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Career Paths with a Two-Body Problem: Occupational Specialization and Geographic Mobility

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ABSTRACT

We develop a model of joint job search and occupational choice in which job opportunities can be incompatible inside the couple. Typically, incompatibilities may arise because jobs are not in the same location. We show that the existence of incompatible jobs pushes some couples to sacrifice the career of one partner. The model predicts occupational switches throughout the career and at the time of couple formation. Gendered equilibria, whereby all women (or men) choose the accommodating occupation, may arise. Any element of ex-ante unfavorable gender gaps—for instance, due to discrimination or norms—is amplified and can generate large systemic differences in gender composition between occupations.

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Career Paths with a Two-Body Problem: Occupational Specialization and Geographic Mobility

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Abstract

We develop a model of joint job search and occupational choice in which job opportunities can be incompatible inside the couple. Typically, incompatibilities may arise because jobs are not in the same location. We show that the existence of incompatible jobs pushes some couples to sacrifice the career of one partner. The model predicts occupational switches throughout the career and at the time of couple formation. Gendered equilibria, whereby all women (or men) choose the accommodating occupation, may arise. Any element of ex-ante unfavorable gender gaps—for instance, due to discrimination or norms—is amplified and can generate large systemic differences in gender composition between occupations.

1 Introduction

How does geographic mobility affect career choices inside the couple? How does it affect gender composition across careers?

Many occupations require workers to move from one place to another, whether to obtain a job or to climb the job ladder to a successful career. Most of these occupations are high-paying and considered prestigious: top managerial positions in the financial sector, diplomacy, the military, or academia. For instance, in their junior programs, banks impose on their new recruits the condition that they visit different offices for several months. In academia, job scarcity forces workers to be geographically mobile. Mobile workers also have access to a larger pool of job promotions, irrespective of the occupation.

We show that mobility-demanding occupations can produce long-lasting occupational specialization within the couple, whereby only one member of the couple will have a career in the mobility-demanding occupation. Specialization will occur in a world without any form of ex-ante differences between men and women and arises from the difficulty of finding compatible

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jobs for both members of the couple. In other words, the two-body problem can generate occupational specialization. Moreover, small gender gaps in wage or promotion opportunities in the mobility-demanding profession can lead heterosexual couples to assign males to mobility-demanding careers and females to accommodating careers. This, in turn, generates large systemic gender employment gaps.

We base our thesis on a theoretical model of joint occupational choices for a couple. Jobs are not only hard to find because of search frictions, they may also be incompatible with the spouse's job. In the two-body problem, incompatibility arises because of physical distance.[1] With incompatibility, career decisions become strategic inside the couple.

In the model, workers who make up a couple choose an occupation and sample occupation-specific job offers. Jobs in occupation A are hard to find but offer large wages at the top of the distribution. Jobs in occupation B pay less on average but are easy to find and available everywhere. Couples are geographically constrained since they want to live in the same place.[2] We show that occupational switches may occur not only when a partner receives an incompatible job offer that forces the couple to move, but also when the offer is compatible, as the couple anticipates fewer career-improving opportunities in the future. Intuitively, a couple in which one currently brings home a high wage in occupation A would lose a lot if that partner quits. As a result, the spouse faces fewer career-improving prospects in A, prompting a switch to career B. In short, the two-body search may generate occupational switches. This mechanism differs from the classical models of occupational choice, in which occupational switches are due to experimentation in occupations of uncertain quality (Miller, 1984; McCall, 1991; Neal, 1999).

In this working paper, we introduce a bare-bones modeling of couple formation, which will be enhanced in a future version. We observe that at the moment when couples form, they coordinate their careers, which may entail an immediate career switch. The intuition is the same as described above, when a couple, both partners of which are employed in A, embraces a career switch after receiving a high-paying compatible offer. Before couple formation, single workers may also anticipate that in a durable relationship they will be more constrained in their labor mobility, possibly determining a different career choice than if they were to remain single forever. This model can generate gendered equilibria, whereby each side of the marriage market chooses a distinct occupation.

This paper bridges the literature on gender gaps that result from occupational characteristics and the literature on family job search.

Our research contributes to the literature on within-occupation characteristics as determinants of gender gaps in the labor market, especially at the top of the income distribution (Goldin, 2014; Blau and Kahn, 2017). Goldin (2014) emphasizes the role of temporal flexibility as a determinant of the gender pay gap in high-paying jobs. She points out that requirements for long hours of "face-time" work, like socializing with clients or being on call, can explain gender pay

[1]Our theory can also apply to other instances of incompatibility. Conflicts of interest in a couple can also lead to incompatibilities: for instance, the ethical guidelines at the New York Times clearly state that "in some cases (of romantic involvement), staff members may have to recuse themselves from certain coverage" (New York Times, 2020).

[2]Geographical constraints are modeled as job incompatibilities rather than through an explicit geographical modeling. This means that we do not impose the condition that jobs require a couple to be in the exact same location for those jobs to be compatible. Instead, we can think of job incompatibility as something that is specific to the couple, so that, for some, a trans-Atlantic relationship is compatible.

gaps. Workers differ in their preference for flexibility, and jobs differ in their cost of providing it. In equilibrium, workers sort accordingly. Because women sort into the less temporally flexible jobs, they are underrepresented in the highest-paying positions inside each occupation. Flabbi and Moro (2012) integrate preferences for flexibility in a search model; they estimate that women value flexibility more than men and that it substantially impacts the wage distribution. We focus on the compatibility of jobs inside the household as a different occupational characteristic that can lead to gendered equilibria. Interestingly, requirements for geographic mobility, the most straightforward example of job incompatibility, are a stringent type of flexibility requirement that has not received attention in this literature.

The recent family job-search literature studies the problem of optimal job-search strategies when decisions are taken by the household. From a theoretical perspective, the household's problem is relevant compared to the decisions of two separate risk-neutral individuals, for four main reasons. First, risk-averse individuals with pooled income and wealth coordinate their search, leading to "breadwinner cycles" (Guler et al., 2012; García-Pérez and Rendon, 2020). Second, coordination also arises in the case of within-household complementarity in hours worked or leisure (Burdett and Mortensen, 1977; Flabbi and Mabli, 2018). Third, job benefits such as health insurance have externalities that bear on the spouse's search (Dey and Flinn, 2008). Fourth, couples face a cost of living apart, which affects their geographic flexibility (Guler et al., 2012; Benson, 2015; Gemici, 2020). Our paper is most related this fourth strand.

We contribute to this fourth strand of literature with a theory of dynamic occupational decisions arising from on-the-job search. Guler et al. (2012) formalizes "tied movers" (Mincer, 1978), which means people in a relationship who accept offers that they would otherwise have rejected if they were single. Benson (2015) focuses on career choices before marriage in a two-period model. His model generates gendered equilibria in which one party specializes in the geographically mobile occupation. We add to Guler et al. (2012) by introducing dynamic careers that are compatible with the geographically flexible one, in a similar vein as Benson (2015). Gemici (2020) proposes a structural estimation of a model with migration and marital stability. Our focus is not on a structural estimation. Instead, our paper provides a theory of career accommodations that facilitate the spouse's climb up the career ladder. With stringent geographic mobility requirements, people sort into different occupations throughout their careers, in the same way that requirements for flexibility in schedules sort people across jobs in Goldin (2014).

Unlike the literature on schedule flexibility, our predictions do not rely on any effort-inducing labor contracts. Therefore, the more commonly advocated policies to bridge the gender gap, such as increasing access to child-care service, will not necessarily solve this particular problem. Solutions to gender differences due to geographic mobility are more likely to be found through innovative contract designs that incorporate joint geographic constraints within the household.

A literature has developed theoretical models that generate gendered equilibria, explaining asymmetric configuration within couples, without any ex-ante differences between genders.

One approach is based on asymmetric information on the labor market. Firms and households construct self-fulfilling beliefs that generate gender discrimination and gendered self-selection. The articles in this literature focus on different household decisions or investments

Francois (1998); Bjerk and Han (2007); Albanesi and Olivetti (2009); Dolado et al. (2013); Lommerud et al. (2015); Cuberes et al. (2018). In particular, Lommerud et al. (2015) consider two types of jobs, but the gendered allocation of jobs is decided by the firm. Instead, in our model, couples self-select into different careers.

The second approach focuses on the marriage market and premarriage decisions. The idea is that individuals make premarriage decisions that generate complementarities with the future partner. There is a gain to be had by individuals in coordinating by gender as a best strategy. Hadfield (1999) extends Becker's model (1991) of the sexual division of labor to generate gendered equilibria. Benson (2015) and Dekel and Pauzner (2014) consider career choices that, respectively, affect geographic flexibility and job satisfaction. We integrate their approach of precouple coordination gains in our dynamic career-decision model to generate gendered equilibria.

