



The flip side of marital specialization: the gendered effect of divorce on living standards and labor supply

Carole Bonnet¹ · Bertrand Garbinti²  · Anne Solaz¹

Received: 21 February 2019 / Accepted: 15 June 2020 / Published online: 19 August 2020
© Springer-Verlag GmbH Germany, part of Springer Nature 2020

Abstract

Drawing upon an exhaustive administrative dataset on French households, this paper presents new findings on the effects of divorce on living standards and labor supply for both women and men, accounting for public and private transfers and household size. We document the crucial role of within-couple earnings inequality on post-divorce living standards for each partner. Since standard before–after estimates may be biased by confounders (economic conditions, anticipation of divorce, selection issues, etc.), we implement a difference-in-differences framework associated with a nearest neighbor matching approach to assess the causal effects of divorce on both spouses. By doing so, we compare divorced individuals before and just after divorce with individuals who remained married over the same period and who are similar in many characteristics, including individual earning dynamics several years before divorce. Results show that women’s decrease in living standards is larger, on average, than that of men. Child support payments, public transfers, massive female labor market returns, and rapid repartnering mitigate, but do not eliminate, post-divorce gender inequalities. The number of children plays only a minor role in single mothers’ impoverishment; within-couple earnings inequality before divorce, resulting mainly from marital specialization, is the main driver. We document massive labor market reentry after divorce by previously inactive women, which can be viewed as another consequence of this marital specialization.

Keywords Divorce · Living standards · Matching method · Difference in differences · Labor supply · Gender inequalities

JEL codes J12 · J16 · K36 · I38

Responsible editor: Alessandro Cigno

✉ Bertrand Garbinti
bertrand.garbinti@ensae.fr

Extended author information available on the last page of the article

1 Introduction

Divorce has major consequences for both ex-spouses, but its economic impact may be different for each partner. Women generally experience a large decrease in their living standards,¹ with a higher risk than men of entering poverty after union dissolution, whereas men's living standards tend to increase or remain stable (Peterson 1996; Bratberg and Tjøtta 2008; Leopold 2018). By increasing both poverty and gender inequality, divorce gives rise to major welfare issues, and many mechanisms contribute to its economic consequences. Changes in individual earnings and labor market participation, in public and private transfers, and in household size, as well as the loss of the partner's earnings, may all play a role. To obtain a broad picture, we study these factors jointly—an approach that, to our knowledge, has never been applied.

Post-divorce gender inequality is often explained by the greater prevalence of custodial mothers than custodial fathers. With primary responsibility for childcare, custodial parents generally incur more expenses and have less opportunity to reentry to the labor market or remain in full-time employment. But, this is only part of the story. We examine here the role of the presence of children and introduce another much less documented pre-divorce characteristic into the analysis, that of within-couple inequality of earnings (considered as a proxy of marital specialization). Our work explores the role of the marital specialization process both theoretically and empirically, analyzing the extent to which it might widen preexisting inequalities when a separation occurs (and when specialization is not fully or sufficiently compensated by transfers between spouses). By introducing the level of specialization into our analysis, we go beyond the simple gender dichotomy, making it possible to consider also female-breadwinner couples. While the divorce risk of female-breadwinner couples has been largely studied in the recent economic literature (see, for instance, Foster and Stratton (2020) for a reappraisal of Bertrand et al.'s (2015) seminal article), the economic consequences of divorce for each partner of such couples have received much less attention.

We use an exhaustive administrative dataset that allows us to follow the two partners after divorce and have information on 64,000 women and 56,000 men who dissolved their marriage or civil partnership in 2009 in France.² Apart from some exceptions,³ the literature on the economic consequences of divorce focuses on comparing the two partners' living standards before and after divorce. Though informative about the losses and gains of each ex-partner, this method does not assess the causal effect of divorce since these estimates may be affected by economic cycles and selection issues. We use difference-in-differences (DID) propensity score matching to address this issue and estimate the causal effect of divorce on each ex-spouse. We compare the changes in

¹ “Living standard” of the household usually refers to income per equivalent adult (also called equivalized income or adjusted income). In our benchmark specification, we use the Organization for Economic Cooperation and Development (OECD)-modified equivalence scale to equalize incomes, taking household composition into account (see further for more details).

² Most studies focus on women only and rely on small survey samples, which may lead to concerns about inference and selective panel attrition.

³ Bedard and Deschênes (2005) and Ananat and Michaels (2008) take the causality issue seriously by using an instrumental variable approach. However, instrumental variable estimations lead to local estimators, which is a well-known limitation of this kind of identification strategy.

living standards between 2008 and 2010 experienced by two groups: individuals who divorced in 2009 (treated group) and individuals with similar characteristics who were still married in 2010 (control group). We build this control group using a propensity score matching approach based on a large set of pre-divorce variables. This DID framework allows us to account for unobserved time-invariant characteristics.

Our strategy relies on two exceptional features of our data. First, we use a large number of variables to describe the economic situation of each couple up to 3 years preceding divorce. This addresses the problem of possible anticipation of divorce that could affect pre-divorce earnings dynamics⁴ first pointed out by Johnson and Skinner (1986) and later by other authors (Poortman 2005). Second, the number of married couples we use to find a nearest neighbor in our matching approach is more than 100 times higher than the number of divorced couples to be matched with, which comes close to exact matching,⁵ as shown by the very similar distributions of these characteristics between our control group and the divorcees.

Four main results stand out from our analysis. First, 1 year after divorce, women's living standards have fallen considerably (− 19% on average), and men also experience losses (− 2%). Second, while family size is often seen as the main driver of changes in living standards, we show that it plays only a minor role in explaining women's impoverishment. In France, changes in living standards turn out to be similar regardless of the number of children because higher pre-transfer losses observed for large families are offset by higher public transfers and welfare benefits. Third, within-couple earnings inequality, partly due to marital specialization, turns out to be the major determinant of gender inequality after divorce. All these results remain consistent whatever the equivalence scale or types of indicator (mean or median of changes) used. Finally, by studying labor supply, we show that inactive women and men who divorce are more likely to reentry to the labor market. The effect is twice as large for women (29% reentry) than for men. Previously active women increase their labor supply after divorce. We also document substantial heterogeneity in labor market reentry according to within-couple earnings inequality, quintiles of income before separation, and to a lesser extent, the number of children.

2 Empirical and theoretical background

2.1 Women are more adversely affected by divorce than men

The literature on the economic consequences of divorce and its gendered effects is extensive. It generally shows worsening of women's living standards after separation, whereas those of men remain stable or increase.⁶ Duncan and Hoffman (1985), on the U.S. Panel Study of Income Dynamics, found that women's adjusted income falls by about 25% following divorce while that of men increases by about 3%. Peterson (1996)

⁴ The anticipation of divorce exists if partners change (generally increase) their labor supply in anticipation of divorce. This might produce a downward bias in the before–after estimate of the causal effects of divorce.

⁵ Exact matching could have been achieved by introducing classes for each continuous variable. We did not do so, but the similarity of distributions between treated and control groups on the continuous variables suggests that we are close to exact matching (see Appendix Figs. 8, 9, 10, 11, 12, and 13).

⁶ A more extended presentation of the literature can be found in Garbinti et al. (2016).

found a 27% decrease for women and a 10% increase for men. He points out, however, that for 10% of women (and 9% of men), living standard falls by 73% or more, emphasizing the need not only to look at the median or average change but also to consider its distribution. Other assessments using U.S. data agree upon a significant decrease in women's living standards following divorce (Appendix Table 9). The reported magnitudes of change differ, however, ranging from 10% (Hoffman 1977; Duncan and Hoffman 1985) to 36% (Bianchi et al. 1999). Holden and Smock (1991) and McKeever and Wolfinger (2001) report the same order of magnitude (from 10 to 40%).

Research using European data (Appendix Table 10) comes to the same range of conclusions. Drawing on the European Community Household Panel (ECHP) for the 1994–2000 period, Uunk (2004) shows that France is one of the European countries where change is greatest, with a 30% decrease in women's adjusted median income following divorce. Considering all couple dissolutions and using the French part of SILC for 2003–2005, Jauneau and Raynaud (2009) also report comparable figures, with a 31% median decrease in living standards following a separation for women who did not repartner after separation. More recently, on administrative data, Abbas and Garbinti (2019) find a median decrease in living standards 1 year after union dissolution of 13% for nonmarried custodial mothers and 17% for married custodial mothers.

Interest in the economic consequences of divorce for men came later, and the results obtained so far are more ambiguous. The question is more about the sign of the change than the magnitude of the effect. Most studies find a significant improvement in living standards following divorce. Finnie (1993), Bianchi et al. (1999), and Smock (1993, 1994) find particularly large improvements, ranging from +47 to +93%. Some studies find stability (Jarvis and Jenkins 1999; Poortman 2000; Kalmijn and Alessie 2008), whereas a few find deterioration (Burkhauser et al. 1991; McManus and DiPrete 2001; Jauneau and Raynaud 2009).

The differences in these results may be due to various factors. First, period and institutional aspects may explain certain country-specific results. For example, both child support decisions and their recovery rate are country-specific and may drive differences in private transfers. State support to single mothers also varies considerably among countries. Second, the magnitude of the effects may depend on how living standards are defined. The sources of income included (private and public transfers) and the choice of equivalence scale or of the indicator used (change in mean/median living standards, median/mean change in living standards, or subpopulation studied, such as Black/White in the USA) differ widely across studies. Third, attrition is often large in survey panel data, mainly because of the high likelihood of moving after separation (Feijten and Van Ham 2010; Mulder and Wagner 2010).⁷ It is generally easier to interview the partner who remains in the couple's common home than the one who moved out. These moves may not be random because the decision to move after divorce may be linked to financial constraints. Fourth, beyond these representativeness

⁷ After divorce, at least one spouse generally moves out the common home. Over the period 2010–2013, this was the case for 59% of divorced men and 67% of divorced women (Ferrari et al. 2019). This means that simultaneous moves, which present a higher risk of attrition in panel data, are also frequent. According to Durier (2017), 20% of divorces involve simultaneous moves by both partners in the year following separation.

issues, most of the previous studies we mentioned may also have inference issues due to the small size of their samples (Appendix Table 11).

2.2 Marital specialization and compensation mechanisms

The observed greater impoverishment of one partner after divorce—more often the woman—may appear puzzling, leading to further questions about the division between spouses of accumulated marital gains when divorce occurs. Recent theoretical and empirical studies have examined the process of marital specialization and the compensation mechanisms that come into play at the time of divorce.

