

Evaluating the effects of Australian policy changes on human capital: The role of a graduate visa

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Introduction

- **High-skilled migration** is becoming increasingly important in policy and academic debates (Franklin, 2003, Faggian and McCann 2009a,b, Faggian et al. 2013a, Venhorst et al. 2010, 2011; Marinelli 2011).
- Over the last four decades, there has been a **substantial increase in the competition for international high-skilled migrants**, with a resulting rise in their stock, from approximately 70 million in 1975 to 190 million in 2005 (Lowell 2007).
- This increase has in part been a product of **policies designed to attract foreign talent** by various developed countries in response to ageing populations and labour shortages.

Introduction

- In Australia the visa schemes have been revised in order to attract highly skilled migrants
- Australia was the second most popular destination of OECD-born high-skilled expatriates in 2001 and the third OECD nation in terms of high-skilled immigrant population (OECD 2008).
- The “**graduate**” **visa scheme** was introduced in September 2007 in Australia.
 - Overseas graduates allowed to remain in Australia for **18 months** with full working rights.
 - Following its implementation there was a sharp increase in the number of overseas graduates staying in Australia

Introduction

- This paper introduces a bipartite approach integrating a spatial descriptive analyses with an econometric evaluation technique to assess the effects of a federal policy on overseas graduates
- The empirical analysis is based on a unique dataset detailing employment-mobility behaviour of university graduates in Australia.

Research Questions:

- No research has focused so far on the effects of the introduction of the visa scheme **on interregional migration patterns** of these graduates and the differences between domestic and overseas graduates.
- Two key questions:
 - *Did the introduction of the visa alter the **location and occupational choices** of the international graduates staying in Australia?*
 - *How do location and occupational choices of domestic graduates compare with those of overseas graduates? And, what is the effect of these choices on **salaries**?*

Methodology

1. Descriptive analysis
 - Flow mapping & simple statistical descriptions
2. Difference-in-differences analysis
 - Compare characteristics of different subgroups of the graduate population in the period pre- and post-introduction of the graduate visa scheme (see Dynarski, 2003).
 - The effect of the graduate visa scheme on the graduate population composition and labour market outcomes

