

# **Kinship Network and Marriage Stability through Taiwan's Demographic Transition\***

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## **Abstract**

The important effects of kinship on marital relationships have long been examined in depth and thoroughly documented by sociologists; but little evidence has been reported in the literature on economics. This study explores the kinship-related factors that influence the stability of marriage, with a particular focus on the unique characteristics and long-standing traditions of Chinese society. One important finding is that women's traditional functions and kinship network are the main determinants of the marriage outcome of older couples, whereas preconceived notions of family and kinship play a significant role in the success or failure of marriage for younger couples.

***Keywords: marriage, kinship, proportional hazards model.***

# I. Introduction

Most of the time, a marriage is considered not only a relationship between a husband and wife, but also a union of two families. In the context of traditional Chinese society, where the clan is generally valued more than the individual, a marriage is typically a functional link in the chain that connects two different clans. For this reason, although both economic factors and personal characteristics largely determine the stability of a couple's marriage, the families, the relatives, and even the whole clan may also be important determinants of the success or failure of a marriage. Briefly stated, the main objective of this paper is to explore the impact of kinship-related factors on marriage stability and the extent to which this may have changed through Taiwan's demographic transition.

Economists began expressing interest in the behavior of marriage in the 1970s when sociologists had accumulated a rich literature in this field. After many forms of non-monetary behavior-such as fertility, education, politics, and labor-force participation-were successfully analyzed under unified economic framework, economists were confident that marital behavior, with no exception, could also benefit from modern economics. The new perspective brought about by economists is an analogy that compares the marriage market to the job market, stating that in these markets both partners search for the most optimal mate and, if matched, cooperate with each other to produce household goods or commodities. Becker's (1973, 1974) pioneering work characterized the searching rule as comparing gains in either marital status for each potential spouse after taking all expected benefits and costs into account. As a result, marriage gains became the crucial determinants of the formation or dissolution of a

marital union. Becker, Landes, and Michael (1977) extended Becker's (1973, 1974) model to demonstrate that uncertainty and deviations between expected and realized marriage gains are also important in terms of their effects on the risk of divorce.

Weiss (1997) and Lehrer (2003) summarized major sources of marriage gains as specialization in the division of labor, economies of scale, risk pooling, sharing public goods, and positive externalities. The aforementioned benefits, however, were also applied to other types of unions. For a man and a woman to form a marital relationship, there may additionally be a need for sexual attraction and a strong preference for own marriage-specific capital, usually in the form of children. The existence of marriage gains explains why the majority of people choose to marry. Moreover, the level of marriage gains, which varies across couples and over time, determines the duration of a marriage. Previous empirical studies showed that marriage gains depend on both the couple's characteristics and the quality of their match, which include education, earnings capability, age, religion, ethnicity, and many others. Among these findings, little empirical evidence pertaining to kinship-related factors has been documented<sup>1</sup>.

By contrast, the highly-influential role of family members in a couple's marriage has been widely reported in sociology in recent decades. As early as the 1950s, Duvall (1954) proposed that a low level of discord with the spouse's family of origin increases the happiness of the couple. In sociology, the influence of in-laws on a marriage primarily originated from its importance among the members of couples' social networks that are well-

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1 To the best of our knowledge, few studies in the economics literature discuss the influence of family members and cultural tradition on marriage. Burgess, Propper, and Aassve (2003) considered the traditional attitude to be one of the determinants of divorce. This, however, was used only as one of the several control variables, nor did it present any significance in the regressions.

known determinants of the quality of marital relationships (Lewis 1973; Boissevain 1974; Ridley and Avery 1979; Milardo and Lewis 1985). Since in-laws are family ties linked by marriage instead of by blood, many scholars have claimed that these kinds of forced relationships are more likely to give rise to pressures and conflicts between the couple (Boszormenyi-Nagy and Spark 1973; Apter 1986; Berg-Cross 1997). Bryant, Conger, and Meehan (2001) demonstrated that conflicts involving extended family members indeed erode marital satisfaction and stability over time. However, some researchers have opposite opinions on the role of in-laws in marriage. According to family systems theory, Timmer, Veroff, and Hatchett (1995) showed that a close connection with the spouse's family of origin help raise the quality of a couple's marriage. Since building emotional ties with in-laws results in the spouse's perceived integration into a family system, Timmer and Veroff (2000) found that the marriage of a couple where the wife is from divorced parents especially benefits from the wife's closeness to her husband's family.

In sociological research exploring the effects of kinship on marital relationships in Western society, the target of analysis has typically been on the impact of the emotional ties between two partners and their parents-in-law on the likelihood of divorce. However, this kind of analysis has a severe causality problem since a couple's emotional interaction with their in-laws usually affects their satisfaction with their marriage, and vice versa. Bryant, Conger, and Meehan (2001) found that, in the United States, not only does concord with parents-in-law predict marital success at a later period of time, but marital success also predicts less discord with in-laws. Therefore, without adequately dealing with the possible endogeneity, the analysis would produce biased conclusions on the strength/direction of the kinship effects.

To minimize the possibility of causality, our analyses instead focus on the kinship-related factors in regard to their influence on marriage gains. First of all, we hypothesize that a couple who live with in-laws or parents may have larger marriage gains and will therefore have improved stability of their marriage. For example, larger family size implies more specialization in the division of labor, a higher level of economies of scale, more positive externalities, and better risk pooling. Nevertheless, more members living together may also generate more uncertainty and frictions during daily life, which enlarges the difference between expected and realized marriage gains and raises the likelihood of divorce. Consequently, the benefits from co-residence with the elders will be cancelled out to some extent by its negative effects.

The deviation between expected and realized marriage gains could be lessened if each of the two partners were to have more opportunities to get along with the family members of their potential spouse, especially in a traditional society where the clan is more valued than the individual. Similar to the negative impact of co-residence with the elders on a marriage, a detrimental interrelation may also be introduced by these interactions into the couple's marital life. We secondly hypothesize that the level of interaction between the couple and their kin is important in terms of influencing the stability of marital relationships.

The substantial role played by long-standing traditions in Chinese society on marriage also deserves consideration. Weiss (1997) claimed that cultural traditions and social norms support the stability of marriage, especially in a traditional society where the market mechanism is less efficient. Since nowadays Chinese society maintains its traditions in many aspects of the people's lives, we thirdly hypothesize that these items in the context of traditional culture play an important role in the determinants of

marital dissolution for Chinese couples.

