Adult skill proficiency and migrant/native wage assimilation

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Background

- In 2019, 169M labor migrants worldwide (ILO, 2021)
- Roughly 30% of working adults (aged 25-54) in New Zealand were born abroad (OECD)
- Effective skilled immigration policies may be particularly important for *small, geographically isolated island economies with limited capacity to produce enough high skilled workers to meet their domestic needs*
- Indication of migrant wellbeing: wage growth compared to native workers in the host country
  - We call this process "wage assimilation"

Background

- Understanding wage assimilation is crucial to crafting policies meant to:
  1. encourage skilled immigration
  2. retain skilled immigrants
- We focus on the role of literacy and numeracy in the wage assimilation process
  - That is, whether migrants in the host country "catch up" to native-born workers, and if so, what does this path look like?

Background

- Research questions:

  1. How do wage assimilation processes compare across 23 OECD countries?

  2. How do estimates of wage assimilation change when we include direct measures of skill?

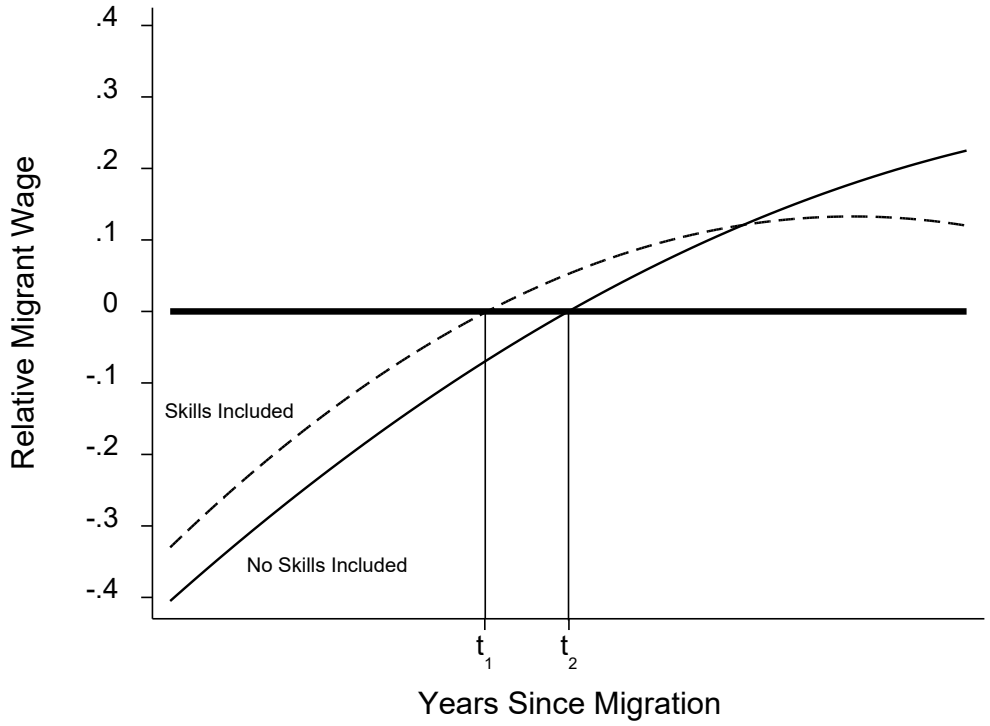
  3. Do relatively high skilled migrants assimilate faster?

Background

- Migrant workers typically earn less than their native counterparts:
  1. Non-transferability of certain types of human capital (Friedberg, 1992; Shields and Price, 1998; Kee, 1995; Friedberg, 2000; Bonfanti and Xenogiani, 2014; Dell'Aringa, Lucifora, and Pagani, 2015; Ingwersen and Thomsen, 2019)
  2. Migrant workers may lack the language skills to effectively compete with native workers (Friedberg, 2000; Warman *et al*., 2015)
  3. Labor market discrimination (Oreopoulous, 2011; Carlsson and Rooth, 2012; Zschirnt and Ruedin, 2012; Neumark, 2018)
- Losses in non-transferable human capital are made up for with time in the host country (Chiswick, 1978; Borjas, 1985)

