Education and Adult Literacy Skills

Higher Education Quality Council of Ontario

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Assessing PSE quality

- Debate over whether Univ quality has fallen
- Lack of good outcome measures makes it difficult to assess quality
- Most quality measures are inputs, not outcomes
- One key outcome is earnings of graduates
- However, earnings are influenced by many factors in addition to quality of education
- Ideally we would like a "pure" quality measure

Adult skills as quality measures

- Direct measures of skills arguably provide a suitable measure

- IALS 1994 and IALSS 2003 provide measures of literacy skills of adult population

- PIAAC 2012 will also provide comparable measures of literacy skills

- IALSS 2003 and PIAAC 2012 provide comparable measures of numeracy skills of adults

- All three surveys provide direct skill measures for a representative sample of adults

This presentation

- Presentation uses data from IALS94 and IALSS 2003 to assess PSE quality

- Draws on two recent studies:

- Green and Riddell (2012) "Ageing and Literacy Skills: Evidence from Canada, US and Norway"

- Green and Riddell (2012) "Understanding Educational Impacts: The Role of Literacy Skills"

Relevance to PSE

- Fundamental skills like literacy and numeracy might seem more appropriate for assessing elementary and secondary school

- However, some of the IALS questions required fairly advanced knowledge/skills

- Cascio et al (2008) find that literacy gains into adulthood vary across countries and these gains are strongly correlated with participation in PSE

Relevance to PSE

- Figure 1 plots partial correlation between literacy skills and years of schooling controlling for age, gender, parental education, etc.
- Some evidence of diminishing returns
- Nonetheless positive marginal gains in skills associated with extra schooling beyond HS
- Fig 2: skill distributions by education level
- Univ skill distribution dominates that of college, and college dominates HS grads

Regression-Adjusted log skill by Years of Schooling with School 0-8 as Base Category
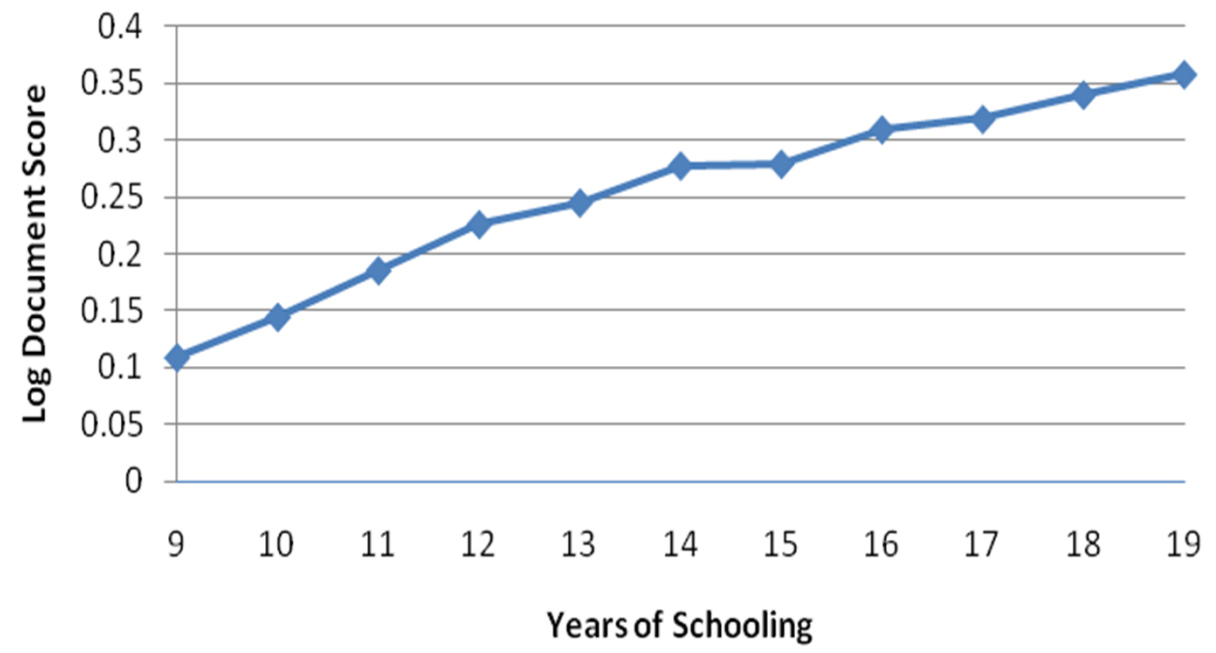
Average Literacy by Education Group
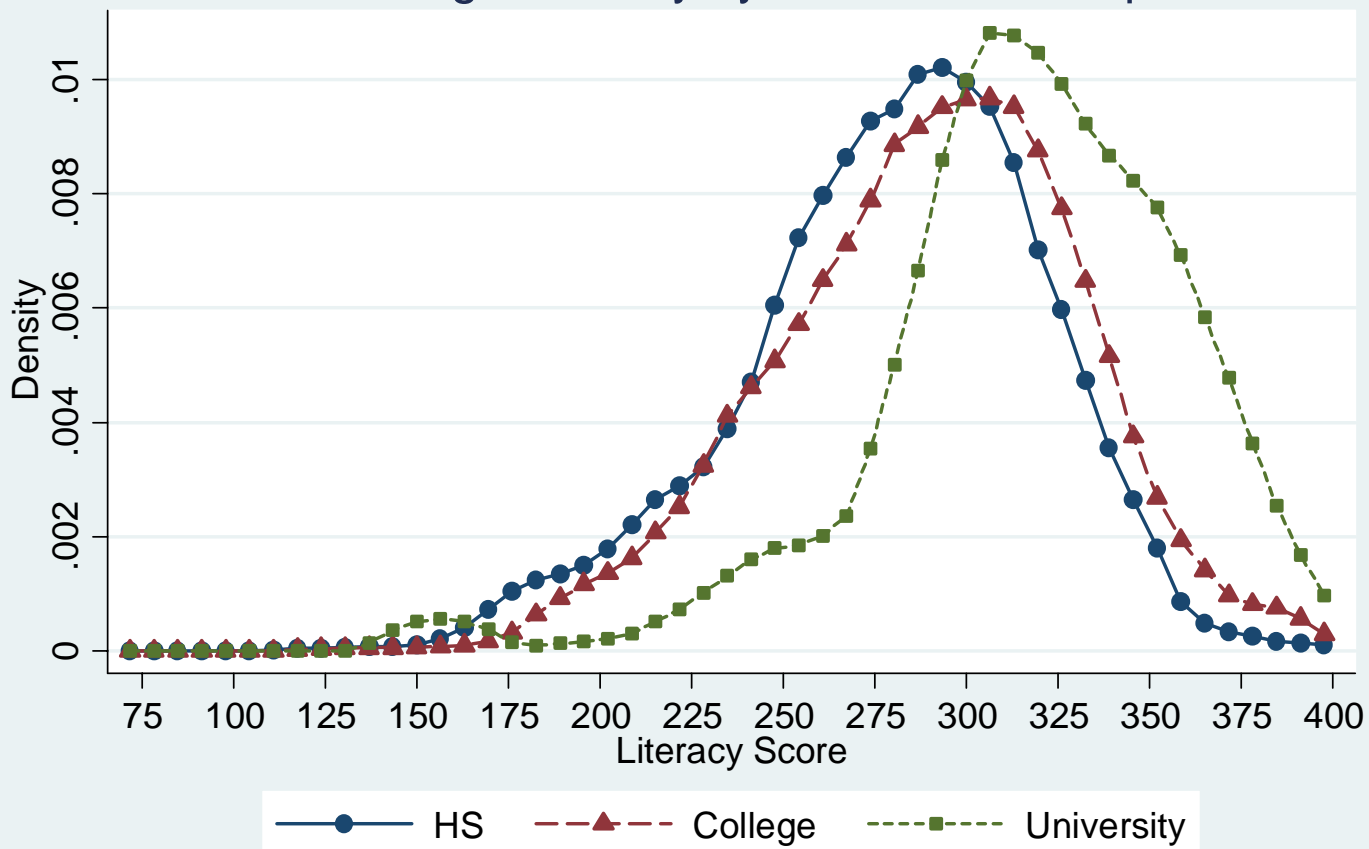
Source: IALSS 2003

