<b>8 109 182</b>

- Information on the geographical coverage and classifications used  
The information is detailed in the Patstat report

ISO 3166 a standard developed for the current names of countries, dependencies, and other areas of particular geopolitical interest, on the basis of lists of country names obtained from the United Nations and maintained by the ISO 3166 Maintenance Agency established by the ISO Council, the International Organization for Standardization (ISO). The international two letter country code (ISO alpha-2) is used as Harmonized country code.

The distributions of firms and priority patent applications from 1986 to 2009 by firm's country and firm's continent are shown below.

Harmonized country name	Harmonized country code	Number of firms	Number of priority patents
NETHERLANDS ANTILLES	AN	1	6 755

AUSTRIA	AT	25	5 511
AUSTRALIA	AU	9	3 042
BELGIUM	BE	39	14 161
BERMUDA	BM	11	20 383
BRAZIL	BR	9	1 618
BAHAMAS, THE	BS	1	32
CANADA	CA	25	18 916
SWITZERLAND	CH	41	73 733
CHINA	CN	80	60 965
CZECH REPUBLIC	CZ	2	18
GERMANY	DE	182	397 198
DENMARK	DK	43	15 783
SPAIN	ES	21	2 259
FINLAND	FI	59	34 277
FRANCE	FR	109	152 648
UNITED KINGDOM	GB	260	89 416
GIBRALTAR	GI	3	74
GREECE	GR	6	178
HONG KONG	HK	6	3 970
HUNGARY	HU	2	743
IRELAND	IE	11	2 167
ISRAEL	IL	10	2 714
INDIA	IN	326	7 220
ITALY	IT	51	17 311
JAPAN	JP	245	5 418 369
SOUTH KOREA	KR	18	492 731
CAYMAN ISLANDS	KY	5	6 433
LIECHTENSTEIN	LI	1	2 033
LUXEMBOURG	LU	5	1 119
MALTA	MT	1	31
MALAYSIA	MY	1	0
NETHERLANDS	NL	49	98 262
NORWAY	NO	8	2 895
NEW ZEALAND	NZ	2	598
PANAMA	PA	1	1 090
POLAND	PL	3	204
PORTUGAL	PT	4	3
RUSSIA	RU	3	237
SWEDEN	SE	77	51 140
SINGAPORE	SG	5	999
SLOVENIA	SI	2	30
TURKEY	TR	2	41
TAIWAN	TW	41	75 198
UNITED STATES	US	513	1 053 152
SOUTH AFRICA	ZA	1	329

Patents are counted at the firm level. For patents co-applied by several firms, double counting is applied. A patent shared by firm A and firm B counts as one patent for firm A and one patent for firm B. As a consequence the total is higher than the total number of patents applied for in the CIB database.

Continent	Number of firms	Number of priority patents
Africa	1	329
Asia	734	6 062 207
Europe	1024	995 002
Latin America and the Caribbean	11	2 740
Northern America	538	1 072 068
Oceania	11	3 640
Total	2319	8 135 986

The distribution of priority patent applications from 1986 to 2009 by national or regional patent office is shown below.

Country of the patent office (appln_auth)	Number of priority applications	Country of the patent office (appln_auth)	Number of priority applications	Country of the patent office (appln_auth)	Number of priority applications
JP	5 319 006	LU	683	CR	22
US	1 252 880	TR	589	TH	20
KR	488 898	DO	433	BX	18
DE	383 434	ID	419	TJ	14
EP	130 561	YU	355	GT	13
GB	117 300	HK	340	BA	10
CN	112 929	XH	336	MD	9
FR	102 821	PT	291	EE	7
TW	31 725	MY	268	MW	7
SE	23 992	CS	246	VE	7
IT	15 885	HR	230	MC	6
FI	15 452	EG	220	MT	6
AU	14 204	GR	193	PK	6
IN	11 592	CU	188	NI	5
CH	11 566	RO	183	VN	5
CA	8 515	SU	182	BD	4
NL	8 121	PH	156	SM	4
DK	7 314	MA	128	BH	2
AT	4 184	IS	105	BY	2