From a theoretical standpoint, marital specialization can be explained by a simple mechanism. Efficient time allocation within the couple requires the partner with a relative advantage in the domestic sphere to invest more time in the home (and less in the labor market) than the other. The partner who decides to spend more time in the domestic sphere (for instance, to raise children) should then receive adequate compensation from the main earner not only during marriage but also after separation if the union is dissolved. Otherwise, as pointed out by Cigno (2012), “neither party will agree to be the main child carer without adequate compensation from the main earner.” The role of divorce laws governing spousal alimony or property division, for instance, is to guarantee that the gains and losses associated with marriage will be equally shared between partners. Other types of partnership dissolution do not benefit from such guarantees.⁸ Marriage, because of the compensation mechanisms associated with divorce, may thus be a form of commitment that permits a high degree of specialization by offering insurance to the lower earning partner. However, Cigno (2012) investigates the crucial role of financial constraints on this commitment and points that the efficiency of this marital specialization is not necessarily reached. In particular, he shows that, in case of credit rationing, the prospective main earner may not be able to commit to compensate the prospective main childcarer in the future (or may find it disadvantageous or impossible), which, in turn, leads to an inefficient division of labor between domestic and income-raising activities. Following this idea, Lafortune and Low (2019) show the existence of joint assets within couple which may help to reach efficiency. They proposed a collateralized version of the marriage contract (proxied through the existence of joint assets) that results in a higher degree of specialization and greater production of household public goods (proxied by the number of children and their human capital acquisition). The partner investing in home production may specialize at the expense of her or his income growth, but in return, she or he benefits from the couple’s investment in joint assets to be shared in case of divorce. A marriage contract may thus provide insurance to the lower-earning partner and foster efficient specialization. Conversely, when a couple is noncooperative and cannot commit to fair resource allocation in case of divorce, household specialization and investment in public goods are less encouraged and significantly reduced.

However, the private transfers received in case of a breakup are far from sufficient to compensate for marital investments and to equalize the two ex-partners’ standards of living.⁹ Empirical results show not only that marital investments in household public

⁸ Even if they guarantee custodial rights (and obligations) for parents

⁹ However, each parent may not value the time spent with their children in the same way. Lower living standards could thus be offset by more time spent with children.

goods (such as raising children) are made at the cost of future earnings for women (who have generally invested more in domestic work) but also that their loss of living standard is much larger than it is for men after a divorce. The within-couple gap in living standards or income observed at the time of divorce is generally much larger than the initial gap at marriage formation (Angelov et al. 2016), and the potential compensation mechanisms are insufficient to guarantee a fair division of marital gains.

Some reasons have been advanced to explain this insufficiency, such as overoptimism on the part of the lower earner, who may underestimate the risk of divorce (Smith 2003), or the role of the judge who sets the level of spousal alimony and benefits (Bourreau-Dubois and Doriat-Duban 2016). Bianchi et al. (2014) also show that systems that guarantee compensation in the event of separation may encourage specific investments that turn out to be too costly regarding the actual protection offered.

To better understand these unbalanced economic consequences, the specific influence of the mechanisms designed to compensate for marital specialization must be investigated. The role of private transfers—in particular, spousal and child support payments—in offsetting the negative consequences of divorce for women (or, conversely, in making the situation less favorable for men) has rarely been explored, doubtless due to a lack of suitable data. Yet, ignoring them may lead to an overstatement of the drop in women's income and a symmetrical overstatement of the income increase for men (Kalmijn and Alessie 2008). Even when information on support payments is available in surveys, this may lead to an unbalanced picture (Jarvis and Jenkins 1999) when comparing men and women's living standards. In most data sources, the amount received by the custodial parent (in most cases, the mother) may be known while the amount paid by the noncustodial parent (the father) may not be, or vice versa. Thus, only a handful of studies compare changes in income before and after taking private and/or public transfers into account. Using German and U.S. data, Burkhauser et al. (1991) show that following divorce, once private transfers are included, women's living standards in the USA decrease by 37% without public transfers and by 24% with them, while in Germany, the decrease is 44% whether or not public transfers are included. Using Dutch data, Poortman (2000) shows that the drop in women's living standards excluding private and public transfers is about 65% and 31% if they are included (−18% and +4%, respectively, for men). Using data on 14 European countries, Uunk (2004) shows that in the European Union, women's changes in living standard after divorce differ from country to country. The decline is smaller in countries with a high level of public childcare provision and higher social welfare payments, especially for single parents. To our knowledge, only McManus and DiPrete (2001), focusing on men, distinguish between the roles of public and private transfers. They find that, following separation, taxes and transfers significantly reduce the gains for traditional male breadwinners by around a quarter. The payment of child support shrinks the gains to a statistically nonsignificant 1%. For men who were not the primary income provider, public taxes and transfers operate the other way around, reducing the losses in living standard following divorce, although child support payments cancel out this compensatory effect. All in all, these men's losses in living standards are barely changed by taxes and transfers.

2.3 Effect of marital specialization and children on living standard

Both marital specialization, if not well compensated, and the presence of children could be drivers of inequality after divorce. While much attention has been devoted to the role

of children (Bratberg and Tjøtta 2008), the literature says less about the role of marital specialization.

Marital specialization can be proxied by comparing each partner's share of the couple's labor earnings. Although marital specialization may not be totally responsible for the difference between these shares,¹⁰ it does account for a large fraction of this difference (or the widening of an existing difference): one partner (generally the woman) invests less in the labor market and more in domestic work, especially in childcare. The literature has focused little on within-couple earnings inequality as a factor of post-separation gender inequality. Two exceptions include McManus and DiPrete (2001), who show that among divorced men, those who were the second earner face a loss in living standards; those whose partner had a similar income maintain a similar living standard; and those who were the main breadwinner have a higher living standard after separation. The other exception is Manting and Bouman (2006), who examine changes in the living standards of men and women in three different situations of relative income before divorce. They find that when the man is the primary income provider, the woman's economic situation is slightly less favorable after dissolution than when they both earn equally. When the woman is the main earner, it is her living standard that increases.

The relative omission of marital specialization in the literature is surprising, as a straightforward decomposition of the change in living standards after divorce suggests that this factor might be a key driver of that change. We show here that, for a given level of within-couple earnings inequality,¹¹ the number of children appears to have little effect on the change in living standards. In contrast, for a given number of children, within-couple earnings inequality plays a significant role.

Let us consider a couple with n children below 14 years old and total joint earnings (E). The living standard of each married partner is $E/(1.5 + 0.3n)$ according to the OECD-modified equivalence scale,¹² which enables us to take household composition (and more particularly, the number of children in post-divorce households) into account. Assuming constant total earnings (E) and individual incomes of both partners, and no change in public and private transfers, the living standard after divorce for the custodial parent (generally the mother) is $(1 - \alpha)E / (1 + 0.3n)$, where α stands for the share of couple's income provided by the noncustodial parent (generally the father) before divorce.

The change in living standard for the custodial parent is thus

$$\frac{\text{Living standard after divorce}}{\text{Living standard before divorce}} = (1 - \alpha) \frac{1.5 + 0.3n}{1 + 0.3n} \quad (1)$$

¹⁰ The difference may be linked to the matching process (gap in educational attainment or age gap between partners) and may exist before union formation. Furthermore, gender wage discrimination in the labor market may also explain the gender wage gap between spouses: for the same educational level or labor market experience, women may earn less than men (Ponthieux and Meurs 2015).

¹¹ Within-couple earnings inequality is measured by the man's pre-divorce share of the couple's total labor earnings.

¹² This scale assigns a value of 1 to the household head, 0.5 to each additional adult member or child aged 14 and over, and 0.3 to each younger child. In case of shared custody, the child weights are divided equally between the parents. We use the most common equivalence scale, but our results are not influenced by this choice. They remain unchanged when an alternative equivalence scale, with a different weighting for children, is used.

This change is negatively related to both within-couple earnings inequality (α) (i.e., the share of income provided by the other parent) and the number of children (n). But, the effects of these two components on changes in living standards differ considerably in magnitude. The change is barely affected by the number of children, but much more so by within-couple earnings inequality. For instance, as illustrated in Appendix 3, the predicted change in living standard of a woman who earns as much as her husband before divorce ranges from -31% with one child to -39% with four children; for a woman who earns less than 20% of the total pre-divorce income, the loss ranges from -72% with one child to -75% with four children, whereas for women who are the main breadwinner, the change ranges from $+11\%$ with one child to -2% with four children.

The change in living standard for the noncustodial parent is

$$\frac{\text{Living standard after divorce}}{\text{Living standard before divorce}} = \alpha(1.5 + 0.3n) \quad (2)$$

The living standard of the noncustodial parent increases with α and the number of children (who are no longer in the household due to the “noncustodial” status of this parent). As is the case for the custodial parent, we observe that the effect of the within-couple earnings inequality is larger than that of the number of children.

This decomposition highlights that within-couple earnings inequality is a key parameter for analyzing changes in living standards before and after divorce for both ex-partners and that it has a much stronger influence than family composition.

2.4 Sparse literature on the causal effect of divorce

Most empirical studies look at the changes in living standards following divorce using a before–after estimator, although these estimators are now well known to be sensitive to the economic cycle and selection bias. More recent research aims to assess the causal effect of divorce. Two studies by Bedard and Deschênes (2005) and Ananat and Michaels (2008) use instrumental variables (first child’s sex) to address the problem of selection in divorce and separation. Bedard and Deschênes (2005) find a positive gain for women at separation. With the same dataset, Ananat and Michaels (2008) provide evidence of a strong decrease in standard of living for women at the bottom of the distribution and a strong increase for those at the top. However, these findings can only be interpreted locally. The results hold for the “compliers,” i.e., for the couples who break up when the firstborn is a girl and who do not if it is a boy. While the method’s internal validity is not in doubt, the usual external validity problem arises here. Another method is considered by Ongaro et al. (2009) on Italian data and by Aassve et al. (2007) on European data. They design a “control group” of couples who do not divorce and who have characteristics similar to the divorced couples before they separated. Although neither of these studies computes change in living standards, they both find a deterioration in women’s economic situation.

3 Data

3.1 Sample definition

As mentioned above, the differing magnitudes of the effects found in the literature might be explained by various factors: the definition of living standards, and especially the lack of information regarding private transfers, the small survey sample sizes, and the attrition in panel data. We overcame these difficulties, however, using exhaustive information from the database of French income tax and housing tax returns, recently made available on an exceptional basis. In principle, data on income from tax returns are more reliable than survey data because some components are communicated directly by employers or banks. In addition, the dataset provides information on the amounts paid for child and spousal support. Because these transfers are tax deductible, there is a strong incentive to report them on the tax return form. This dataset also includes income earned in previous years.

