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**A test of the usefulness
of the EUROCCUPATIONS
database
for self-administered
computer-based
questionnaires**

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1. Introduction

Occupation is a key variable in socio-economic research, but two problems are associated with the measurement of occupations. The first one is a measurement problem in questionnaires and the second is the lack of international comparability of occupational coding systems. Web-surveys may in part solve both problems. Regarding the measurement problem, in contrast to other survey modes, web-surveys can employ three-tier search trees, which allow for respondents' self-identification of their occupational titles. The search tree consists of an aggregated list in the first tier to a detailed list of approx. 1,500 occupational titles in the third tier. It prevents that occupation data is collected by means of an open response field, which requires a huge recoding effort, or by means of a limited, aggregated list of occupational groups. Regarding the comparability problem, web-surveys allow for multi-country surveys if an international comparable, multilingual database of occupational titles is used. As part of the EurOccupations project, such a database and a search tree for respondents' self-identification have been developed.

The EurOccupations project aims at building and testing an international comparative occupations database for the eight largest EU member states, notably Belgium, France, Germany, Italy, the Netherlands, Poland, Spain, and the United Kingdom. The database is freely available at www.eurooccupations.org/main/researchlab/deliverables. Publications about the database can be found at the same page. Deliverables D01a/b and D25 are related to this deliverable. Deliverable D01a1 details the underlying principles of the database (Tijdens 2009).

This deliverable aims at a self-evaluation of the usefulness of the EUROCCUPATIONS database for self-administered computer-based questionnaires. It does so in three ways. The first reflects on the use of the Database of Occupations in the WageIndicator web-survey. The second test reflects on the email response of the WageIndicator web-visitors concerning the occupation search tree and list of occupations, used in the WageIndicator web-survey. The third test compares the distribution over ISCO minor groups in the European Labour Forces Survey and in the WageIndicator survey.

2. Test 1: The use of the Database of Occupations in the WageIndicator web-survey

By the end of year 1 of EurOccupations, the draft Database of Occupations was finalised, based on draft 3 of the ISCO2008 classification (Tijdens 2007; Tijdens and Jacobs 2007). Since 2007/2, this version of the database has been used in the WageIndicator web-survey to respond on the survey question “What is your occupation”. This web-survey is posted on frequently visited websites in an increasing number of countries in Europe and outside Europe. For more information see www.wageindicator.org.

The EurOccupations Database of Occupations has been successfully used in the WageIndicator web-survey. Apart from the eight EurOccupations countries, the database has been translated for use in web-surveys in many other countries, as Table 1 shows. See for a list of languages in use, EurOccupations Deliverable D25 (Tijdens and Jacobs 2009).

Table 1 Number of respondents in the WageIndicator web-survey for OCCUPAI, the occupation search tree based on the EurOccupations Database of Occupations, using ISCO-2008 preliminary classification draft 3, 2007/2 until 2008/4.

Country of survey	N	Country of survey	N
31 Azerbaijan	4	380 Italy	512
32 Argentina	24632	398 Kazakhstan	26
51 Armenia	5	410 Korea, Rep.	5153
56 Belgium	2698	417 Kyrgyzstan	1
76 Brazil	24108	484 Mexico	9000
112 Belarus	71	600 Paraguay	2505
152 Chile	5187	616 Poland	7476
156 China	12	643 Russian Federation	9491
170 Colombia	1528	710 South Africa	10792
208 Denmark	1097	724 Spain	12029
246 Finland	10902	752 Sweden	4405
250 France	184	795 Turkmenistan	2
268 Georgia	2	804 Ukraine	71
276 Germany	12935	826 United Kingdom	17612
320 Guatemala	908	840 United States	2292
348 Hungary	2094	860 Uzbekistan	10
356 India	3699		

Table 2 reveals in greater detail the number of respondents in the EurOccupations countries reporting a valid value on the variable OCCUPAI, recoded into the ISCO1988 classification. Unfortunately, no data can be provided to what extent respondents start the search tree but do not finish it because a valid value for OCCUPAI is one of the criteria in the data-cleaning process.

Table 2 Distribution over ten ISCO1988 major groups according to the WageIndicator web-survey, collected 2007/2 until 2008/4.

	Belgium	France	Germany	Italy	Poland	Spain	UK
0 Armed forces	.2%	.5%		.4%	.3%	.2%	.4%
1 Legislators, senior officials and managers	12.9%	15.2%	19.3%	12.3%	15.4%	9.9%	18.1%
2 Professionals	23.4%	27.7%	17.9%	34.4%	33.2%	25.2%	28.1%
3 Technicians and associate professionals	17.9%	21.2%	16.4%	17.4%	22.2%	16.4%	20.7%
4 Clerks	20.8%	14.1%	13.5%	15.0%	16.4%	25.9%	13.8%
5 Service workers and shop and market sales workers	5.5%	3.8%	9.8%	4.5%	3.0%	7.1%	5.4%
6 Skilled agricultural and fishery workers	.5%	1.1%	2.0%	.6%	.4%	.4%	.6%
7 Craft and related trades workers	6.6%	7.1%	15.3%	8.4%	4.1%	6.0%	4.9%
8 Plant and machine operators and assemblers	7.6%	8.2%	5.2%	4.7%	3.0%	5.3%	4.7%
9 Elementary occupations	4.6%	1.1%	.5%	2.3%	2.2%	3.7%	3.4%
Total	100%	100%	100%	100%	100%	100%	100%
N	2698	184	12935	512	7476	12029	17612

Note: The German WageIndicator web-survey uses a reduced occupation search tree, but can nevertheless be recoded into ISCO1988.

Note: The web-survey in France did not start until 2008/2.

Note: The web-survey in Italy suffers from a lack of cooperating partners. The response to the survey therefore remains low.

Table 2 shows that the distributions over the ten ISCO major groups seem reasonable. No weird outliers can be detected. Therefore, test 1 learns that it is feasible in a web-survey to use the Database of Occupations with its search tree and list of occupations.

3. Test 2: The email response of web-visitors about the WageIndicator web-survey

Since the start in 2007/2 until 2008/4, the WageIndicator web-survey has received some ten to twenty emails from respondents who could not find their occupation in the search tree. Taking into account that in this period 171,443 respondents have used the occupation search tree when completing the web-survey, this is an extremely small percentage. In this period, the total number of emails received was over five thousand. Below, a few comments are listed:

Noch ein Hinweis: in der Liste der Sparten im Bereich Medien sollten Sie auf jeden Fall die Erstellung von Onlineprodukten ergänzen / berufliche Tätigkeit Onlinejournalistin (Another suggestion: in the occupational list in the media sector you should at least include the production of online products – occupation online journalist).

In de loonwijzer kan ik mijn eigen beroep (adviseur bij een advies/ingenieursbureau) met geen mogelijkheid vinden. Wat zie ik over het hoofd? (I cannot find by any means my own occupation (consultant with a consultancy/engineering firm). What do I overlook?)

Gezien mijn functie als medisch technicus (medische elektronicus) niet gekozen kan worden heb ik getracht dit aan te geven in de enquête, zodat, zoals beloofd, dit volgend jaar wordt mee genomen (As my occupation as medical technician (medical electronical engineer) cannot be chosen, I have tried to indicate this as next year this can be included).

This WageIndicator inquiry is not possible to take if you are in the consulting/machine building business. Every choice of occupation you make takes you to a dead end where no remotely correct answers are possible.

