



## Divorce: What does learning have to do with it?☆



Ioana Marinescu

University of Chicago, United States

### HIGHLIGHTS

- What is the role of learning vs. shocks to marriage quality in explaining divorce?
- I develop four theoretical models of divorce, three of which include learning.
- I test these models using data from the Survey of Income and Program Participation.
- The data does not support models with a substantial amount of learning.
- Shocks to marriage quality can best account for the divorce patterns in the data.

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### ABSTRACT

Learning about marriage quality has been proposed as a key mechanism for explaining how the probability of divorce evolves with marriage duration, and why people often cohabit before getting married. I develop four theoretical models of divorce, three of which include learning. I use data from the Survey of Income and Program Participation to test reduced form implications of these models. The data is inconsistent with models including a substantial amount of learning. On the other hand, the data is consistent with a model without any learning, but where marriage quality changes over time.

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### 1. Introduction

Traditionally, the bride and groom leave the parents' nest to be married until death tears them apart. Modern marriages fundamentally differ from this model in that the rate of divorce is substantial. This raises the key question of why people marry only to divorce a few years later. The answer must be that something changes over time that makes divorce preferable to the continuation of the relationship. A number of theories exist that posit different sources of change as being the drivers of divorce. One theory is that the outside option of one of the partners can change, and the marriage dissolves when one of the partners meets a better match (Weiss and Willis, 1997). A second theory is that one of the aims of marriage is consumption insurance and marriages end when such insurance fails (Hess, 2004). Finally, a third theory invokes learning: when spouses marry they are not perfectly informed about their match quality. Instead, they learn about it over time, and divorce occurs when spouses find out that they are in a bad match. This theory also offers a reason for

why people cohabit before marriage, another key feature of modern relationships (e.g. Brien et al., 2006). In this framework, cohabitation allows partners to learn about match quality before making a commitment that is costly to break.

I argue that the theories explaining why people marry only to divorce a few years later can be broadly classified into two categories. One theory is that the value of the relationship relative to the outside option changes over time. The other is that the value of the relationship does not change over time, but partners' beliefs about this value change as they gradually learn about match quality. This paper will show that, empirically, learning plays little to no role in divorce and that divorce can be fully explained by changes in the value of the relationship itself. I start with constructing a model that nests both theories by assuming that match quality follows a random walk and partners learn about match quality through signals a la Jovanovic (1979). I then derive empirically testable predictions that can, under some parameter restrictions, distinguish between a pure learning model (no changes in match quality over time), a pure changes model (no learning) and a mixed model that includes both learning and changes in match quality. In order for models to yield starkly different predictions, it is necessary to assume that there is substantial learning in any of the models that include learning, i.e. that the signal of marriage quality observed by couples is noisy enough. Under this assumption and

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a number of additional parameter restrictions, we can make the following empirically testable predictions. First, the divorce hazard increases and then decreases with marriage duration in the pure learning model or the mixed model, but it monotonically decreases with duration in the pure changes model. In order to get further predictions, I derive the impact of observing a signal of low match quality on the divorce hazard. I find that, in the pure learning model, marriages for which a signal of low match quality is observed are more likely to terminate even many periods after the signal of low match quality was observed. In the other models, the impact of observing a signal of low match quality declines to zero as time goes by: after enough time has elapsed, marriages for which a signal of low match quality was observed at some time in the past are no more likely to terminate than marriages for which no such signal was observed. A second prediction using a signal of low match quality is that in the pure learning model, the impact of a signal of low match quality on the divorce hazard monotonically decreases with marriage duration. In contrast, in the pure changes model, the impact of a signal of low match quality on the divorce hazard monotonically increases with marriage duration. Finally, in the mixed model, the impact of a signal of low match quality on the divorce hazard decreases and then increases with marriage duration.

My empirical analysis uses monthly longitudinal data on married and cohabiting couples from the 1990–2004 waves of the Survey of Income and Program Participation (SIPP). I use job loss (either being laid off or getting fired) as a signal of low match quality. Indeed, spouses care about economic success (e.g. [Hitsch et al., 2010](#)). Additionally, job loss has a negative impact on subsequent earnings, unemployment ([Gibbons and Katz, 1991](#)) and survival ([Sullivan and von Wachter, 2009](#)). Importantly, job loss is in fact associated with an increased probability of divorce ([Charles and Stephens, 2004](#)). Using the tests outlined above, I find that the data is most consistent with the pure changes model. Substantively, I find that the divorce hazard monotonically decreases with marriage duration and that the impact of a discharge for cause on the divorce hazard is monotonically increasing with duration.<sup>1</sup> Additionally, I find that a job loss that occurred more than a year ago has no significant impact on current divorce. One may question the assumption that job loss is simply a signal of low match quality: what if job loss has a causal effect and actually decreases match quality just as much for good as for bad marriages? I use an alternative learning model that embodies this assumption. I cannot reject that this model is incorrect. Overall, in two of the three tests I use, the predictions of the pure learning model are not supported against the null of no effect, while in the third case the coefficient is significant and wrongly signed. Thus, the pure learning model is a poor fit for the data. By contrast, the predictions of the pure changes model are never rejected. I conclude that the pure changes model is the best candidate to explain the divorce hazard.

