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## Distance between occupations in the task complexity space

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## **UP School of Economics** **Discussion Papers**

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### **Distance between occupations in the task complexity space**

by

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# Distance between occupations in the task complexity space<sup>1</sup>

## Abstract

Using the task-based framework, this study measures the level of skill transferability across occupations by building an occupational distance measure. The distance measure allows us to compare occupations in terms of their task profiles. Skill transferability between two occupations is high if the occupations are 'close' with each other and low if occupations are 'far' from each. In addition, the distance measure allows us to classify which occupational moves are considered an upskilling, down-skilling or lateral occupational moves. The occupational distance measure is also applied to the sample of TVET graduates to measure their level of occupational mobility pre- and post-training. This has important implications in terms of the amount of additional training and education needed by individuals to move from one occupation to another. This study constitutes a basis for further studies on understanding the relationship among occupational distances, mobility and wage differentials in different economies.

**JEL Classification:** J24, J62

**Keywords:** Tasks, Skills, Human Capital, Occupational Mobility

The changing labor market environment brought about by globalization and the advent of the fourth industrial revolution (4IR) calls for better understanding of the extent of skill transferability. Individuals working in a particular occupation, belonging to a specific industry and sector must reconsider other opportunities outside their current work arrangement. Thus, workers need to retool and reskill by engaging in retraining and education to better adapt to the evolving occupations and emergence of new occupations<sup>2</sup>.

Measuring the extent of skill transferability revolves around the notion of human capital specificity. Skills may be transferable only across industries [Neal (1995); Parent (2000)], across firms [Becker 1993(1964)] or even across occupations [Kambourov and Manovskii 2009] making human capital industry-, firm- and occupation-specific, respectively. This means that regardless of occupational mobility, human capital can be preserved at different levels depending on one's view on specificity.

The task-based framework treats occupations not as discrete categories but rather as bundles of tasks<sup>3</sup>. This approach views human capital as task-specific which implies that the productivity of certain skills in an occupation is lost when a different skillset is required to perform the tasks in the new occupation. In other words, unlike occupation-specific skills, when individuals change occupations, their human capital is not fully lost if they continue to perform similar tasks in their

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<sup>1</sup> This paper draws heavily from Generalao [2019a], an unpublished master's thesis, which builds an occupational distance measure and uses it as a proxy for a training-job mismatch measure.

<sup>2</sup> See Khatiwada and Veloso (2019). New technology and emerging occupations: Evidence from Asia.

<sup>3</sup> The assignment of skills to tasks depends on labor market prices and is considered endogenous in the model. The use of tasks as proxies for unobserved worker skills and the assumption that skill prices are constant are developed by Autor et al. [2003], Ingram and Neumann [2006], and Autor and Handel [2013]. Yamaguchi [2012] challenges this assumption stating that skill prices vary by the complexity of the task in a given occupation.

new occupation. For example, a carpenter who decides to become a cabinet maker does not lose human capital in the process since he will still perform tasks of the same nature in his new occupation. The opposite can happen if the carpenter becomes a machine operator where much of his task-specific human capital will be left unused and will depreciate.

One of the applications of the task-based approach is measuring the degree of similarity between occupations in terms of their task contents [(Polataev and Robinson [2008]; Gathmann and Schönberg [2010]; Nedelkoska et al. [2015]; Robinson [2018]). This paper builds an occupational distance measure to estimate this magnitude using the task profiles developed by Generalao [2019b]. Comparing occupations using this measure allows us to identify which occupations are 'close' or 'far' from each other and to determine how similar or different occupations from each other. We apply the task-based framework to examine the degree of skill transferability across occupations and specifically in the sample of vocational training. Skill transferability between two occupations is high if the occupations are similar in their skill vectors which are derived from the tasks performed in the occupation. It implies that a move from, say, occupation A to B, will incur little to no costs for the individual. On the other hand, low skill transferability between two occupations is deemed to be a skill mismatch which is both costly to the individual in monetary and nonmonetary terms.

## **Related literature**

Several studies (Poletaev and Robinson [2008]; Lazear [2009]; Gathmann and Schönberg [2010]; Nedelkoska et al. [2015]; Bechichii et al. [2018]) have built measures of distance between jobs in terms of the underlying skills and tasks that these jobs require. These distance measures are constructed from the task portfolios describing the nature of the tasks performed in the occupation.

Robinson [2018] identifies two approaches in the task-based literature that are used in constructing the distance measure. The first one uses a relatively small number of skills or task measures such as that of Gathmann and Schönberg [2010] while the other one uses factor analysis or principal component analysis to extract a smaller number of task measures from a larger dimension vector of measures (Poletaev and Robinson [2008]; Robinson [2018]).

Three data sets are prominently cited in the task-based literature. These are (1) US O\*NET, (2) Germany's QCS and (3) The Survey of Adult Skills by the PIACC. The first and third datasets have been used in the second approach. O\*NET was developed by the U.S. Department of Labor to provide standardized occupational information for an employment service which matches job applicants with job openings. It contains a multitude of occupation characteristics with detailed definitions and that are rated using a multipoint scale. These are converted to task scores for each occupation using factor analysis and principal component analysis. The Survey of Adult Skills by PIACC is a recent survey which "measures adults' proficiency in key information-processing skills literacy, numeracy and problem solving in technology-rich environments and gathers information and data on how adults use their skills at home, at work and in the wider community." On the other hand, Gathmann and Schönberg [2010] use 19 task indicators and aggregate them to three task classifications. Survey scores for each classification comprise the task portfolio of each occupation.

The distance measures based on the two approaches still have drawbacks. For the distance measure constructed using the first approach, Bechichii et al. [2018] point out its failure to take into consideration the relative importance of skills in an occupation. In a similar vein, although the distance measure by Poletaev and Robinson [2008] using factor analysis is computationally simple, its lack of accounting for the direction of the skill change (upskilling or down-skilling) makes it problematic. Both measures are symmetric in nature and are indifferent towards the possible differences between occupations in terms of the absolute intensity of skill requirements. As noted by Bechichii et al. [2018], managers and salespeople may both be using their negotiation skills intensively, say in 70 percent of all their tasks, but the absolute intensity of their skill requirements is not the same. That is, managers require higher levels of negotiation skills than salespeople do.

Nedelkoska et al. [2015] introduce a distance measure of skill similarities between occupations that takes into account not just the magnitude of the distance but also the direction (that is, either upward or downward) of the occupational move. However, the validity of years of schooling as proxy for the complexity of the skills needed for the occupation remains debatable. One might argue that acquiring skills is not only attributed to schooling but also to the learning-by-doing effects of continuous work measured by work experience.

### **Occupational distance measure**

To derive an occupational distance measure, we begin by adopting the task profiles of occupations by Generalao (2019b). Table 1 below illustrates the task profiles of 14 of the 424 occupations. It tells us the intensity of an occupation in terms of performing different task types (non-routine analytical, routine manual, etc.) relative to the other occupations. The numbers in each table entry are normalized task scores from the relative proportion of each task type in each occupation<sup>4</sup>.

Note that the task types will vary depending on the literature being adapted in the methodology. For instance, Ingram and Neumann [2006] categorize skills into (1) intelligence, (2) clerical, (3) fine motor and (4) strength. From the five-task classification scheme of Autor et al. [2003], Spitz-Oener [2006], Antonczyk et al. [2009], the non-routine analytical is combined with non-routine interpersonal to form category (1) while routine cognitive fits the category (2). Non-routine manual skills are linked to category (3), while routine manual requires strength in general. Gathmann and Schönberg [2010] categorize task types into another different set of task types which are cognitive, manual or interpersonal. Similar to Gathmann and Schönberg [2010], Autor and Handel [2013] also adopt three broad task categories which are abstract, routine and manual. Following Autor and Handel [2013], this paper reduces the five classifications to these three. Non-routine analytical and interpersonal skills are collapsed to abstract skills. Non-routine manual skills represent manual skills. Routine manual and cognitive skills determine the routine task category.

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<sup>4</sup> See Generalao (2019b) for the detailed methodology.

**Table 1. Task profiles of selected occupations using the five-task classification scheme**

PSOC	occupation	non-routine analytical	non-routine interpersonal	non-routine manual	routine manual	routine cognitive
2411	Accountants	2.237	-0.742	-0.745	-0.438	-0.472
4311	Accounting and Bookkeeping Clerks	-0.128	-0.742	-0.745	-0.438	1.935
3313	Accounting Associate Professionals	0.923	-0.017	-0.745	-0.438	0.271
2655	Actors	-0.329	1.743	-0.745	-0.438	0.101
3343	Administrative and Executive Secretaries	-0.829	0.345	-0.745	-0.438	1.757
2431	Advertising and Marketing Professionals	2.286	-0.259	-0.745	-0.438	-0.918
1222	Advertising and Public Relations Managers	0.047	2.520	-0.745	-0.438	-0.918
1343	Aged Care Services Managers	0.572	1.433	-0.745	-0.438	-0.561
1311	Agricultural and Forestry Production Managers	0.631	1.433	-0.745	-0.438	-0.621
7233	Agricultural and Industrial Machinery Mechanics and Repairers	-0.829	-0.742	0.583	0.221	0.610
3142	Agricultural Technicians	1.118	-0.259	0.288	-0.438	-0.918
7127	Air Conditioning and Refrigeration Mechanics	0.047	-0.742	0.805	-0.438	-0.027
3154	Air Traffic Controllers	0.047	0.345	0.030	-0.438	-0.027
3155	Air Traffic Safety Electronics Technicians	0.728	0.225	-0.745	-0.438	0.271

**Source:** Selection section of Table 12, Generalao (2019) p.12

### Distance measure

This paper follows Robinson [2018] in defining the distance between occupations. The distance between occupations is the measure of how different occupations are from each other based on the skill vector derived from their task contents. It explains the magnitude of the scaling up or down of the entire task portfolio in terms of a one standard deviation change in all the skill components. For example, a move from being a cabinet maker to a call center agent is generally a scaling up in terms of cognitive and interpersonal skills and a scaling down in terms of non-routine manual or finger dexterity related skills.

The normalized task scores from Table 1, and the remaining occupations, will serve as the vector of factor task scores as proposed by Robinson [2018].<sup>5</sup>

The distance measure of an individual moving from occupation A to B is defined as:

$$Euclidean\ Distance_{AB} = \left( \sum_{k=1}^n (x_{Bk} - x_{Ak})^2 \right)^{0.5} \quad (1)$$

where  $x_{Bk}$  is the factor score of occupation B in terms of the  $k$ th factor.

The number of factors,  $n$ , depends on which task classification scheme is adopted.

We simply substitute the task scores in Equation 1 and compute for the distance between the two occupations.

<sup>5</sup> See also Nedelkoska et al. [2015].

### Direction measure

Assigning a direction is needed to classify a move from working as a cabinet maker to a call center agent as either upskilling, down-skilling or a lateral move. While the distance measure estimates the absolute difference between two occupations, the sign of the direction measure determines whether an occupational move is an upskilling or down-skilling. A positive sign means that the mobility involves upskilling and suggests human capital accumulation. A negative sign implies human capital loss from the down-skilling move. Thus, the direction of an occupational move is crucial when analyzing occupational moves. So far, only Nedelkoska et al. [2015] and more recently Robinson [2018] attempt to incorporate the direction of an occupational move in analyzing mobility [Bechichii et al. 2018]. This study also attempts to define the direction measures that will be paired with the formulated distance measure.

Robinson [2018] uses two direction measures and pairs them with the distance measure. The first direction measure is a simple unweighted sum of the differences between components of factor scores.

$$Unweighted\ Direction_{AB} = \sum_{k=1}^n (x_{Bk} - x_{Ak}) \quad (2)$$

This is a crude measure but is computationally simple. However, this assumes that each task type has equal weights in terms of skill level for an occupation which might be debatable since some task types are more complex, productive or rewarded differently.

The second direction measure is weighted. Robinson [2018] applies weights for each task type based on its relative importance in wage determination. It makes sense to determine the direction of an occupational move based on the productivity of each task type as reflected by their relative importance in predicting wages.

To explore the relationship between task-specific skills and wages, we first estimate a maximum likelihood Heckman selection model. Ordinary Least Squares (OLS) regression can suffer from sample selection bias since only those who are working and receiving wages are observed in the sample. Assumption of random employment may not be true for any individual. Ignoring this issue could lead to overestimation of returns to schooling and task-specific skill scores. There are several other individual attributes (years of schooling, unobserved ability, age, etc.) and labor market factors (unemployment, GDP, productivity, etc.) that may likely influence the employment of a worker. Thus, we run a selection model first (Equation 3) with these characteristics as covariates to being selected in the main model (Equation 4).

#### Selection model

$$employed_i = \beta_0 + \beta_1 reg(unemp)_{ij} + \beta_2 \log(rgdp)_{ij} + \beta_3 \log(rlabprod)_{ij} \\ + \beta_4 workexp_i + \beta_5 workexp_i^2 + \beta_6 educattainment_i + \epsilon \quad (3)$$

#### Wage Regression

$$\log(wages)_{io} = \beta_0 + \beta_1 demographic_i + \beta_2 task\ scores_{io} + \beta_3 region_i + \beta_4 public_{io} \\ + \epsilon \quad (4)$$

The coefficients of each task type,  $\beta_2$ , are the weights for the corresponding task type. The subscript  $j$  corresponds to the regional characteristics where the  $i$ th individual is working in occupation  $o$ .

We use the merged Labor Force Survey – Family Income and Expenditure Survey (LFS-FIES) 2015 data of PSA to determine the individual worker characteristics of full-time and permanent workers such as monthly wage, current primary occupation, years of education, sex, age and location. We also added labor market characteristics such as regional unemployment, gross domestic product and labor productivity obtained from official statistics reported by the PSA. Different specifications are tested.

The weighted approach leads to the direction measure:

$$Weighted\ Direction = \sum_{k=1}^n \beta_k(x_{Bk} - x_{Ak}) \quad (5)$$

where  $\beta_k$  is the corresponding weight of task type  $k$ .

#### Overall occupational distance measure

The overall occupational distance measure is simply the product of the distance measure and the chosen direction measure (Equation 4.5). That is, the value derived from Equation 4.1 is multiplied with the computed value from either Equation 4.2 or 4.5 depending on the direction measure of choice.

$$Overall\ Occupational\ Distance = Distance * Direction \quad (6)$$

### **Analyses of results**

This section is divided into three parts. The first part discusses the results from the maximum likelihood Heckman selection regression to derive the weighted direction measure described in the previous section. It is followed by the presentation of the calculated overall occupational distance measures for two occupations, namely an accountant and a garbage and recycling collector. Finally, the occupational distance measure is applied to a sample of TVET graduates.

#### Weights of the direction measure

One type of the direction measure is the weighted one as described in Equation 5. This subsection explains how to derive this measure which will be paired with the distance variable computed in the preceding section. From Equation 5,  $\beta_k$  represents the weights of the  $k$ th task type. To derive these weights, we employ a Heckman sample selection regression<sup>6</sup> following the specification in Equations 3 and 4 using the LFS-FIES 2015 as the data source. The coefficient estimates of the task types in the regression will serve as the weights.

Table 2 summarizes the coefficient estimates of each task type. The negative coefficients are not unusual in the literature. Both Autor and Handel [2013] and Ingram and Neumann [2006] in the earlier periods of their analyses, obtained negative coefficients for some task types. Autor and Handel [2013] justify these negative returns by offering some theoretical propositions stating some conditions where it might remain valid. These include, “the cross-occupation covariance

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<sup>6</sup> The sample selection bias from running OLS regressions is confirmed by the Ramsey’s Regression Specification Error Test (RESET).



among task returns cannot be uniformly positive across all task pairs” [Autor and Handel: S67]. Also, although there are some task type variables which are insignificant predictors of wages, we still use these estimates since not all variables in the literature tackling the returns to task-specific skills are robustly significant in all specifications. As such, the coefficient estimates presented in Table 2 will serve as the corresponding weights of each task type. These weights will be plugged in Equation 5 to derive the weighted direction measures.