For 2009, we first extracted from the tax return database all divorcees and partners who dissolved a civil partnership¹³ (hereafter called a *Pacs*¹⁴). We then restricted our sample to the couples who did not form a union in 2008 or 2009 in order to focus on couples who had lived together for at least 1 year¹⁵ (only 0.7% of couples who married in 2008 divorced the year after¹⁶). After excluding tax returns with missing data, we obtained a sample of 126,250 couples who were married (in 2008) and 9800 who were in a *Pacs* (in 2008), for which we found at least one of the former partners the year following the divorce or *Pacs* dissolution.¹⁷ Our sample covers more than 95% of all divorces and more than 55% of *Pacs* dissolutions recorded in French official statistics in 2009. We then matched them with the data for 2010 and were thus able to compare divorced individual in the year before divorce (2008) and the year after (2010) for 93% of our sample. As the 7% attrition may be not random, we computed weights to take into account this potential differential attrition bias (see Appendix 4 for more details on dataset construction and weighting calculations). This substantial, representative sample size is one of the significant advantages of our database. Also, each annual tax return contains information about total earnings in the two preceding years. It thus provides reliable information on earnings for the 3 years preceding the divorce.¹⁸

Because we are equally interested in labor supply after divorce, we focused on individuals aged 20–55.¹⁹ In our first approach, we excluded individuals who live with another adult one year after the breakup. The final sample thus includes 56,300 men

¹³ For reasons other than marriage or death of one partner

¹⁴ The *Pacte civil de solidarité*, or *Pacs*, was introduced in France in 1999, initially to legalize same-sex partnerships. But within a very short time, different-sex couples massively and increasingly opted for this form of union. *Pacs* legislation has gradually incorporated rights (and duties) previously granted exclusively to married couples, such as joint taxation from 2005. Like married couples, *Pacs* partners must file a joint tax return.

¹⁵ As well as excluding very unstable couples that might have specific characteristics, this choice is driven by the difficulty of interpreting and matching tax returns when several events occur in the same year.

¹⁶ Source: French Ministry of Justice

¹⁷ Couples may dissolve a *Pacs* in order to marry. We exclude them from our analysis.

¹⁸ We include this information in our matching strategy to control for earning dynamics (see below).

¹⁹ We set the upper age limit to 55 because workers in some specific occupations in France can enter retirement or early retirement from this age onwards.

and 64,400 women who either divorced or dissolved a *Pacs* in 2008 and for whom we have information from income and housing tax returns in 2008 and 2010.

In an alternative approach, we included the individuals who repartnered within a year. Additional precautions must be taken when computing living standards for cohabiting couples. Post-divorce coresidential arrangements take diverse forms: people may live in the same dwelling with a new partner (either married or in a *Pacs*), with one or more relatives (such as a parent), with friends, or in collective housing. We were only able to consider coresident partners not yet remarried or in a new *Pacs* union²⁰ in the year following divorce. They represent most repartnering arrangements, since remarriage within a year of divorce is rare; second unions are less often formalized by a contract than first ones (Costemalle 2017). Abbas and Garbinti (2019), who observed divorced parents for 4 years after divorce, found that three quarters of new unions are consensual unions (17% *Pacs* and 10% marriage). This suggests that remarriage or new *Pacs* unions are rare in the year following divorce.

Unlike married couples or *Pacs* partners who file jointly, cohabitants complete two separate tax returns. The nature of the relationship is not specified in the administrative data but can be guessed since we know that the partners share the same dwelling (from the housing tax returns) the year following divorce. To avoid fuzzy cases, we first excluded individuals who live with two or more adults. In such cases, computing the household living standard would be subject to too many assumptions about income pooling and would be a source of measurement error. Among those living with only one adult, we then assumed that household members are in a relationship if they are of different sex (since we focus on different-sex couples) with an age gap of less than 15 years. Our sample of newly repartnered individuals includes 11,511 women and 13,672 men. They represent roughly 15% of separated women in 2009 and 20% of separated men. This gender difference is consistent with men's higher likelihood of repartnering.

3.2 Definition of variables

The term “living standard” usually refers to household income adjusted by household size using an equivalence scale (also called equivalized income or adjusted income). Household income is composed of labor-related and capital income and private and public transfer net of taxes. To assess the effect of public and private transfers on changes in living standards after divorce, we included the different components of household income step by step. We defined three key variables of living standard. In our benchmark results, all these variables are adjusted by household size using the OECD-modified equivalence scale (see Section 6.3 for robustness to the choice of other equivalence scales).

First, we calculated *living standard before transfers*, also called pretax equivalized income. It includes labor market and replacement income (such as wages, self-

²⁰ For income earned in the year of marriage, individuals must fill in three distinct tax returns: one for each spouse corresponding to the income earned in the period before marriage and one for the newly married couple including all income earned by both spouses in the period after marriage. To compute equivalized income for individuals in this situation, we would have had to consult these three different tax returns and to match them correctly. This would have raised significant merging and measurement issues.

employment income, unemployment benefits, and public and private pensions²¹) and taxable asset/capital income.²²

Second, to compute the *living standard with private transfers*, we considered, in addition to labor-related and capital incomes, the monetary transfers between ex-spouses. During the divorce procedure, the family judge may impose child support and spousal alimony. Child support is the contribution to the cost of children paid by the noncustodial parent to the custodial parent (mainly the mother).²³ No rule governs decisions on the level of child support, but an advisory scheme helps family judges to calculate the appropriate amount (Sayn et al. 2012).²⁴ Child support orders are a common feature of divorce with children. They concern seven in ten minor children, and their average monthly amount was €186 per child in 2012 (Carrasco and Dufour 2015). Child support is not always paid, but it is difficult to assess the nonpayment rate. While we do not have information on the set amount of child support, we know from our data the exact amount paid (and received), which is the exact information required for computing living standards. Spousal alimony is less common and concerned one in five divorces in 2013 (Belmokhtar and Mansuy 2016). Older age, a long marriage duration, and a large within-couple income gap are the three main factors that determine the granting of alimony. The median level is €25,000. Spousal alimony is now paid as a lump sum rather than as an annuity, making it very difficult to transform their value into yearly amounts. Therefore, as in most articles, information on spousal alimony is not used here (though we discuss this exclusion later).

Third, to compute the *total living standard*, we added net public transfers (computed as welfare benefits minus income taxes). Income taxes are known precisely in our data, but public transfers are not reported (because nontaxable). We thus computed family and welfare benefits (minimum benefits and housing allowances) using the comprehensive information on family composition (number, age of children in the household, child custody arrangements) and income available in the income tax files.²⁵ These benefits must be taken into account because they represent a significant share of income for lone parents and for large families. For instance, they increase the median income of lone parents with one child by 16% and that of lone parents with two children or more

²¹ Pensions are rare, given the age range of the population considered.

²² In most cases, capital income is taxable in France and thus reported on the tax return. This is the case for rents, income from taxable saving accounts, dividends, and interest. More details about taxable and nontaxable capital income can be found in Garbinti et al. (2020).

²³ Child support may be ordered in case of shared custody, but such cases are less common and are associated with considerably lower amounts than those received when one parent has sole custody.

²⁴ Child support after divorce is determined according to the principle of equal contribution of both parents to the cost of children in proportion to their share of the couple's total income. The custodial parent is assumed to contribute directly through coresidence with the child, and the noncustodial parent contributes through the child support payment. The level of child support is based on the estimated cost of a child. The advisory scheme applies a scale similar to the OECD-modified scale that we use here. For example, a single child under 14 years old "costs" 0.3/(1.8), i.e., 17% of the couple's income. This percentage is applied to the income of the noncustodial parent (minus a deduction corresponding to the minimum subsistence level) to determine the amount of child support. Depending on the circumstances, the family judge may deviate from this scale.

²⁵ We assume a 100% take-up rate for these social and welfare benefits. We are aware that non take-up may exist, especially for minimum income benefits. But, we assume that after a divorce, especially when children are involved, people are generally more likely to receive advice (from lawyers, social workers, or family mediators) and thus to be informed about available public benefits. The take-up rate is thus likely to be high for lone-parent families, and the potential overestimation of living standard resulting from this assumption of a 100% take-up rate may be limited.

by 55%.²⁶ Welfare benefits represent a much higher share of income for lone parents than for couples; lone parents are more often eligible for means-tested benefits (because of their lower income) and are subject to more favorable rules for calculating these benefits.²⁷ We also used information about the dwelling reported in the housing tax returns. Computation of the different family and welfare benefits is detailed in the Appendix 6.

To obtain comparable living standards for men and women, we took household composition (and more particularly, the number of children in post-divorce households) into account using the OECD-modified equivalence scale. Alternative equivalence scales, such as the square-root household size scale, and an alternative scale that takes into account child visits to the noncustodial parent were also tested to check our results' sensitivity to this choice. Our conclusions are not affected by the choice of equivalence scale.

4 Empirical framework

4.1 Divorce's effect on living standards: a matching approach

4.1.1 Nearest neighbor matching approach

Direct comparison of living standards before and after divorce does not guarantee that the change results solely from divorce. For instance, if people tend to divorce more when they are on a negative income trend,²⁸ we may observe a decrease in living standards, a part of which is due not to the divorce but to this negative trend. To address this possible selection issue, as well as possible earnings anticipations or dynamics that may play a significant role in the divorce decision, we used a matching approach. Initially developed by Rosenbaum and Rubin (1983), this method is now widely used in the literature on public policy evaluation. Ongaro et al. (2009) and Aassve et al. (2007) were the first to use a matching approach applied to divorce. We went further by using a large sample as well as many matched pre-divorce characteristics. Our method is based on a nearest neighbor approach without replacement.²⁹

²⁶ See *Programmes de qualité et d'efficience, "Famille"* (quality and efficiency programs, "Family"), appended to the 2013 draft of the social security financing law (https://www.securite-sociale.fr/files/live/sites/SSFR/files/medias/PLFSS/2013/ANNEXE_1/PLFSS-2013-ANNEXE_1-PQE-FAMILLE.pdf).

²⁷ This is the case for housing allowances in particular. When dependent children are in the household, allowances are calculated according to the number of children only, whether the household is a couple or a single-parent family. These rules give a specific advantage to single parents.

²⁸ This is a plausible assumption given that, for instance, unemployment generally increases the risk of divorce (Boheim and Ermisch 2001; Charles and Stephens 2004; Solaz et al. 2020).

²⁹ As explained later, this nearest neighbor approach is based on a two-step matching process. First, we match perfectly on certain characteristics (gender, number of children, and within-couple earnings inequality). Second, to account for the other characteristics, we use a propensity score matching process. The propensity score is estimated separately within each of the 24 subsamples (of the possible combinations of the three characteristics), which allows for more flexibility in the specification of this score. This process does not require all 40 variables to be introduced into the estimation of each propensity score to ensure that, for each of the 40 variables, the distribution for the control group is similar to that of the treated group.

From the population of married people who did not divorce in 2009, we selected still-married couples with the same characteristics as the divorced couples.³⁰ The higher the number of identical characteristics shared by the treated and the control groups, the more credible the assumption that they have the same propensity to divorce. The large pool of still-married couples (which includes more than 100 times the number of divorced couples to be matched with) allows us to choose one very similar to each divorcee, based on more than 40 characteristics. We document the characteristics used and the quality of our matching approach in Appendix 7.

4.1.2 Using a large number of characteristics and tracking changes in labor supply back to 3 years before divorce

We used information about income received not only the year before divorce but also 2 years and 3 years preceding divorce. This information concerns not only total income but also specific income sources (unemployment benefits, self-employment benefits, wages, etc.) that may account for changes in income composition and labor market situation. We think this is an effective way to address the issue of possible selection based on potentially anticipated earnings dynamics. We matched on the number of children, age of partner and child(ren),³¹ housing situation (tenants, homeowners), place of residence (Paris, Paris region excluding Paris, and other areas), details on the kind and amount of individual income received (labor income, unemployment benefits, pensions, self-employment incomes—also broken down into profits from commercial and noncommercial occupations and farming profits), and other characteristics, such as experience of long-term unemployment.