For our analysis of marriage, we chose as our focus not the whole of Chinese society but families in Taiwan, partly because the quality data that is available for Taiwan allows us to quantify the kinship-related factors and partly because the rapid demographic transition and economic and social development during the last few decades in Taiwan has generated a variety of different kinship patterns, family structures, and preconceived notions of family and kinship.

Weinstein, Sun, Chang, and Friedman (1990) observed dramatic and persistent changes in the economy, education, communications and transport, health and household amenities during the 1952-1985 period in Taiwan. Besides this, longer life expectancy, a decrease in net reproduction, and more widely practiced effective contraception also characterize modern Taiwan society. Table 1 lists selected economic, social, and demographic statistics in Taiwan during the last several decades. The demographic indicators show that household composition has changed considerably over time. Accompanied by a decreasing percentage of co-residence with the husband's parents, we observe a steady trend toward nuclear families between 1968 and 2006. The remarkable rise in the divorce rate over the last several decades is also worth noticing.

During the process of industrialization and Westernization, the scenario for modern Chinese/Taiwanese couples is found to be much different today from that before, particularly with regard to behavioral patterns between partners and preconceived notions toward family. First of all, men's/women's traditional role at work/home is no longer the standard pattern of the division of labor within a family. The statistics in the "Population and Housing Census" show that the percentage of female primary earners almost doubled from 18.2 percent to 29.2 percent between

Table 1: Selected Statistics in Taiwan, 1968-2006

	1968	1973	1980	1985	1990	2000	2006
Economic indicator -							
GDP per capita (thousand NT dollars)	12.3	26.9	86.3	132.1	218.7	453.4	521.6
Education indicator -							
Percentage of senior high school graduates enrolling in schools of higher education	39.0	37.9	44.6	40.2	48.6	68.7	83.9
Communication and transport indicators -							
Percentage of households w/ telephone	2.4	15.8 <sup>a</sup>	51.1	82.1	93.1	98.0	97.4
Percentage of households w/ automobiles	0.1	1.3 <sup>a</sup>	5.1	11.9	29.1	55.6	59.1
Demographic indicators -							
Average persons per household	5.8	5.5	4.8	4.6	4.2	3.6	3.4
Household composition <sup>b</sup> -							
Nuclear family (%)	35.0 <sup>c</sup>	43.0	50.0	56.0	77.0	76.6	78.9
Stem and joint stem family (w/ husband's parents, %)	57.0 <sup>c</sup>	50.0	45.0	39.0	16.2	15.7	15.7
Stem and joint stem family (w/ wife's parents, %)	3.0 <sup>c</sup>	4.0	3.0	3.0	6.8 <sup>d</sup>	7.5 <sup>d</sup>	5.5 <sup>d</sup>
Joint family (%)	4.0 <sup>c</sup>	3.0	2.0	1.0			
Gross marriage rate <sup>e</sup>	7.5	7.9	9.7	8.0	8.1	8.3	6.3
Gross divorce rate <sup>e</sup>	0.4	0.4	0.8	1.1	1.4	2.4	2.8
Male labor force participation rate (w/ spouse present, %)	- <sup>f</sup>	- <sup>f</sup>	89.0	86.9	84.8	79.0	75.1
Female labor force participation rate (w/ spouse present, %)	- <sup>f</sup>	- <sup>f</sup>	32.2	39.7	42.5	46.1	48.4

Notes: Figures are from the Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Taiwan; Ministry of Education, Taiwan; Department of Household Registration Affairs, Ministry of the Interior, Taiwan.

<sup>a</sup> Reported figures are for 1975 since 1973 data are not available.

<sup>b</sup> Figures for 1965 to 1985 are from Weinstein, Sun, Chang, and Friedman (1990), Table 2, and figures beyond 1985 are from "Population and Housing Census, 1990/2000", and the "Survey of Family Income and Expenditure, 2006". Note that figures from different sources are not comparable.

<sup>c</sup> Reported figures are for 1965 since 1968 data are not available.

<sup>d</sup> Figures are for all other types of household composition, which may include stem and joint stem family (w/ wife's parents) and joint family.

<sup>e</sup> The number of marriages/divorces per 1,000 persons of the mid-year total population within a specific year.

<sup>f</sup> - indicates that data are not available because the "Yearbook of Manpower Survey Statistics" was not compiled until 1978.

1990 and 2000. Second, the percentage of Chinese people who lay emphasis on traditional norms toward family and marriage has been decreasing across cohorts. For example, figures in the "Survey on Social Development Trends, 2006"<sup>2</sup> show that 47.1 percent of people who are aged 60 or above

2 Conducted by the Directorate-General of Budget, Accounting and Statistics, Executive Yuan - Central Region Office, Taiwan.



have children for the reason of lineage preservation, compared to only 12.4 percent of people who are 20 to 29 years old. We suspect that the decreasing degree of traditionalism may well be correlated to different marital behaviors between the older and younger cohorts.

The important finding of this paper is that we discovered significant and measurable differences between the older and younger cohorts in terms of behavioral patterns of marriage. Women's traditional functions and kinship networks play a significant determining role in the success of the marriage of the older cohort. For younger married couple's, however preconceived notions of family and kinship are major factors in determining the marital outcome.

Our major contribution is that we shed new light on the role of kinship-related factors in the marital relationships using economic analytical tools. This study extends the divorce research to cover additional cultural, social, and familial factors, along with the long-discovered economic factors and personal characteristics in the economics literature. Using an alternative economic point of view, our analysis nonetheless emerges with findings similar to those of sociology, and hence reinforces support for the importance of kinship on marriage stability.

In the next section, we describe the econometric framework we employ in our analysis. In Section 3 we discuss the data and variables; and in Section 4 we present the empirical results. Finally, the last section reviews the conclusions we draw.

## II. Empirical Framework

Most of earlier studies of marriage stability adopted the logit model to estimate the effects of explanatory variables on the probability of divorce in a fixed period of  $n$  years (Ross and Sawhill 1975; Becker, Landes, and Michael 1977; Michael 1979). More recent research, however, has instead primarily used hazard models that deal with the problem of data censoring, because the end of marriage is in fact unknown for those who are still married on the survey date.

By the format of data, hazard models can be divided into two groups: discrete-time models and continuous-time models. When researchers are interested primarily in the effect of time-varying covariates—such as the wage rate, benefit receipts, or educational level in each period—the discrete-time hazard models are good choices, given the availability of data (South and Spitze 1986; Hoffman and Duncan 1995; Burgess, Propper, and Aassve 2003).