Background

- Thus, migrants incur initial wage penalties that diminish with time spent in the host country (Chiswick, 1978; Borjas, 1985; LaLonde and Topel, 1992; Borjas, 1995)



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Contribution

- As far as we know, the only study of wage assimilation across many OECD countries
- Focus on the *speed* of assimilation, conditional on literacy and numeracy skills, is novel in the literature

speed of wage assimilation = f(initial penalty, relative wage growth)

Data

- OECD's restricted-use Programme for International Assessment of Adult Competencies (PIAAC)
  - Largest source of key information-processing skills collected at the country level
  - Literacy and numeracy skills for those aged 16-65
  - 37 OECD member countries
  - Collected in three rounds: round one in 2011-2012; round two in 2014-2015; and round three in 2017

Data

- OECD's restricted-use Programme for International Assessment of Adult Competencies (PIAAC)
  - Limit sample to those reporting a wage at the time of the survey, giving us roughly 49,000 observations
  - 11 countries excluded (less than 5% migrant workers)
    - Chile, Ecuador, Hungary, Japan, Korea, Lithuania, Mexico, Peru, Poland, the Slovak Republic, and Turkey
  - Russia excluded due to suspect data
  - Australia doesn't include years since migration
  - Indonesia retracted their data

Data

- For brevity/clarity, here we focus on just a few OECD countries:
  - Canada
  - Germany
  - Israel
  - New Zealand
  - United Kingdom
  - United States

Data

Table 1. Descriptive statistics for select countries, PIAAC survey

country	CA	DE	IL	NZ	UK	US
gross hourly wage[1]	22.32 (10.0)	21.02 (10.2)	14.13 (9.1)	19.72 (9.3)	21.04 (11.9)	24.53 (14.6)
wage inequality[2]	1.41	1.52	1.48	1.04	1.26	1.54
numeracy	277.0 (51.0)	283.9 (47.2)	267.2 (58.2)	281.6 (52.1)	280.7 (49.1)	267.6 (54.5)
literacy	283.8 (46.5)	278.1 (43.8)	267.5 (50.8)	289.5 (46.0)	288.2 (44.4)	281.2 (48.0)
schooling (years)	13.9 (2.4)	14.1 (2.4)	13.7 (2.4)	14.2 (2.4)	13.4 (2.3)	14.4 (2.7)
experience (years)	19.9 (9.1)	18.9 (9.5)	17.6 (8.3)	19.6 (9.1)	19.5 (9.4)	19.5 (9.3)
female share	.45	.37	.46	.42	.40	.46
migrants share	.19	.11	.22	.29	.12	.15
observations	7,004	1,864	1,473	1,751	2,606	2,931

[1] Gross hourly wage is measured in the national currency. [2] Wage inequality is defined as the log differential between the 90th and 10th percentiles of the wage distribution.

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Empirical Model

- Chiswick (1978) derived the seminal econometric specification
  - Add migrant status and years since migration to the Mincer earnings function

$$\ln(Y_i) = \ln(Y_0) + r_i S_i + C_1 T_i + C_2 T_i^2 + C_3 YSM_i + C_4 YSM_i^2 + C_5 FOR_i + C_6 NUM_i + C_7 FEM_i + C_8 MAR_i + U_i$$

