

Skills, Economic Crises and the Labour Market

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Disclaimer

The results in this paper are not official statistics, they have been created for research purposes from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand. The opinions, findings, recommendations and conclusions expressed in this paper are those of the author(s) not Statistics NZ.

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Careful consideration has been given to the privacy, security and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the Privacy impact assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

Introduction

The paper in a nutshell

- ▶ Do higher skills help mitigate the negative impact of economic crises?
- ▶ Global Financial Crisis (2007-09); Covid-19 lockdown (2020)
- ▶ Focus: wage progression
- ▶ PIAAC survey data on literacy and numeracy skills ↔ Inland Revenue's tax records
- ▶ GFC: shock on wage progression lower for the higher skilled (employer change)
- ▶ Covid-19: no differences in wage progression across skill levels population

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Background

Human capital

- ▶ Human capital: “the knowledge, skills, competencies and other attributes embodied in individuals that are relevant to economic activity”
- ▶ Individual-level like personality characteristics are unobservable
- ▶ Educational attainment used as a proxy
- ▶ Studies on years of schooling ↔ labour market performance (Bowen and Finegan, 1966; Leigh, 2008; Forbes et al., 2010)
- ▶ Education not a good proxy (alternative means)
- ▶ Hanushek et al. (2015): positive relationship between higher cognitive skills—measured (numeracy, literacy, and problem-solving skills) and wages across 23 OECD countries.
- ▶ Erwin et al. (2020): adults with low literacy and numeracy skills → less likely to work full time and more likely to be unemployed.

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The GFC and its impact on New Zealand

- ▶ **Global Financial Crisis (GFC) of 2007-09**
- ▶ New Zealand experienced a sharp decline in employment, especially between the 2008-Q4 and 2009-Q4
- ▶ The economically vulnerable groups were the most severely affected (young workers, workers with no/only school qualifications, those with a temporary contract)
- ▶ Major industries affected: construction, manufacturing, finance and insurance

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The Covid-19 period in New Zealand

- ▶ On 25 March, New Zealand went into a strict (Level 4) lockdown
- ▶ COVID-19 Wage Subsidy Scheme
- ▶ Wage subsidy reached 400 000 by the end of March
- ▶ Incidences of permanent layoff and increases in job seeker support (Fletcher, 2020; Fletcher et al., 2021).

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Data and Descriptive Statistics

PIAAC

- ▶ OECD administers PIAAC in over 40 countries
- ▶ Focus: assess and analyze skills of the working-age adult population (aged 16 to 65 years).
- ▶ Literacy, numeracy, and problem-solving skills in technology-rich environments
- ▶ In particular: “broadly transferable (generic) in nature”
- ▶ New Zealand participated in the OECD’s survey in 2014

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- ▶ Primary variables: individuals' numeracy and literacy skills, separately measured on a 500-point proficiency score
- ▶ 'low-skilled' if their numeracy and literacy scores are **both** below 200 and higher-skilled otherwise
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Data and sample selection

Integrated Data Infrastructure (IDI)

- ▶ Inland Revenue EMS data: 2005-09 (GFC) & 2017-20 (Covid-19)
- ▶ Men aged between 25 and 60
- ▶ IR-EMS: industry classification, employer's age, firm size, low and higher-paying firm
- ▶ DIA data on marriage/civil union and biological children
- ▶ Border movement data → physically present in NZ
- ▶ Ministry of Education: remove individuals enrolled in tertiary education
- ▶ Personal details file: ethnicity, residential address

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Data and sample selection

Wage progression

Table: Wage progression

Δ_{year}	GFC period			Δ_{year}	COVID-19 period		
	low skill	higher-skilled	diff		low skill	higher-skilled	diff
Panel A: Full Sample							
2005/06	0.051 (0.013)	0.033 (0.003)	0.018 (0.012)	2017/18	0.028 (0.013)	0.032 (0.002)	-0.005 (0.012)
2006/07	0.066 (0.013)	0.036 (0.003)	0.030*** (0.011)	2018/19	0.038 (0.013)	0.037 (0.002)	0.001 (0.012)
2007/08	-0.007 (0.012)	0.034 (0.003)	-0.041*** (0.000)	2019/20	0.015 (0.015)	0.020 (0.003)	-0.005 (0.013)
2008/09	-0.012 (0.011)	0.007 (0.002)	-0.019* (0.011)				
Panel B: Low earnings							
2005/06	0.183 (0.02)	0.159 (0.142)	0.024 (0.024)	2017/18	0.109 (0.019)	0.116 (0.007)	-0.007 (0.021)
2006/07	0.172 (0.021)	0.142 (0.008)	0.030 (0.022)	2018/19	0.124 (0.019)	0.13 (0.007)	-0.006 (0.021)
2007/08	0.080 (0.018)	0.144 (0.008)	-0.064*** (0.022)	2019/20	0.113 (0.023)	0.117 (0.007)	-0.004 (0.024)
2008/09	0.046 (0.016)	0.111 (0.008)	-0.065*** (0.019)				