In other cases, if discrete-time data is unavailable and the effects of time-varying factors are not the center of the analysis, then the continuous-time hazard models are usually employed (Lehrer 1988; Lehrer and Chiswick 1993; Georgellis 1996). The continuous-time hazard models can be further categorized into parametric models (Weibull, log-logistic, Gompertz, etc.) and the semi-parametric model (Cox proportional hazards model). Parametric models and semi-parametric model differ in the assumption about the shape of the baseline hazard.

Our major concern is the kinship-related factors that are only from the first-year survey for each group of sample; therefore, this study deals with time-constant variables. The Cox proportional hazards model is adopted in

this analysis. As Tuma and Michael (1985) put it, when compared with binary response models, the Cox proportional hazards model provides a better fit of duration data and a more powerful way of testing hypotheses regarding the impacts of the explanatory variables. The strength of the Cox model over parametric models is that it can estimate the relationships between the hazard rate and the covariates in a very general sense without specifying an arbitrary functional form for the baseline hazard, which avoids possible misspecification problems.

The focus of the duration analysis, or survival time, is defined here as the years between the date of the respondent's wedding and her/his "divorce in practice" (which includes a legal divorce or a separation). Let  $T$  be the duration of the marriage, which is a non-negative random variable. We denote  $t$  as a particular value of  $T$ . Then the distribution of  $T$  can be expressed as the probability density function  $f(t)$ , and its cumulative distribution function  $F(t) = P(T \leq t)$ .  $F(t)$  is also known as the failure function. The survival function  $S(t)$  and the hazard function  $\lambda(t)$  are defined as:

$$S(t) \equiv 1 - F(t) = P(T > t); \tag{1}$$

$$\lambda(t) = \lim_{h \rightarrow 0} \frac{P(t \leq T < t+h | T \geq t)}{h}; \text{ and} \tag{2}$$

$$= \lim_{h \rightarrow 0} \frac{F(t+h) - F(t)}{h} \cdot \frac{1}{S(t)} = \frac{f(t)}{S(t)} = -\frac{d \log S(t)}{dt}. \tag{3}$$

For each  $t$ ,  $\lambda(t)$  represents the instantaneous rate of getting divorced per unit of time. By integrating  $\lambda(t)$ , we have the relationship between the hazard function  $\lambda(t)$  and the survival function  $S(t)$ :

$$S(t) = \exp\left[-\int_0^t \lambda(s) ds\right], t \geq 0. \tag{4}$$

Given the proportional hazard specification, the hazard function can be expressed by:

$$\lambda(t, \mathbf{X}_i) = \lambda_0(t) \exp(\beta' \mathbf{X}_i), \quad (5)$$

where  $\lambda_0(t)$  is the baseline hazard;  $\beta$  is a vector of the coefficients to be estimated; and  $\mathbf{X}_i$  is the set of covariates. Note that  $\beta$  measures semielasticity which is the percentage change in the hazard rate with respect to a one-unit change in the explanatory variable. If  $X_k$  is a continuous variable, by taking the log on both sides, we have the equation for  $\beta$ . That is:

$$\beta_k = \frac{\partial \log \lambda(t, \mathbf{X})}{\partial X_k}. \quad (6)$$

Cox (1972) proposed a partial likelihood method to efficiently and consistently estimate  $\beta$ . Unlike the maximum likelihood estimation, the Cox procedure works in terms of the ordering of events/(failures) instead of duration spells. Supposing  $\mathfrak{R}_{it}$  represents the risk set, that is, for all observations where the persons involved have not experienced divorce and have not been censored by the survey date or the death of a spouse, then the probability that person  $i$  is divorced (the  $m$ th failure) at time  $t_i$  is:

$$L_m = \frac{\lambda(t_i) \exp(\beta' \mathbf{X}_i)}{\sum_{j \in \mathfrak{R}_{it_i}} \lambda(t_i) \exp(\beta' \mathbf{X}_j)} = \frac{\exp(\beta' \mathbf{X}_i)}{\sum_{j \in \mathfrak{R}_{it_i}} \exp(\beta' \mathbf{X}_j)}. \quad (7)$$

The partial likelihood for the whole sample is the product of these probabilities over total  $M$  failures; that is:

$$PL = \prod_{m=1}^M L_m = \prod_{m=1}^M \frac{\exp(\beta' \mathbf{X}_i)}{\sum_{j \in \mathfrak{R}_{it_i}} \exp(\beta' \mathbf{X}_j)}. \quad (8)$$

### III. Data and Variables

Our data are from the recently available "Panel Study of Family Dynamics (PSFD)" survey. The PSFD project is a panel dataset for family studies in Taiwan; it is being undertaken with the support of the National Science Council and the Chiang Ching-Kuo Foundation for International Scholarly Exchange. Its advisors include Gary Becker, James Heckman, Robert Hauser, Cheng Hsiao, and Ronald Lee.

The interviews began in 1999, when 999 randomly sampled Taiwanese between 36 and 45 years of age were first surveyed in person. An additional 1,958 Taiwanese aged 46-65 were first surveyed in 2000. Since the first interview, all observations have been followed up on an annual basis. Core questions-such as employment status, marital status, and residential arrangement-are surveyed annually; additional questions that focus on particular topics change from year to year.

The PSFD project is beneficial to family studies because the respondents were required to provide information regarding their spouse, parents, children, and siblings, which enables us to use the family instead of a single husband or wife as the unit of observation. Since the personal characteristics and kinship-related variables were surveyed mainly in the first year of the interview, we employ the data collected in the 1999/2000 survey for the first/second group of sample.

In addition, supplementary data containing the respondents' complete history with respect to marriage, fertility, and co-residence practices were collected in only the 2003 survey. These are used to elicit the number and gender of children born during the current (and previous) marriage and to extract data on the duration of the marriage and co-residence. Since most of