4.1.3 Matching over 24 subsamples

Aiming to assess changes in living standard for subsamples, we matched each subsample separately, following Dehejia's (2005) recommendations, to obtain exact matching on the key characteristics defining each one. Our 24 subsamples are defined by combining gender, number of children (0, 1, 2, 3, or more), and within-couple earnings inequality (share of individual earnings provided by the man before divorce above 60%, between 40% and 60%, or below 40%).³² Matching was thus performed using a propensity score estimated separately for each subsample.

³⁰ As a control group, we could have chosen individuals who will divorce in the near future, but conditioning on a future event (the end of marriage) may introduce some bias due to anticipation, for instance. Moreover, we are unable to distinguish between those who will divorce some years later (because of the short observation window) and those who will stay married. Since the annual divorce rate is around 2% (Costemalle 2017), we can easily assume that most people in our control group are still married in the year following the observation period.

³¹ Union duration may influence the risk of divorce. Although we do not have reliable information on this duration, we know the age of all children. Since age of children can be a proxy for union duration, we checked that our matching process leads to similar characteristics in terms of age of children. More precisely, they are similar in the fact of having (or not) at least one child aged under 1; aged 2, 3, 4–6, 7–9, 10–14, 15–17, 18–25, and 26 and older (when disabled).

³² For the computation of this share, we include all labor and replacement incomes but not capital income because it cannot be individualized from the tax returns.

In practice, this stratification offers two main advantages. First, it leads (by construction) to perfect matching on the share of the couple's income provided by the man, on the number of children, and on gender. Second, since the empirical specification of the propensity to divorce is allowed to change within each subsample, it is less parametric and captures the heterogeneity of behaviors more effectively than a global propensity score computed at a more aggregate level. It results in a control group similar to the treated group. We show in Appendix 7 that the overlapping assumption holds and that all covariates are well balanced. The means of these variables³³ are the same for both groups,³⁴ and the overall distributions of each continuous characteristic are similar.

4.2 Econometric specification

As previously mentioned, to compute the effect of divorce, we used a difference-in-differences method applied to a matching method (DID propensity score matching approach).³⁵ Once matching is complete, the difference-in-differences framework involves computing the before–after divorce differences for both the divorced individuals (the treated group) and the still-married ones (the control group) and subtracting these differences. In this situation, if unobservable characteristics are time-invariant, they are ruled out and the estimator is not biased. We also introduce three pre-separation characteristics (number of children, within-couple inequality, and quintile of household income before separation) to allow for heterogeneity in the effect of marital disruption along these three dimensions.

More precisely, we estimate

$$\ln Y_{it} = 1_{t \geq 1} \times X_{i0} \gamma + T_{it} \times X_{i0} \beta + a_i + e_{it} \quad (3)$$

where Y_{it} stands for the living standard in period t for individual i , t for the period (0 for the year before divorce, 1 for the year following divorce), and X_{i0} for the three pre-divorce characteristics of the couple (number of children, share of couple's income provided by the husband, and quintile of income); T_{it} is the treatment status (1 in period 1 for divorcees and 0 otherwise); a_i is a fixed effect corresponding to all unobserved time-invariant characteristics; and e_{it} is the idiosyncratic error term. $T_{it} \times X_{i0}$ allows for heterogeneity in the effect of separation according to the characteristics (X_{i0}) the year before divorce.

In this DID setup, thanks to the first difference, the individual time-invariant fixed effect (a_i) is canceled out

$$\ln Y_{i1} - \ln Y_{i0} = X_{i0} \gamma + T_{i1} \times X_{i0} \beta + (e_{i1} - e_{i0}) \quad (4)$$

³³ We compute standardized differences as recommended in Imbens and Wooldridge (2008). They are all far below the rule of thumb of one quarter, which ensures that the means are identical between groups.

³⁴ We introduced the different kinds of income for the 3 years before divorce into our matching variables. This ensures that, by construction, the common trend assumption is fully verified for these 3 years preceding divorce.

³⁵ This two-step method has been widely used since Heckman et al. (1997) proposed it to relax the conditional independence assumption.

It shows that if divorcees and married people differ in unobserved characteristics, this does not bias our results as long as those differences are constant³⁶ between the two periods.³⁷

Finally, we used the subsampling method to compute standard errors because bootstrapping is not a valid option in DID matching (cf., for instance, Politis et al. (1999) or Romano and Shaikh (2012)).

5 Gendered differences in the economic consequences of divorce

5.1 Distribution of before–after changes in living standards

Figure 1 illustrates the distribution of changes in women’s living standards³⁸ according to our three defined concepts. The mass point at -100% (black curve) shows that a significant proportion of women do not earn any labor or capital income at all after divorce (mainly those who opted for a traditional model of specialization and were housewives during marriage). As expected, adding private transfers shifts the distribution to the right (dotted curve): child support payments increase custodial mothers’ living standards. Public transfers play an even more important role in reducing the negative effects of divorce on living standards (gray curve). Low-income custodial single mothers with children receive family and welfare benefits (especially minimum income and housing allowances). After adding public transfers, there are no longer any women with a null income, and the dispersion of changes in living standards narrows significantly. However, 77% of women still have a loss in their living standards, with the mode of the distribution at -20% .

For men, the story is different (Fig. 2). First, as they are usually net payers of child support, the inclusion of private transfers reduces their income (shifting the change in living standards to the left, from the black to the dotted curve).

Public transfers and, more specifically, tax income lead to another leftward shift. When men are not the custodial parent (the most frequent post-divorce arrangement is mothers’ sole custody), they no longer benefit from family benefits and tax deductions associated with the presence of children, but continue to pay taxes. Therefore, adding

³⁶ The usual limitation of this approach is that it does not cancel out time-variant unobserved characteristics.

³⁷ To assess mean changes in living standards (our main specification), we do not directly estimate Eq. (3) with an ordinary least squares regression. With an OLS regression on model 3, $\exp(\hat{\beta}^{OLS}) - 1$ would be commonly interpreted as the expected percentage change in living standard due to a 1-unit increase in a variable X_0 (for instance, an additional child or a change from 0 to 1 for a dummy variable). But, this interpretation is a potentially unsatisfactory approximation (Jensen’s inequality easily shows that $\exp\left(E\left(\ln\left(\frac{Y_1}{Y_0}\right)\right)\right) \leq E\left(\frac{Y_1}{Y_0}\right)$). To avoid this approximation, we run the following nonlinear regression model:

$$\frac{Y_1}{Y_0} = \exp(X_{i0}\gamma + T_{i1} \times X_{i0}\beta + (e_{i1} - e_{i0})) \quad (5)$$

Doing so, β directly corresponds to our coefficients of interest (the vector of proportional changes). For the sake of readability, we directly express the variable β in percentage (i.e., after multiplying them by 100) in the regression tables.

³⁸ $(Y_{i,t+1} - Y_{i,t-1})/Y_{i,t-1}$, where $Y_{i,t-1}$ is the living standard of individual i in $t - 1$ (the year before divorce), divorce occurs in t , and $t + 1$ stands for the year after divorce.

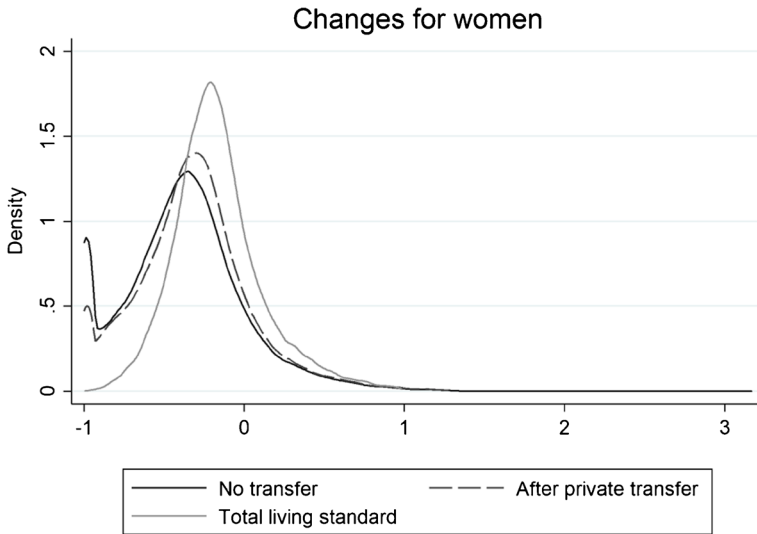


Fig. 1 Pre- and post-transfer changes in women's living standards (source: French exhaustive income tax returns database, divorced women in 2009). On the x -axis, 0 indicates that these individuals experience no change in their living standards; -1 means a loss of all income (100% loss)

private and public transfers mitigates the negative economic consequences of divorce for women, while for men, it reduces the gain in living standards. More than half of them (53%) experience a loss in their living standard.

Looking at the male and female distributions together, women appear to incur most losses (Fig. 3). Once both public and private transfers are taken into account, the male and female distributions become more similar and are more “concentrated” around the

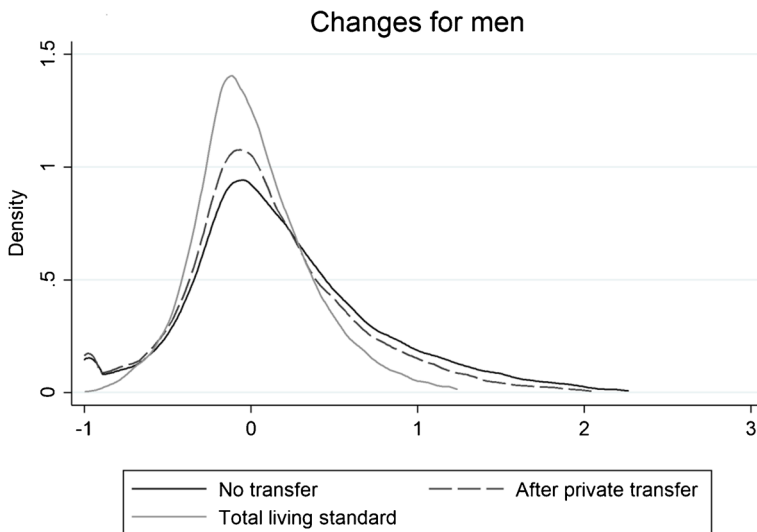


Fig. 2 Pre- and post-transfer changes in men's living standards (source: French exhaustive income tax returns database, divorced men in 2009). On the x -axis, 0 indicates that these individuals experience no change in their living standards; -1 means a loss of all income (100% loss)

mode. Transfers appear to limit the amplitude of change (either negative or positive). After public and private transfers, the proportion of women whose living standard increases after divorce is still much lower than that of men. The gender gap remains but is much less pronounced.