Hi, I tried to submit my profile to the Wageindicator, but I can't find my business branch "defence industry" and I can't find my line of job "quality manager". Can you help me in what to do!?

In part, the comments refer to not listed occupations, and in part to the paths in the search tree. Where adequate, these comments have been taken into account in drafting the final Database of Occupations. Test 2 learns that only very few respondents complain when a search tree and the Database of Occupations is used in a web-survey.

4. Test 3: Comparing Eurostat data with WageIndicator data

For this test we compare the distributions of the labour force over 117 minor groups of the 3-digit ISCO1988(COM) classification for two datasets. The first one is the European Labour Force Survey 2001 for "Employed persons aged 15 and over by detailed occupation, 2001", currently available at Eurostat's website. The second one is the WageIndicator dataset, using the EurOccupations search tree for measuring ISCO2008_draft 3, resulting in the previously mentioned OCCUPAI variable. The data has been collected between 2007/2 and 2008/4. Using an ISCO2008_draft 3 -> ISCO1988 cross over table, the OCCUPAI data has been converted into 3-digit ISCO1988(COM) classification.

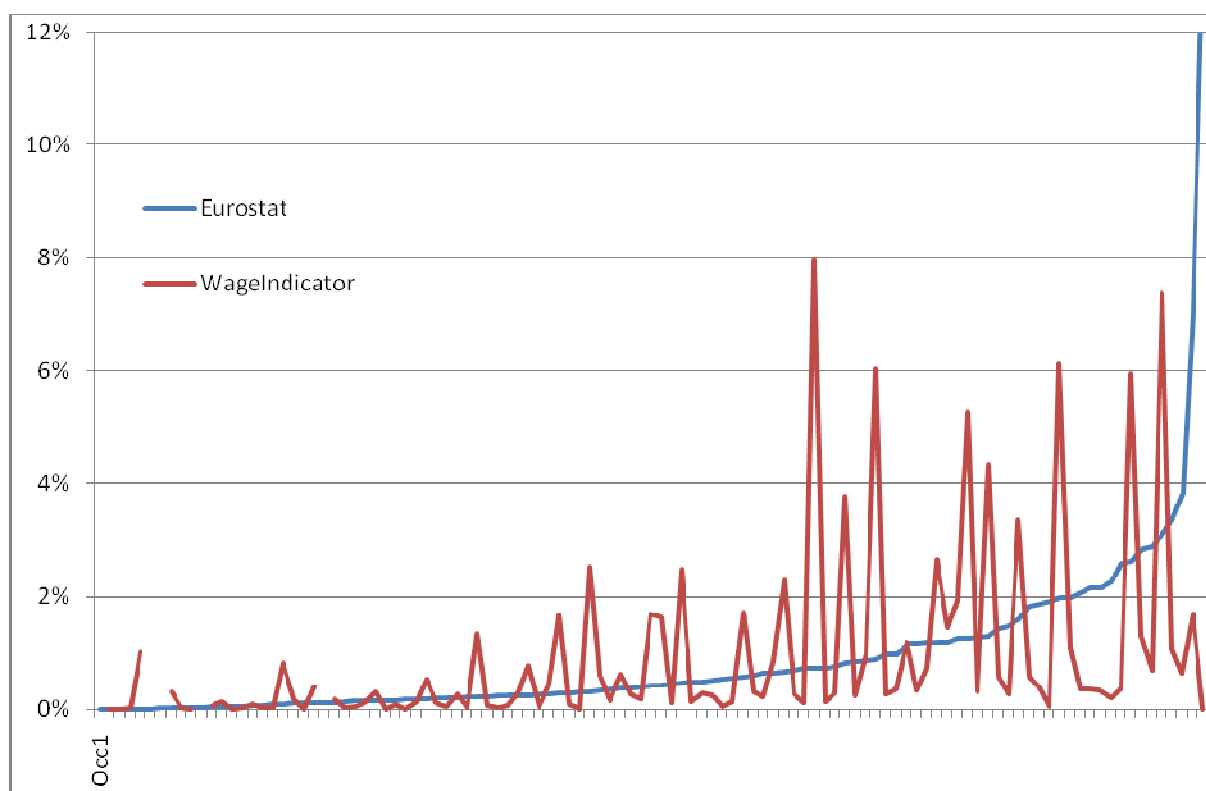
This comparison is hampered because the years of surveying are not the same, and because both classifications are based on cross over tables, for Eurostat data from the National Occupational Classification into ISCO1988(COM) and for WageIndicator data from ISCO2008_draft 3 into ISCO1988. Moreover, sampling and survey modes are different across the two datasets. The European Labour Force Survey is based on a random sample of the population, in most countries by means of face-to-face interviews, whereas WageIndicator data is collected by means of a volunteer web-survey. Nevertheless, no other datasets are available when aiming for a comparison of the distribution over the detailed 3-digit ISCO1988(COM) classification. Therefore, conclusions should be drawn with caution.

The comparison has been made for three countries: UK, Spain, and Poland. For the remaining countries, no comparisons could be made. Eurostat does not provide data for Belgium, and WageIndicator does not have sufficient observations for France and Italy, whereas the occupation data for the Netherlands is not collected using the EurOccupations search tree. In the next sections the results are summarized per country.

4.1 Comparing occupational distributions for Poland

Graph 1 presents a brief impression of the distribution over the 117 minor groups of the 3-digit ISCO1988(COM) classification for the Polish data from the European Labour Force Survey (ELFS) and for WageIndicator. On the horizontal axis the 117 minor groups have been ranked from the smallest (0%) to the largest group (13.4%) in ELFS. On the vertical axis, the percentages per occupation are shown.

Graph 1 Distribution over 117 occupational categories, ranked from lowest to highest percentage, using European Labour Force Survey data 2001 and WageIndicator data 2007/08 for POLAND.



The data of Graph 1 are detailed in Table 3 in the Appendix, which is ranked according to the ISCO classification. Graph 1 and Table 3 reveal some extreme differences. Most remarkable is that 13.4% of the Polish ELFS is classified as "Market-oriented crop and animal producers" (ISCO613), whereas this percentage is almost 0% for WageIndicator. Furthermore, in ELFS 7.05% is classified as "Shop, stall and market salespersons and demonstrators", whereas this is only 1.70% for WageIndicator. In contrast, according to ELFS 0.72% of the labour force is classified "Computing professionals", whereas this percentage is 7.96% for WageIndicator. In addition, according to ELFS 3.11% is classified "Administrative associate professionals", while according to WageIndicator this is 7.37%. It is likely that these differences are to a minor extent caused by problems in the search

tree, but to a larger extent by self-selection-bias in the web-survey and by changes in the Polish labour market between 2001 and 2007/08.

