

How Couple Hiring Practices Influence Faculty Productivity and Promotion

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BACKGROUND

- ▶ The practice of couple hiring is a welcome change for many couples.

Couples who work at the same university have less stress and report being happier than those who do not. [Wilson, 2002]

- ▶ Women in particular stand to benefit as they are more likely to have an academic partner [Blondin et al., 1990, Villalba, 1999, Scheibinger et al., 2008].
- ▶ Others however, are not as keen on the idea.

It may be unfair in a time of budget cuts to give some individuals special treatment. [Wilson, 2001]

A LITTLE MORE BACKGROUND

- ▶ Regardless, more couples are searching for jobs jointly.
- ▶ According to Scheibinger et al. [2008] dual hires¹ made up:
 - ▶ 3% of all new hires in the 1970's.
 - ▶ 13% of all new hires in the 2000's.
- ▶ Some university administrators have recognized couple hiring as an important recruiting tool.

[Wendy K. Wilkins] knew she could “get a leg up on the competition” by offering a job to a spouse. Wilson [2001]

- ▶ But what about the stigma of “less good” [Scheibinger et al., 2008] that often is attached to the second hire?

¹Throughout the presentation when I refer to couple hire or dual hire I am referring to those couples who search for jobs jointly and negotiate employment in the same university at the same time either jointly - it is known from the beginning that the couple is searching for a job - or sequentially - one partner receives an offer then works to obtain an offer for the other.

RESEARCH QUESTIONS

- ▶ While arguments can be made on both sides, much research still needs to be done.
- ▶ Regarding the increase in the proportion of dual hires, we want to know:
 1. What are the ramifications of couples conducting joint searches?
 2. How does couple hiring allow universities to “get a leg up” on the competition?
 3. Does this apply to all universities, or only to those with specific characteristics?
- ▶ Regarding this stigma of “less good,” we want to know:
 4. How do dual hires compare to their non-dual hire colleagues in terms of productivity?²

²74% of second hires in the survey of Scheibinger et al. [2008] were female. So we are particularly interested in how female second hires compare to other females.

OUR GOAL

1. Create a theoretical framework for dual hiring in the academic labor market.
2. Empirically evaluate the implications of this theoretical model.
3. Corroborate some of the findings of previous work using a new data source.

WHAT WE ADD

- ▶ To our knowledge, a model of how couple hiring affects the academic labor market does not exist.
- ▶ We build this model and show under plausible assumptions that dual hires are likely to be among an institution's top faculty.
- ▶ The reason for our result is that couples prefer to stay together.
 - ▶ Couples often have different job prospects and one partner may take a lesser offer in order to be near their partner.

HOW WE TEST THE THEORY

- ▶ Washington State University has kept data on dual hires since 1999.
- ▶ We test our model's implication using this data and find that the average dual hire does exhibit higher levels of productivity.
- ▶ Thus for a school like WSU, couple hiring can be a tool to help attract candidates who otherwise would not be interested.

FOUNDATIONS OF A MODEL

- ▶ By necessity models are simplifications of reality.
- ▶ We want them to be as simple as possible and still capture all of the important elements.
- ▶ We use existing literature to guide our assumptions.

MODEL BUILDING BLOCKS: COUPLES

- ▶ According to Scheibinger et al. [2008]:
 - ▶ 93% of new dual hires work at the same institution
 - ▶ More than 20% of dual hires reported taking a position at a less prestigious institution in order to be near their partner.
- ▶ We feel it is reasonable to assume that academic couples have a strong desire to work in the same school.
- ▶ For simplicity we have a fixed number of job candidates applying for an equal number of openings.
- ▶ Each candidate has a different level of productivity.
- ▶ We allow some portion of candidates to form couples.
- ▶ The decision to form a couple is independent of productivity levels.

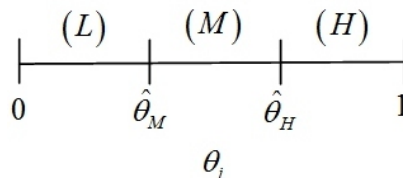
MODEL BUILDING BLOCKS: UNIVERSITIES

- ▶ 3 schools that vary by initial quality or prestige: L, M, H .
- ▶ Each school has $1/3$ of the job vacancies to fill.
- ▶ Both productivity and couple status is observable by the university.
- ▶ The model is evaluated under the assumption that when schools consider a couple they evaluate each partner based on individual merit.

