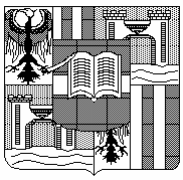

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Divorce and the Excess Burden of Lawyers

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Abstract

We present a model where divorcing spouses can choose to hire lawyers in their divorce process. Spouses encounter incentives as in the classical prisoners' dilemma: Despite the zero sum nature of the game and the lawyers' fees, each spouse has an incentive to hire a lawyer. We propose a simple institutional setting allowing for joint lawyers in order to overcome this socially inefficient situation. This model is estimated and tested with rich micro-data from court records. Employing a multiple treatment matching procedure we estimate the causal effect of lawyers on the division of matrimonial property, on the length of the divorce process and on the quality of the divorce settlement.

JEL Classification: K41, J12, J52, K36, C72.
Keywords: litigation, lawyers, divorce settlements, dispute resolution, family law, multiple treatment matching

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1 Introduction

A central role of the legal system is dispute resolution. If parties do not resolve a dispute by themselves, the legal system provides different mechanisms for conflict resolution.[1] In each case parties have an incentive to devote resources either to gain at the expense of the other or to avoid exploitation by the opposition. The result of these contentious moves is typically a less efficient outcome than if litigants had managed to cooperate. A common attempt to try/avoid exploitation is hiring an expert agent, namely a lawyer. One could argue in favor of the participation of lawyers in dispute resolution if lawyers make negotiations more rational, minimize the number of disputes, ensure that the outcomes reflect applicable norms and may even discover pareto-superior agreements with which litigants would not have came up without legal assistance. But the predominant contemporary view is that the involvement of lawyers prolongs and aggravates conflicts.[2]

A common example of a dispute is a divorce process. After the breakdown of marriage spouses have to divide their matrimonial property comprising tangible and intangible assets (Becker, Landes and Michael, 1977; Weiss and Willis, 1997). Divorce law typically necessitates a specified division of matrimonial property in order to dissolve marriage legally. This is aggravated by the desire of each spouse to obtain a large share as possible. Many observers are especially critical of the way lawyers behave in divorce processes (Gilson and Mnookin, 1994). Indeed, lawyers face some incentives to adopt negotiating strategies involving threats and conscious misrepresentations of their clients' true preferences in order to maximize their profit. Lawyers may make divorce processes more adversarial and painful than necessary. The presence of lawyers frequently makes it more difficult and costly for spouses to reach an agreement on the division of matrimonial property. The policy question arises to what extend should the state permit and encourage divorcing couples to take legal assistance.[3]

In order to answer this question we formulate a simply model where divorcing spouses can choose to hire lawyers in their divorce process. The benefit of hiring lawyers is captured by their ability to affect the division of matrimonial property. It is obvious that spouses encounter incentives as in the classical prisoners' dilemma: Despite the zero sum nature of the game and the lawyers' fees, each spouse has a clear incentive to hire a lawyer. In fact, if the expected benefits from hiring a lawyer

[1] One typically distinguishes between conventional judicial dispute resolution (Cooter and Rubinfeld, 1989) and extrajudicial processes, so-called alternative dispute resolution (Shavell, 1995). An example of the latter – which has been heavily studied in the economic literature on trade unions – is arbitration (Ashenfelter and Bloom, 1984; Ashenfelter, Currie, Farber and Spiegel, 1992). See also Casella (1996) for a discussion of arbitration in international trade.

[2] Cutler and Summers (1999) demonstrate that the legal dispute between Texaco and Pennzoil reduced the combined equity value of the two companies by over 30 percent. After settlement only a large fraction of the losses in combined value was restored. As one possible cause of these large fluctuations in joint value the authors discuss the fees that both companies paid to their hosts of lawyers. Murphy, Shleifer and Vishny (1991) provide evidence that the ratio of college enrollments in law to total college enrollments is inversely related to a country's growth.

[3] In fact, we are not aware of any state that prohibits the use of lawyers in a divorce process. Contrary, there are at least some countries where divorcing spouses are (partly) forced to hire a lawyer. See Table 2 (column 1) in the Appendix.

outweigh the associated cost retaining a lawyer is a dominant strategy.[4] Although this result is straightforward we represent it formally, since we propose in a next step an institutional setting to overcome this socially inefficient situation. It turns out, that allowing for joint lawyers enables a second-best solution.[5]

In the empirical part of the paper the model is estimated and tested with rich micro-data from court records. The primary aim of our empirical analysis is to assess whether the involvement of lawyers in a divorce process has a causal effect on the divorce settlement. We use four different outcome variables to characterize the consequences of the involvement of lawyers. To capture the division of matrimonial property we employ two outcome measures: (i) the alimony award to the wife and (ii) the child-support award for the oldest minor. It turns out that in general there is no causal effect of the involvement of lawyers on the division of matrimonial property. Just in the one case where only the wife has retained a lawyer she obtains a higher share of matrimonial property compared to the situation without any lawyer. Our third outcome measure is the length of the divorce process which should capture additional monetary and psychic cost. Our fourth and final outcome measure, the number of subsequent trials, is a proxy for the quality of the divorce settlement in terms of sustainability over time. We find that in most of the cases lawyers unnecessarily prolong the divorce process and cause an excess burden which increases both the private and public cost of divorce. Since there exists also no benefit of the engagement of lawyers in terms of more sustainable divorce settlements over time, we suggest to tune the institutional setting in order to minimize the engagement of lawyers in divorce processes.

2 Theoretical considerations

Consider a couple who have decided to divorce. The spouses have already fixed a hearing at court. The prerequisite for divorce is that the spouses agree upon division of matrimonial property. We presume that each spouse seeks to get the largest possible share of the matrimonial property. If they cannot find an agreement a judge is used to resolve this dispute.[6] That means, the judge decides upon the division of matrimonial property. We define the judge's preferred award $a_f \in [0, 1]$ as a share of the matrimonial property awarded to the wife. Therefore, the husband receives $1 - a_f$. Spouses are free to hire a lawyer. However, neither spouse knows for sure what choice the other will make. The rationale behind hiring a lawyer is that a lawyer may alter the judge's decision in ones favor. We therefore presume that the benefit of legal representation is exclusively given by the lawyer's ability to increase the share of matrimonial property allocated to his client. Hence, we reduce a lawyer to his role as negotiator and litigator. He has the responsibility for marshaling and presenting relevant evidence and making the necessary legal arguments. While we

[4] This result was first brought forward by Ashenfelter and Bloom (1990) and is discussed in the context of arbitration more elaborately by Ashenfelter and Dahl (2003).

[5] In some countries the possibility of joint lawyers is indeed available. See Table 2 (column 2) in the Appendix.

[6] Although this model is framed in the context of a court system it could equally as well be applied to any (alternative) dispute resolution system such as final offer arbitration.

think that this is the fundamental aspect of legal representation, we concede that a client may profit from his lawyer in further ways.[7]

2.1 Regime I - Separate lawyers only

As a first step we presume an institutional setting where spouses are free to engage a lawyer *each*. Thereby, we allow for the possibility that the spouses' lawyers may differ in their ability of shifting the award of a male or a female spouse. If the wife hires a lawyer it increases the award a_f by the quantity $l_w \in [0, 1 - a_f]$. The husband's lawyer reduces the award a_f by the quantity $l_h < a_f$. The restrictions on l_w and l_h simply guarantee that no spouse may receive more than the whole matrimonial property. For the moment we assume that the quantities l_w and l_h are irrespective of the usage of the lawyer of the other spouse. We will relax this assumption below.[8] The lawyers' fees are expressed as a fraction of the matrimonial property, where c_w and c_h are the cost for hiring a lawyer for the wife and the husband respectively. We therefore assume that the market for lawyers offers two standardized services (l_w, l_h) with fixed prices (c_w, c_h).[9]

		Husband	
		NL_h	L_h
Wife	NL_w	$0, 0$	$-l_h, l_h - c_h$
	L_w	$l_w - c_w, -l_w$	$l_w - c_w - l_h, l_h - c_h - l_w$

Figure 1: *Regime I.*

Assuming that the husband does not employ a lawyer, the expected net gain for the wife from employing a lawyer is equal to $l_w - c_w$. Equivalently, if only the husband hires a lawyer his net gain amounts to $l_h - c_h$. In the case where both spouses retain a lawyer the net-effect of the lawyers is unclear. If the lawyers have equal abilities

[7] It is typically necessary to follow certain legal procedures and complete various forms in order to secure a divorce. A lawyer can take over these tasks and relieve his client. Moreover, a lawyer may act as a counselor and help his client to determine his real interests. In addition, he can simple provide moral support. For a further discussion of the several functions of a lawyer in a divorce process refer to Mnookin and Kornhauser (1979).

[8] Another possibility is to model the award a_f as being drawn from a normal probability density function with mean μ and variance σ^2, $a_f \sim N(\mu, \sigma^2)$. One may think of judges being statistically exchangeable and the distribution can be viewed as the distribution of preferred awards for a large sample of judges who execute all the same case. This would introduce some uncertainty and the lawyers would affect the distribution, e.g. a shift in the mean. However, this would provide no additional insights.

[9] Of course this is a very simplifying assumption. Instead one could introduce continuous strategies $S_i = [0, \infty)$, in which case a strategy s_i is the amount of money spent for the lawyer's services and the effort/quality of a lawyer increases in s_i but at a decreasing rate, i.e. $l_i'(s_i) > 0$ and $l_i''(s_i) < 0$. However, this more realistic set-up does not change the basic result. Moreover, if there is asymmetric information between lawyer and client the divorce process is characterized by a further dimension of strategic interaction. We will discuss this issue in Section 2.3.

to shift the award, $l_w = l_h$, the effects of the lawyers cancel out and the wife's net gain amounts to $-c_w$ and the husband's to $-c_l$. However, if $l_w \neq l_h$ the net gains are determined by the lawyers' relative abilities to shift the award.[10] The game is illustrated by the bi-matrix in Figure 1 where each spouse i ($i = w, h$) has the choice between hiring a lawyer (L_i) or not (NL_i). The payoffs are expressed relative to the case where neither party hires a lawyer and the payoffs in this latter case are normalized to zero. The first entry represents the wife's payoff and the second entry the husband's payoff.

