**Appendix A (Harmonisation of Variables)**

**Education**

Although different, the ABSCQ and ASCED education classifications share similar structures and conceptual bases that allow their comparison. Both classifications divide the population into those with no post-school qualification and those with some post-school qualification. In addition, they further categorise those in the latter group according to their highest level of qualification. The ABSCQ includes seven categories of post-school qualifications ordered from highest to lowest level of education qualification: higher degree, postgraduate diploma, bachelor’s degree, undergraduate diploma, associate diploma, and skilled and basic vocational qualifications. The ASCED reduced the number of categories to five including postgraduate degree, graduate diploma and graduate certificate, bachelor’s degree, advanced diploma and diploma level, and certificate level.

Inspection of the correspondences in ABS (2001) reveals a high degree of concordance between post-school qualifications in the ABSCQ and ASCED classifications. Indeed, there is a perfect correspondence between the top three categories of both classifications justifying their inclusion in the *bachelor’s degree and higher* category of the new harmonised classification. The *diploma and advance diploma* harmonised category includes the undergraduate and associate diploma categories of the ABSCQ and the advanced diploma and diploma level categories of the ASCED. The decision to group these categories is justified by the nearly perfect match between diploma qualifications in the ABSCQ and ASCED classifications. The only exception is the Certificate IV qualification, which is recorded as a certificate level qualification in the ASCED but as an associate diploma in the ABSCQ. There is also an almost perfect correspondence between the vocational qualifications in the ABSCQ and the certificate level category of the ASCED. Indeed, all the skilled and basic vocational qualifications in the ABSCQ are recorded as certificates in the ASCED. Moreover, apart from the Certificate IV which is classified as an associate diploma, all the certificates in the ASCED are recorded as either skilled or basic vocational qualifications in the ABSCQ. Thus, these categories are included in the *certificate level* category of the harmonised classification allowing meaningful comparisons of those educational levels between years. Unfortunately, the lack of more desegregated data precludes the reclassification Certificates IV to ensure a perfect correspondence between the ABSCQ and ASCED classifications.

**Occupations**

Both the ASCO1 and ANZSCO divide occupations into eight categories. In the ASCO1, these are: (1) managers and administrators; (2) professionals; (3) para-professionals; (4) trades persons; (5) clerks; (6) sales persons and personal service workers; (7) plant machine operators and drivers; and (8) labourers. The categories of the ANZSCO are: (1) managers; (2) professionals; (3) technicians and trades workers; (4) community and personal service workers; (5) clerical and administrative workers; (6) sales workers; (7) machinery operators and drivers; and (8) labourers. Both the ASCO and the ANZSCO provide a skilled-based classification of occupations and jobs with differences between them reflecting changes in labour markets and the occupational structure. These include changes in the skill content of occupations and the emergence of new occupations, most noticeably in IT and other technological sectors, as well as, the disappearance of occupations such as those involving routine tasks subject to automation.

The ASCO2 classification divides occupations into nine categories whose nomenclature is very similar to that of the ASCO1 and ANZSCO classifications: (1) managers and administrators; (2) professionals; (3) associate professionals; (4) tradespersons and related workers; (5) advanced clerical and serviced workers; (6) intermediate clerical, sales, and service workers; (7) intermediate production and transport workers; (8) elementary clerical, sales and service workers; and (9) labourers and related workers. In contrast with the ASCO1 and ANZSCO, the ASCO2 classification includes a hierarchy of clerical jobs differentiating between advanced, intermediate, and elementary clerical jobs. The classification of legal clerks is a good illustration of this. Thus, for example, the ASCO2 distinguishes trust officers from bailiffs considering the former advanced and the latter intermediate, whereas in the ASCO1 those types of occupations are grouped together in the legal clerks category. Similarly, while in the ANZSCO all call centre occupations are included in the category (5) of that classification, the ASCO2 classifies some of those occupations as intermediate inquiry clerks (group 6) and others as intermediate switchboard operators (group 8). The ASCO2’s structure of occupations at other skill levels resembles more that of ASCO1 and ANZSCO. As we discuss below, this is particularly true for high and low-skilled categories of occupations, which is important given our interest in groups at the top and the bottom of the socioeconomic ladder.

