`We don't need no education…'. Creative workers' returns to education and experience. The evidence from Australia

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Abstract

This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The general sample (GS) for the analysis embraces 7340 individuals, who had any wage or salary in 2010. Then, the mapping methodology of Australian creative economy has been implemented to extract information on 455 workers belonging to a group of 27 creative occupations (creative sample – CS) out of GS. To compare differentiation of influence of human capital on the creative workers' hourly wage with the general population's returns to education and work experience, the quantile and OLS regressions (as a benchmark) have been used. Estimated models are based on the Mincer wage function. Results indicate that at the same level of schooling and experience the average hourly wage for women differs from men's hourly wage more among creative workers than in GS. Returns to education and to experience are similar in creative workers' population (6% on average), while among general population return to education is three times as large as to experience (10% and 3.5% respectively). Our research indicates, thus, that investment in creative workers' school education is less profitable than that for the others. Besides, the study shows a significant differentiation in profitability of investment to schooling and education among creative workers by sex. At each decile of hourly wage distribution women working in creative occupations gain lesser schooling returns than male creative workers. Also investment in male creative workers' experience is, on average, much more profitable than that for female creative workers. Interestingly, the classic Mincer wage model's goodness of fit is considerably lower for CS women than for CS men. It implies that the creative women's hourly wage is determined to a larger extent by other set of factors than years of education and work experience.

Keywords: creative workers, wage function, returns to schooling, returns to experience, gender differentials

JEL Classification: J24, J31, Z11.

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1. Introduction

Creative economy workers are a quite particular, but also much differentiated, part of labour market. As numerous analyses show they are, on average, a very well educated population that invests a lot of time and money in its competence capital. It seems to be rational, therefore, to investigate the differences in return to formal qualification versus to work experience among creative workforce. On the other hand, a distribution of income of the creative workers is stratified and highly dispersed. One should take into account thus that looking at the impact of the main variables only at the average level of income in such population may be not sufficient to understand the complexity of that influence. That is why using the quantile regression – an econometric tool that enables estimation of the sign and strength of the impact of education and experience on particular parts of the income distribution – may be recommended.

We have formulated following research questions:

- Does the Mincer earnings function explain the differentiation of hourly wages of creative workers?
- What are the returns to education and work experience among creative workers and in the whole workforce?
- What are the rates of returns to education and work experience for creative workers at each decile of hourly wage distribution?
- What are the differences in returns to education and work experience among creative men and women?

Besides, we would like to consider a set of hypotheses:

1. The Mincer earnings function explains well the differentiation of hourly wages of creative workers.
2. The returns to education and work experience among creative workers and in the whole workforce are different.
3. The higher decile of hourly wage distribution, the bigger rates of return to education for creative workers.
4. The higher decile of hourly wage distribution, the lower rates of return to work experience for creative workers.
5. The returns to work experience are higher for the creative men than women.
6. The returns to education are higher for the creative women than men.

2. Description of the samples

To carry out the analysis of impact of creative human capital on various parts of the income distribution we use unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. That survey data has been already used for human capital return estimations (Peng 2004; Leigh & Ryan 2008), but not for analyses on the creative occupations. The general sample (GS) that we investigate embraces 7340 individuals with any occupation, who had any wage or salary in 2010, lived in Australia and had at least 11 years of education. We have taken into consideration only medium and well educated individuals to have better qualification benchmark for generally well educated creative professionals.