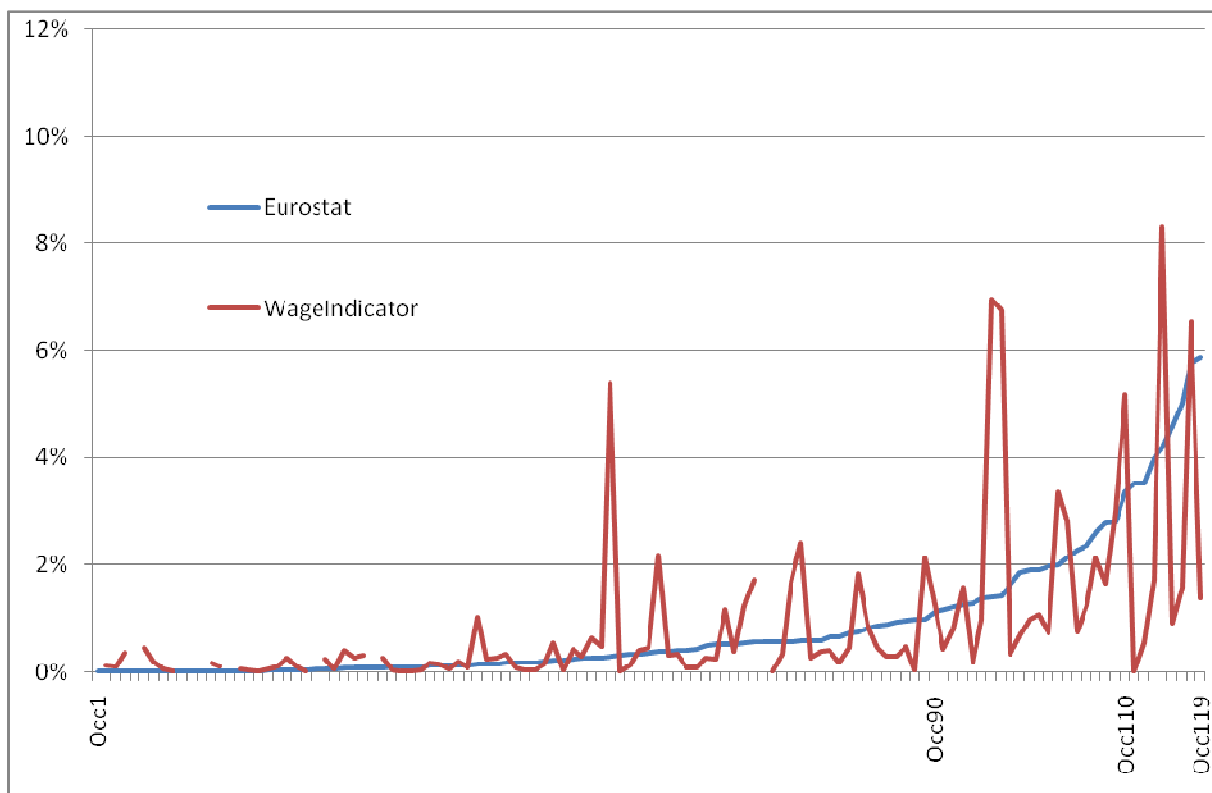
Furthermore, Table 3 reveals that the ELFS does not classify teachers in Poland at the 3-digit level (ISCO331, ISCO332, ISCO333). In WageIndicator 0.64% is being classified as "Primary school teachers", and another 0.05% as "Pre-primary education teaching associate professionals" and "Special education teaching associate professionals". The Table furthermore reveals that in ELFS no "Nursing and midwifery professionals" (ISCO223) and 1.86% "Nursing and midwifery associate professionals" (ISCO323) are classified, whereas according to the self-identification method of WageIndicator this is 0.12% respectively 0.37%. Finally, the ELFS does not classify "Manufacturing labourers" (ISCO932).

For Poland test 3 reveals that the distinction between professionals (ISCO major group 2) and Associate professionals (ISCO major group 3) may cause different results when comparing to the self-identification method.

4.2 Comparing occupational distributions for the UK

Graph 2 presents a brief impression of the distribution over the 117 minor groups of the 3-digit ISCO1988(COM) classification for the UK data from the European Labour Force Survey (ELFS) and for WageIndicator. On the horizontal axis the 117 minor groups have been ranked from the smallest (0%) to the largest share (5.87%) in ELFS. On the vertical axis, the percentages per occupation are shown.

Graph 2 Distribution over 117 occupational categories, ranked from lowest to highest percentage, using European Labour Force Survey data and WageIndicator data for UK.



The data of Graph 2 are detailed in Table 4 in the Appendix, which is ranked according to the ISCO classification. Graph 2 and Table 4 reveal some extreme differences. Most remarkable is that 8.32% of the WageIndicator respondents are classified as "Other specialist managers" (ISCO123), whereas this percentage is 4.18% for UK ELFS. Estimates of the "Production and operations department managers" (5.67% in UK ELFS and 6.55% in WageIndicator), however, are pretty similar across the two datasets. Furthermore, in WageIndicator 6.95% is classified as "Computing professionals" (ISCO213), whereas this percentage is 1.38% for UK ELFS. As in Poland, this might in part be attributed to the self-selection bias and in part to the growth of the number of computer specialists between 2001 and 2007/08. As was the case in Poland, in the UK the "Shop, stall and mar-

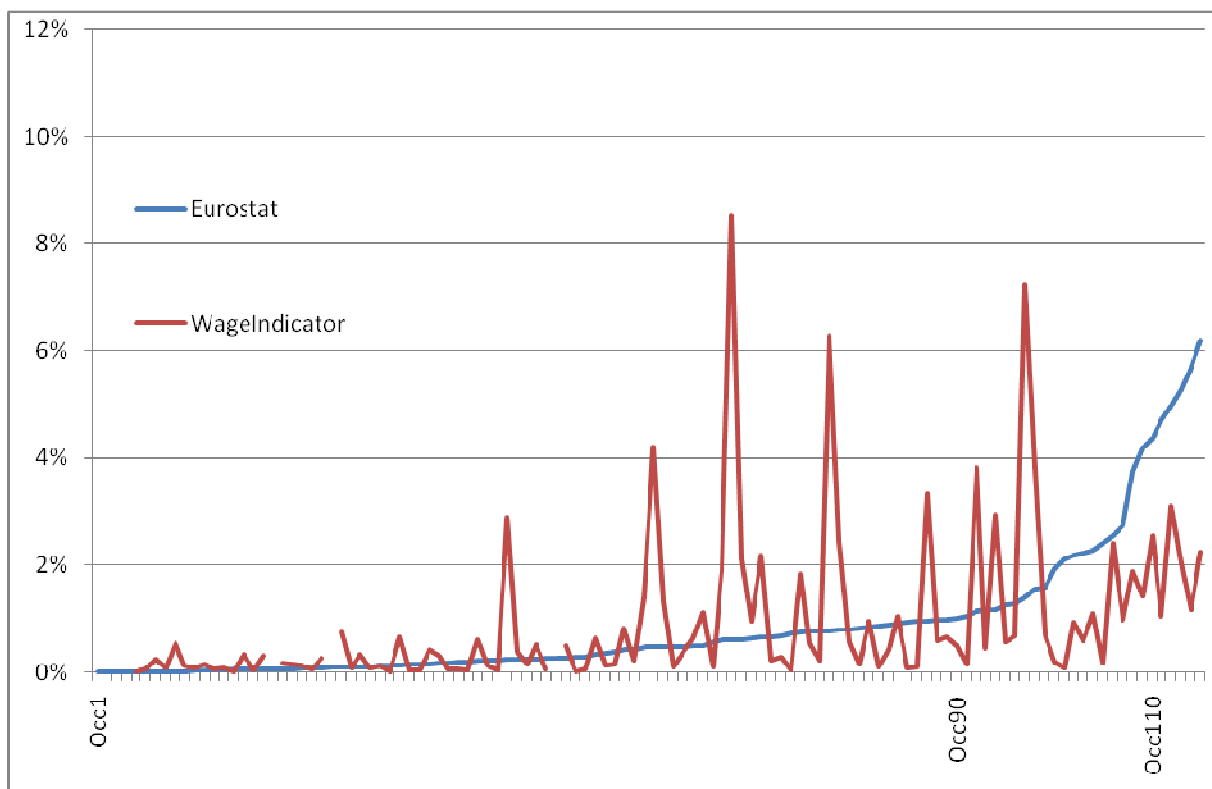
ket salespersons and demonstrators” (ISCO522) have a much higher share in the UK Labour Force compared to WageIndicator (5.87% respectively 1.37%).