Alternatively, the results presented in Table 2 can be interpreted as the returns to skills.<sup>7</sup> The first column of Table 2 tells us the returns to task-specific skills classified into non-routine analytical, non-routine interpersonal, non-routine manual, routine manual and routine cognitive. Out of the five, non-routine interpersonal and routine manual turn out to be insignificant predictors of wage variation. Holding all other things constant, a one-standard deviation increase in non-routine analytical task score leads to a 19.67 percent wage gain. On the other hand, the same level of increase in non-routine manual and routine cognitive task scores are associated with a wage penalty of 5.84 percent, 12.66 percent and 21.45 percent, respectively.

Following the task classification of Ingram and Neumann [2006], one can identify the returns to skills relating to intelligence, clerical, fine motor and physical tasks. The second column suggests that a one-standard deviation increase in skills associated with intelligence and clerical tasks leads to 13.92 percent and 4.53 percent wage gains, *ceteris paribus*. Physical and fine motor tasks, although insignificant, are associated with wage penalties.

The last two columns only consider three task categories. Autor and Handel [2013] consider abstract, manual and routine task types. The manual task type is the only insignificant predictor of wage levels and has a negative estimate. Holding other things constant, both abstract and routine task types, significantly increase the individual worker’s wages by 13.92 percent and 4.21 percent, respectively. Note that the estimate of 13.92 percent wage premium for abstract skills is identical to the estimate for intelligence skills.

Lastly, the task classifications of Gathmann and Schönberg [2010] are all found to be significant explanatory variables of wage variation. That is, *ceteris paribus*, a one-standard deviation increase in cognitive skills leads to a 5.7 percent wage premium. Similar increases in manual and interpersonal skills are associated with wage penalties equivalent to 10.17 percent and 1.91 percent, respectively.

For all classifications, the signs and magnitudes of the estimates of each task type seem to be intuitive and expected. That is, tasks which require higher level of thinking and complexity are rewarded more in the market. Specifically, cognitive or non-routine analytical skills are associated with large positive wage premiums. This is also consistent with the prediction of the model discussed above.

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<sup>7</sup> In the literature, analyzing the returns to task-specific skills usually entails multiple period analysis. That is, how much have the returns to task-specific skills changed over time. However, in this paper, we only attempt to estimate the returns to task-specific skills for one period. Further study on this subject matter is recommended.

**Table 2. Coefficient Estimates of Task Scores<sup>8</sup> from the Heckman Sample Selection Regression**

	Autor et al. [2003]		Ingram and Neumann [2006]		Autor and Handel [2013]		Gathmann and Schönberg [2010]	
<b>Task Types</b>	Non-routine analytical	0.1967*** (0.0143)	Intelligence	0.1392*** (0.02)	Abstract	0.1392*** (0.0232)	Manual	-0.1017*** (0.0046)
	Non-routine interpersonal kill	-0.0018 (0.0113)	Clerical	.0453** (0.0146)	Manual	-0.0186 (0.0197)	Cognitive	0.057*** (0.0041)
	Non-routine manual	-0.0484** (0.015)	Fine Motor	-0.0215 (0.0168)	Routine	0.0421* (0.0194)	Interpersonal	-0.0191*** (0.0053)
	Routine manual	-0.013 (0.0103)	Physical	0.0027 (0.0114)				
	Routine cognitive	.0294* 0.013						
<b>Constant</b>	8.748*** (0.0563)		8.691*** (0.0575)		8.675*** (0.0574)		8.632*** (0.0567)	
<b>Wald test of indep. eqns.</b>	938.37		983.93		979.44		927.45	

*Note.*  $n=26,736$ ; Standard errors are in parentheses. All models include demographic variables such as educational attainment, potential work experience, sex, public/private sector and regional dummies and are weighted by sampling weights.

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

<sup>8</sup> To deal with the perfect collinearity of the task scores, I added a small random number  $\varepsilon \sim (0, 0.06)$  for each task score. The source of the perfect collinearity is the nature of the task profiling elaborated in the methodology.

### Occupational distance measures

From the task profiles of Generalao (2019b), we can easily plug in the normalized task scores of any pair of occupations and derive distance measures following Equation 1. These distance measures are paired with the direction measure of our choice. As elaborated above, we will use the more intuitive weighted direction measure. This results to the estimation of an overall occupational distance measure.

Using these occupational distance and direction measures, we can now compare any pair of occupations in terms of their task profiles. We cannot only determine whether an occupational move from one to another is upskilling, down-skilling or a lateral move but also the relative magnitude of reskilling needed for such a move.

Suppose we compare two occupations, say, accountants and garbage recyclers and collectors, across all other occupations. Tables 3 and 4 describe the outcomes of our comparisons using our derived measures. Both tables contain the initial occupation in the first column moving to say, an accountant or a garbage collector, and are arranged from the most upskilling to the most down-skilling.

For instance, from Table 3, individuals currently employed or skilled to be in any of the first 8 occupations, namely crane, hoist and related plant operators, earthmoving and related plant operators, food and related products machine operators, hand packers, packing, bottling and labelling machine operators, paper products machine operators, shoemaking and related machine operators, textile, fur and leather products machine operators not elsewhere classified, require the most upskilling needed to become an accountant. On the other hand, looking at the bottom rows of the same table, economists, geologists and geophysicists, sociologists, anthropologists and related professionals, visual artists becoming accountants are identified to be the most, yet only slightly, down-skilling occupational moves. The down-skilling move is determined by the fourth column, *Sign of the direction*, while the small magnitude is captured by the value of the last column, which is close to zero. Majority of the occupations moving to an accounting job requires a certain level of upskilling which clearly suggests that being an accountant is a relatively high-skilled occupation.

**Table 3. Distance and directions measures of occupations relative to Accountants (from the most upskilling to the most down-skilling)**

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Crane, Hoist and Related Plant Operators</b>	5.5542	0.6761	positive	5.5542	3.7553
<b>Earthmoving and Related Plant Operators</b>	5.5542	0.6761	positive	5.5542	3.7553

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Food and Related Products Machine Operators</b>	5.5542	0.6761	positive	5.5542	3.7553
<b>Hand Packers</b>	5.5542	0.6761	positive	5.5542	3.7553
<b>Packing, Bottling and Labelling Machine Operators</b>	5.5542	0.6761	positive	5.5542	3.7553
<b>Paper Products Machine Operators</b>	5.5542	0.6761	positive	5.5542	3.7553
<b>Shoemaking and Related Machine Operators</b>	5.5542	0.6761	positive	5.5542	3.7553
<b>Textile, Fur and Leather Products Machine Operators Not Elsewhere Classified</b>	5.5542	0.6761	positive	5.5542	3.7553
<b>Glass and Ceramics Plant Operators</b>	5.2690	0.6831	positive	5.2690	3.5990
<b>Fur and Leather Preparing Machine Operators</b>	5.2192	0.6843	positive	5.2192	3.5716
<b>Fiber Preparing, Spinning and Winding Machine Operators</b>	4.9621	0.6911	positive	4.9621	3.4295
<b>Wood Processing Plant Operators</b>	4.8563	0.6941	positive	4.8563	3.3710
<b>Bicycle and Related Repairers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Building Structure Cleaners</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Carpenters and Joiners</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Cleaners and Helpers in Offices, Hotels and Other Establishments</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Concrete Placers, Concrete Finishers and Related Workers</b>	4.3830	0.7662	positive	4.3830	3.3584

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Craft and Related Workers Not Elsewhere Classified</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Fishery and Aquaculture Labourers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Fruit, Vegetable and Related Preservers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Hand Launderers and Pressers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Handicraft Workers in Wood, Basketry and Related Materials</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Metal Moulders and Coremakers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Odd-job Persons</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Other Cleaning Workers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Ships' Deck Crews and Related Workers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Spray Painters and Varnishers</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Vehicle Cleaners</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Water and Firewood Collectors</b>	4.3830	0.7662	positive	4.3830	3.3584
<b>Creative and Performing Artists Not Elsewhere Classified</b>	5.3399	0.6240	positive	5.3399	3.3323
<b>Dancers and Choreographers</b>	5.3399	0.6240	positive	5.3399	3.3323
<b>Fashion and Other Models</b>	5.3399	0.6240	positive	5.3399	3.3323
<b>Weaving and Knitting Machine Operators</b>	4.7150	0.6773	positive	4.7150	3.1935
<b>Bricklayers and Related Workers</b>	4.4846	0.7062	positive	4.4846	3.1668
<b>Laundry Machine Operators</b>	4.7304	0.6678	positive	4.7304	3.1591

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Bleaching, Dyeing and Fabric Cleaning Machine Operators</b>	4.6521	0.6774	positive	4.6521	3.1514
<b>Handicraft Workers in Textile, Leather and Related Materials</b>	4.2100	0.7480	positive	4.2100	3.1492
<b>Forestry Labourers</b>	4.1581	0.7550	positive	4.1581	3.1393
<b>Pelt Dressers, Tanners and Fellmongers</b>	4.1975	0.7466	positive	4.1975	3.1340
<b>Print Finishing and Binding Workers</b>	4.5851	0.6816	positive	4.5851	3.1250
<b>Sewing, Embroidery and Related Workers</b>	4.1831	0.7450	positive	4.1831	3.1164
<b>Bus and Tram Drivers</b>	4.1345	0.7534	positive	4.1345	3.1148
<b>Mining and Quarrying Labourers</b>	4.1345	0.7534	positive	4.1345	3.1148
<b>Building Construction Labourers</b>	4.1066	0.7512	positive	4.1066	3.0850
<b>Kitchen Helpers</b>	4.1066	0.7512	positive	4.1066	3.0850
<b>Domestic Cleaners and Helpers</b>	4.1288	0.7459	positive	4.1288	3.0797
<b>Civil Engineering Labourers</b>	4.0744	0.7482	positive	4.0744	3.0485
<b>Firefighters</b>	4.0987	0.7425	positive	4.0987	3.0434
<b>Subsistence Mixed Crop and Livestock Farmers</b>	4.1227	0.7379	positive	4.1227	3.0423
<b>Garden and Horticultural Labourers</b>	4.0574	0.7462	positive	4.0574	3.0277
<b>Subsistence Fishers, Hunters, Trappers and Gatherers</b>	4.0938	0.7344	positive	4.0938	3.0064
<b>Garbage and Recycling Collectors</b>	4.0415	0.7437	positive	4.0415	3.0057

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Sweepers and Related Labourers</b>	4.0415	0.7437	positive	4.0415	3.0057
<b>Floor Layers and Tile Setters</b>	4.1611	0.7212	positive	4.1611	3.0009
<b>Manufacturing Labourers Not Elsewhere Classified</b>	4.1611	0.7212	positive	4.1611	3.0009
<b>Mobile Farm and Forestry Plant Operators</b>	4.1611	0.7212	positive	4.1611	3.0009
<b>Building Frame and Related Trades Workers Not Elsewhere Classified</b>	4.0289	0.7362	positive	4.0289	2.9661
<b>Information and Communications Technology Installers and Servicers</b>	4.0578	0.7298	positive	4.0578	2.9615
<b>Stonemasons, Stone cutters, Splitters and Carvers</b>	4.0578	0.7298	positive	4.0578	2.9615
<b>Subsistence Crop Farmers</b>	4.0578	0.7298	positive	4.0578	2.9615
<b>Crop Farm Labourers</b>	4.0425	0.7324	positive	4.0425	2.9609
<b>Metal Finishing, Plating and Coating Machine Operators</b>	4.6424	0.6349	positive	4.6424	2.9476
<b>Conference and Event Planners</b>	4.8272	0.6079	positive	4.8272	2.9346
<b>House Builders</b>	4.0059	0.7256	positive	4.0059	2.9067
<b>Riggers and Cable Splicers</b>	4.0121	0.7238	positive	4.0121	2.9038
<b>Structural Metal Preparers and Erectors</b>	4.0121	0.7238	positive	4.0121	2.9038
<b>Rubber Products Machine Operators</b>	4.3742	0.6637	positive	4.3742	2.9031
<b>Sewing Machine Operators</b>	4.2781	0.6781	positive	4.2781	2.9008

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Drivers of Animal-drawn Vehicles and Machinery</b>	3.9344	0.7279	positive	3.9344	2.8639
<b>Fast Food Preparers</b>	3.9344	0.7279	positive	3.9344	2.8639
<b>Waiters</b>	4.0264	0.7053	positive	4.0264	2.8398
<b>Miners and Quarriers</b>	4.1267	0.6879	positive	4.1267	2.8385
<b>Hunters and Trappers</b>	3.9526	0.7153	positive	3.9526	2.8272
<b>Motorcycle Drivers</b>	3.9526	0.7153	positive	3.9526	2.8272
<b>Tobacco Preparers and Tobacco Products Makers</b>	3.9526	0.7153	positive	3.9526	2.8272
<b>Butchers, Fishmongers and Related Food Preparers</b>	3.8909	0.7231	positive	3.8909	2.8135
<b>Hairdressers</b>	3.8862	0.7166	positive	3.8862	2.7848
<b>Street and Related Services Workers</b>	3.8862	0.7166	positive	3.8862	2.7848
<b>Mixed Crop and Livestock Farm Labourers</b>	3.8585	0.7185	positive	3.8585	2.7723
<b>Wood Treaters</b>	4.0080	0.6893	positive	4.0080	2.7628
<b>Fumigators and Other Pest and Weed Controllers</b>	3.8395	0.7170	positive	3.8395	2.7528
<b>Livestock Farm Labourers</b>	3.8446	0.7137	positive	3.8446	2.7440
<b>Motor Vehicle Mechanics and Repairers</b>	3.8737	0.7025	positive	3.8737	2.7213
<b>Car, Taxi and Van Drivers</b>	3.8057	0.7119	positive	3.8057	2.7091
<b>Welders and Flame Cutters</b>	3.8057	0.7119	positive	3.8057	2.7091
<b>Domestic Housekeepers</b>	3.8221	0.7063	positive	3.8221	2.6996
<b>Freight Handlers</b>	3.9753	0.6787	positive	3.9753	2.6980
<b>Security Guards</b>	3.9753	0.6787	positive	3.9753	2.6980



<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Plastic Products Machine Operators</b>	3.8824	0.6912	positive	3.8824	2.6835
<b>Tailors, Dressmakers, Furriers and Hatters</b>	3.8421	0.6967	positive	3.8421	2.6769
<b>Electrical Mechanics and Fitters</b>	3.8253	0.6934	positive	3.8253	2.6525
<b>Plasterers</b>	3.8253	0.6934	positive	3.8253	2.6525
<b>Home-based Personal Care Workers</b>	3.8779	0.6747	positive	3.8779	2.6165
<b>Insulation Workers</b>	3.7665	0.6937	positive	3.7665	2.6129
<b>Building Caretakers</b>	3.8031	0.6810	positive	3.8031	2.5901
<b>Cleaning and Housekeeping Supervisors in Offices, Hotels and Other Establishments</b>	3.8031	0.6810	positive	3.8031	2.5901
<b>Mineral and Stone Processing Plant Operators</b>	4.2441	0.6102	positive	4.2441	2.5898
<b>Railway Brake, Signal and Switch Operators</b>	4.2441	0.6102	positive	4.2441	2.5898
<b>Locomotive Engine Drivers</b>	3.7124	0.6972	positive	3.7124	2.5884
<b>Subsistence Livestock Farmer</b>	3.7420	0.6907	positive	3.7420	2.5844
<b>Religious Professionals</b>	4.7233	0.5466	positive	4.7233	2.5816
<b>Garment and Related Patternmakers and Cutters</b>	3.7715	0.6813	positive	3.7715	2.5694
<b>Prison Guards</b>	4.0263	0.6357	positive	4.0263	2.5595
<b>Teachers' Aides</b>	4.0263	0.6357	positive	4.0263	2.5595
<b>Food Service Counter Attendants</b>	3.7464	0.6828	positive	3.7464	2.5581
<b>Dairy Products Makers</b>	3.6994	0.6913	positive	3.6994	2.5572