Table 1. Structure of the General Sample by sex and years of education

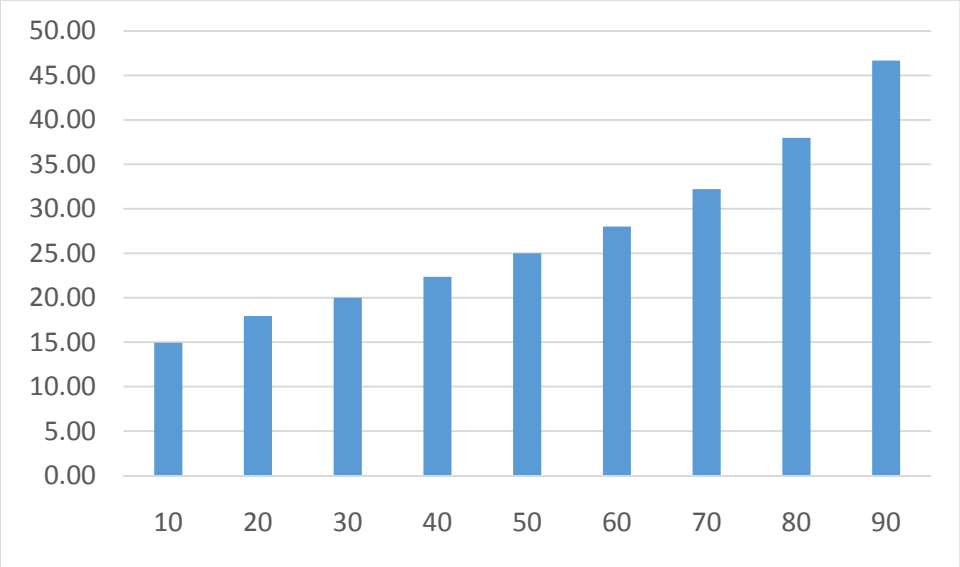
		Years of education						Total
		11	12	13	15	16	18	
women	number	736	1328	360	696	286	180	3586
	% of women	20,5%	37,0%	10,0%	19,4%	8,0%	5,0%	100,0%
	% of the group of years in education	49,4%	42,9%	53,8%	56,3%	58,5%	49,3%	48,9%
men	number	753	1764	309	540	203	185	3754
	% of men	20,1%	47,0%	8,2%	14,4%	5,4%	4,9%	100,0%
	% of the group of years in education	50,6%	57,1%	46,2%	43,7%	41,5%	50,7%	51,1%
Total	number	1489	3092	669	1236	489	365	7340
	% total	20,3%	42,1%	9,1%	16,8%	6,7%	5,0%	100,0%
	% of the group of years in education	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Almost two thirds of the general sample consists of medium educated individuals who finished 11 or 12 years in formal education. 28.5% of that subpopulation are tertiary graduates. Australian women are, on average, better educated than men. Almost every third women in the general sample (32.4%) and every fourth men (24.7%) has at least a bachelor degree. The average respondent's professional experience is almost 22 years. 10% of the GS has short experience (not more than 4 years), on the other hand – 10% have worked for more than 40 years.

Income distribution in the general sample is asymmetric. The median (25.00 AUD per hour) is smaller by one sixth from the mean (29.84 AUD per hour), a standard deviation

equals as high as 31.54 AUD. The distribution of GS income by deciles is presented at Graph 1.

Graph 1. Hourly wages (in AUD) in the GS by percentile



We implemented the mapping methodology of Australian creative economy to extract information on 455 workers belonging to a group of 27 creative occupations (creative sample – CS) out of the GS. Codes for `Creative occupations' have been taken according to Higgs & Cunningham (2007, p. 34-36). In consequence, the creative sample in our research embraces 27 creative occupations (table 2) chosen at the 4-digit level, which is the most detailed level available in HILDA – of Australian and New Zealand Standard Classification of Occupations (ANZSCO) 2006.

Table 2. Creative occupations according to the unit groups of ANZSCO

4-digit code	Unit group
1311	Advertising and Sales
1399	Other Specialist Managers
2111	Actors, Dancers and Other Entertainers
2112	Music Professionals
2113	Photographers
2114	Visual Arts and Crafts Professionals
2121	Artistic Directors, and Media Producers and Presenters
2122	Authors, and Book and Script Editors
2123	Film, Television, Radio and Stage Directors
2124	Journalists and Other Writers

2242	Archivists, Curators and Records Managers
2246	Librarians
2251	Advertising and Marketing Professionals
2252	ICT Sales Professionals
2321	Architects and Landscape Architects
2323	Fashion, Industrial and Jewellery Designers
2324	Graphic and Web Designers, and Illustrators
2325	Interior Designers
2326	Urban and Regional Planners
2613	Software and Applications Programmers
2632	ICT Support and Test Engineers
3131	ICT Support Technicians
3993	Gallery, Library and Museum Technicians
3994	Jewellers
3995	Performing Arts Technicians
5997	Library Assistants
5999	Other Miscellaneous Clerical and Administrative Workers

Source: Australian Bureau of Statistics (2006), p. 26-34.

