Witte, James C.

Labor force integration and marital timing: An analysis of couples in the United States and Germany

DIW Discussion Papers, No. 49

Provided in Cooperation with:
German Institute for Economic Research (DIW Berlin)

Suggested Citation: Witte, James C. (1992) : Labor force integration and marital timing: An analysis of couples in the United States and Germany, DIW Discussion Papers, No. 49, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at:
https://hdl.handle.net/10419/95769

DIW Diskussionspapiere
Discussion Papers

Diskussion Paper No. 49

Labor Force Integration and Marital Timing: An Analysis of Couples in the United States and Germany

from
*James C. Witte**

Deutsches Institut für Wirtschaftsforschung, Berlin
German Institute for Economic Research, Berlin

Deutsches Institut für Wirtschaftsforschung

Diskussion Paper No. 49

Labor Force Integration and Marital Timing: An Analysis of Couples in the United States and Germany

from
*James C. Witte**

*) James C. Witte war Gast der SOEP-Gruppe während eines Forschungsaufenthaltes am DIW, im Sommer 1991

Berlin, Mai 1992

Deutsches Institut für Wirtschaftsforschung, Berlin
Königin-Luise-Str. 5, 1000 Berlin 33
Telefon: 49-30 - 82 991-0
Telefax: 49-30 - 82 991-200

LABOR FORCE INTEGRATION AND MARITAL TIMING: AN ANALYSIS OF COUPLES IN THE UNITED STATES AND GERMANY

James C. Witte
Carolina Population Center
University of North Carolina at Chapel Hill

ABSTRACT

Given the collective nature of marital decisionmaking and the vast changes in female labor force participation in recent years, it may be misleading to view marital timing in terms of individual labor force integration. To do so, is to stress the effects of a set of factors on some individuals, while ignoring the impact of these very same processes on the formation of the occupational identity of the [potential] spouse. Accordingly, this paper examines the relative importance of both husbands' and wives' employment and enrollment statuses, and the joint effects of both partners' integration in the labor force on the rate of entry into marriage. The analysis is based on two data sets: the German Socio-economic Panel (SOEP) and the Survey of Income and Program Participation (SIPP). After discussing the practical and conceptual issues associated with using couples as the unit of analysis, in particular the question of potential selection bias, a descriptive presentation and cross-national comparison of patterns of labor force integration at the time of marriage are presented. A discrete time approach to event history analysis is used to test the observed differences, especially the gender question. The results show that the rate of entry into marriage is indeed influenced by the enrollment and employment status of both partners, but that the effects are gender variable. Leaving school or entering employment by the male partner increases the couple's rate of entry into marriage. This rate also responds to the female partner completing her education, but her further labor force integration through employment fails to have any additional positive impact.

Paper prepared for the 1992 Population Association of America Meetings in Denver, CO. May 1992. Contact address: James Witte, Carolina Population Center, University of North Carolina at Chapel Hill, University Square, Chapel Hill, NC 27514. Bitnet: UWITTE@UNC

Labor Force Integration and Marital Timing: An Analysis of Couples in the United States and Germany

The central assumption of this paper is that to simply look at individuals ignores the collective nature of marital decisionmaking. Particularly with the vast changes in female labor force participation in recent years, it would be overly simplistic to explain marital timing in terms of individual labor force integration. To do so is to stress the effects of a set of factors on some individuals, while ignoring the impact of these very same processes on the formation of the occupational identity of the [potential] spouses. Accordingly, this paper examines the relative importance of husbands' and wives' employment and enrollment statuses, and the joint effects of both partners' integration in the labor force for the rate of entry into marriage. Several theoretical models incorporating both partners are introduced and then tested using data on recent birth cohorts from the German Socio-economic Panel (SOEP) and the US Survey of Income and Program participation (SIPP). First, however, the paper begins by defining the process of labor force integration and its apparent relationship to entry into marriage among individuals.

The Theoretical Significance of Labor Force Integration for Marital Timing

This study rests on the argument that during the years of early adulthood the aspects of identity organized around establishing and maintaining one's place in the labor force weigh quite heavily in the formation of other aspects of individual identity, including that which is obtained and maintained through marriage. With a strong sense of identity the individual knows what he or she seeks in marriage and in a marriage partner, and is able to judge whether alternative candidates are appropriate partners. Likewise, based on the extent to which identity formation is complete and stable, the individual is a more or less calculable entity for those viewing him or her as a potential parnter. Occupational identity is defined through a process of secondary socialization centered around completing one's education and entering regular employment and emerges within the institutional

constraints of the educational system and the labor market.

Furthermore, entry into marriage is promoted by labor force integration through two analytically distinct processes related to the development of occupational indentity:

1) Occupational Roles

> The extent to which one is tied (at least at a given moment) into a relatively fixed career plan that defines current and future occupational status. The issue, here, is the extent to which of labor force integration contributes to identity formation based on role behavior related to occupational status. This additional sense of identity should lead to clearer preferences as to what one seeks in a spouse and, in turn, what one has to offer a spouse.

2) Financial Resources

> The extent to which one is locked into a relatively stable income stream. In this case, the issue is the extent to which integration in the labor force provides an adequate and sufficiently secure source of income for establishing and maintaining residential and financial independence.

With this model in mind, the increasing age at first marriage for those in more recent birth cohorts is presumably tied to relative difficulty they have had in the early years of their work lives. Average later entry into marriage for members of these cohorts, in part, may be attributed to the financial consequences of their initially insecure positions in the labor force, as well as the impact of educational and labor market experience on the process of identity formation.

Developing this argument depends on distinguishing between the two aspects of labor force integration introduced above: occupational roles and financial resources.