Breakdowns by education

- Breakdowns by education level, without regression-controls

- HS grads: worsening at top, significant improvement at bottom

- College grads: worsening at top, improvement at bottom

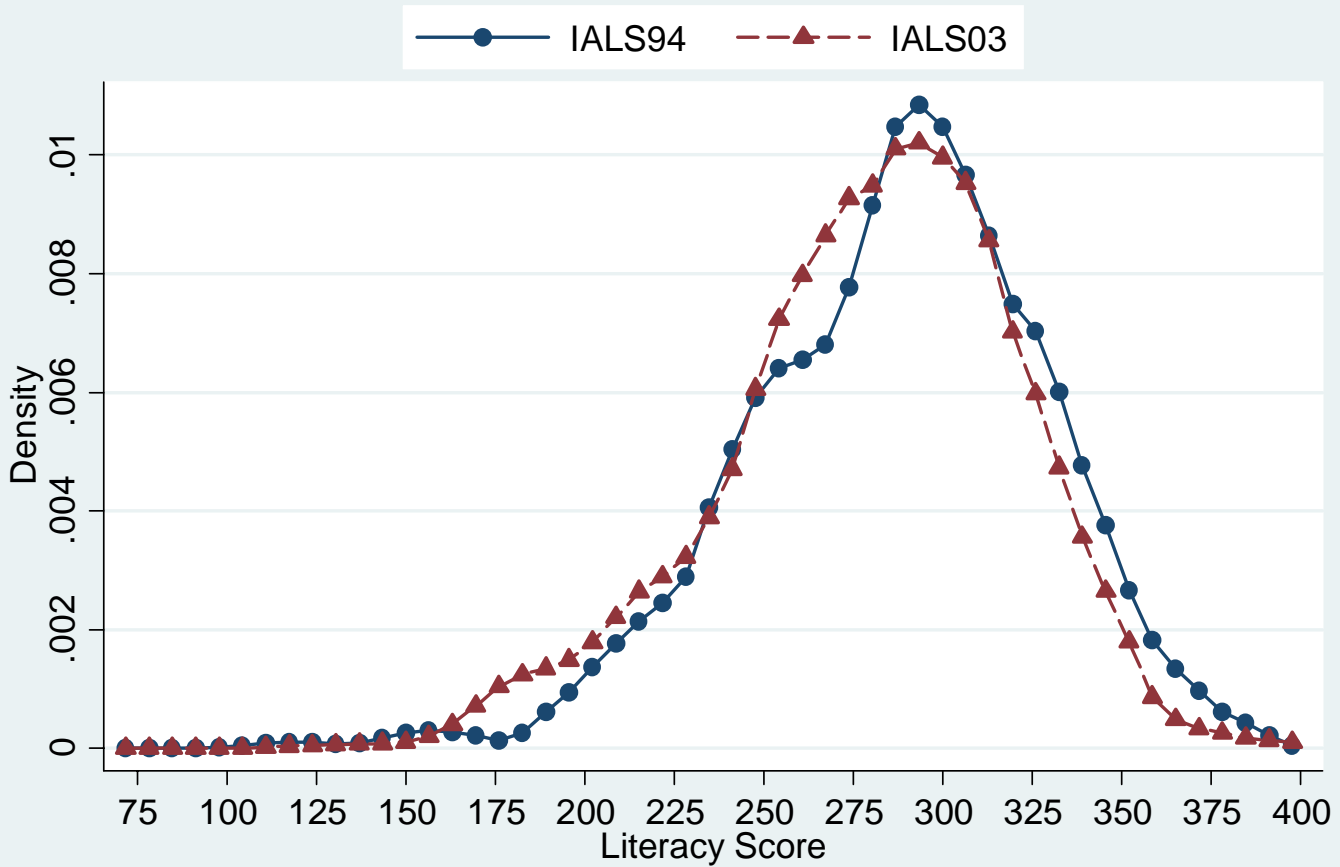- Univ grads: substantial worsening at top, small improvement at bottom
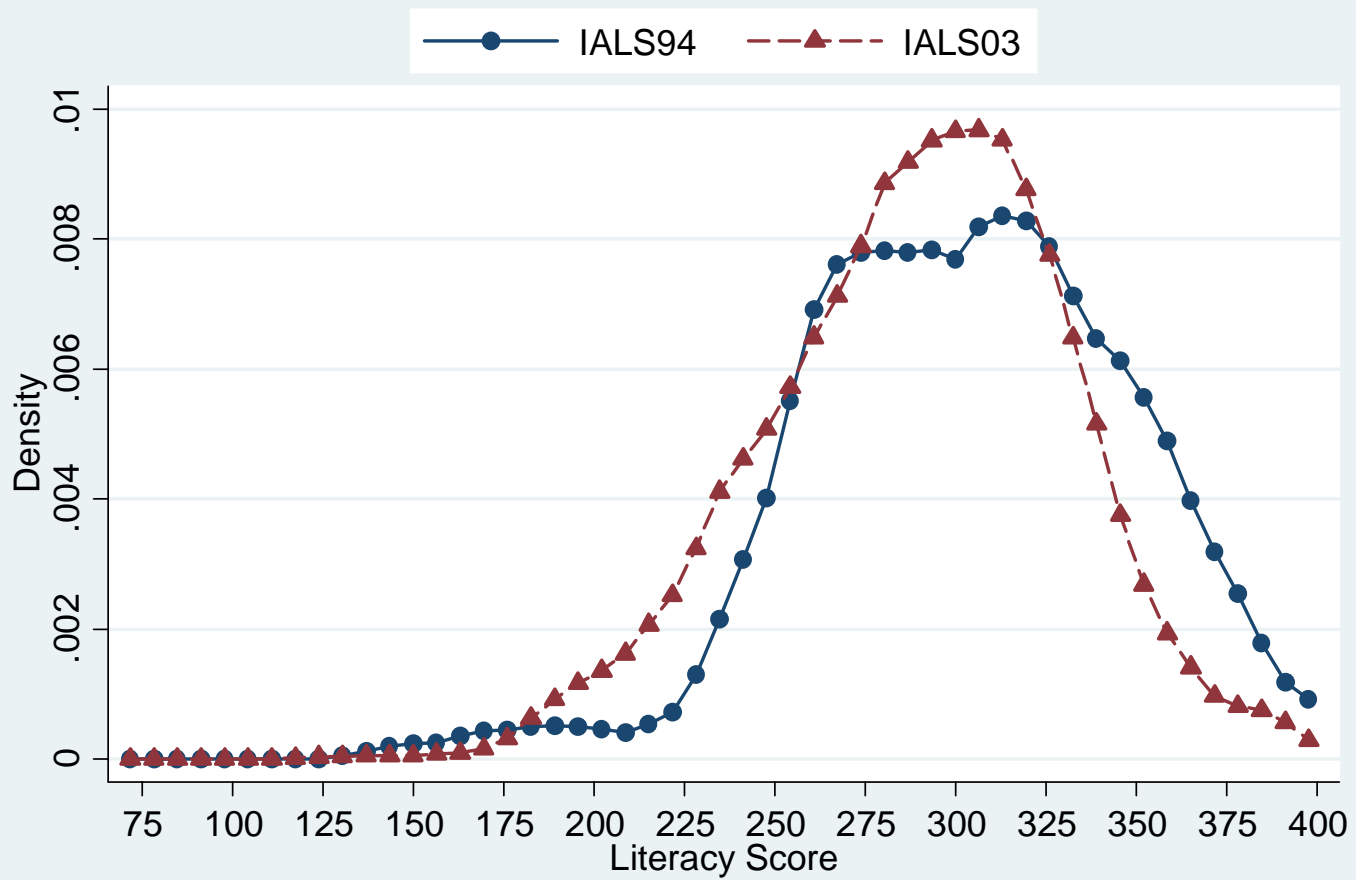
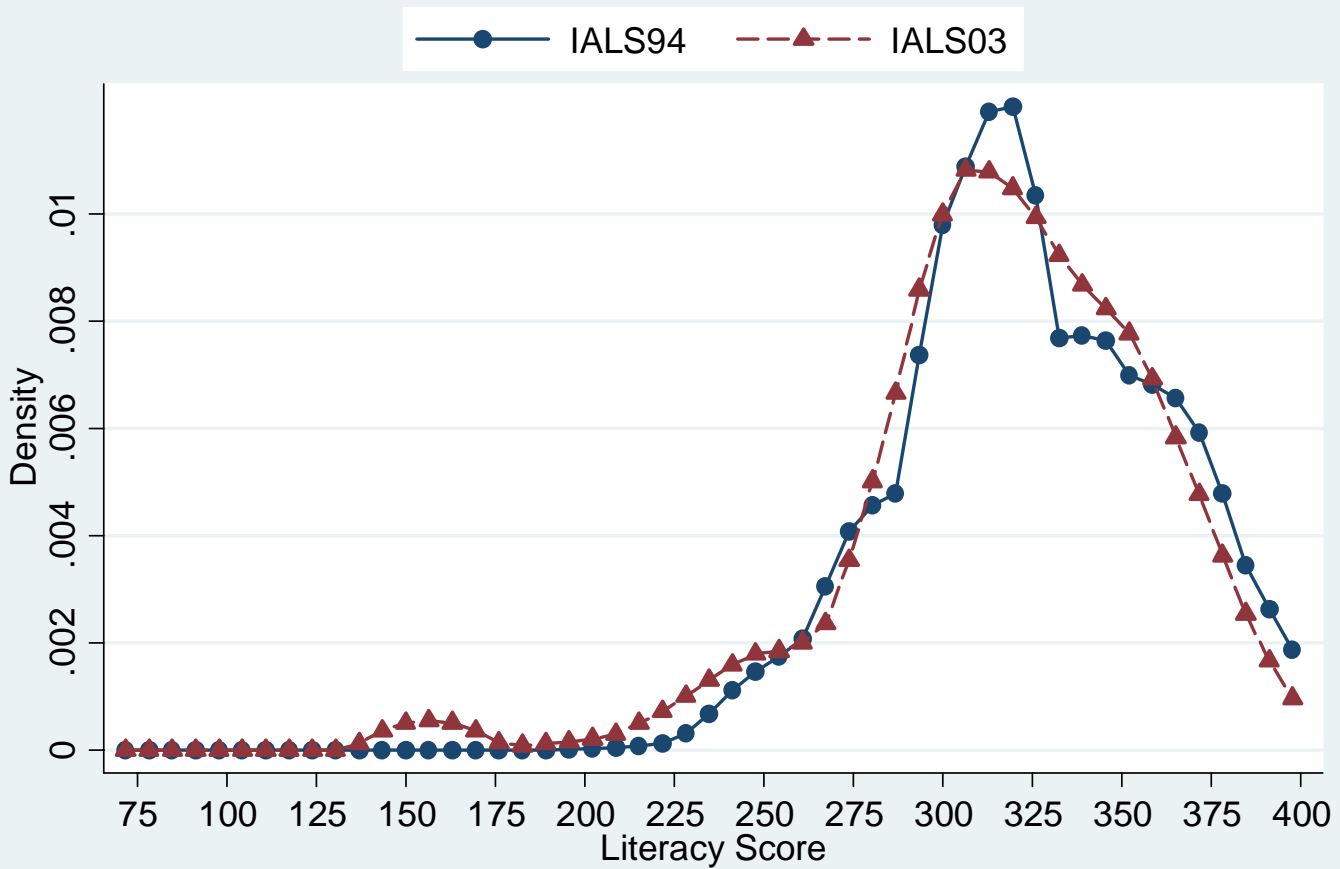Figure 7: Average Literacy, High School