γ: gross hourly wage

T: potential work experience

NUM: std. **numeracy** score

MAR: married indicator

S: years of formal schooling

YSM: years since migration

FEM: female indicator

U: idiosyncratic error term

Results w/o skill proficiency

Table 2. Migrant wage assimilation, PIAAC, no skill proficiency

	CA	DE	IL	NZ	UK	US
Foreign	-.374*** (.04)	-.503*** (.14)	-.881*** (.019)	-.180*** (.06)	-.405** (.16)	-.362*** (.13)
H.S. Equiv.	.215*** (.03)	.189*** (.06)	.273*** (.06)	.177*** (.03)	.142*** (.04)	.351*** (.04)
> H.S. Equiv.	.541*** (.02)	.602*** (.06)	.715*** (.06)	.476*** (.03)	.491*** (.04)	.876*** (.04)
Experience	.015*** (< .01)	.018* (.01)	.038*** (.01)	.027*** (.01)	.019** (.01)	.015* (.01)
Experience^2	-.0002*** (< .01)	-.0003* (< .01)	-.0006*** (< .01)	-.0005*** (< .01)	-.0004* (< .01)	-.0002 (< .01)
Female	-.186*** (.02)	-.186*** (.02)	-.176*** (.03)	-.165*** (.02)	-.201*** (.02)	-.249*** (.03)
Married	.094*** (.02)	.040 (.03)	.128*** (.04)	.128*** (.03)	.091*** (.02)	.119*** (.03)
Mig. Years	.012*** (< .01)	.018 (.01)	.048*** (.01)	.006 (.01)	.033** (.01)	.025** (.01)
Mig. Years^2	-.0001 (< .01)	-.0001 (< .01)	-.0006** (< .01)	-.0001 (< .01)	-.0005* (< .01)	-.0004*** (< .01)
Observations	9,772	1,864	1,473	1,751	2,606	2,931
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Results w/ skill proficiency