Now let us analyse the structure of the creative sample by education and sex (table 3).

Table 3. Structure of the creative sample by sex and years of education

		Years of education						Total
		11	12	13	15	16	18	
women	Number	20	42	20	63	17	22	184
	% of women	10,9	22,8	10,9	34,2	9,2	12,0	100,0
	% of the group of years in education	57,1	34,4	36,4	39,1	39,5	56,4	40,4
men	Number	15	80	35	98	26	17	271
	% of men	5,5	29,5	12,9	36,2	9,6	6,3	100,0
	% of the group of years in education	42,9	65,6	63,6	60,9	60,5	43,6	59,6
Total	Number	35	122	55	161	43	39	455
	% z Sex_1male	7,7	26,8	12,1	35,4	9,5	8,6	100,0
	% of the group of years in education	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Only one third of creative workers in our research had only 11 or 12 years of formal education. It is a half of the share of similarly educated in the general population. On the other hand, tertiary education appears in the CS (54.5%) almost twice as often as in the GS. There are however no disproportion in education of creative men and women: a share of university graduates is similar for both sexes. The only important difference concerns the highest level of education, namely master or PhD, which was achieved by twice as much women than men.

The average individual within the creative sample is slightly less experienced than in the GS – a half of them had been working for less than 20 years. 10% of the least experienced workers have not more than 4 years of experience, and 10% the most experienced had been present in the labour market for more than 40 years.

Income dispersion among the creative workers is less asymmetric than in the general population. The median (25.00 AUD per hour) is lower from the mean (29.84 AUD per hour) only by 7.5%, and standard deviation in that distribution equals 18.57 AUD, which is much less than in the GS.

3. Estimation

To compare differentiation of influence of human capital on the creative workers' hourly wage with the general population's returns to education and work experience, we used the quantile and OLS regressions (as a benchmark). Estimated models are based on the Mincer wage function (Mincer 1974).

3.1. Model specification

We used the most popular Mincer's human capital earnings function, where natural log hour earnings are modelled as the sum of a linear function of years of education and a quadratic function of years of experience.

$$\ln y = \ln y_0 + YoEDU + \beta_1 EXP + \beta_2 EXP^2 \text{ , where} \quad (1)$$

$\ln y$ is a natural logarithm of hourly wage. The hourly wage is calculated using the derived variables taken from HILDA dataset: combined hours per week usually worked in all jobs, and imputed current weekly gross wages & salary in all jobs. A vector of independent variables embraces:

1) YoEDU – a variable showing years of schooling; it represents the highest level of education achieved. The levels have been recoded into years according to suggestion of the Melbourne Institute at the University of Melbourne (responsible for HILDA survey):

- Masters or doctorate – 18 years
- Graduate diploma or certificate – 16 years

- Bachelor of honours – 15 years
- Diploma – 13 years
- Certificate III or IV – 12 years
- Certificate I or II – 11 years
- Certificate not defined – 11 years
- Year 12 – 12 years
- Year 11 and below – 11

2) EXP – time in paid work since leaving full-time education – (years)
3) EXP_squared – number of years of work experience squared

Moreover, for the equations comparing the whole general sample and creative sample we added a binary variable Sex_1male, which equals 1 for "Male", and 0 for "Female"

3.2.Estimations for the general population (GS)

Using the OLS and quantile regression we estimated six models: three for the GS (whole population, men and women) and three for the creative sample (CS, whole creative population, men and women). For our estimations we used econometric program GRETL ver. 1.9.92.

Here there are the results of these estimations.

3.2.1. General population: the whole sample.

Table 4. OLS estimation of hourly wage (ln) for the whole general population (N=7340)

Variable	Coefficient	SE	t	p-value	significance
constant	1,58373	0,0398096	39,7825	<0,00001	***
EXP_squared	−0,000471726	2,96645e-05	-15,9021	<0,00001	***
EXP	0,0284505	0,00144491	19,6902	<0,00001	***
YoEDU	0,0987124	0,00291477	33,8663	<0,00001	***
Sex_1male	0,13227	0,0111758	11,8354	<0,00001	***

Significance: * p≤0.1; ** p≤0.05; *** p≤0.01.