IE	4 074	PE	90	KP	2
BR	4 058	CL	77	KZ	2
NO	3 282	SI	72	MK	2
ES	3 278	SK	71	OM	2
CZ	3 112	BG	69	SY	2
IB	2 964	LV	53	TN	2
ZA	2 911	SV	47	AE	1
SG	2 794	AP	45	AM	1
EM	2 222	OA	44	AZ	1
HU	1 928	PA	42	CY	1
BE	1 615	LT	40	IR	1
IL	1 503	DZ	38	JO	1
RU	1 418	EC	38	LB	1
NZ	1 381	UA	31	LK	1
AR	1 028	GC	29	NG	1
MX	1 019	ZW	29	PY	1
PL	974	EA	26	SB	1
DD	970	RS	26		
CO	870	HN	23		
UY	754	ZM	23		

## 2.5 Quality and accuracy of data

- Information on the number of missing values (no ipc, no inventors, no date, no addresses, no countries)

The Patstat database includes artificial priority patents for which no information is available to the exception of the filing patent office and date of filing. When possible, filling of missing information of artificial patents was carried out (retrieved from other patents belonging to the same patent family) in the PATSTAT-IFRIS (see PATSTAT-IFRIS Report for further details). When missing applicants were filled, it allows to also consider artificial patents when matching the patents DB and the firm name list.

In CIB, 11,4% of the patents are artificial patents that were enriched prior to DB matching.

Patent origin	Number of first filing
Non artificial	7 187 452
Artificial	921 730
Total	8 109 182

## 1) Dates of patent applications

All the patent applications are given an application filling date and an application-filing year.

## 2) Missing information on patent inventors or patent applicants

As detailed in the PATSTAT-IFRIS section, patent often displays missing information on inventors and/or applicants. Despite several step to recover information from other databases (Regpat and Inpi databases), patents lacking inventor or applicant information are still present in the CIB database.

Different case of missing information exists:

- The database gives no information on any inventor (or applicant) of a patent. In that case, the patent application is present (with its appln\_id) in table firm\_tls201\_appln\_ifris but absent of the table invt\_addr\_ifris that includes only patent with at least a few information on inventors (or table applt\_addr\_ifris only patent with at least a few information on applicants).
- The number of priority patents (appln\_id in firm\_tls201\_appln\_ifris) without any information on inventors is 110 771 (appln\_id not in table invt\_addr\_ifris). The number of priority patents (appln\_id in firm\_tls201\_appln\_ifris) without any information on applicants is 11 971 (appln\_id not in table applt\_addr\_ifris)<sup>12</sup>. The number of priority patents (appln\_id in firm\_tls201\_appln\_ifris) without any information on applicants nor on inventors is 28 (appln\_id not in table applt\_addr\_ifris nor in table invt\_addr\_ifris). The number of priority patents applied for an entity belonging to a large firm (appln\_id in Table firm\_tls001\_rappln\_id) without any information on inventors is 110 739 (appln\_id not in table invt\_addr\_ifris).
- The database gives information on inventor (or applicant) of a patent but this information may be partial (absence of the inventor or applicant name, address, country). In that case, the patent application is present (with its appln\_id) in table invt\_addr\_ifris (or table applt\_addr\_ifris) but some fields are still empty after the filling steps described in the PATSTAT-IFRIS section.

The tables shown below give the number and share of given or missing information for inventors (or applicants) in the final CIB database (priority patents from 1986 to 2009). The statistics are calculated using data from table invt\_addr\_ifris for inventors and from table applt\_addr\_ifris for applicants.