-- TABLE 1 ABOUT HERE --

As Table 1 indicates, assuming that employment status primarily captures the financial resource aspect of labor force integration and enrollment status principally measures the occupational role aspect, marriage should be most likely to occur when individuals have found a secure place in the labor force with regard to both aspects of labor

force integration. However, integration with respect to either aspect, financial resources *or* occupational roles should be sufficient to improve the odds that an individual enters marriage. Thus, once either school is finished or employment has begun, the rate of entry into marriage should be greater than those instances when neither of these indicators of labor force integration is present.

Estimating separate models for men and women allows one to consider gender-related differences in the relationship between labor force integration and entry into marriage. In both countries, increasing rates of female labor force participation, particularly in employment that implies occupational prestige and a degree of career commitment, places the traditional marriage arrangement in a different light. For increasing numbers of women, and for increasing periods in the life course of individual women, employment is a viable substitute for marriage. In other words, the relationship between labor force integration and the probability of entry into marriage, as depicted above may well represent a traditional male model of entry into marriage. For women, the positive correlation should be weaker and the link with each of the two aspects of labor force integration may be different than that found among men.

Moreover, based on the different vocational education systems in the two countries, there should be cross-national differences in the frequency of those combinations of employment and enrollment status indicative of incomplete labor force integration -- those cases where the probability of marriage is labeled medium. In the US, where on the job training plays an important role, entry into marriage should be more common if the individual is employed yet remains within the educational system, than if an individual is not employed but is no longer enrolled and is presumed to have completed his or her education. In the FRG, exactly the opposite is to be expected: one would expect, marriage is more likely if the individual is not regularly employed but is outside the educational system.

An analysis of male and female marriage patterns in the two countries based on

individuals as the units of analysis is found in Witte (1991). There it was found that for each of the four groups, as defined by gender and nationality, a positive and significant coefficient is associated with all three terms[1] representing different degrees of labor force integration. On the whole, the inclusion of these terms goes a long way toward diminishing and, in some instances eliminating observed pattern of time dependency (age, period and cohort effects) in marriage patterns.

Furthermore, a similar gender difference appears in both the United States and Germany. For males the data indicate a direct positive relationship. Leaving school and entering the labor force are indications that young men are acquiring the occupational roles and financial resources that are central to the process of identity formation at this stage in the life course. The acquisition of an occupational identity provides a reference point for the coherent organization of other aspects of his identity. In this capacity it clarifies the parameters of marital decisionmaking and facilitates entry into marriage. For women, on the other hand, the relationship is somewhat different: as with men, leaving school increases the rate of marriage. But among women regular employment fails to provide the same boost to the rate of entry into marriage found among men. *In other words, completing school or entering regular employment increases the likelihood of marriage for both men and women. However, for men, the maximum effect requires both, whereas for women simply leaving school is the critical event.* If a woman is outside the educational system, the fact that she is or is not engaged in regular employment does not enhance the odds of her entering marriage.

The Couple as a Unit of Analysis

In the analysis of marital timing whether individuals or couples should serve as the basic unit of analysis rests, in part, on the event one is interested in understanding. If one is interested primarily in the decision to marry, then the focus is rightly on the individual. But since the making up of individuals' minds is not a process that lends itself to empirical

observation, reported marriage date is commonly used to mark the timing of entry into marriage. Easily observable and well-suited to retrospective study designs, this date appears a natural choice for studies of marital timing. However, the collective character of the decisionmaking process surrounding marriage date implies that the couple should be the fundamental units of analysis. The timing of entry into marriage is a joint decisionmaking process. The date is codetermined by a simultaneous set of processes that influence the probability of marriage for both partners.

There are good reasons why past research has tended to shy away from the couple as the unit of analysis and has steered clear of two-sex models in general. Indeed, the literature tends to speak of a two-sex problem, rather than two-sex models, because the importance of analyzing both partners became clear when attempting to reconcile conflicting results derived from the single sex theories of classical stable population theory (Pollak, 1986). Efforts to address this issue have made some progress on individual cases, primarily through the use of iterative adjustment procedures, but a general solution to the problem, has not been found (see, for example, for example, Schoen's (1981) use of the harmonic mean and Pollak's (1990) birth matrix-mating rule (BMMR) model. However, this debate has sensitized researchers to the issue by highlighting the dangers inherent in taking an individualistic approach to a question of collective action.

More broadly, a number of conceptual questions surround the use of longitudinal data whenever a collectivity, rather than an individual, is viewed as the unit of analysis. In the literature this discussion has focused on the question of longitudinal households (McMillen and Herriot 1985; Duncan and Hill 1985; Espenshade and Braun 1982.) In the case of couples, the question is: at what point in a relationship should two individuals be considered a couple, as an observation at risk of entry into marriage. The data used in this study does not include systematic information on each couple's premarital history. As a result, the only practical solution is to say that a couple is at risk once both partners have reached the age of sixteen.[2]

Thus, the analysis focuses on the question of timing for couples who marry and not the more general question of whether or not a particular pair of partners marry and form a couple. Restricted to couples who do eventually marry, the question is: what causes a couple to marry at a particular moment, rather than sooner or later? In particular, can timing be tied to the current enrollment and employment status of both partners as indicators of the degree to which they are integrated in the labor force.

Even restricted in this way, practical issues remain to confound the problem; though the couple may be the unit of analysis, the individual remains the principal vehicle for data collection -- to begin with, this increases the likelihood that a given case must be excluded due to missing data. Furthermore, the two panel data sets used in the analysis sample on the basis of households and then interview all adult members; but both individuals are generally not available, as sources of data, for marriages that had already been dissolved by the start of the panel.[3] Full information for both partners is also likely to be missing for those who marry after the start of the panel. Moreover, there is ample reason to suspect that the incidence of missing data of this type is not randomly distributed. For example, couples who marry early also tend to divorce earlier and may have relatively low levels of labor force integration at the time of marriage.

