

# Marriage Networks, Nepotism and Labor Market Outcomes in China\*

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## Abstract

This paper considers the potential role of marriage in improving labor market outcomes through the expansion of an individuals' networks. I focus on the impact of a father-in-law on a young man's career using panel data from China. Particular features of the Chinese context allow for an identification strategy that isolates the network effects related to a man's father-in-law by comparing the post-marriage death of a father-in-law with the death of a mother-in-law. The estimates suggest that the loss of the father-in-law translates into a decrease in a man's earnings by 20%. Furthermore, the evidence indicates that the decline in wages can be attributed to nepotism rather than a decline in job information.

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# 1 Introduction

In the past few decades, China has moved from a socialist system in which central planners assigned workers to state-owned enterprises towards a market system in which workers and firms are responsible for finding and creating matches. Until the late 1980s, approximately 95% of wage jobs in urban areas were assigned by state bureaucrats (Bian 1994). The system began to change with the economic reforms and shift towards decentralization that began in the 1980s. This paper seeks to understand the role of social networks on labor market outcomes during this period of transition and rapid economic growth. Furthermore, I explore whether the use of social networks alleviates information problems between workers and firms that emerge with the shift away from government allocation of labor, or whether the role of networks facilitates decentralized favoritism and rent-seeking.

The type of social networks examined in this paper are marriage networks. Such networks are interesting because marriage allows for an immediate and substantial increase in an individual's networks. After marriage, people who care about the outcomes of the person's spouse have incentive to provide labor market assistance to the person directly. I examine one particular affine connection, the relationship between a young man and his father-in-law. This paper contributes to a relatively new trend in the literature on social networks towards estimating the effects of disaggregated social connections (Blanes i Vidal, Draca and Fons-Rosen 2010, Magruder 2010).<sup>1</sup> The focus on one specific node-to-node connection allows the analysis to move beyond providing evidence that networks matter for labor market outcomes and quantifying the impact; the paper also explores the mechanisms through which a personal relationship affects economic outcomes.

To estimate the impact of the connection between a man and his father-in-law on the young man's labor market outcomes, I use panel data from the China Health and Nutrition Survey covering the period 1991 to 2006 to compare labor market outcomes of the same person before and after the post-marriage death of his father-in-law. While death plausibly terminates any labor market assistance between men and their fathers-in-law, it is also likely that death is associated with other changes that are not related to their labor market relationship. To remove other changes in behavior or outcomes surrounding the death of the father-in-law, I also compare individuals for whom a father-in-law died in the sample period with individuals for whom a mother-in-law died in the sample period. The validity of this strategy relies on two key assumptions. First, it assumes a high degree of gender

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<sup>1</sup>Magruder (2010) examines the impact of a father on his son's labor market outcomes by using fluctuations in the employment status of parents to capture their ability to provide information and referrals to children. Blanes i Vidal, Draca and Rosen (2010) find that lobbyists with past experience working with a U.S. Senator suffer a 24% drop in revenue when that particular Senator leaves office.

segregation in jobs such that men are more likely to receive information about job openings, referrals or direct assistance from their fathers-in-law than from their mothers-in-law. A second assumption is that any time-varying unobservable changes in behavior or characteristics associated with an in-laws' death are similar for mothers-in-law and fathers-in-law. I will provide evidence supporting these key assumptions.

Certain features of the Chinese context facilitate the focus on the relationship between a man and his father-in-law. First, while households with multiple generations are common in China, tradition dictates that elderly parents live with their sons and that women live with their husbands' parents.<sup>2</sup> Thus, the death of an in-law does not have a direct, mechanical effect on the composition of the household and its income and consumption patterns. Furthermore, I do not need to consider an endogenous decision regarding whether to reside with the in-laws.

This paper is closest to work on the labor market effects of marriage networks by Luke and Munshi (2006).<sup>3</sup> Their paper argues that marriage provides access to new affine networks in Kenya which help migrants to urban areas find jobs. The use of such networks has both costs and benefits; their results demonstrate that marriage leads to a greater probability of employment and higher wages but also increases remittances as a fraction of income. While the research question is similar to mine, the empirical strategy is quite different. They use traditional rules dictating exogamous marriages to instrument for marriage, and interpret the coefficient on marriage in these estimates as the impact of marriage networks. My identification strategy does not rely on the assumption that the only causal mechanism through which marriage matters for labor market outcomes is through networks.

While the connection between a man and his father-in-law can have several implications in the labor market, the identification strategy that relies on the death of the father-in-law limits the analysis to mechanisms that change at the time of death. For example, a personal referral may reduce an employer's uncertainty about an applicant's true productivity (Simon and Warner 1992, Rees 1966); if the father-in-law uses private information to reduce uncertainty in the signal of his son-in-law's productivity, this represents a type of network effect but it would not be measured through the death of the father-in-law. While most papers on social networks examine the labor market impacts of existing network relationships, this paper focuses on the effects of the dissolution of networks. This analysis contributes to our understanding of the ways in which the effects of networks can persist over time.

This paper considers two mechanisms through which the relationship with a father-in-law can

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<sup>2</sup>In the data used in this analysis, about one-third of young adult men live with at least one of their parents while less than 4% of young adult men live with at least one of the parents of their wives.

<sup>3</sup>A related paper on marriage and labor market outcomes in the same context is Luke, Munshi and Rosenzweig (2004).

have persistent labor market effects that are identified through the termination of the connection. First, an individual's wages may be augmented by nepotism based on his relationship with his father-in-law. Nepotism is modeled as a type of favoritism that boosts individuals' wages above what they would earn in the absence of the family connection.<sup>4</sup> I explore the hypothesis that the death of a father-in-law may remove the nepotistic component of wages based on the relationship with the father-in-law and reduce the level of men's wages to the market value. This paper contributes to the existing literature on labor market inefficiencies associated state control of enterprises (Wang forthcoming) and rent-seeking in the labor market (Gelb, Knight and Sabot 1991, Goldberg 1982, Singell and Thornton 1997). To my knowledge, this is the first paper that provides a method to empirically measure the effects of nepotism on wages. The results of the paper suggest that favoritism based on marriage networks increases the level of men's wages by 20%.

The second mechanism considered in this paper is that the father-in-law provided a flow of information about job openings. This mechanism can be framed within the landmark argument of Granovetter (1983), who argued that acquaintances provide more new and useful information about job openings than close friends and family; the father-in-law provides a link to a set of acquaintances with whom the son-in-law does not directly associate, and when the father-in-law passes away, the son-in-law loses access to a flow of information. The existing empirical evidence provides strong support for the importance of networks for labor market outcomes. Using random variation in the size of an individual's networks, as defined by refugees from the same country (Beaman forthcoming) or by migrants from the same village (Munshi 2003), research has demonstrated that the size of the network matters. Using spatial variation, Bayer, Ross and Topa (2008) and Conley and Topa (2002) find stronger correlations in labor market outcomes between individuals that live close together than those who live slightly further apart. This paper is quite different in its focus on the termination of relationships, and I do not find evidence that the death of the father-in-law ended a useful flow of job information for young men.

In addition to the literatures on labor market inefficiencies and on social networks, this paper also contributes to a large literature on the returns to marriage (Antonovics and Town 2004, Casale and Posel 2010, Gray 1997, Korenman and Neumark 1991, Loh 1993). A robust empirical relationship found in many countries is that married men earn higher wages than single men. In this literature, explanations for the marriage premium in wages include taste-based discrimination, selection into

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<sup>4</sup>The paper abstracts away from the numerous ways in which this type of nepotism can occur. For example, a man may engage in direct rent-seeking by hiring his son-in-law to a position above his qualifications or by setting his son-in-law's wages above marginal productivity. Alternatively, the relationship with a father-in-law may increase a man's wages indirectly if firms hope to gain favor with the father-in-law by giving the son-in-law above-market wages.

marriage of men with better unobservable characteristics, and improvements in productivity resulting from gender specialization in production. This paper offers an additional potential explanation for the marriage wage premium, that the expansion of social networks associated with marriage improve married men’s labor market outcomes relative to similar single men.<sup>5</sup>

The next section presents the conceptual framework and the theoretical predictions associated with nepotism and with the flow of job information. Section 3 discusses the data and presents benchmark estimates of the returns to marriage in China. Section 3 also provides in more detail the empirical strategy that relies on the deaths of the parents-in-law and presents the results. Additional evidence supporting the hypothesis that nepotism is a determinant of men’s wages is shown in section 4. Finally, alternative explanations for the results, including inheritance effects and heterogeneity in household preferences, are considered.

## 2 Conceptual Framework

### 2.1 Nepotism

I consider a specific form of nepotism that builds on the Becker’s (1971) standard model of taste-based discrimination. Firms demonstrate nepotism towards individuals with family connections rather than discrimination against certain groups. Wages of person  $i$  in year  $t$  are given by:

$$w_{it} = \beta X_{it} + N_{it} + \gamma_i + u_{it} \tag{1}$$

where  $X_{it}$  is a vector of variables that determine a worker’s productivity, and  $\gamma_i$  is unobserved individual ability. The term,  $N_{it}$ , is the additional amount of wages that an individual receives due to taste-based nepotism. In a straightforward case of nepotism from the father-in-law, a father-in-law hires and pays his son-in-law wages that above marginal productivity. This framework also captures the returns to a relationship with a father-in-law that may occur in the absence of direct intervention by the father-in-law; if the father-in-law is in a position of power, firms may hope to gain favor with the father-in-law by employing his son-in-law at a wage above what he would earn in the market in the absence of the relationship with his father-in-law.

If the nepotism premium,  $N_{it}$ , is the result of an individual’s relationship with his father-in-law, then  $N_{it}$  will decline following the death of the father-in-law. This can result because the individual

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<sup>5</sup>The potential impact of marriage networks has been considered in the context of the wage returns associated with immigrants marrying natives, but this literature has not separated the impact of marriage networks from assimilation or learning associated with intermarriage (Furtado and Theodoropoulos 2010).

loses the position that was above his capabilities.<sup>6</sup> The key implication is that nepotism can explain a decrease in the level of a man's wages following the death of his father-in-law.

Existing theoretical work suggests that firms that exhibit taste-based discrimination will face higher costs than non-discriminatory firms, and competition will lead to the demise of firms with the highest levels of discrimination in the long run (Arrow 1973, Becker 1971). Goldberg (1982) develops a similar model of nepotism towards white workers rather than discrimination against black workers. The firm pays white workers  $W_w$  but behaves as if white wages were  $W_w(1 - d)$  where  $d \geq 0$  is the coefficient of nepotism. Goldberg shows that profits are non-increasing in  $d$  and there is a critical value,  $\bar{d}$ , above which profit-maximizing firms cannot survive. Thus, another testable implication is that we would expect the effects of nepotism to be largest among firms that are not profit-maximizing.

## 2.2 Information Networks

Another possible way that a father-in-law could improve his son-in-law's labor market outcomes is through the provision of information about job openings. When the father-in-law passes away, the son-in-law may lose a valuable flow of information from the father-in-law. While there may be negative labor market effects associated with the loss of job information networks that were connected to a man by his father-in-law, I will demonstrate that this hypothesis predicts a fall in the *growth rate* of wages.