Source	PersonName of inventors	Number	Share (%)
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<sup>12</sup> Patents without any information on applicants are patents belonging to inpadoc families of firm priority patents (see 2.1 of this report for further explanations)

Patstat Raw data	WithoutPersonName	6	0,00
Patstat Raw data	WithPersonName	14 663 514	76,32
ARTIFICIAL	WithoutPersonName	5	0,00
ARTIFICIAL	WithPersonName	2 975 012	15,49
INPI	WithPersonName	163 765	0,85
PROPAG	WithPersonName	1 115 432	5,81
REGPAT	WithPersonName	294 250	1,53
Total		19 211 984	100,00

Table invt\_addr\_ifris gives information for all inventor names (except 11) of the priority patents.  $\frac{3}{4}$  of this information was given in the initial Patstat raw data (76%); 15% by retrieving information in patent families of artificial patents (see Pastat report for details).

The table below describes number and share of present and missing information in fields related to addresses of inventors. It gives statistics on two fields, the address field (complete information on the address) (field adr\_final from Table invt-addr\_ifris) and the country field (field ctry\_final from Table invt-addr\_ifris)

Source	Address of inventors	CtryCode	Number	Share (%)
Patstat Raw data	WithAddress	WithCtryCode	2 303 170	11,99
Patstat Raw data	WithAddress	WithoutCtryCode	7 889	0,04
Patstat Raw data	WithoutAddress	WithCtryCode	1 916 813	9,98
Patstat Raw data	WithoutAddress	WithoutCtryCode	10 435 648	54,32
ARTIF	WithAddress	WithCtryCode	2 106 892	10,97
ARTIF	WithAddress	WithoutCtryCode	1 826	0,01
ARTIF	WithoutAddress	WithCtryCode	254 981	1,33
ARTIF	WithoutAddress	WithoutCtryCode	611 318	3,18
INPI	WithAddress	WithCtryCode	163 388	0,85
INPI	WithoutAddress	WithCtryCode	375	0,00
INPI	WithoutAddress	WithoutCtryCode	2	0,00
PROPAG	WithAddress	WithCtryCode	1 113 399	5,80
PROPAG	WithAddress	WithoutCtryCode	2 033	0,01
REGPAT	WithAddress	WithCtryCode	293 202	1,53
REGPAT	WithoutAddress	WithCtryCode	1 048	0,01
Total			19 211 984	100,00

Source	PersonName of applicants	Number	Share (%)
Patstat Raw data	WithoutPersonName	2	0,00
Patstat Raw data	WithPersonName	7 592 258	78,25
ARTIF	WithoutPersonName	3	0,00

ARTIF	WithPersonName	1 660 617	17,11
INPI	WithPersonName	63 212	0,65
PROPAG	WithPersonName	268 955	2,77
REGPAT	WithPersonName	117 882	1,21
TOTAL		9 702 929	100,00

Table applt\_addr\_ifris gives information for all applicant names (except 5) of the priority patents. Most of this informaton was given in the initial Patstat raw data (78 %) and artificial patents (17%).

The table below describes number and share of present and missing information in fields related to addresses of applicants. It gives statistics on two fields, the address field (complete information on the address) (field adr\_final from Table applt-addr\_ifris) and the country field (field ctry\_final from Table applt-addr\_ifris).

Source	Address	CtryCode	NbAddressesApplications	Share (%)
Patstat Raw data	WithAddress	WithCtryCode	870 397	8,97
Patstat Raw data	WithAddress	WithoutCtryCode	1 173	0,01
Patstat Raw data	WithoutAddress	WithCtryCode	1 184 853	12,21
Patstat Raw data	WithoutAddress	WithoutCtryCode	5 535 837	57,05
ARTIF	WithAddress	WithCtryCode	666 940	6,87
ARTIF	WithAddress	WithoutCtryCode	360	0,00
ARTIF	WithoutAddress	WithCtryCode	694 294	7,16
ARTIF	WithoutAddress	WithoutCtryCode	299 026	3,08
INPI	WithAddress	WithCtryCode	63 208	0,65
INPI	WithoutAddress	WithCtryCode	2	0,00
INPI	WithoutAddress	WithoutCtryCode	2	0,00
PROPAG	WithAddress	WithCtryCode	268 531	2,77
PROPAG	WithAddress	WithoutCtryCode	424	0,00
REGPAT	WithAddress	WithCtryCode	117 876	1,21
REGPAT	WithoutAddress	WithCtryCode	6	0,00
total			9 702 929	100,00

### 3) Missing information on patent IPC code

140 203 priority patents (appln\_id in Table firm\_tls201\_appln\_ifris do not have any information on IPC (appln\_id not in table firm\_appln\_ipc techno). 134 476 of them are priority patents of firms (present in Table firm\_tls001\_rappln\_id and not in table firm\_appln\_ipc techno).

