Debt, Human Capital Accumulation, and the Allocation of Talent

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This paper

- What is the effect of student debt on job choice and human capital accumulation on the job?

- New, convincing, empirical results from clever and clear IV design
  - Higher debt $\implies$ Higher initial earnings, Lower earnings growth
  - Separate out into between and within occupation effects

- Use empirical results to estimate quantitative model
  1. Schooling decision/occupation choice integrates empirical design
  2. Life-cycle human capital accumulation

- Counterfactual exercises
  - In progress

Overview

- Two period model
  - Within-occupation - Ben-Porath + Constraints
  - Across-occupation - Roy
- How these relate to the within/between occupation empirics
- Ben-Porath or menu of jobs?
- General discussion

Within occupation

$$V(\varphi, w, \theta, a_0) = \max_{a', s} \; u(c_1) + \beta \quad u(c_2)$$

subject to

$$\begin{aligned} c_1 + a' + w\theta\boxed{s} &= w\theta + a_0 \\ c_2 &= w\theta \left[\varphi^{1-\alpha} s^{\alpha}\right] + Ra' \quad , \quad \varphi > 1 \\ a' &\geq -\underline{a} \end{aligned}$$

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- Human capital investment

$$1 = \frac{\beta u'(c_2)}{u'(c_1)} \times \left[\alpha \varphi^{1-\alpha} s^{\alpha-1}\right]$$

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$$\frac{\beta u'(c_2)}{u'(c_1)} = \frac{1}{R} \quad \rightarrow \quad s^* \quad , \quad y_1^* \quad , \quad \Delta y^*$$

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- Constrained

$$\frac{\beta u'(c_2)}{u'(c_1)} < \frac{1}{R} \quad \rightarrow \quad s^c < s^* \quad , \quad \underbrace{y_1^c > y_1^*}_{w\theta(1-s)} \quad , \quad \Delta y^c < \Delta y^*$$

Within occupation

$$V(\varphi, w, \theta, a_0) = \max_{a', s} \; u(c_1) + \beta \mathbb{E}\Big[u(c_2)\Big]$$

subject to

$$\begin{aligned} c_1 + a' + w\big[s\big] &= w\theta + a_0 \\ c_2 &= w\theta z\Big[\varphi^{1-\alpha} s^{\alpha}\Big] + Ra' \quad , \quad z \sim F(z) \\ a' &\geq -\underline{a} \end{aligned}$$

- Buffer stock - If a_0 low, build savings by increasing labor supply, $\downarrow s$
- Constraint - Similar discussion as before

Within occupation

- Discussion of borrowing constraints and human capital development nested in papers that combine Bewley + Ben-Porath

- Huggett, Ventura, Yaron (AER, 2011), Griffy (2020)

- Main result: Initial differences in wealth can have large effects on lifetime human capital accumulation and individual welfare

- As it stands the theory part of the paper focuses a lot on this: Prop 1,2,3

- Suggestion: Shift focus to occupational choice

Across occupation

- Choose between occupations: $\left(\varphi_A, w_A, \theta_A^i\right)$, $\left(\varphi_B, w_B, \theta_B^i\right)$
- $V(\varphi_k, w_k\theta_k^i, a_0^i)$ is increasing in $(\varphi, w\theta)$
- As the constraint becomes more binding, then $\downarrow V_\varphi \propto s^\alpha u'(c_2)$
  - However, for fixed (w, θ) a binding constraint doesn't flip $\gtrless$ over k
- Example: $\varphi_A < \varphi_B$
  - $w_A\theta_A^i < w_B\theta_B^i$: Both constrained *and* unconstrained prefer B
  - $w_A\theta_A^i > w_B\theta_B^i$: Constrained may choose A despite $\theta_A^i < \theta_B^i$
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Depends a lot on the joint distribution of (w_k, φ_k)