Our work is motivated by the recent questioning over female representation in academia (Ceci et al., 2014; Bayer and Rouse, 2016), especially in economics. Economics departments have notoriously low ratios of women to men, and women's representation tends to fall as academic rank increases (Lundberg and Stearns, 2019). The career pipeline in economics tends to "leak" at moments of promotion (movement from PhD to assistant professorship, or stages of promotion in the tenure track). Moreover, it is also one of the only academic professions where the trends do not appear to be improving—on the contrary, it appears that the pipeline is leaking earlier, as the share of female assistant professors is no longer tracking with the share of female PhD graduates (Chevalier, 2020).

Many reasons are invoked to explain this lack of representation in this particular occupation, with a strong emphasis on implicit attitudes and institutional practices (see Bayer and Rouse, 2016, for a comprehensive review). Wu (2020) demonstrates the tendency to deemphasize women's professional accomplishments and highlight their personal characteristics on *Econ Job Market Rumors*, the most ubiquitous online professional forum, documenting widespread gender discrimination in the profession. Hengel (2020a,b) demonstrates higher publication standards at top economic journals. Bosquet et al. (2019) observe that female economists are less likely to apply for promotion, even those whose research is top quality. In revealing the difficulties in designing policy to improve gender balance in research, Deschamps (2018) shows that imposing quotas on review boards for recruitment can backfire, hindering prospects for women. However, other research finds no evidence of systemic differences at other professional events, such as conferences or the refereeing process.[3] Card et al. (2020) suggest that the choice of a particular field within the profession partly accounts for observed differences in publication standards. Overall, considering different professional aspects of academic economics—such as publishing, promotions, or refereeing—existing research exposes instances of gender gaps in some but not all of them. Both "objective" factors (such as field specialization) and subjective ones (such as implicit biases) explain these differences. Importantly, however, this evidence cannot easily account for *worsening* trends, such as a leakage of women in the career pipeline.

Our research suggests that recruitment practices and job mobility throughout one's career can help explain the leaky pipeline and the worsening trends. Academic recruitment is based

[3]See Card et al. (2020) for a comprehensive literature review.

on a centralized, global, and competitive market that a growing number of international institutions have joined. With such a global market, moving up the career ladder likely requires geographical flexibility. We show that this flexibility generates situations of "tied stayers" (Mincer, 1978), with people being less likely to move up the career ladder when many jobs are incompatible with their spouse's. It also leads to situations of "tied movers," in which people quit their careers to accommodate their spouse's. Any small dose of the gender disparities, whether due to institutional practices or implicit attitudes, will be amplified into larger differences in promotion and the likelihood of staying in the occupation. In other words, even small disparities will lead to a "leaky" career pipeline. If the globalization of the job market has increased the possibility for job incompatibility between the couple, then this amplification phenomenon may be exacerbated, explaining recent worsening trends.

In the second section, we explain our mechanism in a toy model to emphasize the key assumptions. The dynamic model is solved and analyzed in the third section. The fourth section discusses the results, and the fifth concludes.

2 Toy model

In this section, we present a one-shot job search model that generates asymmetric careers. This toy model permits us to better describe the assumptions leading to strategic occupational choices inside the couple. It is similar to Benson (2015), with the major difference being that in our case, occupational decisions are made after couple formation.

2.1 The environment

The labor market is fully segmented into two occupation-specific submarkets. Job seekers must therefore choose an occupation before finding a job. When a job seeker chooses occupation A, that person can sample a high wage $\overline{w}$ with probability λ or a low wage $\underline{w}$ with probability $1-\lambda$, $0 \leq \lambda \leq 1$. When a job seeker chooses occupation B, the person obtains wage w_B for sure. We assume that $\underline{w} < w_B < \overline{w}$. This situation captures the choice between a path without uncertainty, B, and an uncertain but ambitious path, A. If a job seeker draws a low wage $\underline{w}$ in occupation A, that person can obtain a job in occupation B but at an extra cost, so that income is $w_B - f$, with $f \geq 0$. We assume that $\underline{w} \leq w_B - f$.

The extra cost f captures several ideas: occupation A may require an initial investment that will be lost in the event of a career switch, a psychological cost, or the opportunity cost of not having chosen track B from the start. In the toy model, we are silent about the microfoundations of the switching cost.

We consider the search problem for both single workers and two-earner couples. Workers are risk-neutral, and couples' utility is simply the combined income. The choice of occupation within the couple maximizes expected joint income.

The reason why the couple's problem differs from the one of two separate single workers is the existence of incompatible jobs. When both individuals in the couple receive a job offer in occupation A, there is a probability $1-\alpha$ that the two job offers are not compatible, with $0 \leq \alpha \leq 1$. In that case, one of them has to decline the job offer and consider a career switch.

We typically interpret incompatibility as job opportunities that require a geographical move. Under this interpretation, career A is mobility-demanding.[4]

The timing is as follows. In the first period, job seekers choose an occupation and look for an occupation-specific job. In the second period, job offers are revealed and each worker decides whether to accept the offer or reject it and switch careers.

Throughout the paper, we will use the term "symmetric" for couples with both partners in career A, and "asymmetric" for couples with one partner in A and the other one in B.

2.2 Optimal career decisions

Single's decision. Under career path A, the worker obtains a wage $\overline{w}$ with probability λ, or, with probability $1-\lambda$, pays the switching cost f to receive wage w_B. Alternatively, career path B yields w_B for sure. The single agent's problem is

$$\max\{\lambda\overline{w} + (1-\lambda)(w_B - f), w_B\}. \tag{1}$$

A single agent always prefers taking the risk for the mobility-demanding occupation M if the switching cost is not prohibitive: $f \leq \overline{f}$ with

$$\overline{f} \equiv \frac{\lambda}{1-\lambda}(\overline{w} - w_B).$$

Couple's decision. The couple's problem differs from the single's problem because of the gains from coordinating career decisions with potentially incompatible jobs. The utility when both partners choose career B is the sum of the two certain wages,

$$V_{BB} = 2w_B. \tag{2}$$

When the partners take different career paths, they obtain income $\overline{w} + w_B$ with probability λ and $2w_B - f$ with probability $1-\lambda$. The joint utility in that case is

$$V_{AB} = \lambda(\overline{w} + w_B) + (1-\lambda)(2w_B - f). \tag{3}$$

The utility of the two partners choosing career A is the sum of three terms corresponding to three distinct cases. In the first case, with probability λ^2, they both receive a high-wage job offer. With probability α, the jobs are compatible, yielding $2\overline{w}$. With probability $1-\alpha$, one partner has to reject the offer, and the couple gets $\overline{w} + w_B - f$. In the second case, with probability $2\lambda(1-\lambda)$, only one partner receives a high-wage job offer, so the couple receives $\overline{w} + w_B - f$. In the last case, with probability $(1-\lambda)^2$, the couple receives two low-wage offers, and both partners end up in occupation B. They receive $2(w_B - F)$ in that case. The joint utility when the two partners choose career A is

$$V_{AA} = \lambda^2\left[\alpha 2\overline{w} + (1-\alpha)(\overline{w} + w_B - f)\right] + 2\lambda(1-\lambda)(\overline{w} + w_B - f) + (1-\lambda)^2 2(w_B - f). \tag{4}$$

[4] We exclude incompatible couples as a possibility—or, equivalently, we impose an infinite cost on incompatible relationships. This differs from (Guler et al., 2012), who introduce a cost to distance relationships.

The couple chooses the utility-maximizing combination among AA, AB, and BB. Before characterizing the optimal career decisions, we define another threshold cost $\underline{f}$:

$$\underline{f} \equiv \frac{\lambda - \lambda^2(1-\alpha)}{1-\lambda+\lambda^2(1-\alpha)}(\overline{w} - w_B).$$

We use the definitions of $\overline{f}$ and $\underline{f}$ to rewrite Equations (3) and (4) as

$$V_{AB} = V_{BB} + (1-\lambda)(\overline{f} - f), \tag{5}$$
$$V_{AA} = V_{AB} + [1-\lambda-\lambda^2(1-\alpha)](\underline{f} - f). \tag{6}$$

The values can now easily be compared: $V_{AB} \geq V_{BB}$ if and only if $f \leq \overline{f}$, and $V_{AA} \geq V_{AB}$ if and only if $f \leq \underline{f}$. The highest value depends on the position of the switching cost f relative to $\overline{f}$ and $\underline{f}$. Notice that the inequality $\underline{f} \leq \overline{f}$ always holds. Figure 1 shows how the asset values vary with the switching cost f. The couple optimally makes the following career decisions:

- both partners choose career path B when $f > \bar{f}$;
- both partners choose the mobility-demanding career A when $f < \underline{f}$;
- the couple chooses different careers when $\underline{f} < f < \overline{f}$.