Consider a simple job search framework where wages are partially determined by the match-specific productivity between a worker and a firm.<sup>7</sup> Workers do not know at which firm they will be the most productive, so they must search for the best match and can continue to search for better matches after establishing a match with a firm. Wages of person  $i$  at his current firm  $j$  in year  $t$ ,  $w_{ijt}$ , are given by:

$$w_{ijt} = \beta X_{it} + \delta_t + \epsilon_{ijt}. \quad (2)$$

Aggregate wage trends are given by  $\delta_t$ . Certain characteristics,  $X_{it}$ , such as human capital, have returns that are not firm-specific. The error term,  $\epsilon_{ijt}$ , can be decomposed as follows

$$\epsilon_{ijt} = \gamma_i + m_{ijt}(\lambda_{it}) + u_{ijt}. \quad (3)$$

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<sup>6</sup>See Jacobson, LaLonde and Sullivan (1993) or Ruhm (1991) for general analyses of earnings losses associated with workers losing their jobs.

<sup>7</sup>Such job matching models were developed by Jovanovic (1979).

The individual fixed effect is given by  $\gamma_i$  and the expected quality of the match between the worker and firm by  $m_{ijt}(\lambda_{it})$ . The match quality is a function of the individual's offer rate,  $\lambda_{it}$ , which varies over time with the size of the network, such that  $m'_{ijt}(\lambda_{it}) \geq 0$ . Individuals with a higher offer rate are more likely to increase the match-specific component of wages. This can happen as individuals switch to jobs that offer them higher wages than their current jobs. The model assumes downward wage rigidity for a given match between a worker and a firm. In other words, even if a worker receives no outside offers, the match-specific quality with a given firm does not decline after a worker joins.

Wage growth is then given by

$$w_{ijt} - w_{ij,t-1} = \beta(X_{it} - X_{i,t-1}) + \delta_t - \delta_{t-1} + m_{ijt}(\lambda_{it}) - m_{ij,t-1}(\lambda_{i,t-1}) + u_{ijt} - u_{ij,t-1}. \quad (4)$$

If the death of a father-in-law affects a man's labor market outcomes by reducing information flows about job openings, then  $\lambda_{it} < \lambda_{i,t-1}$  and  $m_{ijt}(\lambda_{it}) - m_{ij,t-1}(\lambda_{i,t-1}) \leq 0$ . The key prediction of such a model of job information networks is that we would expect the growth rate of wages to be slower for a man after losing the network connection with his father-in-law.

The model of job information networks and the model of nepotism have different predictions for the level and for growth rate of wages. A reduction in the flows of information about job opportunities can influence the size of wage increases over time, and the gradient of wage growth should decline if the father-in-law is providing lucrative information about jobs. In the simple model, a decline in job information alone cannot explain a fall in the level of wages because the individual can remain with his current employer at his current wage rate even if his offer rate declines with the passing of his father-in-law.

If the model were extended to include an exogenous separation rate between workers and firms, then a fall in information flows could lead to a fall in the level of wages. If a worker undergoes a separation with a firm after experiencing a decrease in the flow of information, then the worker may subsequently accept an offer from a firm with which it has a lower match quality. In this case, the model of job information predicts a decline in both the level and growth rate of wages following the death of the father-in-law.

### 2.3 Empirical Predictions

There are distinct empirical implications that allow me to test the two mechanisms through which a man's labor market outcomes may worsen following the death of his father-in-law. First, if an individual's wages are characterized by favoritism on the basis of the relationship with his father-

in-law, then we would expect to see a decline in the level of his wages following the death of his father-in-law. An additional implication of a model of nepotism is that we would expect to that the impact of the father-in-law’s death on wages to be smaller in competitive, profit-maximizing firms than in firms that are less constrained by profit maximization. China is a good environment to examine this prediction because a substantial portion of the urban labor force is employed in state-owned enterprises, which are plausibly less concerned with profit-maximization than private firms. To examine the second hypothesis that the labor market effects of a father-in-law’s death operated through the loss of the flow of information about job openings, I will also examine the impact of the father-in-law’s death on the growth rate of wages.

### 3 Empirical Analysis

#### 3.1 Data

The panel data set used in this paper is the China Health and Nutrition Survey (CHNS). The CHNS covers nine provinces (Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Liaoning, and Shandong), which vary considerably in their geography and levels of economic development. The survey was sampled with a multistage, random cluster design. Counties were stratified into three levels of income, and a weighted sampling technique randomly selected four counties in each province. In addition, the data include the provincial capital and one low-income city. The analysis in this paper uses waves 1991, 1993, 1997, 2000, 2004 and 2006. I exclude the first wave of the CHNS (1989) because it did not ask the set of questions about adult women’s parents that are used to construct information about men’s parents-in-law.<sup>8</sup> The information available on the non-resident parents of the married women in the sample includes whether each parent is living and the distance at which they each live, but is quite limited and does not include any information about their age, employment status, wages, or their sector or industry of employment.

For most of the analyses, the sample is limited to adult men in the labor force between the ages of 22 and 45. The lower-bound age is set to 22 for two reasons; according to the marriage law of 1980, the legal age of marriage for men in China is 22 (for women, 20) and second, this age excludes the vast majority of individuals who are still in school. The upper-bound age is set to 45 because the focus of the analysis is on the career effects of marriage networks across generations. The data include both rural and urban households, but the main analysis in this paper is limited to individuals living in urban

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<sup>8</sup>This set of questions is called the “Ever Married Women” section of the survey instrument. There is no corresponding set of questions for married men, so I cannot construct information about non-resident parents-in-law for women.

areas, which are defined as neighborhoods where the majority of households have urban registrations.

In Table 1, summary statistics for single men in the 1997 wave of the survey are presented in column 1 and for married men in column 2. Not surprisingly, single men are younger and earn less per hour of work than married men.<sup>9</sup> Wage growth is calculated as the log difference of real hourly earnings from the previous wave, and is slightly larger for single men than for married men. Married men are also twice as likely as single men to be in a white collar occupation but the share of men in the state sector is around two-thirds regardless of marital status.

Columns 3 and 4 of Table 1 present information for the subsets of married men for whom an in-law dies in the period covered by the survey. The third column refers to characteristics in the period prior to the death of the father-in-law, and the fourth column to the period prior to the death of the mother-in-law. For all characteristics of the individual, including age and job characteristics, men for whom their fathers-in-law die in the next period are similar to men for whom their mothers-in-law die in the next period. Prior to the death of the mother-in-law, individuals are living closer to their in-laws and are slightly more likely to reside with their in-laws but these differences are not statistically significant at the 10% level. Finally, I measure characteristics of the marriage match as the difference in the age, education and height of husband and wife. For individuals whose fathers-in-law and mothers-in-law pass away in the next survey wave, husbands are less than two years older than their wives, have an additional year of education and are about 11 centimeters taller. The strong similarities in observable characteristics between the sample for whom a father-in-law dies and a mother-in-law dies provides support for the identification strategy.

### 3.2 Benchmarking the Marriage Premium

In this section, I estimate the returns to marriage for women and men in China. This paper suggests that the marriage premium for men may be explained by the expansion of social networks, and this section provides a benchmark to estimates of the returns to marriage found in other countries. The basic cross-sectional relationship between marriage and earnings is estimated with the following equation

$$\log w_{it} = \alpha_0 + \alpha_1 M_{it} + \alpha_2 X_{it} + \epsilon_{it} \tag{5}$$

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<sup>9</sup>I construct real hourly earnings by using total individual annual earnings and scaling up the average number of hours the person worked in the past week. Variables in units of RMB (including earnings and assets) are converted into real 2006 RMB using a United Nations GDP deflator for mainland China.

where the dependent variable is the logarithm of the hourly real earnings of individual  $i$  in year  $t$  and  $M$  is an indicator that takes the value of 1 if the person is married and 0 otherwise.  $X$  is a vector of control variables including a cubic in age, years of education and indicators for province and for year.

The estimates of Equation 5 are presented in Table 2. The first two columns present the results for the urban sample while the last two columns present the corresponding results for the rural sample. Columns 1 and 3 correspond to men, and columns 2 and 4 to women. Consistent with previous studies across many countries, the cross-sectional results for the urban sample indicate the marriage is positively correlated with wages for men but not for women. Conditional on age and education, married men in urban areas earn 10% higher wages than single men. This estimate is significant at the 5% level or higher. In contrast, marriage corresponds with lower wages for urban women and for both women and men in rural areas; however, these estimates are not statistically different from zero.

A common method of estimating the causal effect of marriage on wages is to remove unobserved individual heterogeneity with individual fixed effects. Exploiting the panel dimension of the CHNS data, I estimate

$$\log w_{it} = \alpha_0 + \alpha_1 M_{it} + \alpha_2 X_{it} + \gamma_i + \epsilon_{it}. \quad (6)$$

Table 3 displays these results. The marriage premium for men remains around 10% and is statistically significant at the standard levels. The magnitude of the estimate is much smaller at less than 1% for rural men and not statistically different from zero at the 10% level. The marriage premium for women is negative in urban areas and positive in rural areas but not statistically different from zero at the standard levels.

There are limitations to the use of individual fixed effects to address the issue of selection into marriage. As noted by Korenman and Neumark (1991), Gray (1997) and Casale and Posel (2010), if selection is such that men with faster rates of wage growth are more likely to get married, than the returns to marriage in the fixed effects estimator may reflect time-varying unobserved differences that drive the timing of marriage for men. Following these papers, I examine this issue by examining whether wage growth of single men predicts marriage in subsequent periods. The estimates suggest that this issue is not relevant in this context; the magnitude of the effect of wage growth on subsequent marriage is small and not statistically different from zero at the standard levels.<sup>10</sup>

Overall, the results indicate that married men in urban China experience a wage premium over

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<sup>10</sup>The results are available from the author upon request. Furthermore, the relationship between wage growth and subsequent marriage is similar for individuals whose fathers-in-law versus mothers-in-law die between 1991 and 2006.

single men. Even controlling for time-invariant, unobservable characteristics, the premium persists. The lack of returns to marriage found in rural areas is consistent with the hypothesis of marriage networks given that it is likely that labor market networks are less relevant in rural areas where almost everyone works in agriculture. Furthermore, the absence of returns to marriage for women is also consistent with the networks story because there is strong evidence that women are less likely to use social networks in their job searches than men.<sup>11</sup> The goal the paper is to examine the hypothesis of the expansion of job networks associated with marriage more rigorously.

### 3.3 Empirical Strategy

I implement a strategy that is analogous to a difference-in-differences estimator. It compares labor market outcomes of the same individual before and after the post-marriage death of his father-in-law. While the timing of a person's death may be somewhat unpredictable, it is unlikely to be completely exogenous to the decisions made by a family. For example, death can be preceded by illness and anticipation of this event may alter outcomes leading up to the event.<sup>12</sup> To remove other changes in outcomes or behavior that occur both before and after the death of the father-in-law, I also compare individuals whose fathers-in-law die in the sample period with individuals whose mothers-in-law die in the sample period.

This strategy addresses several common concerns in estimating the impact of social networks on labor market outcomes. One possible concern is the endogenous formation of networks.<sup>13</sup> In this case, the concern is that unobservable factors that influence the formation of the marriage match and the marriage network parents or other relatives also directly affect the labor market outcomes. The identification strategy avoids this problem by focusing on the termination of connections. Furthermore, any time-invariant unobservable characteristics will be removed with the individual fixed effects, and time-varying factors are removed in the post-marriage comparison of the death of the mother-in-law and the death of father-in-law.

The validity of the identification strategy depends on two key assumptions. First, any time-varying unobservable characteristics associated with an in-law's death is similar for mothers-in-law and fathers-in-law. Second, this strategy also assumes that there is a high degree of gender segregation

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<sup>11</sup>See Ioannides and Loury (2004) for an overview of the literature.

<sup>12</sup>Unfortunately, the data do not allow me to separate deaths that follow illnesses from deaths that result from accidents. It is unclear that this separation would be useful given that accidents may be correlated with risky behaviors.