Empirical identification strategy

$$\Delta_{y_{i,t}} = \beta HS_i + \sum_{\text{year}} \delta \text{year}_{i,t} + \sum_{\text{year}} \theta \text{year}_{i,t} \times HS_i + \eta X_{i(t-12)} + u_{it} \quad (1)$$

with $\Delta_{y_{i,t}} = \log(y_{i,t}) - \log(y_{i,t-12})$

Results

Regression results

Table: Regression results

	GFC period			COVID-19 period	
	total	low earnings		total	low earnings
HS	0.026 (0.017)	-0.011 (0.028)	HS	0.052*** (0.017)	0.031 (0.025)
2006/07	0.014 (0.024)	-0.001 (0.035)	2018/19	0.015 (0.024)	0.014 (0.036)
2007/08	-0.058** (0.026)	-0.096*** (0.033)	2019/20	-0.001 (0.025)	0.019 (0.035)
2008/09	-0.069*** (0.023)	-0.133*** (0.031)			
HS × 2006/07	-0.011 (0.024)	-0.013 (0.038)	HS × 2018/19	-0.008 (0.024)	0.003 (0.038)
HS × 2007/08	0.062** (0.027)	0.082** (0.037)	HS × 2019/20	-0.008 (0.025)	-0.008 (0.038)
HS × 2008/09	0.046** (0.023)	0.085** (0.034)			

Results

Changes of wage progression over time

Table: Changes of wage progression over time

Δ_{year}	GFC period				Δ_{year}	COVID-19 period			
	low skill		higher skill			low skill		higher skill	
	total	low earnings	total	low earnings		total	low earnings	total	low earnings
2005/06	<i>reference</i>				2017/18	<i>reference</i>			
2006/07	0.014 (0.024)	-0.001 (0.035)	0.003 (0.005)	-0.014 (0.015)	2018/19	0.015 (0.024)	0.014 (0.036)	0.007* (0.004)	0.017 (0.012)
2007/08	-0.058** (0.026)	-0.096*** (0.033)	0.003 (0.005)	-0.013 (0.016)	2019/20	-0.001 (0.025)	0.019 (0.035)	-0.009** (0.004)	0.010 (0.013)
2008/09	-0.069*** (0.023)	-0.133*** (0.031)	-0.023*** (0.005)	-0.048*** (0.015)					

Results

Marginal effects

Table: Marginal effects

Δ_{year}	GFC period			COVID-19 period	
	total	low earnings		total	low earnings
2005/06	0.026 (0.017)	-0.011 (0.028)	2017/18	0.052*** (0.017)	0.031 (0.025)
2006/07	0.015 (0.019)	-0.024 (0.028)	2018/19	0.045** (0.019)	0.034 (0.027)
2007/08	0.088*** (0.019)	0.071*** (0.027)	2019/20	0.044** (0.018)	0.023 (0.029)
2008/09	0.072*** (0.019)	0.074*** (0.025)			

Results

Robustness test

- ▶ Skill-score cut-off
- ▶ Cut-off point to define the low earnings group
- ▶ Separate regressions by skill type

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Results

Mechanisms

Table: Regression results by employer

	GFC period			
	Same employer		Changed employer	
	total	low earnings	total	low earnings
HS	0.043*** (0.016)	0.017 (0.030)	-0.040 (0.041)	-0.109** (0.052)
2006/07	0.021 (0.025)	-0.005 (0.038)	-0.047 (0.048)	-0.073 (0.051)
2007/08	-0.027 (0.029)	-0.058 (0.042)	-0.182*** (0.054)	-0.241*** (0.056)
2008/09	-0.040* (0.024)	-0.084** (0.034)	-0.165*** (0.046)	-0.316*** (0.073)
HS × 2006/07	-0.018 (0.025)	-0.011 (0.042)	0.050 (0.051)	0.091 (0.060)
HS × 2007/08	0.028 (0.030)	0.033 (0.045)	0.192*** (0.057)	0.267*** (0.066)
HS × 2008/09	0.016 (0.024)	0.033 (0.038)	0.151*** (0.049)	0.331*** (0.080)

Results

Mechanisms

Table: Regression results by employer

	GFC period			
	Same employer		Changed employer	
	total	low earnings	total	low earnings
	Covid-19 period			
HS	0.055*** (0.017)	0.047 (0.029)	0.012 (0.056)	-0.055 (0.064)
2018/19	-0.012 (0.025)	0.030 (0.041)	0.111* (0.062)	-0.052 (0.092)
2019/20	0.008 (0.023)	0.030 (0.041)	-0.077 (0.075)	-0.095 (0.102)
HS × 2018/19	0.019 (0.025)	-0.016 (0.042)	-0.102 (0.064)	0.079 (0.097)
HS × 2019/20	-0.021 (0.024)	-0.020 (0.043)	0.084 (0.076)	0.132 (0.107)

Conclusion

- ▶ Are cognitive skills adequate safeguards during unanticipated adverse economic shocks?
- ▶ OECD's PIAAC survey of individuals' numeracy and literacy skills and linking it with the IDI
- ▶ GFC: shock on wage progression lower for the higher skilled (employer change)
- ▶ Covid-19: no differences in wage progression across skill levels

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