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Service Station Attendants</b>	3.6994	0.6913	positive	3.6994	2.5572
<b>Bartenders</b>	3.6630	0.6943	positive	3.6630	2.5432
<b>Undertakers and Embalmers</b>	3.7319	0.6764	positive	3.7319	2.5241
<b>Musical Instrument Makers and Tuners</b>	3.7439	0.6736	positive	3.7439	2.5217
<b>Construction Supervisors</b>	4.2848	0.5865	positive	4.2848	2.5129
<b>Personal Services Workers Not Elsewhere Classified</b>	4.2848	0.5865	positive	4.2848	2.5129
<b>Power Production Plant Operators</b>	3.9411	0.6362	positive	3.9411	2.5074
<b>Information and Communications Technology Operations Technicians</b>	4.0117	0.6219	positive	4.0117	2.4949
<b>Deep-sea Fishery Workers</b>	3.6635	0.6780	positive	3.6635	2.4838
<b>Pet Groomers and Animal Care Workers</b>	3.6635	0.6780	positive	3.6635	2.4838
<b>Well Drillers and Borers and Related Workers</b>	3.7318	0.6650	positive	3.7318	2.4816
<b>Potters and Related Workers</b>	3.6283	0.6824	positive	3.6283	2.4759
<b>Painters and Related Workers</b>	3.7179	0.6643	positive	3.7179	2.4697
<b>Street Food Salespersons</b>	3.7179	0.6643	positive	3.7179	2.4697
<b>Cooks</b>	3.5974	0.6850	positive	3.5974	2.4643
<b>Photographic Products Machine Operators</b>	4.3427	0.5619	positive	4.3427	2.4401
<b>Contact Centre Salespersons</b>	4.1934	0.5818	positive	4.1934	2.4396
<b>Field Crop and Vegetable Growers</b>	3.6683	0.6641	positive	3.6683	2.4361

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Mixed Crop Growers</b>	3.6683	0.6641	positive	3.6683	2.4361
<b>Tree and Shrub Crop Growers</b>	3.6683	0.6641	positive	3.6683	2.4361
<b>Blacksmiths, Hammersmiths and Forging Press Workers</b>	3.6372	0.6677	positive	3.6372	2.4284
<b>Debt Collectors and Related Workers</b>	4.1439	0.5790	positive	4.1439	2.3991
<b>Traditional Chiefs and Heads of Villages</b>	4.5473	0.5244	positive	4.5473	2.3848
<b>Metal Working Machine Tool Setters and Operators</b>	3.6581	0.6512	positive	3.6581	2.3823
<b>Woodworking Machine Tool Setters and Operators</b>	3.6581	0.6512	positive	3.6581	2.3823
<b>Personal Care Workers in Health Services Not Elsewhere Classified</b>	3.5890	0.6576	positive	3.5890	2.3600
<b>Heavy Truck and Lorry Drivers</b>	3.6867	0.6388	positive	3.6867	2.3551
<b>Mail Carriers and Sorting Clerks</b>	3.6867	0.6388	positive	3.6867	2.3551
<b>Precision-instrument Makers and Repairers</b>	3.6867	0.6388	positive	3.6867	2.3551
<b>Bakers, Pastry-cooks and Confectionery Makers</b>	3.5908	0.6529	positive	3.5908	2.3444
<b>Aquaculture Workers</b>	3.6989	0.6329	positive	3.6989	2.3410
<b>Hand and Pedal Vehicle Drivers</b>	3.5707	0.6463	positive	3.5707	2.3076

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Agricultural and Industrial Machinery Mechanics and Repairers</b>	3.5738	0.6441	positive	3.5738	2.3019
<b>Companions and Valets</b>	3.6225	0.6339	positive	3.6225	2.2962
<b>Jewellery and Precious metal Workers</b>	3.5600	0.6436	positive	3.5600	2.2912
<b>Travel Attendants and Travel Stewards</b>	3.6525	0.6218	positive	3.6525	2.2713
<b>Health Care Assistants</b>	3.6102	0.6264	positive	3.6102	2.2613
<b>Roofers</b>	3.6102	0.6264	positive	3.6102	2.2613
<b>Glass Makers, Cutters, Grinders and Finishers</b>	3.6225	0.6221	positive	3.6225	2.2534
<b>Travel Guides</b>	3.8149	0.5897	positive	3.8149	2.2498
<b>Refuse Sorters</b>	3.7684	0.5963	positive	3.7684	2.2471
<b>Metal Processing Plant Operators</b>	3.9188	0.5731	positive	3.9188	2.2460
<b>Office Supervisors</b>	4.4153	0.5078	positive	4.4153	2.2423
<b>Bank Tellers and Related Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Clearing and Forwarding Agents</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Clerical Support Workers Not Elsewhere Classified</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Coding, Proof-reading and Related clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Data Entry Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Filing and Copying Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Food and Beverage Tasters and Graders</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>General Office Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Hotel Receptionists</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Inquiry Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Payroll Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Personnel Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Production Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Receptionists (general)</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Secretaries (general)</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Stock Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Transport Clerks</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Typists and Word Processing Operators</b>	4.3748	0.5113	positive	4.3748	2.2370
<b>Poultry Producers</b>	3.4886	0.6395	positive	3.4886	2.2310
<b>Pharmaceutical Technicians and Assistants</b>	4.1160	0.5397	positive	4.1160	2.2213
<b>Elementary Workers Not Elsewhere Classified</b>	4.0873	0.5432	positive	4.0873	2.2202
<b>Assemblers Not Elsewhere Classified</b>	3.9472	0.5623	positive	3.9472	2.2196
<b>Mechanical Machinery Assemblers</b>	3.9472	0.5623	positive	3.9472	2.2196
<b>Meter Readers and Vending-machine Collectors</b>	4.0515	0.5478	positive	4.0515	2.2193
<b>Metal Production Process Controllers</b>	3.8054	0.5832	positive	3.8054	2.2192
<b>Messengers, Package Deliverers and Luggage Porters</b>	4.0062	0.5538	positive	4.0062	2.2187
<b>Livestock and Dairy Producers</b>	3.4523	0.6406	positive	3.4523	2.2115
<b>Beauticians and Related Workers</b>	3.5090	0.6295	positive	3.5090	2.2088
<b>Transport Conductors</b>	3.6232	0.6088	positive	3.6232	2.2058
<b>Metal Polishers, Wheel Grinders and Tool Sharpeners</b>	3.6268	0.6077	positive	3.6268	2.2041

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Aircraft Engine Mechanics and Repairers</b>	3.4865	0.6313	positive	3.4865	2.2011
<b>Nursing Associate professionals</b>	3.5753	0.6151	positive	3.5753	2.1991
<b>Inland and Coastal Waters Fishery Workers</b>	3.4213	0.6418	positive	3.4213	2.1959
<b>Electrical and Electronic Equipment Assemblers</b>	3.6749	0.5953	positive	3.6749	2.1876
<b>Lifting Truck Operators</b>	3.6749	0.5953	positive	3.6749	2.1876
<b>Cashiers and Ticket Clerks</b>	4.1094	0.5319	positive	4.1094	2.1860
<b>Printers</b>	3.7816	0.5763	positive	3.7816	2.1793
<b>Ambulance Workers</b>	3.6821	0.5914	positive	3.6821	2.1776
<b>Sales Demonstrators</b>	3.9111	0.5564	positive	3.9111	2.1762
<b>Chemical Products Plant and Machine Operators</b>	3.7403	0.5813	positive	3.7403	2.1742
<b>Shelf Fillers</b>	3.8538	0.5638	positive	3.8538	2.1728
<b>Health Associate Professionals Not Elsewhere Classified</b>	3.9039	0.5536	positive	3.9039	2.1612
<b>Information and Communications Technology Services Managers</b>	4.3314	0.4973	positive	4.3314	2.1539
<b>Information and Communications Technology Sales Professionals</b>	4.0749	0.5274	positive	4.0749	2.1493
<b>Legal Secretaries</b>	4.0749	0.5274	positive	4.0749	2.1493
<b>Door-to-door Salespersons</b>	3.6981	0.5800	positive	3.6981	2.1447
<b>Client Information Workers Not Elsewhere Classified</b>	3.9031	0.5489	positive	3.9031	2.1424

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Ships' Engineers</b>	3.6622	0.5849	positive	3.6622	2.1419
<b>Street Vendors (excluding Food)</b>	3.6622	0.5849	positive	3.6622	2.1419
<b>Business Services Agents Not Elsewhere Classified</b>	4.0383	0.5301	positive	4.0383	2.1408
<b>Library Clerks</b>	4.0383	0.5301	positive	4.0383	2.1408
<b>Medical Records and Health Information Technicians</b>	4.0383	0.5301	positive	4.0383	2.1408
<b>Medical Assistants</b>	3.9941	0.5339	positive	3.9941	2.1323
<b>Administrative and Executive Secretaries</b>	3.9435	0.5395	positive	3.9435	2.1276
<b>Cement, Stone and Other Mineral Products Machine Operators</b>	3.6253	0.5863	positive	3.6253	2.1254
<b>Shop Sales Assistants</b>	3.7252	0.5668	positive	3.7252	2.1116
<b>Mixed Crop and Animal Producers</b>	3.3894	0.6142	positive	3.3894	2.0816
<b>Protective Services Workers Not Elsewhere Classified</b>	3.4560	0.5984	positive	3.4560	2.0680
<b>Community Health Workers</b>	4.2307	0.4846	positive	4.2307	2.0503
<b>Cabinet-makers and Related Workers</b>	3.3498	0.6113	positive	3.3498	2.0479
<b>Animal Producers Not Elsewhere Classified</b>	3.3268	0.6131	positive	3.3268	2.0395
<b>Gardeners, Horticultural and Nursery Growers</b>	3.3401	0.6027	positive	3.3401	2.0129
<b>Upholsterers and Related Workers</b>	3.3401	0.6027	positive	3.3401	2.0129
<b>Underwater Divers</b>	3.2897	0.6089	positive	3.2897	2.0030

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Shoemakers and Related Workers</b>	3.3170	0.5979	positive	3.3170	1.9833
<b>Early Childhood Educators</b>	4.1077	0.4691	positive	4.1077	1.9270
<b>Policy and Planning Managers</b>	4.1077	0.4691	positive	4.1077	1.9270
<b>Pulp and Papermaking Plant Operators</b>	3.5656	0.5348	positive	3.5656	1.9067
<b>Electrical Line Installers and Repairers</b>	3.2333	0.5839	positive	3.2333	1.8878
<b>Fitness and Recreation Instructors and Programme Leaders</b>	3.8196	0.4891	positive	3.8196	1.8680
<b>Religious Associate Professionals</b>	3.8196	0.4891	positive	3.8196	1.8680
<b>Chemical Processing Plant Controllers</b>	3.4296	0.5388	positive	3.4296	1.8479
<b>Restaurant Managers</b>	3.6146	0.5092	positive	3.6146	1.8407
<b>Veterinary Technicians and Assistants</b>	3.2112	0.5729	positive	3.2112	1.8397
<b>Petroleum and Natural Gas Refining Plant Operators</b>	3.6491	0.4933	positive	3.6491	1.8002
<b>Glaziers</b>	3.2251	0.5564	positive	3.2251	1.7945
<b>Police Officers</b>	3.2251	0.5564	positive	3.2251	1.7945
<b>Actors</b>	3.6175	0.4922	positive	3.6175	1.7807
<b>Advertising and Public Relations Managers</b>	3.9541	0.4498	positive	3.9541	1.7784
<b>Finance Managers</b>	3.9541	0.4498	positive	3.9541	1.7784
<b>Research and Development Managers</b>	3.9541	0.4498	positive	3.9541	1.7784



<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Sales and Marketing Managers</b>	3.9541	0.4498	positive	3.9541	1.7784
<b>Child Care Workers</b>	3.5257	0.4946	positive	3.5257	1.7439
<b>Dentists</b>	3.4669	0.5027	positive	3.4669	1.7427
<b>Incinerator and Water Treatment Plant Operators</b>	3.4181	0.5001	positive	3.4181	1.7093
<b>Gallery, Museum and Library Technicians</b>	3.1602	0.5397	positive	3.1602	1.7055
<b>Forestry and Related Workers</b>	3.0540	0.5429	positive	3.0540	1.6580
<b>Plumbers and Pipe Fitters</b>	3.0209	0.5474	positive	3.0209	1.6537
<b>Buyers</b>	3.5321	0.4621	positive	3.5321	1.6321
<b>Primary School Teachers</b>	3.5321	0.4621	positive	3.5321	1.6321
<b>Broadcasting and Audiovisual Technicians</b>	3.4055	0.4749	positive	3.4055	1.6174
<b>Information and Communications Technology User Support Technicians</b>	3.1839	0.5056	positive	3.1839	1.6097
<b>Film, Stage and Related Directors and Producers</b>	3.7568	0.4249	positive	3.7568	1.5961
<b>Real Estate Agents and Property Managers</b>	3.3508	0.4761	positive	3.3508	1.5955
<b>Steam Engine and Boiler Operators</b>	3.1120	0.5114	positive	3.1120	1.5913
<b>Employment Agents and Contractors</b>	3.3825	0.4703	positive	3.3825	1.5907
<b>Ships' Deck Officers and Pilots</b>	3.1666	0.4983	positive	3.1666	1.5780
<b>Pre-press Technicians</b>	3.6606	0.4279	positive	3.6606	1.5662
<b>Travel Consultants and Clerks</b>	3.6606	0.4279	positive	3.6606	1.5662
<b>Shop Supervisors</b>	3.3569	0.4665	positive	3.3569	1.5659

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Customs and Border Inspectors</b>	3.0778	0.5048	positive	3.0778	1.5538
<b>Commercial Sales Representatives</b>	3.3741	0.4440	positive	3.3741	1.4980
<b>Stall and Market Salespersons</b>	2.9614	0.5039	positive	2.9614	1.4923
<b>Hotel Managers</b>	3.2730	0.4508	positive	3.2730	1.4755
<b>Computer Network and Systems Technicians</b>	3.5415	0.4139	positive	3.5415	1.4660
<b>Contact Centre Information Clerks</b>	3.5415	0.4139	positive	3.5415	1.4660
<b>Electronics Mechanics and Servicers</b>	2.7620	0.5256	positive	2.7620	1.4517
<b>Trade Brokers</b>	3.1703	0.4515	positive	3.1703	1.4314
<b>Shotfirers and Blasters</b>	2.8586	0.4896	positive	2.8586	1.3995
<b>Credit and Loans Officers</b>	3.2277	0.4327	positive	3.2277	1.3967
<b>Driving Instructors</b>	3.4940	0.3917	positive	3.4940	1.3685
<b>Manufacturing Supervisors</b>	3.4940	0.3917	positive	3.4940	1.3685
<b>Professional Services Managers Not Elsewhere Classified</b>	3.4940	0.3917	positive	3.4940	1.3685
<b>Medical and Dental Prosthetic Technicians</b>	2.7578	0.4935	positive	2.7578	1.3609
<b>Announcers on Radio, Television and Other Media</b>	3.0956	0.4395	positive	3.0956	1.3606
<b>Survey and Market Research Interviewers</b>	3.0956	0.4395	positive	3.0956	1.3606
<b>Air Conditioning and Refrigeration Mechanics</b>	2.7199	0.4927	positive	2.7199	1.3401
<b>Building and Related Electricians</b>	2.7199	0.4927	positive	2.7199	1.3401