PREFERENCES

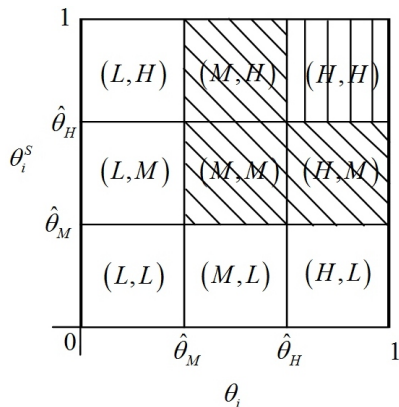
- ▶ Single candidates prefer the best school that offers them a job.
- ▶ Couple candidates prefer the best school that offers a job to **both partners**.
- ▶ Universities seek to higher the most productive candidates possible

NO COUPLES



- ▶ Each school makes offers to all candidates whose level of productivity is greater than their minimum threshold, $\hat{\theta}_K$.
- ▶ Candidates will accept their best offer.

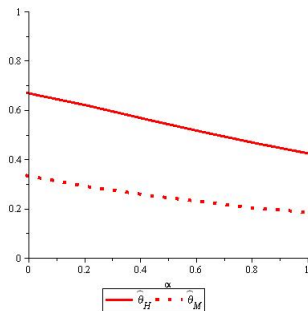
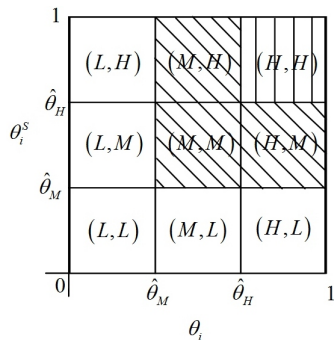
EXPECTED PRODUCTIVITY LEVELS



- ▶ We calculate expected productivity.
- ▶ We find that dual hire productivity is:
 - ▶ higher in the low- and mid-tier schools.
 - ▶ no different in the highest-tier school.

- ▶ The driving force behind these results is the strong preference of couples with mixed productivity levels to remain together.

THRESHOLD VALUES MUST ADJUST

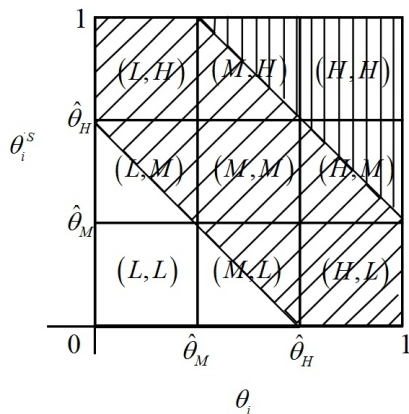


- ▶ Because some of the more productive candidates go to lesser ranked schools, vacancies are created.
- ▶ The high- and mid-tier schools must reduce their thresholds in order to fill those vacancies.

DO ALL ADMINISTRATORS EVALUATE INDEPENDENTLY?

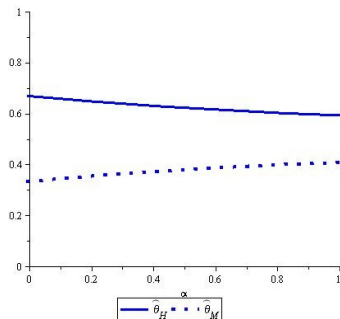
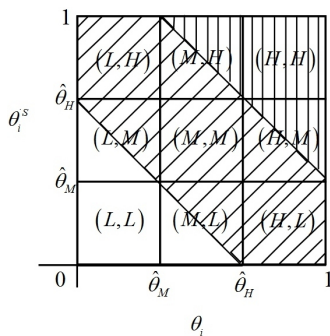
- ▶ Is independent evaluation plausible in all circumstances?
- ▶ As an alternative we consider the case where universities make offers to couples whose average productivity is higher than a certain threshold.