Mean dependent var.	3,238836	S.D. dependent var.	0,536724
sum of squared residuals	1671,877	standard error of the residuals	0,477422
R-squared	0,209202	Pseudo-R-squared	0,208771
F(4, 7335)	485,1110	F test p-value	0,000000
Log-likelihood	−4985,641	AIC	9981,282

BIC	10015,79	HQC	9993,144

Table 5. Quantile regression (deciles) estimation of hourly wage (ln) for the general population (N=7340)

Decile (tau)	Coefficients			
	YoEDU	EXP	EXP squared	Sex_1male
0,1	0,0822145	0,0393800	-0,000759152	0,0874334
0,2	0,0863542	0,0271663	-0,000467734	0,0846292
0,3	0,0874685	0,0260813	-0,000435833	0,100355
0,4	0,0937039	0,0262357	-0,000439246	0,112492
0,5	0,0999451	0,0263801	-0,000429823	0,127214
0,6	0,0992404	0,0266023	-0,000427467	0,136677
0,7	0,0993630	0,0279635	-0,000448033	0,170271
0,8	0,102407	0,0300252	-0,000388786	0,185933
0,9	0,114253	0,0281397	-0,000388786	0,201840

Median (lnY)= 3,218876, standard dev. (lnY) = 0,536724

3.2.2. General population: male only

Table 6. OLS estimation of hourly wage (ln) for the general population, male only (N=3754)

Variable	Coefficient	SE	t	p-value	significance
Constant	1,58892	0,0562761	28,2343	<0,00001	***
YoEDU	0,10291	0,00428514	24,0155	<0,00001	***
EXP	0,0350238	0,0020704	16,9164	<0,00001	***
EXP_squared	−0,000577298	4,19938e-05	-13,7472	<0,00001	***

Mean dependent var.	3,289304	S.D. dependent var.	0,554631
sum of squared residuals	893,9528	standard error of the residuals	0,488249
R-squared	0,225668	Pseudo-R-squared	0,225049
F(4, 7335)	364,2947	F test p-value	1,3e-207
Log-likelihood	−2633,343	AIC	5274,685
BIC	5299,607	HQC	5283,548

Table 7. Quantile regression (deciles) estimation of hourly wage (ln) for the general population, male only (N=3754)

Decile (tau)	YoEDU	EXP	EXP squared
0,1	0,0753020	0,0455811	-0,000864357
0,2	0,0889256	0,0338513	-0,000589047
0,3	0,0900991	0,0317691	-0,000533987
0,4	0,0963750	0,0315287	-0,000516008
0,5	0,105621	0,0314665	-0,000512253

0,6	0,105573	0,0333316	-0,000537939
0,7	0,106524	0,0347508	-0,000557108
0,8	0,111659	0,0370230	-0,000577397
0,9	0,123692	0,0324068	-0,000451973

Median (lnY)= 3,267666 standard dev. (lnY) = 0,554631

3.2.3. General population: female only

Table 8. OLS estimation of hourly wage (ln) for the general population, female only (N=3586)

Variable	Coefficient	SE	t	p-value	significance
Constant	1,72008	0,0538482	31,9430	<0,00001	***
YoEDU	0,0939562	0,00394989	23,7870	<0,00001	***
EXP	0,0219027	0,00200741	10,9109	<0,00001	***
EXP_squared	−0,000367461	4,17535e-05	-8,8007	<0,00001	***

Mean dependent var.	3,186005	S.D. dependent var.	0,512089
sum of squared residuals	770,2735	standard error of the residuals	0,463724
R-squared	0,180658	Pseudo-R-squared	0,179972
F(4, 7335)	263,2673	F test p-value	2,1e-154
Log-likelihood	−2330,595	AIC	4669,191
BIC	4693,930	HQC	4678,009

Table 9. Quantile regression (deciles) estimation of hourly wage (ln) for the general population, female only (N=3586)