Figure 1 reveals that if $l_w > c_w$ it pays for the wife to retain a lawyer regardless of what the husband does. If the husband does not retain a lawyer, the wife receives $l_w - c_w$, which is greater than 0. Likewise, if the husband does retain a lawyer, the wife is certainly better off doing the same. In sum, the wife is better off employing a lawyer regardless of what the husband does. An equivalent reasoning applies to the husband's choices. Therefore, if the following condition its satisfied,

$$l_i > c_i \quad i = w, h \tag{1}$$

it pays for either spouse to retain a lawyer regardless of what the other does and the actions (L_w, L_h) constitute a Nash equilibrium. In other words, if the expected gain is higher than the cost, retaining a lawyer is a dominant strategy and the spouses may face incentives to hire lawyers even if, in equilibrium, they do not improve their payoffs. Of course, our framework enables us to explain situations where neither spouse or only one spouse may hire a lawyer. For instance, the gain of hiring a lawyer may simple not outweigh the cost for individual spouses. It is even conceivable that the institutional setting implies that $l_w \neq l_h$ and e.g. women's lawyers may face a systematic higher potential to shift the award. In any case if lawyers are paid according to their productivity, i.e. $l_i = c_i$, hiring a lawyer is a weakly dominant strategy.

Until now we presumed that the effect of a lawyer was independent from the existence of another lawyer in the courtroom. We now allow for the possibility that the lawyer's ability to affect the award varies with the other spouse's hiring decision. Suppose that the wife's award is increased by her lawyer by $\bar{l}_w$ if the husband has no lawyer and otherwise by $\underline{l}_w$ where $\bar{l}_w - \underline{l}_w \equiv \varepsilon_w > 0$. The respective quantities for the effect of the husband's lawyer are $\bar{l}_h$ and $\underline{l}_h$ where $\bar{l}_h - \underline{l}_h \equiv \varepsilon_h > 0$. We refer to this as *conditional lawyers' effects*. We are now interested in the respective abilities of the lawyers to shift the award. Therefore, we define $\underline{s}_i = \underline{l}_i - \underline{l}_j$ where $i \neq j$. To which we refer as *direct superiority* capturing the case of a direct confrontation of the two spouses' lawyers in the courtroom. If $\underline{s}_i > 0$ the lawyer of spouse i is able to shift the award further than spouse's j lawyer. We refer to this situation as the direct superiority of lawyer i over the lawyer of spouse j. As a matter of course we denote the case of $\underline{s}_i < 0$ as the direct superiority of lawyer j.[11]

[10] The encounter of two lawyers in the courtroom introduces a third potential dimension of strategic interaction in the divorce process (see Section 2.3).

[11] Equivalently, we can define for the comparison of the two cases where only one spouse retains a lawyer the hypothetical *indirect superiority* given by $\bar{s}_i = \bar{l}_i - \bar{l}_j$ where $i \neq j$. If $\bar{s}_i > 0$ the lawyer of spouse i is able to exploit the absence of lawyer j more efficiently than the lawyer of spouse j can do, and *vice versa*.

The modified bi-matrix in the case of conditional lawyers' effects is depicted in Figure 2. Again, we have expressed the payoffs relative to the case where neither spouse hires a lawyer and the payoffs in this latter case are normalized to zero.

		Husband	
		NL	L
Wife	NL	$0, 0$	$-\bar{l}_h, \bar{l}_h - c_h$
	L	$\bar{l}_w - c_w, -\bar{l}_w$	$\underline{s}_w - c_w, -\underline{s}_w - c_h$

Figure 2: *Regime I* with conditional lawyers' effects.

Now, the actions (L_w, L_h) constitute a Nash equilibrium if the following condition is satisfied

$$\bar{l}_i > c_i \text{ and } \underline{l}_i > c_i - \varepsilon_j \quad \forall i \neq j, i = w, h. \tag{2}$$

Therefore, hiring a lawyer is a dominant strategy if (i) in the case where the other spouse has no lawyer the benefits of hiring a lawyer outweigh the associated cost and (ii) if in the case where the other spouse has hired a lawyer too, the benefits outweigh the cost minus the others lawyer potential ability to exploit the absence of one's own lawyer. Note, in the case where i's lawyer's ability to exploit the absence of a further lawyer is superior to j's lawyer's equivalent ability ($\varepsilon_i > \varepsilon_j$) the first condition is sufficient and hiring a lawyer is a dominant strategy for spouse i as long as $\bar{l}_i > c_i$. Whereas in the case of $\varepsilon_i < \varepsilon_j$ the condition $\underline{l}_i > c_i - \varepsilon_j$ is sufficient.[12]

To sum up, an institutional setting offering spouses the possibility to retain a lawyer *each* embodies incentives associated with the prisoner's dilemma if the individual gain from engaging in noncooperative behavior is likely to exceed the cost. Given that, each spouse employs a lawyer in the hope of exploiting the other. At the same time both are aware that failing to do so will give the other the possibility to exploit oneself. Both spouses retain a lawyer and pay a lawyer's fee, but the award may be precisely the same as would have occurred if neither spouse had hired a lawyer. The individual demand for a lawyer in the divorce process is (at least) from the spouses' point of view inefficient.[13] In the next section we propose a reform of *Regime I* which should result in a more efficient situation. By allowing spouses to employ a *joint* lawyer a second best solution may be achievable.

[12] One can state these conditions in terms of superiority too: The actions (L_w, L_h) constitute a Nash equilibrium if the $\bar{l}_i > c_i$ and $\underline{s}_i > c_i - \bar{l}_j \quad \forall i \neq j, i = w, h$. If the indirect superiority of lawyer i is greater then his direct superiority ($\bar{s}_i > \underline{s}_i$) the condition $\bar{l}_i > c_i$ is sufficient to guarantee that hiring a lawyer is a dominant strategy for spouse i. While, if the direct superiority of lawyer i is greater then his indirect superiority ($\underline{s}_i > \bar{s}_i$) the condition $\underline{s}_i > c_i - \bar{l}_j$ is sufficient.

[13] Of course, in sum this results just in a redistribution from the divorcing spouses to lawyers and for the economy as a whole no inefficiencies arise.

2.2 Regime II - Allowing for a joint lawyer

Let us now consider an institutional setting which allows couples to hire a *joint* lawyer. A joint lawyer is supposed to work simultaneously for both parties and may therefore seem to be a non-intuitive concept at first view. But as already mentioned there a couple of countries where lawyers are allowed to represent the interests of both husband and wife. In practice, a joint lawyer consults with the clients and they work out together the terms of an agreement. Consequently, a joint lawyer is only possible for no-fault divorces. However, since the principal of marital breakdown has overridden the principle of fault throughout the Western world (Boele-Woelki, Braat and Sumner, 2005) *Regime II* is indeed a highly relevant option.[14] In any case it has to be guaranteed that in a case of a conflict of interests a joint lawyer should step down according to professional ethic rules.

For modeling it is a natural starting point to assume that spouses decide first whether to take a joint lawyer or not. If not, each spouse may decide to retain a separate lawyer. *Regime II* implies a two stage game which is depicted by Figure 13 in the Appendix. In the first stage of the game both spouses decide simultaneously whether to employ a joint lawyer (J_i) or not (NJ_i). If both spouse choose to make use of a joint lawyer the game ends, but if only one or either spouse prefers not to employ a joint lawyer, the game reaches a second stage. Their choice will of course crucially depend on which payoff they can expect in each case. Assuming that a joint lawyer has to act in agreement with both clients, he will strive for a fair division in the legal sense. What is a fair division in the legal sense? Most probably it is exactly the division that the unaffected judge has in mind. Therefore, the payoffs in the case with a joint lawyer should differ from the case without any lawyer only by the joint lawyer's fee denoted by c_J. Each spouse knows that if they do not manage to agree on a joint lawyer they face the prisoner's dilemma provided that (1) or (2) hold. Assuming that the joint lawyer's fee is shared equally we solve this (potential) two stage game by backwards induction and conditioning on inequality (2) it reduces to the bi-matrix depicted in Figure 3.

		Husband	
		J_h	NJ_h
Wife	J_w	$-c_J/2, -c_J/2$	$\underline{s}_w - c_w, -\underline{s}_w - c_h$
	NJ_w	$\underline{s}_w - c_w, -\underline{s}_w - c_h$	$\underline{s}_w - c_w, -\underline{s}_w - c_h$

Figure 3: *Regime II*, second stage conditioning on (2).

The payoff matrix implies that a hiring a joint lawyer is a weakly dominant strategy if the individual cost for hiring a joint lawyer are lower than the cost of a separate

[14] For instance, in the US no state today requires fault for the dissolution of a marriage (Brinig and Buckley, 1998) and the most US-states have completely eliminated the principle of fault.

lawyer minus his direct superiority:

$$c_J/2 < c_i - \underline{s}_i \quad i = w, h. \tag{3}$$

In other words, in the case of conditional lawyers' effects the incentive to hire a joint lawyer in the first stage of the game falls (rises) *ceteris paribus* with the superiority of one's own lawyer (the opponent's lawyer) in the second stage of the game.

For the special case where the abilities of both spouses' lawyers cancel each other out in the courtroom, i. e. the direct superiority of lawyer i and j is zero, condition (3) simplifies to $c_J/2 < c_i$. In that case hiring a joint lawyer is a weakly dominant strategy as long as the individual cost of a joint lawyer are below the cost of hiring a separate lawyer. In order to examine the likelihood of the favorable equilibrium (J_w, J_h) in the general case we need to make a statement on the potential magnitudes of the superiority of a lawyer. Therefore, we make an assumption on the remuneration of lawyers in the second stage. If a lawyer (representing one spouse) is paid according to his productivity ($c_w = \underline{l}_w$ and $c_h = \underline{l}_h$), that means measured by his capacity to shift the award then condition (3) simplifies to $c_J/2 < c_j$.

To sum up, under realistic assumptions the actions (J_w, J_h) constitute a Nash equilibrium in an institutional setting which allows divorcing couples to hire a joint lawyer as long as policy makers take care that a joint lawyer does not charge twice as much as a lawyer representing one spouse only. The rationale behind hiring a joint lawyer in the first stage of the game is the thread of ending up in the prisoner's dilemma in the second stage of the game. Therefore, it is up to policy makers to prevent the socially inefficient equilibrium (L_w, L_h) and enable the second-best solution where divorcing couples hire a joint lawyer.

2.3 Further dimensions of strategic interaction

So far we have neglected two further prevailing dimensions of strategic interaction: There is (i) a potential conflict of interest between lawyers and clients and (ii) a strategic interaction between lawyers.