Most importantly, the issue of right censoring takes on a very different character once the emphasis is on couples rather than individuals. At the individual level those who have not [yet] married at the time of the final observation still contribute useful information regarding constant and time-varying factors associated with slow rates of entry into marriage. Comparable information, however, is not available for not [yet] married couples, since the event is needed to define each couple as a unit of analysis. The extent to which this is a problem varies with the proportion of the sample who have not married at the close of the observation period and the degree to which late-marrying couples differ from early-marrying couples. The magnitude of this problem for the analysis at hand is described below in the discussion of the findings.

Models of the Combined Influence of Both Partners on Marital Timing

Moving from the perspective of the individual to that of the couple entails looking at the relative significance of men and women as they combine to set the rate of entry into marriage for couples when the partners are at various stages in the individual process of labor force integration. Before turning to the observed patterns found in the US and the FRG, three illustrative, hypothetical cases may be considered. In Figures 1 through 3 each of the columns corresponds to a unique combination of the employment and enrollment statuses of both partners. The height of the column indicates the rate of entry into marriage associated with that combination of male and female partners' labor force integration. For example, the columns located in the front corner of these graphs represent the rate of entry into marriage when both are still in school and not employed.

Figure 1 represents the extreme form of a traditional arrangement, the rate of entry into marriage is determined solely by the enrollment and employment status of men and, thereby, illustrates the sort of one-sex model used in standard demographic work. Since this model assumes that the couple's rate of entry into marriage is driven solely by the labor force integration of the male partner, the rate of entry into marriage remains the same even if the female partner is better integrated in the labor force (following the scale of female labor force integration along the horizontal axis back and to the right). On the other hand (moving along the horizontal axis back and to the left), as the male is further

FIGURE 1 ABOUT HERE

integrated in the labor force the rate of entry into marriage increases, again independent of the enrollment or employment status of his partner.[4] In brief, this model assumes that the marital timing of couples is governed solely by the direct positive relationship between labor force integration and entry into marriage found among men.

The symmetrical model represented by Figure 2 assumes that the positive

relationship between labor force integration and entry into marriage characteristic to men is found among women as well. In this instance, marital timing of couples is equally determined by the individual level process of both partners. Regardless of whether it is the man or woman, further integration in the labor force of either partner increases the couple's rate of entry into marriage. In contrast to the traditional model both partners codetermine the rate of marriage for the couple. In addition, the symmetrical model presumes that the development and clarification of an occupational identity has the same effect on women as on men. The symmetrical model does take both male and female partners into account, but nonetheless a strong one-sex orientation can be recognized in the model's underlying behavioral assumptions. The predicted probability of marriage is codetermined by men and women, but women are presumed to act just like men.

FIGURE 2 ABOUT HERE

However, the individual level analyses reviewed above suggest that a more realistic model should differentiate between the effects of women leaving school and the effects of female labor force participation. Among women, the former appears to increase the probability of marriage, as it does for men, while the latter does not have the same positive effects for women as it does for men. The model represented in Figure 3 assumes this type of gender variation in the relationship between labor force integration and entry into marriage. Compared to the previous two models nothing has changed with regard to the step function characteristic of the relationship between labor force integration and .pa

FIGURE 3 ABOUT HERE

entry into marriage for men. However, among women the positive influence of labor force integration on the rate of entry into marriage is seen solely as a consequence of leaving the educational system.

To summarize, the models presented in this section can be described in the following manner: the gender variable model (Figure 3) differs from the traditional model (Figure 1) in that the enrollment and employment status of the female partner affects the

couple's rate of entry into marriage; but unlike the symmetrical model (Figure 2), the gender variable model allows for the fact that the development of an occupational identity has a different meaning for women than men, at least with regard to the decision to marry.

Data

The analysis of recent marital patterns presented in this paper looks at persons born between 1952 and 1967 and is based on data from the Survey of Income and Program Participation (SIPP) and the German Socio-Economic Panel (SOEP).[5] It is important to recognize that in addition to rich panel data during the period of panel observation, both panels contain strong retrospective components, including yearly records of enrollment, employment and marital status during the years before the panel began. The analyses presented in this paper began with from the individual person records that are key components in the publicly distributed versions of the two panels. Separate male and female data sets were then created and complete records for husbands and wives, including each partner's education, employment and marital history,were merged using the partner pointer variables that are a part of each panel data set.

The SIPP data come from the "1984 SIPP Full Panel Longitudinal Research File" prepared by the Bureau of the Census.[6] This file covers a 32 month period and includes a record for each person who was a member of an interviewed household at any time during the panel. From this group only persons who were present in the first month and had a positive interview status for all succeeding months are included in the analysis. In the SIPP 1984 panel there is no alternative but to rely on those persons present for all 32 months of the study. Retrospective educational and employment data was obtained relatively early in the 1984 SIPP panel. But marital histories were only collected in the 8th round of interviewing -- after most of those who were destined to drop out of the panel already did so. Table 1 describes the SIPP individual data set.

TABLES 2 AND 3 ABOUT HERE

The original SOEP sample contained 3,871 respondents born between the years 1952 and 1967. Attrition due to panel nonresponse does not create serious problems for the question at hand because the retrospective marital histories were collected relatively early in the panel (in 1985 during wave 2). The relevant information (and thus the number of observations) for those already married at this point in time is fixed, regardless of their further participation in the panel.[7] The resulting data set is described in Table 2.

Due to the problems of right and left censoring and the uncertainty as to the underlying population of couples, it is impossible to directly assess the representative character of the couple data set. The best alternative is to consider the attributes of the individual men and women who make up the selected couples and compare these results to the attributes of persons in the individual data set. Tables 3 and 4 compare attributes from couple-level and individual-level SIPP and SOEP data sets with an eye to differences in birth cohort and level of education, as well as employment and enrollment status. Men and women, or in the case of couples male and female characteristics, are considered separately and information is provided for all observations and then again specifically for those who experienced marriage. Relevant comparisons are between the total set of observations for individuals and the total set of observations for couples and between the set of individual marital observations and the set of couple marital observations.