AN ALTERNATIVE APPROACH TO COUPLE HIRING



- ▶ We calculate expected productivity.
- ▶ We find that dual hire productivity is:
 - ▶ higher in the lowest-tier school.
 - ▶ no different in the mid-tier school.
 - ▶ lower in the highest-tier school.

THRESHOLD ADJUSTMENTS UNDER AVERAGE EVALUATION



- ▶ Single candidates will accept their best offer.
- ▶ Couple candidates accept the offer from the best school that offers a job to both of them.

TESTABLE IMPLICATION

- ▶ The average dual hire candidate in lower- and mid-tier schools should have higher levels of productivity than their otherwise equal colleagues.

PREVIOUS EMPIRICAL WORK

- ▶ Using a large cross section of survey data, Scheibinger et al. [2008] test whether there is any merit to the stigma of “less good” for second hires.
- ▶ They find that after disaggregating their data into fields and controlling for gender and rank, that there is no difference in the number of publications for second hires.
- ▶ Our theory drives us to test a similar question.
- ▶ We look not only whether second hires are “less good” but also whether the average dual hire has greater levels of productivity.

ABOUT WASHINGTON STATE UNIVERSITY

- ▶ Washington State University is a rural, doctoral granting, land grant institution ranked among the nation's 50 leading public research universities.³
- ▶ Their written policy on couple hiring closely resembles independent evaluation.
- ▶ We have access to a panel⁴ of administrative data on all faculty as opposed to a cross- section of survey data.
- ▶ We have year by year publications as well as grant data from 2005 - 2010.
- ▶ We are able to include additional controls such as prior experience, seniority, and field and year variables.

³The Center for Measuring University Performance

<http://mup.asu.edu/research.html>

⁴Our panel comprises all tenure stream faculty for the years 1999 - 2010

SUMMARY STATISTICS:

Table : WSU Tenure Stream Faculty from 2005 - 2010. Subset includes only those hired since 1999

	All	Percent	of Group
Number of person/year observations	2740		
Number of individuals	681		
Males	406	60%	of Total
Females	275	40%	of Total
Non-Dual Hire individuals	587	86%	of Total
Non-Dual Hire Males	352	60%	of Non-Dual Hires
Non-Dual Hire Females	235	40%	of Non-Dual Hires
Dual Hire individuals	94	14%	of Total
Dual Hire Males	54	57%	of Dual Hires
Dual Hire Females	40	43%	of Dual Hires

MEAN PRODUCTIVITY MEASURES

	All	Males	Females
Mean Publications: Non Dual Hire	1.16	1.19	1.11
Mean Publications: Dual Hire	1.63	1.96	1.18
Number of Grantees: Non-Dual Hire	332	188	144
Number of Grantees: Dual Hire	64	37	27
% of Group who are Grantees: Non-Dual Hire	49%	53%	61%
% of Group who are Grantees: Dual Hire	68%	69%	68%
Mean Grant Dollars ⁵ : Non Dual Hire	104,121	105,035	102,788
Mean Grant Dollars: Dual Hire	156,011	153,577	159,206

⁵We do not look at the size of grants at this time because of confounding factors such as multiple people per grant, and large variations across fields

VARIABLE NAMES AND DEFINITIONS

Publications	Journal articles, book chapters, or books published per year
Grantee	= 1 if the individual has ever received a grant
Dual Hire	= 1 if the individual was part of a dual hire couple
First Hire	= 1 if the individual was the initial candidate
Second Hire	= 1 if the individual accompanied the initial candidate
Admin	= 1 if the individual is an administrator
Female	= 1 if the individual is female
Prior	Years between highest degree and starting year at WSU
Seniority	Indicators for years of seniority
Rank	Indicators for Assistant, Associate, and Full Professor
Field	field fixed effects
Year	Year fixed effects

METHODS

- ▶ We use two different measures of productivity to test whether productivity is different for the average dual hire.
 1. Publications
 - ▶ Linear estimation for the quantity of publications per year.⁶
 2. Grants
 - ▶ Probit estimation for whether an individual ever obtained a grant.
- ▶ We evaluate each measure for all fields as well as STEM⁷ designated fields only.