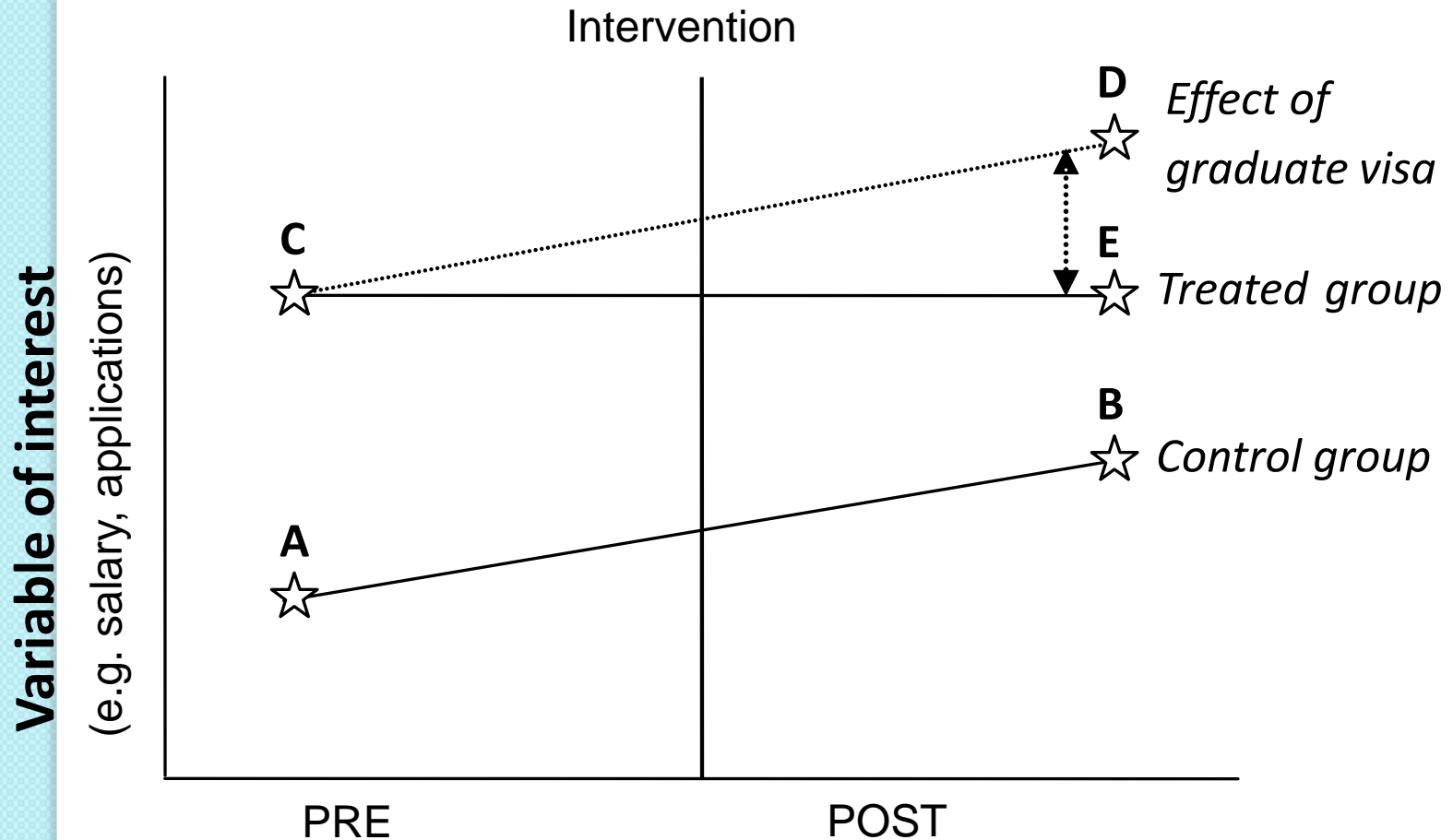
Methodology

Difference-in-differences analysis

		Period	
		Pre graduate visa	Post graduate visa
Group	Affected group <i>"treated"</i>	Overseas graduates <i>2006</i>	Overseas graduates <i>2009</i>
	Unaffected group <i>"control"</i>	Domestic graduates <i>2006</i>	Domestic graduates <i>2009</i>

Methodology

Difference-in-differences analysis



Data

- Survey of *graduates* in the academic years between 2005/6 and 2008/9
- 115,457 records in 2005/6 and 122,380 in 2008/9, after restricting to those graduates remaining in Australia and in paid or seeking employment, our final dataset contains **55,569** (domestic) and **3,844** (overseas) valid observations for 2006 and **64,249** (domestic) and **7,291** (overseas) for 2009.
- Sharp increase in proportion of overseas graduates between 2006 and 2009.

Some descriptive statistics..

- Top 5 subjects studied (2006)

TOP 5 OVERSEAS	Overseas (%)	Domestic (%)
Business Studies	25.21	18.64
Computer Science	19.93	5.15
Accounting	16.42	6.76
Electronic /Computer Engineering	3.54	1.05
Engineering (Other)	3.04	1.27

TOP 5 DOMESTIC	Domestic (%)	Overseas (%)
Business Studies	18.64	25.21
Education	15.86	3.10
Accounting	6.76	16.42
Life Sciences	5.65	2.78
Health	5.42	2.34

- Top 5 subjects studied (2009)

TOP 5 OVERSEAS	Overseas (%)	Domestic (%)
Accounting	26.42	5.78
Business studies	24.26	15.97
Computer science	13.56	2.87
Nursing	4.59	5.08
Life sciences	3.20	5.13
TOP 5 DOMESTIC	Domestic (%)	Overseas (%)
Business studies	15.97	24.26
Education	13.57	2.36
Humanities	9.40	2.94
Accounting	5.78	26.42
Health	5.53	2.36