Table 4 provides these details for the SIPP sample. Clearly, the age composition of the individual and couple-level data sets varies. Males and females in the youngest, as well as females in the oldest (1952-55), birth cohorts are underrepresented in the couples sample. In large part, the underrepresentation of the younger birth cohorts is due to the fact that members of the youngest cohorts are less likely to have married by the start of the panel.[8] For men and women the distribution according to level of education varies little between the individual and couple-based data sets. With regard to employment and enrollment status, the SIPP couple data set includes a slightly greater proportions of total observations and marital events marked by full labor force integration (employed and not

enrolled). However, these differences are all relatively small (under 10%) and do not change the relative significance of each state for entry into marriage.

TABLE 4 ABOUT HERE

Table 5 provides similar comparisons for the SOEP individual and couple data sets. Here, too, the underrepresentation of the younger birth cohorts in the couple data set is quite apparent. In addition, the SOEP couple data set compared to the corresponding individual data set contains a disproportionately high concentration of "employed and not enrolled" observations, especially among the observations with an event. This shift in the distribution tends primarily to downplay the link between marriage and the condition "not employed and not enrolled." However, as with the SIPP data these shifts are relatively minor and do not change the relative importance of the various degrees of labor force integration for entry into marriage.

TABLE 5 ABOUT HERE

It is also important to note that similar cross-national differences are apparent, regardless of whether one looks at the individual or couple data sets. In both countries about one-third of all observations, for men as well as women, are concentrated at each extreme; about one-third of the time between age 16 and marriage is spent enrolled and not employed, while another third is spent not enrolled and employed. The combination "enrolled and employed" is characteristic for the remainder of the observations in the US, while the pattern "not employed and not enrolled" prevails in the FRG. In the US young people are likely to initially acquire the financial resources that could serve as the basis for marital choices, while in the FRG young people are likely to begin building an identity based on occupational roles rather than financial resources.

Descriptive Analyses of the Relative Significance of Male and Female Labor Force Integration at the Time of Marriage

The models presented above (in Figures 1 through 3) can now be compared to the actual patterns of entry into marriage found in the US and the FRG. Figures 4 and 5 describe the relationship between both partners' enrollment and employment status and the timing of marriage in the US and the FRG. The height of the columns indicates the proportion of all intervals (couple-years at risk) that end in marriage.

Looking first at the results for the United States, Figure 4 is clearly similar to the model with a gender-variable relationship between labor force integration and marriage (Figure 3). There is a direct positive relationship between male labor force integration and entry into marriage. However, among women a different pattern is found. Female labor force participation does relatively little to increase the likelihood that a couple will marry above and beyond the effects of finishing school.

FIGURE 4 ABOUT HERE

The implication is that a couple's marital timing is not simply governed by male labor force integration, as in the case of the traditional model. This is evident, for example, from considering the frequency of marital events when one or both partners is employed but still in school. A relatively low proportion of marital events is found when both partners are in this state. However, if either partner, *male or female,* leaves school and both remain in the labor force then the proportion of events goes up dramatically. In fact, the incidence of marriage increases more when it is the female partner who is out of school and in the labor force.

Turning to the results for Germany (Figure 5), the overall pattern indicates that the gender variable relationship between labor force integration and entry into marriage affects the marital timing of German couples as well.[9] On the whole, in both countries, marital events are relatively uncommon unless at least one of the partners is out of school and in the labor force. The countries are most similar in those instances where one partner

is fully integrated and the other is not. In such cases, the incidence of marriage varies directly with the employment and enrollment status of the second partner -- regardless of the gender of the fully integrated partner. Among those cases where the woman is fully integrated, the incidence of events varies in a step-like fashion with the enrollment and employment status of the male partner. On the other hand, if the man is fully integrated and the woman is still in school, the incidence of marriage varies little with the employment status of the woman. The incidence is much greater if the woman is no longer enrolled, regardless of whether the woman is in or out of the labor force.

FIGURE 5 ABOUT HERE

Comparing Figures 4 and 5 the differences between the two countries appear to be concentrated in those observations where neither partner is fully integrated in the labor force. In the US one sees a relatively large proportion of marriages among those observations where one or both partners is not enrolled but is employed. The incidence of marriages among couples where both partners are not enrolled and not employed also stands out. In the FRG, short of those observations where one partner is fully integrated, the incidence of marital events peaks with two different combinations of male and female labor force integration. Though they lack the financial resource that regular employment provides, both have the degree of identity that comes with the clear occupational roles that the German vocational education system provides.

However, the other combination marked by a high incidence of marital events (male, not employed but enrolled; female, not employed and not enrolled) illustrates the weakness of this method of presentation. The descriptive materials provided in Figures 4 and 5 provide an indication of the rate at which couples leave various states through marriage, but does not convey the relative importance of these states for entry into marriage. Table 6 shows which combinations of employment and enrollment status are common circumstances upon entry into marriage, rather than indicating whether couples are prone to linger or quickly leave any state, as defined by the combined enrollment and

employment status of the two partners,

To begin with, the results found in Table 6 indicate that the significance of full labor force integration (employed and not enrolled) as a precursor to marriage is very similar in both countries: in approximately two-thirds of the cases (65.7% in the US and 68.8% in the FRG) the man was employed and not enrolled at the time of marriage; about half the time (51.7% in the US and 51.6% in the FRG) the woman was; and both partners were out of school and regularly employed at the time of marriage in 37.5% of the cases in the US and 41% of the time in the FRG. At the other end of the spectrum, German couples were also more likely to marry when one or both partners were fully outside the labor force (enrolled and not employed), though here, too, the differences are small.