Dispute resolution may be complicated by the fact that the lawyer's interests are not necessarily identical to his client's. This potential conflict can be described as a principal-agent problem. There are a number of papers in the economic literature which try do design contracts between lawyers and their clients that favor efficient legal representation (Danzon, 1993; Rubinfeld and Scotchmer, 1993; Polinsky and Rubinfeld, 2002).[15] This principal agent problem may ceteris paribus reduce the incentive to hire a lawyer. Little attention has been devoted to the interaction

[15]The basic problem can be described as follows: If a lawyer is paid for his working hours (irrespective of the outcome) he will spend more hours on the case than the client would want and will have an excessive motive – relative to his client's interest – to bring the case. Whereas if a lawyer receives a fraction of any trial award or settlement and bears all of the cost – this so-called contingent fee arrangement is widely used in the US – he may spend too little time on the case and have an excessive motive to settle it (Polinsky and Rubinfeld, 2003).

between lawyers in the economic literature.[16] The encounter of two lawyers in the courtroom introduces a third dimension of strategic interaction in the divorce process. In contrast to the divorcing spouses who are very unlikely to divorce from each other ever again lawyers will probably meet each other in a different (divorce) trial again. Therefore, from the spouses' point of view the divorce process is best described as a one-shot game. In contrast, the interaction between lawyers appears to be a (finitely) repeated game. This repeated nature of the game constitutes – beside the outlined principal-agent-problem – a further source of conflict of interest between lawyer and his client. From experimental evidence we know that cooperation may arise as an equilibrium outcome in finitely repeated prisoner's dilemma (Andreoni and Miller, 1993). Therefore, the lawyers may embark on less aggressive strategies compared to the situation they are the only lawyer in the courtroom. In terms of our model this would imply that $\varepsilon_i \equiv \bar{l}_i - \underline{l}_i$ increases if $\underline{l}_i$ tends to zero as lawyers treat each other with care. Whether the lawyers' tendency to cooperate aggravates or alleviates the principal-agent-problem depends on the stipulated fee system.

3 Empirical analysis

The primary aim of our empirical analysis is to assess whether the involvement of lawyers in a divorce process has a causal effect on the divorce settlement. We use four different outcome variables to characterize the consequences of the involvement of lawyers. To capture the division of matrimonial property we employ two outcome measures: (i) the alimony award to the wife as a percentage of the husband's income and (ii) the child-support award for the oldest minor as a percentage of the husband's income. Thereby, we try to measure the payoff matrices discussed in the theoretical part of the paper and compare the benefit of hiring a lawyer with the associated out of pocket expenditures. Our third outcome measure is the length of the divorce process. We employ this outcome in order to proxy for additional non-monetary/psychic cost of the involvement of lawyers. Our fourth and final outcome measure is the number of post-divorce trials. We check whether the lawyers' expertise affects the sustainability of divorce settlements over time. To identify causal effects we employ a multiple treatment matching procedure since we can use unusually informative micro-data from divorce records.

3.1 Data and institutional setting

Our empirical analysis is based on data on divorce records of cases from five district courts in Austria covering divorces initiated between 1997 and 2003. A divorce record is an official record comprising all relevant information the judge's decision is

[16] Gilson and Mnookin (1994) argue in their 'litigation game' that two disputants (with or without a lawyer) face a prisoners' dilemma strategic structure: Each litigant can either cooperate by voluntarily disclosing his private information or he can defect by refusing to provide it. However, the other side can force disclosure which causes cost for both parties. The authors suggest that the litigants may overcome this dilemma by hiring lawyers who have an interest in maintaining reputations as cooperative types. There is experimental (Crosona and Mnookin, 1997) and empirical (Johnston and Waldfogel, 2002) evidence for this commitment strategy.

Table 1: The usage of lawyers in the different samples.

	Full sample $N = 6,049$	Used sample $N = 2,436$
Neither spouse has a lawyer	77.00	77.22
Spouses have a joint lawyer	4.88	4.31
Both spouses have a lawyer	9.08	8.62
Only the wife has a lawyer	5.55	6.40
Only the husband has a lawyer	3.49	3.45
	100.00	100.00

based on. This data set therefore contains comprehensive and accurate information on the spouses, on any child, on the involvement of lawyers and on the outcome of the divorce case. The only drawback of this data-set is caused by the fact that some judges just annotate in the divorce record that the spouses declare their income (by showing their account statements or a confirmation) but do not record the amount. Since the husband's income is an essential variable in order to construct outcome variables we restrict our analysis to the sub-sample of $2,436$ observations which include information on the husband's income.[17] Table 1 compares the distribution of lawyer usage in the full sample and in this sub-sample. The distribution in the two samples is very similar. The largest difference in a category is within one percentage point. Therefore, we have no evidence that divorce cases with missing information on the income are a selected group with respect to the usage of lawyers. This is not surprising since couples are matched randomly to judges.

From the $2,436$ couples in our data $2,256$ (or 92.6 percent) have at least one joint minor at the time of divorce. In about 98.7 percent the mother is the custodian.[18] Until 2004 divorcing couples where free to hire a joint lawyer as presumed by *Regime II* in the theoretical part of the paper. However, on 1 January 2005 a new draft of the so-called Non-Contentious Proceedings Act entered into force and repealed the possibility of joint lawyers. This change was justified by avoiding conflict of interests between parties and following foreign models, for example Germany. Since then couples are only allowed to hire separate lawyers as described by *Regime I*. Our data covers the time period before the legal change. Figure 4 shows – upper

[17] The wife's income is used as an explanatory variable only. Therefore, we impute for it in the $1,697$ cases where the wife's income is missing. Fortunately, we have very detailed information on the wives' occupations which allows us to impute for missing incomes based on a multivariate OLS-regression. The explanatory variables in this regression comprise age at marriage, age at the birth of the first child, dummy variables for the different occupations (unskilled blue collar worker, skilled blue collar worker or craftsman, white collar worker, civil servant, self-employed, etc.), for the place of birth, for citizenship and for the place of residence (zip-code). All coefficients show the expected sign and are of reasonable size. The predictive power of the regression is quite good with an R^2 of 0.53.

[18] During marriage both parents hold parental responsibilities for a child. After divorce parents have to arrange child custody. Traditionally divorcing parents had to assign sole custody to one parent. In 2001, Austria has reformed the custody law after divorce. Joint custody is now the rule. It continues after divorce, unless the parents agree on a sole custodian. Nevertheless, in order to sustain joint custody parents have to agree on the primary residence of the child. For simplicity we refer to this so-called 'resident parent' as custodian too.

entries represent relative numbers and lower entries absolute numbers – that the majority of all couples do not employ any lawyer (77.2 percent). The second largest group consists of couples who hire a separate lawyer each. For these 8.6 percent of all couples a divorce case may embody incentives associated with the prisoner's dilemma. Couples where only the wife is represented by a lawyer account for 6.4 percent of all cases. A small group of couples (4.3 percent) manage to cooperate and hire a joint lawyer.[19] Most uncommon are couples where only the husband employs a lawyer (3.4 percent).[20]

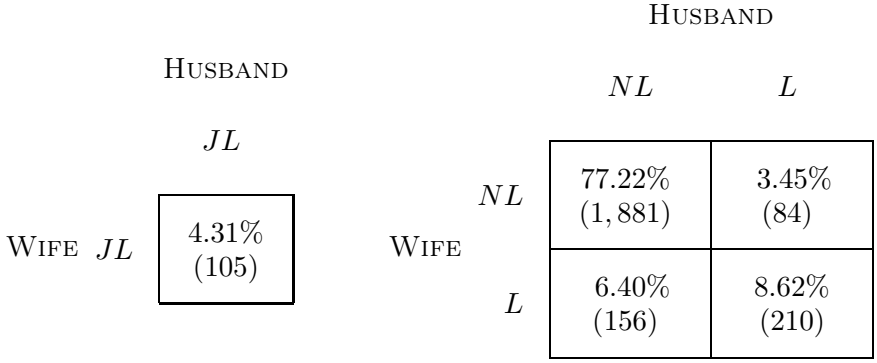

Figure 4: Usage of lawyers for all spouses ($N = 2,436$).

We now consider whether hiring a lawyer is associated with advantageous awards. In a first step we capture the division of matrimonial property by the monthly alimony award to the wife as a share of the husband's monthly income.

According to Austrian Law the alimony award is predominantly determined by the grounds for divorce.[21] If the spouses divorce on the grounds of fault/irretrievable breakdown the sole or predominantly guilty party must generally pay alimony. The amount of alimony depends primarily on the spouses' financial circumstances. For a divorce by mutual consent it is only necessary that the spouses *agree* on alimony.

The simple descriptive statistics in Figure 5 suggest that wives from couples without any lawyer get on average the lowest alimony payment of about 5.7 percent of the husband's income. For couples where only the husband is represented by a lawyer we obtain a slightly higher mean alimony payment of about 7.3 percent. For wives from the group with a joint lawyer and for the group where only the wife has a lawyer we

[19] In terms of the theoretical considerations, for these couples the game ends in the first stage.

[20] As Figure 14 in the Appendix shows the usage of lawyers is similar for the sub-sample of spouses with at least one minor.

[21] The Austrian divorce law provides basically two different grounds for divorce: (i) Divorce on the ground of fault/irretrievable breakdown and (ii) divorce by mutual consent. While the first type of divorce is closed by a verdict the second type requires a settlement. In practice, the judge takes an active part in finding and formulating a settlement. Divorce by mutual consent has been introduced in 1978 and since then it has extremely increased in popularity, probably because it is the cheapest way to obtain divorce. In 2003, about 88 percent of all divorces were divorces by mutual consent. Nevertheless, many divorce cases are initiated by a lawsuit, meaning that one or either spouse aims to obtain a divorce by the ground of fault/irretrievable breakdown of the other spouse, and during the divorce process they turn in to a divorce by mutual consent.

obtain fairly similar mean awards around 15 percent. The highest award is obtained by wives from couples where both spouses employ a lawyer (17.7 percent).

		Husband
		JL
Wife	JL	15.51% (23.84)

		Husband	
		NL	L
Wife	NL	5.70% (16.80)	7.29% (16.39)
	L	15.05% (21.82)	17.65% (23.65)

Figure 5: Mean of alimony award as percentage of husband's income for all spouses. ($N = 2,436$ – standard errors are in brackets below)

While it is reasonable that wives who are the only party represented by a lawyer obtain a higher award compared to wives without a lawyer, the remaining ordering suggested by these descriptive statistics seems odd. However, as we pointed out in the theoretical part of the paper spouses will hire a lawyer only if the expected benefit of doing so outweighs the cost. Therefore, the involvement of lawyers is likely the result of systematic decisions and the sample of spouses with lawyers will not be random. It is yet impossible to decide whether the order of alimony awards is due to a causal effect of lawyers or due to a systematic selection of couples with fairly different characteristics into specific situations. In the next section we present our estimation strategy to disentangle these two factors and to uncover causal effects of lawyers.