Panel A in Table 1 presents changes in living standards by gender. Women's living standards decrease by 35% on average when measured without any transfers, while men's living standards increase by 24%. Taking private transfers into account moderates the gender gap. The mean loss for women is 29%, and the gain for men falls to 15%. Finally, after including public transfers and taxes, the mean loss for women is 14%, and the gain for men is just +3.5%.

The loss for women is consistent with findings in other developed countries. In France as elsewhere, women incur the greatest losses after divorce. However, the loss is less pronounced than that found for France by Uunk (2004) and Jauneau and Raynaud (2009) (−32% and −31% for women and −6% for men after transfers). Beyond the differences in data sources, sample definition, sample sizes, and indicators used, this difference in magnitude may be partly due to economic cycles, well known to be embedded in the before–after estimator.

5.2 The causal effect of divorce

So far, we have compared living standards for divorced people before and after divorce. Here, we assess the causal effect of divorce by comparing the divorced individuals with a control group and show how this modifies our assessment of the impact of divorce.

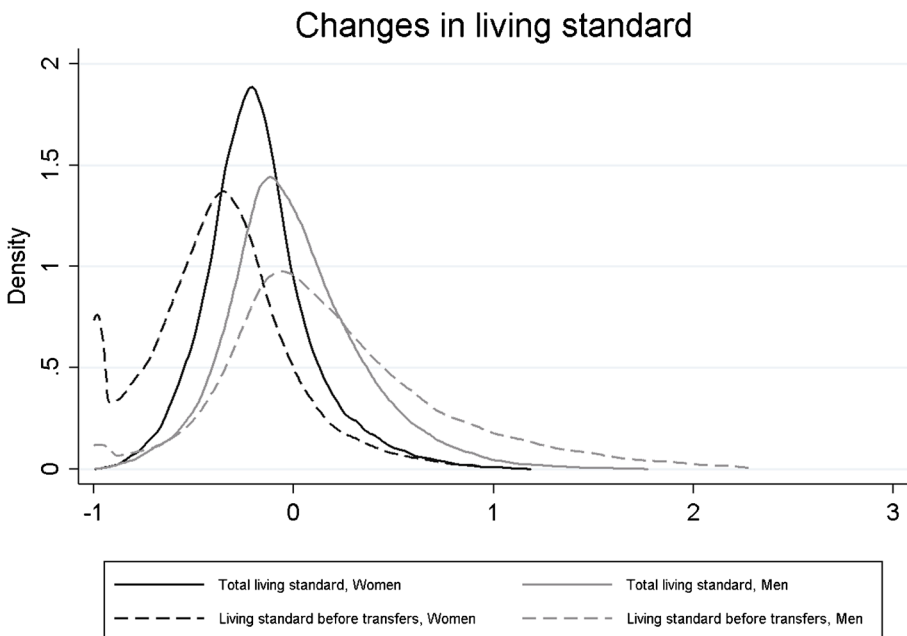


Fig. 3 Pre- and post-transfer changes in living standards by gender (source: French exhaustive income tax returns database, divorced men and women in 2009). On the x -axis, 0 indicates that these individuals experience no change in their living standards; −1 means a loss of all income (100% loss)

Table 1 Change in living standards by the number of children and share of earnings provided by the man before separation

	Women				Men			
	No transfer	With private transfer	Total living standard	Total living standard with control group	No transfer	With private transfer	Total living standard	Total living standard with control group
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: no control								
All	-35.1***	-29.4***	-14.4***	-18.5***	24.2***	15.1***	3.5***	-2.1***
Panel B: by number of children								
0	-26.9***	-25***	-18.6***	-21.2***	-1.9***	-3.7***	-5.2***	-9.1***
1	-32.7***	-28***	-13.5***	-18.8***	12.4***	6.3*	2.1***	-4***
2	-36.2***	-29.2***	-13.9***	-18.6***	28.1***	16.8***	5.5***	-1***
≥ 3	-45***	-36.6***	-12***	-15.6***	64.6***	47.2***	11.9***	5.6***
Panel C: by share of earnings (%) provided by man before separation								
< 40	18.9***	21.4***	18**	1.9***	-9***	-13.2***	-8.2***	-20.4***
40–60	-26.1***	-23***	-16.3***	-17.3***	-3.6***	-8.7***	-13.6***	-15.3***
> 60	-53.8***	-45.8***	-21***	-24.7***	49.9***	37.1***	17.4***	10.3***
N	64,393	64,393	64,393	128,786	56,299	56,299	56,299	112,598

Source: French exhaustive income tax returns database, divorced women and men in 2009; standard errors are computed by subsampling

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

First, compared with the control group, the situation for both women and men worsens (columns 4 and 8, Table 1). Women's change in living standards becomes even more negative, falling from -14 to -19%. This means that if divorced women had remained married, their income would have increased in the following 2 years and not just remained stable, as assumed when computing the simple before–after estimator. For men, divorce leads to a sign change with respect to the outcome computed with before–after estimator. Their change in living standards becomes negative, at about -2%. Thus, during the period, the still-married men enjoyed an increase in their living standards that male divorcees did not.

6 Understanding the gendered differences in the economic consequences of divorce

Our results confirm that divorce has highly gendered consequences on living standards. Previously, relying on a simple decomposition of the changes in living standards, we emphasized the much more crucial role of within-couple earnings inequality compared

with the limited role of the number of children. In this section, we investigate empirically the determinants of these gendered consequences, paying attention to the relative effects of these two dimensions.

6.1 Changes in living standard by the number of children

Table 1 presents before-and-after changes in living standards by gender, not only for the whole population but also by the number of children (panel B) and by within-couple earnings inequality (measured by the share of couple earnings provided by the man, panel C). First, for women, when no transfers or only private transfers are added (columns 1 and 2, panel B), the loss after divorce rises sharply with the number of children. When public transfers are added (column 3), the picture changes considerably. For women, public transfers offset the increasing loss with family size. Interestingly, changes in their total living standards no longer depend on the number of children (or barely so), even when compared with their married “twins” (column 4). The loss is more pronounced (for instance, from -19 to -16% for two or three children), but the magnitude does not vary much with the number of children. It even decreases for families of three children and more (-16%), who are treated advantageously by French family policy.

For men, the picture is reversed. Before any transfers, we observe that the gain increases with the pre-divorce number of children (column 5), due largely to the absence of children in the household after divorce; men are less likely to be the custodial parent, and their income is no longer shared with others³⁹ (apart from private transfers). Private transfers through child support payments notably reduce men’s gain (column 6). Strikingly, public transfers play an even more important role in reducing their gain (column 7) for two reasons. First, fathers no longer receive family benefits because the mothers are generally the main custodial parent.⁴⁰ Second, divorced men no longer benefit from the tax deduction for married couples with children (quite substantial if there are three or more children).⁴¹ As a result, men generally have to pay more taxes after divorce because they no longer have dependent children in the household.

When compared with their married twins, the initial increase computed with before–after estimates for men with one or two children turns out to be a significant decrease (column 8). All men appear to experience losses in living standard except when they have three or more children. This effect might also be driven by differences in the socioeconomic characteristics of large families. But even in that case, the before–after

³⁹ Since incomes are adjusted by family size (see Section 3.2).

⁴⁰ In most cases, it is the mothers who received child-related welfare benefits since they are generally the custodial parent. These benefits are not shared between parents after divorce (the sole exception is family allowances, at the parents’ request, but only a very small share of the divorced population with children is concerned).

⁴¹ Divorced men must pay more taxes because they no longer benefit from tax breaks for children and from joint income taxation for married couples, whose taxable income is equal to the reported income divided by a coefficient reflecting the family composition. This coefficient (called the *quotient conjugal*) is 2 for a couple, with an addition for each child (0.5 for each of the first two children and 1 from the third child onward, called the *quotient familial*). For instance, the taxable income of a married couple with three children corresponds to their reported income divided by 4. This is a powerful tool for reducing income taxes, especially when the gap between partners’ income is wide or they have a large number of children.

gain of 12% is halved when the earnings dynamics of still-married men are taken into account.

6.2 The key role of marital specialization

To assess more precisely the economic consequences of marital specialization and, more broadly, of gendered inequality in partners' earnings, we distinguish three types of couples: the "traditional" ones where the man is the main income provider (providing more than 60% of the couple's total earnings), the "egalitarian" ones where the man and woman provide roughly the same amount of income, and those (much rarer) where the woman is the main breadwinner.

When both partners have similar incomes, their average total living standard loss is the same, at -16% for women and -14% for men (columns 3 and 7, panel C, Table 1), with the loss in economies of scale due to the end of communal living being shared almost equally. The comparison with the control group magnifies the losses, but they remain of similar magnitude for women and men (columns 4 and 8). The main breadwinner, whether man or woman, generally experiences a gain in his or her living standards, which appears to be of similar magnitude before comparison with the control group. When women provide more than 60% of earnings before divorce, their living standard increases by 18%. For men, the increase is 17%. When compared with the still-married twins, the gain for women falls from 18 to 2%. There is a fall for men, but of smaller magnitude, for whom the increase drops to 10%. Whatever the share of income contributed by the partners to the household, the comparison with the control group leads to a more pronounced loss in living standards (or a decrease in the gain). This is particularly striking for second-earner men: the difference between the before-after estimator and the causal effect of divorce is 12 percentage points, representing a decrease of -20% . But, couples where the woman is the main breadwinner are uncommon. Only in a minority of divorced couples (13%) is the man not the main earner; 53% of households have a traditional breakdown of earnings (where the man earns more than 60% of the couple's income).

6.2.1 Disentangling the effects

The number of children and degree of specialization are related. The higher the number of children, the greater the likelihood that the man earns more than the woman. The couple's level of income before divorce is also an important determinant of living standards and is likely to be correlated with these two other dimensions. Because of these possible correlations, we ran regressions including the number of children, marital specialization, and household income quintile before separation in order to disentangle the effects of all these dimensions (Table 2). Controlling for household income before divorce reinforces the previous results on the importance of specialization.

