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Do Double Majors Face Less Risk? An Analysis of Human Capital Diversification

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Introduction

Motivation

- Literature shows mixed results for mean returns to double majors (see Del Rossi & Hersch, 2008, 2016)
- Minimal attention paid to diversification of human capital (see Light & Schreiner, 2019)
- Research question:** does the undergraduate double major provide an option value, or protection against earnings shocks

Objectives

- Estimate degree to which double major reduces earnings shock
- Show that academic distance between degrees increases protection of double majors
- Measure skills and occupational differences between single and double majors

Data: ACS

2009-2019, 1% sample of US population
Sample selection: keep respondents who...

- Earned a bachelor's degree
- Are employed
- Are between 30 and 65 years or old
- Work at least 40 weeks and 35 hours a week.
- Earn >\$2,000 a year
- Were born in a US State
- Total sample: = 1,423,860
- Respondents list first and second majors, and corresponding field

Data: NSCG

2003, 2010, 2013, 2015, 2017 waves

Sample Selection: Same as ACS and...

- Parental education
- University Carnegie classification

Data: O*NET

- Skills (developed capacities that facilitate learning or the more rapid acquisition of knowledge)
- Knowledge - organized sets of principles and facts applied in general domains

Endogeneity Concerns

- Individuals choose major – our selection criteria reduces the chance our results are affected by labor market conditions at time of choice
- Individuals choose double major – we leverage exogenous variation in income across states, majors, and time
- Innate ability – we control for parental education and university quality (Carnegie classification)

Figure 1: Plausibly exogenous residual variation across states, years and time

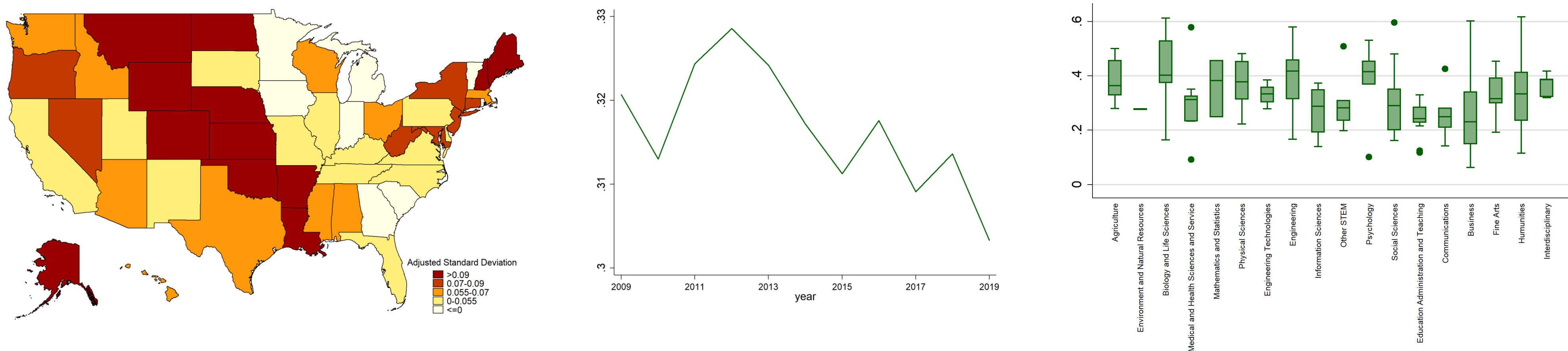


Table 1: Estimated protection of double majors against year-state-major shocks

	(1)	(2)	(3)	(4)
Year-state-major shock: first major	0.522*** (0.014)	1.006*** (0.004)	1.017*** (0.014)	0.059*** (0.013)
Year-state-major shock: second major	0.390*** (0.014)		0.012 (0.013)	0.969*** (0.014)
Year-state-major shock: higher major	0.019 (0.023)		-0.028 (0.018)	-0.028 (0.018)
Year-state-major shock: first major*double major		-0.941*** (0.014)	-0.958*** (0.014)	
Year-state-major shock: second major* double major		0.012 (0.013)		-0.958*** (0.014)
Year-state-major shock: higher major* double major		-0.028 (0.018)		
First major earning	0.523*** (0.029)	0.523*** (0.029)	0.523*** (0.029)	0.523*** (0.029)
Second major earning	0.294*** (0.030)	0.302*** (0.029)	0.302*** (0.029)	0.302*** (0.029)
Higher paying major earning	0.212*** (0.050)	0.202*** (0.049)	0.202*** (0.049)	0.202*** (0.049)
Double major	0.006** (0.003)	0.010*** (0.003)	0.010*** (0.003)	0.010*** (0.003)
Occupation F.E.	yes	yes	yes	yes
Observations	1,423,860	1,423,860	1,423,860	1,423,860
R-squared	0.347	0.350	0.350	0.350

Table 2: Double majors tend rank high in skills and knowledge relative to single-majors

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Number of high skills/35 O*NET skills						
	Above median		Above top 75%		Above top 90%	
Double major	0.015*** (0.004)		0.010*** (0.003)		0.002*** (0.001)	
Global double major		0.019*** (0.005)		0.013*** (0.004)		0.003*** (0.001)
Local double major		0.007* (0.004)		0.003 (0.002)		-0.000 (0.001)
First major F.E.	yes	yes	yes	yes	yes	yes
Second major F.E.	yes	yes	yes	yes	yes	yes
Observations	1,429,573	1,429,573	1,429,573	1,429,573	1,429,573	1,429,573
R-squared	0.134	0.134	0.149	0.149	0.102	0.102
Panel B: Number of high knowledge categories/32 O*NET knowledge categories						
	Above median		Above top 75%		Above top 90%	
Double major	0.006** (0.003)		0.006*** (0.002)		0.002 (0.001)	
Global double major		0.009*** (0.002)		0.008*** (0.002)		0.003* (0.002)
Local double major		0.002 (0.005)		0.001 (0.002)		-0.000 (0.001)
First major F.E.	yes	yes	yes	yes	yes	yes
Second major F.E.	yes	yes	yes	yes	yes	yes
Observations	1,429,573	1,429,573	1,429,573	1,429,573	1,429,573	1,429,573
R-squared	0.075	0.075	0.110	0.110	0.096	0.096

Table 3: Double majors tend to hold a broader variety of jobs relative to single majors

	(1)	(2)	(3)	(4)	(5)	(6)
	1st major-job correlation		2nd major-job correlation		Average major-job correlation	
Double major	-0.007*** (0.001)		-0.006*** (0.001)		-0.006*** (0.001)	
Global double major		-0.011*** (0.002)		-0.008*** (0.001)		-0.009*** (0.002)
Local double major		0.003 (0.002)		-0.000 (0.002)		0.001 (0.004)
First major F.E.	yes	yes	yes	yes	yes	yes
Second major F.E.	yes	yes	yes	yes	yes	yes
Observations	1,429,573	1,429,573	1,429,573	1,429,573	1,429,573	1,429,573
R-squared	0.500	0.500	0.504	0.504	0.501	0.501

Conclusions

- Results tend to support protection, not option, effect – reduce effects of shocks, both positive and negative
- Regressions with proxies for ability – parental education and university quality – show no effect on results
- Evidence that double majors rank high in skills and knowledge
- Evidence that double majors tend to hold a wider variety of jobs

References

- Del Rossi, Alison F., and Joni Hersch. "Double your major, double your return?." Economics of Education Review 27, no. 4 (2008): 375-386.
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- Light, Audrey, and Sydney Schreiner. "College major, college coursework, and post-college wages." Economics of Education Review 73 (2019): 101935.