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Aquaculture and Fisheries Production Managers</b>	3.3383	0.4009	positive	3.3383	1.3382
<b>Athletes and Sports Players</b>	2.8385	0.4712	positive	2.8385	1.3376
<b>Sheet Metal Workers</b>	2.7214	0.4900	positive	2.7214	1.3336
<b>Accounting and Bookkeeping Clerks</b>	3.3749	0.3945	positive	3.3749	1.3313
<b>Government Licensing Officials</b>	3.3749	0.3945	positive	3.3749	1.3313
<b>Pawnbrokers and Money-lenders</b>	3.3749	0.3945	positive	3.3749	1.3313
<b>Health Services Managers</b>	3.2980	0.4036	positive	3.2980	1.3312
<b>Construction Managers</b>	3.1816	0.4134	positive	3.1816	1.3154
<b>Telephone Switchboard Operators</b>	3.0519	0.4274	positive	3.0519	1.3044
<b>Chefs</b>	2.9820	0.4179	positive	2.9820	1.2461
<b>Education Managers</b>	3.3271	0.3705	positive	3.3271	1.2328
<b>Human Resource Managers</b>	3.3271	0.3705	positive	3.3271	1.2328
<b>Teaching Professionals Not Elsewhere Classified</b>	3.3271	0.3705	positive	3.3271	1.2328
<b>Dental Assistants and Therapists</b>	2.6500	0.4515	positive	2.6500	1.1965
<b>Paramedical Practitioners</b>	3.0328	0.3940	positive	3.0328	1.1949
<b>Product Graders and Testers (excluding Foods and Beverages)</b>	3.0328	0.3940	positive	3.0328	1.1949
<b>Air Traffic Controllers</b>	2.6034	0.4571	positive	2.6034	1.1901
<b>Special Needs Teachers</b>	2.9393	0.4032	positive	2.9393	1.1851
<b>Legislators</b>	3.2645	0.3626	positive	3.2645	1.1838

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Forestry Technicians</b>	2.9766	0.3924	positive	2.9766	1.1679
<b>University and Higher Education Teachers</b>	3.0730	0.3791	positive	3.0730	1.1651
<b>Midwifery Associate professionals</b>	2.6806	0.4290	positive	2.6806	1.1499
<b>Toolmakers and Related Workers</b>	2.4855	0.4596	positive	2.4855	1.1424
<b>Traditional and Complementary Medicine Professionals</b>	2.8402	0.3927	positive	2.8402	1.1152
<b>Medical Imaging and Therapeutic Equipment Technicians</b>	2.7870	0.3934	positive	2.7870	1.0964
<b>Medical Secretaries</b>	2.7870	0.3934	positive	2.7870	1.0964
<b>Midwifery Professionals</b>	2.8761	0.3793	positive	2.8761	1.0910
<b>Other Arts Teachers</b>	3.1271	0.3452	positive	3.1271	1.0795
<b>Insurance Representatives</b>	2.8902	0.3729	positive	2.8902	1.0777
<b>Photographers</b>	2.4388	0.4290	positive	2.4388	1.0462
<b>Signwriters, Decorative Painters, Engravers and Etchers</b>	2.3874	0.4301	positive	2.3874	1.0268
<b>Supply, Distribution and Related Managers</b>	3.0356	0.3336	positive	3.0356	1.0126
<b>Aircraft Pilots and Related Associate Professionals</b>	2.4629	0.4043	positive	2.4629	0.9958
<b>Audiologists and Speech Therapists</b>	2.6420	0.3766	positive	2.6420	0.9949
<b>Web Technicians</b>	2.6420	0.3766	positive	2.6420	0.9949
<b>Chemical and Physical Science Technicians</b>	2.2984	0.4290	positive	2.2984	0.9860

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Traditional and Complementary Medicine Associate Professionals</b>	2.4481	0.3966	positive	2.4481	0.9709
<b>Environmental and Occupational Health Inspectors and Associates</b>	2.5930	0.3698	positive	2.5930	0.9590
<b>Nursing Professionals</b>	2.4237	0.3841	positive	2.4237	0.9308
<b>Life Science Technicians (excluding Medical)</b>	2.6714	0.3442	positive	2.6714	0.9195
<b>Aged Care Services Managers</b>	2.7399	0.3339	positive	2.7399	0.9149
<b>Vocational Education Teachers</b>	2.7399	0.3339	positive	2.7399	0.9149
<b>Agricultural and Forestry Production Managers</b>	2.7075	0.3242	positive	2.7075	0.8777
<b>Secondary Education Teachers</b>	2.4150	0.3630	positive	2.4150	0.8766
<b>Financial and Insurance Services Branch Managers</b>	2.8279	0.3072	positive	2.8279	0.8687
<b>Veterinarians</b>	2.7082	0.3165	positive	2.7082	0.8573
<b>Physiotherapy Technicians and Assistants</b>	2.2242	0.3778	positive	2.2242	0.8403
<b>Sports, Recreation and Cultural Centre Managers</b>	2.4155	0.3416	positive	2.4155	0.8251
<b>Specialist Medical Practitioners</b>	2.5310	0.3259	positive	2.5310	0.8249
<b>Securities and Finance Dealers and Brokers</b>	2.4225	0.3227	positive	2.4225	0.7816
<b>Dieticians and Nutritionists</b>	2.4342	0.3092	positive	2.4342	0.7526
<b>Other Music Teachers</b>	2.4685	0.2969	positive	2.4685	0.7330

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Social Work and Counselling Professionals</b>	2.4685	0.2969	positive	2.4685	0.7330
<b>Database and Network Professionals Not Elsewhere Classified</b>	2.2465	0.3204	positive	2.2465	0.7197
<b>Business Services and Administration Managers Not Elsewhere Classified</b>	2.5796	0.2755	positive	2.5796	0.7106
<b>Lawyers</b>	2.5796	0.2755	positive	2.5796	0.7106
<b>Musicians, Singers and Composers</b>	2.5796	0.2755	positive	2.5796	0.7106
<b>Social Welfare Managers</b>	2.5796	0.2755	positive	2.5796	0.7106
<b>Social Work Associate Professionals</b>	2.5796	0.2755	positive	2.5796	0.7106
<b>Bookmakers, Croupiers and Related Gaming Workers</b>	2.0290	0.3286	positive	2.0290	0.6666
<b>Statistical, Finance and Insurance Clerks</b>	2.3749	0.2776	positive	2.3749	0.6592
<b>Systems Administrators</b>	2.3749	0.2776	positive	2.3749	0.6592
<b>Police Inspectors and Detectives</b>	2.0722	0.2992	positive	2.0722	0.6200
<b>Technical and Medical Sales Professionals (excluding ICT)</b>	2.0769	0.2960	positive	2.0769	0.6148
<b>Child Care Services Managers</b>	2.1209	0.2892	positive	2.1209	0.6133
<b>Physiotherapists</b>	2.0784	0.2931	positive	2.0784	0.6091
<b>Retail and Wholesale Trade Managers</b>	2.0784	0.2931	positive	2.0784	0.6091
<b>Managing Directors and Chief Executives</b>	2.3325	0.2438	positive	2.3325	0.5687

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Optometrists and Ophthalmic Opticians</b>	2.0013	0.2770	positive	2.0013	0.5543
<b>Shopkeepers</b>	2.0013	0.2770	positive	2.0013	0.5543
<b>Public Relations Professionals</b>	2.0944	0.2614	positive	2.0944	0.5475
<b>Sports Coaches, Instructors and Officials</b>	1.9634	0.2764	positive	1.9634	0.5428
<b>Senior Government Officials</b>	2.2777	0.2368	positive	2.2777	0.5393
<b>Senior Officials of Special-interest Organizations</b>	2.2777	0.2368	positive	2.2777	0.5393
<b>Air Traffic Safety Electronics Technicians</b>	1.9397	0.2767	positive	1.9397	0.5366
<b>Building Architects</b>	1.9397	0.2767	positive	1.9397	0.5366
<b>Landscape Architects</b>	1.9397	0.2767	positive	1.9397	0.5366
<b>Pharmacists</b>	1.8791	0.2676	positive	1.8791	0.5029
<b>Agricultural Technicians</b>	1.6593	0.2842	positive	1.6593	0.4715
<b>Manufacturing Managers</b>	2.1277	0.2174	positive	2.1277	0.4626
<b>Dispensing Opticians</b>	1.7628	0.2473	positive	1.7628	0.4360
<b>Mining Managers</b>	2.0381	0.2058	positive	2.0381	0.4194
<b>Mining Supervisors</b>	2.0381	0.2058	positive	2.0381	0.4194
<b>Government Regulatory Associate Professionals Not Elsewhere Classified</b>	1.8749	0.2191	positive	1.8749	0.4109
<b>Government Social Benefits Officials</b>	1.8749	0.2191	positive	1.8749	0.4109
<b>Accounting Associate Professionals</b>	1.6746	0.2379	positive	1.6746	0.3984

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Financial and Investment Advisers</b>	1.6746	0.2379	positive	1.6746	0.3984
<b>Training and Staff Development Professionals</b>	1.9042	0.1884	positive	1.9042	0.3587
<b>Environmental Engineers</b>	1.5190	0.2117	positive	1.5190	0.3216
<b>Management and Organization Analysts</b>	1.5190	0.2117	positive	1.5190	0.3216
<b>Education Methods Specialists</b>	1.6245	0.1945	positive	1.6245	0.3160
<b>Generalist Medical Practitioners</b>	1.4880	0.2028	positive	1.4880	0.3018
<b>Civil Engineering Technicians</b>	1.3870	0.2150	positive	1.3870	0.2982
<b>Information Technology Trainers</b>	1.6833	0.1593	positive	1.6833	0.2682
<b>Physical and Engineering Science Technicians Not Elsewhere Classified</b>	1.3602	0.1937	positive	1.3602	0.2634
<b>Industrial and Production Engineers</b>	1.3254	0.1832	positive	1.3254	0.2429
<b>Chemical Engineering Technicians</b>	1.3749	0.1607	positive	1.3749	0.2210
<b>Software and Applications Developers and Analysts Not Elsewhere Classified</b>	1.3749	0.1607	positive	1.3749	0.2210
<b>Valuers and Loss Assessors</b>	1.3749	0.1607	positive	1.3749	0.2210
<b>Archivists and Curators</b>	1.2277	0.1720	positive	1.2277	0.2111
<b>Mechanical Engineering Technicians</b>	1.0566	0.1780	positive	1.0566	0.1880
<b>Draughtspersons</b>	1.2500	0.1461	positive	1.2500	0.1826



<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Mining and Metallurgical Technicians</b>	1.2500	0.1461	positive	1.2500	0.1826
<b>Judges</b>	1.4353	0.1261	positive	1.4353	0.1810
<b>Systems Analysts</b>	1.4353	0.1261	positive	1.4353	0.1810
<b>Health Professionals Not Elsewhere Classified</b>	1.1233	0.1602	positive	1.1233	0.1799
<b>Other Language Teachers</b>	1.1233	0.1602	positive	1.1233	0.1799
<b>Environmental and Occupational Health and Hygiene Professionals</b>	1.0680	0.1248	positive	1.0680	0.1333
<b>Farming, Forestry and Fisheries Advisers</b>	1.2541	0.1012	positive	1.2541	0.1269
<b>Software Developers</b>	1.2541	0.1012	positive	1.2541	0.1269
<b>Librarians and Related Information Professionals</b>	1.0416	0.1217	positive	1.0416	0.1268
<b>Scribes and Related Workers</b>	1.0416	0.1217	positive	1.0416	0.1268
<b>Translators, Interpreters and Other Linguists</b>	1.0416	0.1217	positive	1.0416	0.1268
<b>Medical and Pathology Laboratory Technicians</b>	0.8322	0.1442	positive	0.8322	0.1200
<b>Environmental Protection Professionals</b>	0.8410	0.1100	positive	0.8410	0.0925
<b>Mining Engineers, Metallurgists and Related Professionals</b>	1.1175	0.0819	positive	1.1175	0.0915
<b>Psychologists</b>	1.1175	0.0819	positive	1.1175	0.0915
<b>Computer Network Professionals</b>	0.8035	0.0939	positive	0.8035	0.0755

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Electronics Engineering Technicians</b>	0.8035	0.0939	positive	0.8035	0.0755
<b>Interior Designers and Decorators</b>	1.0121	0.0664	positive	1.0121	0.0672
<b>Journalists</b>	1.0121	0.0664	positive	1.0121	0.0672
<b>Telecommunications Engineering Technicians</b>	1.0121	0.0664	positive	1.0121	0.0672
<b>Web and Multimedia Developers</b>	1.0121	0.0664	positive	1.0121	0.0672
<b>Physicists and Astronomers</b>	0.7386	0.0863	positive	0.7386	0.0638
<b>Cartographers and Surveyors</b>	0.6981	0.0871	positive	0.6981	0.0608
<b>Electrical Engineering Technicians</b>	0.6979	0.0668	positive	0.6979	0.0466
<b>Government Tax and Excise Officials</b>	0.6250	0.0730	positive	0.6250	0.0457
<b>Legal Professionals Not Elsewhere Classified</b>	0.6250	0.0730	positive	0.6250	0.0457
<b>Astrologers, Fortune-tellers and Related Workers</b>	0.8634	0.0431	positive	0.8634	0.0372
<b>Electrical Engineers</b>	0.8634	0.0431	positive	0.8634	0.0372
<b>Telecommunications Engineers</b>	0.6315	0.0469	positive	0.6315	0.0296
<b>Civil Engineers</b>	0.7673	0.0265	positive	0.7673	0.0204
<b>Policy Administration Professionals</b>	0.7673	0.0265	positive	0.7673	0.0204
<b>Electronics Engineers</b>	0.5907	0.0319	positive	0.5907	0.0188
<b>Applications Programmers</b>	0.3750	0.0438	positive	0.3750	0.0164
<b>Personnel and Careers Professionals</b>	0.3750	0.0438	positive	0.3750	0.0164

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Philosophers, Historians and Political Scientists</b>	0.7031	0.0141	positive	0.7031	0.0099
<b>Statistical, Mathematical and Related Associate Professionals</b>	0.7031	0.0141	positive	0.7031	0.0099
<b>Town and Traffic Planners</b>	0.7031	0.0141	positive	0.7031	0.0099
<b>Authors and Related Writers</b>	0.2083	0.0243	positive	0.2083	0.0051
<b>Database Designers and Administrators</b>	0.2083	0.0243	positive	0.2083	0.0051
<b>Advertising and Marketing Professionals</b>	0.6593	0.0044	positive	0.6593	0.0029
<b>Chemists</b>	0.6593	0.0044	positive	0.6593	0.0029
<b>Engineering Professionals Not Elsewhere Classified</b>	0.6593	0.0044	positive	0.6593	0.0029
<b>Product and Garment Designers</b>	0.6593	0.0044	positive	0.6593	0.0029
<b>Mechanical Engineers</b>	0.0893	0.0104	positive	0.0893	0.0009
<b>Biologists, Botanists, Zoologists and Related Professionals</b>	0.0000	0.0000	zero	0.0000	0.0000
<b>Chemical Engineers</b>	0.0000	0.0000	zero	0.0000	0.0000
<b>Financial Analysts</b>	0.0694	-0.0081	negative	-0.0694	-0.0006
<b>Meteorologists</b>	0.0694	-0.0081	negative	-0.0694	-0.0006
<b>Graphic and Multimedia Designers</b>	0.6290	-0.0033	negative	-0.6290	-0.0021
<b>Mathematicians, Actuaries and Statisticians</b>	0.6290	-0.0033	negative	-0.6290	-0.0021
<b>Economists</b>	0.6250	-0.0730	negative	-0.6250	-0.0457
<b>Geologists and Geophysicists</b>	0.6250	-0.0730	negative	-0.6250	-0.0457

Occupation	Distance	Direction	Sign of the direction	Occupational distance (sign only)	Overall occupational distance measure
<b>Sociologists, Anthropologists and Related Professionals</b>	0.6250	-0.0730	negative	-0.6250	-0.0457
<b>Visual Artists</b>	0.6250	-0.0730	negative	-0.6250	-0.0457

The opposite pattern can be observed for garbage and recycling collectors from Table 4. Except for some predominantly non-routine manual jobs, most occupational moves to a garbage collector is generally a down-skilling implied by the *Sign of the direction* in the fourth column. This strongly suggests the relatively low-skilled nature of non-routine manual jobs, specifically of garbage and recycling collectors.