Table 2: Characteristics of the Variables by Cohort<sup>a</sup>

	Total	Older Cohort		Younger Cohort	
	Obs	Obs	Mean	Obs	Mean
Divorced	2,224	1,721	3.14	503	3.98
Separated or divorced	2,224	1,721	3.95	503	3.98
Complete marriage duration (yrs)	88	68	17.18	20	7.65
Censored marriage duration (yrs)	2,136	1,653	30.24	483	13.05
Female respondent	2,224	1,721	57.52	503	40.36
Husband's education (yrs)	2,192	1,693	8.18	499	11.84
Wife's education (yrs)	2,200	1,704	6.38	496	11.28
Difference between husband's age and wife's education (yrs)	2,168	1,676	1.78	492	0.55
Husband's age in the first interview (yrs)	2,195	1,697	59.46	498	45.95
Wife's age in the first interview (yrs)	2,192	1,697	55.28	495	42.20
Difference between husband's age and wife's age (yrs)	2,163	1,673	4.28	490	3.81
Respondent previously married	2,224	1,721	0.41	503	4.37
Husband's age at the most recent marriage (yrs)	2,195	1,697	26.26	498	30.0
Wife's age at the most recent marriage (yrs)	2,192	1,697	22.01	495	26.24
Having children prior to the most recent marriage	2,224	1,721	19.17	503	15.11
Not having children in the most recent marriage	2,224	1,721	1.92	503	7.16
Traditional wife's functions					
No son born	2,224	1,721	7.15	503	22.27
Wife quits her job because of marriage	2,214	1,713	42.09	501	36.13
Kinship network					
Ways of meeting the most recent spouse	2,194	1,701		493	
By themselves			32.45		45.03
By being introduced by kith and kin <sup>b</sup>			33.57		41.38
Via match making			33.98		13.59
Co-residence experience	2,191	1,704		487	
None			30.9		43.12
Have always lived with husband's parents			15.38		27.10
Sometimes live with husband's parents <sup>b</sup>			48.59		24.85
Other cases			5.11		4.93
Attendance at family grave visits	2,210	1,709	78.35	501	77.84
Attendance at Chinese Lunar New Year dinner	2,213	1,711	81.82	502	86.85
Preconceived notions of family and kinship					
Bring the clan honor	2,220	1,717	35.00	503	41.55
Accomplish parents' wishes	2,216	1,716	29.55	500	23.80
Preference for son	2,220	1,718	38.36	502	31.08
Couple's separate functions	2,221	1,718	44.12	503	39.56
Traditional attitude toward the interaction of spouse and her/his family	2,224	1,721	29.40	503	17.50

Notes: Numbers in this table represent percentages if not specified otherwise.

<sup>a</sup> Couples who married after 1981 comprise the younger cohort; otherwise, they belong to the older cohort.

<sup>b</sup> This group is used as the reference group.

the demographic and kinship-related data cover only the most recent spouse, our study focuses on the respondents' most recent marriage.

After excluding never-married individuals and respondents with missing marriage information, we include only 2,224 out of 2,957 observations in our analysis. Using 1981 as the dividing year for the date of marriage<sup>3</sup>, we define the older cohort as those who married in or prior to 1981 and the younger cohort as those who married after 1981<sup>4</sup>. The descriptive statistics in Table 2 show that the average age of the older cohort is about 13 years greater than that of the younger cohort. Also, the younger cohort has a higher (legal) divorce rate than the older one, which mirrors current demographic data. However, sometimes marriage failure does not end in a legal divorce. In a conservative Chinese society, divorce is often considered too shameful for society at large to accept; hence, people with more traditional mores may functionally cease the marriage by living apart. To eliminate the possibility of underestimating the percentage of marriage failures, we measure "divorce in practice" as being the case when the husband and wife in such cases begin to live apart. The percentage of marital failures measured as "divorce in practice" is very similar in both cohorts.

Lehrer (1988) categorized factors that lead to marriage failure into

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- 3 Weinstein, Sun, Chang, and Friedman (1990) indicated that 1980-1985 was "a period of continuing rapid social, economic and demographic change" in Taiwan. We try to use different years to divide the younger and older cohorts. The more recent years, 1982-1985 in our case, generate fewer observations that belong to the younger cohort, which makes regression results more sensitive to the specifications of the model. Compared with 1980, using 1981 as the dividing year results in slightly better goodness-of-fit measures in the regression results. However, both years produce relatively robust conclusions.
  - 4 To mitigate the impact of delayed marriage on dividing cohorts by the date of marrying, we include "husband's age at marriage" or "wife's age at marriage" to control for its effect on divorce probability. Though the age of husband or wife is an alternative way to divide cohorts, it is not convincing that two couples with same age difference but belong to different cohorts because one with older husband and the other with older wife.

three groups. The first encompasses factors that affect the gains from marriage. In accordance with Becker's (1973, 1974) pioneering economic model of marriage, gains from marriage are positively related to the relative difference in the partners' individual wage rates and their degree of assortative mating for traits. Factors in the second group influence the length of the process of searching for a mate in the marriage market. Age at marriage is used as the proxy for the duration of the search for a marital partner. The cost of divorce is the third and last set of possible determinants of the success of a marriage. The more capital, such as children, that is accumulated during a marriage, the higher the opportunity costs of a divorce. Therefore, the chances of marital failure may be lower when the opportunity costs of divorce are high. To facilitate a parallel comparison, we select similar explanatory variables to those used in previous studies. Table 2 summarizes the descriptive statistics of the relevant variables by cohort. Since it is hard to choose income at any specific point in time to proxy for earning ability over a long duration, we use educational attainment instead because it is an important determinant in the wage equation<sup>5</sup>. In addition, we use the age gap between the husband and wife to proxy for differences in their personal characteristics<sup>6</sup>. People who differ in age are more likely to have their own distinct childhood background, schooling experience, philosophy on life, and so on. Therefore, we hypothesize that positive assortative mating in relation to age corresponds to positive assortative

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- 5 Burgess, Propper, and Aassve (2003) use real earnings in different years to estimate long-run fixed effect earnings, which would be a good alternative to proxy earning ability. However, we did not select this because in the PSFD survey there were too many missing values for respondents' past earnings information, such as earnings in the first job and earnings in the beginning of the marriage.
- 6 Our research is restricted to the availability of the spouse's personal information. Respondents are more likely to refuse to answer questions regarding their former spouse. Moreover, the more detailed the interview questions, the greater tendency for people not to respond.



mating in relation to personal characteristics.

In addition to economic factors and personal characteristics, our study further delves into possible determinants of marriage stability from the point of view of kinship are also examined. By quantifying kinship network, traditional female responsibilities, and preconceived notions of family and kinship, we are able to investigate how these variables separately influence the marriage of the older and younger cohorts. Table 3 lists the detailed definitions of all the kinship-related variables we use in our analysis<sup>7</sup>.

Given the Chinese patrilineal family system, living with the husband's parents has traditionally been the predominant pattern of co-residence. For diverse reasons, however, more and more couples now choose to live by themselves or with the wife's parents for diverse reasons. Our data also exhibit differences in the residential arrangements during marital life between the two cohorts. As concerns the histories of co-residence, we divide our sample into four groups: no co-residence history at all throughout the marriage, living with the husband's parents throughout the marriage, sometimes living with the husband's parents, and all other cases (including co-residing with the wife's parents or other relatives).