3.2 The problem of causal inference

The ultimate aim of our empirical analysis is to identify causal effects. We would like to ask questions like 'By how much would the wife's alimony award – who actually has hired a lawyer – differ if she would have not had a lawyer?'. In order to answer this question we would ideally be able to observe the wife with and without a lawyer. Since this is in reality not possible it is usually referred as the fundamental problem of causal inference (Holland, 1986*a*). We cannot infer the effect of the lawyer because we do not have the counterfactual evidence, i. e. what would have happened in the absence of the wife's lawyer. The statistical approaches to solve such a problem aim to identify average causal effects. Therefore, we translate this problem into a treatment-control situation typical of the experimental framework (Rubin, 1974) and utilize its terminology. We refer to the representation by a lawyer as a so-called *treatment* and the resulting alimony award is termed *outcome*. In our specific case we have four different treatments: 'spouses have a joint lawyer' or T^{JL}, 'both spouses have a lawyer' or $T^{L,L}$, 'only the wife has a lawyer' or $T^{L,NL}$ and 'only the husband has a lawyer' or $T^{NL,L}$. The case where neither spouse has a lawyer is the special

case of the treatment type 'no treatment'. Therefore, we will refer to it as control group, T^0. We are primarily interested in the comparison of the causal effect of each of the following treatments

$$T^j, \text{ where } j \in \{JL; L, L; L, NL; NL, L\}, \tag{4}$$

on the outcome compared to the case without any lawyer, T^0. Since we argue in a treatment-control framework it is not relevant whether we state that the wife and/or the husband receive a certain treatment. In order to avoid confusion we refer to a participant of a treatment as a unit. In the following empirical analysis we aim to simulate an experimental setting and do not follow a behavioral approach per se. Therefore, we will focus on the effect of certain treatments on various outcomes, rather than on describing why units choose different treatments.

The set of potential outcomes associated with these treatments is given by Y^{JL} , $Y^{L,L}$, $Y^{L,NL}$ and $Y^{NL,L}$. The outcome associated with the control case is denoted by Y^0. Every unit either belongs to the control group or receives exactly one of the treatments. Therefore, for any unit only one element of $\left\{Y^0, Y^{JL}, Y^{L,L}, Y^{L,NL}, Y^{NL,L}\right\}$ is observable and the remaining 4 outcomes are *counterfactuals*. The definition of (average) treatment effects for the case of multiple treatments – compared to the case of a binary treatment – is extended by Imbens (2000) and Lechner (2001) who describe this as pair-wise comparisons of the effects of two particular treatments. For instance, consider the comparison of treatment T^j and T^0. The expected average effect of treatment T^j relative to T^0 for a unit drawn randomly from the population (the *Average Treatment Effect*, ATE^{T^j,T^0}) is given by

$$ATE^{T^j,T^0} = E(Y^j - Y^0) = E(Y^j) - (Y^0). \tag{5}$$

This average treatment effect is symmetric, i.e. $ATE^{T^j,T^0} = -ATE^{T^0,T^j}$. Similarly, the expected average effect of treatment T^j relative to T^0 for a unit drawn randomly from the sub-population actually participating in treatment T^j (the *Average Treatment Effect on Treated*, ATT^{T^j,T^0}) is given by

$$ATT^{T^j,T^0} = E(Y^j - Y^0|T^j) = E(Y^j|T^j) - (Y^0|T^j). \tag{6}$$

This treatment effect is only symmetric – i.e. $ATT^{T^j,T^0} = -ATT^{T^0,T^j}$ – if participants in treatments T^j and T^0 do not differ.[22]

In an ideal setting one would like to compare units with a treatment T^j and one from the control group, T^0, who have the same values of all relevant characteristics (i. e. units who are observably identical). For obvious reasons, this procedure suffers

[22]We concentrate on these two treatment effects. However, note these are only two examples of many possible treatment effects. One can define different treatment effects with respect to comparisons of types of treatments and with respect to populations under consideration. For instance, consider the expected average effect of treatment T^k relative to treatment T^l ($l \neq k$) for a unit drawn randomly from the sub-population actually participating in either T^k or T^l. This treatment effect is given by $E(Y^k - Y^l|T^k \vee T^l) = E(Y^k|T^k \vee T^l) - (Y^l|T^k \vee T^l)$. This specific treatment effect is a weighted combination of ATT^{Y^k,Y^l} and ATT^{Y^l,Y^k}, where weights are given by the participation probabilities in the respective treatments T^k and T^l. In Section 4 we explore the issue of treatment heterogeneity.

from multi-dimensionality. To overcome this dimensionality problem Rosenbaum and Rubin (1983) propose for the binary treatment case an equivalent and feasible estimation strategy based on the concept of the so-called *propensity score*. The propensity score is the conditional probability of receiving a treatment given the vector of relevant characteristics $\mathbf{X}$. Rosenbaum and Rubin (1983) show that if assignment to treatment is random within cells defined by $\mathbf{X}$ then it is also random within cells defined by the mono-dimensional propensity score.

Imbens (2000) and Lechner (2001) show that properties similar to the propensity score hold in the multiple treatment case for pair-wise comparisons as well. In particular, Lechner (2001, Proposition 3) shows that in order to identify the ATE^{T^j,T^0} and the ATT^{T^j,T^0} it is sufficient to obtain information on the sub-population actually participating in treatment T^j and T^0. As a consequence two possibilities are available to estimate the selection probabilities, which can then be used as input to a matching estimator. Firstly, one can estimate binary choice models on the different sub-samples to obtain the binary conditional probabilities. This approach is called the *reduced-form approach*. This estimation strategy closely mirrors the conventional approach for binary treatments. Secondly, one can formulate a complete multinomial-choice model to estimate the conditional probabilities. This approach is called *structural approach*. Lechner (2002) considers the relative performance of the reduced-form approach and the structural approach by estimating a multinomial probit model in the case of a Swiss labor market programs. He finds little difference in their relative performances. Nevertheless, he concludes that the reduced-form approach may be more robust, since a mis-specification in the structural approach in one series may spill over. Therefore, we follow the reduced-form approach.

3.3 Identification strategy

In the following we explain the procedure of our empirical analysis and discuss the assumptions which have to be fulfilled in order to identify average treatment effects. In order to make any statement on causal effects the assumption of *stable unit treatment value* (SUTVA) has to be made (Rubin, 1980, 1986; Holland, 1986*b*). SUTVA requires that potential outcomes and treatments of unit m are independent of the potential assignments, treatments and outcomes of unit $n \neq m$ and therefore rules out any cross-effects or general equilibrium effects. In our specific case we can credibly argue that SUTVA is fulfilled since it is not plausible that the divorce settlement or the hiring decision of one couple is influenced by the hiring decision or the divorce settlement of a different couple.

To estimate the ATE^{T^j,T^0} and the ATT^{T^j,T^0} via the reduced form approach we need the conditional probability of receiving the treatment T^j compared to T^0 given the vector of attributes $\mathbf{X}$. We estimate the propensity score based on the data on the sub-population actually participating in treatment T^j and T^0 with a probit model. The identification of average causal effects depends now crucially on the so-called

conditional independence assumption (CIA) formalized in equation (7).

$$\begin{aligned} Y^0, Y^{JL}, Y^{L,L}, Y^{L,NL}, Y^{NL,L} \perp\!\!\!\perp T^j | b(\mathbf{X}) = b(x), \quad \forall\, x \in \chi \\ \text{if } E\left[P(T^j|\mathbf{X}=x)|b(\mathbf{X})=b(x)\right] = P\left[T^j|\mathbf{X}=x\right] = P^j(x), \\ 0 < P^j(x) < 1, \quad \forall j = 0; JL; L, L; L, NL; NL, L \end{aligned} \tag{7}$$

The CIA requires that all potential outcomes are independent of the assignment mechanism conditioning on a given vector of attributes $\mathbf{X}$, in an attribute space χ. The CIA therefore requires that all characteristics that jointly affect the potential outcomes as well the assignment into treatments to be observable. The plausibility of this strong assumption heavily relies on the amount and quality of available information. In turn, the credibility of multiple treatment matching as a tool for causal inference depends therefore crucially on the quality and amount of observable pre-treatment characteristics $\mathbf{X}$.

In fact, the choice of multiple treatment matching as an empirical tool for this analysis was motivated by the richness and the accuracy of the available information on the divorce cases. We can control for the detailed background variables available in divorce records. A divorce record is an official record comprising all relevant information on which the judge's decision is based. Therefore, a divorce record consists of socio-economic information on the whole family, transcripts of all proceedings, the correspondence between the litigants and the court, different certificates, the judgment or the settlement.[23] In our probit estimations we control for the spouses' labor market status, for their income, for their age at the time of divorce, for their education, for their citizenship, for their former marriages, for their number of joint non-minors, for their number of joint minors, for the child's/children's age, for the length of marriage, for any spouses' further support obligations, for any real estate(s), for any liabilities, for the judge's sex and for the courts where divorce took place as well for a time trend.[24] Note, the CIA allows only to match on time constant factors and variables that are not determined or affected by the treatment. For instance, the allocation of custody may be influenced by the presence of a lawyer. Conditioning on it would tamper that part of the causal effect of a lawyer on alimony that operates through custody allocation. In each and every estimation the *balancing property* is satisfied, i. e. it is guaranteed that units from the control group and treatment group

[23] We collected the data from divorce records on-site at the district courts. The time we needed to pick and type the relevant information varied widely with the complexity of the case and could take up to an hour for just one case.

[24] The selection into all four treatments (compared to the control group) is positively related to the existence of any real estate(s). Apart from that, the results indicate that the selection into the four treatments is driven by quite different determinants. For instance, the probability of selection into the treatment 'both spouses have a lawyer' is decreasing with the husband's education, with the number of the husband's further support obligations, with the length of marriage, with the children's age (but at a decreasing rate) and rising with the husband's income. Whereas the selection into the treatment 'only the wife has a lawyer' is decreasing with the wife's education, with the number of joint non-minors, with the length of marriage (but at a decreasing rate) and with the number of the husband's former marriages. The main determinants of the selection into the cooperative treatment 'spouses have a joint lawyer' are the number of joint minors, their age and the spouses previous divorce experience. The estimation results are not presented in the paper but of course available upon request.

with the same propensity score have the same observable characteristics.[25]

In general, the best feasible way to assess whether propensity score matching is an appropriate empirical tool for the research design and the data in question is to inspect the overlap between the treatment and control units in terms of the propensity score. A sufficient overlap indicates that the assumption of selection on observables is reasonable. Figures 16 to 19 in the Appendix plot the histograms of the estimated propensity scores for the control couples and the respective treated couples. If there is selection into treatment control couples should have on average lower propensity scores compared to treated. Therefore, as expected the propensity score distribution of the control couples is in each case skewed to the left. In fact, it is one of the strengths of the propensity score method to highlight this fact dramatically (Dehejia and Wahba, 2002). However, most importantly we see that in each case there is substantial overlap in the distribution of the propensity score between the control and treatment couples. This indicates that propensity score matching is an appropriate tool for the estimation of causal effects of the involvement of lawyers on divorce settlements. We are confident that after controlling for our rich set of information, there is little unobservable heterogeneity left that is correlated with our outcome measures and the hiring of lawyers.