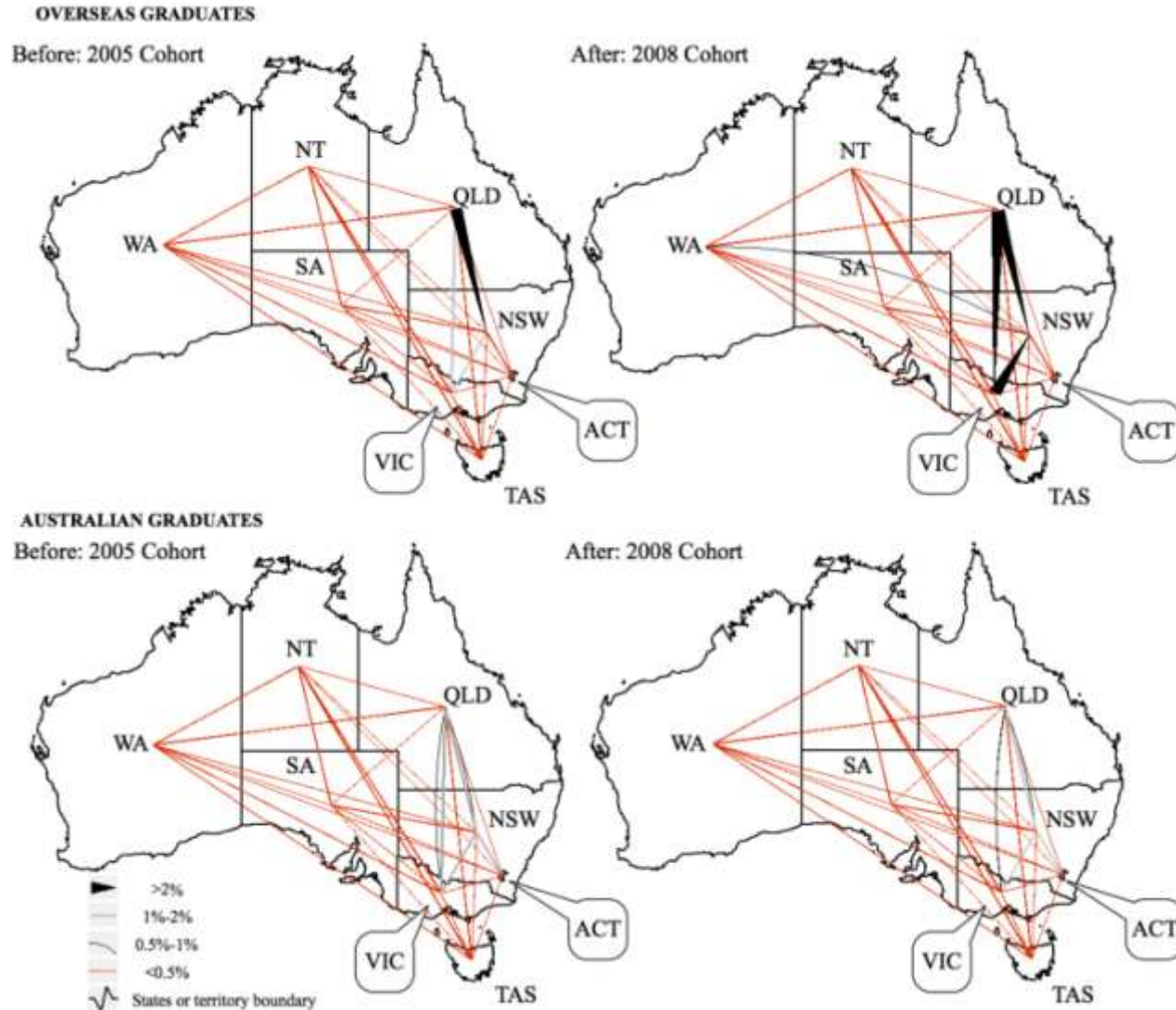
- Top 5 professions (2006)

TOP 5 OVERSEAS	Overseas (%)	Domestic (%)
Sales Assistant	6.24	3.11
Computing professional	5.07	2.94
Waiter	4.92	0.83
Accountant	4.27	4.07
Registered nurse	2.63	6.25
TOP 5 DOMESTIC	Domestic (%)	Overseas (%)
Registered nurse	6.25	2.63
Pre-primary school teachers	6.18	0.10
Primary school teachers	5.48	0.65
Accountant	4.07	4.27
Sales assistant	3.11	6.24

- Top 5 professions (2009)

TOP 5 OVERSEAS	Overseas (%)	Domestic (%)
Sales assistant	9.40	4.58
Accountant (general)	5.23	2.58
Accounts clerk	2.25	0.52
General clerk	1.7	0.03
Registered nurse	1.49	2.25
TOP 5 DOMESTIC	Domestic (%)	Overseas (%)
Primary school teacher	5.09	0.47
Sales assistant	4.58	9.40
Secondary school teacher	4.33	0.58
Accountant (general)	2.58	5.23
Registered nurse	2.25	1.49

Spatial patterns



Note: As a base the total number of either Australian or overseas graduates was used.

Spatial patterns

■ Similarities

- Large proportion of Australian & Overseas graduates remain in the state where they graduated.
- NSW, VIC and QLD account for the largest proportions of stayers.
- High interaction of graduate flows between WA, NSW, VIC and QLD.