Main empirical results

Dependent Variable: Log(earnings)	(I)	(II)
Effect of student debt ($000s) on:		
(i) Initial earnings	2.34%	1.45%
(pvalue)	0.01	0.02
(ii) Returns to experience	-0.47%	-0.19%
(pvalue)	0.07	0.33
Fixed Effects:		
(a) Occupation FE & Occupation x Exp		Yes
(b) Industry FE & Industry x Exp		
(a) and (b)		
Initial wage effect explained		37.75%
RTE explained		60.45%

1. Higher debt - Higher initial earnings
   - Consistent with Rothstein Rouse (2011), Luo Mongey (2019).
   - OLS $\rightarrow$ Sign flips. Cross-section: higher debt, lower ability $\rightarrow$ lower wages

2. Higher debt - Flatter path for earnings
   - Consistent with Folch Mazzone (JMP, 2020). Use same IV as LM (2019)
   - https://sites.google.com/view/lucamazzone/

Within or across occupation?

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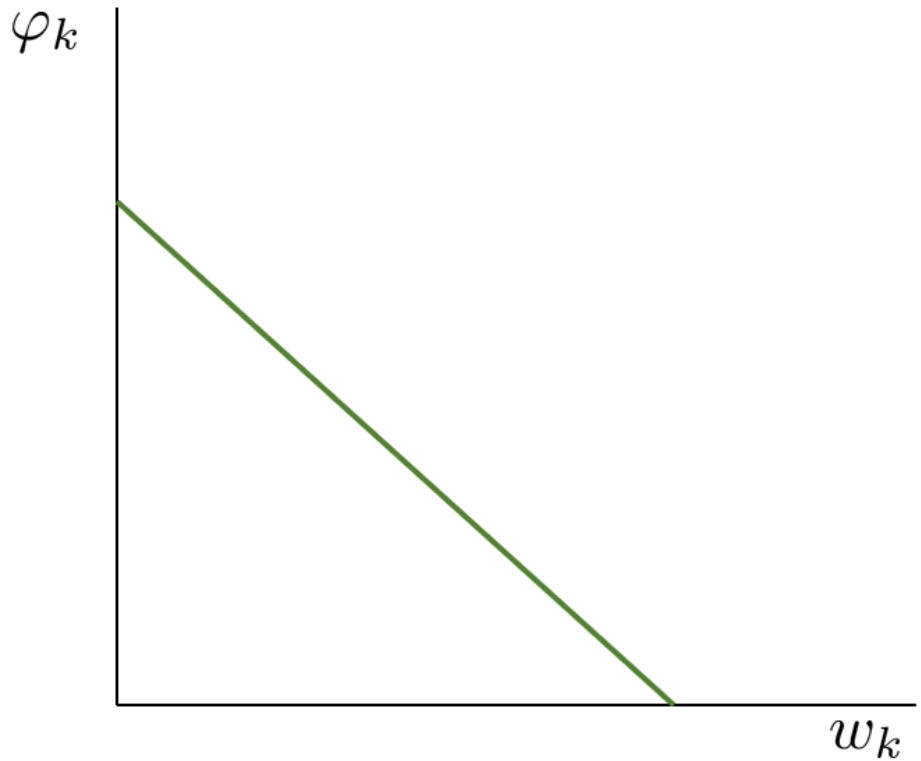
- Within occupation, the returns to experience aren't significantly lower
- Is the Ben-Porath element necessary?
- Seems to be more about the joint distribution of (w_k, φ_k)?