Finally, to calculate average treatment effects we have to compare the outcomes of as similar as possible control and treatment couples. Obviously, the probability of observing couples with identical propensity scores tends to be zero. To overcome this problem one usually employs a matching estimator. We follow the advise of Lechner (2002) and employ a simple and stable matching algorithm: We match each treated couple with the control couple that is closest in terms of the propensity score (*nearest neighbor matching*).[26] Thereby, a couple from the control group can serve as best match for more than one treated couple.[27] Unmatched control couples are completely disregarded. The average treatment effects are then estimated as the average of all the differences in the outcomes of pairs of treated couples and matched control couples.[28]

[25]To be more concrete, after every estimation we have split the sample in 5 equally spaced intervals of the propensity score. In each interval, we have then tested that the average propensity score of treated and control units does not differ. If the test has failed in an interval, we have split this interval again until in all intervals treated and control units had the same average propensity score. Given that, we have then checked within each interval that the means of each explanatory variable does not differ between treated and control units at least at a level of 0.01. If the mean of one or more variables has differed we have chosen a less parsimonious specification of $b(x)$ by including higher order terms and/or interaction terms of the variables with different means.

[26]Denote the set of control units matched to the treated unit m with an estimated propensity score P_m by C_m. The nearest neighbor matching procedure sets $C_m = \min ||P_m - P_n||$.

[27]In principle, one can consider each untreated couple only once ('without replacement'). However, since matching 'with replacement' minimizes the propensity-score distance between matched control couples and the treatment couple we can benefit in terms of bias reduction (Dehejia and Wahba, 2002).

[28]The matching procedure is performed over the *region of common support*, i. e. treated units whose propensity score is higher than the maximum or less than the minimum propensity score of the control units are disregarded. However, our results are not sensitive to the common support restriction. For details see Section 4.

3.4 Division of matrimonial property

In this section we present our estimates of the average causal effects of our four different treatments on the division of matrimonial property. First we consider the alimony award to the wife as a percentage of the husband's income. The estimation of our average treatment effects on treated are summarized by Figure 6.

		Husband
		JL
Wife	JL	-0.485% (-0.137)

		Husband	
		NL	L
Wife	NL	base group	-4.531% (1.338)
	L	5.444% (2.319)	1.369% (0.513)

Figure 6: Average treatment effects on treated on the alimony award as percentage of the husband's income compared to (NL, NL). (t-statistics are in brackets below)

The first entry represents the estimated average treatment effect on treated and the second entry the t-statistic. Each ATT has to be interpreted as the average causal effect of the respective treatment compared to the situation without any lawyer (for a unit actually participating in this treatment). Our estimation shows that just in the case where only the wife has hired a lawyer the alimony award is statistically significant different from the award which wives from couples receive where neither spouse has a lawyer. The causal effect of the wife's lawyer is equal to an increased alimony award of 5.4 percent of the husband's income. The causal effect of the remaining treatments on the alimony award is zero.[29]

These results have immediate implications: (i) Couples who have hired a lawyer each are indeed in a prisoners' dilemma. Both incur cost but the award is precisely the same as would have occurred if neither spouse had hired a lawyer. (ii) Our empirical results affirm the assumption from the theoretical part that the award in the case with a joint lawyer does not differ from the case without any lawyer. Therefore, an institutional setting facilitating the engagement of a joint lawyer compared to the involvement of two separate lawyers is indeed a second-best solution. (iii) Since the husband's lawyer has no effect in the case where he is the only lawyer in the courtroom, but offsets the effect of the wife's lawyer in a direct confrontation, the assumption of conditional lawyers' effects seems to be appropriate. (iv) From this it follows that lawyers seem to be more important for women compared to men. One possible explanation is that the Austrian legal system or the legal practice may offer

[29]The average treatment effect of $T^{L,NL}$ for a unit randomly drawn from the population, $ATE^{T^{L,NL},T^0}$, is equal to an increased alimony award of 4.5 percent of the husband's income. This reduced population effect is not surprising, since hiring a lawyer should be more efficient for the sub-population of women actually hiring a lawyer compared to an arbitrary one. We explore the issue of treatment heterogeneity in more detail in Section 4.

room to negotiate only in favor of women. (v) Does the involvement of the lawyer pay of for a wife if her husband has no lawyer? On average wives (husbands) are 35 (38) years old at the time of divorce. According to the Austrian Statistical Office the wife's further life expectancy is about 47 years and the husband's one about 39 years. Therefore, a wife can expect 39 years alimony payments by her former husband.[30] Since the husbands average monthly income is equal to €1,368 the engagement of a lawyer generates according to our estimates an additional monthly alimony payment of €74.5. If we assume a yearly interest rate of 5 percent the causal effect of the lawyer is equal to a present value of about €15,320. We do not have information on the lawyer's fee for each case in our data. In practice, the lawyer's fee for a divorce by mutual consent amounts up to €2,000 to €7,000.[31] Therefore, considering only these out-of pocket expenses the engagement of the lawyer certainly pays off for these wives.

3.4.1 Child-support award

So far we have examined the effect of lawyers on the division of matrimonial property captured by the alimony award. While the alimony award is an essential part of the divorce settlement the allocation of child custody and corresponding child-support awards are crucial issues for parents of minors. While it is straightforward to estimate the impact of lawyers on the child-support award we refrain from quantifying their effect on child custody.[32]

In contrast to the alimony award, all arrangements relating to minors are irrespective of the grounds of divorce. The non-custodian parent is obliged to pay child-support after divorce until the child can support itself. According to law, the amount of child-support corresponds to the age of the child, to the parents' living standards, to possible further support obligations of the non-custodian parent and especially to the non-custodian's net income.[33] Due to these stricter regulations and the ceiling there is a reduced possibility for bargaining in the case of child-support award compared to the alimony award. This fact is reflected in the descriptive statistics. Figure 7 summarizes the average child-support award as percentage of husband's income for spouses with minors by the usage of lawyers. Compared to the alimony award we now observe much less variation across and within groups. The highest child-support

[30] Of course, the alimony payments flow may stop earlier, if for instance the wife remarries.

[31] In principle, the lawyer's fee is regulated by law and it is calculated based on the amount in dispute. However, client and lawyer are generally free to reach any agreement. In the case of a divorce by fault the lawyer's fee can be possibly much higher, depending on the complexity of the case and the specific fee arrangement.

[32] This is due to couple of reasons: (i) A monetarization of custody is well beyond the scope of this paper. However, without that it is not feasible to quantify the payoff matrices in this case. It is only possible to observe who gets custody. (ii) Preferences may be more important in the context of custody compared to regular alimony and child-support payments and (iii) custody is still consuetudinarily awarded to the mothers in Austria.

[33] In practice, the actual amount is determined by age-related average rates of the non-custodian's net income (recommended by the Department of Justice) and by age-related regular needs (recommended by the Department of Finance). A child should at least receive this age-related regular needs but not receive more than twice (2.5 times) the value for a child below (over) ten 10 years of age.

awards (about 18 percent of the father's income) are obtain by minors whose parents divorce without any lawyer. Minors from the group where only one parent has hired a lawyer and minors whose parents have a joint lawyer obtain fairly similar mean awards around 17 percent. The lowest mean award (about 16 percent) is obtained by minors whose parents both employ a separate lawyer.

		Husband
		JL
Wife	JL	16.72% (5.11)

		Husband	
		NL	L
Wife	NL	17.93% (9.14)	17.41% (5.68)
	L	17.28% (4.87)	16.34% (4.92)

Figure 7: Mean of child-support award as percentage of husband's income for spouses with minors. ($N = 2,256$ – standard errors are in brackets below)

The estimation of our average treatment effects on treated of our four different treatments on the outcome child-support award is summarized by Figure 8. Again, the first entry represents the estimated ATT and the second entry the t-statistic. Each ATT has to be interpreted as the average causal effect of the respective treatment compared to the situation without any lawyer.

		Husband
		JL
Wife	JL	-0.093% $(-.105)$

		Husband	
		NL	L
Wife	NL	base group	0.080% (0.094)
	L	0.253% (0.329)	-1.367% (-1.686)

Figure 8: Average treatment effects on treated on child-support award as percentage of the husband's income compared to (NL, NL). (t-statistics are in brackets below)

However, we obtain no statistical significant difference in the child-support awards in situations with different combinations of lawyers compared to the situation without any lawyer.

So far we know that the net benefit of hiring a lawyer is clearly negative for both spouses in a situation where both of them have a lawyer. Each spouse has to pay lawyer fees but does not gain from the lawyer's services compared to the situation without any lawyer. The same is true for spouses who have hired a joint lawyer.

However, they have to pay for one lawyer only. Surprisingly we observe that even in the case where only the husband has hired a lawyer the division of matrimonial property is not different compared to the situation without any lawyer. Just in the case where only the wife has hired a lawyer there is a shift in the alimony award. To evaluate further aspects of the divorce process we now proceed to the estimation of the causal effect of lawyers on two further important dimensions of the divorce process: (i) the length of the divorce process and (ii) the number of post-divorce trials.

3.5 Length of the divorce process

Longitudinal studies show that the psychological well-being of divorcing spouses – quantified by standard mental well-being measures and by life satisfaction scores – decreases in the run-up to divorce, reaches its minimum in the period of divorce, but subsequently improves as time passes (Booth and Amato, 1991; Gardner and Oswald, 2006).[34] Therefore, while out of pocket expenditures for lawyers are substantial further costs may arise if the involvement of lawyers unnecessarily prolongs the divorce process. We measure the length of the divorce process as the time span from the first hearing at court to the final decision. Simple descriptive statistics (Figure 9) hint that there is indeed a difference in the average length of divorce processes by the involvement of lawyers.[35] The quickest divorces processes are divorces with a joint lawyer. These couples obtain divorce on average after 44 days after the first hearing.