<sup>13</sup>It is not common for parents to arrange marriages in urban areas of China. According to the 1991 Study for the Status of Contemporary Chinese Women, only 19% of urban couples found their spouse through involvement by relatives (Huang, Jin and Xu 2010). Thus, it is not the case that fathers-in-law are selecting husbands for their daughters based on their ability to assist the young men's careers.

in jobs such that men are more likely to receive information about job openings, or direct assistance from their fathers-in-law than from their mothers-in-law. If mothers-in-law do help the labor market outcomes of their sons-in-law, but to a lesser extent than fathers-in-law, then the strategy will yield underestimates of the impact of fathers-in-law.

There are several possible concerns with the idea that the impacts of a mother-in-law's death and a father-in-law's death are the same except for differences in the labor market networks. First, it is possible that there are different inheritance effects associated with the two types of deaths. This idea is explored and rejected in Section 5.1. Second, household expenditures and time demands leading up to the death or following the death may differ by the gender of the person. To explore the latter possibility, I compare time and financial expenditures associated with the death of men's mother-in-laws with the death of men's father-in-laws in Table 4. The summary statistics in Panel A make use of survey questions about the time that the household head and spouse spend caring for elderly parents.<sup>14</sup> This question is only asked in the CHNS in 1989, so I examine care for elderly parents for households in which the wife's mother dies between 1991 and 1993 and households where the wife's father dies between 1991 and 1993. The share of households that report having elderly parents that need care a few years prior to death is similar at around 12%. Among households that report elderly parents needing care, about 30% of household heads and spouses provide some care themselves prior to both types of deaths. The average amount of time that households spend taking care of elderly parents prior to the death of each in-law is similar at around 6 minutes per week; this is driven by the fact that most couples do not provide any care for their elderly parents, and among those that do provide care, they spend on average over two hours per week caring for their parents.

Panel B of Table 4 presents summary statistics for previous-year funeral expenses by the household asked in the period following the passing of a mother-in-law or a father-in-law.<sup>15</sup> Regardless of the gender of the in-law that died, about 30% of households report having spent money on funeral expenses in the last year. Households report spending an average of 185 RMB following the death of a mother-in-law and 218 RMB following the death of father-in-law, but this difference is not statistically significant. Overall, the time expenditures prior to death and the funeral expenditures following death are quite similar for mothers-in-law and fathers-in-law that pass away, and this provides empirical support for the key identification assumption.

In addition to changes in care given to elderly parents, I examine how the care of young children by maternal grandparents varies by the gender of the death of the maternal grandparent. The question

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<sup>14</sup>This question does not separate elderly parents of the husband and the wife.

<sup>15</sup>This question was included only in the 1993 and 1997 waves.

is asked in all waves of the CHNS but only to households that have at least one child under the age of 6. Table 5 displays the average share of households with a young child that report receiving child care assistance from maternal grandparents. The first row refers to the periods prior to death, and for both samples about 10% of households received child care assistance from the wife's parents. It falls to 2.3% after the passing of the mother-in-law and to 2.4% after the father-in-law. While the death of one of the wife's parents has effects on time demands of the household, the results suggest that the effects do not vary substantially by whether the father-in-law or the mother-in-law passes away.

Finally, Table 6 presents the average hours per day that households spend on purchasing food, cooking food, and washing clothes. These statistics are broken down by before and after the death of the woman's mother and her father. For all three types of chores, the passing of a parent-in-law corresponds to an increase in the amount of time that household members spend on these tasks. This suggests that parents-in-law were assisting in household chores. However, the increases that follow a death are quite similar regardless of the gender of the in-law that passes away.

The identification strategy also assumes a high degree of gender segregation of the labor market.<sup>16</sup> The CHNS data are limited in that only information at the one-digit level is provided for occupations. Table 8 presents the one-digit occupations by men and women in the sample of analysis. Even at this coarse level, the differences by gender are quite pronounced. In particular, men have much higher concentrations as executives, skilled labor, drivers and army workers whereas women are concentrated as professional or technical workers, office staff and service workers. For more precise evidence on gender segregation in the urban Chinese labor market, I use 1999 data from the Study of Family Life Survey in Urban China to calculate the female share of workers in two-digit occupations.<sup>17</sup> Figure 1 plots the density of the fraction of female workers faced by male and female workers.<sup>18</sup> The skewness in the distributions indicates that men are much more likely to be in male-dominated occupations and women in female-dominated occupations. The median male and female works in an occupation where about three-quarters of the workers are their same gender. Overall, the descriptive evidence supports the assumption that fathers-in-law are more likely to have information about openings and to be able to provide other assistance for positions staffed by men than mothers-in-law.

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<sup>16</sup>A high degree of gender segregation in labor market networks has been demonstrated in numerous other settings including the U.S. (Loury 2006) and India (Munshi and Rosenzweig 2006). Kuhn and Shen (2010) use internet postings for jobs to demonstrate that Chinese firms have strong gender preferences for positions.

<sup>17</sup>There are 249 two-digit occupation categories in the data.

<sup>18</sup>This method of measuring gender segregation is used in Magruder (2010).

### 3.4 Descriptive Results on Characteristics of the Parents-in-Law

Table 7 presents the non-causal, empirical relationship between whether the father-in-law and the mother-in-law is living and the wages of men. The specification includes an indicator for marriage as well as individual fixed effects, so the coefficients on *Married \* Father-in-LawAlive* and *Married \* Mother-in-LawAlive* are identified from individuals from whom the status of the in-law changes. In column 1, the estimates show that a marriage premium of 20.7% for men with deceased fathers-in-law. A living father-in-law increases wages of married men by an additional 7.6% but this is not statistically significant at the standard levels. In contrast, a living mother-in-law has a negative effect on men’s wages, but again, this is not statistically significant.

The estimations displayed in column 2 of Table 7 also include the logarithm of the distance at which the father-in-law and mother-in-law live. The ability of in-laws to provide information about relevant job openings or other labor market assistance should be higher if they live closer.<sup>19</sup> In this specification, having a living father-in-law almost doubles the marriage premium and this is significant at the 5% level. A living mother-in-law corresponds with 18.5% *lower* wages. This provides suggestive evidence in favor of the idea that having a network connection with a father-in-law improves a man’s labor market outcomes. As the distance at which the father-in-law lives increases, the premium associated with a living father-in-law declines and this is significant at the 10% level. Again, variation in the distance at which the mother-in-law lives has the opposite effect on the impact of a living mother-in-law on men’s wages, but this is not statistically significant. Overall, the results provide descriptive evidence that a living father-in-law enhances the labor market outcomes of married men, but a living mother-in-law does not improve men’s outcomes.

### 3.5 Labor Market Effects of Marital Networks

The main identification strategy employed to estimate the network effects associated with the relationship between a man and his father-in-law is given by

$$y_{it} = \alpha_0 + \alpha PostFIL_{it} + \delta PostMIL_{it} + \beta X_{it} + \gamma_i + \epsilon_{it} \tag{7}$$

where  $y$  is either the logarithm of hourly earnings or the growth rate of earnings (calculated as the first difference of the logarithm of wages) for individual  $i$  in year  $t$ . *PostFIL* equals one for each wave following the death of the father-in-law, and *PostMIL* equals one for each wave following the

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<sup>19</sup>This geographic limitations of job assistance is particularly relevant in China where city-to-city mobility is constrained by the household registration, or *hukou*, system.

death of the mother-in-law. Individual fixed effects,  $\gamma_i$ , are also included. In the most parsimonious specification,  $X$  includes years of education, a cubic in age, indicators for marital status (married, divorced, separated) and a constant term. The coefficient  $\alpha$  provides the within-person effect of the death of a father-in-law and is identified from individuals for whom their father-in-law dies between 1991 and 2006. However, I also need to remove other time-varying changes associated with the death of the father-in-law that are not driven by labor market networks, such as changes in child care expenses, time spent caring for sick elderly parents or the psychological effects of dealing with a death. Thus, the estimate of interest is  $\alpha - \delta$ ; this is net impact of the father-in-law's death which differences out the impact of the mother-in-law's death and removes other changes surrounding the death of an in-law.

The results corresponding to equation 7 are displayed in Table 9.<sup>20</sup> The dependent variable is the logarithm of hourly earnings in the first three columns, and the growth rate of hourly earnings in the last three columns. The parsimonious specification is shown in columns 1 and 4. In order to address concerns that the timing of the death of the in-laws is correlated with the man's own health status or his marriage tenure, columns 2 and 5 add the number of years married, height and his current health status.<sup>21</sup> Finally, the results in columns 3 and 6 also control for characteristics of the spouse, including her age, height, health status and whether she is currently working. In column 1, the results indicate that the net impact of the loss of a father-in-law is a 25% fall in wages relative to other men. This estimate is significant at the 5% level. The magnitude and significance of the impact on wages remain similar with the inclusion of the additional controls. The estimate is driven mainly by the significant decline in wages of around 14% following the death of the father-in-law.

The net effect is amplified by the removal of other changes that are associated with the death of an in-law as the estimated impact of the death of the mother-in-law is positive. The coefficient on the death of the mother-in-law is fairly large in magnitude at 11%. A positive non-network impact of an in-law's death on men's wages may reflect increases in residential and labor market mobility following a death or decreases in time expenditures on in-laws. However, it is important to note that the non-network wage impact of the death of an in-law is not statistically different from zero.

The results in the last three columns indicate that the net impact of the passing of the father-in-law on the rate of growth of wages is a decline of around 12 to 13%. However, we cannot reject that these estimates are equivalent to zero. Furthermore, these estimates on the growth rate of wages are

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<sup>20</sup>The corresponding results for the impact of the death of a woman's parents on her own outcomes is shown in Appendix Table 17. The net impact of the death of the father is a small, insignificant increase in the level of her wages. The difference in the results for women and men provide support for the hypothesis that the impact of the death of the father-in-law on men's outcomes is working through male labor market networks rather than a mechanism that directly affects the entire household.

<sup>21</sup>Health status is self-reported with four categories ranging from poor to excellent.

largely driven by a positive effect of the mother-in-law’s death rather than a negative effect associated with the farther-in-law’s death. The estimates of  $\alpha$  are quite small in magnitude at around -3%. Overall, the results suggest that the father-in-law’s death does not have an important effect on the growth rate of wages. The lack of evidence on the flow of job information between the father-in-law and son-in-law may be explained by the focus on the dissolution of networks; job information flows may matter most at the initial formation of network connections.

The results suggest that the main labor market effects of the relationship between a young man and his father-in-law around the time of the father-in-law’s death occurs not through provision of a flow of job information but rather through nepotistic labor market assistance. The magnitude of the effects of nepotism in the determination of wages is quite large. This is not surprising in the Chinese context where personal networks of influence and obligations, called *guanxi*, have important economic implications (Bian 1994, Hwang 1987, Whyte 1996).

### 3.6 Estimates Conditional on the Status of the Other In-Law

The baseline specification described above does not distinguish between the impact of the death of the father-in-law when the mother-in-law is still alive from the impact of his death when the mother-in-law has already died. The estimates in first three columns of Table 10 are altered from the baseline results associated with equation 7 such that  $PostFIL_L$  equals one after the death of the father-in-law in cases where the mother-in-law was alive at the time of the father-in-law’s death, and  $PostMIL_L$  equals one after the death of mother-in-law in cases where the father-in-law was still alive at the time of death. The regressions also include indicators for the passing of the father-in-law (mother-in-law) conditional on the mother-in-law (father-in-law) already being deceased,  $PostFIL_D$  ( $PostMIL_D$ ).

