Learning with your spouse: Does the similarity of spouse's occupation affect individual's earnings?

Literature Review

Ningyin Xu

I'm still working on this project and haven't got the result, so the "contribution" part in this literature review is based on my expected result and may not be very detailed. And the requirement of 3-6 pages of this literature review makes me a little verbose.

Background and Conceptual Framework

Related literature on factors affecting individual earnings

During the last five decades, Gary Becker (1975), Jacob Mincer (1958), T.W. Schultz (1960) and others popularized the concept of "human capital", which asserts that individual productive capacities are determined by individual stocks of productive attributes like skills, health, knowledge etc., and that investment decisions determine the evolutions of these stocks. With the term "capital" using, human is regarded as machine that needs investment to increase capacity to produce. Economists have done much work in the field of human capital from both micro-level and macro-level, trying to describe optimal decisions to invest in human capital thus either increase individual earnings or national economic development.

In the early development of human capital theory, economists tend to focus on investments in one type of skill, like Ben-Porath (1967) and Mincer (1974), while recent economics literature pioneered by James Heckman devotes attention to the fact that when parents and schools invest in the human capital of young persons, these investments create different types of skills and build on each other over time in complex ways (Cunha and Heckman 2007, Heckman, Pinto, and Savelyev (2013), Deming (2009), Belfield et al. (2006), and Anderson (2008)). Cunha and Heckman (2007) give a detailed conclusion of six facts from

recent empirical literature in human capital theory: (a) ability gaps between individuals and across socioeconomic groups open up at early ages, for both cognitive and noncognitive skills; (b) in both animal and human species, there is compelling evidence of critical and sensitive periods in the development of the child. Some skills or traits are more readily acquired at certain stages of childhood than other traits (Knudsen et al. 2006). Different types of abilities appear to be manipulable at different ages; (c) despite the low returns to interventions targeted toward disadvantaged adolescents, the empirical literature shows high economic returns for remedial investments in young disadvantaged children; (d) if early investment in disadvantaged children is not followed up by later investment, its effect at later ages is lessened; (e) the effects of credit constraints on a child's adult outcomes depend on the age at which they bind for the child's family; (f) socioemotional (noncognitive) skills foster cognitive skills and are an important product of successful families and successful interventions in disadvantaged families. These facts serve as a background of our paper, the early investment of individual and thus cognitive/noncognitive skills are considered as important components in our model.

While the importance of early investment in skills during childhood can't be stressed enough, investment during human's adult life is also worth exploring. Studies by Sumru Altug and Richard A. Miller (1998) and Ricardo Cossa et al. (1999) find a significant effect of past work experience on current wage earnings. Cossa et al. (1999) compared two main models of skill formation in their study: the Becker - Ben Porath model and Learning-by-doing model, and proved that they have different implications for the effect of wage subsidies on skill formation. They also proved that in a special case, the two models become effectively equivalent if leisure is added to the Becker - Ben Porath framework and learning-by-doing opportunities are priced appropriately. Hansen and Imrohoroğlu (2009) studies two forms of skill accumulation in adult life: learning by doing and on-the-job training, and analyzed their different effect on labor supply and volatility of hours over life cycle. They found that introducing on-the-job training gives steady state and business cycle properties that are essentially identical to the case without skill accumulation. Learning by doing (LBD), on the other hand, affects both sets of properties significantly. LBD has more significant effect on skill accumulation throughout an individual's working life. Chang et al. (2002) use PSID (the Panel Study of Income Dynamics) data provide micro evidence for LBD model on skill accumulation. Adding the propagation mechanism provided by LBD into a dynamic stochastic general-equilibrium model, they manage to improves the fitness to the dynamics of aggregate output and hours.

In this paper, we therefore focus on LBD instead of on-the-job training. And since we're focusing on individuals' working life, schooling, health and other form of investment in human capital in their early life would be plugged into the LBD model as attributes of individuals.