TABLE 6 ABOUT HERE

However, in those cases where both partners are partially integrated in the labor force and one of them has not yet completed the process, the cross national differences are striking and conform to the pattern hypothesized above. A couple marrying when at least one partner is employed but still in school occurs far more frequently in the US (29.7% of all couples) than in the FRG (4.7%). The obverse condition, a couple marrying when at least one partner is not employed and not enrolled, is far more common in the FRG (34.6%) than in the US (12.4%). The important point of similarity between the two countries with regard to couples who marry when one or both are not wholly integrated in the labor force -- the relatively high incidence of marriage when both partners are not enrolled and not employed -- has to be seen in this light. Couples in both countries may be prone to marry under these circumstances, but one must keep in mind that this experience is far more common in the FRG than in the US.

Testing the Relative Significance of Male and Female Labor Force Integration at the Time of Marriage

The discrete time event history analyses in this section focus on the transition out of the state of being single and into that of marriage. Using continuous time methods one would be concerned with estimating the transition rate at any point in time. A discrete time approach takes the period of time at risk, breaks it into a sequence of discrete intervals and estimates the transition rate for each interval. The central question is to determine the sources of systematic covariation in these rates.[10]

In his discussion of discrete-time methods, Allison (1982) begins from a proportional hazards model of the form:

$$[1] \qquad \log \lambda\,(t, \mathbf{x}) = \alpha\,(t) + \boldsymbol{\beta}' \mathbf{x}$$

where $\alpha(t)$ is an unspecified function of time. The vector $\boldsymbol{\beta}$ stands for the effects of the explanatory variables on the instantaneous probability of an event, whereby the effects are assumed to be constant over time. He argues that the continuous time model presented described in equation [1] is closely approximated by the logistic regression function

$$[2] \qquad P_{it} = 1/[1 + \exp(-\alpha_t - \boldsymbol{\beta}' \mathbf{x}_{it})]$$

because the interpretation of the coefficient vector $\boldsymbol{\beta}$ is identical in the two models. To highlight the emphasis in this paper on the relative influence of the labor force integration of both partners on entry into marriage, the model may be defined in the following manner:

$$[3] \qquad P_{it} = 1/[1 + \exp(-\alpha - \beta_M' x_{itM} - \beta_F' x_{itF} - \beta_{MF}' x_{itMF})]$$

Where the index M indicates the terms associated with the enrollment and employment status of the male partner, the index F those associated with the female partner and the index MF the interactive effect of particular combinations of male and female enrollment and employment statuses.

The discrete time approach to event history analysis lends itself to testing the relative impact of male and female labor force integration. Estimates for a series of models for each country are presented in Tables 7 and 8. In each case, as implied by the traditional model found in Figure 1, Model [1] only takes the enrollment and employment status of the male partner into account. Model [2] considers the female partner's enrollment and employment status, and Model [3] assumes that both partners have an independent influence on the rate of entry into marriage. Finally, Model [4] includes an interaction term representing significant joint effects of male and female labor force integration.

Turning first to Model [1] for the US in Table 7, the effects of male enrollment and employment status on couples are very similar to that found in the analyses based upon individuals referred to above. Each of the three coefficients representing various combinations of enrollment and employment status may be considered significantly different than the omitted category (enrolled and not employed). As in the analysis of individuals, the predicted rate of entry into marriage for couples is greatest when a male is employed and enrolled. By contrast, the combinations "employed and enrolled" and "not employed and not enrolled" are significantly lower; they are also both significantly greater than the omitted category, however they are indistinguishable from one another.

TABLE 7 ABOUT HERE

Likewise, considering only females (Model [2]) the results for couples are quite similar to those found in the analysis of individuals. The exception concerns the combination "employed and enrolled." Here, in the analysis of couples, the coefficient representing this state is not sufficiently different from zero to justify its inclusion in the

model. Model [2] then simplifies to all enrolled observations, regardless of employment status, combined in the omitted category. Coefficients are then estimated for the combinations "employed and not enrolled" and "not employed and not enrolled." Both coefficients are significantly different than the omitted category; however, the coefficients attached to these two combinations remain indistinguishable from one another.

Model [3] then considers the combined impact of both male and female labor force integration within a single framework. Regardless of whether the male or female model is considered the base model, adding the enrollment and employment status of the other partner represents a highly significant improvement in the overall fit of the model at a cost of 2 (3 if Model [2] is seen as the base model) degrees of freedom. All five coefficients meet the standard test of significance; though the magnitude of all are reduced slightly and their standard errors increased somewhat compared to the single partner models. In addition, the relative magnitude of the coefficients for partners of each sex changes little -- the combination "employed and not enrolled" still may be distinguished from the other two levels of male labor force integration, but a distinction between "employed and enrolled" and "not employed, not enrolled' is not possible. For women, the two coefficients indicating non-enrollment remain virtually identical.

Along with the independent impact of the enrollment and employment status of each of the partners, there is the added possibility that male and female labor force integration in certain combinations may produce an additional interaction effect. A series of models representing potential interaction effects were tested. Only in one case did the interaction term constitute a significant improvement compared to the two partner model in Table 7. In this case, Model [4], a separate coefficient was estimated to contrast those cases where both partners were fully integrated in the labor force with all other observations.

Beyond improving the overall fit of the model, this coefficient is also interesting because of the effect its inclusion has on the other coefficients; these are essentially

unchanged with the exception of the term associated with observations where the woman is employed and not enrolled. Compared to model [2], the coefficient associated with observations where the women is fully integrated in the labor force has increased by nearly fifty percent. Combined with a male fully integrated in the labor force the net impact is negligible due to the negative coefficient attached to the interaction term. In those cases where the male is less fully integrated in the labor force, the fact that the woman is employed and not enrolled serves to boost the predicted probability of entry into marriage for the couple to a greater extent than that found in Model [3]. Moreover, the increase in the estimated coefficient is large enough so that the two coefficients for women are significantly different. In other words, as is regularly found for males in the US, female labor force participation does increase a couple's rate of entry into marriage above and beyond that associated with leaving school, once the full effects of the partner's enrollment and employment status are taken into account.