In column 1, the net impact of the father-in-law’s death on men’s wages is larger in absolute magnitude when the other-in-law was living (around -17%) than when the other-in-law was already deceased (-7%). Furthermore, this pattern is reflected in the estimates of  $\alpha_L$  and  $\alpha_D$ . Only the estimates of  $\alpha_L$  are significantly different from zero at the 5% level, and  $\alpha_L - \delta_L$  is not statistically different from  $\alpha_D - \delta_D$  at the standard levels. With the inclusion of additional controls, the net impact of the father-in-law’s death conditional on the other in-law being alive remains similar in magnitude at a decline of about 17% and the coefficient estimates of  $\alpha_L$  are significant at the 5 and 10% levels in columns 2 and 3, respectively. The magnitude of the the impact conditional on the other in-law remaining alive also remains similar. While the net impact of losing the father-in-law is stronger when the other in-law is living, we cannot reject the hypothesis that the net impact of the loss of the

father-in-law on wages is the same regardless of whether the mother-in-law is alive or not.

Columns 3 through 6 display the corresponding results with the growth rate of wages as the dependent variable. In contrast to the results on the level of wages, the negative estimate of  $\alpha - \delta$  is larger when the other in-law is deceased than when the other in-law is living. The standard errors around the estimates of  $\alpha_L - \delta_L$  or  $\alpha_D - \delta_D$  are quite large though. Furthermore, as with the baseline results in Table 9, the net impact on wage growth is primarily driven by a positive impact on the growth rate of wages associated with the mother-in-law’s death rather than a negative effect associated with the father-in-law’s death. The results suggest there is not much effect of the father-in-law’s death on wage growth when the effects are separated by the living status of the other in-law.

### 3.7 Flexible Estimates

The previous results assume that the gap in the outcomes associated with the father-in-law’s death and the mother-in-law’s death is constant prior to the death as well as after the death. I take advantage of the multiple waves available in the panel data set and allow the effects of each death to vary over the periods before and after the death with the following regression

$$y_{it} = \alpha_0 + \sum_{k \in \{-2, 1, 2\}} [\alpha_k FILPost_{k,it} + \delta_k MILPost_{k,it}] + \beta X_{it} + \gamma_i + \epsilon_{it} \quad (8)$$

where the sample is restricted to two waves prior to death and two waves following death for those for whom the father-in-law or mother-in-law pass away in the sample frame. Thus,  $FILPost_k$  ( $MILPost_k$ ) equals 1 for if the observation is  $k$ th period after the death of father-in-law (mother-in-law). In other words,  $k = -2$  refers to two periods before the death of the in-law. The omitted category is  $k = -1$ , the period prior to the in-law’s death. By presenting the time patterns of the effect both before and after the death of the father-in-law, this specification offers an additional test of the validity of the empirical approach.

Table 11 presents the estimates of equation 8. Relative to the period before the in-laws’ deaths, the estimates of  $\alpha_{-2} - \delta_{-2}$  in the first three columns show very little difference in the level of wages for men whose fathers-in-law will die in two periods following from men whose mothers-in-law will die then. The estimates are small in magnitude, ranging from -1.8 to -2.5%, and none are statistically different from zero. This provides additional support for the assumption of the identification strategy that other changes occurring around the time of death are similar for the mother-in-law and father-in-law. The magnitude and the significance of the wage effects shift immediately following the in-laws’ death. The net effect of the loss of the relationship with the father-in-law is a drop in wages of about 40%.

This is significant at the 10% level in all three specifications. The net impact of the father-in-law’s death on the wages of young men remains high in magnitude two periods after the death in all three specifications. Furthermore, the estimated net impact of the father-in-law’s death,  $\alpha_k - \delta_k$  is driven by the patterns in  $\alpha_k$ . The estimates indicate that relative to the period prior to the father-in-law’s death, there is a positive but insignificant and small difference two periods before the death. There is a large and significant drop in the level of men’s wages immediately after death, and they remain considerably lower even two periods after the death. The estimates of  $\alpha_2$  are not significantly different from the estimates  $\alpha_1$ . The time pattern of the wages surrounding the death of a father-in-law and mother-in-law suggest that the loss of the network relationship with the father-in-law caused a large and constant drop in wages of men; these results provide support for the hypothesis that married men’s wages reflect substantial nepotism from the father-in-law.

Similar to the results on wage growth in the previous sections, the time-varying impact of the in-laws’ death in the last three columns show weak and ambiguous effects on the growth rate of men’s earnings. The magnitude of the effects on growth rate of wages are mainly driven by changes around the time of the mother-in-law’s death. Wage growth was around 11-12% higher both two periods before the mother-in-law’s death and one period after the death relative to the growth rate immediately prior to her death. We see a one-time drop in the growth rate of earnings of around 4-5% following the father-in-law’s death, but this pattern is reversed in the subsequent period. Given that we have observed a fall in the level of wages following the father-in-law’s death, it is likely that this dip in the growth rate after his death is driven by the one-time fall the level of his wages but there is not a permanent shift in the rate of growth of the son-in-law’s wages. It is also important to note that none of the estimates in the growth rate regressions are statistically significant. Overall, all of the estimates on wage growth do not support the hypothesis that the evolution of men’s wages flattened out as the result of losing job information from his father-in-law’s networks.

## 4 Additional Evidence on Nepotism

### 4.1 Heterogeneity by Distance of the In-Laws

This section explores heterogeneity in the impact of the deaths of in-laws on wages. In particular, I consider whether the net impact of the father-in-law’s death on the level of wages varies by distance at which the father-in-law lived in a way that is consistent with the hypothesis of nepotism. To do

this, I estimate

$$y_{it} = \alpha_0 + \alpha PostFIL_{it} + \delta PostMIL_{it} + \rho PostFIL_{it} * D_i + \sigma PostMIL_{it} * D_i + \beta X_{it} + \gamma_i + \epsilon_{it} \quad (9)$$

where  $D_i$  is the logarithm of the distance (in kilometers) at which the in-law lived at the time of the death of the in-law plus one. Distance should play an important role in the ability of the father-in-law to provide nepotistic labor market assistance to his son-in-law. In particular, I expect that the impact of favoritism by the father-in-law to be strongest if they are in the same city, so the further apart they live when the father-in-law is alive, the less likely that the death of the father-in-law leads to a loss in nepotism. In other words, if the fall in wages following death is explained by nepotism, we expect  $\rho - \sigma > 0$ .

The results are presented in Table 12. The estimates show that the net impact of the death of the father-in-law is mitigated the further away that the father-in-law lived at the time of death. A standard deviation increase in the distance at which married men live from their in-laws reduces the negative impact of the death on wages by 14 percentage points. The estimates of  $\alpha$  and  $\rho$  are significant at the 5% level while the corresponding estimates for mothers-in-law,  $\delta$  and  $\sigma$ , are not statistically significant. This is consistent with the idea that the wage effects of a father-in-law's favoritism are localized.

## 4.2 Job Changes

Given that wages are likely to display some nominal downward rigidity, the loss of a nepotistic component of wages is likely to be associated with individuals losing jobs that are based on their relationships with their fathers-in-law. I examine the impact of the death of in-laws on the probability that the individual changes his job. In Table 13, the dependent variable is an indicator for whether the individual has changed his job since the last wave of the survey. This question was only added to the survey in 1997 so the size of the sample is smaller than the estimates of wages. The estimates of  $\alpha$  show that the rate of job changes increases following the death of a father-in-law by about 7.5 percentage points. This is significant at the 10% level. The corresponding rate of job changes following the death of the mother-in-law is negative, small in magnitude and not statistically different from zero. Overall, the net impact of the relationship with the father-in-law corresponds to a 8.3 to 8.6 percentage point increase in the rate of job changes. The magnitude of the impact is quite large relative to the average rate of job changes for the sample, which is 12.9%. However, this is not statistically significant, and the loss of power may be due to the smaller sample size. Another possible reason that the results for

job changes are not robust is that they correspond to the period in the late 1990s and early 2000s where we have already seen the estimates of nepotism to be muted in the wage results.

### 4.3 Sector of Employment

There is strong evidence for the prediction of the model of nepotism that men experienced large declines in the level of their wages following the death of the father-in-law. An additional prediction of nepotism is that firms that are not profit-maximizing can sustain higher levels of nepotism than profit-maximizing firms. To examine this prediction, I exploit the structure of the urban economy which is split into three main sectors in China. The assumption is that state-owned enterprises are less constrained by profit maximization than private firms. This is plausible given that state-owned enterprises had goals other than profits, including maintaining stability and employment (Bai et al 2000; Bai, Lu and Tao 2006). In addition to the private and state sector, there are collective enterprises, which have features of both private and state firms. Urban collective enterprises, owned by local governments or employees, are responsible for their own profits and losses and are not subject to central planning targets. There is considerable variation across collectives in their relationships with state banks and with private companies.

I estimate Equation 7 separately by the employment sector of the individual. For individuals for whom one of the parents-in-law died during the survey period, the sector of employment is defined in the wave immediately prior to the death. For other individuals, the sector of employment is defined in first wave. Assuming that state-owned enterprises are the less constrained by profit maximization, we would expect the death of the father-in-law to have stronger effects among individuals in the state sector than in the private sector. The magnitude of the effect for individuals in collective enterprises should fall between the estimated effects in state and in private firms, and ultimately depends on whether they are more like state or private firms.

Panel A of Table 14 displays the results. As predicted, the impact of the death of the father-in-law net of the impact of the death of the mother-in-law has the largest negative effect for men who were working in the state sector. The estimates range from -20 to -21%. However, these estimates are not significant at the 10% level though they are close. It is reassuring that the estimates of the difference,  $\alpha - \delta$ , are driven by large and significant estimates of the death of the father-in-law,  $\alpha$ , and the impact of the death of the mother-in-law,  $\delta$ , is relatively small in magnitude and not statistically different from zero. The estimates for collective sector employees in columns 4 though 6 are estimated with less precision, but the magnitude of the estimates indicate a similar impact as in the state sector.

Finally, the estimates for private sector workers are presented in the last three columns. The impact of the death of the father-in-law, given by  $\alpha$ , is actually positive in all three specifications and the net impact is also positive across the specifications, but these estimates are not statistically different from zero. Overall, the results indicate that favoritism played a role in men’s wages in the state sector and provide additional support for nepotism as the mechanism through which the father-in-law’s death affects a young man’s outcomes.

Gradual reform of the socialist system towards a mixed economy began following the death of Chairman Mao Zedong in 1976. The sample period in my analysis covers the years 1991, 1993, 1997, 2000, 2004 and 2006. Major reforms of the state sector occurred in the mid- to late-1990s, including privatization of the total stock of state-owned housing, privatization of some state-owned enterprises and lay-offs of employees of state-owned enterprises. During this period of reform, there was a shift in the pressure on remaining state-owned enterprises to become more competitive. I exploit this change to provide an additional test of the idea that competition reduces nepotism. I estimate the following equation

$$y_{it} = \alpha_0 + \alpha PostFIL_{it} + \delta PostMIL_{it} + \alpha_{97} PostFIL97_{it} + \delta_{97} PostMIL97_{it} + \beta X_{it} + \gamma_i + \epsilon_{it} \quad (10)$$

where  $PostFIL97$  equals one if the father-in-law passed away in the 1997 wave or later, and  $PostMIL97$  equals one if the mother-in-law passed away in the 1997 wave or later. Assuming that state-owned enterprises became more concerned with profit maximization in the mid-1990s, a model of nepotism implies that  $\alpha - \delta < 0$  and  $\alpha_{97} - \delta_{97} > 0$  in the sample of state sector employees. In other words, the estimated difference in the impact of the death of the father-in-law and mother-in-law is negative during the pre-reform period when state-owned enterprises were less concerned with profit-maximization but this impact is diminished for deaths that occur in or after 1997 because the ability of state-owned enterprises to maintain rent-seeking wages was reduced.