Menu of jobs



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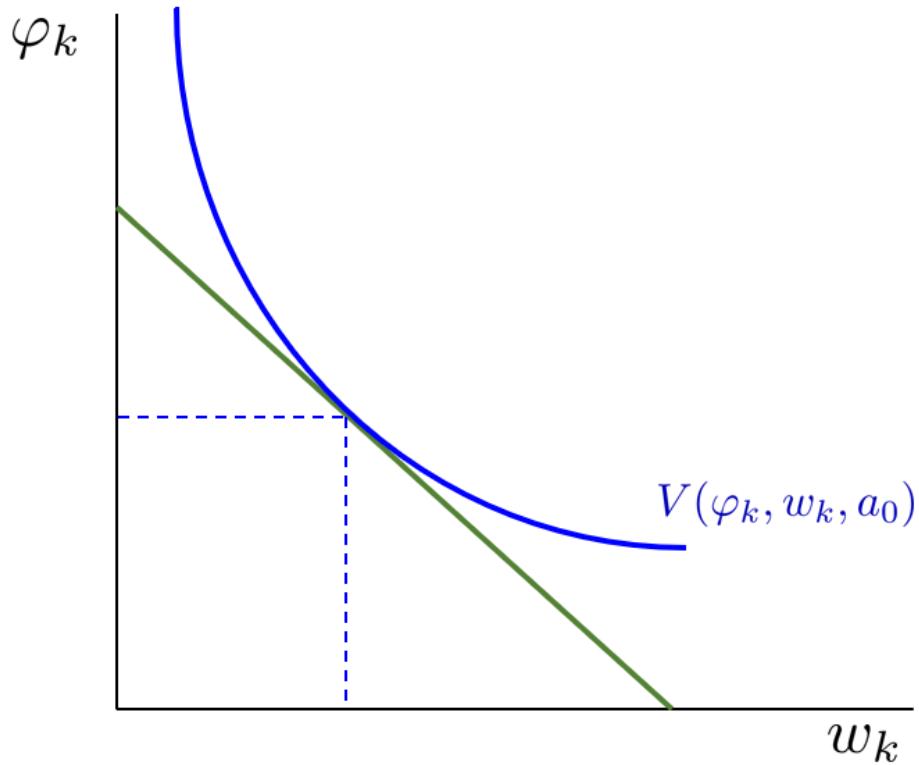

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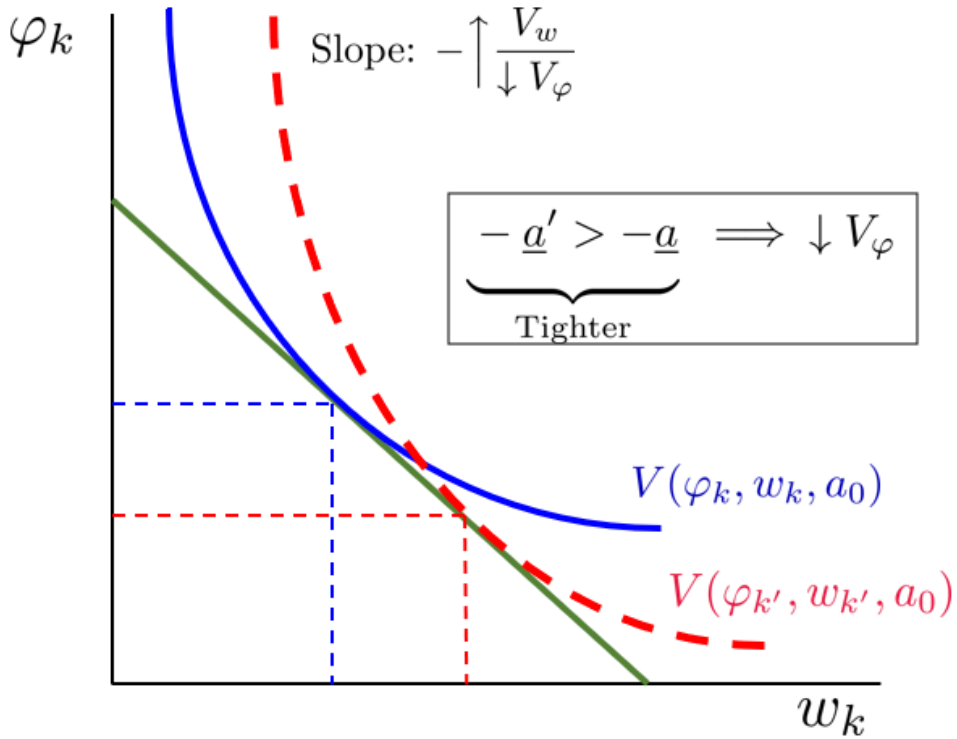

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- Lower assets, on average, puts you at a higher w_k, lower φ_k