- Estimation of data quality issues with respect to data acquisition, reliability of retrieving system

No external current assesment is available but exchanges on methodological strategies for DB building with FhG ISI are regularly programmed.

Various sources of noise have been identified:

- Quality for ORBIS information
- Quality of standardisation for applicants' names
- Patents where information does not allow a unequivocal allocation

### 3 Legal issues encountered and access conditions

- Legal issues concerning access of the database

Information can only be opened at aggregated level (i.e. group level). It can not be opened at a non aggregated level (i.e. at subsidiaries level) as it builds directly on ORBIS proprietary data.

- Owner of raw data:
- EPO and UPEM IFRIS for patent information
- Bureau van Dijk, IPTS and IFRIS for corporate data

Current practice for opening up of the database to external users :

The access to the CIB data within the RISIS project requires that the partners previously subscribe to the Patstat database (version Patstat 2011 Autumn or more version). The access is limited to academic exploitation and collaborations. No contractual use of the CIB data is allowed.

- Legal necessities for potential opening procedures: a Patstat subscription from users is required

## 4 Technical structure of *CIB*

### 4.1 Information on the data base system

- Current data base system used (e.g. Microsoft Access)

The current data base system is My SQL 5.1.63 with MyISAM as the default storage engine. In term of maintainability and backup, the main advantage of this storage engine is to use three different files for each table of a database:

- the data file has a .MYD (MYData) extension;
- the index file has a .MYI (MYIndex) extension;
- the structure file has a .frm extension.

MySQL is optimized for an intensive usage: a high level of accessibility and efficiency, for a low amount of users

- Planned future technical changes concerning data base system

No changes planned

## 4.2 Technical variable definition

- Labeling of all variables
- Data type of all variables (e.g., float, string, etc.)
- Current usage and definition of unique identifiers (if applicable)
- Name of the firm using various spellings (Table orb\_guo\_corr):

guo\_name (varchar(255))

guo\_name\_std (varchar(255))

guo\_name\_patstatstd (varchar(255))

- Acronym of the firm (Table orb\_guo\_corr):

guo\_acronym (varchar(255))

- Database id of the firm (Table orb\_guo\_corr, Table firm\_tls0018rappln\_id, Table firm\_tls0018rappln\_id\_group ):

guo\_id : unique identifier (int(11))

- IndexScoreBoard of the firm (Table orb\_guo\_corr). This is the firm's id in the Industrial R&D investment Scoreboard:  
IndexScoreBoard (double)
- Industry Classification of the firm (Table orb\_guo\_corr). It give the sector of the firm according to ICB categories (see below):  
ICB (int(11))
- Country where the firm's headquarters is located ( Table orb\_guo\_corr):  
guo\_etry (varchar(50))
- Country code where the firm's headquartes is located (Table orb\_guo\_corr) following the international two letter country code (ISO alpha-2):  
guo\_etrycode (varchar(50))

- Standard Industrial Classification (SIC) codes of the firms (Table orb\_guo\_corr). It is the business classification codes that the U.S. government assigns to businesses. SIC coding is used primarily to classify a company's main industry and line of business<sup>13</sup>:  
 guo\_sic\_core\_code (int(11))  
 guo\_sic\_core (varchar(255))

The table below presents the country harmonisation that has been applied.