**Table 4. Distance and directions measures of occupations relative to garbage and recycling collectors (from the most upskilling to the most down-skilling)**

Occupation	Distance	Direction	Sign of the direction	Occupational distance (sign only)	Overall occupational distance measure
<b>Bicycle and Related Repairers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Building Structure Cleaners</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Carpenters and Joiners</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Cleaners and Helpers in Offices, Hotels and Other Establishments</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Concrete Placers, Concrete Finishers and Related Workers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Craft and Related Workers Not Elsewhere Classified</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Fishery and Aquaculture Labourers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Fruit, Vegetable and Related Preservers</b>	1.3888	0.0225	positive	1.3888	0.0313

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Hand Launderers and Pressers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Handicraft Workers in Wood, Basketry and Related Materials</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Metal Moulders and Coremakers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Odd-job Persons</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Other Cleaning Workers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Ships' Deck Crews and Related Workers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Spray Painters and Varnishers</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Vehicle Cleaners</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Water and Firewood Collectors</b>	1.3888	0.0225	positive	1.3888	0.0313
<b>Forestry Labourers</b>	0.6944	0.0113	positive	0.6944	0.0078
<b>Bus and Tram Drivers</b>	0.5952	0.0097	positive	0.5952	0.0057
<b>Mining and Quarrying Labourers</b>	0.5952	0.0097	positive	0.5952	0.0057
<b>Handicraft Workers in Textile, Leather and Related Materials</b>	1.3036	0.0043	positive	1.3036	0.0056
<b>Pelt Dressers, Tanners and Fellmongers</b>	1.3005	0.0029	positive	1.3005	0.0038
<b>Building Construction Labourers</b>	0.4629	0.0075	positive	0.4629	0.0035
<b>Kitchen Helpers</b>	0.4629	0.0075	positive	0.4629	0.0035
<b>Domestic Cleaners and Helpers</b>	1.3507	0.0022	positive	1.3507	0.0030
<b>Sewing, Embroidery and Related Workers</b>	1.2975	0.0013	positive	1.2975	0.0017

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Civil Engineering Labourers</b>	0.2778	0.0045	positive	0.2778	0.0013
<b>Garden and Horticultural Labourers</b>	0.1543	0.0025	positive	0.1543	0.0004
<b>Sweepers and Related Labourers</b>	0.0000	0.0000	zero	0.0000	0.0000
<b>Firefighters</b>	1.3857	-0.0012	negative	-1.3857	-0.0016
<b>Building Frame and Related Trades Workers Not Elsewhere Classified</b>	0.4629	-0.0075	negative	-0.4629	-0.0035
<b>Subsistence Mixed Crop and Livestock Farmers</b>	1.2925	-0.0058	negative	-1.2925	-0.0075
<b>Crop Farm Labourers</b>	0.6944	-0.0113	negative	-0.6944	-0.0078
<b>Drivers of Animal-drawn Vehicles and Machinery</b>	0.7579	-0.0158	negative	-0.7579	-0.0120
<b>Fast Food Preparers</b>	0.7579	-0.0158	negative	-0.7579	-0.0120
<b>Subsistence Fishers, Hunters, Trappers and Gatherers</b>	1.2950	-0.0093	negative	-1.2950	-0.0121
<b>Mixed Crop and Livestock Farm Labourers</b>	0.4901	-0.0252	negative	-0.4901	-0.0124
<b>Butchers, Fishmongers and Related Food Preparers</b>	0.7285	-0.0206	negative	-0.7285	-0.0150
<b>Information and Communications Technology Installers and Servicers</b>	1.3031	-0.0139	negative	-1.3031	-0.0181
<b>Stonemasons, Stone cutters, Splitters and Carvers</b>	1.3031	-0.0139	negative	-1.3031	-0.0181
<b>Subsistence Crop Farmers</b>	1.3031	-0.0139	negative	-1.3031	-0.0181

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Car, Taxi and Van Drivers</b>	0.5907	-0.0319	negative	-0.5907	-0.0188
<b>Welders and Flame Cutters</b>	0.5907	-0.0319	negative	-0.5907	-0.0188
<b>Livestock Farm Labourers</b>	0.6297	-0.0300	negative	-0.6297	-0.0189
<b>Fumigators and Other Pest and Weed Controllers</b>	0.7182	-0.0268	negative	-0.7182	-0.0192
<b>Riggers and Cable Splicers</b>	1.3222	-0.0200	negative	-1.3222	-0.0264
<b>Structural Metal Preparers and Erectors</b>	1.3222	-0.0200	negative	-1.3222	-0.0264
<b>House Builders</b>	1.6984	-0.0181	negative	-1.6984	-0.0307
<b>Floor Layers and Tile Setters</b>	1.3888	-0.0225	negative	-1.3888	-0.0313
<b>Manufacturing Labourers Not Elsewhere Classified</b>	1.3888	-0.0225	negative	-1.3888	-0.0313
<b>Mobile Farm and Forestry Plant Operators</b>	1.3888	-0.0225	negative	-1.3888	-0.0313
<b>Hairdressers</b>	1.3500	-0.0271	negative	-1.3500	-0.0366
<b>Street and Related Services Workers</b>	1.3500	-0.0271	negative	-1.3500	-0.0366
<b>Hunters and Trappers</b>	1.3642	-0.0285	negative	-1.3642	-0.0388
<b>Motorcycle Drivers</b>	1.3642	-0.0285	negative	-1.3642	-0.0388
<b>Tobacco Preparers and Tobacco Products Makers</b>	1.3642	-0.0285	negative	-1.3642	-0.0388
<b>Locomotive Engine Drivers</b>	0.8821	-0.0465	negative	-0.8821	-0.0410
<b>Insulation Workers</b>	1.0496	-0.0500	negative	-1.0496	-0.0525
<b>Domestic Housekeepers</b>	1.5767	-0.0374	negative	-1.5767	-0.0590
<b>Dairy Products Makers</b>	1.1301	-0.0525	negative	-1.1301	-0.0593
<b>Service Station Attendants</b>	1.1301	-0.0525	negative	-1.1301	-0.0593

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Motor Vehicle Mechanics and Repairers</b>	1.4571	-0.0412	negative	-1.4571	-0.0600
<b>Bartenders</b>	1.2400	-0.0494	negative	-1.2400	-0.0613
<b>Tailors, Dressmakers, Furriers and Hatters</b>	1.5097	-0.0470	negative	-1.5097	-0.0709
<b>Plastic Products Machine Operators</b>	1.3893	-0.0525	negative	-1.3893	-0.0730
<b>Potters and Related Workers</b>	1.1945	-0.0613	negative	-1.1945	-0.0733
<b>Cooks</b>	1.2756	-0.0587	negative	-1.2756	-0.0748
<b>Electrical Mechanics and Fitters</b>	1.5423	-0.0503	negative	-1.5423	-0.0776
<b>Plasterers</b>	1.5423	-0.0503	negative	-1.5423	-0.0776
<b>Subsistence Livestock Farmer</b>	1.5235	-0.0530	negative	-1.5235	-0.0808
<b>Waiters</b>	2.2603	-0.0384	negative	-2.2603	-0.0868
<b>Bricklayers and Related Workers</b>	2.3147	-0.0376	negative	-2.3147	-0.0869
<b>Food Service Counter Attendants</b>	1.4758	-0.0609	negative	-1.4758	-0.0899
<b>Wood Treaters</b>	1.696588	-0.05439	negative	-1.6966	-0.0923
<b>Cabinet-makers and Related Workers</b>	0.7452	-0.1324	negative	-0.7452	-0.0986
<b>Garment and Related Patternmakers and Cutters</b>	1.6758	-0.0624	negative	-1.6758	-0.1046
<b>Miners and Quarriers</b>	1.9518	-0.0559	negative	-1.9518	-0.1090
<b>Blacksmiths, Hammersmiths and Forging Press Workers</b>	1.4347	-0.0760	negative	-1.4347	-0.1091
<b>Field Crop and Vegetable Growers</b>	1.4352	-0.0796	negative	-1.4352	-0.1143
<b>Mixed Crop Growers</b>	1.4352	-0.0796	negative	-1.4352	-0.1143
<b>Tree and Shrub Crop Growers</b>	1.4352	-0.0796	negative	-1.4352	-0.1143



<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Deep-sea Fishery Workers</b>	1.8038	-0.0657	negative	-1.8038	-0.1185
<b>Pet Groomers and Animal Care Workers</b>	1.8038	-0.0657	negative	-1.8038	-0.1185
<b>Freight Handlers</b>	1.8303	-0.0650	negative	-1.8303	-0.1190
<b>Security Guards</b>	1.8303	-0.0650	negative	-1.8303	-0.1190
<b>Musical Instrument Makers and Tuners</b>	1.7704	-0.0702	negative	-1.7704	-0.1242
<b>Jewellery and Precious metal Workers</b>	1.3620	-0.1001	negative	-1.3620	-0.1364
<b>Building Caretakers</b>	2.1880	-0.0627	negative	-2.1880	-0.1371
<b>Cleaning and Housekeeping Supervisors in Offices, Hotels and Other Establishments</b>	2.1880	-0.0627	negative	-2.1880	-0.1371
<b>Well Drillers and Borers and Related Workers</b>	1.7670	-0.0787	negative	-1.7670	-0.1391
<b>Undertakers and Embalmers</b>	2.0938	-0.0674	negative	-2.0938	-0.1410
<b>Beauticians and Related Workers</b>	1.3110	-0.1142	negative	-1.3110	-0.1498
<b>Painters and Related Workers</b>	1.8920	-0.0794	negative	-1.8920	-0.1503
<b>Street Food Salespersons</b>	1.8920	-0.0794	negative	-1.8920	-0.1503
<b>Wood Processing Plant Operators</b>	3.0554	-0.0496	negative	-3.0554	-0.1514
<b>Inland and Coastal Waters Fishery Workers</b>	1.4998	-0.1019	negative	-1.4998	-0.1528
<b>Health Care Assistants</b>	1.3175	-0.1174	negative	-1.3175	-0.1546
<b>Roofers</b>	1.3175	-0.1174	negative	-1.3175	-0.1546
<b>Sewing Machine Operators</b>	2.3643	-0.0657	negative	-2.3643	-0.1552

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Livestock and Dairy Producers</b>	1.5244	-0.1031	negative	-1.5244	-0.1572
<b>Aircraft Engine Mechanics and Repairers</b>	1.4084	-0.1124	negative	-1.4084	-0.1583
<b>Metal Working Machine Tool Setters and Operators</b>	1.7971	-0.0925	negative	-1.7971	-0.1662
<b>Woodworking Machine Tool Setters and Operators</b>	1.797079	-0.09248	negative	-1.7971	-0.1662
<b>Personal Care Workers in Health Services Not Elsewhere Classified</b>	1.9666	-0.0861	negative	-1.9666	-0.1694
<b>Fiber Preparing, Spinning and Winding Machine Operators</b>	3.2406	-0.0526	negative	-3.2406	-0.1704
<b>Home-based Personal Care Workers</b>	2.4736	-0.0690	negative	-2.4736	-0.1707
<b>Hand and Pedal Vehicle Drivers</b>	1.8071	-0.0975	negative	-1.8071	-0.1761
<b>Poultry Producers</b>	1.7178	-0.1042	negative	-1.7178	-0.1790
<b>Print Finishing and Binding Workers</b>	2.9171	-0.0622	negative	-2.9171	-0.1813
<b>Bakers, Pastry-cooks and Confectionery Makers</b>	2.0033	-0.0908	negative	-2.0033	-0.1820
<b>Agricultural and Industrial Machinery Mechanics and Repairers</b>	1.8903	-0.0996	negative	-1.8903	-0.1883
<b>Bleaching, Dyeing and Fabric Cleaning Machine Operators</b>	2.9447	-0.0663	negative	-2.9447	-0.1952
<b>Protective Services Workers Not Elsewhere Classified</b>	1.3577	-0.1453	negative	-1.3577	-0.1973

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Weaving and Knitting Machine Operators</b>	3.0364	-0.0664	negative	-3.0364	-0.2016
<b>Shoemakers and Related Workers</b>	1.3971	-0.1458	negative	-1.3971	-0.2037
<b>Gardeners, Horticultural and Nursery Growers</b>	1.5038	-0.1411	negative	-1.5038	-0.2121
<b>Upholsterers and Related Workers</b>	1.5038	-0.1411	negative	-1.5038	-0.2121
<b>Rubber Products Machine Operators</b>	2.7042	-0.0800	negative	-2.7042	-0.2164
<b>Fur and Leather Preparing Machine Operators</b>	3.6614	-0.0594	negative	-3.6614	-0.2175
<b>Animal Producers Not Elsewhere Classified</b>	1.7130	-0.1307	negative	-1.7130	-0.2238
<b>Glass and Ceramics Plant Operators</b>	3.7391	-0.0607	negative	-3.7391	-0.2268
<b>Electrical Line Installers and Repairers</b>	1.4454	-0.1598	negative	-1.4454	-0.2310
<b>Heavy Truck and Lorry Drivers</b>	2.2603	-0.1049	negative	-2.2603	-0.2371
<b>Mail Carriers and Sorting Clerks</b>	2.2603	-0.1049	negative	-2.2603	-0.2371
<b>Precision-instrument Makers and Repairers</b>	2.2603	-0.1049	negative	-2.2603	-0.2371
<b>Veterinary Technicians and Assistants</b>	1.4037	-0.1708	negative	-1.4037	-0.2398
<b>Laundry Machine Operators</b>	3.1621	-0.0759	negative	-3.1621	-0.2400
<b>Underwater Divers</b>	1.8261	-0.1348	negative	-1.8261	-0.2462
<b>Mixed Crop and Animal Producers</b>	1.9701	-0.1296	negative	-1.9701	-0.2552
<b>Power Production Plant Operators</b>	2.4519	-0.1075	negative	-2.4519	-0.2636
<b>Glaziers</b>	1.4476	-0.1873	negative	-1.4476	-0.2711

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Police Officers</b>	1.4476	-0.1873	negative	-1.4476	-0.2711
<b>Companions and Valets</b>	2.5518	-0.1098	negative	-2.5518	-0.2803
<b>Crane, Hoist and Related Plant Operators</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Earthmoving and Related Plant Operators</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Food and Related Products Machine Operators</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Hand Packers</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Packing, Bottling and Labelling Machine Operators</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Paper Products Machine Operators</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Shoemaking and Related Machine Operators</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Textile, Fur and Leather Products Machine Operators Not Elsewhere Classified</b>	4.1664	-0.0676	negative	-4.1664	-0.2816
<b>Glass Makers, Cutters, Grinders and Finishers</b>	2.3681	-0.1217	negative	-2.3681	-0.2881
<b>Aquaculture Workers</b>	2.7287	-0.1108	negative	-2.7287	-0.3024
<b>Plumbers and Pipe Fitters</b>	1.5951	-0.1963	negative	-1.5951	-0.3131
<b>Electronics Mechanics and Servicers</b>	1.5179	-0.2181	negative	-1.5179	-0.3311
<b>Nursing Associate professionals</b>	2.5888	-0.1286	negative	-2.5888	-0.3330
<b>Travel Attendants and Travel Stewards</b>	2.7750	-0.1219	negative	-2.7750	-0.3382
<b>Prison Guards</b>	3.1973	-0.1080	negative	-3.1973	-0.3454