Table 3. Migrant wage assimilation, PIAAC, skill proficiency included

	CA	DE	IL	NZ	UK	US
Numeracy	.138*** (.01)	.197*** (.02)	.175*** (.02)	.145*** (.02)	.170*** (.02)	.161*** (.02)
Foreign	-.323*** (.04)	-.251* (.15)	-.686*** (.019)	-.125** (.05)	-.330** (.15)	-.348*** (.12)
Num. x For.	.018 (.02)	-.060 (.04)	-.032 (.03)	-.002*** (.03)	.080* (.05)	.030 (.04)
H.S. Equiv.	.109*** (.03)	.065 (.06)	.148*** (.05)	.102*** (.03)	.068 (.04)	.245*** (.05)
> H.S. Equiv.	.353*** (.03)	.360*** (.07)	.454*** (.06)	.325*** (.03)	.341*** (.04)	.622*** (.06)
Experience	.010*** (< .01)	.017** (.01)	.029*** (.01)	.024*** (.01)	.008 (.01)	.010 (.01)
Experience^2	-.0001 (< .01)	-.0002 (< .01)	-.0004** (< .01)	-.0004*** (< .01)	-.0001 (< .01)	-.0001 (< .01)
Female	-.147*** (.02)	-.137*** (.02)	-.123*** (.03)	-.139*** (.02)	-.144*** (.02)	-.210*** (.03)
Married	.077*** (.02)	.028 (.03)	.110*** (.04)	.100*** (.03)	.060** (.02)	.085*** (.03)
Mig. Years	.016*** (< .01)	.008 (.01)	.040*** (.01)	.005 (.01)	.036*** (.01)	.031*** (.01)
Mig. Years^2	-.0001 (< .01)	-.0001 (< .01)	-.0005** (< .01)	.0001 (< .01)	-.0007*** (< .01)	-.0005*** (< .01)
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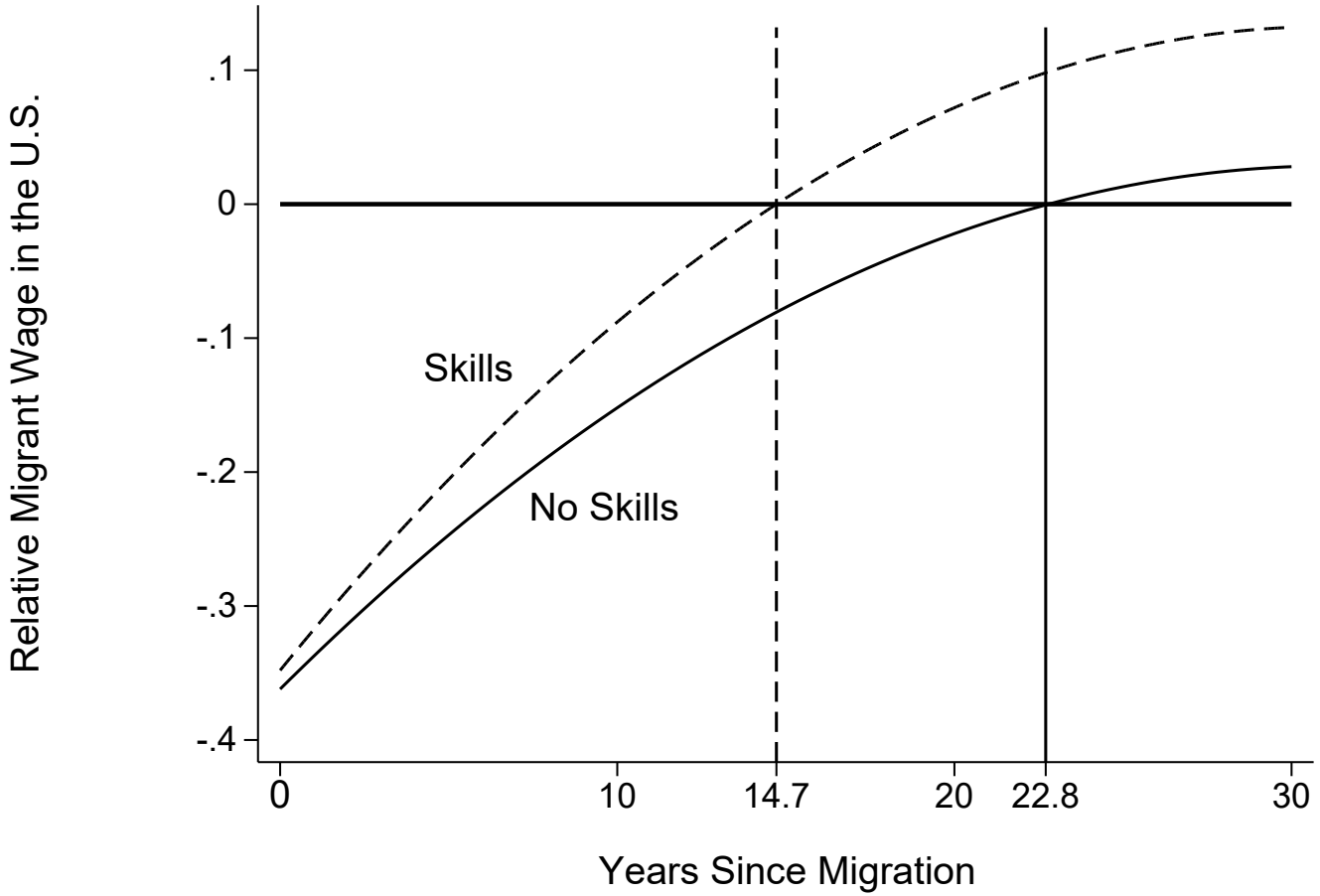