Figure 8: Average Literacy, College

Figure 9: Average Literacy, University

Age and cohort effects

- Research question: how do skills of successive generations compare?

- Use IALS94 and IALSS03 to create synthetic cohorts – allows separation of age and cohort effects

- E.G. observe skills of 26-35 year olds in 1994 and 35-44 year olds in 2003

- Each is a random sample of 1959-68 birth cohort, so can identify effects of ageing

Cohorts

- Cohorts defined for age ranges:
- Cohort 1: 26-35 in 1994 (35-44 in 2003)
- Cohort 2: 36-45 in 1994 (45-54 in 2003)
- Cohort 3: 46-55 in 1994 (55-64 in 2003)
- Cohort 4: 56-65 in 1994 (65-74 in 2003)
- Cohort 5: 65+ in 1994   (74+ in 2003)

Cohort differences

- Compare the same age groups in 1994 and 2003, shows cohort effects holding age constant
- 26-35 year olds in both years:
  – large improvement at bottom of distribution
  – decline at top of distribution
  – little change in median
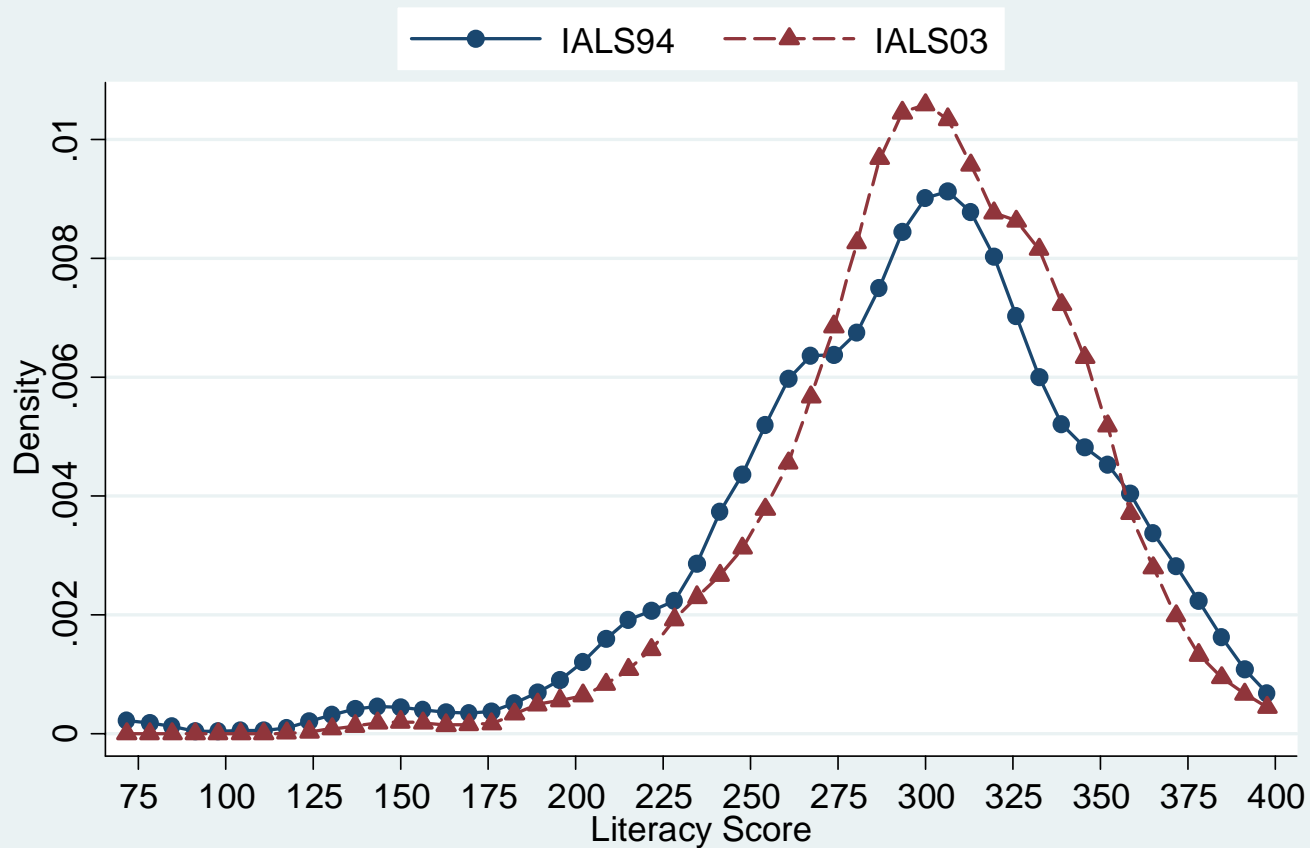- 36-45 year olds in both years: similar patterns