The corresponding results are shown in Panel B of Table 14. For the sample employed in the state sector in columns 1 through 3, the estimates of  $\alpha - \delta$  are negative and  $\alpha_{97} - \delta_{97}$  positive. These estimates are significant at the 1 or 5% levels. Furthermore, the magnitude of the estimates indicate that the loss of the nepotistic component of wages associated with the father-in-law’s death was reduced by about three-quarters in the post-reform period. The patterns in the collective sector are similar to the state sector, but these estimates are not statistically significant. Finally, the results for the private sector show a reversed pattern of effects though this is not statistically significant. Overall, the results in Panel B confirm the idea that nepotism played a larger role in the determination of wages in the

state sector prior to the economic reforms of the mid to late 1990s in China.

## 5 Alternative Explanations

### 5.1 Inheritance Effects

If inheritances are larger following the death of the father-in-law than the mother-in-law, then the estimated effects on the level of men’s wages may reflect a wealth effect rather than a loss in nepotism. More specifically, the net wealth effect induces young men to switch into jobs that are less demanding. In this case, the death of the father-in-law could plausibly lead to a drop in men’s hourly wages.

The legal institutions and common practices surrounding inheritance in China make this an unlikely explanation for the results. First, the Law of Succession of 1985 specifies an order of inheritance that does not favor female children. The law specifies that successors who have made predominant contributions to caring for the deceased may be given larger shares of the assets. Given that elderly parents are far more likely to reside with their sons than their daughters, the households of daughters are unlikely to receive substantial inheritances.<sup>22</sup> Second, at least half of the assets accumulated during marriage must go to the surviving spouse.<sup>23</sup> If surviving spouses receive the majority of assets following death, then the inheritance hypothesis would suggest that the impact on wages to be stronger when there is no surviving spouse. This is not consistent with the results of Table 10 where the wages effects are larger when the other spouse was alive.

While the CHNS does not ask directly about inheritance transfers or receipts, I examine consumption, assets and hours worked to further consider the alternative hypothesis. The inheritance hypothesis is predicated on the idea that the wealth transfer was large enough to reduce men’s effort in the labor market such that hourly wages fell by over 20%. Under the inheritance story, we would expect consumption and assets to increase following the death of the father-in-law and labor supply of men to decrease. In contrast, if the death of the father-in-law leads to a loss of job networks or other labor market assistance, we would expect consumption and assets to fall.

Table 15 presents the results that correspond to equation 7 where the dependent variables are measures of consumption, assets and the number of hours worked per week.<sup>24</sup> In columns 1 and

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<sup>22</sup>Individuals in the adult sample were born before the implementation of the one-child policy and very few of the adult women in the sample are only children. Over 97% of the men in the sample have a sibling-in-law (and 87% have a brother-in-law).

<sup>23</sup>Data collected in four cities by the Study of Popular Habits of Succession in 2005 confirm that popular beliefs about inheritance are consistent with the law. About three-quarters of respondents reported that the spouse should be the first to inherit. Furthermore, most respondents thought that sons should have the next rights of inheritance before daughters.

<sup>24</sup>The results for the specification that also include spouse controls are very similar to the results in the even columns, and are available on request.

2, the dependent variable is total household food consumption in kilograms over three days.<sup>25</sup> The estimates of  $\alpha$  indicate that the death of the father-in-law corresponds with a fall of 7 kilograms of food consumption, or approximately 10%. The net impact of the father-in-law's death,  $\alpha - \delta$ , is a 12 kilogram decrease in food consumption by the household. These results are significant at 5% level or higher. I also construct another measure of consumption that is the logarithm of the total value of purchases of household electronic goods, such as televisions and sewing machines, over the past year. The net impact of the father-in-law's death on consumption of these types of household goods is negative but not significantly different from zero.

The next two columns of Table 15 are assets: the logarithm of the self-reported value of a person's privately-owned home, and an indicator for whether the household owns a refrigerator. In both cases the net impact of the death of the father-in-law is negative, but not significant at the standard levels. Finally, in last two columns, I examine the impact of the in-law's deaths on the average number of hours that the man worked per week in the previous year. The results show that individuals increased the number of hours worked following the death of his wife's father. After removing the effects of the death of the mother-in-law, the results indicate an increase of 4.5 hours per week though these results are only statistically different from zero at the 15% level. The estimates suggest that the drop in wages following the death of a father-in-law does not correspond with an increase in leisure by these men.

Overall, the results of Table 15 do not support the idea that there was a large wealth effect associated with a father-in-law's death, or that it was greater than a windfall following a mother-in-law's death. The results are consistent with the hypothesis that a living father-in-law provides valuable labor market assistance and that the negative labor market repercussions associated with the death of a father-in-law make the household worse off in terms of consumption and leisure.

## 5.2 Insurance Effects

Another alternative explanation for the fall in the level of wages and an increase in the probability of job changes is if the mother-in-law and the father-in-law provided different amounts of insurance while living. If the death of father-in-law corresponds to less insurance, we may see individuals switching into jobs that have lower wages but less volatility of wages and less unemployment risk. However, this explanation is not consistent with the results in Section 4.3 where the loss associated with the father-in-law's death was strongest in the state sector and weaker in the after the reforms of state-

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<sup>25</sup>This is taken from a detailed food diary that the household filled out for three consecutive days and includes food consumed in the home as well as away from home.

owned enterprises. Given that state jobs provided more security than private sector jobs, the insurance hypothesis would predict that the results would be strongest in the private sector. Furthermore, it would predict an increase in the impact of the father-in-law's death after 1997 when the security associated with state jobs declined and the rate of lay-offs increased.

### 5.3 Household Preferences for In-Laws Differs by Gender

The identification strategy requires the assumption that non-network related changes surrounding the death of an in-law are addressed by differencing out the effects of the mother-in-law's death, and this was supported by the evidence in Tables 4 and 5. However, we cannot observe all relevant changes surrounding the death of an in-law to test that the effects are the same for both mothers-in-law and fathers-in-law. For an alternative explanation to be valid, it will need to be consistent with a fall in men's wages as well as a decrease in consumption. One possibility is that households have greater sympathy for a widowed mother-in-law than a widowed father-in-law. This may result if daughters have stronger emotional bonds with their mothers than their fathers. The death of a woman's father may lead the household to move closer to her surviving mother, and the change in residence requires the man to change to a job with lower wages and longer hours. This alternative explanation for the results is also consistent with the results in Table 10 that showed stronger effects of the father-in-law's death when the mother-in-law was still alive.

To explore this possible explanation, I first examine the probability of moving or attriting from the survey. Table 16 presents the impact of the death of in-laws conditional on whether the other in-law is living or deceased on the probability of either moving (within the sample area) or attriting from the survey. The net impact of the father-in-law's death conditional on the other in-law being dead on residential mobility is an increase in mobility of around 9%. The mean rate of moving or attriting in the sample of analysis is 20%. However, this is not statistically different from zero and driven more by a positive effect of the mother-in-law's death on mobility than a negative effect of the father-in-law's death. The estimates that are conditional on the other in-law being alive suggest a decline in mobility following the death of a father-in-law of 6% and the magnitude of the decline is reduced to 3.5% after the removal of the mother-in-law's effects. A possible explanation is that the household chooses to remain near the woman's mother following the death of the woman's father. While the reduction in mobility could lead to a lower growth rate of earnings, it is difficult to think of a plausible story in which remaining in the same location leads to a sizable drop in the level of wages observed for young men. Overall, the results do not support the idea that the differences in the reduction of mobility

following the death of a father-in-law or a mother-in-law can explain the large, negative impact of the death of the father-in-law on men's wages.

## 6 Conclusion

The results of the paper indicate that men's labor market outcomes in China decline substantially following the death of their fathers-in-law. After controlling for other changes that occur around the death of an in-law, the net impact of the passing of the father-in-law is a decline in the level of wages of around 20%. The estimates suggest that the death of the father-in-law makes them worse off; not only do their wages decline but the number of hours that the men work increases and the total consumption of the household falls. This paper emphasizes the importance of marriage networks on the labor market outcomes of young men.

The ways in which individuals use marriage networks can have important implications for labor market efficiency. If marriage networks facilitate the flow of information about job openings, then marriage networks can improve matches between firms and workers and increase efficiency of the labor market. The results do not support the mechanism whereby marriage helps the functioning of the labor market. Rather, the empirical evidence suggests that use of marriage networks decreases efficiency in the labor market in this particular context. Individuals use marital connections to distort wages of family members above the market value. This type of nepotism is facilitated by the structure of Chinese economy where state-owned enterprises are relatively less focused on profit maximization than private firms. One of the policy implications of this research is that privatization of state-owned enterprises leads to the reduction of this type of rent-seeking behavior in the state sector.

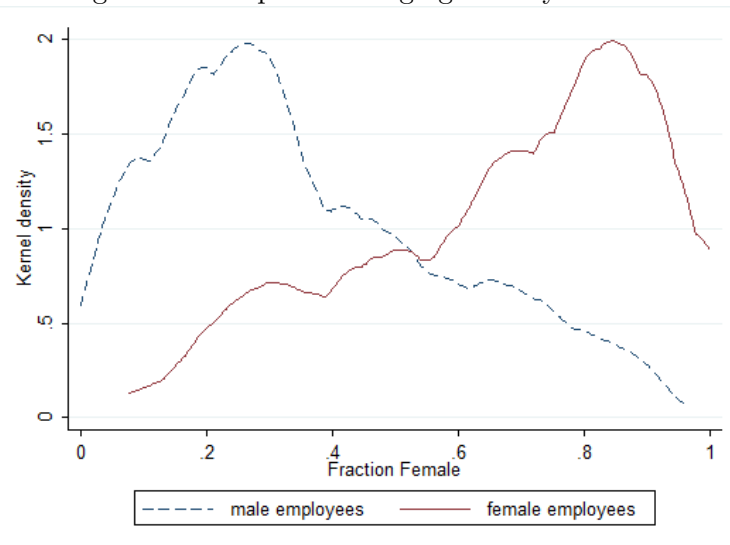
The results of this paper highlight the role that marriage-driven favoritism play in creating inefficiencies in the labor market in China. Further research is needed to understand whether the full transition from a socialist economy to a market-driven economy is either necessary or sufficient for eliminating the inefficiencies associated with nepotism. Other possible policy solutions that would be interesting to explore in future research include the implementation and enforcement of anti-nepotism laws.