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Teachers' Aides</b>	3.1973	-0.1080	negative	-3.1973	-0.3454
<b>Metal Polishers, Wheel Grinders and Tool Sharpeners</b>	2.5435	-0.1360	negative	-2.5435	-0.3459
<b>Cement, Stone and Other Mineral Products Machine Operators</b>	2.2061	-0.1574	negative	-2.2061	-0.3473
<b>Transport Conductors</b>	2.6279	-0.1349	negative	-2.6279	-0.3545
<b>Information and Communications Technology Operations Technicians</b>	2.9515	-0.1218	negative	-2.9515	-0.3595
<b>Forestry and Related Workers</b>	1.8020	-0.2008	negative	-1.8020	-0.3619
<b>Metal Finishing, Plating and Coating Machine Operators</b>	3.3932	-0.1088	negative	-3.3932	-0.3691
<b>Electrical and Electronic Equipment Assemblers</b>	2.7458	-0.1484	negative	-2.7458	-0.4076
<b>Lifting Truck Operators</b>	2.7458	-0.1484	negative	-2.7458	-0.4076
<b>Mineral and Stone Processing Plant Operators</b>	3.1693	-0.1335	negative	-3.1693	-0.4231
<b>Railway Brake, Signal and Switch Operators</b>	3.1693	-0.1335	negative	-3.1693	-0.4231
<b>Sheet Metal Workers</b>	1.7019	-0.2537	negative	-1.7019	-0.4317
<b>Refuse Sorters</b>	2.9411	-0.1474	negative	-2.9411	-0.4335
<b>Metal Processing Plant Operators</b>	2.6708	-0.1706	negative	-2.6708	-0.4556
<b>Air Conditioning and Refrigeration Mechanics</b>	1.8685	-0.2510	negative	-1.8685	-0.4690

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Building and Related Electricians</b>	1.8685	-0.2510	negative	-1.8685	-0.4690
<b>Chemical Processing Plant Controllers</b>	2.3006	-0.2049	negative	-2.3006	-0.4714
<b>Gallery, Museum and Library Technicians</b>	2.3147	-0.2040	negative	-2.3147	-0.4723
<b>Ambulance Workers</b>	3.1433	-0.1523	negative	-3.1433	-0.4788
<b>Chemical Products Plant and Machine Operators</b>	3.0119	-0.1624	negative	-3.0119	-0.4892
<b>Ships' Engineers</b>	3.0937	-0.1589	negative	-3.0937	-0.4915
<b>Street Vendors (excluding Food)</b>	3.0937	-0.1589	negative	-3.0937	-0.4915
<b>Printers</b>	3.0972	-0.1674	negative	-3.0972	-0.5186
<b>Travel Guides</b>	3.3912	-0.1540	negative	-3.3912	-0.5221
<b>Dental Assistants and Therapists</b>	1.7902	-0.2922	negative	-1.7902	-0.5231
<b>Door-to-door Salespersons</b>	3.2509	-0.1638	negative	-3.2509	-0.5324
<b>Metal Production Process Controllers</b>	3.3854	-0.1605	negative	-3.3854	-0.5435
<b>Photographers</b>	1.7545	-0.3147	negative	-1.7545	-0.5522
<b>Toolmakers and Related Workers</b>	1.9575	-0.2841	negative	-1.9575	-0.5561
<b>Steam Engine and Boiler Operators</b>	2.4813	-0.2324	negative	-2.4813	-0.5766
<b>Shop Sales Assistants</b>	3.2856	-0.1769	negative	-3.2856	-0.5812
<b>Pulp and Papermaking Plant Operators</b>	2.8314	-0.2089	negative	-2.8314	-0.5916
<b>Chemical and Physical Science Technicians</b>	1.8798	-0.3147	negative	-1.8798	-0.5917
<b>Medical and Dental Prosthetic Technicians</b>	2.3805	-0.2502	negative	-2.3805	-0.5957
<b>Shelf Fillers</b>	3.3528	-0.1799	negative	-3.3528	-0.6032

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Photographic Products Machine Operators</b>	3.3331	-0.1818	negative	-3.3331	-0.6061
<b>Creative and Performing Artists Not Elsewhere Classified</b>	5.0646	-0.1197	negative	-5.0646	-0.6062
<b>Dancers and Choreographers</b>	5.0646	-0.1197	negative	-5.0646	-0.6062
<b>Fashion and Other Models</b>	5.0646	-0.1197	negative	-5.0646	-0.6062
<b>Signwriters, Decorative Painters, Engravers and Etchers</b>	1.9376	-0.3136	negative	-1.9376	-0.6077
<b>Shotfirers and Blasters</b>	2.4002	-0.2541	negative	-2.4002	-0.6100
<b>Conference and Event Planners</b>	4.5707	-0.1358	negative	-4.5707	-0.6206
<b>Stall and Market Salespersons</b>	2.6000	-0.2398	negative	-2.6000	-0.6235
<b>Assemblers Not Elsewhere Classified</b>	3.5180	-0.1814	negative	-3.5180	-0.6381
<b>Mechanical Machinery Assemblers</b>	3.5180	-0.1814	negative	-3.5180	-0.6381
<b>Construction Supervisors</b>	4.0687	-0.1573	negative	-4.0687	-0.6398
<b>Personal Services Workers Not Elsewhere Classified</b>	4.0687	-0.1573	negative	-4.0687	-0.6398
<b>Contact Centre Salespersons</b>	3.9890	-0.1619	negative	-3.9890	-0.6460
<b>Debt Collectors and Related Workers</b>	3.9471	-0.1648	negative	-3.9471	-0.6503
<b>Customs and Border Inspectors</b>	2.7846	-0.2389	negative	-2.7846	-0.6652
<b>Messengers, Package Deliverers and Luggage Porters</b>	3.6649	-0.1899	negative	-3.6649	-0.6959

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Broadcasting and Audiovisual Technicians</b>	2.5963	-0.2688	negative	-2.5963	-0.6978
<b>Information and Communications Technology User Support Technicians</b>	2.9401	-0.2382	negative	-2.9401	-0.7002
<b>Sales Demonstrators</b>	3.7868	-0.1873	negative	-3.7868	-0.7093
<b>Health Associate Professionals Not Elsewhere Classified</b>	3.7899	-0.1901	negative	-3.7899	-0.7205
<b>Air Traffic Controllers</b>	2.5447	-0.2866	negative	-2.5447	-0.7292
<b>Incinerator and Water Treatment Plant Operators</b>	3.0183	-0.2436	negative	-3.0183	-0.7353
<b>Meter Readers and Vending-machine Collectors</b>	3.7704	-0.1960	negative	-3.7704	-0.7388
<b>Athletes and Sports Players</b>	2.7124	-0.2725	negative	-2.7124	-0.7391
<b>Client Information Workers Not Elsewhere Classified</b>	3.8065	-0.1948	negative	-3.8065	-0.7416
<b>Petroleum and Natural Gas Refining Plant Operators</b>	3.0015	-0.2504	negative	-3.0015	-0.7515
<b>Ships' Deck Officers and Pilots</b>	3.1043	-0.2454	negative	-3.1043	-0.7618
<b>Elementary Workers Not Elsewhere Classified</b>	3.8498	-0.2005	negative	-3.8498	-0.7719
<b>Administrative and Executive Secretaries</b>	3.8822	-0.2042	negative	-3.8822	-0.7928
<b>Pharmaceutical Technicians and Assistants</b>	3.9117	-0.2041	negative	-3.9117	-0.7982
<b>Medical Assistants</b>	3.9537	-0.2098	negative	-3.9537	-0.8296
<b>Dentists</b>	3.4444	-0.2410	negative	-3.4444	-0.8303



<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Cashiers and Ticket Clerks</b>	3.9341	-0.2118	negative	-3.9341	-0.8331
<b>Business Services Agents Not Elsewhere Classified</b>	4.0116	-0.2136	negative	-4.0116	-0.8569
<b>Library Clerks</b>	4.0116	-0.2136	negative	-4.0116	-0.8569
<b>Medical Records and Health Information Technicians</b>	4.0116	-0.2136	negative	-4.0116	-0.8569
<b>Restaurant Managers</b>	3.6907	-0.2345	negative	-3.6907	-0.8654
<b>Midwifery Associate professionals</b>	2.7710	-0.3147	negative	-2.7710	-0.8721
<b>Information and Communications Technology Sales Professionals</b>	4.0578	-0.2163	negative	-4.0578	-0.8776
<b>Legal Secretaries</b>	4.0578	-0.2163	negative	-4.0578	-0.8776
<b>Aircraft Pilots and Related Associate Professionals</b>	2.6694	-0.3394	negative	-2.6694	-0.9059
<b>Child Care Workers</b>	3.6666	-0.2491	negative	-3.6666	-0.9133
<b>Religious Professionals</b>	4.6724	-0.1971	negative	-4.6724	-0.9211
<b>Actors</b>	3.7683	-0.2515	negative	-3.7683	-0.9476
<b>Real Estate Agents and Property Managers</b>	3.5771	-0.2676	negative	-3.5771	-0.9571
<b>Employment Agents and Contractors</b>	3.6356	-0.2734	negative	-3.6356	-0.9941
<b>Traditional Chiefs and Heads of Villages</b>	4.5697	-0.2193	negative	-4.5697	-1.0020
<b>Shop Supervisors</b>	3.6162	-0.2773	negative	-3.6162	-1.0026
<b>Traditional and Complementary Medicine Associate Professionals</b>	2.9014	-0.3471	negative	-2.9014	-1.0071
<b>Fitness and Recreation</b>	3.9794	-0.2546	negative	-3.9794	-1.0134

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Instructors and Programme Leaders</b>					
<b>Religious Associate Professionals</b>	3.9794	-0.2546	negative	-3.9794	-1.0134
<b>Bank Tellers and Related Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Clearing and Forwarding Agents</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Clerical Support Workers Not Elsewhere Classified</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Coding, Proof-reading and Related clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Data Entry Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Filing and Copying Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Food and Beverage Tasters and Graders</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>General Office Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Hotel Receptionists</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Inquiry Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Payroll Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Personnel Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Production Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Receptionists (general)</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Secretaries (general)</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Stock Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Transport Clerks</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Typists and Word Processing Operators</b>	4.4107	-0.2324	negative	-4.4107	-1.0249
<b>Telephone Switchboard Operators</b>	3.2450	-0.3163	negative	-3.2450	-1.0264
<b>Trade Brokers</b>	3.5153	-0.2922	negative	-3.5153	-1.0272
<b>Physiotherapy Technicians and Assistants</b>	2.8110	-0.3659	negative	-2.8110	-1.0285

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Hotel Managers</b>	3.6193	-0.2929	negative	-3.6193	-1.0601
<b>Office Supervisors</b>	4.4957	-0.2359	negative	-4.4957	-1.0604
<b>Announcers on Radio, Television and Other Media</b>	3.5053	-0.3042	negative	-3.5053	-1.0662
<b>Survey and Market Research Interviewers</b>	3.5053	-0.3042	negative	-3.5053	-1.0662
<b>Buyers</b>	3.8137	-0.2816	negative	-3.8137	-1.0741
<b>Primary School Teachers</b>	3.8137	-0.2816	negative	-3.8137	-1.0741
<b>Nursing Professionals</b>	3.0472	-0.3597	negative	-3.0472	-1.0960
<b>Information and Communications Technology Services Managers</b>	4.4500	-0.2464	negative	-4.4500	-1.0966
<b>Chefs</b>	3.3690	-0.3259	negative	-3.3690	-1.0978
<b>Commercial Sales Representatives</b>	3.7230	-0.2998	negative	-3.7230	-1.1160
<b>Credit and Loans Officers</b>	3.6406	-0.3110	negative	-3.6406	-1.1322
<b>Community Health Workers</b>	4.3968	-0.2591	negative	-4.3968	-1.1392
<b>Early Childhood Educators</b>	4.3340	-0.2746	negative	-4.3340	-1.1901
<b>Policy and Planning Managers</b>	4.3340	-0.2746	negative	-4.3340	-1.1901
<b>Bookmakers, Croupiers and Related Gaming Workers</b>	2.8697	-0.4151	negative	-2.8697	-1.1913
<b>Special Needs Teachers</b>	3.5358	-0.3405	negative	-3.5358	-1.2041
<b>Medical Imaging and Therapeutic Equipment Technicians</b>	3.4444	-0.3503	negative	-3.4444	-1.2066
<b>Medical Secretaries</b>	3.4444	-0.3503	negative	-3.4444	-1.2066
<b>Secondary Education Teachers</b>	3.1699	-0.3807	negative	-3.1699	-1.2069

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Agricultural Technicians</b>	2.6495	-0.4595	negative	-2.6495	-1.2176
<b>Construction Managers</b>	3.7008	-0.3303	negative	-3.7008	-1.2223
<b>Traditional and Complementary Medicine Professionals</b>	3.4999	-0.3510	negative	-3.4999	-1.2286
<b>Audiologists and Speech Therapists</b>	3.4084	-0.3671	negative	-3.4084	-1.2514
<b>Web Technicians</b>	3.4084	-0.3671	negative	-3.4084	-1.2514
<b>Advertising and Public Relations Managers</b>	4.2593	-0.2940	negative	-4.2593	-1.2521
<b>Finance Managers</b>	4.2593	-0.2940	negative	-4.2593	-1.2521
<b>Research and Development Managers</b>	4.2593	-0.2940	negative	-4.2593	-1.2521
<b>Sales and Marketing Managers</b>	4.2593	-0.2940	negative	-4.2593	-1.2521
<b>Forestry Technicians</b>	3.6162	-0.3513	negative	-3.6162	-1.2706
<b>Paramedical Practitioners</b>	3.6370	-0.3497	negative	-3.6370	-1.2719
<b>Product Graders and Testers (excluding Foods and Beverages)</b>	3.6370	-0.3497	negative	-3.6370	-1.2719
<b>Environmental and Occupational Health Inspectors and Associates</b>	3.4025	-0.3739	negative	-3.4025	-1.2721
<b>Pre-press Technicians</b>	4.0411	-0.3159	negative	-4.0411	-1.2764
<b>Travel Consultants and Clerks</b>	4.0411	-0.3159	negative	-4.0411	-1.2764
<b>Midwifery Professionals</b>	3.5730	-0.3644	negative	-3.5730	-1.3019
<b>Health Services Managers</b>	3.8440	-0.3401	negative	-3.8440	-1.3073

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Computer Network and Systems Technicians</b>	3.9886	-0.3298	negative	-3.9886	-1.3153
<b>Contact Centre Information Clerks</b>	3.9886	-0.3298	negative	-3.9886	-1.3153
<b>Film, Stage and Related Directors and Producers</b>	4.1698	-0.3189	negative	-4.1698	-1.3296
<b>Aquaculture and Fisheries Production Managers</b>	3.8904	-0.3428	negative	-3.8904	-1.3338
<b>Insurance Representatives</b>	3.6305	-0.3708	negative	-3.6305	-1.3463
<b>Sports, Recreation and Cultural Centre Managers</b>	3.3978	-0.4021	negative	-3.3978	-1.3664
<b>University and Higher Education Teachers</b>	3.7542	-0.3646	negative	-3.7542	-1.3687
<b>Accounting and Bookkeeping Clerks</b>	3.9200	-0.3493	negative	-3.9200	-1.3691
<b>Government Licensing Officials</b>	3.9200	-0.3493	negative	-3.9200	-1.3691
<b>Pawnbrokers and Money-lenders</b>	3.9200	-0.3493	negative	-3.9200	-1.3691
<b>Life Science Technicians (excluding Medical)</b>	3.4673	-0.3995	negative	-3.4673	-1.3852
<b>Police Inspectors and Detectives</b>	3.1257	-0.4445	negative	-3.1257	-1.3894
<b>Driving Instructors</b>	4.0627	-0.3520	negative	-4.0627	-1.4303
<b>Manufacturing Supervisors</b>	4.0627	-0.3520	negative	-4.0627	-1.4303
<b>Professional Services Managers Not Elsewhere Classified</b>	4.0627	-0.3520	negative	-4.0627	-1.4303
<b>Database and Network Professionals Not Elsewhere Classified</b>	3.3811	-0.4233	negative	-3.3811	-1.4314