In conclusion, for the UK test 3 reveals that the computing professionals are likely to be overrepresented in a web-survey. Management occupations are revealing large differences too, and need a closer enquiry, as do the salespersons.

4.3 Comparing occupational distributions for Spain

Graph 3 presents a brief impression of the distribution over the 117 minor groups of the 3-digit ISCO1988(COM) classification for the Spanish data from the European Labour Force Survey (ELFS) and for WageIndicator. On the horizontal axis the 117 minor groups have been ranked from the smallest (0%) to the largest share (6.21%) in ELFS. On the vertical axis, the percentages per occupation are shown.

Graph 3 Distribution over 117 occupational categories, ranked from lowest to highest percentage, using European Labour Force Survey data and WageIndicator data for Spain.



The data of Graph 3 are detailed in Table 5 in the Appendix, which is ranked according to the ISCO classification. Graph 3 and Table 5 reveal similar differences as was the case for Poland and the UK. In WageIndicator 8.52% is classified as “Computing professionals” (ISCO213), whereas this percentage is 0.61% for ES ELFS. As in Poland, this might in

part be attributed to the self-selection bias and in part to the growth in the number of computer specialists between 2001 and 2007/08. As was the case in Poland and the UK, in Spain the "Shop, stall and market salespersons and demonstrators" (ISCO522) have a much higher share in the ELFS compared to WageIndicator (6.21% respectively 2.524%). Regarding the managerial occupational categories, less differences across the two datasets are revealed in Spain compared to Poland and the UK.

In conclusion, for Spain test 3 reveals that the computing professionals are likely to be overrepresented in a web-survey, and shop assistants are likely to be underrepresented.

5. Conclusions

The major lesson learned from this comparison, is that the managerial occupations, the shop assistants occupations and the computing occupations may need improvements in the Database of Occupations and its search tree, because in these occupational groups substantial differences in their distribution have been revealed for the three countries. In the final EurOccupations Database of Occupations much attention has been paid to these groups, as is explained in Deliverable 1c.

6. References

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Appendix Distribution tables

Table 3 Distribution over 117 occupational categories for European Labour Force data 2001 and for WageIndicator data2007/08 for POLAND.

	isco88	Poland ELFS N	Poland ELFS %	Poland WI N	Poland WI %	Dif. (WI-EU)	Dif. (EU-WI)/EU
10	Armed forces	126825	0.97%	19	0.25%	-0.72%	74%
111	Legislators	431	0.00%	76	1.02%	1.01%	-30686%
112	Senior government officials	15180	0.12%	#N/A	#N/A	#N/A	#N/A
113	Traditional chiefs and heads of villages	0		#N/A	#N/A		
114	Senior officials of special-interest organisations	1569	0.01%	23	0.31%	0.30%	-2459%
121	Directors and chief executives	156103	1.20%	109	1.46%	0.26%	-22%
122	Production and operations department managers	164392	1.26%	393	5.26%	4.00%	-317%
123	Other specialist managers	113612	0.87%	451	6.03%	5.16%	-593%
131	General managers	369504	2.83%	96	1.28%	-1.55%	55%
211	Physicists, chemists and related professionals	12787	0.10%	60	0.80%	0.70%	-719%
212	Mathematicians, statisticians and related professionals	5914	0.05%	10	0.13%	0.09%	-195%
213	Computing professionals	93939	0.72%	595	7.96%	7.24%	-1006%
214	Architects, engineers and related professionals	155901	1.19%	198	2.65%	1.45%	-122%
221	Life science professionals	13427	0.10%	13	0.17%	0.07%	-69%
222	Health professionals (except nursing)	163813	1.26%	144	1.93%	0.67%	-53%
223	Nursing and midwifery professionals	0		9	0.12%		
231	College, university and higher education teaching professionals	74084	0.57%	128	1.71%	1.14%	-202%
232	Secondary education teaching professionals	439636	3.37%	78	1.04%	-2.32%	69%
233	Primary and pre-primary education teaching professionals	93536	0.72%	9	0.12%	-0.60%	83%
234	Special education teaching professionals	9870	0.08%	1	0.01%	-0.06%	82%
235	Other teaching professionals	42047	0.32%	44	0.59%	0.27%	-83%
241	Business professionals	342365	2.62%	444	5.94%	3.32%	-126%
242	Legal professionals	59668	0.46%	186	2.49%	2.03%	-444%
243	Archivists, librarians and related information professionals	32828	0.25%	58	0.78%	0.52%	-208%
244	Social science and related professionals	105584	0.81%	282	3.77%	2.96%	-366%
245	Writers and creative or performing artists	54819	0.42%	121	1.62%	1.20%	-285%
246	Religious professionals	27105	0.21%	19	0.25%	0.05%	-22%
247	Scientific administration employees	0		82	1.10%		
311	Physical and engineering science technicians	258987	1.98%	80	1.07%	-0.91%	46%
312	Computer associate professionals	28264	0.22%	100	1.34%	1.12%	-518%
313	Optical and electronic equipment operators	14966	0.11%	29	0.39%	0.27%	-238%
314	Ship and aircraft controllers and technicians	9098	0.07%	6	0.08%	0.01%	-15%
315	Safety and quality inspectors	82877	0.63%	62	0.83%	0.19%	-31%

321	Life science technicians and related associate professionals	22208	0.17%	39	0.52%	0.35%	-207%
322	Health associate professionals (except nursing)	112570	0.86%	73	0.98%	0.11%	-13%
323	Nursing and midwifery associate professionals	243230	1.86%	28	0.37%	-1.49%	80%
324	Traditional medicine practitioners and faith healers	0		#N/A	#N/A		
331	Primary education teaching associate professionals	0		48	0.64%		
332	Pre-primary education teaching associate professionals	0		4	0.05%		
333	Special education teaching associate professionals	0		4	0.05%		
334	Other teaching associate professionals	27549	0.21%	2	0.03%	-0.18%	87%
341	Finance and sales associate professionals	170039	1.30%	324	4.33%	3.03%	-233%
342	Business services agents and trade brokers	97684	0.75%	21	0.28%	-0.47%	62%
343	Administrative associate professionals	405616	3.11%	551	7.37%	4.26%	-137%
344	Customs, tax and related government associate professionals	54327	0.42%	126	1.69%	1.27%	-305%
345	Police inspectors and detectives	52953	0.41%	13	0.17%	-0.23%	57%
346	Social work associate professionals	31979	0.25%	21	0.28%	0.04%	-15%
347	Artistic, entertainment and sports associate professionals	37029	0.28%	125	1.67%	1.39%	-489%
348	Religious associate professionals	377	0.00%	0	0.00%	0.00%	100%
411	Secretaries and keyboard-operating clerks	85883	0.66%	170	2.27%	1.62%	-246%
412	Numerical clerks	257179	1.97%	457	6.11%	4.14%	-210%
413	Material-recording and transport clerks	210264	1.61%	251	3.36%	1.75%	-108%
414	Library, mail and related clerks	40700	0.31%	188	2.51%	2.20%	-706%
419	Other office clerks	270781	2.07%	27	0.36%	-1.71%	83%
421	Cashiers, tellers and related clerks	151516	1.16%	88	1.18%	0.02%	-1%
422	Client information clerks	47714	0.37%	46	0.62%	0.25%	-68%
511	Travel attendants and related workers	15766	0.12%	13	0.17%	0.05%	-44%
512	Housekeeping and restaurant services workers	192539	1.48%	20	0.27%	-1.21%	82%
513	Personal care and related workers	82461	0.63%	16	0.21%	-0.42%	66%
514	Other personal services workers	67816	0.52%	3	0.04%	-0.48%	92%
515	Astrologers, fortune-tellers and related workers	714	0.01%	#N/A	#N/A		
516	Protective services workers	186479	1.43%	42	0.56%	-0.87%	61%
521	Fashion and other models	413	0.00%	1	0.01%	0.01%	-323%
522	Shop, stall and market salespersons and demonstrators	919931	7.05%	127	1.70%	-5.35%	76%
523	Stall and market salespersons	0		#N/A	#N/A		
611	Market gardeners and crop growers	296173	2.27%	14	0.19%	-2.08%	92%
612	Market-oriented animal producers and related workers	33180	0.25%	4	0.05%	-0.20%	79%