This paper makes three key contributions. First, while the learning model has been widely used to explain divorce and cohabitation, I show that learning plays at best a modest role in accounting for how divorce probabilities change with marriage duration. On the other hand, a model that assumes that match quality is perfectly observed and follows a random walk can fully explain the data. This finding can also make sense of the fact that many papers fail to find that cohabitation unambiguously and significantly decreases the divorce hazard (see e.g. [Lillard et al., 1995](#); [Reinhold, 2010](#)), a key implication of the learning model. Beyond the fact that there is selection into cohabitation ([Axinn and Thornton, 1992](#); [Lillard et al., 1995](#); [Reinhold, 2010](#)), learning may simply not play an important role in marriage. The second contribution of this paper is to the literature on the impact of job loss on divorce. While it is known that job loss is associated with a higher divorce hazard, it has not yet been clear to what extent this relationship could be interpreted causally. The results

of this paper are consistent with job loss having a causal impact on divorce. For a given belief about match quality prior to job loss, marriages in which a job loss occurs are more likely to end in divorce. At the same time, job loss does not occur randomly; instead, the evidence is consistent with lower quality marriages being also more likely to experience job loss, and in particular a discharge for cause. The third contribution of this paper is to provide a model of relationship separation that can be applied to other relationships such as employment relationships or commercial contracts. The model yields empirically testable predictions that can allow us to learn about the role of learning and shocks in other domains.

There is a limited literature in economics that investigates the impact of labor market shocks on the probability of divorce or separation. [Weiss and Willis \(1997\)](#) look at the impact of unexpected wage gains on divorce and find a negative impact for men's wage gains and a positive one for women's wage gains. This supports the idea that women prefer men with higher earning potential. [Charles and Stephens \(2004\)](#) find that the probability of divorce increases when either spouse is laid off (with a stronger effect for men). Moreover, a layoff has a stronger effect than a plant closing. [Charles and Stephens \(2004\)](#) speculate that what matters is the information conveyed by job loss about the fitness of the partner as a mate rather than purely economic factors. Plant closure also significantly increases the probability of divorce ([Rege et al., 2007](#)), which suggests that job loss has a causal impact on divorce.

There is a much larger literature in psychology that addresses marital functioning and its relationship to economic factors, even though this literature does not focus specifically on the impact of job loss. Economic stress decreases marital satisfaction, and this is in part due to worse marital functioning, i.e. worse communication and the like ([Conger et al., 1999](#)). [Kinnunen and Feldt \(2004\)](#) show that even in a country like Finland, where unemployment benefits are very generous, the longer the husband stays unemployed the more likely his wife is to report increased conflict and decreased common interests.

This paper also relates to a theoretical literature that explains the evolution of the hazard of relationship separation in various contexts. With respect to job separation, [Jovanovic \(1979\)](#) develops the classical learning model and [Mortensen and Pissarides \(1994\)](#) explain job separation through the occurrence of random productivity shocks. A series of subsequent papers have further developed theory and tested it in the context of job separation ([Farber, 1994](#); [Nagypal, 2007](#); [Marinescu, 2009](#); [Kahn and Lange, 2010](#)). In the case of marital separation, [Brien et al. \(2006\)](#) develop a marriage model inspired by [Jovanovic \(1979\)](#) and structurally estimate the model, finding that cohabitation is explained by both the need to learn about potential partners and by the desire to hedge against future bad shocks. Finally, an extension of the [Jovanovic \(1979\)](#) learning model has also been developed and tested for firm learning in the first year of a firm's life ([Abbring and Campbell, 2005](#)): there is no evidence for Jovanovic-style learning in this context. With the exception of [Farber \(1994\)](#), all of the papers that test theory empirically use structural estimation. This paper shows how one can use intuitive and easy to implement reduced-form tests to test for the presence of substantial learning. Additionally, to perform these tests, one only needs a crude signal of low match quality: a dummy variable is sufficient. More detailed data is of course in principle desirable but it will tend to be missing for some applications, and in particular in the case of marriage. Indeed, there is to my knowledge no high-frequency data that tracks beliefs about match quality in marriage.

Finally, this paper relates to a literature in econometrics that addresses the issue of causality in duration models. The question is whether some treatment is causally related to duration, or whether the impact of the treatment is due to unobserved heterogeneity. [Abbring and van den Berg \(2003\)](#) develop empirical tests that are similar in spirit to what I propose here. A contribution of my paper is to show how these econometric tests can be grounded in microeconomic theory based on agents' optimizing behavior.

The remainder of the paper is organized as follows. [Section 2](#) presents a theory of marriage duration. [Section 3](#) discusses the main

<sup>1</sup> As will be discussed below, it is likely that other studies have underestimated the divorce hazard at low durations because no high frequency panel data was available. Underestimating the hazard at low durations will tend to yield an overall hazard that increases initially with relationship duration.

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