The results for the FRG, presented in Table 8, also illustrate the comparative advantage of a model based on the enrollment and employment status of both partners, rather than men or women alone. As was found for the US, among German couples a model based on the employment and enrollment status of both partners (Model [3]) represents a significant improvement over the models based on the labor force integration of a single partner (Models [1] and [2]) and is well worth the loss of two or three degrees of freedom. Likewise, either alone or in combination with the enrollment and employment status of the male partner, the distinction between the combination "employed and enrolled" and the omitted category is of no import in assessing the influence of female labor force integration on a couple's rate of entry into marriage. Finally, as in Model [3] for the US, the model for the FRG based on the independent effects of the enrollment and employment status of both partners suggests that the labor force participation of women does not increase the rate of entry into marriage beyond that associated with leaving school.

TABLE 8 ABOUT HERE

In the US the addition of interaction terms in Model [4] altered the image of the gender difference and suggests that once male labor force integration is taken into account, female labor force participation may boost a couple's rate of entry into marriage if the male is not fully integrated in the labor force. However, the analysis of interaction terms in the FRG tells a different story -- a story that highlights the important structural differences between the two countries in the processes of labor force integration. A series of interaction terms representing different combinations of male and female labor force integration were also tested in the FRG. As in the US, only one of these coefficients allowed for the estimation of an improved model. However, in the FRG this resulted from adding a term indicating those observations where the male was employed and enrolled and the female employed and not enrolled.

As in the case of the US, the importance of the interaction term must be seen in combination with the other estimated coefficients. To begin with, in the US the inclusion of an interaction term suggests that female labor force participation significantly increases a couple's rate of entry into marriage, above and beyond the effects attributable to completing school. In the FRG, on the other hand, the couple's predicted rate of entry is lower if a woman is employed and out of school than if she is not employed but still out of school. Though the difference falls short of statistical significance, the lack of a difference in the other direction makes it safe to conclude that female labor force participation does not boost the couple's rate of entry into marriage beyond that associated with leaving school. On the one hand, this finding corresponds to the expectations described by the model in Figure 4 that assumes a gender variable relationship between labor force integration and entry into marriage. On the other hand, the importance of the German vocational educational system in providing the sense of identity that facilitates marital choice should promote this pattern as well.

In fact, the estimated coefficients associated with male enrollment and employment

status in Model [4] indicates that the observed outcome is rooted in this cause as well. Unless the female partner is fully integrated in the labor force, regular employment by the male partner also does not increase the couple's rate of entry into marriage while the man is still in school. On the other hand, if the male leaves school this acts to boost the couple's rate of entry into marriage regardless of his employment status or the employment or enrollment of his partner.

Summary and Discussion of the Analysis of Couples

The collective nature of marital decisionmaking, along with the tendency for single-sex models of entry into marriage to lead to inconsistent results, are good reasons to continue the analysis of the relationship between labor force integration and entry into marriage with couples as the unit of analysis. A hypothetical model is presented in Figure 3 that makes marital timing dependent on the enrollment and employment status of both partners. Moreover, it does so in a way that maintains the gender differences in marriage rates emphasized above. Leaving school or entering employment by the male partner increases the couple's rate of entry into marriage. This rate also responds to the female partner completing her education, but her further labor force integration through employment fails to have any additional effect.

To show the extent to which the observed marital patterns in the US and the FRG correspond to the gender variable model, Figures 4 and 5 plot the proportion of observations with events according to both partners' employment and enrollment status. In both cases, the results approximate the hypothetical model, particularly if either one of the partners is out of school and regularly employed.

The similarity in marriage rates, however, only represents one aspect of the comparison. It is important to keep in mind that the social structure of each country promotes a characteristic sequence of transitions. For example, an American male who has finished school and has not entered the labor force is just as likely to marry as an

American male who is still in school but is also engaged in regular employment. However, since American males are much more likely to find themselves in the latter situation than the former, a male marrying while out of school and unemployed is relatively rare in the US. In Germany, on the other hand, regular employment generally follows leaving school. It is not at all unusual to find a young German out of school and not employed. Due to the strong vocational orientation of their school-based education, many of these young people will also already have a strong sense of occupational identity, built upon their anticipated occupational roles.

The logistic regression results presented constitute a more formal test of the extent to which marital patterns in the two countries resemble the gender variable model. In the US and the FRG, the model including the enrollment and employment status of both partners represents a significant improvement over either a male or female single-sex model. In addition, as anticipated, the coefficients attached to each partner's measures of labor force integration vary according to gender.

REFERENCES

Allison, Paul D., 1982. "Discrete-Time Methods for the Analysis of Event Histories." in *Sociological Methodology* Samuel Leinhardt (ed.). San Francisco: Jossey-Bass Inc.

Diekmann, Andreas. 1987. "Determinanten des Heiratsalters und Scheidungsrisikos" unpublished manuscript.

Diekmann, Andreas, and Peter Mitter. 1984. "A Comparison of the "Sickle Function" with Alternative Stochastic Models of Divorce Rates." in A. Diekmann and P. Mitter (eds.), *Stochastic Modelling of Social Processes*. New York: Academic Press.

Hernes, Gudmund. 1972. "The Process of Entry into First Marriage." *American Sociological Review* 37 (April): 173-182.

Pollak, Robert A. 1986. "A Reformulation of the Two-Sex Problem." *Demography* 23(2): 247-259.

Sørensen, Aage. 1986. "Progress in Studying Change." *American Journal of Sociology* 92 (3): 691-706.