The way of meeting a spouse and frequency of attending family

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7 It is worth noting that kinship-related variables in Table 3 are used to measure other concepts in sociology. For example, the division of domestic labor is usually explained by sociologists as the reflection of marital power that is determined by the amount of resources owned by the husband and wife and their gender ideologies (Rodman 1972, Xu and, Lai 2002). Economics, however, adopt the concept of comparative advantage to analyze the division of labor within households. In a traditional society, the pattern whereby the husband is responsible for earning a living and the wife is charged with household duties always promises an optimal division of domestic labor because men were much more educated than women in olden times. In more modern times, the traditional pattern of division of labor may not be optimal because female educational attainments have increased to a large extent. To save space, we will not list each of the differences in terms of the usage of kinship-related variables between sociology and economics. Our explanation and analysis of those kinship-related variables are all based on an economic point of view and we follow Becker's (1973, 1974) and Weiss's (1997) discussion.

Table 3: Definitions of Kinship-Related Variables

Variable	Definition
<b>Kinship network</b>	
Way of meeting the most recent spouse	
By themselves	=1 if the couple met each other at school, workplace, or other place
By being introduced by kith and kin	=1 if the couple met each other by being introduced by kith and kin
Via match making	=1 if the couple got married via match making arranged by parents or relatives
<b>Co-residence experience</b>	
None	=1 if the couple do not have any co-residence experience throughout the marriage
Have always lived with husband's parents	=1 if the couple have co-resided with husband's parents throughout the marriage
Sometimes live with husband's parents	=1 if the couple co-reside with husband's parents during part of duration of marriage
Other cases	=1 if the couple co-reside with wife's parents or other relatives
Attendance at family grave visits	=1 if the respondent answered that (s)he frequently attends family grave visits <sup>a</sup>
Attendance at Chinese Lunar New Year family dinner	=1 if the respondent answered that (s)he frequently attends Chinese Lunar New Year family dinner <sup>a</sup>
<b>Traditional wife's functions</b>	
No son born	=1 if the couple do not have a son, whether or not in the most recent marriage
Wife quits her job because of marriage	=1 if a wife quits her job because of marriage or does not have a job at the time of marrying
<b>Preconceived notions of family and kinship</b>	
Bring the clan honor	=1 if the respondent gave the question that doing something to bring the clan honor a score of 5 <sup>b</sup>
Accomplish parents' wishes	=1 if the respondent gave the question that accomplishing parents' wishes even if those wishes go against his(her) own will a score of 5 <sup>b</sup>
Preference for son	=1 if the respondent gave the question that having a son to sustain the bloodline a score of 5 <sup>b</sup>
Couple's separate functions	=1 if the respondent gave the question that the husband should be responsible for earning a living and the wife should be charged with staying home for household duties a score of 5 <sup>b</sup>
Traditional attitude toward the interaction of spouse and her/his family	=1 if a male respondent gave the question that married women should visit their original family frequently a score of 1 or 2, or if a female respondent gave the question that a married son should live with his parents a score of 4 or 5 <sup>b</sup>

<sup>a</sup> There are three answers to this question: "never", "sometimes", and "frequently".

<sup>b</sup> The five scores, 1 to 5, indicate the level of importance: "not important," "a little important," "somewhat important," "quite important," to "absolutely important" respectively.

functions are selected to sketch the interaction patterns of the couple and their kin. In a traditionally closed society, most men and women get married via match making arranged by parents or relatives, and the choice of marriage partner is made by the parents rather than the marriage partners themselves. In recent times, people have had more freedom to choose their own marriage partner, and their families of origin may not be acquainted with each other before marriage. Besides the above two cases, couples may know each other through the introduction of their kin, which demonstrates a premarital overlapping social network between the partners. We therefore divide the ways in which respondents meet their spouses into three categories: via match making, by being introduced by kith and kin, and meeting by themselves. Variables that examine whether respondents frequently attend family functions include the Chinese Lunar New Year family dinner and commemorative visits to graves. Generally speaking, and not particularly surprisingly, the summary of the statistics shows that kinship occupies a larger part of marital life for the older cohort than the younger one. We also examine if there is any correlation between the more relaxed kinship network of today and behavior patterns with respect to marriage.

The last group of kinship-related variables is used to measure the level of traditionalism of the respondents. Since traditionalism is difficult to quantify, we adopt various indicators, including selected behavioral patterns and traditional norms toward marriage and family, to measure the degree of traditionalism. The requirements for a virtuous wife in the old Chinese society are used as the indicators of traditional behavioral patterns for the reason that familial norms—such as the "three abidance", "four virtues", and "seven rules of discarding wives" are set only for women. The most important duty for a married woman is lineage preservation, which refers to

the expectation that the husband will have at least one son to sustain the bloodline. Another expectation of the husband's family is that the daughter-in-law be fully committed and eager to care for her parents-in-law. We define a traditional wife as one who quits her job because of marriage<sup>8</sup>. As long as a wife fulfills her responsibilities, she is recognized as dutiful, and her marriage is safeguarded by the traditional ethical system. In modern times when individualism tends to dominate the family-centered system, the two partners' feelings and needs for each other have gradually replaced the traditional functions of a woman as the major factor that keeps the partners satisfied and their marriage together. We postulate that the impact of the wife's traditional functions should be greater on the older cohort than the younger one.

For preconceived notions of family and kinship, five dummy variables examine the degree of traditionalism and capture the differentials between the two cohorts<sup>9</sup>. The first two measure how traditional the respondents' attitude is toward their clan and parents. We propose that people rooted deeply in traditional norms attach more attention to the needs of the clan. Moreover, the requirement of blind obedience to parents in filial piety is less valued by the Westernized younger cohort than by the older cohort. In the survey questionnaire, the respondents are asked how important they think it is for them to do something to bring their clan honor and for them to accomplish their parents' wishes even if those wishes go against their own will. Since people usually tend to give positive answers to moral questions,

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8 To the question of whether they quit their job because of marriage, some family-centered women would answer "no" because they did not work at all before marriage. Women in these cases are also categorized as traditional wives.

9 To diminish the possibility that marital outcome may influence the couples' attitude toward preconceived notions of family and kinship, we chose preconceived notions that are less correlated with the couple's emotional feelings.

we define dummy variables equal to 1 if the respondent's choice is absolutely important, and 0 otherwise.