continent	region	lib_etry_harm	etry_harm	guo_etrycode	NbGUO
Africa	Southern Africa	SOUTH AFRICA	ZA	ZA	1
Asia	Eastern Asia	CHINA	CN	CN	80
Asia	Eastern Asia	HONG KONG	HK	HK	6
Asia	Western Asia	ISRAEL	IL	IL	10
Asia	South-central Asia	INDIA	IN	IN	326
Asia	Eastern Asia	JAPAN	JP	JP	245
Asia	Eastern Asia	SOUTH KOREA	KR	KR	18
Asia	South-eastern Asia	MALAYSIA	MY	MY	1
Asia	South-eastern Asia	SINGAPORE	SG	SG	5
Asia	Western Asia	TURKEY	TR	TR	2
Asia	Eastern Asia	TAIWAN	TW	TW	41
Europe	Western Europe	AUSTRIA	AT	AT	25
Europe	Western Europe	BELGIUM	BE	BE	39
Europe	Western Europe	SWITZERLAND	CH	CH	41
Europe	Eastern Europe	CZECH REPUBLIC	CZ	CZ	2
Europe	Western Europe	GERMANY	DE	DE	182
Europe	Northern Europe	DENMARK	DK	DK	43
Europe	Southern Europe	SPAIN	ES	ES	21
Europe	Northern Europe	FINLAND	FI	FI	59
Europe	Western Europe	FRANCE	FR	FR	109
Europe	Northern Europe	UNITED KINGDOM	GB	BM	11
Europe	Northern Europe	UNITED KINGDOM	GB	GB	260
Europe	Northern Europe	UNITED KINGDOM	GB	GI	3
Europe	Northern Europe	UNITED KINGDOM	GB	KY	5
Europe	Southern Europe	GREECE	GR	GR	6
Europe	Eastern Europe	HUNGARY	HU	HU	2
Europe	Northern Europe	IRELAND	IE	IE	11
Europe	Southern Europe	ITALY	IT	IT	51
Europe	Western Europe	LIECHTENSTEIN	LI	LI	1
Europe	Western Europe	LUXEMBOURG	LU	LU	5
Europe	Southern Europe	MALTA	MT	MT	1
Europe	Western Europe	NETHERLANDS	NL	AN	1
Europe	Western Europe	NETHERLANDS	NL	NL	49
Europe	Northern Europe	NORWAY	NO	NO	8
Europe	Eastern Europe	POLAND	PL	PL	3
Europe	Southern Europe	PORTUGAL	PT	PT	4

<sup>13</sup> [http://www.ehow.com/facts\\_7277558\\_primary-sic-code\\_.html#ixzz33qksBG58](http://www.ehow.com/facts_7277558_primary-sic-code_.html#ixzz33qksBG58)

Europe	Eastern Europe	RUSSIA	RU	RU	3
Europe	Northern Europe	SWEDEN	SE	SE	77
Europe	Southern Europe	SLOVENIA	SI	SI	2
Latin America and the Caribbean	South America	BRAZIL	BR	BR	9
Latin America and the Caribbean	the Caribbean	BAHAMAS, THE	BS	BS	1
Latin America and the Caribbean	Central America	PANAMA	PA	PA	1
Northern America	Northern America	CANADA	CA	CA	25
Northern America	Northern America	UNITED STATES	US	US	513
Oceania	Australia and New Zealand	AUSTRALIA	AU	AU	9
Oceania	Australia and New Zealand	NEW ZEALAND	NZ	NZ	2

The table below presents the nomenclature of industrial super sectors, sectors and subsectors that has been used for firms.