		Husband
		JL
Wife	JL	44.03% (43.03)

		Husband	
		NL	L
Wife	NL	56.21 (63.77)	65.45 (82.11)
	L	71.89 (87.22)	119.07 (153.79)

Figure 9: Mean length of divorce in days for all spouses ($N = 2,431$ – standard errors are in brackets below)

Couples without any lawyer need longer to divorce (on average about 56 days). Divorce processes where only one spouse (either the wife or the husband) has retained a lawyer last on average 65 to 72 days. The longest divorce processes are for couples

[34] On average people improve their psychological wellbeing two years after divorce compared to years before (Gardner and Oswald, 2006).

[35] Note, we have excluded 5 outliers with divorce lengths above 1,000 days for the analysis in this section.

who both hired a lawyer: In these cases a divorce will take them on average 120 days. This is also the group with the largest standard deviation.[36]

However, as outlined above the decision to hire a lawyer is non-random and these simple descriptive statistics may be biased by the existence of confounding factors. Therefore, we estimate the average treatment effects of our four different treatments by employing the strategy described in Section 3.3. The estimated ATT's are summarized by Figure 10.

		Husband JL
Wife	JL	-10.337 (-1.653)

		Husband NL	Husband L
Wife	NL	base group	11.869 (1.045)
	L	25.212 (2.996)	67.174 (5.626)

Figure 10: Average treatment effects on treated on the length of the divorce process compared to (NL, NL). (t-statistics are in brackets below)

The results of the estimation of the ATT's suggest an ordering of divorce process lengths which is similar to the ordering suggested by a simple comparison of means. Nevertheless, considering the t-statistics the multiple treatment matching shows that divorce processes with a joint lawyer and where only the husband has a lawyer do not have a statistically significant different length compared to divorces without any lawyer. Whereas, if only the wife has hired a lawyer or both spouses have hired a lawyer the divorce processes will last longer compared to the case without any lawyer. In the case where the wife has a lawyer we obtain a statistically significant effect of 25 days. The involvement of two lawyers prolongs the process by 67 days.[37]

These delays constitute an excess burden of the involvement of lawyers and increase both the private and public cost of divorce. Families are exposed to additional painful (adversary) proceedings which encumber courts and burden the national budget. Moreover, underage children have to suffer an additional period with unresolved issues such as custody allocation and cannot start to accustom to an unwanted but stable situation.

In the previous section we concluded that considering out of pocket expenditures the involvement of a lawyer financially benefits a wife if her husband has no lawyer. We now observe that the lawyer prolongs the divorce cases by about 1 month compared

[36] As Figure 15 in the Appendix shows the mean lengths of divorce are quite similar for the sub-sample of spouses with minors.

[37] The corresponding average treatment effects for a unit randomly drawn from the population, the , $ATE^{T^{L,NL},T^0}$ and $ATE^{T^{L,L},T^0}$ are equal to 15 days and 41 days. Theses results suggest that selection into the treatments $T^{L,NL}$ and $T^{L,L}$ is positively correlated with outcome measure length of the divorce process.

to the case without any lawyer. Whether this extended divorce process generates additional monetary and/or psychic cost which outweigh the positive net-present value is an open issue.

3.6 Post-divorce trials

So far we have shown that involvement of lawyers – except for the case where only the wife hired a lawyer – does neither alter the alimony award nor the child-support award. However, lawyers prolong the divorce process and generate, in addition to their substantial fees, monetary and/or psychic cost for all parties involved. So far we have no argument which supports the involvement of lawyers in divorce processes. However, one could justify the involvement of lawyers and the associated cost if their expertise leads to a low number of post divorce re-negotiations. If an agreement between spouses, reached with or without the help of lawyers, leads to no re-negotiation, we may consider this agreement sustainable. In contrast, if an agreement leads to re-negotiation, we may deem this divorce settlement unsustainable. Of course, it is both in the public interest and in the separated families' interest to achieve a sustainable divorce settlement in order to minimize ceteris paribus the cost of divorce. In this section we therefore try to uncover the causal effect of the involvement of lawyers on the sustainability of divorce settlements.

Our data set allows us to follow spouses with at least one minor at the time of divorce for one district court over time and to observe if either spouse or a public authority files an application for a modification of the divorce settlement concerning the minor(s).[38] From these 1,174 couples 24.62 percent go to trial at least once after divorce.[39] The average number of subsequent trials for the whole sample is 0.49. Figure 11 shows the percentage of cases with at least one subsequent trial, the number of average subsequent trials and the number of cases for the four treatment groups and the control group.

[38] The reason that we have these information for only one of the five district courts is simply due to financial restrictions. In order to have a reasonable number of observations available for the empirical analysis in this section we now use the observations with missing information on the husband's income too. This procedure is now unproblematic since the construction of the outcome variable does not depend on the husband's income. Of course, we use the husband's income as an explanatory variable in our probit estimations where we impute for missing observations on the basis of multivariate OLS-regressions equivalently as outlined above.

[39] In the majority of the cases (about 34 percent) the wife is the applicant of the (first) subsequent trial. In 30 percent of the cases the husband requests a modification. In 11 percent of the cases the parents fill jointly an application for a modification and in the remaining 25 percent of the cases a public authority approaches the court. The majority of the subsequent trials (about 80 percent) concerns the child-support award. The remaining 20 percent of the cases regard the arrangement of custody or visitations of the non-custodian parent.

		Husband
		JL
Wife	JL	13.79%, 0.35 N=29

		Husband	
		NL	L
Wife	NL	24.35%, 0.49 N=920	37.93%, 0.77 N=58
	L	27.69%, 0.43 N=65	20.59%, 0.36 N=102

Figure 11: Percentage of cases with at least one subsequent trial, the number of average subsequent trials and the number of cases.

Considering the number of average subsequent trials we see that couples where only the husband had a lawyer at divorce go on trial most often. Couples without any lawyer and those were only the wife had a legal representation have on average about 0.4 subsequent trials. The group with the lowest number of subsequent trials (about 0.35) consists of couples who had a either a joint lawyer or a lawyer each. In order to account for confounding factors we employ the estimation strategy described in Section 3.3. The estimated average treatment effects on treated of our four different treatments are summarized in Figure 12.

		Husband
		JL
Wife	JL	0.345 (1.583)

		Husband	
		NL	L
Wife	NL	base group	0.333 (1.454)
	L	−0.125 (−0.333)	−0.051 (−0.275)

Figure 12: Average treatment effects on treated on the number of subsequent trials compared to (NL, NL). (t-statistics are in brackets below)

The results show that neither combination of lawyers has a causal effect on the sustainability of divorce settlements compared to the situation without any lawyer. Therefore, the involvement of lawyers does not alter the sustainability of divorce settlements.

4 Robustness of the empirical findings

Let us now examine the robustness of the results reported in Section 3.4 to 3.6. We have carried out several sensitivity checks concerning (i) the estimation of the

propensity score, (ii) the restriction to the common support and (iii) the treatment effect heterogeneity.

Firstly, instead of a probit model we have estimated the propensity score with a logit model. The estimates of the average treatment effects are robust with respect to this change. Secondly, we have checked the sensitivity of the results due to the restriction of common support. By imposing the common support restriction the quality of the matches improves. However, as Lechner (2001) argues the definition of the average treatment effects is now changed for a narrower population. This causes a problem if the treatment effects are heterogeneous inside and outside the region of common support. Without imposing the restriction to the common support we obtain no qualitative differences and quantitative effects that are similar to the ones already presented. This is not surprising since the loss of observations due to the restriction to the common support is very small in our case[40] and we have no evidence for heterogeneous treatment effects over the propensity score distribution (see next point). The third set of sensitivity checks relate to the treatment effect heterogeneity. We implement a regression analogy of the propensity score matching within the sample of matched control and treated units. Thereby we also check the robustness of the estimated average effects of the treatment j on the outcome k.

$$outcome_k = \alpha + \theta T_i^j + \delta_1 \hat{P}_i^j(\mathbf{X}) + \delta_2 [\hat{P}_i^j(\mathbf{X})]^2 + \delta_3 [\hat{P}_i^j(\mathbf{X}) - \bar{P^j}] \cdot T_i^j + u_i \qquad (8)$$

We simply include the estimated propensity score, $\hat{P}_i^j(\mathbf{X})$, as a regressor. The propensity score summarizes the selection bias by a single index and plays the role of a control function. In order to allow for more flexibility in the functional form of the control function we add the estimated propensity score squared, $[\hat{P}_i^j(\mathbf{X})]^2$. Under CIA θ consistently estimates the ATE^{T^j,T^0}. The interaction of the deviation of individual propensity score from the mean propensity score and treatment dummy, $[\hat{P}_i^j(\mathbf{X}) - \bar{P^j}] \cdot T_i^j$, is included to allow for heterogeneous treatment effects over the propensity score distribution. A positive δ_3 would indicate that units with a higher propensity to take the treatment have larger treatment effects. However, since δ_3 is not statistically significant the results (Tables 3 and 4) indicate that there are no heterogeneous treatment effects over the propensity score distribution.[41]

5 Summary

We present a structural model where divorcing spouses can choose to hire lawyers in their divorce process. Our theoretical considerations show that they encounter incentives as in the classical prisoners' dilemma. Therefore, we propose a simple institutional setting allowing for a joint lawyer to overcome this socially inefficient situation and facilitate a second-best solution.

In our empirical analysis we employ rich micro-data from court records. A multiple treatment matching procedure shows that it is financially beneficial for the wife to

[40] On average we only loose 1.9 percent of our treated units.

[41] In a further specification we have additionally controlled for $\mathbf{X}$ in equation (8) to gauge the balancing quality of propensity score. However, the estimates of δ_3 remain unchanged.

hire a lawyer, if she expects their husband not to. The lawyer increases the wife's alimony award in this case by 5.4 percent of the husband's income. This is equal to an average present value of €15,320. For all other combinations we do not identify any causal effect of the involvement of lawyers on the division of matrimonial property: The child-support award and the alimony award would have been precisely the same as in the case where neither spouse had hired a lawyer. There exists also no benefit of the engagement of lawyers in terms of more sustainable divorce settlements over time. Therefore, many spouses incur substantial lawyer fees without any benefit. On top of that in most of the cases lawyers prolong the divorce process. This excess burden of lawyers increases both the private and public cost of divorce. In the case where both spouses hire a lawyer, the highest lawyer fees accrue and the divorce process is extended unnecessarily by about 2 months. In order to overcome this worst case we suggest to change the institutional setting so that as many of these couples as possible choose to hire a joint lawyer. A joint lawyer does not alter the divorce settlement either, should charge a lower fee and most importantly does not unnecessarily delay the divorce process. In any case it should be guaranteed that in a case of a conflict of interests a joint lawyer should step down according to professional ethic rules.