The losses in living standards are of larger magnitude for men and women in upper income quintiles, and of smaller magnitude for those in the bottom quintile. The inclusion of public transfers significantly improves the situation of women from the poorest households, suggesting that low-income lone mothers are particularly targeted by these transfers. For men, the effect is opposite. As the main providers of household income, they keep this income after divorce. They are thus less likely to benefit from

Table 2 Regression estimates of change in living standard

	Women				Men			
	No transfer	With private transfer	Total living standard	Total living standard with control group	No transfer	With private transfer	Total living standard	Total living standard with control group
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Number of children								
0	4.8***	1.1 (ns)	-8***	-5.2***	-13.7***	-10.6***	-8***	-5.9***
1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2	-0.5 (ns)	2.3***	3.2***	3.5***	12.3***	8.8***	2.6***	2***
3 or more	-7.2***	-3***	0.9**	4.4***	29***	22.7***	0.2 (ns)	2.6***
Share of income (%) provided by man before separation								
< 20	136.3***	126.4***	47.2***	23.2***	-21.9***	-21.9***	-3.2**	-16.8***
20–40	79.7***	67.3***	33.3***	29.3***	-34.9***	-33.3***	-24.8***	-27.9***
40–60	35.7***	28.3***	13.6***	15.1***	-21.9***	-20.3***	-17.9***	-17.3***
60–80	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
> 80	-36.1***	-24.6***	-5.2***	-6.1***	25.7***	21.9***	14.8***	11.9***
Quintile of income before separation								
1st	21.6***	16***	45.7***	33.3***	19.3***	23.5***	18***	4.7***
2nd	1.5***	0.6 (ns)	10.5***	10.6***	3.9***	4.9***	4***	3.2***
3rd	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
4th	0.5 (ns)	0.8**	-4.6***	-5.7***	-0.5 (ns)	-1.1***	0.2 (ns)	-1***
5th	-5.6***	-4***	-14.4***	-14.4***	-1.8***	-3.1***	0 (ns)	0.2 (ns)
Cons.	-45.9***	-40.7***	-26.2***	-28.5***	16.3***	9.3***	4.2***	1.8***
N	64,393	64,393	64,393	128,786	56,299	56,299	56,299	112,598

Source: French exhaustive income tax returns database, divorced women and men in 2009; standard errors are computed by subsampling

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

public transfers but more likely to pay taxes. The changes in living standards are less affected by the number of children (+ 3.2 and + 2.6 percentage points for couples with two children relative to one-child couples and + 0.9 and + 0.2 percentage point for three or more children; columns 3 and 7) than by both pre-divorce share of income provided by the man and quintile of household income. Comparison with the control group leads to the same conclusion about the limited effect of the number of children (columns 4 and 8).

On the other hand, the change associated with marital specialization is strikingly high. The change in living standards is 8–15 percentage points more favorable for women who are the main income providers (i.e., the man's share of joint earnings ranges from 0 to 40%) compared with women providing an equal share of income (i.e., the man's share ranges from 40 to 60%, column 4), and 23 to 35 percentage points higher compared with male breadwinner couples (i.e., the man's share is above 60%). The magnitude of the effect of specialization is also considerable for men. For those who provide less than 40% of earnings before divorce, the loss is 17–40 percentage points greater than that for those who are the main breadwinners (providing more than 60% of joint earnings, column 8).

Thus, whatever the gender, the causal effect of divorce for second-earner partners is always more negative than for the main providers. This can easily be interpreted as a consequence of marital specialization choices if they are not fully offset after divorce.

6.3 Sensitivity analyses

Four sensitivity analyses are described below. They prove the robustness of our findings to the type of indicator used (median vs. mean of changes in living standard), the choice of equivalence scale (testing with three alternative equivalence scales), the pre-divorce marital status (comparing married couples with *Pacs* partners), and the possible role of repartnering. We systematically report the changes in living standards with no controls (panel A) and with our controls (number of children, share of couple's income provided by the man before separation, and quintile of household income before separation; panel B).

6.3.1 Median of changes in living standards

To check the sensitivity of our main estimates to extreme values, we ran a quantile regression at the median (Appendix Table 5). This is an appropriate test since the median is well known to be less sensitive to outliers than the mean. Both men and women encounter a loss at the median, but while women's loss is about -21% , men's loss is much more limited at -5% (panel A). Results on the quantile regression including controls are similar to those obtained with our benchmark regressions (panel B). Importantly, the within-couple earnings inequality plays a larger role on changes in living standards around divorce than the number of children.

6.3.2 Choice of equivalence scale

Changes in living standards might be sensitive to the choice of equivalence scale. In our benchmark results, we use the OECD-modified equivalence scale. In the case of lone-

parent families, this raises two problems. For one thing, this scale does not consider the specific expenditures of a lone-parent family. For instance, it considers that the economies of scale for a lone-parent family with one child under 14 years old are larger than those for a childless couple (1.3 vs. 1.5 consumption units). Yet, this might not be the case.⁴² Other equivalence scales can be chosen. One commonly used scale is the square root of the household size, which assumes that economies of scale are smaller for lone parents.⁴³ We introduce this equivalence scale as a first variant in our sensitivity analysis. Another scale used by the French administration adds 0.2 (with respect to the OECD-modified equivalence scale) to the total number of consumption units when dealing with single-parent families. We also introduce this second “lone parent variant” in our analysis.

The second problem with the usual equivalence scale is that it ignores child-related expenditures that may also be incurred by the noncustodial parent (Bratberg and Tjøtta 2008). We propose a third variant, giving a fraction of a consumption unit to the noncustodial parent. Few studies compute this extra expenditure for noncustodial parents (Henman and Mitchell 2001; Martin and Périvier 2018). We assume this fraction reflects the time spent at the noncustodial parent’s home. When custody is not shared, we assume that the child(ren) stays with the noncustodial parent every other weekend and during half of the school vacation (the most common practice). This corresponds roughly to 25% of the time. So, in this variant, we give a quarter of the OECD-modified-scale consumption unit to the noncustodial parent (0.25×0.3 , for example, for a child under 14).

Appendix Table 6 presents these three alternatives scales and compares their results with those previously obtained with the OECD-modified equivalence scale. While the changes in living standards differ slightly, the main conclusions remain unchanged. Whatever the equivalence scale used to compute living standards, the change linked to the number of children is always smaller than that linked to within-couple earnings inequality.

6.3.3 Pre-divorce status

Heterogeneity by pre-divorce marital status is tested. Nearly all union dissolutions are divorces (94%). We do not present results for them because they are the same as those for the whole population. Results for people who end a *Pacs* union (see Appendix Table 7) appear different, however. This was expected, based on what we know from the literature about couples who choose the *Pacs* (Rault and Bailly 2013); they are usually more educated and more egalitarian (with a lower share of inactive women) and have fewer children than married couples. For women leaving a *Pacs* union, the drop in living standards without transfers is smaller than that for divorced women, reflecting the former couple’s more egalitarian earnings. Public and private transfers play a smaller role, since *Pacs* partners have fewer children and are richer. After controlling

⁴² For example, living with a child generally means having two bedrooms, whereas a childless couple needs only one.

⁴³ It assumes that a lone parent with one child needs 40% ($(\sqrt{2} = 1.4)$) of extra income to maintain his/her living standard, while with the OECD-modified scale, he or she is assumed to need 30% (1.3). This holds until at least five children. In cases of six or more children, the OECD-modified scale assumes lower economies of scale ($1 + 5 \times 0.3 = 2.5$) than the square root of the household size ($\sqrt{6} = 2.45$).

for the number of children, household income, and share of income provided by each partner, the differences between former Pacs partners and divorcees are much smaller. The main conclusion about the major role of within-couple earnings inequality remains true even for former Pacs partners, though the magnitude is smaller for men than in cases of divorce.

6.3.4 Repartnering

Lastly, in light of the literature suggesting that repartnering may offset the economic consequences of divorce (Dewilde and Uunk 2008; Mortelmans and Defever 2018), we wondered whether separated individuals who repartner immediately after divorce, whatever the form of the new union, experience the same changes in living standards as those who do not.

Appendix Table 8 shows that for individuals who repartner in a cohabiting union, the negative consequences of divorce largely disappear. We do not observe a decrease in living standards for most divorced women who repartner; in fact, their living standard increases by 6% on average (column 4, panel A).⁴⁴ As the living standard of the control group also increases over the period (as previously observed), the comparison with this group results in a smaller, but still positive, change in living standard for repartnered women. However, we observe a slight decrease in living standard for the most frequent situations, i.e., women who were previously in male breadwinner couples. These results are consistent with Dewilde and Uunk (2008) and Mortelmans and Defever (2018), indicating that repartnering provides a way to maintain previous living standards. Living standards for divorced men who repartner also increase, by 9% on average (column 8, panel A). We still observe gendered economic consequences of divorce, but the differences between men and women are much more limited.

Part of the observed increases may result from positive selection into repartnering just after divorce. Appendix 5 shows that rapidly repartnered men belonged to wealthier households than the overall population of divorcees and that repartnered women are less likely to exit the labor force.⁴⁵

Despite these differences in general results, our main conclusion about the stronger effect of marital specialization compared with that of the presence of children remains valid. When all our controls are included (taking a part of the positive selection into account), a stronger gradient is observed for the effect of within-couple earnings inequality than for the number of children, for both men and women. The second-earner, regardless of gender, is still the more penalized partner after divorce. Finally, if we include the subsample of individuals who repartner in the initial sample,⁴⁶ the results do not change significantly.

⁴⁴ We can notice a sharp increase for women who were breadwinners. One possible interpretation is that women who were breadwinners subsequently repartner with men who have higher earnings relative to themselves as observed for cohabitants in Australia by Foster and Stratton (2020).

⁴⁵ Another hint as to this positive selection of the population that repartners may be given by looking at the counterfactual of the repartnering group, which has higher average income growth (an increase of more than 6% over the period for the married counterfactuals vs. 4% in the nonrepartnered population).

⁴⁶ Results not shown but available upon request

6.4 Divorce and labor supply

Divorce may lead to changes in labor market participation by increasing the economic incentives to (re)enter the labor market or to work more hours to make up for the income loss due to union dissolution. To assess what part of the observed change in living standards is due to recent changes in labor supply, we examined changes in labor market participation for men and women at the intensive and extensive margins.

Half (53%) of the women who were inactive⁴⁷ in the year preceding the divorce (re)entered the labor market in the year following divorce. This proportion is 29 percentage points higher than that of women with identical characteristics who stayed married (Table 3, columns 1 and 2, panel A). These results are comparable to those of Bonnet et al. (2010) showing, on a smaller survey sample, that around 40% of divorced housewives enter the labor market after separation in France. Motherhood status and family size act as constraints (panel B with controls). Women with three or more children are less likely to enter the labor market than women with fewer or no children. Women from the poorest households are also less likely to reenter the labor force after divorce than those from wealthier households, probably because of a lower human capital.⁴⁸

For women previously employed, the effect of divorce on the probability of being inactive after divorce is limited. While the simple before–after estimator points to a higher probability of being inactive (+ 3%, column 3, panel A), the causal effect of divorce is in the opposite direction: active women are less likely to become inactive after divorce (− 2%, column 4). However, the magnitude of these effects is small. Divorce keeps more women on the labor market than marriage. The effects of the other factors are also small. The probability of withdrawing from the labor market after divorce is only 1 percentage point higher for mothers with two or more children relative to one-child mothers. The most notable finding concerns women in couples where the man was providing more than 80% of total earnings. They are less likely (− 5 percentage points) to become inactive after divorce, probably because of their post-divorce financial constraints.