industry	code ndus	supersector	codeS uper	sector	code Sect	subsector	code Sub
Oil & Gas	1	Oil & Gas	500	Oil & gas producers	530		0
Oil & Gas	0	Oil & Gas	0	Oil equipment, services & distribution	570		0
Oil & Gas	0	Oil & Gas	0	Alternative energy	580		0
Basic Materials	1000	Chemicals	1300	Chemicals	1350		0
Basic Materials	0	Basic Resources	1700	Forestry & paper	1730		0
Basic Materials	0	Basic Resources	0	Industrial metals	1750		0
Basic Materials	0	Basic Resources	0	Mining	1770		0
Industrials	2000	Construction & Materials	2300	Construction & materials	2350		0
Industrials	0	Industrial Goods & Services	2700	Aerospace & defence	2710		0
Industrials	0	Industrial Goods & Services	0	General industrials	2720		0
Industrials	0	Industrial Goods & Services	0	Electronic & Electrical Equipment	2730	Electrical components & equipment	2733
Industrials	0	Industrial Goods & Services	0	Electronic & Electrical Equipment	0	Electronic equipment	2737
Industrials	0	Industrial Goods & Services	0	Industrial Engineering	2750	Commercial vehicles & trucks	2753
Industrials	0	Industrial Goods & Services	0	Industrial Engineering	0	Industrial machinery	2757
Industrials	0	Industrial Goods & Services	0	Industrial transportation	2770		0
Industrials	0	Industrial Goods & Services	0	Support services	2790		0
Consumer	3000	Automobiles &	3300	Automobiles & parts	3350		0



Goods		Parts					
Consumer Goods	0	Automobiles & Parts	0	Beverages	3530		0
Consumer Goods	0	Automobiles & Parts	0	Food producers	3570		0
Consumer Goods	0	Personal & Household Goods	3700	Household goods	3720		0
Consumer Goods	0	Personal & Household Goods	0	Leisure goods	3740		0
Consumer Goods	0	Personal & Household Goods	0	Personal goods	3760		0
Consumer Goods	0	Personal & Household Goods	0	Tobacco	3780		0
Health Care	4000	Health Care	4500	Health care equipment & services	4530		0
Health Care	0	Health Care	0	Pharmaceuticals & Biotechnology	4570	Biotechnology	4573
Health Care	0	Health Care	0	Pharmaceuticals & Biotechnology	0	Pharmaceuticals	4577
Consumer Services	5000	Retail	5300	Food & drug retailers	5330		0
Consumer Services	0	Retail	0	General retailers	5370		0
Consumer Services	0	Media	5500	Media	5550		0
Consumer Services	0	Travel & Leisure	5700	Travel & leisure	5750		0
Telecommunications	6000	Telecommunications	6500	Fixed line telecommunications	6530		0
Telecommunications	0	Telecommunications	0	Mobile telecommunications	6570		0
Utilities	7000	Utilities	7500	Electricity	7530		0
Utilities	0	Utilities	0	Gas, water & multiutilities	7570		0
Financials	8000	Banks	8300	Banks	8350		0
Financials	0	Insurance	8500	Nonlife insurance	8530		0
Financials	0	Insurance	0	Life insurance	8570		0
Financials	0	Real Estate	8600	Real Estate Investment & Services	8630		0
Financials	0	Real Estate	0	Real Estate Investment Trusts	8670		0
Financials	0	Real Estate	0	Real Estate Investment Trusts	8670		0
Financials	0	Financial Services	8700	Financial Services	8770		0
Financials	0	Financial Services	0	Equity Investment Instruments	8980		0
Financials	0	Financial Services	0	Nonequity Investment Instruments	8990		0
Technology	9000	Technology	9500	Software & Computer Services	9530	Computer services	9533
Technology	0	Technology	0	Software & Computer Services	0	Internet	9535
Technology	0	Technology	0	Software & Computer Services	0	Software	9537

Technology	0	Technology	0	Software & Computer Services	0	Computer hardware	9572
Technology	0	Technology	0	Software & Computer Services	0	Electronic office equipment	9574
Technology	0	Technology	0	Software & Computer Services	0	Semiconductors	9576
Technology	0	Technology	0	Software & Computer Services	0	Telecommunications equipment	9578

### 4.3 Description of the Entity Relationship Model of *CIB* (if applicable)

- Definition of single tables

Here are described tables that are specific of the CIB database, i.e. not present in the Patstat Ifris database (those tables being described in the the Patstat Ifris section)

Table orb\_guo\_corr: this table give information related to the firms. The fields of this table are described in section 2.3