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Securities and Finance Dealers and Brokers</b>	3.4977	-0.4211	negative	-3.4977	-1.4727
<b>Specialist Medical Practitioners</b>	3.5438	-0.4178	negative	-3.5438	-1.4805
<b>Education Managers</b>	4.0023	-0.3732	negative	-4.0023	-1.4935
<b>Human Resource Managers</b>	4.0023	-0.3732	negative	-4.0023	-1.4935
<b>Teaching Professionals Not Elsewhere Classified</b>	4.0023	-0.3732	negative	-4.0023	-1.4935
<b>Aged Care Services Managers</b>	3.6817	-0.4098	negative	-3.6817	-1.5087
<b>Vocational Education Teachers</b>	3.6817	-0.4098	negative	-3.6817	-1.5087
<b>Technical and Medical Sales Professionals (excluding ICT)</b>	3.3855	-0.4477	negative	-3.3855	-1.5157
<b>Legislators</b>	3.9812	-0.3811	negative	-3.9812	-1.5172
<b>Physiotherapists</b>	3.4018	-0.4506	negative	-3.4018	-1.5329
<b>Retail and Wholesale Trade Managers</b>	3.4018	-0.4506	negative	-3.4018	-1.5329
<b>Dieticians and Nutritionists</b>	3.5670	-0.4345	negative	-3.5670	-1.5500
<b>Agricultural and Forestry Production Managers</b>	3.6991	-0.4195	negative	-3.6991	-1.5519
<b>Child Care Services Managers</b>	3.4481	-0.4545	negative	-3.4481	-1.5673
<b>Other Arts Teachers</b>	3.9381	-0.3985	negative	-3.9381	-1.5694
<b>Veterinarians</b>	3.7084	-0.4272	negative	-3.7084	-1.5841
<b>Air Traffic Safety Electronics Technicians</b>	3.3922	-0.4671	negative	-3.3922	-1.5844
<b>Building Architects</b>	3.3922	-0.4671	negative	-3.3922	-1.5844
<b>Landscape Architects</b>	3.3922	-0.4671	negative	-3.3922	-1.5844

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Sports Coaches, Instructors and Officials</b>	3.4094	-0.4673	negative	-3.4094	-1.5931
<b>Optometrists and Ophthalmic Opticians</b>	3.4223	-0.4667	negative	-3.4223	-1.5973
<b>Shopkeepers</b>	3.4223	-0.4667	negative	-3.4223	-1.5973
<b>Supply, Distribution and Related Managers</b>	3.9119	-0.4101	negative	-3.9119	-1.6044
<b>Pharmacists</b>	3.4002	-0.4761	negative	-3.4002	-1.6188
<b>Other Music Teachers</b>	3.6448	-0.4468	negative	-3.6448	-1.6284
<b>Social Work and Counselling Professionals</b>	3.6448	-0.4468	negative	-3.6448	-1.6284
<b>Financial and Insurance Services Branch Managers</b>	3.8599	-0.4365	negative	-3.8599	-1.6850
<b>Statistical, Finance and Insurance Clerks</b>	3.6439	-0.4661	negative	-3.6439	-1.6985
<b>Systems Administrators</b>	3.6439	-0.4661	negative	-3.6439	-1.6985
<b>Dispensing Opticians</b>	3.4324	-0.4964	negative	-3.4324	-1.7038
<b>Civil Engineering Technicians</b>	3.2333	-0.5287	negative	-3.2333	-1.7095
<b>Public Relations Professionals</b>	3.5585	-0.4823	negative	-3.5585	-1.7163
<b>Accounting Associate Professionals</b>	3.4268	-0.5058	negative	-3.4268	-1.7332
<b>Financial and Investment Advisers</b>	3.4268	-0.5058	negative	-3.4268	-1.7332
<b>Physical and Engineering Science Technicians Not Elsewhere Classified</b>	3.2231	-0.5501	negative	-3.2231	-1.7729
<b>Business Services and Administration Managers Not Elsewhere Classified</b>	3.8122	-0.4682	negative	-3.8122	-1.7850

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Lawyers</b>	3.8122	-0.4682	negative	-3.8122	-1.7850
<b>Musicians, Singers and Composers</b>	3.8122	-0.4682	negative	-3.8122	-1.7850
<b>Social Welfare Managers</b>	3.8122	-0.4682	negative	-3.8122	-1.7850
<b>Social Work Associate Professionals</b>	3.8122	-0.4682	negative	-3.8122	-1.7850
<b>Mechanical Engineering Technicians</b>	3.2671	-0.5658	negative	-3.2671	-1.8483
<b>Environmental Engineers</b>	3.4765	-0.5320	negative	-3.4765	-1.8495
<b>Management and Organization Analysts</b>	3.4765	-0.5320	negative	-3.4765	-1.8495
<b>Managing Directors and Chief Executives</b>	3.7810	-0.4999	negative	-3.7810	-1.8901
<b>Government Regulatory Associate Professionals Not Elsewhere Classified</b>	3.6033	-0.5246	negative	-3.6033	-1.8902
<b>Government Social Benefits Officials</b>	3.6033	-0.5246	negative	-3.6033	-1.8902
<b>Generalist Medical Practitioners</b>	3.4965	-0.5409	negative	-3.4965	-1.8912
<b>Senior Government Officials</b>	3.7763	-0.5070	negative	-3.7763	-1.9144
<b>Senior Officials of Special-interest Organizations</b>	3.7763	-0.5070	negative	-3.7763	-1.9144
<b>Medical and Pathology Laboratory Technicians</b>	3.2684	-0.5995	negative	-3.2684	-1.9593
<b>Industrial and Production Engineers</b>	3.5242	-0.5605	negative	-3.5242	-1.9752
<b>Education Methods Specialists</b>	3.6034	-0.5492	negative	-3.6034	-1.9790



<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Manufacturing Managers</b>	3.7678	-0.5263	negative	-3.7678	-1.9831
<b>Archivists and Curators</b>	3.5339	-0.5717	negative	-3.5339	-2.0205
<b>Mining Managers</b>	3.7658	-0.5379	negative	-3.7658	-2.0257
<b>Mining Supervisors</b>	3.7658	-0.5379	negative	-3.7658	-2.0257
<b>Health Professionals Not Elsewhere Classified</b>	3.5526	-0.5835	negative	-3.5526	-2.0731
<b>Other Language Teachers</b>	3.5526	-0.5835	negative	-3.5526	-2.0731
<b>Training and Staff Development Professionals</b>	3.7670	-0.5554	negative	-3.7670	-2.0921
<b>Chemical Engineering Technicians</b>	3.6318	-0.5830	negative	-3.6318	-2.1173
<b>Software and Applications Developers and Analysts Not Elsewhere Classified</b>	3.6318	-0.5830	negative	-3.6318	-2.1173
<b>Valuers and Loss Assessors</b>	3.6318	-0.5830	negative	-3.6318	-2.1173
<b>Draughtspersons</b>	3.6496	-0.5976	negative	-3.6496	-2.1810
<b>Mining and Metallurgical Technicians</b>	3.6496	-0.5976	negative	-3.6496	-2.1810
<b>Information Technology Trainers</b>	3.7806	-0.5844	negative	-3.7806	-2.2094
<b>Environmental and Occupational Health and Hygiene Professionals</b>	3.6925	-0.6189	negative	-3.6925	-2.2853
<b>Librarians and Related Information Professionals</b>	3.6885	-0.6220	negative	-3.6885	-2.2941
<b>Scribes and Related Workers</b>	3.6885	-0.6220	negative	-3.6885	-2.2941

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Translators, Interpreters and Other Linguists</b>	3.6885	-0.6220	negative	-3.6885	-2.2941
<b>Environmental Protection Professionals</b>	3.6938	-0.6337	negative	-3.6938	-2.3408
<b>Judges</b>	3.8135	-0.6176	negative	-3.8135	-2.3552
<b>Systems Analysts</b>	3.8135	-0.6176	negative	-3.8135	-2.3552
<b>Computer Network Professionals</b>	3.7466	-0.6498	negative	-3.7466	-2.4345
<b>Electronics Engineering Technicians</b>	3.7466	-0.6498	negative	-3.7466	-2.4345
<b>Electrical Engineering Technicians</b>	3.6229	-0.6769	negative	-3.6229	-2.4522
<b>Cartographers and Surveyors</b>	3.7597	-0.6566	negative	-3.7597	-2.4685
<b>Farming, Forestry and Fisheries Advisers</b>	3.8501	-0.6425	negative	-3.8501	-2.4737
<b>Software Developers</b>	3.8501	-0.6425	negative	-3.8501	-2.4737
<b>Physicists and Astronomers</b>	3.7649	-0.6574	negative	-3.7649	-2.4750
<b>Government Tax and Excise Officials</b>	3.7995	-0.6707	negative	-3.7995	-2.5482
<b>Legal Professionals Not Elsewhere Classified</b>	3.7995	-0.6707	negative	-3.7995	-2.5482
<b>Mining Engineers, Metallurgists and Related Professionals</b>	3.8854	-0.6619	negative	-3.8854	-2.5716
<b>Psychologists</b>	3.8854	-0.6619	negative	-3.8854	-2.5716
<b>Telecommunications Engineers</b>	3.7272	-0.6969	negative	-3.7272	-2.5973
<b>Interior Designers and Decorators</b>	3.9178	-0.6773	negative	-3.9178	-2.6537
<b>Journalists</b>	3.9178	-0.6773	negative	-3.9178	-2.6537

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Telecommunications Engineering Technicians</b>	3.9178	-0.6773	negative	-3.9178	-2.6537
<b>Web and Multimedia Developers</b>	3.9178	-0.6773	negative	-3.9178	-2.6537
<b>Electronics Engineers</b>	3.8057	-0.7119	negative	-3.8057	-2.7091
<b>Applications Programmers</b>	3.8860	-0.6999	negative	-3.8860	-2.7198
<b>Personnel and Careers Professionals</b>	3.8860	-0.6999	negative	-3.8860	-2.7198
<b>Astrologers, Fortune-tellers and Related Workers</b>	3.9732	-0.7006	negative	-3.9732	-2.7836
<b>Electrical Engineers</b>	3.9732	-0.7006	negative	-3.9732	-2.7836
<b>Authors and Related Writers</b>	3.9515	-0.7194	negative	-3.9515	-2.8426
<b>Database Designers and Administrators</b>	3.9515	-0.7194	negative	-3.9515	-2.8426
<b>Civil Engineers</b>	4.0176	-0.7172	negative	-4.0176	-2.8813
<b>Policy Administration Professionals</b>	4.0176	-0.7172	negative	-4.0176	-2.8813
<b>Mechanical Engineers</b>	4.0018	-0.7333	negative	-4.0018	-2.9345
<b>Philosophers, Historians and Political Scientists</b>	4.0535	-0.7296	negative	-4.0535	-2.9575
<b>Statistical, Mathematical and Related Associate Professionals</b>	4.0535	-0.7296	negative	-4.0535	-2.9575
<b>Town and Traffic Planners</b>	4.0535	-0.7296	negative	-4.0535	-2.9575
<b>Accountants</b>	4.0415	-0.7437	negative	-4.0415	-3.0057
<b>Biologists, Botanists, Zoologists and Related Professionals</b>	4.0415	-0.7437	negative	-4.0415	-3.0057

<b>Occupation</b>	<b>Distance</b>	<b>Direction</b>	<b>Sign of the direction</b>	<b>Occupational distance (sign only)</b>	<b>Overall occupational distance measure</b>
<b>Chemical Engineers</b>	4.0415	-0.7437	negative	-4.0415	-3.0057
<b>Advertising and Marketing Professionals</b>	4.0828	-0.7393	negative	-4.0828	-3.0185
<b>Chemists</b>	4.0828	-0.7393	negative	-4.0828	-3.0185
<b>Engineering Professionals Not Elsewhere Classified</b>	4.0828	-0.7393	negative	-4.0828	-3.0185
<b>Product and Garment Designers</b>	4.0828	-0.7393	negative	-4.0828	-3.0185
<b>Financial Analysts</b>	4.0734	-0.7518	negative	-4.0734	-3.0625
<b>Meteorologists</b>	4.0734	-0.7518	negative	-4.0734	-3.0625
<b>Graphic and Multimedia Designers</b>	4.1072	-0.7471	negative	-4.1072	-3.0683
<b>Mathematicians, Actuaries and Statisticians</b>	4.1072	-0.7471	negative	-4.1072	-3.0683
<b>Economists</b>	4.3603	-0.8168	negative	-4.3603	-3.5614
<b>Geologists and Geophysicists</b>	4.3603	-0.8168	negative	-4.3603	-3.5614
<b>Sociologists, Anthropologists and Related Professionals</b>	4.3603	-0.8168	negative	-4.3603	-3.5614
<b>Visual Artists</b>	4.3603	-0.8168	negative	-4.3603	-3.5614

Both Tables 3 and 4 provide significant evidence pointing to the validity of the occupational distance and direction measures we developed and estimated. These tables can be duplicated for the rest of the 422 occupations. Note that selecting and comparing any pair of occupations is arbitrary. What is more interesting is looking at actual panel data of individuals moving across occupations over time. The next section presents an example of an application of these measures among individuals, particularly among TVET graduates<sup>9</sup>.

#### Application of the overall occupational distance measure: case of TVET graduates

We use the 2014 Technical-Vocational Education and Training (TVET) graduate tracer survey of Technical Education and Skills Development Authority (TESDA) as the source of occupation

<sup>9</sup> Lack of panel data of working individuals prevents us from applying the distance and direction measures on a broader and more nationally representative population.

information individuals. We estimate the distance between the occupations – pre-training and post-training - of individual TVET graduates in 2014.

Summary statistics of distance measures

Given the task portfolios of occupations derived in the previous subsection, we estimate Equation 1 and compute for the distance between the two occupations – pre-training and post-training - of individual TVET graduates in 2014. The task portfolio of an occupation can be defined in terms of three, four or five combinations of task types. The calculation of the Euclidean distance thus depends on the type of task classification scheme adopted<sup>10</sup>.

Table 5 presents the summary statistics of the calculated Euclidean distance measures by type of classification scheme including the coefficient of variation (CV). The table suggests that there is a significant difference in the distance between occupations, thus rationalizing the use of an empirical measure of distance when determining the effects of occupational moves rather than merely employing a dummy indicator for occupational change.

**Table 5. Summary Statistics of the Distance Measures**

<b>Task Classification Scheme</b>	<b>Number of Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Coefficient of Variation</b>	<b>Min</b>	<b>Max</b>
Autor et al. [2003]	1,781	0.329	0.579	1.756	0	2.607
Ingram and Neumann [2006]	1,721	0.252	0.473	1.877	0	2.624
Autor and Handel [2013]	1,781	0.328	0.610	1.859	0	2.528
Gathmann and Schönberg [2010]	1,781	0.315	0.571	1.812	0	3.067

<sup>10</sup> The task classification scheme can be two-, three, four- or five-dimensional. See Generalao (2019b) for more details.

### Results of distance measure applied to TVET graduates

Tables 6 to 8 allow us to analyze the distance measures of selected outlying occupational pairings. The third column in each table contains the calculated Euclidean distance measure for the corresponding pairing.

The calculated distance measures in Table 6 are close to zero, so the pairs of occupations are classified as being very similar and thus the least distant with each other. The results make sense since the nature of the tasks to be performed in the current occupation is analogous with that of the trainee's previous occupation. On the other hand, Table 7 shows which occupations are completely similar with each other as represented by the zero value of the Euclidean distance. Building caretakers' tasks are similar in nature with those of cleaning and housekeeping supervisors. Typists and word processing operators perform essentially the same job as data entry clerks.