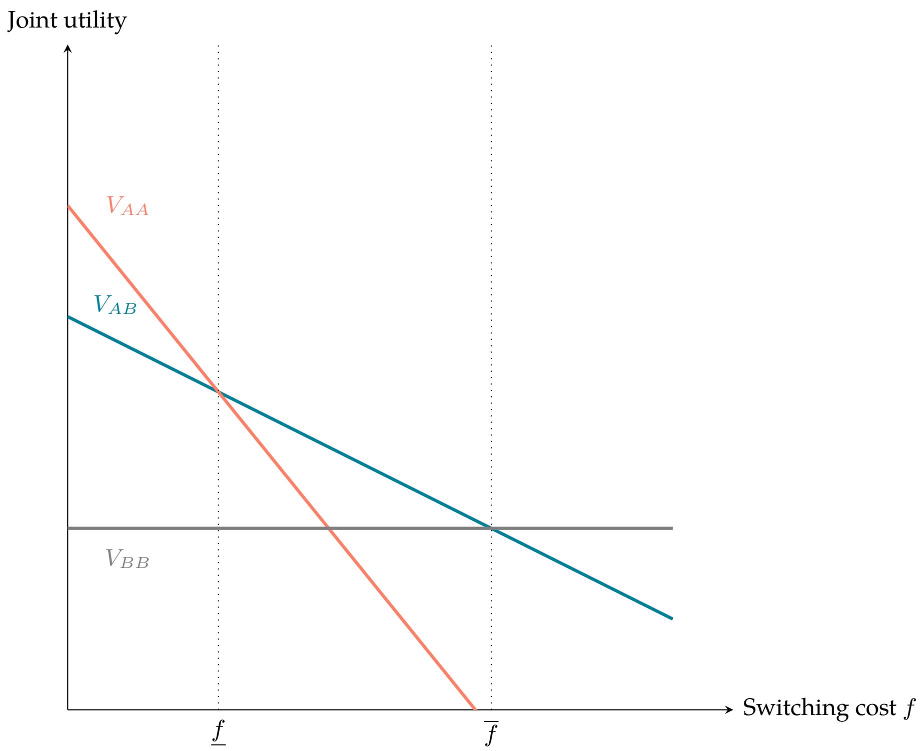

Figure 1: Optimal Career Decisions in the Toy Model

Notes: Both partners choose a career in A when $f < \underline{f}$, whereas an asymmetric career choice AB is preferred in the medium range of switching cost $f \in [\underline{f}, \overline{f}]$.

As in the single agent's problem, the relative position of the switching cost determines the optimal career paths. As the switching cost f increases, the incentives to choose a mobility-demanding career decrease. When the switching cost is low, $f = 0$ at the limit, there is no risk involved in choosing the mobility-demanding career.

Incompatible job offers give rise to a third situation in the couple's problem. For a medium range of switching cost, $\underline{f} < f < \bar{f}$, the couple chooses asymmetric careers. This case crucially depends on the compatibility between jobs. If all the job opportunities are compatible, namely $\alpha = 1$, then $\underline{f} = \bar{f}$ and the situation never occurs. Notice that we only need $\alpha < 1$ to obtain the polarization solution. If $\lambda = 1$, then $\bar{f} = +\infty$. In that case, a single individual always obtains a job in occupation A, but a couple cannot obtain two compatible jobs in A as easily.

In this toy model, the couple jointly makes career decisions. If, instead of assuming cooperation, each partner chooses unilaterally his or her career path, then we would obtain the same optimal career decisions by considering the Nash equilibria with pure strategies when the cost of holding two incompatible jobs or living apart is infinite. Interestingly, the noncooperative game is an example of the "battle of the sexes" (Fudenberg and Tirole, 1991, Chap. 1, p. 20).

When $\underline{f} < f < \bar{f}$, either the first partner chooses A and the second B, or the reverse. There are two gendered equilibria. However, if there is any small element of gender asymmetry ex ante that is unfavorable to women in career path A, then heterosexual couples would strictly prefer to assign men to career A and women to career B. Such elements of asymmetry ex ante can be, for instance, even slightly smaller labor market returns, a culture where women are pushed to be more accommodating than men, or a dynamic in which they have lower bargaining power inside the couple. The existence of a gender-biased focal point, in the sense of Schelling (1960), can also be a reason why females may choose the track B and men the track A.

The toy model introduces many frictional aspects captured by parameters λ, α, and f. In the next section, we develop a dynamic model revealing that to obtain asymmetric careers, we do not require any explicit job-switching cost f. The key assumption is the existence of incompatible job offers, $\alpha < 1$.

3 Dynamic model

In this section, we develop a dynamic model without the exogenous switching cost. At any time, people are making career choices between two alternatives: 1) being paid a possibly low wage in career A, but with the possibility of receiving higher offers in the future, or 2) receiving a moderate constant wage in career B.

3.1 The environment

The model has an infinite horizon, and individuals can search while on the job. Time is continuous and discounted at a rate r. The environment is stationary.

The market for jobs in occupation B is frictionless, and any job in occupation B is paid a wage w_B. When a worker searches for a job in occupation A, that worker receives random job offers between 0 and $\overline{w}$, with $0 \leq w_B \leq \overline{w}$. The arrival rate of jobs with a wage w is $\lambda(w)$. Workers can make a career switch from A to B at any time to instantaneously obtain a wage w_B. However, they stop receiving offers in A, and if they want to come back, they would have to quit their job in B to start over in A. In other words, they cannot search for a job in career A while employed in career B. Unemployed workers are supposed to have the same job-arrival rate, so they are not different from an employed worker at wage 0 in our model.

There is a probability α that a new offer in occupation A is incompatible with the partner's job. In this scenario, accepting the offer entails that the partner quits the current job and tries to find a compatible one, possibly triggering a career switch. Compared to the toy model, a couple will not receive two offers at the exact same time. Such a situation occurs with a zero probability. When either half of a couple receives a job offer, the decision is therefore whether to accept it and whether the partner should switch careers.

The dynamic model captures an essential feature of mobility-demanding occupations that the toy model misses: workers who prefer career A accept low wages and an unstable situation waiting for appealing jobs in the future.

3.2 Benchmark with permanent singles

Define Ω_B as the present-discounted value of being in career B and $\Omega_A(w)$ as that of being in career A with a wage w. In addition to job-acceptance decisions in career A, workers can choose to make a career switch at any time. We use the stationarity of the environment, which derives in particular from the assumption of Poisson job-offer arrival rates, to eliminate suboptimal career decisions.

Consider the decision to take a job in career B. At the steady state, if it is optimal to work in career B at a given time, then it must be optimal to remain permanently in career B. We can therefore focus on the value of staying permanently in career B, V_B, which solves $rV_B = w_B$.

Consider now the decision to take a job at wage w in career A. At the steady state, if it is optimal to take such a job at a given time, then it must be optimal to keep the job at least until a job offer is drawn. When the worker receives a job offer, that worker can always reject it and keep his or her previous job. If the worker preferred to switch to career B after receiving a job offer, then it would imply that it was not optimal to take the current job initially. This suboptimal strategy can be excluded. In other words, if it is optimal to accept a job in career A, it is optimal to remain permanently in career A. We define $V_A(w)$ as the value of accepting a job in career A at wage w and remaining permanently in career A:

$$\begin{aligned} rV_A(w) &= w + \int_0^{\overline{w}} \lambda(x) \max\{V_A(x) - V_A(w), 0\} dx \\ &= w + \int_w^{\overline{w}} \lambda(x)(V_A(x) - V_A(w)) dx. \end{aligned} \tag{7}$$

The worker in career A receives the wage w and draws a job offer x at rate $\lambda(x)$. If the worker accepts the offer, that worker makes a capital gain $V_A(x) - V_A(w)$. The optimal job-acceptance decision in career A is simply to accept any job that pays above the current wage w. The career-decision problem when a worker is in career B is to choose between the asset value V_B and the asset value of starting a career in A, $V_A(0)$, hence $\Omega_B = \max\{V_A(0), V_B\}$. Similarly, the career-decision problem when a worker is paid w in career A is to choose between $V_A(w)$ and V_B, hence $\Omega_A(w) = \max\{V_A(w), V_B\}$.

We define the arrival rate of job offers above wage w in career A as $\Lambda(w) \equiv \int_w^{\overline{w}} \lambda(x)dx$.

Proposition 1 *A career in occupation A is always preferred to a career in occupation B, $V_A(0) \geq V_B$, if and only if*

$$w_B \leq \int_0^{\overline{w}} \frac{\Lambda(x)}{r + \Lambda(x)} dx. \tag{i}$$

The proof is in Appendix A. The right-hand side in condition (i) corresponds to the returns to search in career A at a zero wage. For couples, condition (i) implies that, if jobs were always compatible, it would be optimal that both partners choose a career in occupation A.