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Figure 1: Occupational Segregation by Gender



Data Source: Study of Family Life in Urban China, 1999

Table 1: Summary Statistics

|  | Single Men      | Married Men       | $\Delta$ Father-in-Law<br>(Prior Wave) | $\Delta$ Mother-in-Law<br>(Prior Wave) |
|--|-----------------|-------------------|--|--|
| <b><u>Individual Characteristics</u></b> |                 |                   |  |  |
| Age                                      | 27.84<br>[5.50] | 36.32<br>[5.45]   | 34.77<br>[4.35]                        | 34.87<br>[4.30]                        |
| Education                                | 11.52<br>[3.04] | 11.11<br>[3.05]   | 11.48<br>[2.74]                        | 11.22<br>[2.77]                        |
| Real Hourly Earnings                     | 1.39<br>[1.85]  | 1.83<br>[3.18]    | 1.55<br>[1.52]                         | 1.61<br>[1.77]                         |
| Wage Growth                              | 0.21<br>[0.53]  | 0.17<br>[0.44]    | 0.13<br>[0.36]                         | 0.14<br>[0.50]                         |
| White Collar Occupation                  | 0.32<br>[0.46]  | 0.45<br>[0.49]    | 0.47<br>[0.50]                         | 0.42<br>[0.50]                         |
| State Sector Job                         | 0.64<br>[0.48]  | 0.66<br>[0.47]    | 0.70<br>[0.46]                         | 0.67<br>[0.47]                         |
| Firm over 100 Employees                  | 0.58<br>[0.49]  | 0.53<br>[0.50]    | 0.59<br>[0.49]                         | 0.61<br>[0.49]                         |
| <b><u>In-Law Characteristics</u></b>     |                 |                   |  |  |
| Reside with Father-in-Law                |                 | 0.04<br>[0.19]    | 0.01<br>[0.09]                         | 0.05<br>[0.23]                         |
| Reside with Mother-in-Law                |                 | 0.02<br>[0.16]    | 0.00<br>[0.00]                         | 0.02<br>[0.16]                         |
| Father-in-Law Alive                      |                 | 0.68<br>[0.47]    | 1.00<br>[0.00]                         | 0.73<br>[0.44]                         |
| Mother-in-Law Alive                      |                 | 0.82<br>[0.38]    | 0.91<br>[0.29]                         | 1.00<br>[0.00]                         |
| Father-in-Law Distance (km)              |                 | 56.57<br>[225.04] | 48.55<br>[168.20]                      | 27.73<br>[89.60]                       |
| Mother-in-Law Distance (km)              |                 | 54.51<br>[203.54] | 53.78<br>[195.90]                      | 29.13<br>[93.86]                       |
| <b><u>Match Characteristics</u></b>      |                 |                   |  |  |
| Age Gap                                  |                 | 1.71<br>[2.40]    | 1.31<br>[1.97]                         | 1.56<br>[2.14]                         |
| Education Gap                            |                 | 0.79<br>[2.89]    | 1.14<br>[3.01]                         | 1.25<br>[2.94]                         |
| Height Gap (cm)                          |                 | 11.23<br>[6.21]   | 10.89<br>[6.74]                        | 10.72<br>[6.16]                        |
| Observations                             | 359             | 1750              | 145                                    | 113                                    |

Notes: Standard deviations in brackets. The sample includes working men aged 22 to 45 living in urban areas. Column 1 refers to married men in the 1997 wave and column 2 to single men in the 1997 wave. Columns 3 and 4 are a subset of married men. In the third column,  $\Delta$ Father-In-Law refers to information in the survey wave prior to the father-in-law passing away. In the fourth column,  $\Delta$ Mother-In-Law refers to the same for the mother-in-law. \* denotes that the average for the sample for whom the mother-in-law passes away is significantly different from the sample for whom the father-in-law passes away at the 5% level. The distance at which the in-laws live is averaged over the time the in-law is alive. Under match characteristics, the gaps in age, education and height are measured as the value of the husband subtracted by the value of the wife.

Table 2: OLS Estimates of the Returns to Marriage

|                         | Urban Sample |               | Rural Sample |               |
|-------------------------|--------------|---------------|--------------|---------------|
|                         | Male<br>(1)  | Female<br>(2) | Male<br>(3)  | Female<br>(4) |
| Married                 | 0.102*       | -0.098*       | -0.015       | -0.065        |
|                         | [0.043]      | [0.048]       | [0.061]      | [0.063]       |
| Age                     | -0.237       | 0.180         | -0.040       | 0.711*        |
|                         | [0.182]      | [0.189]       | [0.251]      | [0.291]       |
| Age <sup>2</sup>        | 0.008        | -0.004        | 0.003        | -0.019*       |
|                         | [0.005]      | [0.006]       | [0.008]      | [0.009]       |
| Age <sup>3</sup>        | -0.000       | 0.000         | -0.000       | 0.000+        |
|                         | [0.000]      | [0.000]       | [0.000]      | [0.000]       |
| Education               | 0.039**      | 0.046**       | 0.032**      | 0.034**       |
|                         | [0.005]      | [0.005]       | [0.006]      | [0.006]       |
| Observations            | 3187         | 2876          | 3474         | 2561          |
| Adjusted R <sup>2</sup> | 0.449        | 0.434         | 0.133        | 0.145         |

Notes: Robust standard errors clustered by individual in brackets. \*\*, \*, + denotes significance at the 1%, 5% and 10% level, respectively. Regressions also include indicators for province-year and a constant term. The sample is limited to individuals in urban areas between 22 to 45 years old.

Table 3: Fixed Effects Estimates of the Returns to Marriage

|                         | Urban Sample |               | Rural Sample |               |
|-------------------------|--------------|---------------|--------------|---------------|
|                         | Male<br>(1)  | Female<br>(2) | Male<br>(3)  | Female<br>(4) |
| Married                 | 0.136*       | -0.043        | -0.029       | 0.158         |
|                         | [0.057]      | [0.068]       | [0.111]      | [0.158]       |
| Age                     | 0.113        | 0.316         | 0.884        | 1.613*        |
|                         | [0.324]      | [0.376]       | [0.582]      | [0.709]       |
| Age <sup>2</sup>        | 0.012+       | 0.003         | -0.020*      | -0.013        |
|                         | [0.007]      | [0.007]       | [0.009]      | [0.012]       |
| Age <sup>3</sup>        | -0.000+      | -0.000        | 0.000*       | 0.000         |
|                         | [0.000]      | [0.000]       | [0.000]      | [0.000]       |
| Observations            | 3187         | 2876          | 3474         | 2561          |
| Adjusted R <sup>2</sup> | 0.398        | 0.437         | 0.157        | 0.133         |

Notes: Robust standard errors clustered by individual in brackets. \*\*, \*, + denotes significance at the 1%, 5% and 10% level, respectively. Regressions also include indicators for province-year, a constant term and individual fixed effects. The sample is limited to individuals in urban areas between 22 to 45 years old.

Table 4: Summary Statistics on Death Expenditures (by Gender of In-Law)

| <b>Panel A: Time Expenditures</b>      | Mother-in-Law Passes | Father-in-Law Passes |
|--|----------------------|----------------------|
|  | Away Next Period     | Away Next Period     |
| I(Parents Need Care)                   | 0.129<br>[0.337]     | 0.116<br>[0.322]     |
| I(Parents Cared for by Couple)         | 0.047<br>[0.213]     | 0.032<br>[0.176]     |
| Time Spent Caring for Parents          | 6.603<br>[35.61]     | 5.684<br>[33.70]     |
| Observations                           | 106                  | 95                   |
| <b>Panel B: Financial Expenditures</b> | Mother-in-Law Passed | Father-in-Law Passed |
|  | Away Last Period     | Away Last Period     |
| I(Funeral Expenses in Last Year)       | 0.280<br>[0.451]     | 0.303<br>[0.462]     |
| Amount Spent on Funeral Expenses       | 185.4<br>[743.6]     | 218.4<br>[847.1]     |
| Observations                           | 103                  | 89                   |

Notes: Standard deviations in brackets. In Panel A, the first column display averages corresponding to a sample of households for whom the man’s mother-in-law passes away between 1991 and 1993, and the last column corresponds to the sample of households for whom the man’s father-in-law passes away. “Time Spent Caring for Parents” refers to the number of minutes that an individual spent caring for elderly parents in the previous week. In Panel B, the sample includes waves 1993 and 1997.

Table 5: Care of Young Children by Maternal Grandparents

|                  | Mother-In-Law Passes | Father-in-Law Passes |
|------------------|----------------------|----------------------|
|                  | Away Sample          | Away Sample          |
| Prior to Passing | 0.102<br>[0.303]     | 0.109<br>[0.313]     |
| After Passing    | 0.023<br>[0.152]     | 0.024<br>[0.154]     |
| Observations     | 171                  | 188                  |

Notes: Standard deviations in brackets. The table displays averages of an indicator variable on whether the maternal grandparents provided care outside of the parents’ household for at least one young child. The sample is limited to parents’ households with children under the age of 6. The sample in column 1 is further limited to households where the mother-in-law passes away between 1991 and 2006. The sample in column 2 is further limited to households where the father-in-law passes away between 1991 and 2006.

Table 6: Hours per Day Spent by Household Members on Chores

| <i>In-Law Passing Sample:</i> | Buying Food |         | Cooking Food |         | Washing Clothes |         |
|-------------------------------|-------------|---------|--------------|---------|-----------------|---------|
|                               | Mother      | Father  | Mother       | Father  | Mother          | Father  |
|                               | (1)         | (2)     | (3)          | (4)     | (5)             | (6)     |
| Prior to Passing              | 0.524       | 0.597   | 2.033        | 2.055   | 0.666           | 0.706   |
|                               | [0.534]     | [0.597] | [1.945]      | [2.622] | [0.750]         | [0.745] |
| After Passing                 | 0.606       | 0.631   | 2.707        | 2.436   | 0.868           | 0.885   |
|                               | [0.615]     | [0.684] | [5.368]      | [3.495] | [0.938]         | [0.999] |
| Observations                  | 497         | 576     | 497          | 576     | 497             | 576     |

Notes: Standard deviations in brackets. The table displays averages of the amount of time that members of the household spent on chores in hours per day. The sample is limited the periods 1991 to 2000. The odd columns refer to households where the mother-in-law passes away, and the even columns to the households where the father-in-law passes away.

Table 7: Impact of Characteristics of Parents-in-Law on Wages of Adult Men

|   | (1)     | (2)     |
|---|---------|---------|
| Married   | 0.207*  | 0.205*  |
|   | [0.093] | [0.092] |
| Married*Father-in-Law Alive                             | 0.076   | 0.148*  |
|   | [0.050] | [0.067] |
| Married*Mother-in-Law Alive                             | -0.125+ | -0.185* |
|   | [0.070] | [0.082] |
| Married*Father-in-Law Alive*Log(Distance Father-in-Law) |         | -0.037+ |
|   |         | [0.022] |
| Married*Mother-in-Law Alive*Log(Distance Mother-in-Law) |         | 0.033+  |
|   |         | [0.019] |
| Age   | 0.167   | 0.183   |
|   | [0.345] | [0.345] |
| Age <sup>2</sup>  | 0.015*  | 0.014*  |
|   | [0.007] | [0.007] |
| Age <sup>3</sup>  | -0.000* | -0.000* |
|   | [0.000] | [0.000] |
| Education   | 0.035*  | 0.035*  |
|   | [0.018] | [0.018] |
| Observations  | 2939    | 2939    |
| Adjusted R <sup>2</sup>                                 | 0.411   | 0.412   |

Notes: Robust standard errors clustered by individual in brackets. \*\*, \*, + denotes significance at the 1%, 5% and 10% level, respectively. The sample is limited to men between the ages of 22 and 45 living in urban areas. Regressions also include indicators for province-year, a constant term and individual fixed effects.

Table 8: Occupations by Gender

|                                  | Men   | Women  |
|----------------------------------|-------|--------|
| Senior Professional or Technical | 0.091 | 0.072* |
| Professional or Technical        | 0.068 | 0.128* |
| Executive or Manager             | 0.130 | 0.056* |
| Office Staff                     | 0.119 | 0.166* |
| Agricultural Worker              | 0.013 | 0.017* |
| Skilled labor                    | 0.224 | 0.136* |
| Unskilled labor                  | 0.151 | 0.190* |
| Army                             | 0.019 | 0.002* |
| Driver                           | 0.058 | 0.002* |
| Service                          | 0.083 | 0.192* |
| Observations                     | 3240  | 2916   |

Notes: \* denotes that the share of women in the occupation is significantly different from men at the 1% level.