**Table 6. Least Distant Occupations among TVET graduates**

<b>Occupation in Period 1</b>	<b>Occupation in Period 2</b>	<b>Euclidean Distance Measure</b>
Handicraft workers in textile, leather and related materials	Sewing, embroidery and related workers	0.025
Stonemasons, stone cutters, splitters and carvers	Structural-metal preparers and erectors	0.050
Building construction laborers	Civil engineering laborers	0.083
Motorcycle drivers	Motor vehicle mechanics and repairers	0.106
Motorcycle drivers	Stonemasons, stone cutters, splitters and carvers	0.121

**Table 7. Similar Occupations among TVET graduates**

<b>Occupation in Period 1</b>	<b>Occupation in Period 2</b>	<b>Euclidean Distance Measure</b>
Stock clerks	General office clerks	0
Typists and word processing operators	Data entry clerks	0
Secretaries (general)	General office clerks	0
Cleaning and housekeeping supervisors in offices, hotels and other establishments	Building caretakers	0
Car, taxi and van drivers	Welders and flame cutters	0

Finally, Table 8 tells us which pairs of occupations are the most distant to each other; that is, these occupational pairs are considered the most different from each other in terms of their skill vectors defined by their task contents. However, the conclusions we can derive from these results are fairly limited. The distance measure only provides us a measurement of how different the two occupations are. From Table 8, classifying an occupational move, say from working as a secretary to a sales and marketing manager is almost no different compared to a move from being a policy administration professional to a general office clerk. Clearly, the distance measure simply reveals the magnitude of the similarity or difference between two occupations based on the nature of

tasks performed. It does not tell us whether an occupational move is an upskilling, down-skilling or merely a lateral move. Thus, we need to add a direction measure to derive a better overall occupational distance measure.

**Table 8. Most Distant Occupational Pairings among TVET graduates**

<b>Occupation in Period 1</b>	<b>Occupation in Period 2</b>	<b>Euclidean Distance Measure</b>
General office clerks	Paper products machine operators	2.607
Waiters	Packing, bottling and labeling machine operators	2.361
Secretaries (general)	Sales and marketing managers	2.197
Typists and word processing operators	Graphic and multimedia designers	2.138
Policy administration professionals	General office clerks	2.104

### Summary statistics of the overall occupational distance measure

This section summarizes the results of measuring the occupational mobility of TVET graduates as represented by the overall occupational distance measure defined in Equation 6 above; that is, individual TVET graduates moving from one occupation to another between two periods. As previously discussed, we note that occupational distance is obtained from the product of distance and direction measures. Table 9 presents the summary statistics for all the overall occupational distance measures.

**Table 9. Summary Statistics of the Overall Occupational Distance Measures**

<b>Basis of Task Classification Scheme</b>	<b>Number of Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Coefficient of Variation</b>	<b>Min</b>	<b>Max</b>
Autor et al. [2003]	1,781	0.004	0.154	41.042	-1.182	1.534
Ingram and Neumann [2006]	1,721	0.001	0.105	73.176	-0.771	0.791
Autor and Handel [2013]	1,781	0.004	0.128	33.416	-0.821	0.847
Gathmann and Schönberg [2010]	1,781	-0.002	0.102	-54.501	-0.703	0.566

### Results of the overall occupational distance measure applied to TVET graduates

Tables 10 to 12 summarize the top occupational moves in terms of the magnitude of the overall occupational distance measure. Note that the direction measure used here is weighted and considers the five task categories defined by Autor et al. [2003]. The weights are presented in Column 1 of Table 2. The occupational moves can be classified as either upskilling, down-skilling and lateral moves.

Table 10 tells us the occupational moves that are estimated to have the largest accumulation of human capital from the increased skill vector of the individual. Using this overall distance measure, the data reveals that 16.23 percent of the individuals in the sample experience upward skill mobility after approximately a year.

**Table 10. Top Occupational Moves - Upward Skill Mobility**

<b>Occupation in Period 1</b>	<b>Occupation in Period 2</b>	<b>Overall Occupational Distance Measure</b>
Motorcycle drivers	Visual artists	1.534
Building construction laborers	Graphic and multimedia designers	1.408
Typists and word processing operators	Graphic and multimedia designers	1.100
Construction supervisors	Civil engineers	0.990
Crop farm laborers	Other language teachers	0.909

On the other hand, Table 11 suggests the exact opposite of Table 10 and indicates the mobility associated with human capital loss. Specifically, 14.60 percent of the sample experience downward skill mobility.



**Table 11. Top Occupational Moves - Downward Skill Mobility**

<b>Occupation in Period 1</b>	<b>Occupation in Period 2</b>	<b>Overall Occupational Distance Measure</b>
Mechanical engineers	Motor vehicle mechanics and repairers	-1.182
Policy administration professionals	General office clerks	-1.020
Shopkeepers	Hand packers	-0.914
Shopkeepers	Packing, bottling and labeling machine operators	-0.914
Shopkeepers	Building construction laborers	-0.742

Both Tables 10 and 11 show which combinations of occupations exhibit low skill transferability; that is, a high absolute value of the distance measure.

Table 12 summarizes which pairs of occupations have highly transferable skills. The model predicts that there is no human capital gain or loss in this type of occupational move.

**Table 12. Top Occupational Moves - Lateral Occupational Move**

<b>Occupation in Period 1</b>	<b>Occupation in Period 2</b>	<b>Overall Occupational Distance Measure</b>
Stock clerks	General office clerks	0
General office clerks	Stock clerks	0
General office clerks	Receptionists (general)	0
Typists and word processing operators	Data entry clerks	0
Secretaries (general)	General office clerks	0

The most and least distant (upward and downward) occupational moves for the other methodologies are elaborated on in Appendices 2 and 3. The use of the unweighted sum of components to define a direction measure leads to counterintuitive and inconsistent results as evidenced by the descriptive statistics presented in Appendix 2. For instance, a hand packer becoming a building electrician would not likely be considered a down-skilling occupational move (See Table 2 of Appendix 2). Tables 1 and 4 of the same section also show a counterintuitive result classifying an occupational move of a shopkeeper to a hand packer as an upskilling. These counterintuitive results justify the use of the weighted direction measure which resulted in more sensible occupational move classifications (refer to Appendix 3). For example, a building construction laborer becoming a graphic and multimedia designer is definitely considered an upskilling (see Table 1 of Appendix 3) while teaching professionals shifting to motorcycle drivers is clearly a down-skilling (see Table 2 of Appendix 3).

## **Conclusions and ways forward**

In this age of rapidly evolving labor markets, the flexibility of skills becomes an important consideration for the working population. The employability of certain skills varies across sectors, industries, firms or even across occupations. Using the task-based framework, this study measures the level of skill transferability across occupations by building an occupational distance measure. The distance measure allows us to compare occupations in terms of their task profiles. Skill transferability between two occupations is high if the occupations are 'close' with each other and low if occupations are 'far' from each. In addition, the distance measure allows us to classify which occupational moves are considered an upskilling, down-skilling or lateral occupational moves. This has important implications in terms of the amount of additional training and education needed by individuals to move from one occupation to another.

The occupational distance measure is also applied to the sample of TVET graduates to measure their level of occupational mobility pre- and post-training. This paper recommends the use of a larger data set to capture the behavior of the entire labor force and not just post-training graduates. This should provide better insights on the relationship among occupational distances, mobility and wage differentials in different economies.

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## Appendix 1.

Descriptive Statistics of the Overall Occupational Distance Measures: Using Direction Measure as an Unweighted Sum of Components

**Table 1. Top 5 Upward Skill Mobility - Distances using Unweighted Sum of Components**

Occupation in Period 1	Occupation in Period 2
General office clerks	Paper products machine operators
Butchers, fishmongers and related food preparers	Textile, fur and leather products machine operators not elsewhere classified
Waiters	Packing, bottling and labeling machine operators
Shopkeepers	Hand packers
Shopkeepers	Packing, bottling and labeling machine operators

**Table 2. Top 10 Downward Skill Mobility - Distances using Unweighted Sum of Components**

Occupation in Period 1	Occupation in Period 2
Paper products machine operators	Motor vehicle mechanics and repairers
Hand packers	Building and related electricians
Hand packers	Rice farmers
Rubber products machine operators	Motor vehicle mechanics and repairers
Teaching professionals not elsewhere classified	Motorcycle drivers

**Table 3. Top 3 Lateral Occupational Move using Unweighted Sum of Components**

Occupation in Period 1	Occupation in Period 2
Stock clerks	General office clerks
General office clerks	Stock clerks
General office clerks	Receptionists (general)
Typists and word processing operators	Data entry clerks
Secretaries (general)	General office clerks

**Table 4. Top 5 Upward Skill Mobility - Distances using Unweighted Sum of Components [Ingram and Neumann 2006]**

Occupation in Period 1	Occupation in Period 2
Waiters	Packing, bottling and labeling machine operators
Shopkeepers	Hand packers
Shopkeepers	Packing, bottling and labeling machine operators
Butchers, fishmongers and related food preparers	Textile, fur and leather products machine operators not elsewhere classified
General office clerks	Paper products machine operators

**Table 5. Top 5 Downward Skill Mobility - Distances using Unweighted Sum of Components [Ingram and Neumann 2006]**

Occupation in Period 1	Occupation in Period 2
Hand packers	Rice farmers
Hand packers	Building and related electricians
Paper products machine operators	Motor vehicle mechanics and repairers
Rubber products machine operators	Motor vehicle mechanics and repairers
Cement, stone and other mineral products machine operators	Electrical engineering technicians

**Table 6. Top 5 Lateral Occupational Move using Unweighted Sum of Components [Ingram and Neumann 2006]**

Occupation in Period 1	Occupation in Period 2
Traditional chiefs and heads of villages	Sales and marketing managers
Stock clerks	General office clerks
Professional services managers not elsewhere classified	Civil engineers
Business services and administration managers not elsewhere classified	Policy and planning managers
General office clerks	Stock clerks

**Table 7. Top 5 Upward Skill Mobility - Distances using Unweighted Sum of Components [Gathmann and Schönberg 2010]**

Occupation in Period 1	Occupation in Period 2
Hand packers	Rice farmers
Paper products machine operators	Motor vehicle mechanics and repairers
Hand packers	Building and related electricians
Broadcasting and audio-visual technicians	Building caretakers
Rubber products machine operators	Motor vehicle mechanics and repairers

**Table 8. Top 5 Downward Skill Mobility - Distances using Unweighted Sum of Components [Gathmann and Schönberg 2010]**

Occupation in Period 1	Occupation in Period 2
Waiters	Packing, bottling and labeling machine operators
Butchers, fishmongers and related food preparers	Textile, fur and leather products machine operators not elsewhere classified
Shopkeepers	Hand packers
Shopkeepers	Packing, bottling and labeling machine operators
Construction supervisors	Metal processing plant operators

**Table 9. Top 5 Lateral Occupational Move using Unweighted Sum of Components [Gathmann and Schönberg 2010]**

Occupation in Period 1	Occupation in Period 2
Contact centre information clerks	Filing and copying clerks
General office clerks	Applications programmers
Stock clerks	General office clerks
Financial analysts	Accounting and bookkeeping clerks
General office clerks	Stock clerks

**Table 10. Top 5 Upward Skill Mobility - Distances using Unweighted Sum of Components [Autor and Handel 2013]**

Occupation in Period 1	Occupation in Period 2
Teaching professionals not elsewhere classified	Cashiers and ticket clerks
Policy administration professionals	General office clerks
Teaching professionals not elsewhere classified	Motorcycle drivers
Sales and marketing managers	Garden and horticultural laborers
Legislators	Motor vehicle mechanics and repairers

**Table 11. Top 5 Downward Skill Mobility - Distances using Unweighted Sum of Components [Autor and Handel 2013]**

Occupation in Period 1	Occupation in Period 2
Cashiers and ticket clerks	Sales and marketing managers
General office clerks	Social work associate professionals
General office clerks	Policy and planning managers
Cashiers and ticket clerks	Teaching professionals not elsewhere classified
General office clerks	Policy and planning managers

**Table 12. Top 5 Lateral Occupational Move using Unweighted Sum of Components [Autor and Handel 2013]**

Occupation in Period 1	Occupation in Period 2
General office clerks	Paper products machine operators
Traditional chiefs and heads of villages	Sales and marketing managers
Service station attendants	Car, taxi and van drivers
Service station attendants	Welders and flame cutters
Stock clerks	General office clerks



### Appendix 3.

Descriptive Statistics of the Overall Occupational Distance Measures: Using Direction Measure as a Weighted Sum of Components

**Table 1. Top 5 Upward Skill Mobility - Distances using Weighted Sum of Components [Ingram and Neumann 2006]**

Occupation in Period 1	Occupation in Period 2
Building construction laborers	Graphic and multimedia designers
Civil engineering laborers	Vocational education teachers
Motorcycle drivers	Visual artists
Domestic cleaners and helpers	Sales and marketing managers
Butchers, fishmongers and related food preparers	Aquaculture and fisheries production managers

**Table 2. Top 5 Downward Skill Mobility - Distances using Weighted Sum of Components [Ingram and Neumann 2006]**

Occupation in Period 1	Occupation in Period 2
Sales and marketing managers	Garden and horticultural laborers
Teaching professionals not elsewhere classified	Motorcycle drivers
Legislators	Motor vehicle mechanics and repairers
Shopkeepers	Hand packers
Shopkeepers	Packing, bottling and labeling machine operators

**Table 3. Top 5 Lateral Occupational Move using Weighted Sum of Components [Ingram and Neumann 2006]**

Occupation in Period 1	Occupation in Period 2
Traditional chiefs and heads of villages	Sales and marketing managers
Stock clerks	General office clerks
Professional services managers not elsewhere classified	Civil engineers
Business services and administration managers not elsewhere classified	Policy and planning managers
General office clerks	Stock clerks

**Table 4. Top 5 Upward Skill Mobility - Distances using Weighted Sum of Components [Gathmann and Schönberg 2010]**

Occupation in Period 1	Occupation in Period 2
Other cleaning workers	General office clerks
Hand launderers and pressers	Receptionists (general)
Fishery and aquaculture laborers	Production clerks
Civil engineering laborers	Vocational education teachers
Health care assistants	Early childhood educators

**Table 5. Top 5 Downward Skill Mobility - Distances using Weighted Sum of Components [Gathmann and Schönberg 2010]**

Occupation in Period 1	Occupation in Period 2
General office clerks	Paper products machine operators
Shopkeepers	Hand packers
Shopkeepers	Packing, bottling and labeling machine operators
Sales and marketing managers	Garden and horticultural laborers
Cashiers and ticket clerks	Packing, bottling and labeling machine operators

**Table 6. Top 5 Lateral Occupational Move using Weighted Sum of Components [Gathmann and Schönberg 2010]**

Occupation in Period 1	Occupation in Period 2
Stock clerks	General office clerks
General office clerks	Stock clerks
General office clerks	Receptionists (general)
Typists and word processing operators	Data entry clerks
Secretaries (general)	General office clerks

**Table 7. Top 5 Upward Skill Mobility - Distances using Weighted Sum of Components [Autor and Handel 2013]**

Occupation in Period 1	Occupation in Period 2
Building construction laborers	Graphic and multimedia designers
Motorcycle drivers	Visual artists
Domestic cleaners and helpers	Sales and marketing managers
Civil engineering laborers	Vocational education teachers
Butchers, fishmongers and related food preparers	Aquaculture and fisheries production managers

**Table 8. Top 5 Downward Skill Mobility - Distances using Weighted Sum of Components [Autor and Handel 2013]**

Occupation in Period 1	Occupation in Period 2
Teaching professionals not elsewhere classified	Motorcycle drivers
Sales and marketing managers	Garden and horticultural laborers
Legislators	Motor vehicle mechanics and repairers
University and higher education teachers	Electrical mechanics and fitters
Mechanical engineers	Motor vehicle mechanics and repairers

**Table 9. Top 5 Lateral Occupational Move using Weighted Sum of Components [Autor and Handel 2013]**

Occupation in Period 1	Occupation in Period 2
General office clerks	Paper products machine operators
Traditional chiefs and heads of villages	Sales and marketing managers
Service station attendants	Car, taxi and van drivers
Service station attendants	Welders and flame cutters
Stock clerks	General office clerks