Figure 2: Average Literacy, Age 26-35

Figure 3: Average Literacy, Age 36-45
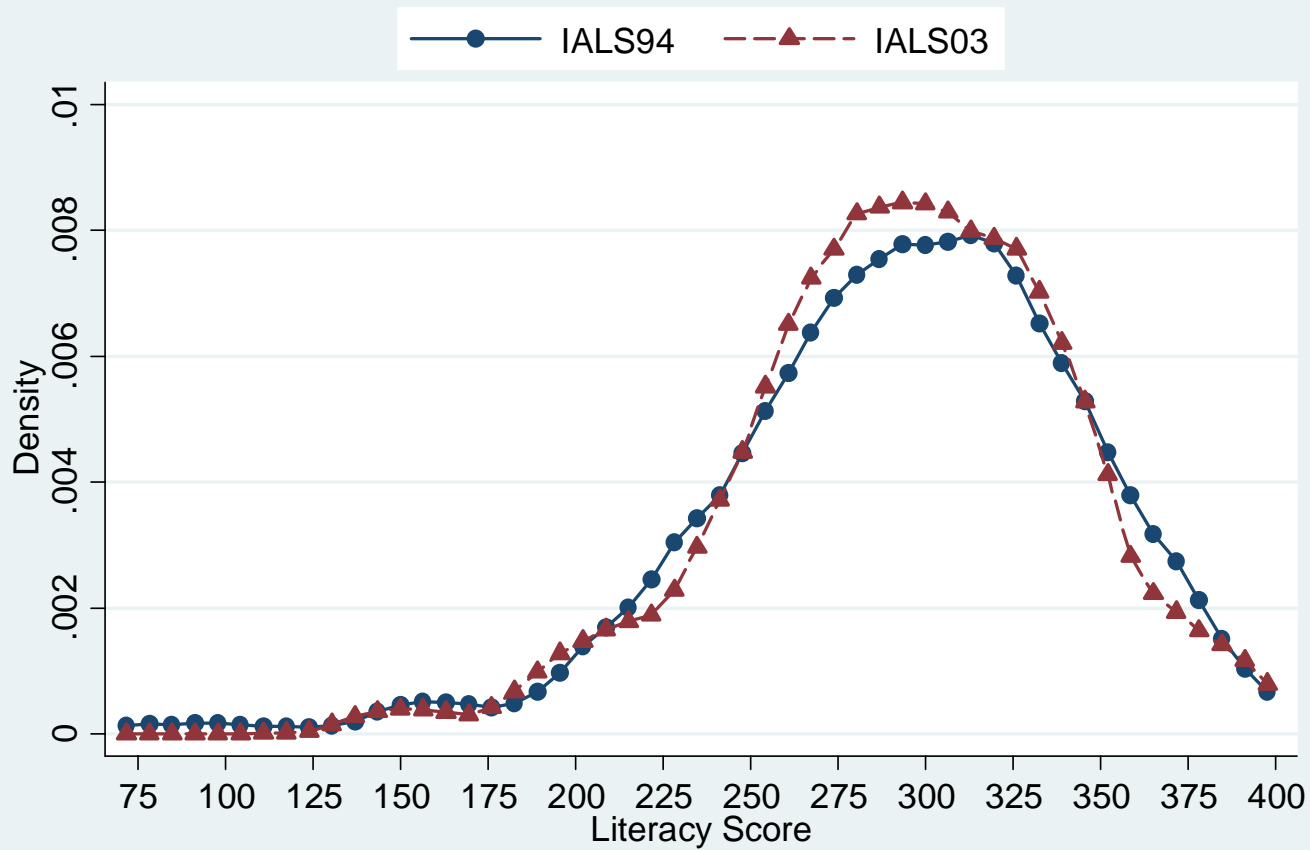
Regression-adjusted cohort effects

- Regression-adjusted cohort effects control for other influences on skills (age, education, gender, parental education, etc)
- Estimates indicate more recent cohorts have significantly lower literacy skills
- Mean estimates of cohort effects relative to most recent cohort (Cohort 1):
  - Cohort 2: + 1.9%
  - Cohort 3: + 2.9%
  - Cohort 4: + 4.0%

Quantile estimates of cohort effects

- Quantile estimates indicate that decline in skills is most evident at top of the skill distribution
- 10th percentile: no significant cohort effects
- Median:
  - Cohort 2 +2.5%   Cohort 3 +4.8%   Cohort 4 +6.6%
- 90th percentile:
  - Cohort 2 +3.3%   Cohort 3 +4.5%   Cohort 4 +8.9%

Summary

- Evidence of declining skills across successive cohorts
- Results suggest we are doing a poorer job of educating successive generations, at least in terms of literacy skills
- Decline in literacy skills is most prominent at top of skill distribution
- Consistent with decline in university quality, though not conclusive
- PIAAC data will enable much richer analysis – three samples for literacy and two for numeracy

Making the Most Out of Post Secondary Education:
A Review of Research on the Returns to Higher Education

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Two Opposing Views About PSE:

1) Nearly Everyone Should Go (and Complete)
- "In a global economy where the most valuable skill you can sell is your knowledge, a good education is no longer just a pathway to opportunity – it is a pre-requisite..I ask every American to commit to at least one year or more of higher education or career training" Obama, February 24, 2009