613	Market-oriented crop and animal producers	1749129	####	0	0.00%	-13.40%	100%
614	Forestry and related workers	19302	0.15%	9	0.12%	-0.03%	19%
615	Fishery workers, hunters and trappers	6140	0.05%	0	0.00%	-0.05%	100%
621	Subsistence agricultural and fishery workers	1437	0.01%	#N/A	#N/A		
711	Miners, shotfirers, stone cutters and carvers	94717	0.73%	10	0.13%	-0.59%	82%
712	Building frame and related trades workers	375938	2.88%	51	0.68%	-2.20%	76%
713	Building finishers and related trades workers	154316	1.18%	54	0.72%	-0.46%	39%
714	Painters, building structure cleaners and related trades workers	66683	0.51%	18	0.24%	-0.27%	53%
721	Metal moulders, welders, sheet-metal workers, structural-metal preparers, and related trades workers	127180	0.97%	26	0.35%	-0.63%	64%
722	Blacksmiths, tool-makers and related trades workers	281171	2.15%	26	0.35%	-1.81%	84%
723	Machinery mechanics and fitters	236947	1.82%	42	0.56%	-1.25%	69%
724	Electrical and electronic equipment mechanics and fitters	282408	2.16%	25	0.33%	-1.83%	85%
731	Precision workers in metal and related materials	19220	0.15%	3	0.04%	-0.11%	73%
732	Potters, glass-makers and related trades workers	30431	0.23%	2	0.03%	-0.21%	89%
733	Handicraft workers in wood, textile, leather and related materials	3082	0.02%	0	0.00%	-0.02%	100%
734	Printing and related trades workers	24440	0.19%	8	0.11%	-0.08%	43%
741	Food processing and related trades workers	151715	1.16%	24	0.32%	-0.84%	72%
742	Wood treaters, cabinet-makers and related trades workers	62571	0.48%	10	0.13%	-0.35%	72%
743	Textile, garment and related trades workers	248428	1.90%	4	0.05%	-1.85%	97%
744	Pelt, leather and shoemaking trades workers	40051	0.31%	0	0.00%	-0.31%	100%
811	Mining and mineral-processing-plant operators	21129	0.16%	7	0.09%	-0.07%	42%
812	Metal-processing plant operators	30828	0.24%	5	0.07%	-0.17%	72%
813	Glass, ceramics and related plant operators	13713	0.11%	0	0.00%	-0.11%	100%
814	Wood-processing- and papermaking-plant operators	22030	0.17%	0	0.00%	-0.17%	100%
815	Chemical-processing-plant operators	20611	0.16%	23	0.31%	0.15%	-95%
816	Power-production and related plant operators	71113	0.54%	10	0.13%	-0.41%	75%
817	Automated-assembly-line and industrial-robot operators	3621	0.03%	#N/A	#N/A		
821	Metal- and mineral-products machine operators	33337	0.26%	33	0.44%	0.19%	-73%
822	Chemical-products machine operators	16877	0.13%	1	0.01%	-0.12%	90%
823	Rubber- and plastic-products machine operators	37656	0.29%	7	0.09%	-0.19%	68%
824	Wood-products machine	2616	0.02%	1	0.01%	-0.01%	33%

	operators						
825	Printing-, binding- and paper-products machine operators	22050	0.17%	10	0.13%	-0.04%	21%
826	Textile-, fur- and leather-products machine operators	29562	0.23%	5	0.07%	-0.16%	70%
827	Food and related products machine operators	64161	0.49%	22	0.29%	-0.20%	40%
828	Assemblers	76909	0.59%	23	0.31%	-0.28%	48%
829	Other machine operators and assemblers	5397	0.04%	5	0.07%	0.03%	-62%
831	Locomotive engine drivers and related workers	58670	0.45%	8	0.11%	-0.34%	76%
832	Motor-vehicle drivers	502114	3.85%	47	0.63%	-3.22%	84%
833	Agricultural and other mobile-plant operators	108124	0.83%	18	0.24%	-0.59%	71%
834	Ships' deck crews and related workers	11120	0.09%	2	0.03%	-0.06%	69%
911	Street vendors and related workers	7004	0.05%	2	0.03%	-0.03%	50%
912	Shoe cleaning and other street services elementary occupations	234	0.00%	0	0.00%	0.00%	100%
913	Domestic and related helpers, cleaners and launderers	338164	2.59%	28	0.37%	-2.22%	86%
914	Building caretakers, window and related cleaners	49494	0.38%	19	0.25%	-0.13%	33%
915	Messengers, porters, doorkeepers and related workers	164924	1.26%	23	0.31%	-0.96%	76%
916	Garbage collectors and related labourers	25536	0.20%	4	0.05%	-0.14%	73%
921	Agricultural, fishery and related labourers	20653	0.16%	0	0.00%	-0.16%	100%
931	Mining and construction labourers	88137	0.68%	20	0.27%	-0.41%	60%
932	Manufacturing labourers		#N/A	58	0.78%		
933	Transport labourers and freight handlers	46900	0.36%	12	0.16%	-0.20%	55%
	Unknown		0.00%				
		13052191	####	7476	#####		

Table 4 Distribution over 117 occupational categories for European Labour Force data 2001 and for WageIndicator data2007/08 for UK.