At this point we want to stress once more that we do not capture all aspects of lawyers' services. Spouses may benefit from their lawyers apart from their ability to extract a monetary pay-off. Therefore, it may well be in this case that the administrative and moral support justifies the associated costs.

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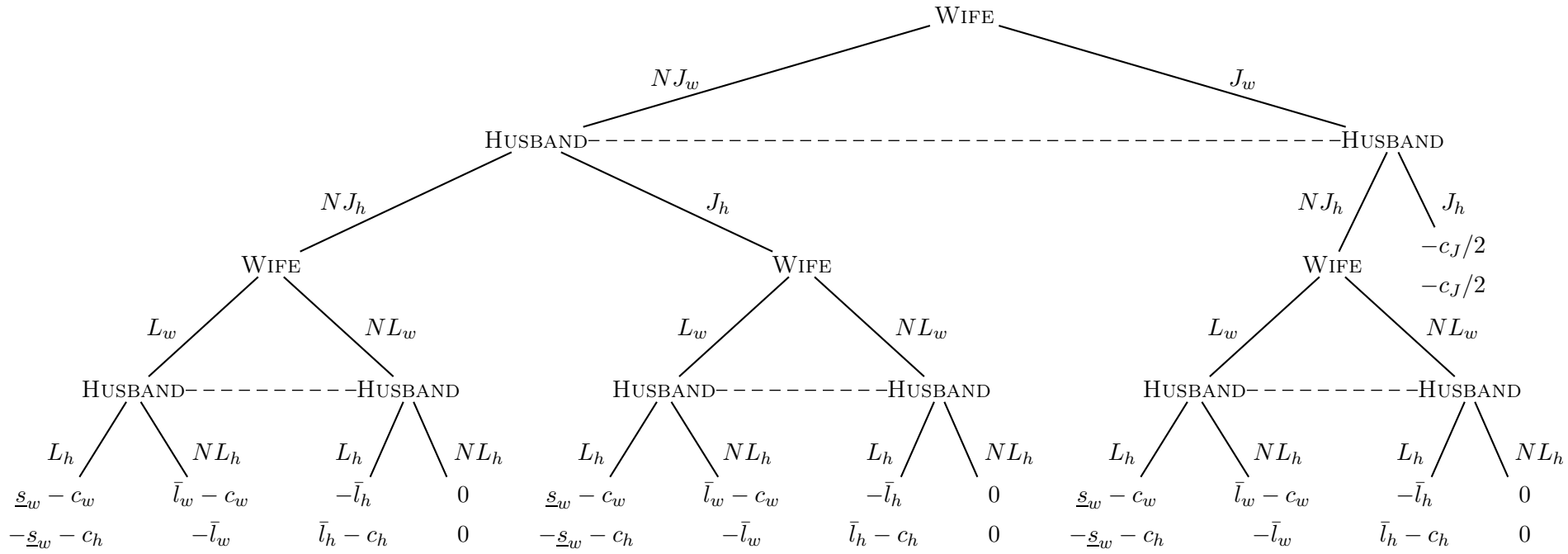
6 Appendix

Table 2: International comparison of procedural regulations.

	Compulsory lawyers[a]	Joint lawyer is possible[b]
Austria	no	no
Belgium	no	no
Bulgaria	no	yes
Czech Republic	no	no
Denmark	no	yes
Finland	no	yes
Germany	partly	no
Greece	partly	yes
Hungary	no	no
Italy	yes	yes
Netherlands	no	yes
Norway	no	yes
Portugal	yes	yes
Russia	no	no
Sweden	no	yes
Switzerland	partly	depending on canton
United States	no	no

[a] Information on compulsory lawyers has been extracted from Boele-Woelki, Braat and Sumner (2005).[b] For the information on the possibility of a joint lawyer I would like to thank Masha Antokolskaia, Nina Dethloff, Milana Hrušáková, Heinz Hausherr, Maarit Jänterä-Jareborg, Chrsitina G. Jeppesen de Boer, Sanna Koula, Achilles Koutsouradis, Kirsti Kurki-Suonio, Ingrid Lund-Andersen, Dieter Martiny, Valentinas Mikelenas, Guilherme de Oliveira, Salvatore Patti, Dominique Pignolet, Wendy Schrama, Isabelle Steiner, Tone Sverdrup, Orsolya Szeibert-Erdös, Machteld Vonk and Velina Todorova.

Figure 13: Game Tree for Regime II.



	Husband	
	JL	
Wife JL	4.21% (95)	

	Husband	
	NL	L
Wife NL	78.46% (1,770)	3.50% (79)
Wife L	5.76% (130)	8.07% (182)

Figure 14: Usage of lawyers for spouses with minors ($N = 2,256$).

	Husband	
	JL	
Wife JL	41.51 (40.53)	

	Husband	
	NL	L
Wife NL	55.37 (59.85)	65.59 (84.14)
Wife L	71.12 (91.63)	112.14 (149.94)

Figure 15: Mean length of divorce in days for spouses with minors. ($N = 2,256$ – Standard errors are in brackets below)

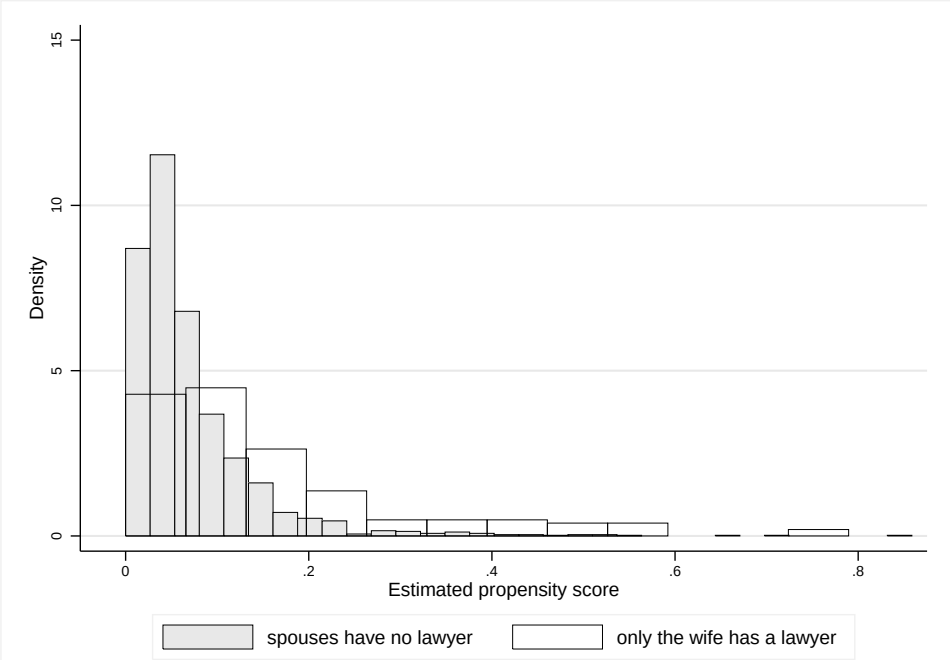


Figure 16: Treatment 'only the wife has a lawyer': Histogram of the estimated propensity score for the treated and the control units.

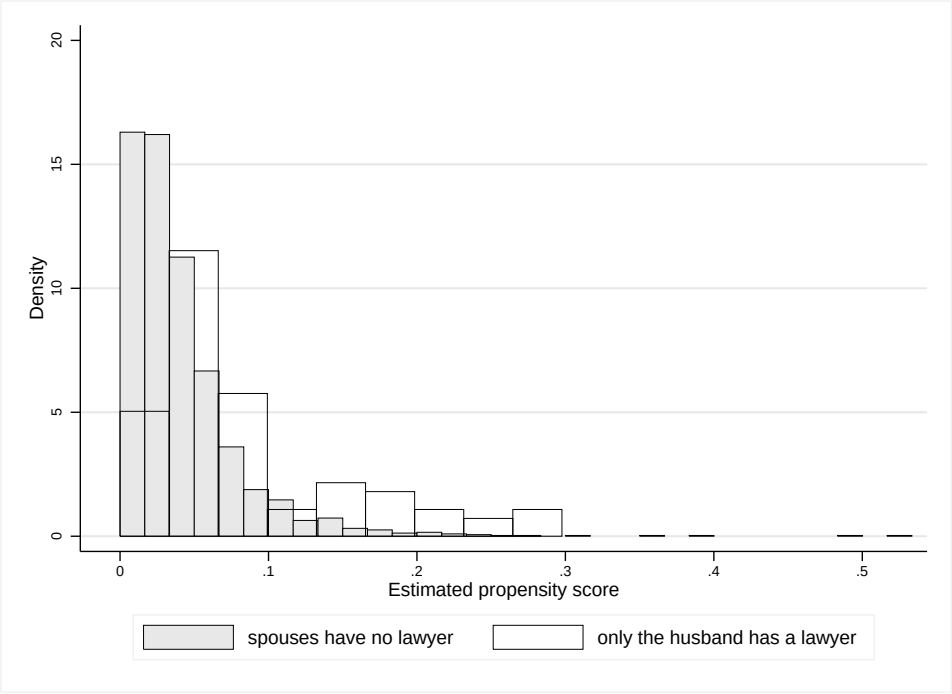


Figure 17: Treatment 'only the husband has a lawyer': Histogram of the estimated propensity score for the treated and the control units.