The third and fourth variables concern traditional norms toward gender ideologies: the preference for a son over a daughter and the concept of the couple's individual, clearly defined functions. A dummy variable is set to 1 if the respondent thinks having at least one son is absolutely important. Another dummy is used to indicate if the respondent thinks that the husband should be responsible for earning a living and the wife should be charged with staying home for household duties. The fifth variable considers the respondents' attitude toward the interaction between their spouse and the spouse's family of origin. Traditional familial notions refer to a married daughter as an "outsider" and do not validate frequent contacts between a wife and her family of origin. On the other hand, a couple's co-residence with the husband's parents is a normative living arrangement. This unequal attitude toward interaction between the spouse and his/her family of origin represents the extent of traditionalism on familial values in the Chinese cultural context. A dummy variable equals 1 if a male respondent thinks it is not important for a married woman to frequently visit her birth family or if a female respondent thinks that it is important for a married son to live with his parents. Since only one partner in each couple is surveyed, we also include the interaction terms between the gender indicator and all perception variables to distinguish the perceptions of a husband from those of a wife. Perception variables capture several aspects of traditional attitudes toward kinship. Our data show a trend toward decreased traditionalism across cohorts<sup>10</sup>.

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10 The variable "bring the clan honor" represents a much higher percentage in the younger cohort. A possible explanation is that the higher propensity to "bring the clan honor" in the younger cohort may imply a more aggressive attitude toward their own career.

## IV. Results and Discussion

The empirical results for the older and younger cohorts are presented in Tables 4 and 5, respectively. For each cohort, we run regressions with the three different specifications to test the effects of diverse aspects of kinship on marriage. The first specification focuses on the impact of the kinship network, while the second and third specifications focus on differentials between cohorts in terms of the impact of a wife's traditional responsibilities and preconceived notions of family and kinship on marriage. Indeed, our results uncover different patterns of marital behavior in the two cohorts, and we discuss this in more detail below.

Aside from the kinship-related variables, several economic factors and personal characteristics have their own important influences on marriage stability. For both cohorts, people who search for a partner in the marriage market for a longer period of time are evidently less likely to divorce. Similar to the findings in the previous literature (Lehrer 1988; Lehrer and Chiswick 1993; Lyngstad 2006), we find that wives, and equally husbands, who are older at the time of marriage have a higher chance of success at marriage. Interesting too, the results also reveal the significance of the husband's education, which does have a different impact on the marriages of the older cohort compared with that of the younger cohort. In the older cohort the higher the education level attained by the husband, the greater the likelihood that the couple will divorce; this is opposite to the finding in most previous studies<sup>11</sup>. Intuitively, the higher educational attainment, used as the proxy for higher income, is an attractive quality and commonly indicates a

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11 See South and Spitze (1986); Hoffman and Duncan (1995), Weiss and Willis (1997), and Burgess, Propper, and Aassve (2003).

higher standard of living, both of which should make marriage more satisfying (positive effect). However, men with a relatively higher income may also be more prone to having extra-marital affairs, or even to marrying several spouses (formally or informally), therefore making his spouse less satisfied and having a negative effect on marriage. Because the negative correlation between the husband's level of education and the success of marriage is only significant only among the older cohort, we conjecture that the dominant negative income effect on marriage may be attributed to the traditional polygamous custom of the past. In more modern times, the polygamous custom has less of a hold, meaning that the two contradictory income effects may cancel each other out; this results in its being insignificant in the younger cohort. We also find that in the younger cohort, compared with people who have only one marriage experience, those who have married twice face a significantly higher possibility of failing in their second marriage<sup>12</sup>. Since the dummy variable indicating whether having children born prior to the current marriage is included in our regressions, the significantly negative impact of the previous marriage on the current marital relationship causes us to conjecture that it is very likely to stem from those individuals' unpleasant personalities<sup>13</sup>. None of the other factors related to personal characteristics, such as differences in education/age, shows a significant influence in our regressions<sup>14</sup>.

Turning to the major focus of our study, the first group of kinship-

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- 12 A very few observations in the old cohort have married twice, which results collinearity of this variable with the censor variable; hence, its coefficient is not able to be estimated.
- 13 There is ample empirical evidence to support the view that a previous marriage has a negative impact on marital stability. See Lehrer and Chiswick (1993), and Weiss and Willis (1997).
- 14 An anonymous referee suggests the insignificance of the differences in education may be due to its highly correlation with the husband's education. Several tests, such as correlation coefficient (0.3145), VIF (1.11), Tolerance (0.9011), and CI (4.8501), are used to measure the level of collinearity. The results show that the collinearity between these two variables is weak.

Table 4: Regression Results for the Older Cohort

	Spec. 1	Spec. 2	Spec. 3	
Observations	1,616	1,647	1,639	
Husband's education	0.09 (0.04)**	0.10 (0.04)**	0.09 (0.04)**	
Difference between husband's and wife's education	-0.08 (0.05)	-0.07 (0.05)	-0.07 (0.05)	
Difference between husband's age and wife's age	-0.06 (0.04)	-0.06 (0.04)	-0.05 (0.04)	
Wife's age at the most recent marriage	-0.17 (0.05)**	-0.19 (0.06)**	-0.19 (0.06)**	
Having children prior to the most recent marriage	-0.05 (0.41)	0.00 (0.40)	0.05 (0.41)	
Not having children in the most recent marriage	1.09 (1.06)	0.59 (1.05)	0.57 (1.05)	
Kinship network				
Way of meeting the most recent spouse				
By themselves	1.05 (0.41)**			
By being introduced by kith and kin <sup>a</sup>	- -			
Via match making	0.83 (0.44)*			
Co-residence experience				
None	0.37 (0.35)			
Sometimes live with husband's parents <sup>a</sup>	- -			
Have always lived with husband's parents	0.83 (0.37)**			
Other cases	-0.59 (1.03)			
Attendance at family grave visits	-0.83 (0.33)**			
Attendance at Chinese Lunar New Year family dinner	-0.66 (0.34)**			
Traditional women's functions				
No son born		1.12 (0.40)**	1.19 (0.41)**	
Wife quits her job because of marriage		0.19 (0.28)	0.19 (0.28)	
Preconceived notions of family and kinship			Single	Interaction <sup>b</sup>
Bring the clan honor			0.29 (0.45)	0.02 (0.63)
Accomplish parents' wishes			-0.83 (0.58)	1.33 (0.74)*
Preference for son			0.34 (0.44)	-0.50 (0.63)
Couple's separate functions			-0.05 (0.43)	-0.35 (0.58)
Traditional attitude toward the interaction of spouse and her/his family			0.27 (0.49)	-0.64 (0.64)
Log-likelihood	-335.62	-356.17	-352.66	
Likelihood ratio test	45.69	21.21	27.66	

Notes: \* and \*\* indicate significance at the 10% and 5% levels, respectively. Standard errors are in parentheses.