	isco88	UK ELFS N	UK ELFS %	UK WI N	UK WI %	Dif. (WI-EU)	Dif. (EU-WI)/EU
10	Armed forces	141444	0.52%	63	0.36%	-0.16%	31%
111	Legislators	16159	0.06%	68	0.39%	0.33%	-556%
112	Senior government officials	19374	0.07%	#N/A	#N/A	#N/A	#N/A
113	Traditional chiefs and heads of villages	0	0.00%	#N/A	#N/A	#N/A	#N/A
114	Senior officials of special-interest organisations	0	0.00%	21	0.12%	0.12%	
121	Directors and chief executives	35430	0.13%	178	1.01%	0.89%	-683%
122	Production and operations department managers	1575469	5.76%	1149	6.55%	0.79%	-14%
123	Other specialist managers	1143749	4.18%	1460	8.32%	4.14%	-99%
131	General managers	1083752	3.97%	300	1.71%	-2.26%	57%
211	Physicists, chemists and related professionals	68899	0.25%	110	0.63%	0.38%	-149%
212	Mathematicians, statisticians and related professionals	0	0.00%	17	0.10%	0.10%	
213	Computing professionals	376510	1.38%	1221	6.96%	5.58%	-405%
214	Architects, engineers and re-	541126	1.98%	589	3.36%	1.38%	-70%

	lated professionals						
221	Life science professionals	37290	0.14%	40	0.23%	0.09%	-67%
222	Health professionals (except nursing)	218377	0.80%	150	0.86%	0.06%	-7%
223	Nursing and midwifery professionals	0	0.00%	60	0.34%	0.34%	
231	College, university and higher education teaching professionals	300283	1.10%	217	1.24%	0.14%	-13%
232	Secondary education teaching professionals	330785	1.21%	137	0.78%	-0.43%	35%
233	Primary and pre-primary education teaching professionals	346185	1.27%	27	0.15%	-1.11%	88%
234	Special education teaching professionals	31464	0.12%	7	0.04%	-0.08%	65%
235	Other teaching professionals	142594	0.52%	215	1.23%	0.70%	-135%
241	Business professionals	382861	1.40%	1185	6.76%	5.36%	-382%
242	Legal professionals	138152	0.51%	202	1.15%	0.65%	-128%
243	Archivists, librarians and related information professionals	33506	0.12%	34	0.19%	0.07%	-58%
244	Social science and related professionals	98599	0.36%	383	2.18%	1.82%	-505%
245	Writers and creative or performing artists	154465	0.57%	290	1.65%	1.09%	-193%
246	Religious professionals	44725	0.16%	11	0.06%	-0.10%	62%
247	Scientific administration employees	11451	0.04%	40	0.23%	0.19%	-444%
311	Physical and engineering science technicians	375188	1.37%	171	0.97%	-0.40%	29%
312	Computer associate professionals	151353	0.55%	299	1.70%	1.15%	-208%
313	Optical and electronic equipment operators	63052	0.23%	75	0.43%	0.20%	-85%
314	Ship and aircraft controllers and technicians	38045	0.14%	44	0.25%	0.11%	-80%
315	Safety and quality inspectors	54180	0.20%	94	0.54%	0.34%	-170%
321	Life science technicians and related associate professionals	18800	0.07%	52	0.30%	0.23%	-331%
322	Health associate professionals (except nursing)	200089	0.73%	319	1.82%	1.09%	-148%
323	Nursing and midwifery associate professionals	538662	1.97%	127	0.72%	-1.25%	63%
324	Traditional medicine practitioners and faith healers	0	0.00%	#N/A	#N/A	#N/A	#N/A
331	Primary education teaching associate professionals	0	0.00%	78	0.44%	0.44%	
332	Pre-primary education teaching associate professionals	0	0.00%	34	0.19%	0.19%	
333	Special education teaching associate professionals	0	0.00%	9	0.05%	0.05%	
334	Other teaching associate professionals	137445	0.50%	39	0.22%	-0.28%	56%
341	Finance and sales associate professionals	916588	3.35%	909	5.18%	1.83%	-55%
342	Business services agents and trade brokers	8405	0.03%	46	0.26%	0.23%	-753%
343	Administrative associate professionals	77236	0.28%	946	5.39%	5.11%	-1808%
344	Customs, tax and related government associate professionals	41521	0.15%	56	0.32%	0.17%	-110%
345	Police inspectors and detectives	7526	0.03%	17	0.10%	0.07%	-252%
346	Social work associate professionals	177719	0.65%	29	0.17%	-0.48%	75%
347	Artistic, entertainment and sports associate professionals	340344	1.25%	276	1.57%	0.33%	-26%
348	Religious associate professionals	0	0.00%	1	0.01%	0.01%	

411	Secretaries and keyboard-operating clerks	766168	2.80%	529	3.02%	0.21%	-8%
412	Numerical clerks	581986	2.13%	493	2.81%	0.68%	-32%
413	Material-recording and transport clerks	157604	0.58%	420	2.39%	1.82%	-315%
414	Library, mail and related clerks	197033	0.72%	76	0.43%	-0.29%	40%
419	Other office clerks	1249908	4.57%	160	0.91%	-3.66%	80%
421	Cashiers, tellers and related clerks	264926	0.97%	372	2.12%	1.15%	-119%
422	Client information clerks	710874	2.60%	374	2.13%	-0.47%	18%
511	Travel attendants and related workers	89802	0.33%	69	0.39%	0.06%	-20%
512	Housekeeping and restaurant services workers	647659	2.37%	220	1.25%	-1.12%	47%
513	Personal care and related workers	1372930	5.02%	277	1.58%	-3.44%	69%
514	Other personal services workers	240295	0.88%	47	0.27%	-0.61%	70%
515	Astrologers, fortune-tellers and related workers	0	0.00%	#N/A	#N/A	#N/A	#N/A
516	Protective services workers	259150	0.95%	81	0.46%	-0.49%	51%
521	Fashion and other models	0	0.00%	2	0.01%	0.01%	
522	Shop, stall and market salespersons and demonstrators	1604940	5.87%	241	1.37%	-4.50%	77%
523	Stall and market salespersons	0	0.00%	#N/A	#N/A	#N/A	#N/A
611	Market gardeners and crop growers	153717	0.56%	57	0.32%	-0.24%	42%
612	Market-oriented animal producers and related workers	0	0.00%	27	0.15%	0.15%	
613	Market-oriented crop and animal producers	153219	0.56%	1	0.01%	-0.55%	99%
614	Forestry and related workers	0	0.00%	16	0.09%	0.09%	
615	Fishery workers, hunters and trappers	23056	0.08%	5	0.03%	-0.06%	66%
621	Subsistence agricultural and fishery workers	0	0.00%	#N/A	#N/A	#N/A	#N/A
711	Miners, shotfirers, stone cutters and carvers	0	0.00%	9	0.05%	0.05%	
712	Building frame and related trades workers	518728	1.90%	170	0.97%	-0.93%	49%
713	Building finishers and related trades workers	519069	1.90%	188	1.07%	-0.83%	44%
714	Painters, building structure cleaners and related trades workers	157792	0.58%	43	0.25%	-0.33%	58%
721	Metal moulders, welders, sheet-metal workers, structural-metal preparers, and related trades workers	175798	0.64%	67	0.38%	-0.26%	41%
722	Blacksmiths, tool-makers and related trades workers	108992	0.40%	55	0.31%	-0.09%	21%
723	Machinery mechanics and fitters	506353	1.85%	117	0.67%	-1.19%	64%
724	Electrical and electronic equipment mechanics and fitters	234723	0.86%	76	0.43%	-0.43%	50%
731	Precision workers in metal and related materials	33805	0.12%	11	0.06%	-0.06%	49%
732	Potters, glass-makers and related trades workers	23146	0.08%	2	0.01%	-0.07%	87%
733	Handicraft workers in wood, textile, leather and related materials	26795	0.10%	3	0.02%	-0.08%	83%
734	Printing and related trades workers	89080	0.33%	20	0.11%	-0.21%	65%
741	Food processing and related trades workers	72454	0.27%	83	0.47%	0.21%	-78%
742	Wood treaters, cabinet-makers and related trades workers	46562	0.17%	6	0.03%	-0.14%	80%
743	Textile, garment and related	45863	0.17%	5	0.03%	-0.14%	83%