Additional factors relating to marriage on personal earnings

Generally, labor economists have long noted that married men earn substantially more per hour worked than men who are not currently married, these cross-sectional wage differentials persist when controls are introduced for education, race, region, age, or work experience, and even occupation and industry (Korenman and Neumark 1991). However, *"... the role of marriage in enhancing the earnings of male workers is still only dimly understood."*(Goldin 1990) One major hypothesis is that earnings differeentials between married men and single men result from productivity differentials: marriage per se makes workers more productive (G. Becker 1981, G. S. Becker (1985), Kenny (1983), and Greenhalgh (1980)); Another hypothesis attributes these differentials to employer favoritism (Hill 1979, bartlett1984wage), and a third to selection into marriage on the basis of wages or personal characteristics that are valued in labor markets (G. Becker 1981, Nakosteen and Zimmer (1987), and Keeley (1977)). Using data from a company personnel file that includes information on job grades and supervisor performance ratings, Korenman and Neumark (1991) provide greater support to the first hypothesis, that marriage enhances men's labor market productivity. Although the mechanism of this enhancement needs further evidence to prove, the selection of men into marriage on the basis of wages, wage growth, or other wage-enhancing characteristics receives little support as an explanation of the observed marital pay premiums. Focusing on self-employed individuals, Hundley (2000) used data from the National Longitudinal Study of the High School Class of 1972 and PSID data and proved that self-employed men's earnings increase with marriage and family size, while organizationally employed workers' earnings exhibited a similar but less pronounced pattern. However, women's earnings decline with marriage, family size, and hours of housework. This implies the different roles of men and women in households. Hundley gets this conclusion that self-employed women and men specialized more intensively in housework and market work respectively because women tend to choose self-employment to facilitate household production, and men to achieve higher earnings. Hotchkiss and Moore (1999) provide support to this by proving that managers with working wives earn lower wages than their counter-parts with non-working wives using March 1993 Cureent Popilation Survey data. These papers serve as evidence for the first hypothesis by suggesting marriage enhances productivity because the specialization between husbands and wives increases their efficiency.

Our paper uses PSID data to support the hypothesis of marriage enhances individuals' productivity by focusing on couples that are both working in the market since household where only one person needs to work is less common in recent years. We're not only focusing on men, but also women's work performance and earnings. We propose a hypothesis that working couples with similar occupation would increase each other's learning-by-doing efficiency and thus increase their skill and work performance, which is indicated by their earnings. This hypothesis is acknowledged in the psychology field. In a recent study, Ferguson et al. (2016) found that work-related spousal support contributed to work-family balance and subsequent improved family satisfaction and job satisfaction of the job incumbent, suggesting that spouses connected by work can provide each other with a unique form of support, making them happier at home and more productive on the job. By our empirical study, we proved that this hypothesis could be supported by economic evidence and thus serve as a proof for marriage's positive influence on productivity. Among economic literature, though there's no existing literature focusing on work-related couples' effect on individual productivity, peer effect in the workplace is well-supported. While one may expect to see productivity spillovers in creative professions, Mas and Moretti (2009) showed they also exist in low-skill occupations. Among couples, one could also expect similar spillovers if they have more similar occupations. By controlling occupations, our study also shows different levels of spillovers in different occupations.

It's worth noting that, occupation, skill or education similarity between couples are often taken as a factor in influencing the strength of spousal matches or marital dissolution. Some relevent literature imply that the optimal pattern for pairing husbands and wives is negative sorting on wages because it maximizes the gains from specialization (G. S. Becker 1973). Benham (1974), argues that one spouse's earnings are enhanced by the knowledge of the other spouse, assuming that the other spouse has relevant knowledge. In our study, marriage stability is not taken into account, only the time length this individual spend with the spouse would be plugged into the model.

Measuring the distance between any two occupations

The measure of distance between any two occupations we used comes from the O*Net Content Model: *"The O*NET database contains several hundred variables that represent descriptors of work and worker characteristics, including skill requirements. (National Center for O*NET Development 2017)"* The activities, abilities, knowledge and skills files contain the variables

we use to measure distance between occupations. The O*Net database consists of scores, from worker and occupational expert questionnaires, assessing the relevance of the various activities, abilities, knowledge, and skills to each occupation. The idea of using this model comes from Kammen and Adams (2014), which helped us to see how different aspects of occupations would help with productivity the most.

References:

Altuğ, Sumru, and Robert A Miller. 1998. "The Effect of Work Experience on Female Wages and Labour Supply." *The Review of Economic Studies* 65 (1). Oxford University Press: 45–85.

Anderson, Michael L. 2008. "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American Statistical Association* 103 (484). Taylor & Francis: 1481–95.

Becker, Gary. 1981. "A Treatise on the Family Harvard University Press." *Cambridge, MA* 30.

Becker, Gary S. 1973. "A Theory of Marriage: Part I." *Journal of Political Economy* 81 (4). The University of Chicago Press: 813–46.

———. 1975. *Human Capital: A Theoretical and Empirical Analysis, with Special Refence to Education.*

———. 1985. "Human Capital, Effort, and the Sexual Division of Labor." *Journal of Labor Economics* 3 (1, Part 2). University of Chicago Press: S33–S58.

Belfield, Clive R, Milagros Nores, Steve Barnett, and Lawrence Schweinhart. 2006. "The High/Scope Perry Preschool Program Cost–benefit Analysis Using Data from the Age-40 Followup." *Journal of Human Resources* 41 (1). University of Wisconsin Press: 162–90.