<sup>a</sup> This group is used as the reference group.

<sup>b</sup> This column presents the coefficients for the interaction terms between perception variables and the female indicator.



Table 5: Regression Results for the Younger Cohort

	Spec. 1	Spec. 2	Spec. 3	
Observations	467	487	484	
Husband's education	0.09 (0.11)	0.14 (0.11)	0.13 (0.12)	
Difference between husband's and wife's education	-0.06 (0.15)	-0.09 (0.13)	-0.04 (0.14)	
Difference between husband's age and wife's age	-0.04 (0.08)	-0.03 (0.08)	-0.02 (0.08)	
Wife's age at the most recent marriage	-0.11 (0.09)	-0.12 (0.08)	-0.18 (0.09)**	
Previous marriage experience	2.48 (1.37)*	1.89 (1.37)	2.41 (1.52)	
Having children prior to the most recent marriage	-1.37 (1.27)	-1.89 (1.51)	-2.03 (1.58)	
Not having children in the most recent marriage	1.84 (1.01)*	2.03 (1.13)*	2.84 (1.23)**	
Kinship network				
Way of meeting the most recent spouse				
By themselves	1.06 (0.66)			
By being introduced by kith and kin <sup>a</sup>	-			
Via match making	0.61 (0.82)			
Co-residence experience				
None	1.52 (1.08)			
Sometimes live with husband's parents <sup>a</sup>	-			
Have always lived with husband's parents	1.49 (1.13)			
Other cases	1.59 (1.43)			
Attendance at family grave visits	-0.18 (0.67)			
Attendance at Chinese Lunar New Year family dinner	1.00 (1.14)			
Traditional women's functions				
No son born		-0.53 (0.78)	-0.59 (0.84)	
Wife quits her job because of marriage		0.42 (0.56)	0.76 (0.60)	
Preconceived notions of family and kinship			Single	Interaction <sup>b</sup>
Bring the clan honor			-0.60 (0.83)	2.85 (1.20)**
Accomplish parents' wishes			0.13 (0.87)	-0.82 (1.50)
Preference for son			2.10 (0.81)**	-2.25 (1.25)*
Couple's separate functions			-1.05 (0.85)	-0.30 (1.42)
Traditional attitude toward the interaction of spouse and her/his family			1.92 (0.86)**	-2.67 (1.46)*
Log-likelihood	-75.44	-83.85	-75.97	
Likelihood ratio test	14.20	10.52	26.17	

Notes: \* and \*\* indicate significance at the 10% and 5% levels, respectively. Standard errors are in parentheses.

<sup>a</sup> This group is used as the reference group.

<sup>b</sup> This column presents the coefficients for the interaction terms between perception variables and the female indicator.

related variables we examine is the kinship network. In our analysis, the changing kinship network has different impacts on the older and younger cohorts. Almost all of the variables of this group show significant effects on the older couples' marriage; but none of them seem to play a determining role in the marriage outcome of the younger cohort. First, the way of meeting the current spouse evidently does matter. We find people who meet their marital partners by being introduced by kith and kin have about half the risk of divorce of their counterparts who choose their mates by themselves or who find a spouse through match making. This implication here is that the couples' overlapping social network, which provides the setting for them to meet before marriage, is beneficial as it contributes to marital stability. Not to be ignored, however, is that parental control over the marriage decision that is too strong or linkages among the couple's relatives that are too few before the marriage increase the risk of a failed marriage. The co-residence arrangements during marital life also have an effect on the likelihood of success in marriage. We find that couples that have lived with the husband's parents throughout their marriage have about a 90 percent higher divorce rate compared to couples that sometimes lived with the husband's parents. Couples with no experience living with their parents and parents-in-law also appear to have an increased probability of divorce, but it is not significant. In essence, it appears that a moderate level of interaction between a married couple and the husband's parents is beneficial to the marriage; it is worth bearing in mind, however, that outsiders' being too closely involved is more likely to generate discord in the marital union. Finally, the evidence indicates that frequent attendance at family functions has a positive impact on a marriage, which is fully consistent with our hypothesis. Those who usually attend family grave visits and the family's Chinese Lunar New Year dinner exhibit less of a tendency to fail at

marriage.

We examine the impact of the long-held traditional functions of the wife on marriage stability in the second specification. Comparing the older and younger cohorts, it is clearly apparent that, for the older cohort, not having a son is a major factor in failed marriages; by contrast, for the younger cohort, not having their own child is the main factor in failed marriages. This reflects the decaying significance of the preference for a son in modern Taiwanese society. It should be noted, nevertheless, that the correlation between increased risk of divorce and not having a child may possibly be the result of reverse causality. The second function of women does not have an important influence on marriages in either cohort. It may well be that requiring women to stay at home is no longer considered reasonable and that the wife's labor income is more and more important to cover family's expenditures. Thus, that a wife holds a job outside the home is evidently not a reason for a failed marriage in either cohort.

The last specification focuses on the impact of various preconceived notions of family and kinship. Both single terms of all perception variables and their interaction terms with the gender indicator are included. In stark contrast to the findings for kinship networks, many of the perception variables are found to be significant in the regressions for the younger cohort but not for the older one. For the younger group, the results attest to the fact that a male with an extremely strong preference for a son and a negative attitude toward the interaction of his spouse and her family of birth has a higher chance of divorce, while a female with the same preference for a son and a positive attitude toward co-residence of her husband and his family helps make a marriage more successful, and thus, stable. Since these two perceptions measure, at least to some extent, the traditionalism of the husband and wife, the results strongly imply that a husband/wife with a very

traditional mindset in modern society has a greater/lower probability of failing in marriage; this seems to echo public sentiment. Over the sharp, almost drastic, social and economic transition in Taiwan, most young women have progressed dramatically from the more classical concepts and behavior, whereas most men have remained relatively traditional. Thus, a traditional husband is more likely to be in conflict with his wife if she is relatively "modern"; but a traditional wife is, in all likelihood, always satisfied with her husband. The finding for the variable concerning attachment to the clan is somewhat counter-intuitive.

We find that the marriage of a wife who has more of an incentive to bring the clan honor is more likely to end in divorce, while for a husband, the opposite holds. We conjecture this variable would be better explained by the woman's attitude toward her career. Women with an aggressive attitude toward their own career in a relatively conservative society usually have conflicting interests, i.e., family versus work; to be sure, this would dampen their satisfaction with their marriage<sup>15</sup>. Men, on the other hand, do not usually have such a problem given that a successful man is commonly considered a plus to a marriage<sup>16</sup>. Finally, the desire to accomplish parents' wishes and the perception vis-a-vis the couple's pre-ascribed, separate functions are not found to be significant determinants; the latter finding corresponds to our earlier results pertaining to women's second function.