Table firm\_tls001\_rappln\_id: this table links firms (guo\_id) with priority patents (appln\_id)

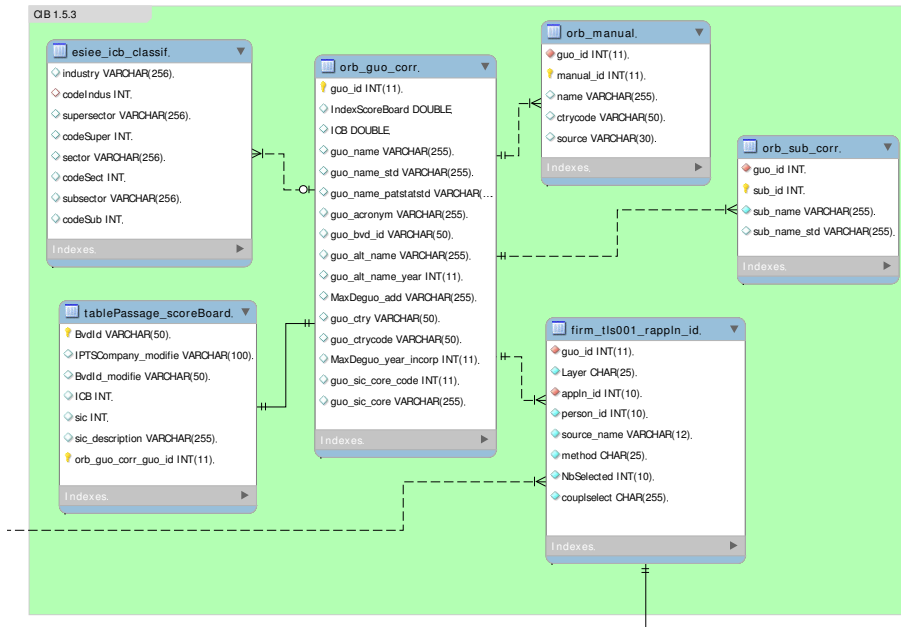
- relation between the tables via unique identifiers:

The list of unique identifiers related to patents is shown in the Patstat report. An additional identifier is present in CIB. It identifies the firm (guo\_id).

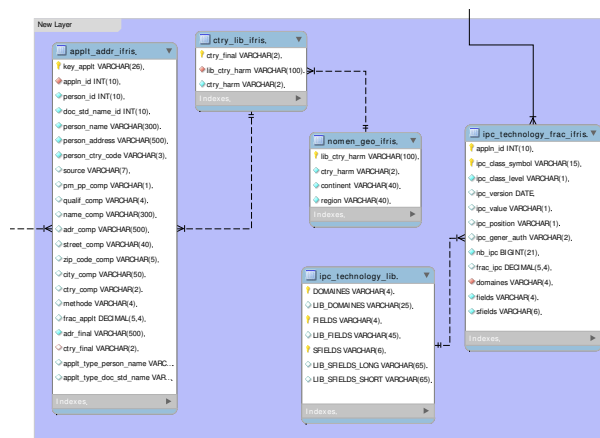
The guo\_id is used to relate Table firm\_tls001\_rappln\_id and Table orb\_guo\_corr.

The database relational model, that connects the CIB and the PATSTAT IFRIS database is shown below. The first block presents the fields specific for the CIB. The second block presents additional fields that have been developed for matching patent data and financial data. Finally, the third diagram connects these 2 blocks with the PATSTAT IFRIS relational model.