Decile (tau)	YoEDU	EXP	EXP squared
0,1	0,0846560	0,0287798	-0,000546485
0,2	0,0844363	0,0221570	-0,000365581
0,3	0,0838399	0,0208220	-0,000346680
0,4	0,0914495	0,0219909	-0,000372835
0,5	0,0938426	0,0211613	-0,000341474
0,6	0,0950596	0,0217149	-0,000350579
0,7	0,0941462	0,0233642	-0,000374514
0,8	0,0930572	0,0219455	-0,000353909
0,9	0,0884869	0,0199122	-0,000267871

Median (lnY)= 3,164758 standard dev. (lnY)= 0,512089

3.3. Estimations for the creative workers

3.3.1. Creative sample

Table 10. OLS estimation of hourly wage (ln) for the creative sample, male and female (N=455)

Variable	Coefficient	SE	t	p-value	significance
Constant	2,19436	0,158777	13,8204	<0,00001	***
YoEDU	0,0599269	0,0107941	5,5518	<0,00001	***

EXP	0,0451234	0,00708609	6,3679	<0,00001	***
EXP_squared	−0,00090081	0,000149661	-6,0190	<0,00001	***

Mean dependent var.	3,454454	S.D. dependent var.	0,493217
sum of squared residuals	93,10991	standard error of the residuals	0,454370
R-squared	0,156930	Pseudo-R-squared	0,151322
F(4, 7335)	27,98329	F test p-value	1,30e-16
Log-likelihood	−284,6845	AIC	577,3689
BIC	593,8501	HQC	583,8618

Table 11. Quantile regression (deciles) estimation of hourly wage (ln) for the creative sample (N=455)

Decile (tau)	Coefficients			
	YoEDU	EXP	EXP squared	Sex_1male
0,1	0,0564199	0,0298650	-0,000619131	0,0555345
0,2	0,0746696	0,0319068	-0,000663167	0,173660
0,3	0,0645018	0,0363257	-0,000695995	0,166368
0,4	0,0633564	0,0385305	-0,000721365	0,122049
0,5	0,0665483	0,0414270	-0,000774597	0,157591
0,6	0,0561752	0,0461479	-0,000869535	0,142105
0,7	0,0561752	0,0516589	-0,00100290	0,145907
0,8	0,0580222	0,0533335	-0,00100290	0,191218
0,9	0,0571979	0,0577898	-0,00113910	0,209945

Median (lnY)= 3,489751 standard dev. (lnY)= 0,493217

3.3.2. Creative sample: male only

Table 12. OLS estimation of hourly wage (ln) for the creative sample, male only (N=271)

Variable	Coefficient	SE	t	p-value	significance
constant	2,08128	0,200464	10,3823	<0,00001	***
YoEDU	0,0668786	0,0137107	4,8778	<0,00001	***
EXP	0,05805	0,00848688	6,8400	<0,00001	***
EXP_squared	−0,00121848	0,000181079	-6,7290	<0,00001	***

Mean dependent var.	3,529645	S.D. dependent var.	0,478295
sum of squared residuals	47,62768	standard error of the residuals	0,422352
R-squared	0,228912	Pseudo-R-squared	0,220248
F(4, 7335)	26,42130	F test p-value	5,37e-15
Log-likelihood	−148,9378	AIC	305,8757
BIC	320,2842	HQC	311,6608

Table 13. Quantile regression (deciles) estimation of hourly wage (ln) for the creative sample, male only (N=271)

Decile (tau)	YoEDU	EXP	EXP squared
0,1	0,0897773	0,0665487	-0,00134064
0,2	0,0906756	0,0407963	-0,000902208

0,3	0,0814881	0,0438244	-0,000881018
0,4	0,0794004	0,0466450	-0,000916561
0,5	0,0736633	0,0403858	-0,000771503
0,6	0,0592706	0,0458847	-0,000869510
0,7	0,0564360	0,0540538	-0,00104623
0,8	0,0631528	0,0568201	-0,00117653
0,9	0,0543346	0,0597900	-0,00117879