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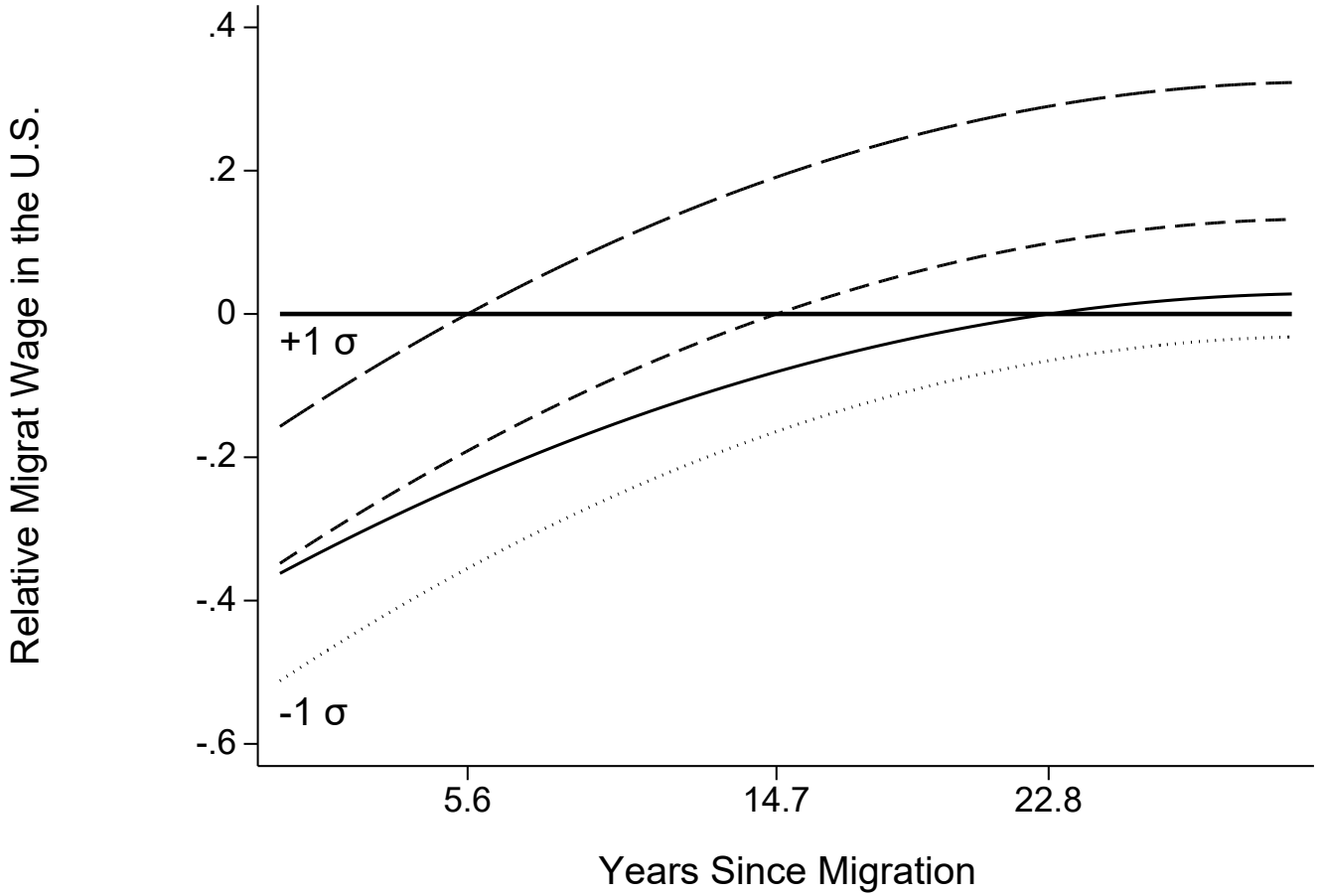

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Results

- Typically, when direct measures of skill are omitted:
  - Initial wage penalties overstated
  - Migrant wage growth understated
- Initial penalties (p) and 10-year wage growth (g)

Country	$p_{\text{No Skills}}$	p_{Skills}	g_{NoSkills}	g_{Skills}
CA	.374	.323	.11	.15
DE	.503	.251	.17	.07
IL	.881	.686	.42	.35
NZ	.180	.145	.05	.06
UK	.405	.330	.28	.29
US	.362	.348	.21	.26

Conclusions

- Higher literacy/numeracy, faster path to wage assimilation
- Policies to promote a stable long-term skilled immigration system should focus on literacy and numeracy proficiency in addition to work experience and education credentials
  - Creative solutions needed given the constraints of national immigration authorities

Conclusions

- Future work...
  - Examine which macro characteristics predict faster wage assimilation
  - Link IALS, ALL, PIAAC
    - Control for trends in skill proficiency (survey year FE)
    - Estimate cohort effects (not enough data in PIAAC alone)
  - Consider immigration between English-Speaking Developed Countries (ESDC)

Thank You

- For full country estimates, contact me at the email below
- Thank you for your time
- Contact:
  - christopher.erwin@aut.ac.nz