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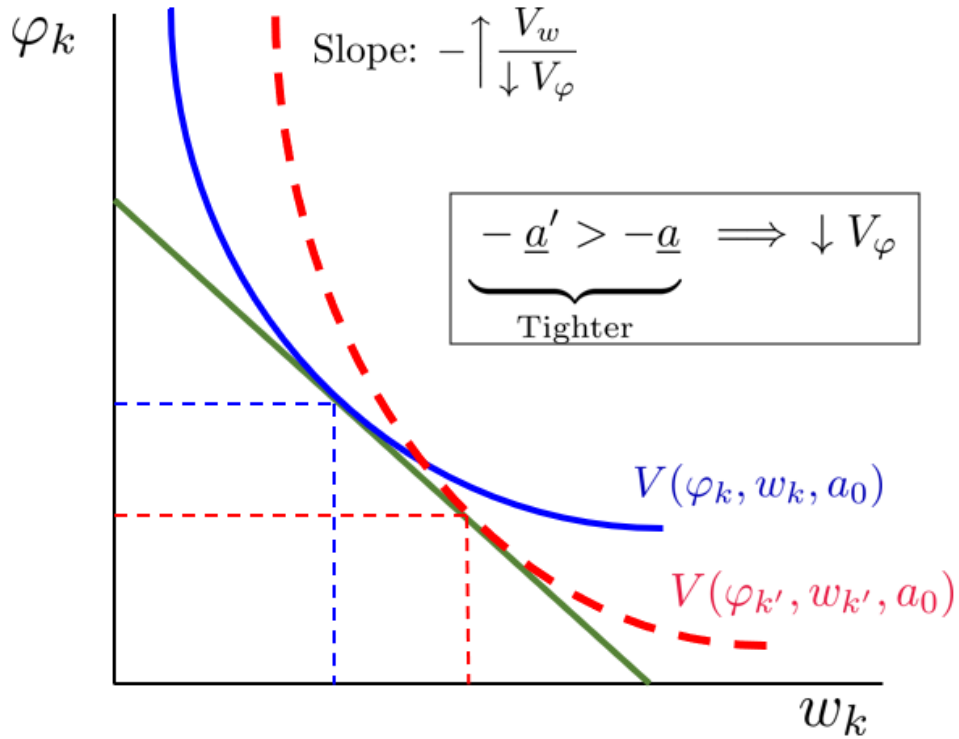

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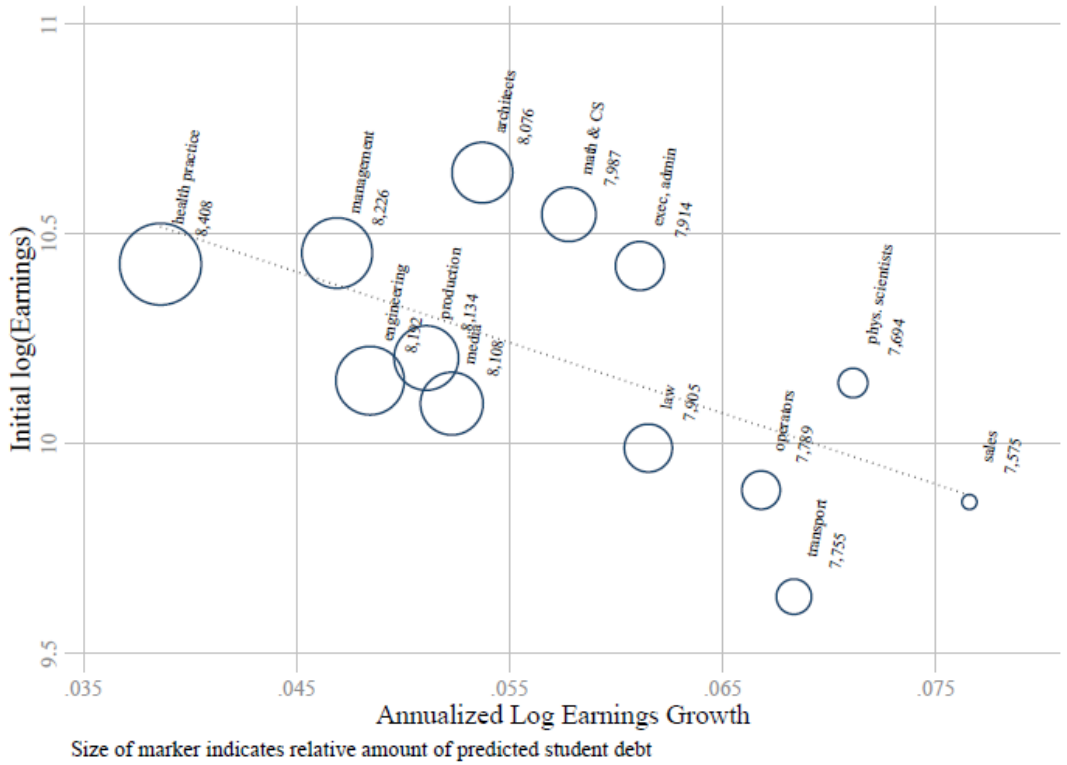
- Luo Mongey (2019): Wages and amenities *+ve'ly correlated* but search + change in reservation policy due to debt induces *-ve'ly correlated* in data