To create the harmonised classification, we performed a two-way triangulation analysis using the ASCO1-ANZSCO and ANZSCO-ASCO1 correspondences.[[1]](#footnote-1) In particular, we combined data on the correspondences between 6-digit level categories in the ASCO1 and ASCO2 (ABS, 1997) and the correspondences between 6-digit categories in the ASCO2 and ANZSCO (ABS, 2019). We used those data to compute the following figures: the percentage of occupations within each of the eight ASCO1 categories with a partial or complete correspondence with each of the nine categories of the ASCO2 classification; the proportion of occupations within each of the nine ASCO2 categories with some correspondence with each of the eight categories of the ANZSCO classification; the proportion of occupations in each of the eight ANZSCO categories with some correspondence with each of the ASCO2 categories; and the percentage of occupations in each ASCO2 category with some correspondence with each of the ASCO1 categories.

The decision to use a parsimonious classification was guided by the results from the analysis and is motivated for various reasons. Given our interest in low- and high-skilled groups, it seems natural to define categories capturing occupations at the top and the bottom of the occupations hierarchy. This decision was also supported by the large correspondence between top and bottom occupation categories of the of the ASCO1, ASCO2, and ANZSCO classifications. The reason to use a parsimonious classification also stems from our interest in reducing the risk of misclassification associated to more narrowly defined categories of occupations. Thus, compared to other alternatives, the three-group classification provides a better match between ASCO1, ASCO2, and ANZSCO categories than others comprising more groups.

The triangulation of the correspondences reveals a large correspondence between managerial and professional occupations in the ASCO1 and ANZSCO classifications. Indeed, more than 92 per cent of the 6-digit groups in the ASCO1 categories (1) and (2) fall entirely within categories (1) and (2) of the ASCO2 classification. In turn, more than 94 per cent of the 6-digit groups in those ASCO2 categories correspond exclusively to categories (1) and (2) in the ANZSCO classification. The correspondence between ANZSCO and ASCO1 categories was found to be very high as well. In fact, nearly 80 per cent of the 6-digit groups in the ANZSCO categories (1) and (2) fall entirely within categories (1) and (2) of the ASCO2 classification with more than 86 per cent of the 6-digit groups matching exclusively with occupations in categories (1) and (2) of the ASCO1. The lower correspondence between the top two categories of ANZSCO and ASCO2 is explained by the reclassification of many associate professionals in the category (3) of the ASCO2 as managers in the ANZSCO classification. The ASCO2’s category of associate professionals is closely linked to the ASCO1 category of para-professional occupations (category 3). However, the inclusion of that category in the top category of our harmonised classification significantly reduces the triangulated correspondence as the majority of occupations in the ASCO2’s category of associate professionals correspond to categories (3)-(6) of the ANZSC classification.

The correspondence analysis suggests a high degree of correspondence between the low-skilled categories (7) and (8) of the ASCO1 and ANZSCO included in our *bottom* category. Thus, more than 85 per cent of the 6-digit groups in the ASCO1 categories (7) and (8) correspond exclusively to categories (7) and (9) of the ASCO2 classification. Importantly, all the 6-digit groups in those ASCO2 categories have some level of correspondence with the ANZSCO categories (7) and (8) and about 94 of them fall entirely within those ANZSCO categories. As for the correspondence between ANZSCO and ASCO1, we find that the majority of machinery operators, drivers and labourers in the ANZSCO classification correspond to intermediate productions, transport, and labourers occupations in ASCO2. Indeed, about 80 per cent of the 6-digit groups in the ANZSCO’s categories (7) and (8) correspond exclusively to categories (7) and (9) of the ASCO2. The lack of perfect correspondence is due to the reclassification of some of labourers and machinery jobs in the ANZSCO as elemental clerical jobs in the ASCO2. There is a nearly perfect correspondence between the ASCO2’s categories (7) and (9) and categories (7) and (8) of the ASCO1. When defining the *bottom* category, we also considered the inclusion of sales workers and personal services occupations. However, including those categories significantly reduced the estimated correspondence between low-skilled occupations and therefore its inclusion was finally discarded.