3.3 Within-couple career decisions

We now turn to couples. We define Ω_{BB} as the asset value of both partners being in career B. $\Omega_{AB}(w)$ is the asset value when one partner has a job w in career A and the other one is in B. $\Omega_{AA}(w_1, w_2)$ is the asset value when partners receive, respectively, wages w_1 and w_2 in career A.

As in the career decisions of single workers, we can reduce the space of career strategies by omitting suboptimal career switches. We now characterize the values of the relevant career strategies.

The value for both partners to take a job in occupation B is captured by the asset value to remain permanently in career B, which is simply $2V_B$.

Consider the decision for one partner to hold a job that pays w in career A and the second partner to work in career B. At the steady state, if this decision is optimal at a given time, then it must be optimal to keep this configuration at least until the partner in career A draws a new job offer. We denote $V_{AB}(w)$ as the asset value when the couple keeps an asymmetric specialization until a job offer is accepted.

Consider the decision for both partners to hold jobs that pay w_1 and w_2 in career A. Similarly, we exclude suboptimal career switches that would happen before a job offer is accepted by one partner. When one partner receives a job offer x, only the second partner may decide to switch careers. We denote $V_{AA}(w_1, w_2)$ as the asset value when there are career switches in the couple only when a spouse accepts a job offer.

Asymmetric couple. The Bellman equation defining $V_{AB}(w)$ is

$$rV_{AB}(w) = w + w_B + \int_0^{\overline{w}} \lambda(x) \max\{\Gamma(x, 0) - V_{AB}(w), 0\} dx, \tag{8}$$

where $\Gamma(w_1, w_2) = \max\{V_{AA}(w_1, w_2), V_{AB}(w_1)\}$.

The term $\max\{\Gamma(x, 0) - V_{AB}(w), 0\}$ inside the integral in (8) captures the decision to accept or reject a new offer paying x. The term $\Gamma(x, 0)$ captures the condition that upon accepting the new offer, the other partner in the couple may start over a career in A.

An asymmetric couple can decide to remain permanently in such a configuration. In that case, the couple receives the value $V_A(w) + V_B$. An asymmetric couple can therefore achieves at least this value, and so $V_{AB}(w) \geq V_A(w) + V_B$.

Symmetric couple. For $V_{AA}(w_1, w_2)$, the Bellman equation is

$$
\begin{aligned}
&rV_{AA}(w_1, w_2) = w_1 + w_2 \\
&+ \int_0^{\overline{w}} \lambda(x) \left[\alpha \max\{\Gamma(x, w_2) - V_{AA}(w_1, w_2), 0\} + (1-\alpha) \max\{\Gamma(x, 0) - V_{AA}(w_1, w_2), 0\}\right] dx \\
&+ \int_0^{\overline{w}} \lambda(x) \left[\alpha \max\{\Gamma(x, w_1) - V_{AA}(w_1, w_2), 0\} + (1-\alpha) \max\{\Gamma(x, 0) - V_{AA}(w_1, w_2), 0\}\right] dx.
\end{aligned} \tag{9}
$$

When one partner, initially paid w_1, receives a wage offer x, there is a probability $1-\alpha$ for it to be incompatible with the partner's job. If that person accepts the job, the second partner loses his or her job. The couple must then decide whether the second partner switches to a career in B or quits the current job w_2 to find a new compatible job in A. With an incompatible offer, the couple therefore receives $\Gamma(x, 0)$.

With a probability of α, the new offer is compatible. The options for the second partner are either to keep job w_2 or to switch to a career in B. The intuition for switching to B even though the offer is compatible is that if one partner has a good job in A, then the other one faces fewer prospects, because any incompatible offer would need to be very strong to justify a change of status for the spouse. This anticipation will prompt a switch to career B. Accepting the job offer means trading the current value $V_{AA}(w_1, w_2)$ for $\Gamma(x, w_2)$.

The last line in the equation corresponds to the symmetric situation when the second partner receives a job offer. Notice that $V_{AA}(w_1, w_2) = V_{AA}(w_2, w_1)$ but $\Gamma(w_1, w_2) \neq \Gamma(w_2, w_1)$.[5]

The joint search problem is *not* equivalent to the permanent single's problem when both partners are in career A. The two-body problem exists because $V_{AA}(w_1, w_2) \leq V_A(w_1) + V_A(w_2)$. We show in Appendix A.3 that $V_{AA}(w_1, w_2)$ indeed increases in α.

Career decisions. There are three problems of career decisions:

$$\Omega_{BB} = \max\{2V_B, V_{AB}(0), V_{AA}(0, 0)\}, \tag{10}$$

$$\Omega_{AB}(w) = \max\{2V_B, V_{AB}(w), V_{AA}(w, 0)\}, \tag{11}$$

$$\Omega_{AA}(w_1, w_2) = \max\{2V_B, V_{AB}(w_1), V_{AB}(w_2), V_{AA}(w_1, w_2)\}. \tag{12}$$

We focus on the career decisions of symmetric couples with both partners in A. Under condition (i), the problem reduces to $\Omega_{AA}(w_1, w_2) = \max\{V_{AA}(w_1, w_2), V_{AB}(w_1), V_{AB}(w_2)\}$. Condition (i) makes suboptimal the decision for both partners to specialize in career B, as it implies $2V_B \leq V_A(0) + V_B \leq V_{AB}(0)$. From now on, we assume condition (i) is always satisfied.

We are now in position to characterize the optimal career decisions. We denote $\mathcal{E} = [0, \overline{w}] \times [0, \overline{w}]$ and define $\mathcal{X}$ as the subset of $\mathcal{E}$ that contains all the elements (w_1, w_2), so that $V_{AA}(w_1, w_2) \geq V_{AB}(w_1)$ and $V_{AA}(w_1, w_2) \geq V_{AB}(w_2)$.

[5]The difference captures that the couple ignores the option for the partner who draws a job offer to turn down the offer and switch to career B. If it is optimal for both partners in a couple to be in career A initially, then it would be suboptimal to make such a move.

Proposition 2 *We define condition* (ii) *as*

$$\int_0^{\overline{w}} \frac{\alpha\Lambda(x)}{r+\alpha\Lambda(x)} dx < w_B. \tag{ii}$$

Under conditions (i) *and* (ii), $\mathcal{X}$ *satisfies the following properties:*

(a) *For any wage* w, (w, w) *belongs to* $\mathcal{X}$*;*

(b) $(\overline{w}, 0)$ *and* $(0, \overline{w})$ *do not belong to* $\mathcal{X}$*;*

(c) *there exists a function* ϕ *that characterizes the boundaries of* $\mathcal{X}$*:*
(w_1, w_2) *belongs to* $\mathcal{X}$ *if and only if* $w_1 \geq \phi(w_2)$ *and* $w_2 \geq \phi(w_1)$*;*

(d) *the set* $\mathcal{X}$ *expands as* α *increases.*

The proof of this proposition is in Appendix A. Notice that conditions (i) and (ii) can be satisfied simultaneously only when the incompatible occurs, and $\alpha < 1$.

Property (a) states that when both partners have the same wage in career A, they are better off than if one would switch to career B. This result is intuitive when $w \geq w_B$, because both partners are already paid more than in career B. When $w < w_B$, the property derives from condition (i). The returns to search are so high in career A that it is better for the couple to wait until one partner receives an offer x with $x \geq w$, and then possibly make the second partner switch to career B, than to make one partner switch to career B right away.

Property (b) implies that it is optimal for a partner to switch to career B when the other partner gets an incompatible offer with the highest possible wage $\overline{w}$ in career A, and $(\overline{w}, 0)$ does not belong to $\mathcal{X}$. The intuition from this result, also presented above, is that if the first partner receives the highest possible offer, then the second partner's prospects are diminished. Indeed, no incompatible offer in the future can justify a change of status for the first partner, pushing the second partner to switch to career B.

Property (c) states that the boundaries of the set $\mathcal{X}$ can be defined with function ϕ as shown in Figure 2. The light-pink area that corresponds to $\mathcal{X}$ is bounded between two curves: the curve below represents ϕ, and the curve above represents the reflexion of ϕ. If a symmetric couple with wages (w_1, w_2) receives a compatible offer x so that (x, w_2) lies outside the light-pink area, then it is optimal for the second partner to switch to career B.

Property (d) states that the set of symmetric careers in occupation A shrinks as job incompatibility becomes relatively more frequent. Graphically, the curve that represents ϕ shifts to the left, and the curve that represents its reflection shifts to the right.

4 Discussion

4.1 Career paths

In this section, we describe what career choices look like as couples search while working in a job. We emphasize four features of the optimal career paths.