Menu of jobs in the data?

Figure 7: Correlation between initial earnings, yearly earnings growth, and student debt by occupation



- Suggestion 1: Throw out occupations that require a post-graduate degree / don't require a BA to be consistent with empirical evidence
- Suggestion 2: Plot the estimated distribution of (w_k, θ_k)

Discussion 1 - Ben-Porath or Menu?

- Do these menus of (w_k, φ_k) exist *within occupations* too?
  - Are they negatively correlated?

- Kitchen cook
  - Line cook: High w_k , Low φ_k
  - Apprentice: Low w_k , High φ_k

- Is Ben-Porath reasonable for explaining within occupation differences in pay?
  1. Choose from a menu of (level, growth)
     - Is there a fundamental difference between this and what the authors have?
     - If not, then maybe this is more straight-forward?
  2. Choose from a menu of (growth, risk) (Kaplan, 2012)

- Hard to think of someone earning more as a first year out lawyer because they are spending *less* time accumulating human capital
- Could be resolved with some direct evidence of the mechanism? Study within occupation lifecycle earnings paths? Examples?

Discussion 1 - Ben-Porath or Menu?

- Do these menus of (w_k, φ_k) exist *within occupations* too?
  - Are they negatively correlated?

- Law
  - Corporate: High w_k , High φ_k , ... High risk, Low amenity
  - Non-profit: Low w_k , Low φ_k , ... Low risk, High amenity

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Discussion 2 - Broad appeal

- Shows that student debt provides a useful environment for thinking about the effect of wealth / credit constraints on various economic decisions

- In particular: (i) provides nice instruments, (ii) lots of within cohort variation, (iii) similar point in life, (iv) simple non-defaultable debt contract with no default, (v) can learn a lot from NLSY, other interesting data sets

  See many papers by Constantine Yannelis and co-authors!

- E.g. Tighter financial constraints $\rightarrow$ Higher wages
  - This paper - Higher wages, lower growth
  - Luo Mongey (2019) - Higher wages, Lower amenities

- Both papers identify trade-offs using student debt related IVs / models, but then show how these trade-offs can be of more general relevance for understanding the welfare effects of policies, in particular those that interact with financial constraints
  - E.g. More accommodating financial environments may lower wages, but lead to happier jobs, increase wage growth, better matching

Conclusion

- Ambitious paper on an important topic
- 'Gold standard' quantitative work
  - (i) Model with IV baked in, (ii) Reduced form IV empirics with convincing IV, (iii) Simulate IV in model to estimate
  - General equilibrium counterfactual exercises
- Needs to clarify contribution a bit more
- Q1: How much is coming from the negative correlation of (w_k, φ_k)?
- Q2: Can theory of occupation-choice for constrained workers be more clearly exposited part of the paper?