Table 9: Net Impact of the Death of a Father-in-Law on the Level and Growth of Hourly Earnings

|                         | Log Hourly Earnings |                    |                    | Growth Rate of Earnings |                   |                   |
|-------------------------|---------------------|--------------------|--------------------|-------------------------|-------------------|-------------------|
|                         | (1)                 | (2)                | (3)                | (4)                     | (5)               | (6)               |
| $\alpha - \delta$       | -0.254<br>(4.958)*  | -0.251<br>(4.818)* | -0.248<br>(4.688)* | -0.136<br>(1.508)       | -0.125<br>(1.331) | -0.118<br>(1.211) |
| $\alpha$                | -0.142*<br>[0.063]  | -0.144*<br>[0.064] | -0.139*<br>[0.064] | -0.030<br>[0.061]       | -0.037<br>[0.062] | -0.031<br>[0.063] |
| $\delta$                | 0.112<br>[0.093]    | 0.107<br>[0.093]   | 0.110<br>[0.094]   | 0.105<br>[0.087]        | 0.088<br>[0.086]  | 0.088<br>[0.084]  |
| Additional Controls     | No                  | Yes                | Yes                | No                      | Yes               | Yes               |
| Spouse Controls         | No                  | No                 | Yes                | No                      | No                | Yes               |
| Observations            | 2900                | 2900               | 2900               | 2279                    | 2279              | 2279              |
| Adjusted R <sup>2</sup> | 0.394               | 0.394              | 0.395              | 0.090                   | 0.099             | 0.100             |

Notes: The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. F-statistic testing whether we can reject that  $\alpha - \delta = 0$  in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 10%, 5% and 1% levels, respectively. The dependent variable is the logarithm of real hourly earnings. All regressions include a cubic in age, education, province-year indicators, marital status indicators, individual fixed effects and a constant term. Additional controls (in columns 2, 3, 5, 6) are years married, height and health status. Spouse controls (in columns 3, 6) are the spouse's age, health status and employment status. The sample is limited to urban men aged 22 to 45.

Table 10: Net Impact of Father-in-Law's Death Conditional on the Status of the Other In-Law

|                         | Log Hourly Earnings |                    |                    | Growth Rate of Earnings |                   |                   |
|-------------------------|---------------------|--------------------|--------------------|-------------------------|-------------------|-------------------|
|                         | (1)                 | (2)                | (3)                | (4)                     | (5)               | (6)               |
| $\alpha_L - \delta_L$   | -0.175<br>(2.228)   | -0.170<br>(2.064)  | -0.174<br>(2.140)  | -0.030<br>(0.063)       | -0.026<br>(0.046) | -0.030<br>(0.066) |
| $\alpha_D - \delta_D$   | -0.066<br>(0.071)   | -0.040<br>(0.024)  | -0.049<br>(0.039)  | -0.085<br>(0.161)       | -0.103<br>(0.231) | -0.101<br>(0.232) |
| $\alpha_L$              | -0.139*<br>[0.067]  | -0.139*<br>[0.068] | -0.134+<br>[0.069] | -0.010<br>[0.074]       | -0.021<br>[0.073] | -0.018<br>[0.074] |
| $\delta_L$              | 0.036<br>[0.102]    | 0.031<br>[0.104]   | 0.040<br>[0.104]   | 0.020<br>[0.096]        | 0.005<br>[0.095]  | 0.013<br>[0.094]  |
| $\alpha_D$              | -0.029<br>[0.147]   | -0.010<br>[0.150]  | -0.017<br>[0.149]  | 0.074<br>[0.118]        | 0.084<br>[0.121]  | 0.084<br>[0.120]  |
| $\delta_D$              | 0.037<br>[0.124]    | 0.029<br>[0.126]   | 0.032<br>[0.124]   | 0.158<br>[0.121]        | 0.187<br>[0.122]  | 0.184<br>[0.119]  |
| Additional Controls     | No                  | Yes                | Yes                | No                      | Yes               | Yes               |
| Spouse Controls         | No                  | No                 | Yes                | No                      | Yes               | Yes               |
| Observations            | 2723                | 2723               | 2723               | 2140                    | 2140              | 2140              |
| Adjusted R <sup>2</sup> | 0.391               | 0.392              | 0.393              | 0.095                   | 0.106             | 0.107             |

Notes: The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. The subscript *L* denotes that the other in-law was living and *D* that the other in-law was deceased. F-statistic testing whether we can reject that  $\alpha - \delta = 0$  in parentheses. Robust standard errors clustered by individual in brackets. +, \* denotes significance at the 10 and 5% levels, respectively. All regressions include a cubic in age, education, province-year indicators, indicators for marital status, individual fixed effects and a constant term. Additional controls are years married, and health status. Spouse controls are the spouse's age, health status and employment status. The sample is limited to urban men aged 22 to 45.

Table 11: Flexible Estimates of a Father-in-Law's Death on the Level and Growth of Earnings

|                             | Log Hourly Earnings |                     |                     | Growth Rate of Earnings |                   |                   |
|-----------------------------|---------------------|---------------------|---------------------|-------------------------|-------------------|-------------------|
|                             | (1)                 | (2)                 | (3)                 | (4)                     | (5)               | (6)               |
| $\alpha_{-2} - \delta_{-2}$ | -0.025<br>(0.030)   | -0.018<br>(0.015)   | -0.021<br>(0.021)   | -0.088<br>(0.316)       | -0.094<br>(0.356) | -0.093<br>(0.362) |
| $\alpha_1 - \delta_1$       | -0.426+<br>(3.532)  | -0.415+<br>(3.360)  | -0.423+<br>(3.499)  | -0.161<br>(1.262)       | -0.161<br>(1.328) | -0.150<br>(1.150) |
| $\alpha_2 - \delta_2$       | -0.250<br>(0.668)   | -0.248<br>(0.657)   | -0.228<br>(0.537)   | 0.033<br>(0.032)        | 0.046<br>(0.066)  | 0.079<br>(0.183)  |
| $\alpha_{-2}$               | 0.037<br>[0.080]    | 0.040<br>[0.080]    | 0.038<br>[0.079]    | 0.034<br>[0.067]        | 0.033<br>[0.067]  | 0.025<br>[0.064]  |
| $\alpha_1$                  | -0.297**<br>[0.096] | -0.300**<br>[0.097] | -0.295**<br>[0.096] | -0.039<br>[0.076]       | -0.047<br>[0.076] | -0.040<br>[0.072] |
| $\alpha_2$                  | -0.211<br>[0.174]   | -0.220<br>[0.171]   | -0.205<br>[0.171]   | 0.071<br>[0.127]        | 0.062<br>[0.124]  | 0.084<br>[0.123]  |
| $\delta_{-2}$               | 0.062<br>[0.108]    | 0.058<br>[0.110]    | 0.059<br>[0.109]    | 0.122<br>[0.133]        | 0.127<br>[0.132]  | 0.118<br>[0.130]  |
| $\delta_1$                  | 0.129<br>[0.183]    | 0.115<br>[0.183]    | 0.128<br>[0.183]    | 0.123<br>[0.096]        | 0.114<br>[0.094]  | 0.110<br>[0.095]  |
| $\delta_2$                  | 0.038<br>[0.207]    | 0.028<br>[0.213]    | 0.024<br>[0.222]    | 0.038<br>[0.092]        | 0.016<br>[0.093]  | 0.005<br>[0.102]  |
| Additional Controls         | No                  | Yes                 | Yes                 | No                      | Yes               | Yes               |
| Spouse Controls             | No                  | No                  | Yes                 | No                      | No                | Yes               |
| Observations                | 2114                | 2114                | 2114                | 1918                    | 1918              | 1918              |
| Adjusted R-squared          | 0.334               | 0.336               | 0.337               | 0.074                   | 0.072             | 0.079             |

Notes: The estimate of  $\alpha_k$  refers to period  $k$  after the death of the father-in-law, and the estimate of  $\delta_k$  refers to period  $k$  after the death of the mother-in-law. F-statistic testing whether we can reject that  $\alpha_k - \delta_k = 0$  in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 10, 5 and 1% levels, respectively. All regressions include a cubic in age, education, province-year indicators, marital status, individual fixed effects and a constant term. Additional controls (in columns 2, 3, 5 and 6) are years married, and health status. Spouse controls (in columns 3 and 6) are the spouse's age, health status and employment status. The sample is limited to urban men aged 22 to 45.

Table 12: Distance and the Net Impact of Father-in-Law's Death on Wages

|  | (1)      | (2)      | (3)      |
|--|----------|----------|----------|
| $(\alpha - \delta) \times \log(\text{distance}+1)$ | 0.059+   | 0.062+   | 0.059+   |
|  | (3.486)  | (3.523)  | (3.290)  |
| $\alpha - \delta$                                  | -0.382*  | -0.383*  | -0.371*  |
|  | (4.258)  | (4.265)  | (3.982)  |
| $\alpha \times \log(\text{distance}+1)$            | 0.0753*  | 0.0759*  | 0.0751*  |
|  | [0.0346] | [0.0346] | [0.0345] |
| $\alpha$   | -0.245*  | -0.251*  | -0.241*  |
|  | [0.106]  | [0.107]  | [0.107]  |
| $\delta \times \log(\text{distance}+1)$            | 0.0159   | 0.0143   | 0.0163   |
|  | [0.0489] | [0.0492] | [0.0488] |
| $\delta$   | 0.137    | 0.132    | 0.130    |
|  | [0.135]  | [0.135]  | [0.134]  |
| Additional Controls                                | No       | Yes      | Yes      |
| Spouse Controls                                    | No       | No       | Yes      |
| Observations                                       | 2396     | 2396     | 2396     |
| Adjusted R <sup>2</sup>                            | 0.380    | 0.380    | 0.381    |

Notes: The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. F-statistic in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 10, 5 and 1% levels, respectively. All regressions include a cubic in age, education, province-year indicators, marital status, individual fixed effects and a constant term. Additional controls (in columns 2, 3) are years married and health status. Spouse controls (in column 3) are the spouse's age, health status and employment status. The sample is limited to urban men aged 22 to 45.

Table 13: The Net Impact of Father-in-Law's Death on Job Changes

|                         | (1)     | (2)     | (3)     |
|-------------------------|---------|---------|---------|
| $\alpha - \delta$       | 0.086   | 0.083   | 0.084   |
|                         | (1.168) | (1.113) | (1.133) |
| $\alpha$                | 0.075+  | 0.076+  | 0.075+  |
|                         | [0.045] | [0.044] | [0.044] |
| $\delta$                | -0.011  | -0.007  | -0.009  |
|                         | [0.055] | [0.054] | [0.054] |
| Observations            | 1998    | 1998    | 1998    |
| Adjusted R <sup>2</sup> | 0.045   | 0.049   | 0.049   |

Notes: The dependent variable is an indicator for job changes and is only available for the 1997 - 2006 waves. The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. F-statistic in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 10, 5 and 1% levels, respectively. All regressions include a cubic in age, education, province-year indicators, marital status, individual fixed effects and a constant term. Additional controls (in columns 2, 3) are years married and health status. Spouse controls (in column 3) are the spouse's age, health status and employment status. The sample is limited to urban men aged 22 to 45.