The *middle* category was defined as a residual category comprising middle-skilled occupations included in categories (3)-(6) of the ASCO1 and ANZSCO classifications. The vast majority (84 per cent) of the 6-digit groups in the ASCO1’s categories (3)-(6) correspond exclusively to categories (3)-(6) and (8) of the ASCO2 classification. In turn, 90 and 83 per cent of the 6-digit groups in those ASCO2 categories correspond, respectively, with categories (3)-(6) of the ANZSCO classification suggesting a high correspondence between middle-skilled categories in ASCO1 and ANZSCO. Similarly, more than 93 per cent of the 6-digit groups of the ANZSCO’s categories (3)-(6) fall exclusively within categories (3)-(6) and (8) of the ASCO2 classification. These categories have a very high correspondence with the ASCO1 groups (3)-(6) suggesting a good match between ANZSCO and ASCO1 groups. Thus, about 86 per cent of the 6-digit groups in the ASCO2’s (3)-(6) and (8) categories correspond exclusively to categories (3)-(6) in the ASCO1.

**References**

ABS – Australian Bureau of Statistics (1997). ASCO Australian Standard Classification of Occupations. Second Edition 1997. Canberra: ABS.

ABS – Australian Bureau of Statistics (2019). Correspondence Tables- ANZSCO First Edition Revision 1 to ASCO Second Edition. Cat no. 1220.0. Canberra: ABS (<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/1220.0First%20Edition,%20Revision%201?OpenDocument>, accessed on 13/04/2019).

**Appendix B (Tables and Figures)**

**Table B1.** Overall segregation (indices *IP* and *M*), SSD level

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***IP* index** | | | | | |
|  | **Sydney** | **Melbourne** | **Brisbane** | **Adelaide** | **Perth** |
| **Education** |  |  |  |  |  |
| 1991 | 0.073 | 0.068 | 0.041 | 0.057 | 0.033 |
| 2011 | 0.121 | 0.107 | 0.102 | 0.075 | 0.043 |
| (%) | 65.8 | 57.4 | 148.8 | 31.6 | 30.3 |
| **Occupation** |  |  |  |  |  |
| 1991 | 0.075 | 0.078 | 0.044 | 0.063 | 0.043 |
| 2011 | 0.110 | 0.100 | 0.085 | 0.068 | 0.043 |
| (%) | 46.7 | 28.2 | 93.2 | 6.3 | 0.0 |
| ***M* index** | | | | | |
|  | **Sydney** | **Melbourne** | **Brisbane** | **Adelaide** | **Perth** |
| **Education** |  |  |  |  |  |
| 1991 | 0.025 | 0.024 | 0.010 | 0.017 | 0.010 |
| 2011 | 0.044 | 0.037 | 0.039 | 0.022 | 0.015 |
| (%) | 76.0 | 58.3 | 290.0 | 29.4 | 50.0 |
| **Occupation** |  |  |  |  |  |
| 1991 | 0.024 | 0.026 | 0.008 | 0.018 | 0.009 |
| 2011 | 0.037 | 0.035 | 0.027 | 0.019 | 0.012 |
| (%) | 50.0 | 34.6 | 237.5 | 5.6 | 33.3 |