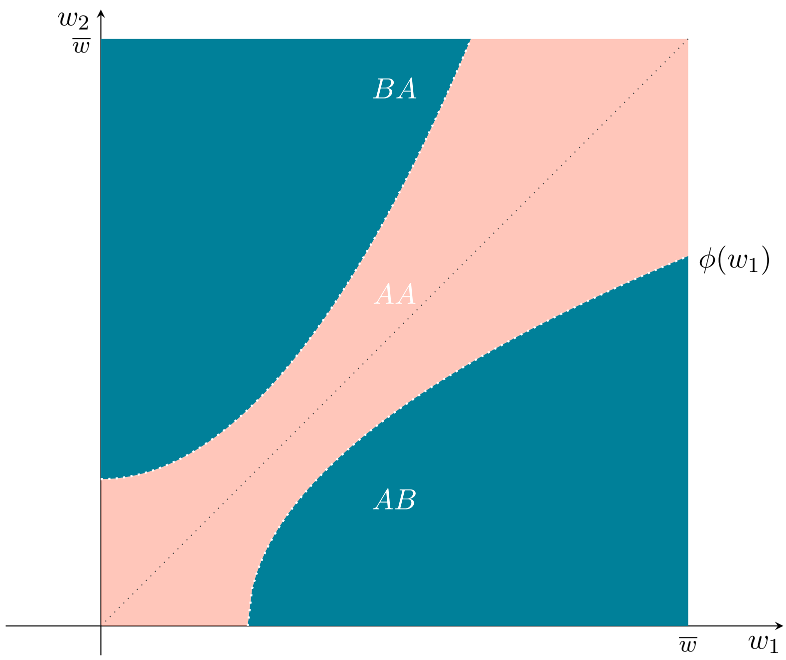

Figure 2: Optimal Career Decisions

Notes: The x-axis corresponds to the first partner's wage, the y-axis to the second partner's. The pink area that contains the first bisector represents the set $\mathcal{X}$. If the couple receives a pair of wages in this area, the partners optimally decide to stay in career A. If the couple receives a pair of wages in the blue area below the first bisector, then it is optimal for the second partner to switch to career B. In the blue area above the bisector, it is optimal for the first partner to switch to career B.

4.1.1 Feature 1) Career switches to B can be permanent

When the second partner switches to career B following a job change of the first partner, then it can be optimal for the second partner to never return to career A in the future. The first partner, who keeps the job in A, will continue to accept higher job offers, climbing the job ladder. Since the second partner has already switched to B, incompatible jobs are not an issue anymore for the couple. This result is in stark contrast with the "breadwinner cycle" result of Guler et al. (2012).

4.1.2 Feature 2) Incompatible job offers

We first discuss the arrival of an incompatible job offer because the mechanisms at work are simpler than with compatible offers.

Career switches may occur because of incompatible jobs. Consider a situation where both partners work in occupation A at wages w_1 and w_2 and the first partner receives an offer x that is incompatible with the second partner's job. If the new offer pays highly enough, then it is optimal to accept the offer even if the second partner has to quit his or her current job.

After quitting the job, the second partner can either start looking for a job in career A, but from the bottom rung of the job ladder, or switch to career B. Notice that if the second partner is single, then under condition (i), it would always be optimal to stay in career A even after quitting a job, as $V_A(0) \geq V_B$. In the family search problem, the difference is that the second partner may have to reject many offers in career A because they are incompatible with the first partner's job. The higher the first partner's wage, the higher the second partner's reservation wage for incompatible job offers. Very few incompatible jobs would indeed make it worthwhile for the first partner to quit his or her job. Any offer $x \geq w_R$ is accepted, and it triggers a career switch when $\phi(x) \geq 0$.

Figure 3 depicts a particular situation in which the starting point (w_1, w_2) lies in the center of the graph. The dark dashed line represents the indifference curve crossing the couple's current situation (w_1, w_2). For any incompatible offer x, the couple can receive the level of utility given by the indifference curve crossing $(x, 0)$ if they both remain in A, or the level of utility given by the indifference curve crossing $(x, \phi(x))$ if the second partner switches to B (since $V_{AB}(x) = V_{AA}(x, \phi(x))$). Any incompatible offer $x < w_R$ is rejected, since the dark dashed line lies above any indifference curve that crosses either $(x, 0)$ or $(x, \phi(x))$. In other words, any incompatible offer $x < w_R$ for the first partner will make the couple worse off, both with and without a career change from the second partner. If $x \geq w_R$, then the couple is better off accepting it and switching to an asymmetric situation, because the indifference curve crossing $(x, \phi(x))$ lies above the dark dashed line.

We can also interpret the reaction to an incompatible job offer using the definition of "tied movers" and "tied stayers" from Mincer (1978). If $w_1 < x < w_R$, the couple rejects an offer that the first partner would have accepted had that partner been single. The first partner is therefore a "tied stayer." If $x \geq w_R$, the second partner switches careers and moves, although if that person were single, he or she would have stayed in the job. The second partner is therefore a "tied mover."

Notice, finally, that in the situation described in the graph, any incompatible offer that is accepted triggers a career change for the second partner. In other words, from this particular starting point, it is never optimal to accept an incompatible offer and remain in a symmetric situation. The possibility of accepting an incompatible offer and remaining in a symmetric situation emerges in the region closer to the origin of the graph.

4.1.3 Feature 3) Compatible job offers

Career switches may also occur when the new job offer is compatible. This could be surprising at first sight, but it derives from the same reasoning as in the case of incompatible job offers. Consider a situation in which both partners work in occupation A at wages w_1 and w_2, and the first partner receives an offer x, with $x \geq w_1$, that is compatible with the second partner's job. Accepting the job is an unambiguous move, as $V_{AA}(x, w_2) \geq V_{AA}(w_1, w_2)$. However, it can be even better for the second partner to switch to career B, if $V_{AB}(x) \geq V_{AA}(x, w_2)$.

Intuition suggests the following: As the first partner receives a better wage or salary, the second partner's reservation wage for incompatible jobs increases. The second partner reduces the scope of his or her search, which reduces the returns to search in occupation A. If the second worker is currently paid less than the wage in career B, it may be worth switching to career B.

Figure 4 depicts a particular situation in which the starting point (w_1, w_2) lies in the center of the graph. The dark dashed line represents the indifference curve crossing the couple's current situation (w_1, w_2). For any compatible offer x, the couple can receive the level of utility given by the indifference curve crossing (x, w_2) if they both remain in A, or the level of utility given by the indifference curve crossing $(x, \phi(x))$ if the second partner switches to B. Any compatible offer $x \geq w_1$ is accepted because (x, w_2) is on the right of the dark dashed indifference curve. It is intuitive that any compatible offer $x \geq w_1$ for the first partner will make the couple better off. How will the offer affect occupational choices inside the couple? If $w_1 \leq x \leq w_S$, then the indifference curve crossing (x, w_2) lies above the one crossing $(x, \phi(x))$, so the couple is better off remaining in a symmetric situation, with the first partner taking offer x and the second partner keeping the compatible job in A. If $x \geq w_S$, then the indifference curve crossing (x, w_2) lies below the one crossing $(x, \phi(x))$, so the couple is better off switching to an asymmetric situation, with the first partner taking offer x and the second quitting his or her job in A and getting one in B.[6]

4.1.4 Feature 4) Symmetric careers

There are trajectories in which both partners remain permanently in career A. In these trajectories, both partners climb the job ladder gradually, in small increments. As explained above in Sections 4.1.2 and 4.1.3, if a job offer is too high, it may trigger a career switch. Notice that accepting incompatible job offers does not necessarily entail a switch to an asymmetric couple. Indeed, it may still be optimal for the "tied mover" partner to quit the current job and look for a new one, still in career A but in the new location. In Figure 3, we can see that it happens when the couple holds lower-paid jobs.

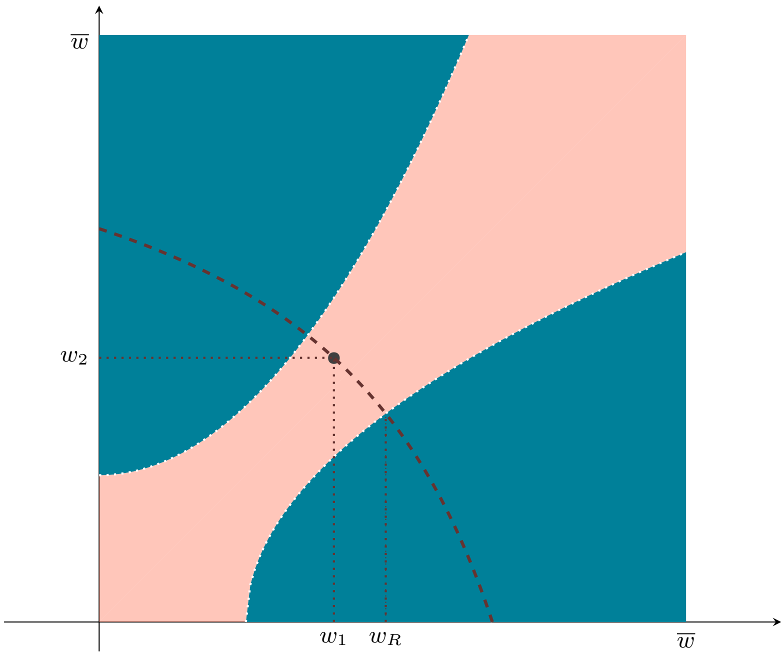

Figure 3: Incompatible Job Offers

Notes: This graph describes the situation in which a symmetric couple with both partners employed in A and earning (w_1, w_2) receives an incompatible offer. The dark dashed line is the indifference curve when both partners are in A going through (w_1, w_2). w_R is the lowest incompatible job offer that will be accepted. In the particular situation described in the graph, any accepted incompatible offer will trigger a career switch from the other partner.