■ Differences

- Overseas migration flows more spatially focused. Gini coefficient of 0.86 vs. 0.63, coefficient of variation of 3.15 vs 2.01

Effect of the graduate visa scheme on the graduate population composition and labour market outcomes

	2006 cohort		2009 cohort		(A)	(B)	Diff-in-diff (B-A)
	Domestic	Overseas	Domestic	Overseas	Diff Dom. 06_09	Diff Over. 06_09	
Personal characteristics							
Age	30.13	26.65	29.44	25.88	-0.69*** (-11.39) ⁺	-0.77*** (-6.99) ⁺	-0.08 (-0.63)⁺⁺
Male	39.07	54.17	38.54	51.7	-0.53* (1.76)	-2.47** (-2.20)	-1.94* (-1.78)
Disability	2.17	0.80	2.17	0.81	0.00 (0.00)	0.01 (0.05)	0.01 (0.04)
Undergrad.	59.4	42.95	61.47	42.73	2.07*** (6.86)	-0.22 (-0.20)	-2.29** (-1.99)

+ z-values in parentheses

++ t-values in parentheses

<i>Job characteristics</i>							
Salary	46,851.43	30,681.83	49,817.49	30,533.59	2,966.06*** (13.74)	-148.24 (-0.23)	-3,114.30*** (-4.64)
Salary FT	53,907.5	44,103.65	60,207.76	46,724.95	6,300.26*** (26.38)	2,621.3** (2.44)	-3,678.96*** (-3.34)
Managers	7.92	4.15	8.89	4.57	0.97*** (5.66)	0.42 (0.91)	-0.55 (-1.12)
Self employed	4.06	3.80	4.24	4.47	0.18 (1.45)	0.67 (1.50)	0.49 (1.05)
Permanent	61.84	36.51	59.08	34.71	-2.79*** (-9.15)	-1.80* (-1.68)	1.96 (0.86)
Full time (FT)	76.76	50.08	70.81	42.96	-5.95*** (-22.04)	-7.12*** (-6.36)	-1.17 (-1.01)
Hours worked	36.21	28.88	34.72	27.72	-1.49*** (-18.83)	1.16 (0.33)	0.33 (1.08)
Seeking FT	22.85	45.46	20.85	48.9	-2.00*** (-7.84)	3.44*** (3.07)	5.44*** (4.73)
Seeking PT	16.55	39.35	18.47	45.48	1.92*** (5.52)	6.13*** (5.51)	4.21* (2.27)
Health	18.72	9.57	18.24	12.29	-0.48** (-2.01)	2.72*** (3.82)	3.20*** (4.40)
Education	16.73	3.69	14.31	2.75	-2.42*** (-10.86)	-0.94** (-2.42)	1.48*** (4.82)
Creative	1.93	1.65	6.19	3.12	4.26*** (34.33)	1.47*** (4.10)	-2.79*** (-8.04)
Government	8.84	2.21	9.52	1.93	0.68*** (3.81)	-0.28 (-0.88)	-0.96*** (-2.60)

Location FIXED-EFFECTS

<i>Location</i>							
NSW	29.70	27.03	30.45	25.06	0.75*** (2.65)	-1.97** (-2.01)	-2.72*** (-2.64)
ACT	3.16	2.17	3.00	2.34	-0.16 (-1.50)	0.17 (0.51)	0.33 (0.95)
VIC	28.32	28.35	26.68	31.06	-1.64*** (-5.96)	2.71*** (2.63)	4.35*** (4.51)
QLD	17.91	23.74	18.84	20.26	0.93*** (3.89)	-3.48*** (3.77)	-4.41*** (-4.56)
SA	8.80	7.89	8.18	6.54	-0.62*** (-3.61)	-1.35** (-2.35)	-0.73 (-1.19)
WA	9.87	9.87	10.49	13.18	0.62*** (3.32)	3.31*** (4.53)	2.69*** (3.70)
TAS	1.80	0.82	1.96	1.39	0.16* (1.91)	0.57** (2.34)	0.41 (1.70)
NT	0.41	0.09	0.37	0.13	-0.04 (-1.04)	0.04 (0.52)	0.08* (1.95)

Modelling the effect of the graduate visa scheme on graduate salaries

- *Model 1* is the basic model in which no control variables are added.
- *Model 2* is the fully-specified model described by the equation:

$$\omega_j = \alpha + \beta_1(Overseas_j * Year06_j) + \beta_2 Overseas_j + \beta_3 Year06_j + \sum_{\alpha=1}^n \gamma_{\alpha} X_{\alpha} + \sum_{\alpha=1}^n \theta_{\alpha} (X_{\alpha} * Overseas_j) + \sum_{\alpha=1}^n \vartheta_{\alpha} (X_{\alpha} * Year06_j) + \varepsilon_j$$

where the subscript j refers to the j th graduate in our sample

- *Model 3* estimates equation (below) on the restricted sample of graduates working full-time.