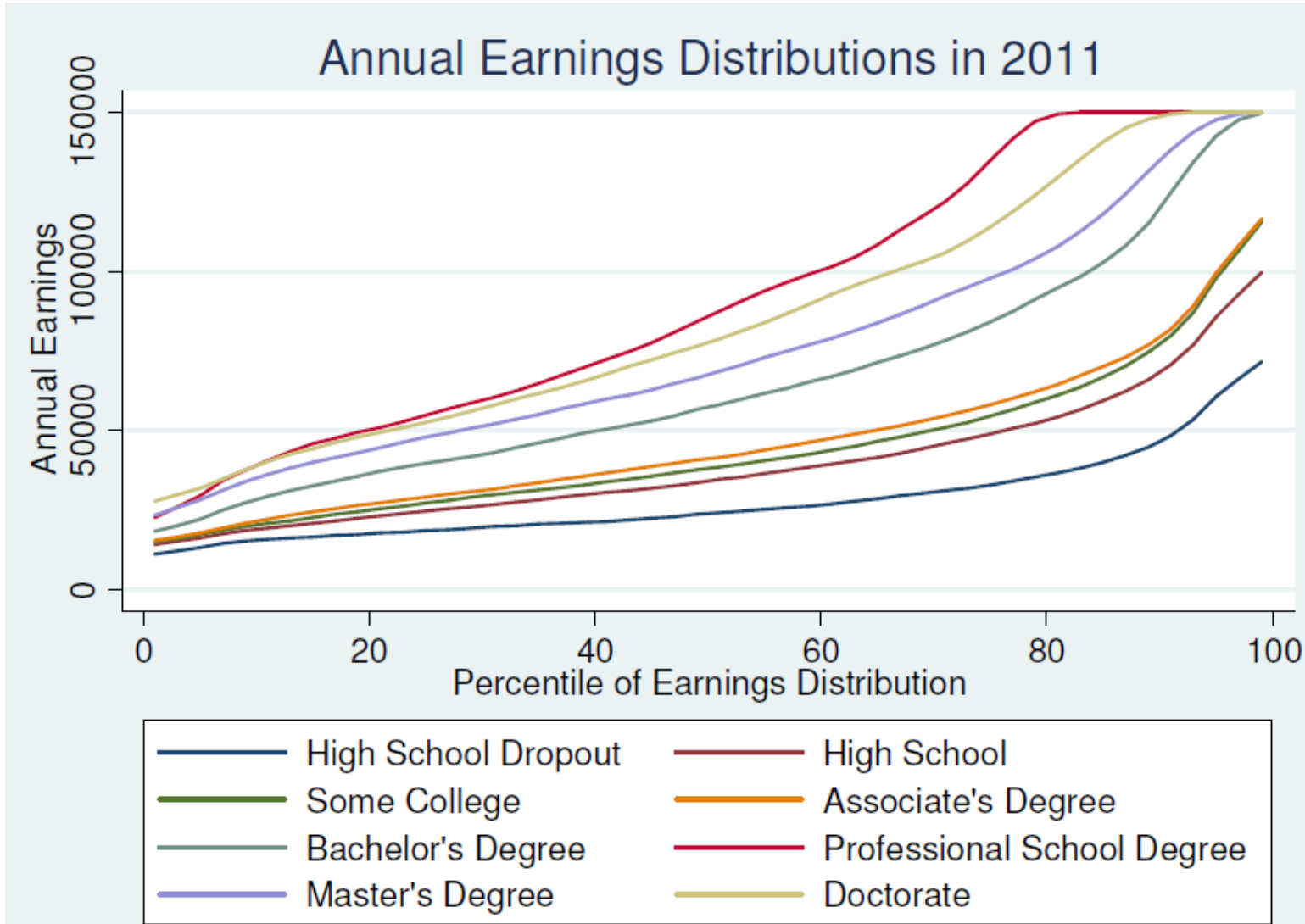**2) No Longer Worth It Especially For Marginal Students (or maybe worth it, but due to signal)**
- Dramatic increases to costs and borrowing rates
- PSE completion rates falling
- Study times down
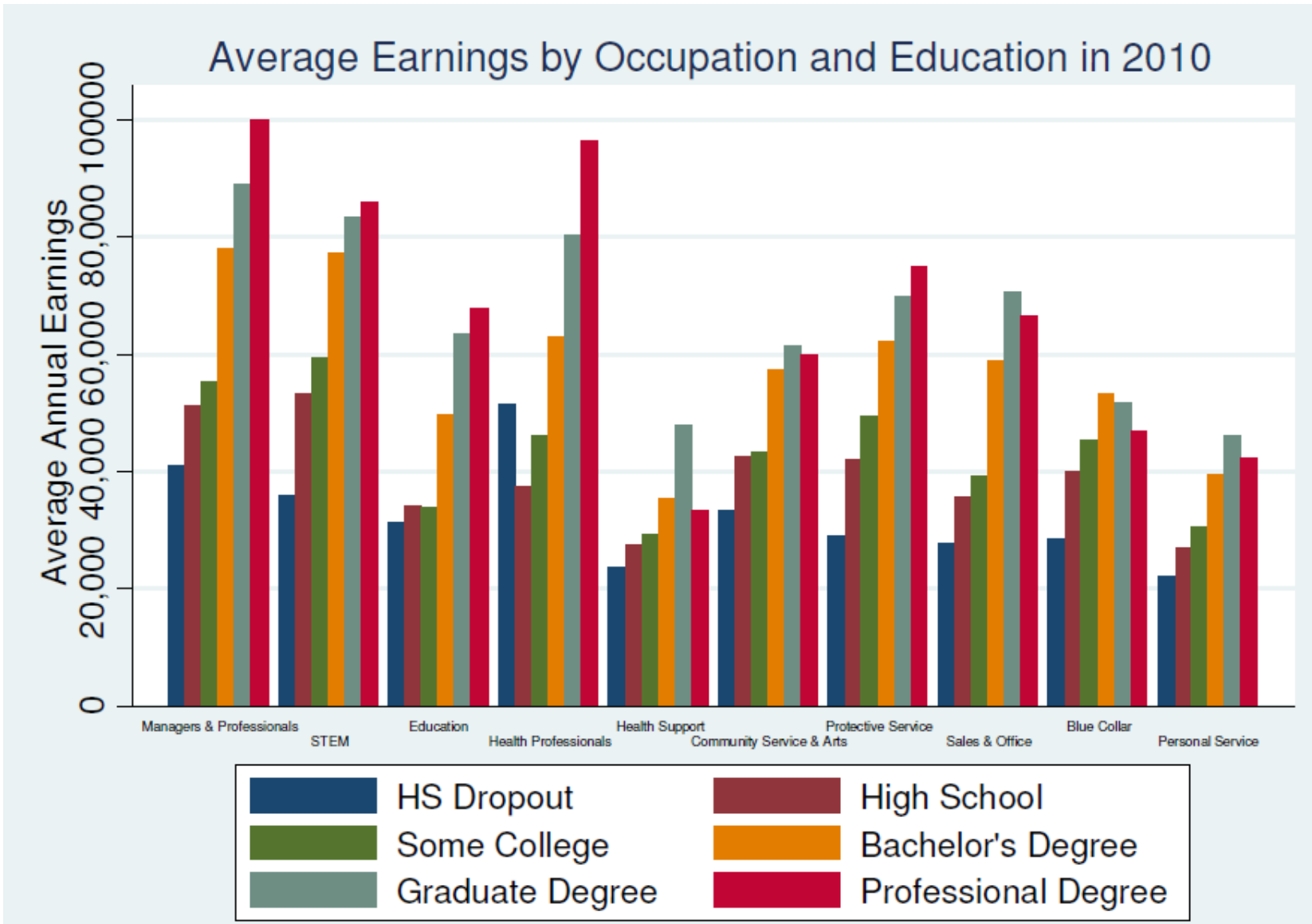- Value added questioned (e.g. Academically Adrift)