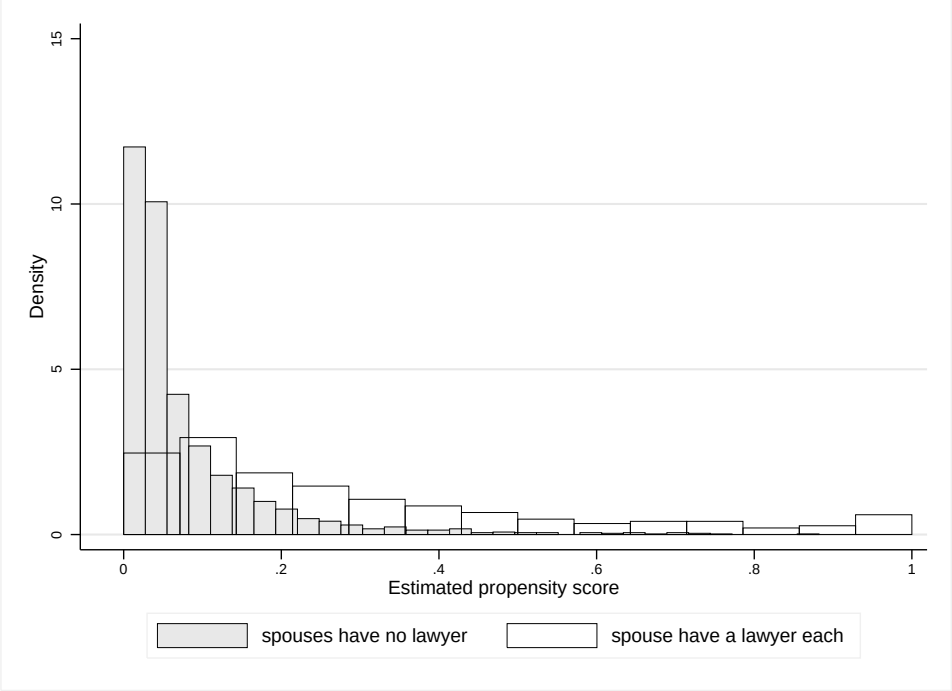


Figure 18: Treatment 'spouses have a lawyer each': Histogram of the estimated propensity score for the treated and the control units.

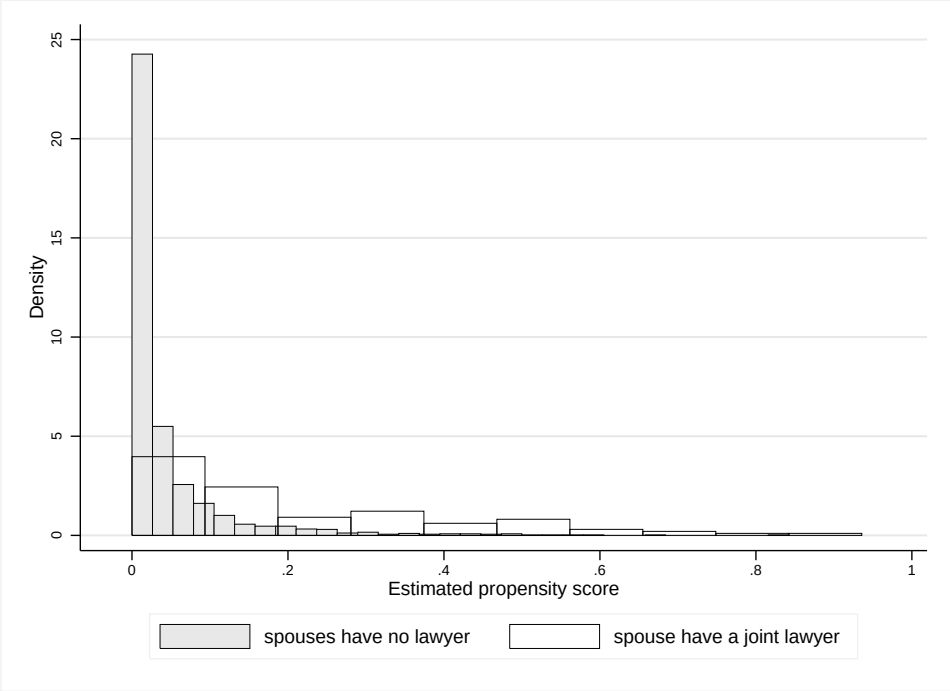


Figure 19: Treatment 'spouses have a joint lawyer': Histogram of the estimated propensity score for the treated and the control units.

Table 3: Robustness checks of the outcomes alimony award and child-support award.

	j = spouses have a joint lawyer			j = spouses have a lawyer each			j = only the wife has a lawyer			j = only the husband has a lawyer		
Dependent variable: alimony award as percentage of the husband's income												
T^j	0.004	0.004	0.004	0.006	0.010	0.007	0.063	0.064	0.063	-0.037	-0.036	-0.037
	(0.033)	(0.033)	(0.033)	(0.024)	(0.024)	(0.025)	(0.021)***	(0.021)***	(0.022)***	(0.033)	(0.033)	(0.033)
$\hat{P}^j(\mathbf{X})$	0.306	0.224	0.190	0.312	0.823	0.853	0.549	0.846	0.959	0.358	0.745	0.896
	(0.114)***	(0.269)	(0.284)	(0.059)***	(0.168)***	(0.173)***	(0.095)***	(0.238)***	(0.238)***	(0.269)	(1.188)	(1.338)
$[\hat{P}^j(\mathbf{X})]^2$		0.127	0.105		-0.607	-0.543		-0.525	-0.419		-1.507	-1.087
		(0.446)	(0.431)		(0.205)***	(0.220)**		(0.384)	(0.492)		(4.118)	(3.913)
$[\hat{P}^j(\mathbf{X})] * T^j$			0.080			-0.116			-0.269			-0.441
			(0.220)			(0.136)			(0.231)			(0.572)
Constant	0.085	0.092	0.100	0.078	0.018	0.006	-0.001	-0.025	-0.044	0.079	0.063	0.047
	(0.033)**	(0.038)**	(0.043)**	(0.019)***	(0.022)	(0.023)	(0.014)	(0.020)	(0.019)**	(0.036)**	(0.068)	(0.082)
N	195	195	195	364	364	364	290	290	290	162	162	162
R^2	0.058	0.060	0.060	0.098	0.125	0.128	0.174	0.180	0.187	0.020	0.021	0.026
Dependent variable: child-support award as percentage of the husband's income												
T^j	0.000	-0.001	0.001	-0.011	-0.011	-0.012	0.002	0.002	0.002	0.004	0.004	0.004
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
$\hat{P}^j(\mathbf{X})$	-0.046	-0.106	-0.117	-0.049	-0.035	-0.020	-0.031	0.041	0.036	-0.101	0.062	0.071
	(0.015)***	(0.048)**	(0.049)**	(0.016)***	(0.057)	(0.066)	(0.032)	(0.098)	(0.116)	(0.052)*	(0.176)	(0.171)
$[\hat{P}^j(\mathbf{X})]^2$		0.078	0.041		-0.017	-0.005		-0.115	-0.120		-0.572	-0.518
		(0.058)	(0.061)		(0.067)	(0.062)		(0.110)	(0.097)		(0.546)	(0.615)
$[\hat{P}^j(\mathbf{X})] * T^j$			0.056			-0.039			0.013			-0.038
			(0.034)			(0.037)			(0.073)			(0.118)
Constant	0.179	0.185	0.190	0.188	0.187	0.182	0.176	0.170	0.171	0.180	0.173	0.172
	(0.008)***	(0.009)***	(0.010)***	(0.006)***	(0.007)***	(0.009)***	(0.004)***	(0.007)***	(0.009)***	(0.007)***	(0.011)***	(0.011)***
N	172	172	172	319	319	319	246	246	246	149	149	149
R^2	0.038	0.047	0.053	0.043	0.043	0.048	0.006	0.003	0.011	0.051	0.051	0.051

Table 4: Robustness checks of the outcomes length of the divorce process and number of subsequent trials.

	j = spouses have a joint lawyer			j = spouses have a lawyer each			j = only the wife has a lawyer			j = only the husband has a lawyer		
Dependent variable: length of the divorce process in days												
T^j	-9.991	-9.880	-9.791	63.195	63.160	64.088	23.811	23.804	23.796	13.375	12.904	12.462
	(6.114)	(6.115)	(6.074)	(11.246)***	(11.194)***	(11.259)***	(8.351)***	(8.349)***	(8.286)***	(11.579)	(11.388)	(11.186)
$\hat{P}^j(\mathbf{X})$	-8.864	25.151	17.394	55.427	45.099	26.782	5.028	-0.877	-0.195	5.523	-300.38	-172.31
	(15.483)	(46.218)	(47.968)	(40.729)	(94.719)	(95.847)	(32.376)	(92.439)	(86.648)	(89.165)	(344.43)	(304.03)
$[\hat{P}^j(\mathbf{X})]^2$		-52.625	-58.158		13.418	-11.224		10.420	11.050		1,213.6	1,675.1
		(57.865)	(58.366)		(136.56)	(133.59)		(138.43)	(143.74)		(1,256.7)	(1,141.8)
$[\hat{P}^j(\mathbf{X})] * T^j$			18.852			55.091			-1.607			-425.52
			(29.804)			(60.715)			(58.352)			(174.13)**
Constant	55.918	52.988	54.784	40.532	41.662	47.498	47.262	47.726	47.614	51.624	63.678	48.800
	(5.574)***	(7.245)***	(8.031)***	(9.579)***	(11.396)***	(10.662)***	(6.388)***	(9.730)***	(9.166)***	(7.848)***	(14.555)***	(11.661)***
N	197	197	197	368	368	368	290	290	290	162	162	162
R^2	0.016	0.019	0.021	0.078	0.078	0.080	0.027	0.027	0.027	0.009	0.016	0.052
Dependent variable: number of subsequent trials												
T^j	0.380	0.383	0.361	-0.050	-0.053	-0.048	-0.092	-0.093	-0.093	0.344	0.344	0.339
	(0.241)	(0.244)	(0.230)	(0.158)	(0.159)	(0.153)	(0.172)	(0.173)	(0.173)	(0.223)	(0.223)	(0.223)
$\hat{P}^j(\mathbf{X})$	-0.912	-0.638	-0.382	-0.890	-1.614	-1.740	-1.305	-0.802	-0.625	-1.307	-1.287	-0.786
	(0.616)	(0.980)	(0.853)	(0.264)***	(0.955)*	(1.066)	(0.527)**	(2.074)	(2.242)	(0.826)	(2.468)	(2.172)
$[\hat{P}^j(\mathbf{X})]^2$		-0.551	0.979		0.979	0.849		-1.158	-1.107		-0.042	1.408
		(1.439)	(2.186)		(0.990)	(0.930)		(3.791)	(3.817)		(3.536)	(4.778)
$[\hat{P}^j(\mathbf{X})] * T^j$			-1.420			0.337			-0.363			-1.941
			(1.102)			(0.624)			(1.094)			(2.254)
Constant	0.118	0.098	0.022	0.658	0.736	0.775	0.688	0.656	0.634	0.588	0.587	0.497
	(0.080)	(0.099)	(0.049)	(0.185)***	(0.240)***	(0.292)***	(0.174)***	(0.225)***	(0.259)**	(0.169)***	(0.245)**	(0.210)**
N	54	54	54	178	178	178	125	125	125	111	111	111
R^2	0.060	0.060	0.069	0.037	0.040	0.041	0.023	0.024	0.024	0.032	0.032	0.037