Median (lnY)= 3,555348 standard dev. (lnY)= 0,478295

3.3.3. Creative sample: female only

Table 14. OLS estimation of hourly wage (ln) for the creative sample, female only (N=184)

Variable	Coefficient	SE	t	p-value	significance
constant	2,24162	0,246031	9,1111	<0,00001	***
YoEDU	0,062817	0,0166681	3,7687	0,00022	***
EXP	0,0204445	0,0118241	1,7291	0,08551	*
EXP_squared	−0,000352984	0,00024629	-1,4332	0,15353	

Mean dependent var.	3,343711	S.D. dependent var.	0,495256
sum of squared residuals	40,21249	standard error of the residuals	0,472655
R-squared	0,104120	Pseudo-R-squared	0,089188
F(4, 7335)	6,973233	F test p-value	0,000183
Log-likelihood	−121,1749	AIC	250,3499
BIC	263,2096	HQC	255,5621

Table 15. Quantile regression (deciles) estimation of hourly wage (ln) for the creative sample, female only (N=184)

Decile (tau)	YoEDU	EXP	EXP squared
0,1	0,0605578	0,00249371	4,64034e-006
0,2	0,0687797	0,0141977	-0,000195742
0,3	0,0517885	0,0233001	-0,000386418
0,4	0,0413563	0,0363610	-0,000671258
0,5	0,0395889	0,0412056	-0,000780087
0,6	0,0499614	0,0513749	-0,000974094
0,7	0,0394111	0,0572215	-0,00112149
0,8	0,0421367	0,0530721	-0,00102761
0,9	0,0410236	0,0345441	-0,000658490

Median (lnY)= 3,359507 standard dev.(lnY)= 0,4952

Results and conclusions

The return to education and experience among creative occupation workers in Australia on hourly wages at different levels of the income proves to be not equally distributed. Our models for men working in the creative occupations explain better the

variance of hourly wages than those for women. It may be a result of the fact that there are more factors – apart from education and experience – playing a significant role in wages distribution among creative women than among men. The results show that men in Australia earn, on average, more than women, both in the whole economy (by 18%) and in the creative occupations (by 13%). It appears, however, that the gender wage gap in the creative economy is smaller than in the whole workforce. In the general population the impact of being female or male is more diverse. Smaller differences between men's and women's income are among the worst paid; accordingly to increase of hour wage rates, the differences between women's and men's income extend as well, in favour of men. Among the creative occupation workers the gender gap is quite similar at almost each level of income, the differences are smaller only at the first decile and larger at two highest deciles of income distribution.

Education is profitable among creative workers as well as among the whole workforce, although in the creative sample education influences the wage rates to a visibly smaller extent than in the GS. Return to education among creative occupations is similar for each level of the hour wages. On the contrary, among the general population the rise of wages can be explained by education to further extent at high income rates than among the worse-off. The impact of professional experience on the wage rate is positive and getting smaller in accordance with growing working experience, both in the GS and among the creative workforce.

Our research show that experience and education explain the variability of the hour wage rate to a much smaller extent in case of women than men, both in the creative sample and in the general sample. Investment in education brings profits (higher hour wage rates) for women. That increase of income is higher among the whole female workforce than among creative women only. However, the working experience of women impact slightly or insignificantly the variability of women's hour wages. Among men the models based on a classic Mincer's wage function can explain the variability of hour wages to a similar extent among men in the creative sample and among men in the whole workforce. Return on investment in education is positive, but it is smaller among the male creative group than among men in the whole economy. Interestingly, when the impact of education on hourly wages increases with growing deciles of wage in the general population, in the creative occupations that phenomenon is opposite and the impact on wages is the smallest among the best-off. We observed that experience of men in creative occupations brings higher return than among in the general sample. In both male samples the return grows with the wage rate, but slower and slower. In a consequence in creative male sample the return to education and

experience is similar, while in the general male sample in Australia education gives higher hourly wages increase than experience does.

The average impact of education is positive among both creative women and men at circa 6.5 per cent, but at each further decile women gain lesser increase of hourly wage caused by education increase than men do. Within creative samples the rise of experience brings on average almost 6 per cent to creative men, while only 2 per cent to creative women.

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