Table 4: Difference-in-differences estimation results

a. OLS with robust standard errors (in parentheses)

	<i>All Workers</i>		<i>Only Full-time Workers</i>
	<i>Diff in Diff</i>	<i>Diff in Diff plus Covariates</i>	
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Dependent variable: Salary			
<i>Overseas * Yr2006 (Before)</i>	3,114.30*** (671.63)	2,092.61*** (623.80)	2,533.84** (1,059.50)
<i>Overseas</i>	-19,283.90*** (464.51)	-17,375.5*** (464.51)	-25,298.33** (7,981.44)
<i>Yr2006</i>	-	-	-2,014.14 (2,810.04)
Personal Characteristics			
<i>Age</i>	-	-	773.39*** (23.80)
<i>Male</i>	-	-	8,083.29*** (345.53)
<i>Disability</i>	-	-	-4,695.72*** (1,168.17)
<i>Undergraduate</i>	-	-11,362.09*** (308.62)	-12,934.84*** (393.90)

When the differences between overseas and domestic are taking into account the actual gap lowers..

Other control variables...mostly as expected

<i>Job Characteristics</i>			
<i>Manager</i>	-	18,102.16*** (693.13)	18,408.42*** (748.34)
<i>Self employment</i>	-	5,441.20*** (1,139.25)	9,507.55*** (1,882.31)
<i>Permanent/open ended</i>	-	5,825.59*** (288.06)	3,775.25*** (365.72)
<i>Hours per week</i>	-	1,075.86*** (13.75)	725.91*** (28.71)
<i>Health sector</i>	-	282.79 (374.23)	-1,145.44** (464.07)
<i>Education sector</i>	-	-4,224.74*** (353.91)	-6,094.89*** (445.20)
<i>Creative sector</i>	-	-6,679.16*** (435.00)	-9,692.17*** (711.20)
<i>Government</i>	-	4,177.70*** (467.61)	1,841.76*** (515.10)

Regional fixed-effects

Job Location			
NSW	-	1,306.42*** (374.19)	1,731.66*** (475.16)
ACT	-	1,330.92* (713.46)	1,623.46* (893.08)
VIC	-	-255.69 (382.85)	258.07 (490.19)
NT	-	-2,741.67* (1,368.40)	-2,655.15* (1,519.25)
SA	-	-1,280.60*** (400.82)	-1,311.71** (522.06)
WA	-	2,525.85*** (481.88)	3,009.24*** (596.58)
TAS	-	-2,598.65** (1,303.05)	-2,874.80 (1,842.99)
Interaction terms			
<i>All Covariates * Yr06</i>	-	YES	YES
<u><i>AllCovariates*Overseas</i></u>	-	YES	YES
<i>Intercept</i>	49,817.49*** (158.72)	-9,813.79*** (1,569.67)	4,418.09** (2,139.92)
R-squared	0.0196	0.3797	0.2650
No. observations	114,497	110,381	78,553

Because of the problems with salary outliers, we also run **quintile regressions at the median**. Results are similar, although the magnitude is different..

b. Quantile regression at the median (with robust standard errors)

	<i>All Workers</i>		<i>Only Full-time Workers</i>
	<i>Diff in Diff</i>	<i>Diff in Diff plus Covariates</i>	
	Model 1	Model 2	Model 3
Dependent variable: Salary			
<i>Overseas * Yr2006 (Before)</i>	5,800.00*** (1,115.55)	1,175.87*** (328.49)	3,638.02*** (514.56)
<i>Overseas</i>	-20,000.00*** (1,066.90)	-9,923.11*** (3,402.13)	82.31 (94)
<i>Yr2006</i>	-5,000.00***	4,123.76***	75
Personal Characteristics			
<i>Age</i>			
<i>Male</i>			
<i>Disability</i>			
<i>Undergraduate</i>			
		(176.52)	(231.24)

In general differences between overseas and domestic are larger when looking at median salaries only for FT..

Some preliminary observations

- Results are very robust to the introduction of a series of control variables showing that the salary disadvantage of overseas increased after the introduction of the visa scheme (willing to stay even if underpaid – removal of barrier to low paid jobs)
- Most of the results on the other control variables are in line with labour economics and human capital theory (e.g. older, PGs, male graduates better off)
- ‘Creative’ jobs = lower salaries (as it is the case for the UK, see Comunian et al. 2010)

Some preliminary observations

- Important for policy: graduate visa scheme introduced 'biases' in the labour markets and allowed overseas to settle for poorer work conditions (lower salaries, more temporary jobs) – Good (first step for future success?) or bad?
- Now looking at longitudinal data recently published...



End