Ben-Porath, Yoram. 1967. "The Production of Human Capital and the Life Cycle of Earnings." *Journal of Political Economy* 75 (4, Part 1). The University of Chicago Press: 352–65.

Benham, Lee. 1974. "Benefits of Women's Education Within Marriage." *Journal of Political Economy* 82 (2, Part 2). The University of Chicago Press: S57–S71.

Chang, Yongsung, Joao F Gomes, and Frank Schorfheide. 2002. "Learning-by-Doing as a Propagation Mechanism." *The American Economic Review* 92 (5). American Economic Association: 1498–1520.

Cossa, Ricardo, James Heckman, and Lance Lochner. 1999. "Wage Subsidies and Skill Formation: A Study of the Earned Income Tax Credit." *Manuscript, University of Chicago, May.*

Cunha, Flavio, and James Heckman. 2007. "The Technology of Skill Formation." National

Bureau of Economic Research.

Deming, David. 2009. "Early Childhood Intervention and Life-Cycle Skill Development: Evidence from Head Start." *American Economic Journal: Applied Economics* 1 (3). American Economic Association: 111–34.

Ferguson, Merideth, Dawn Carlson, K Michele Kacmar, and Jonathon RB Halbesleben. 2016. "The Supportive Spouse at Work: Does Being Work-Linked Help?" *Journal of Occupational Health Psychology* 21 (1). Educational Publishing Foundation: 37.

Goldin, Claudia. 1990. *The Gender Gap: An Economic History of American Women*. New York: Cambridge University Press.

Greenhalgh, Christine. 1980. "Male-Female Wage Differentials in Great Britain: Is Marriage an Equal Opportunity?" *The Economic Journal* 90 (360). JSTOR: 751–75.

Hansen, Gary D, and Selahattin İmrohoroğlu. 2009. "Business Cycle Fluctuations and the Life Cycle: How Important Is on-the-Job Skill Accumulation?" *Journal of Economic Theory* 144 (6). Elsevier: 2293–2309.

Heckman, James, Rodrigo Pinto, and Peter Savelyev. 2013. "Understanding the Mechanisms Through Which an Influential Early Childhood Program Boosted Adult Outcomes." *The American Economic Review* 103 (6). American Economic Association: 2052–86.

Hill, Martha S. 1979. "The Wage Effects of Marital Status and Children." *Journal of Human Resources*. JSTOR, 579–94.

Hotchkiss, Julie L, and Robert E Moore. 1999. "On the Evidence of a Working Spouse Penalty in the Managerial Labor Market." *ILR Review* 52 (3). SAGE Publications Sage CA: Los Angeles, CA: 410–23.

Hundley, Greg. 2000. "Male/Female Earnings Differences in Self-Employment: The Effects of Marriage, Children, and the Household Division of Labor." *Industrial & Labor Relations Review* 54 (1). SAGE Publications: 95–114.

Keeley, Michael C. 1977. "The Economics of Family Formation." *Economic Inquiry* 15 (2). Wiley Online Library: 238–50.

Kenny, Lawrence W. 1983. "The Accumulation of Human Capital During Marriage by Males." *Economic Inquiry* 21 (2). Wiley Online Library: 223–32.

Knudsen, Eric I, James J Heckman, Judy L Cameron, and Jack P Shonkoff. 2006. "Economic, Neurobiological, and Behavioral Perspectives on Building America's Future Workforce."

Proceedings of the National Academy of Sciences 103 (27). National Acad Sciences: 10155–62.

Korenman, Sanders, and David Neumark. 1991. "Does Marriage Really Make Men More Productive?" *Journal of Human Resources*. JSTOR, 282–307.

Mas, Alexandre, and Enrico Moretti. 2009. "Peers at Work." *The American Economic Review* 99 (1). American Economic Association: 112–45.

Mincer, Jacob. 1958. "Investment in Human Capital and Personal Income Distribution." *Journal of Political Economy* 66 (4). The University of Chicago Press: 281–302.

Mincer, Jacob A. 1974. "Schooling and Earnings." In *Schooling, Experience, and Earnings*, 41–63. NBER.

Nakosteen, Robert A, and Michael A Zimmer. 1987. "Marital Status and Earnings of Young Men: A Model with Endogenous Selection." *Journal of Human Resources*. JSTOR, 248–68.

National Center for O*NET Development. 2017. "O*NET 21.2 Database O*NET Resource Center." Accessed April 23. https://www.onetcenter.org/database.html.

Schultz, Theodore W. 1960. "Capital Formation by Education." *Journal of Political Economy* 68 (6). The University of Chicago Press: 571–83.

Van Kammen, Ben, and Scott J Adams. 2014. "Dissimilar Occupations and Marital Stability." *IZA Journal of Labor Economics* 3 (1). Springer: 1–18.