[6] ϕ may not be monotonous, in which case there will be more than two regions of interest for compatible offers.

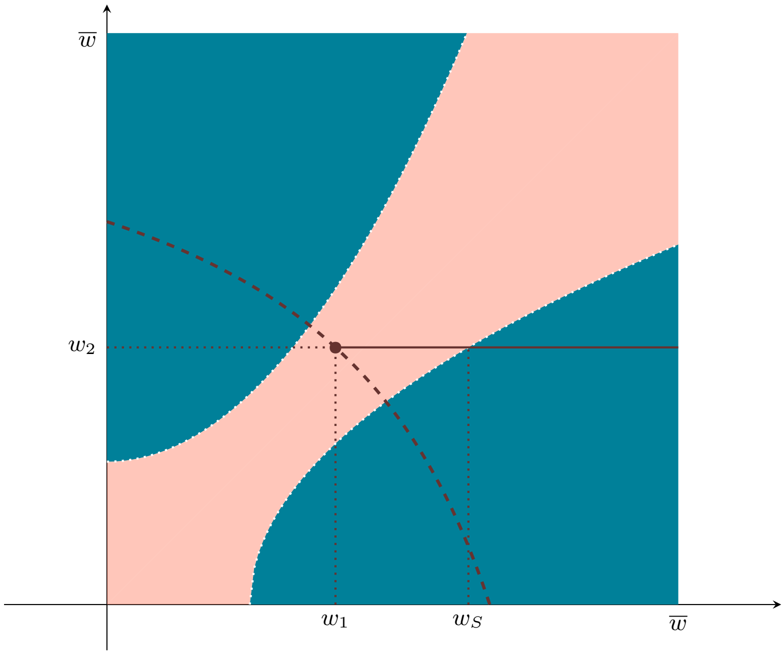

Figure 4: Compatible Job Offers

Notes: This graph describes the situation in which a symmetric couple with both partners employed in A and earning (w_1, w_2) receives a compatible offer. The dark dashed line is the indifference curve when both partners are in A going through (w_1, w_2). w_S is the lowest compatible job offer that will trigger a career switch from the other partner.

4.2 Career decisions at marriage and before

In this subsection, we explore the predictions of the model when we add a precouple formation stage to career decisions. We show first that single workers may switch careers at the moment of couple formation and before meeting a partner. We then show, by considering the marriage market, that the optimal career decisions can lead to gendered equilibria, in which one gender chooses career A and the other career B.

Career decisions before marriage. We define the problem of a single heterosexual woman (or, respectively, man). She meets a potential partner at a rate γ. We assume that they always form a couple after meeting and stay together forever. This implies that there is no shopping for partners based on their jobs or careers, or, equivalently, that couple formation is all about random blind love. There is no job incompatibility at the moment when couples form. We can interpret this as reflecting the fact that people meet locally. Let ψ denote the share of potential partners that are currently in career A. We denote as $\mathbb{E}_w$ the expectation operator over the equilibrium wage distribution of potential partners in career A. Both objects ψ and $\mathbb{E}_w$ are endogenous, as they depend on the career choices of potential partners and the arrival rate of job offers $\lambda(x)$. Last, we assume that partners share the returns 50-50 within the couple. For instance, being in a couple that generates joint present-discounted income Ω provides an individual income $\Omega/2$.[7]

Let $U_A(w)$ be the asset value of being single at wage w in career A, and U_B the asset value

[7] Given that individuals are risk neutral, this sharing of the surplus is efficient in the sense that an individual has an interest in maximizing the joint value Ω.

in career B.[8] They are defined by the Bellman equations

$$rU_B = w_B + \gamma \left(\psi \frac{\mathbb{E}_w \Omega_{AB}(w)}{2} + (1-\psi)\frac{\Omega_{BB}}{2} - U_B \right), \tag{13}$$

$$\begin{aligned} rU_A(w) = w &+ \int_w^{\overline{w}} \lambda(x)(U_A(x) - U_A(w))dx \\ &+ \gamma \left(\psi \frac{\mathbb{E}_{w'} \Omega_{AA}(w,w')}{2} + (1-\psi)\frac{\Omega_{AB}(w)}{2} - U_A(w) \right). \end{aligned} \tag{14}$$

There is a new term compared to the Bellman equations of permanent single workers. This term captures the capital gains that single workers make when they match with someone else.

When a single individual is in career B, that person will switch to career A if he or she meets a partner in career B. Actually, they will both switch. This result comes from the fact that under condition (i),

$$\Omega_{BB} = \Omega_{AB}(0) = \Omega_{AA}(0,0) = V_{AA}(0,0). \tag{15}$$

The individual in career B may also switch if that person meets a partner in career A with a low wage w, so that $\phi(w) = 0$. This is because in the region close to the origin in Figure 2,

$$\Omega_{AB}(x) = \Omega_{AA}(0,x) = V_{AA}(0,x). \tag{16}$$

When a single individual is in career A, that individual may switch to career B instantly after meeting someone in A. This is well illustrated using Figure 4. If the single individual earns w_2, and makes a match with anyone earning above w_S, then the new couple switches instantly to the asymmetric situation. In this scenario, the partner's wage is so high that it eliminates most of the incompatible job opportunities, thus reducing the returns to search.

We denote as $\Sigma(w,\psi)$ the asset value of an individual with wage w in occupation A who joins a couple, $\Sigma(w,\psi) \equiv \psi \frac{\mathbb{E}_{w'}\Omega_{AA}(w,w')}{2} + (1-\psi)\frac{\Omega_{AB}(w)}{2}$. Notice that $(r+\gamma)U_B = w_B + \gamma\Sigma(0,\psi)$.

Proposition 3 *Suppose a worker enters the labor market as single without a job. A single individual optimally chooses career A if and only if the share of occupation A among that individual's potential partners ψ satisfies the following:*

$$w_B \leq \int_0^{\overline{w}} \frac{\Lambda(x)\left(1 + \gamma \frac{\partial \Sigma}{\partial w}(x,\psi)\right)}{r + \Lambda(x) + \gamma} dx. \tag{17}$$

The proof of this proposition is in Appendix A.5. The main point is that this condition may not be satisfied even if condition (i) holds. We discuss this possibility below.[9]

When $\int_0^{\overline{w}} \frac{\Lambda(x)\left(1+\gamma\frac{\partial\Sigma}{\partial w}(x,\psi)\right)}{r+\Lambda(x)+\gamma}dx < w_B$, the perspective of meeting someone and making joint career choices affects the initial occupational choice. Single workers anticipate that in a durable relationship, they will be more constrained in their labor mobility. For instance, if a single woman

[8] Again, we have eliminated the possibility for single workers to make a career switch before meeting a partner.

[9] At this stage, we do not explore further the conditions for $\int_0^{\overline{w}} \frac{\Lambda(x)\left(1+\gamma\frac{\partial\Sigma}{\partial w}(w,\psi)\right)}{r+\Lambda(x)+\gamma}dx < \int_0^{\overline{w}} \frac{\Lambda(x)}{r+\Lambda(x)}dx$.

expects that she will likely switch to occupation B upon meeting someone in A, then she may prefer to choose career B straightaway, even before finding a partner.

Equilibrium on the marriage market. Here, we consider a situation in which all workers optimally choose a career, so that ψ is endogenized and gender-specific. Given Proposition 3, same-gender individuals choose the same career when entering the labor market.

A corollary of Proposition 3 is that gendered equilibria may arise when the condition stated in Equation (18) is satisfied:

$$\int_0^{\overline{w}} \frac{\Lambda(x)\left(1+\gamma\frac{\partial\Sigma}{\partial w}(x,1)\right)}{r+\Lambda(x)+\gamma}dx < w_B \leq \int_0^{\overline{w}} \frac{\Lambda(x)\left(1+\gamma\frac{\partial\Sigma}{\partial w}(x,0)\right)}{r+\Lambda(x)+\gamma}dx. \tag{18}$$

Consider the situation in which all men are in A and all women are in B. In this situation, according to the left-hand side of Equation (18), a woman in B will not deviate from that strategy. The right-hand side of equation (18) shows that a man in A will not deviate from that strategy either. The symmetric configuration with all women in A and all men in B also works. In other words, there are at least two gendered Nash equilibria.