⁶We also use a more sophisticated Poisson regression designed for count data and the results are unchanged.

⁷For a list of STEM designated fields at WSU see the table at the end of the presentation or visit

<http://advance.wsu.edu/default.asp?PageID=4506>

PUBLICATIONS: ALL FIELDS

VARIABLES	All		Males		Females	
Dual Hire	0.486* (0.264)		0.814** (0.392)		0.065 (0.305)	
First Hire		0.794** (0.310)		1.211*** (0.459)		0.217 (0.342)
Second Hire		-0.612** (0.290)		-0.806*** (0.204)		-0.400 (0.545)
Female	-0.092 (0.150)	-0.075 (0.148)				
Observations	2,740	2,740	1,625	1,625	1,115	1,115
R-squared	0.042	0.047	0.049	0.057	0.053	0.055

Robust standard errors in parentheses

Control variable coefficients not reported⁸

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

⁸ Unreported control variables include:

Administrator, Prior Experience, Seniority, Rank, Field, and Year fixed effects.

PUBLICATIONS: STEM FIELDS

VARIABLES	All		Males		Females	
Dual Hire	0.730* (0.382)		1.013* (0.530)		0.225 (0.398)	
First Hire		0.994** (0.434)		1.555*** (0.592)		0.047 (0.441)
Second Hire		-0.200 (0.511)		-1.036*** (0.346)		0.800 (0.737)
Female	-0.424 (0.268)	-0.414 (0.265)				
Observations	1,034	1,034	745	745	289	289
R-squared	0.050	0.054	0.070	0.084	0.078	0.080

Robust standard errors in parentheses

Control variable coefficients not reported⁹

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

⁹ Unreported control variables include:

Administrator, Prior Experience, Seniority, Rank, Field, and Year fixed effects.

GRANTEE: ALL FIELDS

VARIABLES	All		Males		Females	
Dual Hire	0.120**		0.129*		0.091	
	(0.053)		(0.072)		(0.077)	
First Hire		0.100*		0.089		0.095
		(0.059)		(0.080)		(0.088)
Second Hire		0.198*		0.316**		0.077
		(0.111)		(0.148)		(0.139)
Female	0.061	0.060				
	(0.039)	(0.039)				
Observations	2,740	2,740	1,625	1,625	1,115	1,115

Robust standard errors in parentheses

Other Control Variables not reported¹⁰

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

¹⁰ Unreported control variables include:

Administrator, Prior Experience, Seniority, Rank, Field, and Year fixed effects.

GRANTEE: STEM FIELDS

VARIABLES	STEM		Males	Females
Dual Hire	0.220*** (0.077)		0.218** (0.095)	0.159 (0.117)
First Hire		0.168* (0.086)	0.157 (0.106)	0.136 (0.133)
Second Hire ¹¹				
Female	0.093 (0.069)	0.100 (0.072)		

Robust standard errors in parentheses
 Other Control Variables not reported¹²
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

¹¹This variable was dropped from the estimation because it predicts success perfectly. In other words every second hire in a STEM field obtained a grant.

¹²Unreported control variables include:
 Administrator, Prior Experience, Seniority, Rank, Field, and Year fixed effects.

SUMMARY OF PRODUCTIVITY RESULTS: ALL FIELDS

- ▶ A dual hire publishes 0.49 more times per year and is 12% more likely to obtain a grant.
- ▶ A first hire publishes 0.8 more times per year and is 10% more likely to obtain a grant.
- ▶ A second hire publishes 0.6 fewer times per year¹³ and is 20% more likely to obtain a grant
- ▶ Female first and second hires are statistically no different in their publishing rates or in their propensity to obtain a grant.

¹³The significance is likely because our measure of publications does not conform well to fields outside of STEM.