Classical Investment Model Leads to, By Definition, Everyone Optimizing Ex Ante, Except Underinvestment in Cases of Liquidity Constraints

- Tremendous heterogeneity, inappropriate to treat individuals or even groups of individuals identically

- Growing evidence of importance of liquidity constraints or debt aversion - costs growing faster than aid access - lower income families who appear academically prepared for BA not going or failing to finish - trend increasing

- Deviations from model opens possibility for under and over investment: incomplete information (lower-income households tend to over-estimate costs), take-up costs (FAFSA, college application), cultural/social norms

Median BA GRADS Earns 67% more than Median HS Grad, With Gap Increasing Comparing Those Higher in Earnings Distribution

Annual Earnings Distributions in 2011

Legend:
- High School Dropout
- High School
- Some College
- Associate's Degree
- Bachelor's Degree
- Professional School Degree
- Master's Degree
- Doctorate

Occup Matters, But Even Within Occup, College GRADS do Better

Average Earnings by Occupation and Education in 2010

Causal Evidence
- Mostly outdated and questionable (G.I. Bills and Distance to PSE instruments), findings generally 10-15%/year

- Propensity-score approach for more recent cohorts shows higher ret. for those least likely to complete (30%) (Brand and Xie 2010)

- Seth Zimmerman's paper most convincing approach to date to look at recent (marginal) cohorts: Attaining grades just above cut-off for admission to Florida International University predicts college enrollment and completion. While returns could biased downwards due to alternative college options doesn't find evidence of this. Estimates 26.2% return to PSE attendance, though standard error high

Important evidence from increasing demand for 'abstract' and tech-skills corresponding to increasing college premium
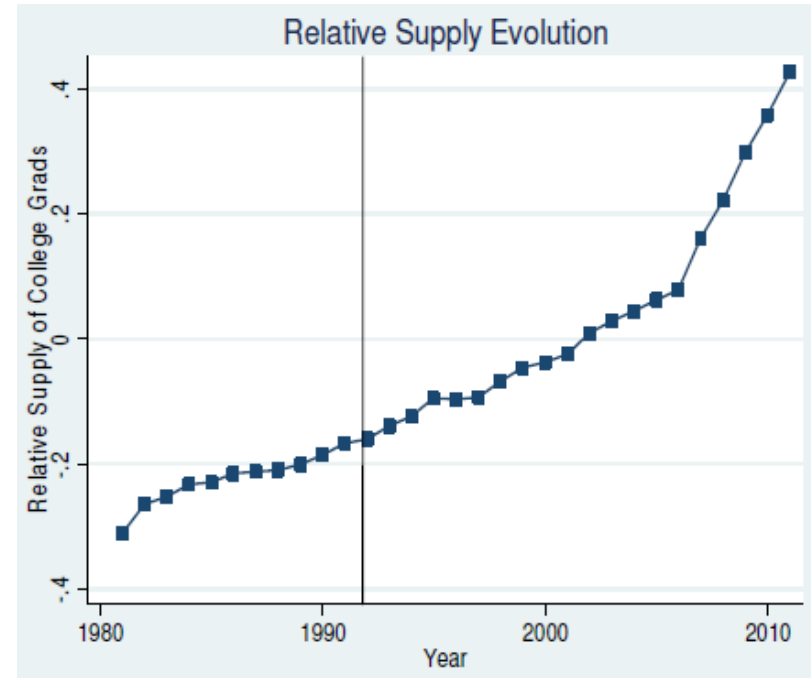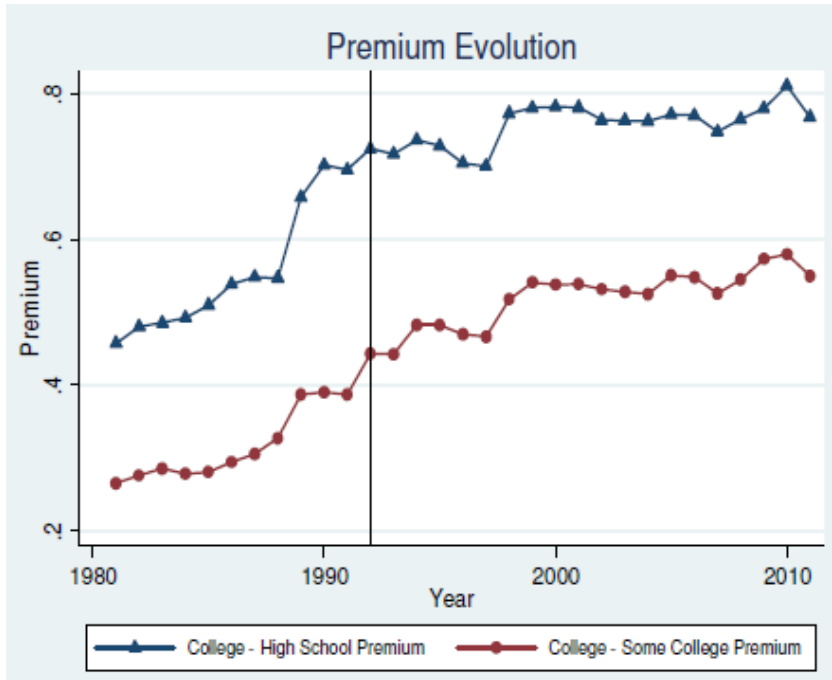
- Carneiro and Lee (2010) show that premium trend would be even higher after adjusting for ability selection in and out of ed. cat.
- Story: college affects occup. placement, also tasks within occup.