*Source*: Authors’ calculation using the new harmonised dataset

**Table B2.** Segregation of the groups (indices *Dg* and), SSD level

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Dg*Index** (consistent with *IP*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **Sydney** | | | | | **Melbourne** | | | | | | | **Brisbane** | | | | | | | | **Adelaide** | | | | | | | | | **Perth** | | | | |
| **EDUCATION** | **1991** | **2011** | | (%) | | **1991** | | **2011** | | (%) | | | **1991** | | | **2011** | | (%) | | | **1991** | | | **2011** | | | (%) | | | **1991** | | | **2011** | (%) |
| Bachelor´s degree | 0.247 | 0.194 | | -21.1 | | 0.223 | | 0.186 | | -16.1 | | | 0.185 | | | 0.209 | | 12.4 | | | 0.224 | | | 0.148 | | | -33.9 | | | 0.147 | | | 0.091 | -38.8 |
| Diploma | 0.108 | 0.062 | | -42.6 | | 0.123 | | 0.042 | | -66.7 | | | 0.068 | | | 0.048 | | -30.9 | | | 0.122 | | | 0.05 | | | -59.0 | | | 0.042 | | | 0.02 | -52.4 |
| Certificate | 0.07 | 0.119 | | 70.0 | | 0.087 | | 0.133 | | 54.0 | | | 0.061 | | | 0.109 | | 77.0 | | | 0.048 | | | 0.075 | | | 56.3 | | | 0.043 | | | 0.045 | 2.3 |
| No post-school | 0.042 | 0.091 | | 119.0 | | 0.035 | | 0.067 | | 91.4 | | | 0.016 | | | 0.06 | | 268.8 | | | 0.034 | | | 0.05 | | | 47.1 | | | 0.014 | | | 0.025 | 78.6 |
| **Index** (consistent with *M*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **Sydney** | | | | | **Melbourne** | | | | | | | | **Brisbane** | | | | | | | **Adelaide** | | | | | | | | | **Perth** | | | | |
| **EDUCATION** | **1991** | **2011** | | (%) | | **1991** | | **2011** | | (%) | | | | **1991** | | **2011** | | (%) | | | **1991** | | | **2011** | | | (%) | | | **1991** | | | **2011** | (%) |
| Bachelor’s degree | 0.151 | 0.097 | | -36.4 | | 0.142 | | 0.087 | | -39.4 | | | | 0.083 | | 0.118 | | 43.4 | | | 0.148 | | | 0.074 | | | -50.0 | | | 0.077 | | | 0.042 | -45.5 |
| Diploma | 0.041 | 0.01 | | -73.2 | | 0.043 | | 0.005 | | -88.4 | | | | 0.013 | | 0.006 | | -53.8 | | | 0.034 | | | 0.006 | | | -82.4 | | | 0.008 | | | 0.001 | -87.5 |
| Certificate | 0.013 | 0.041 | | 215.4 | | 0.022 | | 0.047 | | 113.6 | | | | 0.009 | | 0.029 | | 222.2 | | | 0.006 | | | 0.018 | | | 200.0 | | | 0.009 | | | 0.015 | 66.7 |
| No post-school | 0.005 | 0.021 | | 320.0 | | 0.004 | | 0.013 | | 250.% | | | | 0.001 | | 0.012 | | 1100.0 | | | 0.003 | | | 0.007 | | | 133.3 | | | 0.001 | | | 0.005 | 400.0 |
| ***Dg* Index** (consistent with *IP*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **Sydney** | | | | | **Melbourne** | | | | | | | | | **Brisbane** | | | | | **Adelaide** | | | | | | | | | **Perth** | | | | | |
| **OCCUPATION** | **1991** | **2011** | | (%) | | **1991** | | **2011** | | | (%) | | | | **1991** | **2011** | | (%) | | **1991** | | | **2011** | | | (%) | | | **1991** | | | **2011** | | (%) |
| Top | 0.131 | 0.137 | | 4.6 | | 0.132 | | 0.132 | | | 0.8 | | | | 0.09 | 0.12 | | 33.3 | | 0.125 | | | 0.093 | | | -25.7 | | | 0.076 | | | 0.059 | | -21.1 |
| Middle | 0.028 | 0.056 | | 96.4 | | 0.03 | | 0.049 | | | 66.7 | | | | 0.014 | 0.04 | | 185.7 | | 0.02 | | | 0.032 | | | 58.4 | | | 0.024 | | | 0.025 | | 4.2 |
| Bottom | 0.132 | 0.221 | | 67.4 | | 0.138 | | 0.186 | | | 35.5 | | | | 0.074 | 0.148 | | 100.0 | | 0.109 | | | 0.127 | | | 16.86 | | | 0.061 | | | 0.067 | | 9.8 |
| **Index** (consistent with *M*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | **Sydney** | | | | | | **Melbourne** | | | | | | | | **Brisbane** | | | | **Adelaide** | | | | | | | | | **Perth** | | | | | | |
| **OCCUPATION** | **1991** | | **2011** | | (%) | | **1991** | | **2011** | | | (%) | | | **1991** | **2011** | (%) | | **1991** | | | **2011** | | | (%) | | | **1991** | | | **2011** | | | (%) |
| Top | 0.048 | | 0.044 | | -8.3 | | 0.052 | | 0.044 | | | -15.4 | | | 0.02 | 0.042 | 110.0 | | 0.046 | | | 0.03 | | | -35.2 | | | 0.024 | | | 0.019 | | | -20.8 |
| Middle | 0.002 | | 0.008 | | 250.0 | | 0.003 | | 0.007 | | | 166.7 | | | 0.0005 | 0.005 | 892.6 | | 0.001 | | | 0.003 | | | 170.8 | | | 0.002 | | | 0.004 | | | 100.0 |
| Bottom | 0.055 | | 0.118 | | 116.4 | | 0.054 | | 0.103 | | | 90.7 | | | 0.014 | 0.067 | 378.6 | | 0.031 | | | 0.046 | | | 50.5 | | | 0.012 | | | 0.023 | | | 91.7 |