Tuma, Nancy Brandon, and Michael Hannan. 1984. *Social Dynamics: Models and Methods*. Orlando: Academic Press.

Wagner, Gert G. et al. 1991. "The Socio-Economic Panel (SOEP) for Germany - Methods of Production and Management of Longitudinal Data." DIW Discussion Paper No. 31a. Berlin.

Witte, James C. 1990a. "The Potential for Comparative Panel Research Using the Survey of Income and Program Participation and the German Socio-economic Panel." DIW Discussion Paper No. 14. Berlin.

Witte, James C. 1990b. "Entry into Marriage and the Transition to Adulthood Among Recent Birth Cohorts of Young Adults in the United States and the Federal Republic of Germany." DIW Discussion Paper No. 17. Berlin.

Witte, James C. 1992. *Labor Force Integration and Marital Choice in the United States and the Federal Republic of Germany*. Frankfurt/New York: Campus Verlag.

NOTES

(1) The combination hypothesized to lead to the lowest predicted probability of entry into marriage (not employed and enrolled) is used as the omitted category.

(2) Since the underlying model used in this study does not make the probability of marriage depend on partner interaction, there is no reason to know, or assume, that the partners are involved with each other to consider the couple at risk.

(3) In both studies, the new spouse becomes a member of the panel once the couple begins to live together and data on both partners is available from this point on. Howver, the necessary retrospective data for both partners is only available in those cases where both partners were living in the same household from the start of the panel.

(4) For the sake of simplicity these hypothetical models assume a positive linear relationship entry into marriage across the combinations of employment and enrollment status similar to the relationship expected to be found among men in the US.

(5) Detailed information regarding the SIPP and SOEP studies may be found in their respective user guides (see references). An overview of both and their use in comparative research may be found in Witte (1989.)

(6) Retrospective education, employment and marital histories for these persons, collected as part of the third and eighth topical modules, were merged with the core information found in the 32 month research file.

(7) Clearly, there is no reason to throw away this information because these individuals become nonrespondents later in the study. The same is true of those who report entry into marriage later in the study, but before dropping out of the panel -- they have contributed all relevant information, regardless of their continued participation in the panel. Likewise, the information contained in the knowledge that a person did not enter marriage during a particular interval is not influenced by whether or not the individual remains a respondent throughout the study. The only members of the original sample who can not contribute information to the analysis are those who dropped out of the SOEP between the first and second wave. Yearly education and employment histories were already gathered in the first wave, but individual marital histories were collected as part of the second wave interviews.Unfortunately, it is characteristic for panel studies that nonresponse peaks after the first wave. Thus, there is no way to include any information from the 515 young adults who dropped out of the SOEP sample before the second round of interviews.

(8) As explained in Note 2, marriages that occur during the panel are not considered in this analysis of couples. The age differences may also be related to the tendency for males to marry down, in terms of age, while women marry up. The couple data sets used here only include cases where both partners belong to the birth cohorts 1952-67. As a result, eligible females, who marry partners born before 1952 and eligible males who marry women born after 1967 are automatically excluded from the analysis.

(9) A fact that is reflected in the lower average age at first marriage in Germany (median age for men of 27.2, for women of 24.6) than in the US (median age for men of 26.3, for women of 24.1.)

(10) In this approach the estimation procedure actually uses periods of time rather than couples as the unit of analysis. For each time interval a couple is at risk a new record is written containing potential explanatory variables describing the couple at that particular point in time. In addition, a dichotomous variable representing whether or not the event occurred in this particular time period is included in each record as well. All records are then pooled into a single data set containing one record for each couple for each interval at risk. Regressing the dummy variable indicating the presence or absence of an event on covariates and representations of time provides a means to estimate the probability of entering into marriage for particular combinations of values of the independent variables. It also allows for the comparison of the

relative overall fit of competing models and provides estimates of the parameters for the independent variables in the regression equation.

Table 1: Employment and Enrollment Status in Relation to Different Aspects of Labor Force Integration and Their Combined Impact on Entry into Marriage

Current Enrollment and Employment Status	**Achieved Aspects of Labor Force Integration**	**Probability of Marriage**
Not enrolled and employed	occupational roles financial resources	high
Enrolled and employed	financial resources	medium
Not enrolled and not employed	occupational roles	medium
Enrolled and not employed	neither	low

Table 2: Data Set for the Analysis of Entry into Marriage Among Americans born between 1952 and 1967 Using Data from the Survey of Income and Program Participation (SIPP)

		Birth Year Cohort Groups			
	Total	1952-55	1956-59	1960-63	1964-67
N of individuals	5,869	1,537	1,541	1,398	1,393
N of intervals	41,230	13,041	12,390	9,761	6,038
N of events	3,277	1,310	1,151	654	162
% ind. with event	55.8	85.2	74.7	46.8	11.6
% int. with event	7.9	10.0	9.3	6.7	2.7
% right-censored individuals	44.2	14.8	25.3	53.2	88.4

Table 3: Data Set for the Analysis of Entry into Marriage Among Germans born between 1952 and 1967 Using Data from the German Socio-economic Panel (SOEP)

		Birth Year Cohort Groups			
	Total	1952-55	1956-59	1960-63	1964-67
N of individuals	3,356	775	820	800	961
N of intervals	27,708	7,190	7,799	6,706	6,005
N of events	1,883	674	611	415	183
% ind. with event	56.1	87.0	74.5	51.9	19.0
% int. with event	6.8	9.4	7.8	6.2	3.0
% right-censored individuals	43.9	13.0	25.5	48.1	81.0

Table 4: Characteristics of Yearly Individual and Couple Data Used in the Analysis of Entry into Marriage Among Americans (born 1952-67)[1] from the Survey of Income and Program Participation 1984 Panel