Table 14: Net Impact of Father-in-Law's Death on Wages by Employment Sector

|   | State Sector      |                   |                   | Collective Sector |                  |                  | Private Sector  |                 |                 |
|---|-------------------|-------------------|-------------------|-------------------|------------------|------------------|-----------------|-----------------|-----------------|
|   | (1)               | (2)               | (3)               | (4)               | (5)              | (6)              | (7)             | (8)             | (9)             |
| <b>Panel A: Standard Specification</b>                    |                   |                   |                   |                   |                  |                  |                 |                 |                 |
| $\alpha - \delta$   | -0.21<br>(2.72)   | -0.21<br>(2.71)   | -0.20<br>(2.49)   | -0.16<br>(0.76)   | -0.16<br>(0.79)  | -0.19<br>(1.03)  | 0.04<br>(0.01)  | 0.04<br>(0.01)  | 0.00<br>(0.00)  |
| $\alpha$  | -0.18*<br>[0.07]  | -0.18**<br>[0.07] | -0.17*<br>[0.07]  | -0.24+<br>[0.13]  | -0.25+<br>[0.13] | -0.26*<br>[0.13] | 0.09<br>[0.26]  | 0.10<br>[0.27]  | 0.11<br>[0.28]  |
| $\delta$  | 0.03<br>[0.10]    | 0.03<br>[0.09]    | 0.03<br>[0.09]    | -0.08<br>[0.12]   | -0.08<br>[0.13]  | -0.07<br>[0.13]  | 0.06<br>[0.26]  | 0.06<br>[0.26]  | 0.11<br>[0.27]  |
| Add'l Controls  | No                | Yes               | Yes               | No                | Yes              | Yes              | No              | Yes             | Yes             |
| Spouse Controls   | No                | No                | Yes               | No                | Yes              | Yes              | No              | Yes             | Yes             |
| Observations  | 1774              | 1774              | 1774              | 555               | 555              | 555              | 373             | 373             | 373             |
| Adjusted R <sup>2</sup>                                   | 0.49              | 0.49              | 0.50              | 0.26              | 0.26             | 0.26             | 0.12            | 0.12            | 0.13            |
| <b>Panel B: Allowing for Different Effects After 1997</b> |                   |                   |                   |                   |                  |                  |                 |                 |                 |
| $\alpha - \delta$   | -0.39**<br>(7.33) | -0.39**<br>(7.25) | -0.37*<br>(6.60)  | -0.19<br>(0.30)   | -0.22<br>(0.44)  | -0.23<br>(0.46)  | 0.05<br>(0.01)  | 0.09<br>(0.02)  | 0.18<br>(0.08)  |
| $\alpha_{97} - \delta_{97}$                               | 0.30*<br>(6.22)   | 0.30*<br>(6.18)   | 0.29*<br>(5.62)   | 0.13<br>(0.15)    | 0.18<br>(0.25)   | 0.15<br>(0.22)   | -0.04<br>(0.01) | -0.06<br>(0.02) | -0.16<br>(0.09) |
| $\alpha$  | -0.32**<br>[0.09] | -0.32**<br>[0.09] | -0.31**<br>[0.09] | -0.34<br>[0.22]   | -0.36+<br>[0.21] | -0.36+<br>[0.21] | 0.16<br>[0.33]  | 0.17<br>[0.33]  | 0.08<br>[0.37]  |
| $\alpha_{97}$   | 0.21*<br>[0.09]   | 0.21*<br>[0.09]   | 0.21*<br>[0.09]   | 0.24<br>[0.30]    | 0.26<br>[0.30]   | 0.25<br>[0.30]   | -0.08<br>[0.39] | -0.08<br>[0.40] | 0.05<br>[0.47]  |
| $\delta$  | 0.07<br>[0.11]    | 0.06<br>[0.11]    | 0.06<br>[0.11]    | -0.15<br>[0.19]   | -0.14<br>[0.19]  | -0.13<br>[0.19]  | 0.11<br>[0.64]  | 0.08<br>[0.63]  | -0.10<br>[0.70] |
| $\delta_{97}$   | -0.08<br>[0.13]   | -0.09<br>[0.12]   | -0.08<br>[0.12]   | 0.11<br>[0.27]    | 0.08<br>[0.27]   | 0.10<br>[0.28]   | -0.05<br>[0.58] | -0.02<br>[0.58] | 0.21<br>[0.67]  |
| Add'l Controls  | No                | Yes               | Yes               | No                | Yes              | Yes              | No              | Yes             | Yes             |
| Spouse Controls   | No                | No                | Yes               | No                | Yes              | Yes              | No              | Yes             | Yes             |
| Observations  | 1774              | 1774              | 1774              | 555               | 555              | 555              | 373             | 373             | 373             |
| Adjusted R <sup>2</sup>                                   | 0.49              | 0.50              | 0.50              | 0.26              | 0.26             | 0.26             | 0.12            | 0.12            | 0.12            |

Notes: The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. In Panel B,  $\alpha_{97}$  equals one if the father-in-law died on or after 1997, and  $\delta_{97}$  equals one if the mother-in-law died after on or after 1997. F-statistic testing whether we can reject that  $\alpha - \delta = 0$  in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 10, 5 and 1% levels, respectively. All regressions include a cubic in age, education, year indicators, marital status, sector of employment, individual fixed effects and a constant term. Additional controls are years married and health status. Spouse controls are the spouse's age, health status and employment status. The sample is limited to urban men aged 22 to 45.

Table 15: Impact of Father-in-Law's Death on Consumption, Assets and Hours Worked

|                     | HH Food Consumption |         | Log HH Purchases |        | Log Housing Assets |        | Refrigerator Ownership |        | Hours Worked Per Week |        |
|---------------------|---------------------|---------|------------------|--------|--------------------|--------|------------------------|--------|-----------------------|--------|
|                     | (1)                 | (2)     | (3)              | (4)    | (5)                | (6)    | (7)                    | (8)    | (9)                   | (10)   |
| $\alpha - \delta$   | -11.71+             | -11.93+ | -0.11            | -0.12  | -0.18              | -0.15  | -0.08                  | -0.08  | 4.53                  | 4.46   |
|                     | (3.59)              | (3.71)  | (0.77)           | (0.96) | (0.64)             | (0.47) | (1.29)                 | (1.37) | (2.15)                | (2.09) |
| $\alpha$            | -6.94*              | -6.77*  | -0.15+           | -0.15+ | -0.01              | -0.01  | -0.04                  | -0.05  | 1.37                  | 1.40   |
|                     | [3.18]              | [3.17]  | [0.08]           | [0.08] | [0.11]             | [0.11] | [0.04]                 | [0.04] | [1.30]                | [1.30] |
| $\delta$            | 4.76                | 5.16    | -0.04            | -0.03  | 0.17               | 0.14   | 0.04                   | 0.04   | -1.88                 | -1.81  |
|                     | [4.62]              | [4.64]  | [0.09]           | [0.09] | [0.19]             | [0.19] | [0.05]                 | [0.05] | [1.54]                | [1.54] |
| Add'l               | No                  | Yes     | No               | Yes    | No                 | Yes    | No                     | Yes    | No                    | Yes    |
| Obs                 | 2912                | 2912    | 2830             | 2830   | 2191               | 2191   | 2900                   | 2900   | 2890                  | 2890   |
| Adj. R <sup>2</sup> | 0.05                | 0.05    | 0.06             | 0.06   | 0.12               | 0.13   | 0.15                   | 0.15   | 0.04                  | 0.04   |
| Mean                |                     |         |                  |        |                    |        |                        |        |                       |        |
| Dep Var             | 69.77               | 69.77   | 7.74             | 7.74   | 4.61               | 4.61   | 0.68                   | 0.68   | 45.99                 | 45.99  |

Notes: The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. F-statistic testing whether we can reject that  $\alpha - \delta = 0$  in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 10, 5 and 1% levels, respectively. All regressions include a cubic in age, education, province-year indicators, marital status, individual fixed effects and a constant term. In column 1, the dependent variable is household food consumption (measured in kilograms) over three days. Additional controls are years married and health status. The sample is limited to urban men aged 22 to 45.

Table 16: Net Impact of Father's Death on Moving or Attriting

|                         | (1)                | (2)               | (3)               |
|-------------------------|--------------------|-------------------|-------------------|
| $\alpha_L - \delta_L$   | -0.035<br>(0.302)  | -0.035<br>(0.300) | -0.033<br>(0.274) |
| $\alpha_D - \delta_D$   | 0.093<br>(0.622)   | 0.093<br>(0.624)  | 0.094<br>(0.634)  |
| $\alpha_L$              | -0.061+<br>[0.037] | -0.060<br>[0.037] | -0.059<br>[0.037] |
| $\delta_L$              | -0.026<br>[0.055]  | -0.025<br>[0.055] | -0.026<br>[0.056] |
| $\alpha_D$              | 0.083<br>[0.067]   | 0.082<br>[0.067]  | 0.083<br>[0.067]  |
| $\delta_D$              | -0.010<br>[0.061]  | -0.011<br>[0.060] | -0.011<br>[0.061] |
| Additional Controls     | No                 | Yes               | Yes               |
| Spouse Controls         | No                 | No                | Yes               |
| Observations            | 3620               | 3620              | 3620              |
| Adjusted R <sup>2</sup> | 0.173              | 0.172             | 0.172             |

Notes: The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. F-statistic testing whether we can reject that  $\alpha - \delta = 0$  in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 1%, 5% and 10% levels, respectively. The dependent variable is the logarithm of real hourly earnings. All regressions include a cubic in age, education, province-year indicators, marital status, individual fixed effects and a constant term. Additional controls (in columns 2, 3) are years married, an indicator for marriage and health status. Spouse controls (in column 3) are the spouse's age, health status and employment status. The sample is limited to urban men aged 22 to 45.

Appendix Table 17: Net Impact of Father's Death on the Level and Growth of the Daughter's Wages

|                         | Log Hourly Earnings |                  |                  | Growth Rate of Earnings |                   |                   |
|-------------------------|---------------------|------------------|------------------|-------------------------|-------------------|-------------------|
|                         | (1)                 | (2)              | (3)              | (4)                     | (5)               | (6)               |
| $\alpha - \delta$       | 0.006<br>(0.003)    | 0.008<br>(0.004) | 0.006<br>(0.002) | -0.132<br>(0.990)       | -0.116<br>(0.761) | -0.115<br>(0.736) |
| $\alpha$                | 0.092<br>[0.062]    | 0.093<br>[0.062] | 0.092<br>[0.062] | -0.060<br>[0.058]       | -0.051<br>[0.058] | -0.051<br>[0.058] |
| $\delta$                | 0.085<br>[0.094]    | 0.085<br>[0.095] | 0.086<br>[0.095] | 0.072<br>[0.099]        | 0.065<br>[0.099]  | 0.064<br>[0.101]  |
| Additional Controls     | No                  | Yes              | Yes              | No                      | Yes               | Yes               |
| Spouse Controls         | No                  | No               | Yes              | No                      | No                | Yes               |
| Observations            | 2295                | 2295             | 2295             | 1727                    | 1727              | 1727              |
| Adjusted R <sup>2</sup> | 0.446               | 0.445            | 0.446            | 0.164                   | 0.168             | 0.167             |

Notes: The estimate of  $\alpha$  corresponds to the coefficient on *PostFIL* and  $\delta$  to the coefficient on *PostMIL*. F-statistic testing whether we can reject that  $\alpha - \delta = 0$  in parentheses. Robust standard errors clustered by individual in brackets. +, \*, \*\* denotes significance at the 1%, 5% and 10% levels, respectively. The dependent variable is the logarithm of real hourly earnings. All regressions include a cubic in age, education, province-year indicators, marital status, individual fixed effects and a constant term. Additional controls (in columns 2, 3, 5, 6) are years married, an indicator for marriage and health status. Spouse controls (in columns 3, 6) are the spouse's age, health status and employment status. The sample is limited to urban women aged 22 to 45.