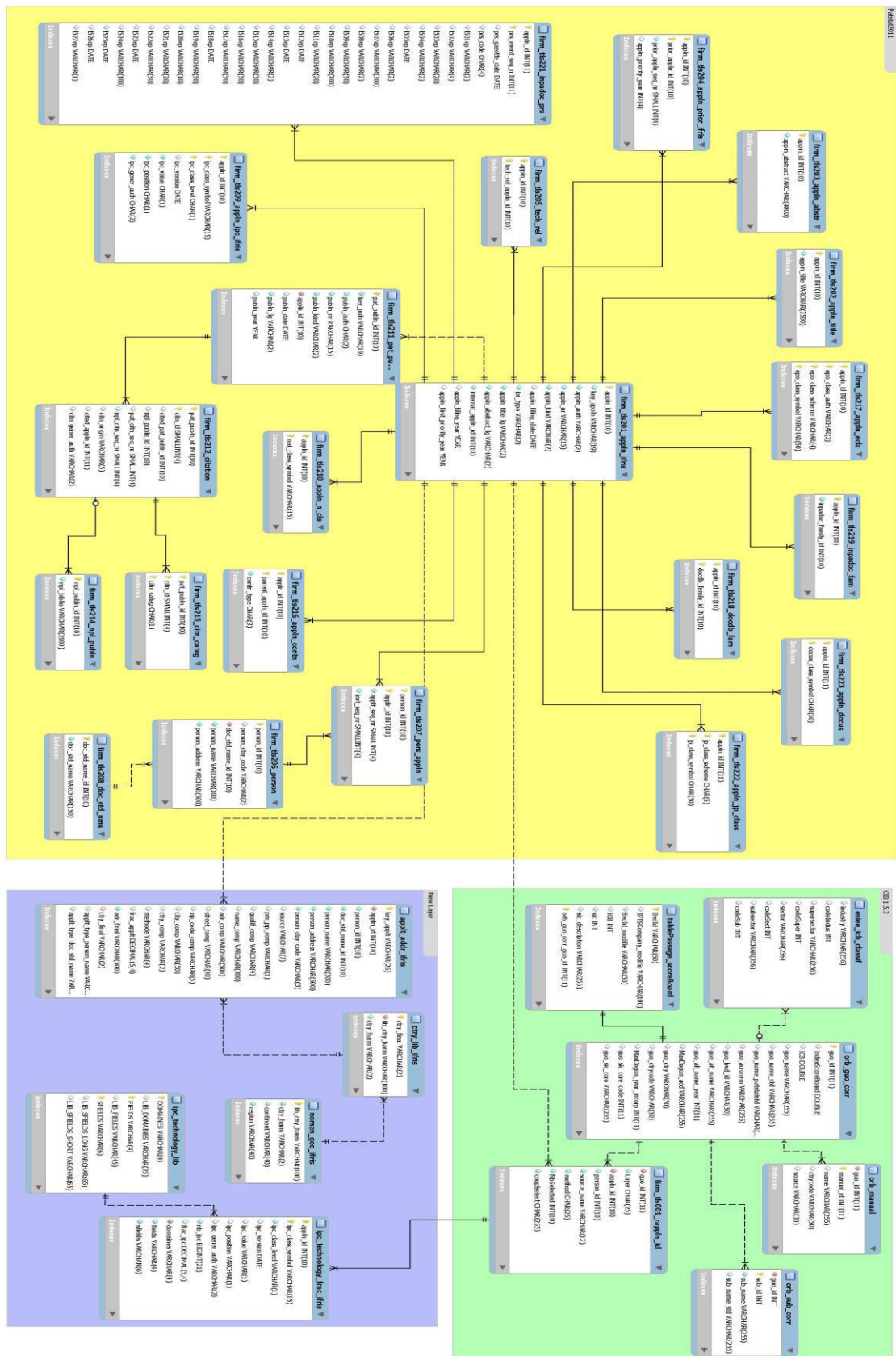
## CIB



## New Layer



## Whole relational diagram linking CIB with PATSTAT IFRIS



#### 4.4 Interfaces for access and to other infrastructures (if applicable)

- Technical information on interfaces with other infrastructures (e.g. web interface for data search. etc.)

### 5 Further planning of the opening of *CIB*

- Document concrete steps towards opening of the respective dataset

We need to carry out a selection of fields and tables to be opened within RISIS

- Necessary updates and/or technical changes

None

- Changing legal conditions for accessing the dataset or parts of the dataset

None