	trades workers						
744	Pelt, leather and shoemaking trades workers	9358	0.03%	1	0.01%	-0.03%	83%
811	Mining and mineral-processing-plant operators	20380	0.07%	45	0.26%	0.18%	-244%
812	Metal-processing plant operators	15242	0.06%	7	0.04%	-0.02%	28%
813	Glass, ceramics and related plant operators	26096	0.10%	2	0.01%	-0.08%	88%
814	Wood-processing- and paper-making-plant operators	55466	0.20%	6	0.03%	-0.17%	83%
815	Chemical-processing-plant operators	68365	0.25%	48	0.27%	0.02%	-9%
816	Power-production and related plant operators	18485	0.07%	43	0.25%	0.18%	-262%
817	Automated-assembly-line and industrial-robot operators	10778	0.04%	#N/A	#N/A	#N/A	#N/A
821	Metal- and mineral-products machine operators	255731	0.94%	49	0.28%	-0.66%	70%
822	Chemical-products machine operators	6554	0.02%	7	0.04%	0.02%	-66%
823	Rubber- and plastic-products machine operators	50464	0.18%	23	0.13%	-0.05%	29%
824	Wood-products machine operators	0	0.00%	3	0.02%	0.02%	
825	Printing-, binding- and paper-products machine operators	0	0.00%	76	0.43%	0.43%	
826	Textile-, fur- and leather-products machine operators	109984	0.40%	14	0.08%	-0.32%	80%
827	Food and related products machine operators	159220	0.58%	65	0.37%	-0.21%	36%
828	Assemblers	98697	0.36%	52	0.30%	-0.06%	18%
829	Other machine operators and assemblers	264789	0.97%	6	0.03%	-0.93%	96%
831	Locomotive engine drivers and related workers	31294	0.11%	28	0.16%	0.05%	-39%
832	Motor-vehicle drivers	758729	2.78%	287	1.64%	-1.14%	41%
833	Agricultural and other mobile-plant operators	133409	0.49%	43	0.25%	-0.24%	50%
834	Ships' deck crews and related workers	8919	0.03%	16	0.09%	0.06%	-180%
911	Street vendors and related workers	82794	0.30%	0	0.00%	-0.30%	100%
912	Shoe cleaning and other street services elementary occupations	961731	3.52%	2	0.01%	-3.51%	100%
913	Domestic and related helpers, cleaners and launderers	961731	3.52%	92	0.52%	-2.99%	85%
914	Building caretakers, window and related cleaners	96586	0.35%	78	0.44%	0.09%	-26%
915	Messengers, porters, doorkeepers and related workers	619460	2.27%	128	0.73%	-1.54%	68%
916	Garbage collectors and related labourers	31383	0.11%	24	0.14%	0.02%	-19%
921	Agricultural, fishery and related labourers	111398	0.41%	12	0.07%	-0.34%	83%
931	Mining and construction labourers	318695	1.17%	73	0.42%	-0.75%	64%
932	Manufacturing labourers			124	0.71%		
933	Transport labourers and freight handlers	440689	1.61%	58	0.33%	-1.28%	79%
	Unknown	152222	0.56%			-0.56%	100%
		27329878	99.96%	17468	100%		

Table 5 Distribution over 117 occupational categories for European Labour Force data 2001 and for WageIndicator data2007/08 for SPAIN.

	isco88	ELFS Spain	ELFS Spain	WI Spain	WI Spain	Difference (WI-EU)	Difference (EU-WI)/EU
10	Armed forces	106429	0.66%	25	0.21%	-0.45%	68%
111	Legislators	774	0.00%	29	0.24%	0.24%	-4941%
112	Senior government officials	7267	0.04%	#N/A	#N/A	#N/A	#N/A
113	Traditional chiefs and heads of villages	13621	0.08%	#N/A	#N/A	#N/A	#N/A
114	Senior officials of special-interest organisations	506	0.00%	6	0.05%	0.05%	-1495%
121	Directors and chief executives	68195	0.42%	96	0.80%	0.38%	-89%
122	Production and operations department managers	185399	1.15%	458	3.81%	2.66%	-232%
123	Other specialist managers	186035	1.15%	353	2.93%	1.78%	-155%
131	General managers	853759	5.28%	244	2.03%	-3.25%	62%
211	Physicists, chemists and related professionals	6817	0.04%	37	0.31%	0.27%	-630%
212	Mathematicians, statisticians and related professionals	4832	0.03%	5	0.04%	0.01%	-39%
213	Computing professionals	98711	0.61%	1025	8.52%	7.91%	-1297%
214	Architects, engineers and related professionals	252310	1.56%	455	3.78%	2.22%	-143%
221	Life science professionals	16997	0.11%	15	0.12%	0.02%	-19%
222	Health professionals (except nursing)	201685	1.25%	67	0.56%	-0.69%	55%
223	Nursing and midwifery professionals	167498	1.04%	17	0.14%	-0.89%	86%
231	College, university and higher education teaching professionals	80405	0.50%	132	1.10%	0.60%	-121%
232	Secondary education teaching professionals	253863	1.57%	84	0.70%	-0.87%	55%
233	Primary and pre-primary education teaching professionals	309291	1.91%	23	0.19%	-1.72%	90%
234	Special education teaching professionals	30968	0.19%	4	0.03%	-0.16%	83%
235	Other teaching professionals	102012	0.63%	115	0.96%	0.33%	-52%
241	Business professionals	75262	0.47%	506	4.21%	3.74%	-804%
242	Legal professionals	135715	0.84%	114	0.95%	0.11%	-13%
243	Archivists, librarians and related information professionals	16488	0.10%	40	0.33%	0.23%	-226%
244	Social science and related professionals	98319	0.61%	228	1.90%	1.29%	-212%
245	Writers and creative or performing artists	75684	0.47%	158	1.31%	0.85%	-181%
246	Religious professionals	10735	0.07%	6	0.05%	-0.02%	25%
247	Scientific administration employees	0		2	0.02%	0.02%	
311	Physical and engineering science technicians	120371	0.74%	219	1.82%	1.08%	-145%
312	Computer associate professionals	126217	0.78%	292	2.43%	1.65%	-211%
313	Optical and electronic equipment operators	33262	0.21%	71	0.59%	0.38%	-187%
314	Ship and aircraft controllers and technicians	8416	0.05%	17	0.14%	0.09%	-172%
315	Safety and quality inspectors	42577	0.26%	58	0.48%	0.22%	-83%
321	Life science technicians and related associate professionals	14114	0.09%	88	0.73%	0.64%	-739%
322	Health associate professionals (except nursing)	104135	0.64%	261	2.17%	1.53%	-237%
323	Nursing and midwifery associate professionals	0		53	0.44%	0.44%	