When remaining in the labor market, divorced women can also modify their labor supply behavior, for example by shifting their work schedule from part-time to full-time. We analyze the intensive margin of labor supply using the changes in labor income for previously working divorcees. Unfortunately, the working hours are not available. A change is thus not necessarily a change in working hours but may also correspond to a per-hour wage increase. At the intensive margin, divorce appears to have a positive effect on labor income for women (+ 12% on average; column 6, panel A, Table 3). The greatest effect is for working women formerly in most specialized couples where the man was providing more than 80% of the couple's earnings. Compared to women in couples where the man was providing 60–80% of income, their labor market earnings increase by 28% (column 6, panel B). The more children

⁴⁷ We define inactivity as receiving neither labor nor replacement income, or as receiving less than 1 month of minimum wage over the year. For collinearity reasons, we do not enter the share of income provided by the man before separation because 99% of inactive women were providing less than 20% of the couple's joint earnings.

⁴⁸ Unfortunately, our administrative database does not include education or labor market experience to assess human capital.

Table 3 Women's labor supply after divorce

		Outcome					
		Working after divorce		Not working after divorce		Change in labor income	
Sample							
		Women out of labor force before divorce		Women working before divorce		Women working before divorce	
		Divorcees	Divorcees with control group	Divorcees	Divorcees with control group	Divorcees	Divorcees with control group
		(1)	(2)	(3)	(4)	(5)	(6)
Panel A: no control							
All		52.8***	28.8***	3.4***	− 1.8***	23.8***	12.4***
Panel B: with controls							
Number of children							
0		4**	7.4***	− 0.9***	1.3***	3.6***	1.6***
1		Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2		7.6***	0.4 (ns)	0 (ns)	1.1***	2.5***	− 2.4***
3 or more		0.4 (ns)	− 4.8***	1.7***	1.2***	1.8 (ns)	− 2.4***
Share of income (%) provided by man before separation							
< 20				− 3.7***	− 0.3***	− 14.7***	− 4.7***
20–40				− 3.2***	0.9***	− 14.3***	− 7.2***
40–60				− 1.8***	1.1***	− 11.7***	− 5.9***
60–80				Ref.	Ref.	Ref.	Ref.
> 80				5.3***	− 5.1***	87.1***	27.8***
Quintile of income before separation							
1st		− 12.6***	− 7.2***	9.8***	− 0.9***	18***	3.2***
2nd		0.2 (ns)	− 2.8***	3.1***	− 0.5***	3.8***	1.6***
3rd		Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
4th		1.2 (ns)	− 1.4 (ns)	− 0.7***	0.6***	− 1.8***	− 1.3***
5th		− 5.2**	4.8***	− 1.4***	0.8***	− 7.1***	− 1***
Cons.		57.4***	33.4***	2.7***	− 2.8***	17.1***	11.3***
N		8122	18,169	56,271	110,617	56,271	110,617

Source: French exhaustive income tax returns database, divorced women in 2009; columns 1 and 2: women who had a null income in 2008; columns 3 to 6: women who had a positive income in 2008; columns 1 to 4: linear probability model; columns 5 and 6: model Eq. (4); standard errors are computed by subsampling. Labor income includes unemployment benefits. The sample size of the regression with the control group is not exactly double the sample size of the regression without, as the treated women and their married counterparts do not always have the same labor market situation. Results are very similar when we restrict our sample to individuals with a perfect match on this variable

*Significant at the 10% level

**Significant at the 5% level

*Significant at the 1% level

women have, the less likely they are to increase their labor supply, though the effect is not considerable (2 percentage points less for mothers with 2 or 3 children relative to those with an only child). It may be difficult for them to reconcile work and family life, probably because they are the custodial parent in most cases.

For men, whatever the outcome considered in Table 4, the effect of the number of children turns out to be either nonsignificant or of very low magnitude. As observed for women, men who were previously inactive⁴⁹ are more likely to enter or reenter the labor market, though the probability is roughly half that of women (+ 14.5%, column 2, panel A). Men are less frequently inactive than women, likely due to different factors and characteristics. Women often withdraw from the labor market for family reasons, whereas for men becoming inactive is more often linked to health problems or long-term unemployment. This may explain the lower reemployment rate of inactive men.

This could also explain why the probability for working men of becoming inactive is barely affected, except for men who were providing less than 20% of the couple's earnings and who are significantly less likely to become inactive (column 4, panel B, Table 4).

At the intensive margin, we again find a positive effect of divorce on men's labor income but entirely explained by selection or other confounders, since the effect becomes negative when compared with the control group. This could mean that divorce reduces the wages of divorcees relative to their married counterpart. An underlying mechanism might be slower career advancement due to a lesser commitment to work following this dramatic change in their personal life. The loss of the partner's support for domestic and parental tasks and the time required to look after the children, even if not the custodial parent, might be another possible explanation. Given the higher probability of unemployment after divorce, men may also have reduced earnings due to a job loss.

There is heterogeneity in the reaction to divorce by share of income provided by the man. Changes are larger for men who were the second income provider (+ 22 percentage points higher when the man was earning less than 20% of the couple's income than men in egalitarian couples; column 6, panel B) than for those who were the main income provider, for whom divorce has a low but significant negative causal impact. Finally, 8.4% of men with a nonzero income and no unemployment benefits before divorce receive unemployment benefits after divorce versus 6% of still-married men with identical characteristics.⁵⁰ Thus, men who divorce have a 40% higher probability of experiencing unemployment than similar married men.

7 Conclusion and discussion

If "the formation of a couple is often efficient from the pure economic perspective" (Browning et al. 2014) because marital gains arise from the production of household public goods and the marital specialization process, couple breakdown has opposite consequences, revealing the flip side of marital specialization. The loss of economies of scale following divorce is well known. Some costs, such as housing and child-related expenses, shared between partners during marriage, must be borne separately after divorce. Empirical studies

⁴⁹ As is the case for women, for collinearity reasons, we do not enter the share of income provided by the man before separation because 95% of inactive men were providing less than 20% of the couple's earnings.

⁵⁰ See Appendix Table 17.

Table 4 Men's labor supply after divorce

Outcome						
Working after divorce		Not working after divorce		Change in labor income		
Sample						
Men out of labor force before divorce		Men working before divorce		Men working before divorce		
Divorcees	Divorcees with control group	Divorcees	Divorcees with control group	Divorcees	Divorcees with control group	
(1)	(2)	(3)	(4)	(5)	(6)	
Panel A: no control						
All	54.7**	14.5***	2.2***	0 (ns)	5.3***	− 2.2***
Panel B: with controls						
Number of children						
0	− 5.6 (ns)	2.6 (ns)	0.4 (ns)	0.6***	1.7**	− 0.1 (ns)
1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2	1.7 (ns)	0 (ns)	− 0.1 (ns)	0.1**	0.3 (ns)	− 0.1 (ns)
3 or more	− 3.6 (ns)	1.2 (ns)	− 0.2 (ns)	0.02 (ns)	− 0.8 (ns)	− 1.1***
Share of income (%) provided by man before separation						
< 20			10.4***	− 6.5***	209.8***	21.7***
20–40			4.1***	− 0.6***	32.8***	4.7***
40–60			0.7***	0.2***	3***	0 (ns)
60–80			Ref.	Ref.	Ref.	Ref.
> 80			− 0.1 (ns)	0.03 (ns)	− 7.1***	− 2.3***
Quintile of income before separation						
1st	18.1***	− 0.5 (ns)	5.5***	− 0.1*	14.1***	− 2.7***
2nd	13.3**	3.5 (ns)	0.8***	− 0.1 (ns)	3.2***	− 0.4**
3rd	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
4th	2.6 (ns)	14.1***	− 0.3*	− 0.2***	− 0.1 (ns)	0.4**
5th	− 0.5 (ns)	28.3***	− 0.2*	− 0.2***	− 0.4 (ns)	0.1 (ns)
Cons.	42.1***	0***	0.5***	− 0.1 (ns)	− 0.8 (ns)	− 1.7***
N	1362	2916	54,937	109,682	54,937	109,682

Source: French exhaustive income tax returns database, divorced men in 2009; columns 1 and 2: men who had a null income in 2008; columns 3 to 6: men who had a positive income in 2008; columns 1 to 4: linear probability model; columns 5 and 6: model Eq. (4); standard errors are computed by subsampling. Labor income includes unemployment benefits. As the treated men and their married counterparts do not always have the same labor market situation, the sample size of the regression with the control group is not exactly double the sample size of the regression without. Results are very similar when we restrict our sample to individuals with a perfect match on this variable

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

have showed that this loss of economies of scale involves a decrease in living standards that primarily affects women. This gender disparity has often been explained by the greater child-rearing costs incurred by the custodial parent (generally the woman).

Using data from a French fiscal database to construct a large sample of couples observed 1 year before and 1 year after their divorce, we evaluated the causal effect of divorce and distinguished the roles of different components of living standards.

First, consistent with the literature, we find that women's total living standards do indeed decrease after divorce, by 19% on average, whereas men's living standards remain stable overall (with a small decrease of -2% at the mean and -5% at the median). Those who repartner immediately after dissolution have no such decrease, so repartnering might be an effective way to overcome financial difficulties after divorce.

Second, while family composition and child custody doubtless play a role in the relative impoverishment of women, we also show that the economic consequences of divorce are much more dependent on preexisting within-couple earnings inequality, often resulting from marital specialization choices. The gender gap in earnings observed at the moment of divorce may, of course, be due to premarital differences in spouses' wages, in line with assortative mating, and linked to differential labor market career advancement that we are unable to control for. However, it may also result from specialization due to a division of labor during marriage that is insufficiently compensated for after divorce. This focus on within-couple earnings inequality also allows us to highlight substantial heterogeneity in post-divorce changes in living standards for men. When men are the couple's main income provider (as in most cases), their living standards increase after divorce. But when they are the secondary earner, they experience losses, as do most women in the same situation. The loss is all the greater if their earnings represented a small fraction of the couple's pre-divorce earnings. Losses after divorce are not so much a question of being a custodial parent, but rather of marital specialization choices and the wage gap between partners at the time of divorce.

Third, this article also investigates the role of public and private transfers. Public transfers (family and welfare benefits) partially offset the negative economic consequences of divorce, especially for large families and those with low income. Some childless women (and, to a lesser extent, childless men) may thus experience larger losses in living standards than mothers with a large family⁵¹ who are helped by generous French family policies. Private transfers, i.e., child support payments, have a smaller effect than public ones. They mitigate the decrease in women's living standards after divorce by about 6 percentage points and reduce the increase for men by about 9 points.

Fourth, our results on labor supply after divorce show that there is no pronounced effect of divorce on the probability of labor market withdrawal. For inactive women, however, we observe a massive labor market reentry, constrained by family size and low household income (probably indirectly capturing low human capital). For men, little change is observed for employment status, except a higher risk of unemployment after divorce and an increase in labor market income for those who were in a second-earner position.