SUMMARY OF PRODUCTIVITY RESULTS: STEM FIELDS

- ▶ A dual hire in a STEM field publishes 0.73 more times per year and is 22% more likely to obtain a grant.
- ▶ A first hire in a STEM field publishes 1 more time per year and is 16% more likely to obtain a grant.
- ▶ There is no difference in publishing rates for second hires in STEM fields and all second hires obtained a grant.
- ▶ Female first and second hires are statistically no different in their publishing rates or in their propensity to obtain a grant.

FINDINGS

- ▶ In support of our theory we find that at WSU dual hires are among the top faculty in terms of productivity.
- ▶ We find very weak evidence of a “less good” second hire and no evidence of it for females.
- ▶ Because they exhibit higher levels of productivity, are dual hires more likely to obtain tenure?

PRODUCTIVITY AND TENURE

Table : Only newly hired assistant professors from 1999-2003

	Count	Percent	of Group
Unique Individuals	168		
Non-Dual Hires	146	87%	of total
Dual Hires	22	13%	of total
Tenured Non-Dual Hires	104	71%	of Non-Dual Hires
Tenured Dual Hires	19	86%	of Dual Hires
Grantee: Non-Dual Hire	80	55%	of Non-Dual Hires
Grantee: Dual Hire	16	73%	of Dual Hires
	Mean	St Dev.	[Min, Max]
Publications: Non-Dual Hires	4.98	7.50	[0,40]
Publications: Dual Hires	11.55	14.44	[0,48]

PROBIT FOR HOW PRODUCTIVITY AFFECTS TENURE

VARIABLES	Spec 1	Spec 2	Spec 3
2005 - 2010 total pubs	0.021** (0.010)		0.021** (0.010)
Grantee	0.224*** (0.058)		0.220*** (0.057)
Dual Hire		0.191 (0.118)	0.048 (0.116)
Female	-0.053 (0.057)	-0.043 (0.066)	-0.053 (0.058)
Observations	168	168	168

Standard errors in parentheses

Other control variables not reported¹⁴

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

¹⁴Unreported control variables include: Female, Prior Experience, Field, and Original Hire Year.

SUMMARY OF TENURE RESULTS

- ▶ For each additional publication and individual is 2% more likely to be granted tenure
- ▶ If an individual obtains a grant he or she is 22% more likely to be granted tenure
- ▶ Since increased productivity has a positive affect on the tenure decision and dual hires are relatively more productive then it makes sense that they should be more likely to obtain tenure.¹⁵

¹⁵Further research into this question is planned for future work.

CONCLUSIONS

- ▶ We theoretically predict that in any institution other than the very top, a dual hire is likely to be more productive than a non-dual hire.
- ▶ We find at WSU that dual hires are more productive in terms of publication rates as well as obtaining grants.
- ▶ Productivity has a positive affect on the tenure decision which may indicate a higher likelihood that dual hires will obtain tenure.

FUTURE WORK

- ▶ Generalize the theory to n-schools and a general distribution of candidate productivity
- ▶ Use a duration model to see whether being a dual hire affects the time an individual stays in an institution.
- ▶ Expand our analysis to more schools - WSU is a single data point and perhaps it is just unique.
- ▶ Use additional measures of productivity.
- ▶ Thank you!

- ▶ Contact Information:
 - ▶ *email*: `jaredwool@wsu.edu`
 - ▶ *Personal Website* `http://cahnrs-cms.wsu.edu/ses/gradstudents/Woolstenhulme`

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LIST OF STEM DEPARTMENTS AT WSU

Anthropology	Mathematics
Biological Systems Engineering	Mechanical and Materials Engineering
Chemical Engineering and Bioengineering	Natural Resource Sciences
Chemistry	Physics and Astronomy
Civil and Environmental Engineering	Plant Pathology
Crop and Soil Sciences	Psychology
Economic Sciences	School of Biological Sciences
Electrical Engineering and Computer Science	School of Earth and Environmental Sciences
Engineering and Computer Science	School of Engineering and Computer Science
Entomology	School of Molecular Biosciences
Food Science	Sociology
Global Animal Health	Statistics
Horticulture & Landscape Architecture	Veterinary & Comparative Anatomy, Pharmacology & Physiology
Institute of Biological Chemistry	Veterinary Microbiology & Pathology