4.3 Gender disparities

Our model shows that couples specialize in different occupations because of job incompatibility. However, when men and women are in a perfectly symmetric situation, there is no reason to observe any systemic differences in gender composition between occupations. Occupational switches will happen with the same probability irrespective of the gender.

So far, we observe a possibility of systemic differences with the gendered equilibria described arising only when Equation (18) is satisfied. As described, however, the model is silent about whether the male or female equilibrium may arise.

In this subsection, we introduce ex-ante gender differences that are unfavorable to women, and we show how this results in a systemically low gender ratio in career A. By introducing a distinction between genders, we break the symmetry of the model between the two partners. The first partners, indexed by 1, correspond to men, and the second partners, indexed by 2, correspond to women. We now distinguish $V_{AB1}(w)$, the asset value when the man is in career A at wage w and the woman is in career B, from $V_{AB2}(w)$, the opposite configuration when the woman is in career A. We also define operator $\Gamma_i(w_1, w_2) = \max\{V_{AA}(w_1, w_2), V_{ABi}(w_i)\}$ for $i = 1, 2$. We denote as $V_{AA}^{gend}(w_1, w_2)$ the value for a couple whose man has a job w_1 and woman has a job w_2. The introduction of gendered disparities also breaks the symmetry of optimal career decisions. We define $\mathcal{X}^{gend}$ as the new set of wages in which symmetric couples remain in career A. Let ϕ_1 and ϕ_2 be the two functions that characterize $\mathcal{X}^{gend}$. (w_1, w_2) belongs to $\mathcal{X}$ if and only if $\phi_1(w_1) \leq w_2$ and $\phi_2(w_2) \leq w_1$, where $V_{AA}^{gend}(w, \phi_1(w)) = V_{AB1}(w)$ and $V_{AA}^{gend}(\phi_2(w), w) = V_{AB2}(w)$.

Fewer job opportunities. We consider a lower job-offer arrival rate for women as a source of ex-ante gender differences. Suppose men in career A receive job offers of wage x at a rate $\lambda(x)$, but women receive these offers at a rate $\delta\lambda(x)$, with $0 \leq \delta \leq 1$.[10] In that case, $V_{AB1}(w) = V_{AB}(w)$ as defined in equation (8), since men are not directly impacted by the reduced job-offer arrival rate of women. When women are in career A, however, the asset value solves

$$rV_{AB2}(w) = w + w_B + \int_{w}^{\overline{w}} \delta\lambda(x) \max\{\Gamma_2(x,0) - V_{AB2}(w), 0\} dx. \tag{19}$$

For women, the reduced job-offer arrival rate decreases their utility but does not affect their reservation strategy. The joint value for couples now solves

$$\begin{aligned} rV_{AA}^{gend}(w_1, w_2) &= w_1 + w_2 \\ &+ \int_{0}^{\overline{w}} \lambda(x) \left[\alpha \max\{\Gamma_1(x, w_2) - V_{AA}^{gend}(w_1, w_2), 0\} + (1-\alpha) \max\{\Gamma_1(x, 0) - V_{AA}^{gend}(w_1, w_2), 0\}\right] dx \\ &+ \int_{0}^{\overline{w}} \delta\lambda(x) \left[\alpha \max\{\Gamma_2(w_1, x) - V_{AA}^{gend}(w_1, w_2), 0\} + (1-\alpha) \max\{\Gamma_2(0, x) - V_{AA}^{gend}(w_1, w_2), 0\}\right] dx. \end{aligned} \tag{20}$$

It can be shown that $V_{AA}^{gend}(w_1, w_2)$ decreases as δ diminishes. The proof is analogous to the one showing that $V_{AA}(w_1, w_2)$ decreases in α. The intuition is simply that the woman in the couple receives fewer job offers today and in the future as δ becomes lower. By observing that δ does not enter the equation defining $V_{AB1}(w)$, we can conclude that $\phi_1(w)$ increases as δ decreases.[11] In Figure 2, this implies an expansion of the dark blue set below the light pink set. As a result, when the man obtains a job offer, compatible or incompatible, the woman is more likely to switch to career B than she would be in the benchmark case without ex-ante differences. The dynamic setting generates an amplification of the effect: not only it is harder for women to find a job now, but also in the future. The couple is therefore more reluctant in accepting an incompatible job offer for the woman.

We can analyze how the assumption of fewer job opportunities for women affects the career decisions before couple formation. As $\delta < 1$, women anticipate that they are more likely to make a career switch at the time of couple formation. This reduces their returns in choosing career A. In terms of gendered equilibria, the equilibrium where women choose career B and men career A is more productively efficient than the opposite gendered equilibrium. We conjecture that the second gendered equilibrium may actually disappear when δ is low enough. The only fully gendered equilibrium would be the one in which men choose career A and women career B.

5 Concluding Remarks

This paper presents a joint search model of occupational choice with on-the-job search when jobs are incompatible inside the couple. Our paper provides a theory of career accommodations that facilitate the couple's climb up the career ladder. When accounting for marriage decisions

[10] We implicitly assume that δ is small enough that it is still optimal for women to choose career A in the absence of compatibility issues, $w_B \leq \int_0^{\overline{w}} \frac{\delta\Lambda(x)}{r+\delta\Lambda(x)} dx$, which is an equivalent to condition (i).

[11] The change of $\phi_2(w)$ is ambiguous, as $V_{AB2}(w)$ also decreases when δ diminishes.

or the possibility of asymmetries in job prospects, our theory can lead to gendered equilibria whereby women sort into less geographically flexible occupations. Future research should attempt to analyze our predictions empirically and incorporate a more sophisticated model of the marriage market.

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A Mathematical appendix

A.1 Proposition 1

We solve the Bellman equation (7). First, we differentiate the Bellman equation to obtain

$$rV_A'(w) = 1 - \Lambda(w)V_A'(w). \tag{21}$$

Notice that $V_A'(w) \geq 0$, so $V_A(w)$ is increasing in w. Second, we integrate by parts the Bellman equation to obtain

$$rV_A(w) = w + \int_w^{\overline{w}} \Lambda(x)V_A'(x)dx = w + \int_w^{\overline{w}} \frac{\Lambda(x)}{r + \Lambda(x)}dx. \tag{22}$$

We find that

$$rV_A(w) = w + \int_w^{\overline{w}} \frac{\Lambda(x)}{r + \Lambda(x)}dx. \tag{23}$$

With this expression, $rV_A(0)$ is the right-hand side of condition (i), while rV_B is the left-hand side.

A.2 Properties of the value functions

Here, we show that the asset values are increasing and convex in each argument. We define the contraction mapping T, whose fixed point determines the two asset values V_{AB} and V_{AA}. For any pair (w_1, w_2), we define $T(F_{AB}, F_{AA})(w_1, w_2) \in \mathbb{R}^2$ with the first component being

$$T_1(F_{AB}, F_{AA})(w_1, w_2) = \max_{w^* \in [0,\overline{w}]} \left\{ \frac{w_1 + w_B + \int_{w^*}^{\overline{w}} \lambda(x)G(x,0)dx}{r + \int_{w^*}^{\overline{w}} \lambda(x)dx} \right\}, \tag{24}$$

and the second component

$$T_2(F_{AB}, F_{AA})(w_1, w_2) = \max_{(w_0^*, w_1^*, w_2^*) \in [0, \overline{w}]^3}$$
$$\left\{ \frac{w_1 + w_2 + 2(1-\alpha) \int_{w_0^*}^{\overline{w}} \lambda(x) G(x, 0) dx + \alpha \int_{w_1^*}^{\overline{w}} \lambda(x) G(x, w_2) dx + \alpha \int_{w_2^*}^{\overline{w}} \lambda(x) G(x, w_1) dx}{r + 2(1-\alpha) \int_{w_0^*}^{\overline{w}} \lambda(x) dx + \alpha \int_{w_1^*}^{\overline{w}} \lambda(x) dx + \alpha \int_{w_2^*}^{\overline{w}} \lambda(x) dx} \right\}, \tag{25}$$

with $G(w_1, w_2)$ a notation for $\max\{F_{AB}(w_1), F_{AA}(w_1, w_2)\}$.

The asset values therefore solve $T(V_{AB}, V_{AA}) = (V_{AB}, V_{AA})$ and T is a contraction mapping. We use this definition to find useful properties of the value functions.

If F_{AB} and F_{AA} are two increasing and convex functions, then G is increasing and convex and so are $T_1(F_{AB}, F_{AA})$ and $T_2(F_{AB}, F_{AA})$. This property implies that V_{AB} and V_{AA} are increasing and convex.