324	Traditional medicine practitioners and faith healers	0		#N/A	#N/A	#N/A	#N/A
331	Primary education teaching associate professionals	795	0.00%	64	0.53%	0.53%	-10730%
332	Pre-primary education teaching associate professionals	776	0.00%	9	0.07%	0.07%	-1460%
333	Special education teaching associate professionals	995	0.01%	15	0.12%	0.12%	-1928%
334	Other teaching associate professionals	10970	0.07%	30	0.25%	0.18%	-268%
341	Finance and sales associate professionals	411123	2.54%	288	2.39%	-0.15%	6%
342	Business services agents and trade brokers	5925	0.04%	39	0.32%	0.29%	-786%
343	Administrative associate professionals	606426	3.75%	226	1.88%	-1.87%	50%
344	Customs, tax and related government associate professionals	23638	0.15%	50	0.42%	0.27%	-185%
345	Police inspectors and detectives	151900	0.94%	10	0.08%	-0.86%	91%
346	Social work associate professionals	33701	0.21%	14	0.12%	-0.09%	44%
347	Artistic, entertainment and sports associate professionals	73411	0.45%	168	1.40%	0.94%	-208%
348	Religious associate professionals	283	0.00%	0	0.00%	0.00%	100%
411	Secretaries and keyboard-operating clerks	35608	0.22%	347	2.88%	2.66%	-1211%
412	Numerical clerks	223913	1.38%	869	7.22%	5.84%	-422%
413	Material-recording and transport clerks	125524	0.78%	755	6.28%	5.50%	-709%
414	Library, mail and related clerks	98984	0.61%	254	2.11%	1.50%	-245%
419	Other office clerks	804063	4.97%	372	3.09%	-1.88%	38%
421	Cashiers, tellers and related clerks	145505	0.90%	125	1.04%	0.14%	-16%
422	Client information clerks	152618	0.94%	399	3.32%	2.37%	-252%
511	Travel attendants and related workers	25220	0.16%	36	0.30%	0.14%	-92%
512	Housekeeping and restaurant services workers	708926	4.38%	305	2.54%	-1.85%	42%
513	Personal care and related workers	366726	2.27%	130	1.08%	-1.19%	52%
514	Other personal services workers	141614	0.88%	51	0.42%	-0.45%	52%
515	Astrologers, fortune-tellers and related workers	0	0.00%	#N/A	#N/A	#N/A	#N/A
516	Protective services workers	161004	0.99%	59	0.49%	-0.50%	51%
521	Fashion and other models	19796	0.12%	0	0.00%	-0.12%	100%
522	Shop, stall and market salespersons and demonstrators	1004411	6.21%	269	2.24%	-3.97%	64%
523	Stall and market salespersons	0	0.00%	#N/A	#N/A	#N/A	#N/A
611	Market gardeners and crop growers	391292	2.42%	20	0.17%	-2.25%	93%
612	Market-oriented animal producers and related workers	138635	0.86%	11	0.09%	-0.77%	89%
613	Market-oriented crop and animal producers	3359	0.02%	8	0.07%	0.05%	-220%
614	Forestry and related workers	20882	0.13%	4	0.03%	-0.10%	74%
615	Fishery workers, hunters and trappers	43201	0.27%	1	0.01%	-0.26%	97%
621	Subsistence agricultural and fishery workers	0	0.00%	#N/A	#N/A	#N/A	#N/A
711	Miners, shotfirers, stone cutters and carvers	20817	0.13%	3	0.02%	-0.10%	81%
712	Building frame and related trades workers	920788	5.69%	139	1.16%	-4.53%	80%
713	Building finishers and related trades workers	441685	2.73%	116	0.96%	-1.77%	65%
714	Painters, building structure	132024	0.82%	18	0.15%	-0.67%	82%

	cleaners and related trades workers						
721	Metal moulders, welders, sheet-metal workers, structural-metal preparers, and related trades workers	206471	1.28%	81	0.67%	-0.60%	47%
722	Blacksmiths, tool-makers and related trades workers	76789	0.47%	45	0.37%	-0.10%	21%
723	Machinery mechanics and fitters	350478	2.17%	112	0.93%	-1.23%	57%
724	Electrical and electronic equipment mechanics and fitters	156940	0.97%	79	0.66%	-0.31%	32%
731	Precision workers in metal and related materials	9570	0.06%	13	0.11%	0.05%	-83%
732	Potters, glass-makers and related trades workers	26256	0.16%	6	0.05%	-0.11%	69%
733	Handicraft workers in wood, textile, leather and related materials	46323	0.29%	6	0.05%	-0.24%	83%
734	Printing and related trades workers	76370	0.47%	10	0.08%	-0.39%	82%
741	Food processing and related trades workers	156657	0.97%	70	0.58%	-0.39%	40%
742	Wood treaters, cabinet-makers and related trades workers	40830	0.25%	6	0.05%	-0.20%	80%
743	Textile, garment and related trades workers	91085	0.56%	11	0.09%	-0.47%	84%
744	Pelt, leather and shoemaking trades workers	34620	0.21%	3	0.02%	-0.19%	88%
811	Mining and mineral-processing-plant operators	7852	0.05%	19	0.16%	0.11%	-226%
812	Metal-processing plant operators	36463	0.23%	17	0.14%	-0.08%	37%
813	Glass, ceramics and related plant operators	28233	0.17%	6	0.05%	-0.12%	71%
814	Wood-processing- and paper-making-plant operators	16495	0.10%	7	0.06%	-0.04%	43%
815	Chemical-processing-plant operators	36811	0.23%	62	0.52%	0.29%	-127%
816	Power-production and related plant operators	4586	0.03%	16	0.13%	0.10%	-369%
817	Automated-assembly-line and industrial-robot operators	42303	0.26%	#N/A	#N/A	#N/A	#N/A
821	Metal- and mineral-products machine operators	185875	1.15%	54	0.45%	-0.70%	61%
822	Chemical-products machine operators	54987	0.34%	13	0.11%	-0.23%	68%
823	Rubber- and plastic-products machine operators	68777	0.43%	25	0.21%	-0.22%	51%
824	Wood-products machine operators	19720	0.12%	12	0.10%	-0.02%	18%
825	Printing-, binding- and paper-products machine operators	35912	0.22%	44	0.37%	0.14%	-65%
826	Textile-, fur- and leather-products machine operators	148749	0.92%	8	0.07%	-0.85%	93%
827	Food and related products machine operators	106881	0.66%	32	0.27%	-0.39%	60%
828	Assemblers	124664	0.77%	64	0.53%	-0.24%	31%
829	Other machine operators and assemblers	6548	0.04%	3	0.02%	-0.02%	38%
831	Locomotive engine drivers and related workers	16128	0.10%	7	0.06%	-0.04%	42%
832	Motor-vehicle drivers	679517	4.20%	169	1.40%	-2.79%	67%
833	Agricultural and other mobile-plant operators	127881	0.79%	68	0.57%	-0.22%	28%
834	Ships' deck crews and related workers	5218	0.03%	7	0.06%	0.03%	-80%
911	Street vendors and related	116027	0.72%	2	0.02%	-0.70%	98%

	workers						
912	Shoe cleaning and other street services elementary occupations	5671	0.04%	0	0.00%	-0.04%	100%
913	Domestic and related helpers, cleaners and launderers	760973	4.70%	124	1.03%	-3.67%	78%
914	Building caretakers, window and related cleaners	79982	0.49%	76	0.63%	0.14%	-28%
915	Messengers, porters, doorkeepers and related workers	52728	0.33%	75	0.62%	0.30%	-91%
916	Garbage collectors and related labourers	58972	0.36%	17	0.14%	-0.22%	61%
921	Agricultural, fishery and related labourers	342046	2.11%	9	0.07%	-2.04%	96%
931	Mining and construction labourers	360250	2.23%	69	0.57%	-1.65%	74%
932	Manufacturing labourers			50	0.42%		
933	Transport labourers and freight handlers	124734	0.77%	25	0.21%	-0.56%	73%
	Unknown	0	0.00%				
		16182579	100%	11979	100%		