Signalling

- Value-added of PSE questioned (Academically Adrift, anecdotes of slacker students, decline in studying)

- SBTC story for tech-specific fields provides evidence against this - issue seems more related to arts and humanities studies

- Arcidiacono, et al.(2010) show no evidence of updating ability priors for PSE grads (while some for HS grads), but if even a little time gap between full knowledge of skills occurs, signalling could still play a long-term role

- PSE completion does appear to be a pre-requisite among employers for many jobs. Grades can be used by employers

- Signalling story may matter more to some than others

No evidence to suggest not going on to PSE better option

To maximize PSE return:

- Make sure you complete program

- Considering ability and interests, choose program that fosters non-routine tasks (abstract, tech, or manual)

- Along same lines, grad school seems to generate high returns if you can complete

- Be well informed about costs and financial aid (get help)

- Get involved, be motivated, and aim for high grades

RETURNS TO APPRENTICESHIP: ANALYSIS

BASED ON THE 2006 CENSUS

HEQCO Learning to Earning Conference

Thursday, November 1, 2012

By: Harry Krashinsky, University of Toronto

(I) Introduction

Historically, data limitations have impacted potential studies of apprentices in Canada

Many datasets don't individually identify apprentices:

- LFS, SCF, SLID and NGS do not identify apprentices
- NLSCY does not identify parents who are apprentices

Other datasets do identify apprentices, but are not ideal:

- YITS has information on apprentices, but only a few in the data
- WES only identifies apprenticeships completed in 12 months from date of interview
- NATS contains detailed information on apprentices, but:
    - (i) only in 1994
    - (ii) limited income information ($5000 increments)
    - (iii) no non-apprentices in the data

Prior to 2006 Census, apprentices are not separately identified

→included with trade certificate or diploma

But in 2006, apprentices are separately identified **for the first time**

(II) Goal: Explore the "Known Knowns"

Use the 2006 Census to compare apprentices to other educational groups:

> (1) High school graduates
> (2) Trade Certificate
> (3) College Graduates

Benefits:

> (1) Large, representative data set
> (2) First time to use the Census data for apprentices

(III) Results

(1) Apprentices exhibit significantly different earnings than those with:
- trades certificate
- high school diploma

→ grouping within the Census prior to 2006 masks this heterogeneity

(2) Male Apprentices exhibit earnings generally similar to college graduates

Selected coefficients from regressions:

	Males	Females
High school grad	.030	.032
Trade certificate	.050	-.039
Apprenticeship	**.092**	**-.117**
College	.114	.089

General wage differences:

(1) For men, apprentices exhibit significantly higher earnings than HS grads and those with a trades certificate, and almost as high as those with a college degree.

(2) For women, apprentices exhibit significantly lower earnings than many comparable educational groups.

Determining source of earnings difference

Use Blinder-Oaxaca decomposition

$$(\bar{Y}_a - \bar{Y}_n) = (\bar{X}_a - \bar{X}_n)\beta_n + (\beta_a - \beta_n)\bar{X}_a$$

Attribute difference in earnings $(\bar{Y}_a - \bar{Y}_n)$ to two factors:

1. Observable characteristics: $(\bar{X}_a - \bar{X}_n)\beta_n$
2. Differences in returns: $(\beta_a - \beta_n)\bar{X}_a$

Males:

	Overall (Ya – Yn) (1)	Endowments (Xa –Xn)ßn (2)	Coefficients (ßa – ßn)Xa (3)
Apprentice – High School Grads	.2405 (100%)	.0150 (6%)	.2255 (94%)
Apprentice – Other Trades	.1549 (100%)	.0982 (63%)	.0567 (37%)
Apprentice – College Grads	.0232 (100%)	.0226 (97%)	.0006 (3%)

Key Observations

(1) As education of comparative group increases, importance of endowments increases.

(2) Selection seems to be important issue for comparison with HS grads

Females:

	Overall (Ya – Yn) (1)	Endowments (Xa –Xn)ßn (2)	Coefficients (ßa – ßn)Xa (3)
Apprentice – High School Grads	-.0656 (100%)	-.0504 (77%)	-.0152 (23%)
Apprentice – Other Trades	-.0112 (100%)	.0429 (383%)	-.0541 (-483%)
Apprentice – College Grads	-.2470 (100%)	-.0424 (17%)	-.2046 (83%)

Key Observations

(1) The importance of endowments runs differently for women than men
→ as education of comparison group increases, importance of endowments decreases

(2) Only reason effect of apprenticeship is not more negative for comparison to trades is the large positive effect of endowments for apprentices

(IV) Next Steps: "Known Unknowns"

(1) What do these returns represent – selection effects seem to be present, but are these true *causal* returns?

(2) Exploit Red Seal exam scores?