A.3 The two-body problem

We first show that $V_{AA}(w_1, w_2) = V_A(w_1) + V_A(w_2)$ when $\alpha = 1$. When $\alpha = 1$, Equation (9) is

$$\begin{aligned} rV_{AA}(w_1, w_2) = w_1 + w_2 + \int_0^{\overline{w}} \lambda(x) \max\{\Gamma(x, w_2) - V_{AA}(w_1, w_2), 0\} dx \\ + \int_0^{\overline{w}} \lambda(x) \max\{\Gamma(w_1, x) - V_{AA}(w_1, w_2), 0\} dx. \end{aligned} \tag{26}$$

We check that $V_{AA}(w_1, w_2) = V_A(w_1) + V_A(w_2)$ is a possible solution to this equation above. In that case, $\Omega_{AA}(w_1, w_2) = V_A(w_1) + V_A(w_2)$ as $V_A(w) \geq V_B$. $V_{AA}(w_1, w_2)$ is uniquely defined by its Bellman equation, which proves that $V_{AA}(w_1, w_2) = V_A(w_1) + V_A(w_2)$.

Second, we argue that $V_{AA}(w_1, w_2)$ is increasing in α. If the probability to receive incompatible job offers was α' with $\alpha' \geq \alpha$, then a couple that earns wages w_1 and w_2 could always adopt the same reservation strategy as in a world with α. The couple would consider a share α/α' of compatible jobs as if they were incompatible. Thus, the couple can achieve at least the same returns to search as if the probability of incompatible offer was lower.

A.4 Proposition 2

A.4.1 The first diagonal

For a wage w, we have

$$\begin{aligned} rV_{AA}(w, w) = 2w + 2\alpha \int_0^{\overline{w}} \lambda(x) \max\{\Gamma(x, w) - V_{AA}(w, w), 0\} dx \\ + 2(1-\alpha) \int_0^{\overline{w}} \lambda(x) \max\{\Gamma(x, 0) - V_{AA}(w, w), 0\} dx. \end{aligned} \tag{27}$$

Observe that

$$rV_{AA}(w,w) \geq 2w + 2\int_0^{\overline{w}} \lambda(x) \max\{\Gamma(x,0) - V_{AA}(w,w), 0\} dx. \tag{28}$$

Now we suppose that $V_{AB}(w) > V_{AA}(w,w)$. We find that

$$rV_{AA}(w,w) > 2w + 2\int_0^{\overline{w}} \lambda(x) \max\{\Gamma(x,0) - \tilde{V}_{AB}(w)\} dx \tag{29}$$

$$> 2(rV_{AB}(w) - w_B) \geq 2rV_A(w) \tag{30}$$

However, we know that $V_{AA}(w,w) \leq 2V_A(w)$. By contradiction, $V_{AB}(w) \leq V_{AA}(w,w)$ for any wage w.

A.4.2 The poles of the second diagonal

We show by contradiction that $V_{AA}(\overline{w},0) < V_{AB}(\overline{w})$ under condition (ii). We assume $V_{AA}(\overline{w},0) \geq V_{AB}(\overline{w})$. This would imply $V_{AA}(\overline{w},x) \geq V_{AB}(\overline{w}) \geq V_{AB}(x)$ for any x, and $\Gamma(\overline{w},w_2) = V_{AA}(\overline{w},x)$. We can then write

$$rV_{AA}(\overline{w},w_2) = \overline{w} + w_2 + \int_{w_2}^{\overline{w}} \lambda(x)\alpha(V_{AA}(\overline{w},x) - V_{AA}(\overline{w},0))dx. \tag{31}$$

Following the same strategy as in the proof of Proposition 1, we can solve the recursive equation and find that

$$rV_{AA}(\overline{w},w_2) = \overline{w} + w_2 + \int_{w_2}^{\overline{w}} \frac{\alpha\Lambda(x)}{r + \alpha\Lambda(x)} dx. \tag{32}$$

Since $rV_{AB}(w) = w + w_B$, condition (ii) implies the contradiction $V_{AA}(\overline{w},0) < V_{AB}(\overline{w})$. As a result, it must be that $V_{AA}(\overline{w},0) \leq V_{AB}(\overline{w})$, and $V_{AA}(0,\overline{w}) \leq V_{AB}(\overline{w})$ derives from the symmetry of V_{AA}.

A.4.3 The boundaries of $\mathcal{X}$

For each $w \in [0,\overline{w}]$, we define $\phi(w)$ as follows:

- If $V_{AA}(w,0) \geq V_{AB}(w)$, then $\phi(w) = 0$.
- If $V_{AA}(w,0) < V_{AB}(w)$, we know that $V_{AA}(w,w) \geq V_{AB}(w)$; then there exists at least a solution $x \in [0,w]$ to $V_{AA}(w,x) = V_{AB}(w)$. Define $\phi(w)$ as the lowest wage that satisfies $V_{AA}(w,\phi(w)) = V_{AB}(w)$.

Because $V_{AA}(w_1,w_2)$ is increasing in its second argument, we can state that, for any $w_2 \geq \phi(w_1)$, $V_{AA}(w_1,w_2) \geq V_{AB}(w_1)$. From the definition of ϕ, it is also true that, for any $w_2 < \phi(w_1)$, $V_{AA}(w_1,w_2) < V_{AB}(w_1)$. As a result, $\mathcal{X}$ is the set of wages (w_1,w_2) so that $w_1 \geq \phi(w_2)$ and $w_2 \geq \phi(w_1)$.

A.4.4 The set $\mathcal{X}$ and job incompatibility

We prove that $\phi(x)$ is decreasing in α. We define a Cauchy sequence (F^n_{AB}, F^n_{AA}) with $(F^{n+1}_{AB}, F^{n+1}_{AA}) = T(F^n_{AB}, F^n_{AA})$. For any n and x, we also define $\phi^n(x)$ as the solution to

$$T_1(F^n_{AB}, F^n_{AA})(x, \phi^n(x)) = T_1(F^n_{AB}, F^n_{AA})(x, \phi^n(x))$$

if such a solution exists or $\phi^n(x) = 0$ otherwise.

We show that $\phi^n(x)$ is decreasing in α by proving that $T_2(F_{AB}, F_{AA})(w_1, w_2)$ from Equation (18) decreases with α. Fixing the arguments F_{AB}, F_{AA}, w_1, and w_2, and denoting w_1^*, w_2^*, and w_3^* the optimal reservation wage, $T_2(F_{AB}, F_{AA})(w_1, w_2)$ solves

$$\begin{aligned} rT_2 = w_1 + w_2 + 2(1-\alpha) \int_{w_0^*}^{\overline{w}} \lambda(x)(G(x,0) - T_2)dx \\ + \alpha \int_{w_1^*}^{\overline{w}} \lambda(x)(G(x,w_2) - T_2)dx + \alpha \int_{w_2^*}^{\overline{w}} \lambda(x)(G(x,w_1) - T_2)dx. \end{aligned} \tag{33}$$

When we differentiate over α, we find that

$$\begin{aligned} &\left(r + \int_{w_1^*}^{\overline{w}} \lambda(x)dx + \int_{w_2^*}^{\overline{w}} \lambda(x) - 2 \int_{w_0^*}^{\overline{w}} \lambda(x)dx \right) \frac{\partial T_2}{\partial \alpha} \\ &= \int_{w_1^*}^{\overline{w}} \lambda(x)(G(x,w_2) - T_2)dx + \int_{w_2^*}^{\overline{w}} \lambda(x)(G(x,w_1) - T_2)dx - 2 \int_{w_0^*}^{\overline{w}} \lambda(x)(G(x,0) - T_2)dx. \end{aligned} \tag{34}$$

As $G(x,0) \leq G(x,w_1)$ and $G(x,0) \leq G(x,w_2)$, the reservation strategies are such that $w_0^* \geq w_1^*$ and $w_0^* \geq w_2^*$. As a result, the term in parentheses on the left-hand side and the term on the right-hand side are both positive, so $\frac{\partial T_2}{\partial \alpha} \geq 0$.

Since (F^n_{AB}, F^n_{AA}) converges to (V_{AB}, V_{AA}), $\phi^n(x)$ converges to $\phi(x)$ and $\phi(x)$ must also be decreasing in α.

A.5 Proposition 3

Following the strategy of the proof in Appendix A.1, we can solve the Bellman Equation (14):

$$(r+\gamma)U_A'(w) = 1 - \Lambda(w)U_A'(w) + \frac{\partial \Sigma}{\partial w}(w,\psi), \tag{35}$$

$$(r+\gamma)U_A(w) = w + \int_w^{\overline{w}} \Lambda(x)U_A'(x)dx + \gamma\Sigma(w,\psi) \tag{36}$$

$$= w + \int_w^{\overline{w}} \frac{\Lambda(x)\left(1 + \gamma\frac{\partial \Sigma}{\partial w}(w,\psi)\right)}{r + \Lambda(x) + \gamma} dx + \gamma\Sigma(w,\psi). \tag{37}$$

The inequality $U_A \geq U_B$ is thus equivalent to the condition in Proposition 3.