	Male Characteristics				Female Characteristics			
	Individuals		Couples		Individuals		Couples	
	Total	Marry[2]	Total	Marry[2]	Total	Marry[2]	Total	Marry[2]
	-- percentages by cohort, education and labor force integration							
Birth Cohort								
1952-1955	32.7	44.6	48.8	45.4	30.6	37.0	30.9	26.9
1956-1959	29.5	35.6	38.7	38.6	30.6	34.9	45.9	43.6
1960-1963	23.1	16.8	11.7	14.9	24.3	22.0	21.1	25.6
1964-1967	14.7	3.0	0.7	1.1	14.6	6.2	2.1	3.9
Level of Education								
No high school diploma	11.1	12.0	8.8	12.0	9.5	11.9	6.1	9.8
High school diploma	34.6	40.9	35.0	40.2	36.6	46.5	42.2	48.2
Attended college	54.3	47.1	56.2	47.8	53.9	41.7	51.7	42.0
Labor Force Integration								
Employed and not enrolled	32.9	63.7	39.7	66.2	27.1	46.6	25.9	52.7
Employed and enrolled	26.0	21.4	28.8	22.9	26.1	20.4	29.3	21.7
Not employed and not enrolled	9.7	8.5	6.4	6.0	10.2	16.5	6.1	11.5
Not employed and enrolled	31.4	6.4	25.1	5.0	36.6	16.5	38.7	14.1
N of years at risk/ N of years with marriage	19,049	1,365	4,764	828	17,909	1,686	4,764	828

Table 5: Characteristics of Yearly Individual and Couple Data Used in the Analysis of Entry into Marriage Among Germans (born 1952-67)[1] from the German Socio-economic Panel

	Male Characteristics				Female Characteristics			
	Individuals		Couples		Individuals		Couples	
	Total	Marry[2]	Total	Marry[2]	Total	Marry[2]	Total	Marry[2]
	-- percentages by cohort, education and labor force integration							
Birth Cohort								
1952-1955	26.2	39.7	39.0	46.5	26.6	34.6	19.5	20.4
1956-1959	27.7	31.8	33.6	36.2	26.8	30.2	40.7	41.5
1960-1963	22.9	19.0	18.7	15.8	25.3	24.6	27.9	30.7
1964-1967	23.2	9.6	8.8	1.4	21.2	10.6	11.8	7.4
Education								
No vocational Education	18.1	19.1	16.0	20.4	27.4	33.4	24.7	30.7
Vocational Education	63.7	68.8	68.7	69.1	58.4	60.0	64.4	64.0
Attended University	18.2	12.0	15.3	10.6	14.2	6.6	10.9	5.3
Labor Force Integration								
Employed and not enrolled	32.0	53.1	46.5	68.8	32.0	45.5	35.7	51.6
Employed and enrolled	4.4	3.5	4.7	3.8	3.7	2.1	4.5	1.9
Not employed and not enrolled	27.4	34.7	20.4	17.7	27.8	40.7	22.6	33.6
Not employed and enrolled	36.2	8.6	28.5	9.6	36.5	11.7	37.2	12.9
N of years at risk/ N of years with marriage	11,608	648	3,267	417	9,464	874	3,267	417

1) Only those couples where both partners were born between 1952 and 1967 are included in the analyses. Marriages that occurred during the panel are excluded here because the retrospective data for the new partner, needed to include these cases in the analysis of couples, is generally not available. For these reasons the number of marriage is slightly less than that found in the individual level results in Table 1. 2) Marry - intervals in which an individual or couple married.

Table 6: Labor Force Integration (LFI) of Husbands and Wives in the SIPP and SOEP Samples at the Time of Marriage -- Cell Percentages

Male LFI	**Female Labor Force Integration**				
American Couples	Employed and not enrolled	Employed and enrolled	Not Employed not enrolled	Not Employed enrolled	Row percentage
Employed and not enrolled	37.5	11.8	8.2	8.3	65.7
Employed and enrolled	10.0	7.9	1.4	4.0	23.3
Not employed and not enrolled	3.0	1.2	1.2	0.6	6.0
Not employed and enrolled	1.3	1.3	0.3	2.2	5.0
Column percentage	51.7	22.1	11.0	15.1	100.0
German Couples					
Employed and not enrolled	41.0	1.4	18.7	7.7	68.8
Employed and enrolled	3.1	0.2	0.2	0.2	3.8
Not employed and not enrolled	4.1	--	11.8	1.9	17.7
Not employed and enrolled	3.4	0.2	2.9	3.1	9.6
Column percentage	51.6	1.9	33.6	12.9	100.0

See Tables 4 and 5 for details on the couple data sets used above.

Table 8: Logistic Regression Coefficients for the Effects of Male and Female Labor Force Integration on Entry into Marriage by German Couples Born between 1952 and 1967

	Model			
	[1]	[2]	[3]	[4]
Constant	-3.103 (.162)	-3.042 (.130)	-3.711 (.186)	-3.702 (.180)
Male LFI				
Employed and not enrolled	1.647 (.174)	--	1.235 (.180)	1.255 (.175)
Employed and enrolled	0.963 (.310)	--	0.638 (.316)	--
Not employed and not enrolled	1.026 (.203)	--	0.433 (.215)	0.442 (.210)
Female LFI				
Employed and not enrolled	--	1.554 (.150)	1.263 (.155)	1.218 (.157)
Not employed and not enrolled	--	1.589 (.160)	1.503 (.169)	1.493 (.170)
Partner Interaction				
Male employed and enrolled/ Female employed, not enrolled	--	--	--	.988 (.354)
Overall Model				
N of intervals	3267	3267	3267	3267
Log Likelihood	-1185	-1168	-1132	-1130
Likelihood Ratio X2	111.66	79.11	5.57	2.46
DF	61	62	59	58

See Table 5 for details on the couple data set used above.

Figure 1: *Traditional Relationship between Labor Force Integration (LFI) and Marriage*