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15 A career-centered wife with higher earnings capacity helps raise the standard of living and then stabilizing her marriage. On the other hand, an aggressive attitude toward her own career for a woman may also produce pressures and frictions with her husband, which will increase the probability of divorce. It is found that the latter effect (negative effect) is larger than the former. The author is grateful to an anonymous referee for comments about this.

16 Our conjecture echoes the empirical findings pertaining to the impact of male/female earnings capacity on marriage. The husband's earnings capacity is usually beneficial to marriage, while the wife's sometimes has a negative effect on marital stability.

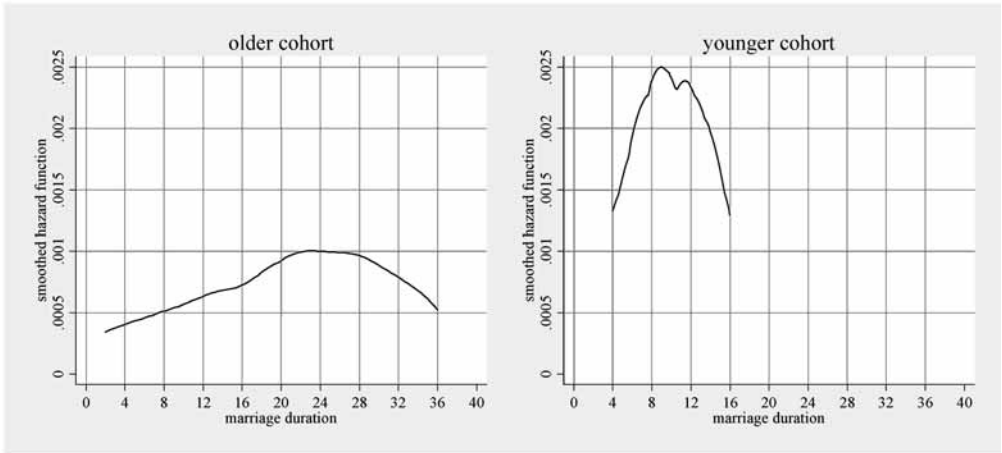


Figure1: Estimated hazard functions for both the older and younger cohorts

Before closing the discussion of regression results, we would like to explore the differences of the shape of hazard functions between the older and younger cohorts. Since the Cox model does not make any assumption about the functional form of the baseline hazard, we are unable to calculate the duration dependence or the mean/median marriage duration by a specific closed form. However, we may still get some ideas pertaining to the shape of the hazards by graphing the smoothed hazard functions.

Figure 1 shows the smoothed hazard functions for both the older and younger cohorts<sup>17</sup>. It is clear that the estimated hazards of the younger cohort are always higher than those of the older counterpart. In addition, the highest probability of marital breakup for the younger cohort occurs in the ninth year of their marriage, while that of the older cohort occurs in the twenty-fourth year.

17 The estimated smoothed hazard functions are evaluated at the mean of all continuous covariates and at the value of zero of all dummies. In addition, the smoothed curves of hazard functions are plotted by using the usual smoothing kernel technique, which may encounter bias near some boundary points of the data.

## V. Conclusion

While the important effects of kinship on marriage have been examined and documented in depth by sociologists, seldom has such an analysis been attempted using an economic approach. This study utilizes data from the PSFD survey and includes 2,224 Taiwan nationals aged 36-65, whom we refer to as the younger and older cohorts as determined by their date of marriage, i.e., after or prior to 1981, respectively. We employ the continuous Cox proportional hazards model to explore kinship-related factors that influence respondents' most recent marriage experiences, with an emphasis on the special characteristics of Chinese society.

Our results provide convincing evidence that there are indeed significant and measurable differences between the older and younger cohorts in terms of behavioral patterns of marriage. Women's traditional functions and kinship network play a significant determining role in the success of the marriage of the older cohort. The results further suggest that only a moderate level of involvement on the part of the couples' parents and other relatives is beneficial to a marriage; against this, these relatives being involved too closely is more likely to result in the couple's failure in marriage. On the other hand, most of the preconceived notions of family and kinship play a significant role in the younger couple's marriage. Generally, a more traditional husband has a higher probability of divorce, while a wife with similar perceptions would likely provide a stabilizing force to the marriage.

The major contribution of this analysis is that we shed new light on the role of kinship-related factors in the marital relationships by economic analytical tools. Compared with previous economics studies, we extend the

divorce research to cover additional cultural, social, and familial factors, along with the long-discovered economic factors and personal characteristics. The empirical results help explain the different patterns of marital stability across various demographic groups. Moreover, this analysis is valuable in that it tells a similar story with that of sociology by way of an alternative economic point of view and hence offers reinforced support for the importance of kinship on marriage stability.

Several issues here are worth further investigation. For example, the couple's incentives for co-residing with the elders may be correlated with the stability of marriage. Given the availability of the relevant information—such as the ownership of the house, the role of the elders in taking care of young children, intergenerational economic dependence—additional research is needed to deal with the causality between these incentives and the resulting co-residence pattern.

Similar concern would arise to the couple's interaction with kin and the satisfaction of their marriage. If the interrelationship between the couple and their kin could be observed annually, then the causal effect between kinship network and marital outcome can be more clearly explained. In addition, discrepancies between the husband and wife on the marital and familial notions are always considered as important sources of pressures and frictions in the partnership, which have a strong correlation with the failure of marriage. Unfortunately, we are unable to answer the aforementioned questions in the current study due to the lack of data. When the required data are available additional interesting research may be conducted .

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# 台灣社會變遷中的親族關係 與婚姻穩定性\*

羅德芬<sup>†</sup>

## 中文摘要

社會學家們對於親族在婚姻關係中的重要影響力，已有相當深入且豐富的研究，然而，在經濟學的文獻中，卻少有以嚴謹的計量方法針對這個部分所進行的實證分析。本文探討婚姻的延續與穩定性如何受到親族相關因素的影響，尤其強調在中國傳統文化中，與西方社會不同的獨特因素，對於離婚機率的影響是否顯著。實證研究發現，親族之間的互動關係與婦女是否符合社會傳統期待等等行為變數是影響老世代婚姻期間長度的主要因素；相反的，婚育態度與家庭價值，則在年輕世代的婚姻關係中，扮演著相當重要的角色。

**關鍵字:** 婚姻，親族，比例危險率模型。

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