*Source*: Authors’ calculation using the new harmonised dataset

**Table B3.** Quintiles of the distribution in each city in 1991

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **P20** | **P40** | **P60** | **P80** |
| Sydney | 0.714 | 0.952 | 1.042 | 1.215 |
| Melbourne | 0.730 | 0.942 | 1.036 | 1.207 |
| Brisbane | 0.777 | 0.959 | 1.029 | 1.140 |
| Adelaide | 0.767 | 0.932 | 1.029 | 1.133 |
| Perth | 0.801 | 0.941 | 1.032 | 1.141 |

*Source*: Authors’ calculation using the new harmonised dataset

|  |  |
| --- | --- |
| Top occupations, 1991 | Top occupations, 2011 |
| C:\Users\usuario\AppData\Local\Temp\Rar$DR12.5693\Perth_top_1991.png | C:\Users\usuario\AppData\Local\Temp\Rar$DR10.7895\Perth_top_2011.png |
| Middle occupations, 1991 | Middle occupations, 2011 |
| C:\Users\usuario\AppData\Local\Temp\Rar$DR13.3685\Perth_Mid_1991.png | C:\Users\usuario\AppData\Local\Temp\Rar$DR13.5525\Perth_Mid_2011.png |
| Bottom occupations, 1991 | Bottom occupations, 2011 |
| C:\Users\usuario\AppData\Local\Temp\Rar$DR15.4437\Perth_bottom_1991.png | C:\Users\usuario\AppData\Local\Temp\Rar$DR14.8804\Perth_bottom_2011.png |

**Figure B1.** Representation of occupation groups in each SLA, Perth

|  |  |
| --- | --- |
| Top occupations, 1991 | Top occupations, 2011 |
| C:\Users\usuario\AppData\Local\Temp\Rar$DR29.8067\Adelaide_top_1991.png | C:\Users\usuario\AppData\Local\Temp\Rar$DR29.2619\Adelaide_top_2011.png |
| Middle occupations, 1991 | Middle occupations, 2011 |
| C:\Users\usuario\AppData\Local\Temp\Rar$DR35.5396\Adelaide_mid_1991.png | C:\Users\usuario\AppData\Local\Temp\Rar$DR35.6506\Adelaide_mid_2011.png |
| Bottom occupations, 1991 | Bottom occupations, 2011 |
| C:\Users\usuario\AppData\Local\Temp\Rar$DR36.6073\Adelaide_bottom_1991.png | C:\Users\usuario\AppData\Local\Temp\Rar$DR35.4315\Adelaide_bottom_2011.png |

**Figure B2.** Representation of occupation groups in each SLA, Adelaide

1. The data on the correspondences and the Stata code used to compute all the figures used in the construction of the harmonised categories are provided as part of the supplemental materials. [↑](#footnote-ref-1)