We will now discuss four main limitations to our study and their consequences on the external validity of our findings. First, in spite of their reliability and the large sample size, the administrative data we drew upon can only be used directly to estimate the effect of divorce, i.e., legal separation of marital unions (divorces and civil

⁵¹ This result is consistent with Manting and Bouman (2006) on Dutch data.

partnerships) but not the separation of couples in consensual unions. However, with the spread of cohabitation, these unmarried couples are becoming similar to married ones in terms of their sociodemographic characteristics. Tach and Eads (2015) analyzed U.S. dissolution trends and found that the economic consequences of consensual union dissolution and divorce have become more similar over time. In a European context, on Dutch data, Manting and Bouman (2006) found that the short-term losses experienced by nonmarried women are smaller than those experienced by married women, but also pointed out that this result is not driven by marital status *per se* but by compositional differences. For instance, unmarried couples have fewer children and are more likely to have equivalent earnings before divorce. As we control for these characteristics, and given that lone-parent welfare benefits are similar for divorced and separated mothers in France, our conclusions would probably have remained identical had we been able to include couples in nonmarital unions in our analysis.

A second limitation is that we present only short-term effects 1 year after the divorce. This is probably the worst period, and some studies show that, after some years, there may be a catch-up effect, with a return to the level of pre-divorce living standards due to repartnering (Manting and Bouman 2006) and labor market behavior adjustments. Nonetheless, their conclusions are generally based on before–after estimators that do not consider comparison with comparable couples who remained married. Consequently, the long-term causal effect of divorce remains unclear.

Third, our measure of private transfers only takes child support into account, whereas spousal alimony may also constitute a major financial resource (and expense). However, spousal support payments only concern one in five divorces in France (Belmokhtar and Mansuy 2016) and, moreover, are generally limited to couples older than those observed in this study, since a particularly long marriage duration is the main determinant for granting spousal support. Moreover, alimony is much more often paid as a lump sum (in 9 out of 10 cases in 2013), not as an annuity. It would thus have been difficult to add it to post-divorce living standards as an annual flow. An arbitrary payment period would have had to be defined to smooth this one-off payment over time. If anything, the losses for married women and the stability for married men are slightly overestimated by not considering such transfers. Nevertheless, the substantial effect we observe makes us confident that inclusion of spousal support, if possible, would not have fully counteracted the inequality created by marital specialization. This limitation applies only to previously married couples, not to former *Pacs* partners, who cannot legally claim spousal alimony.

Last, the choice of an equivalence scale may drive the results—a frequent criticism of analyses of living standards. We show that this is clearly not the case here. First, we theoretically establish that the number of children and custodial status are not the only factors behind changes in living standards. Second, we replicate our analysis using different equivalence scales, and all our conclusions remain valid. The within-couple earnings inequality before divorce is a much stronger determinant than the number of children, whatever the equivalence scale chosen.

We also document an increase in the labor force participation of second earners, especially for women. This tends to support the idea that marital specialization is the main cause of the gender inequality in living standards after divorce. Why, then, do couples continue to specialize (especially women)? First, the benefits of specialization may be assessed on a short-term time horizon, over which it provides an efficient solution. Second, people probably do not realistically anticipate the risk of divorce and may overestimate the

possible compensation offered by the main earner, or they may underestimate the loss in economies of scale.

Finally, our study emphasizes the cost of divorce from a public policy perspective because public transfers to single parents and low-income families are substantial. However, for dual earners or for divorcees reentering the labor market, this cost is much lower. Public policies that encourage both partners to work and that facilitate labor market attachment of women (and mothers) in particular should be promoted (development of childcare provision, work-family balance policies, etc.). It would also be interesting to consider policies that help divorcees to return to work, especially those who withdrew from the labor market during marital life. This would shorten the critical period after divorce when divorcees rely heavily on welfare support.

Acknowledgments We thank Alessandro Cigno, Thomas Deroyon, Xavier D'Haultfoeuille, Lucie Gonzalez, Malik Koubi, Stéfan Lollivier, Thomas Piketty, Corinne Prost, and numerous conference and seminar participants as well as the three anonymous referees for helpful comments and guidance. We are also grateful to Jérôme Accardo and Cédric Houdré for facilitating access to data. This paper presents the authors' views and should not be interpreted as reflecting those of their institutions or of Banque de France.

Funding information This study was funded by the Agence Nationale de la Recherche (ANR) (*Vieillir à deux* project, ANR-15-CE36-0009).

Data availability Fiscal data are only available through special authorization of the Fiscal Administration.

Compliance with ethical standards

Conflict of interest The authors declare they have no conflict of interest.

Appendix 1

Table 5 Median regressions: changes in living standards for women and men

	Women				Men			
	No transfer	With private transfer	Total living standard	Total living standard with control group	No transfer	With private transfer	Total living standard	Total living standard with control group
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: no control								
All	− 35.9***	− 31.6***	− 19.0***	− 21.2***	11.9***	5***	− 2.2***	− 5.1***
Panel B: with controls								
Number of children								
0	4.3***	0.4 (ns)	− 8.4***	− 6.8***	− 12.9***	− 9.2***	− 7.3***	− 6.3***
1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.

Table 5 (continued)

	Women				Men			
	No transfer	With private transfer	Total living standard	Total living standard with control group	No transfer	With private transfer	Total living standard	Total living standard with control group
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2	−2.2***	1.7***	5***	4.4***	10.1***	7.1***	2.3***	1.3***
3 or more	−7.9***	−2.2***	4.5***	6.3***	27.1***	19.3***	0.2 (ns)	1***
Share of income (%) provided by man before separation								
< 20	130.4***	121.3***	47.7***	32.6***	−33.9**	−32.8***	12.5***	−20.2***
20–40	81.5***	68.7***	36.9***	34.8***	−42***	−39.9***	−31.6***	−32.5***
40–60	38.5***	30.7***	16.4***	16.8***	−21.5***	−19.7***	−17.6***	−17.4***
60–80	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
> 80	−39.3***	−31.2***	−9.3***	−9.8***	29.9***	24.8***	16.9***	15***
Quintile of income before separation								
1st	16.2***	6.2***	40.8***	34***	14.3***	18.4***	12.8***	6.2***
2nd	2.1***	−0.2 (ns)	9***	9.1***	3.4***	4.3***	3.1***	2.6***
3rd	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
4th	0 (ns)	0.7***	−4.9***	−5.5***	−1.2***	−1.4***	−0.2 (ns)	−0.9***
5th	−5.8***	−3.7***	−13.6***	−13.7***	−2.6***	−2.9***	−0.3 (ns)	0.4***
Cons.	−46.8***	−41.5***	28.8***	−30.2***	17.7***	9.9***	3***	1.8***
N	64,393	64,393	64,393	128,786	56,299	56,299	56,299	112,598

Standard errors are computed by subsampling. Source: French exhaustive income tax returns database, divorced women and men in 2009

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 6 Changes in living standards for women and men, with control group (different equivalence scales)

Women				Men				
	OCDE	Square root variant	Single parent variant	Noncustodial parent variant	OCDE	Square root variant	Single parent variant	Noncustodial parent variant
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: no control								
All	- 18.5***	- 26.8***	- 25.7***	- 19.4***	- 2.1***	- 11.7***	- 5.9***	- 9.6***
Panel B: with controls								
Number of children								
0	- 5.2***	- 0.6***	- 5.5***	- 3.9***	- 5.9***	- 3.7***	- 2.3***	- 0.7***
1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2	3.5***	1.8***	3.6***	3.7***	2***	- 1***	1.4***	- 1.8***
3 or more	4.4***	3**	6.5***	4.7***	2.6***	- 4.8***	2.5***	- 6.3***
Share of income (%) provided by man before separation								
< 20	23.2***	24.9***	24.4***	23.9***	- 16.8***	- 17.2***	- 16.4***	- 17.8***
20-40	29.3***	29.5***	29.2***	29.6***	- 27.9***	- 27.6***	- 27.1***	- 28.1***
40-60	15.1***	15.2***	14.9***	15.6***	- 17.3***	- 17.3***	- 17.4***	- 17.2***
60-80	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
> 80	- 6.1***	- 6***	- 5.7***	- 6.2***	11.9***	12.5***	12.5***	11.6***
Quintile of income before separation								
1st	33.3***	32.2***	32***	32.9**	4.7***	5***	5.4***	3.9***
2nd	10.6***	9.9***	10***	10.1***	3.2***	3.2***	3.4***	2.6***
3rd	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
4th	- 5.7***	- 5.4***	- 5.3***	- 5.6***	- 1***	- 1.3***	- 1.3***	- 0.8***
5th	- 14.4***	- 14.5***	- 14***	- 14.5***	0.2(ns)	- 0.3***	0 (ns)	1***

Table 6 (continued)

	Women				Men			
	OCDE	Square root variant	Single parent variant	Noncustodial parent variant	OCDE	Square root variant	Single parent variant	Noncustodial parent variant
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cons.	-28.5***	-35.7***	-36.4***	-29.6***	1.8***	-6.1***	-2.6***	-3.6***
N	128,786	128,786	128,786	128,786	112,598	112,598	112,598	112,598

Source: French exhaustive income tax returns database, divorced women and men in 2009; standard errors are computed by subsampling

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 7 Regression estimates of changes in living standards for former Pacs partners

	Women				Men			
	No transfer	With private transfer	Total living standard	Total living standard with control group	No transfer	With private transfer	Total living standard	Total living standard with control group
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: no control								
All	-27.8***	-25.4***	-20.3***	-22.7***	6.1***	2.6***	-5.8***	-8***
Panel B: with controls								
Number of children								
0	12.1***	7.6***	-1.5 (ns)	-3.6***	-9.9***	-7***	-4.2***	-7.4***
1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2	-4.7**	-1.1 (ns)	3.1**	0.7 (ns)	12.4***	9.5***	4.6***	2.1**
3 or more	-7.2*	-2.9 (ns)	3 (ns)	3***	25.9***	20.9***	4 (ns)	2.8***
Share of income (%) provided by man before separation								
< 20	114.7***	103.3***	54.7***	35.1***	-27.4***	-28.2***	-12.2**	-21.7***
20–40	57.4***	52.4***	30.5***	27.8***	-26.4***	-26.2***	-21.1***	-21.9***
40–60	27.4***	25.3***	13.8***	15.9***	-19.7***	-19.5***	-17.7***	-16.6***
60–80	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
> 80	-22.4***	-18.3***	-1.2 (ns)	-6***	31.2***	28.8***	21.6***	14.7***
Quintile of income before separation								
1st	13.5***	13.1***	24.7***	15.8***	11.8***	11.5***	8.4***	0.4 (ns)
2nd	1.5 (ns)	1.5 (ns)	4.2***	5.4***	1.4 (ns)	1.5 (ns)	0.3 (ns)	-0.2 (ns)
3rd	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
4th	-2 (ns)	-1.8 (ns)	-3.7***	-3***	-3.3**	-3.3**	-2.4*	-2.8***
5th	-12.1***	-11.3***	-14.9***	-12.6***	-1.9 (ns)	-2 (ns)	-0.4 (ns)	3.6***
Cons.	-42.1***	-38.8***	-29.7***	-30***	14.4***	10.3***	1.4 (ns)	2.8***
N	4002	4002	4002	8004	3738	3738	3738	7476

Source: French exhaustive income tax returns database, women and men in Pacs unions in 2008, separated in 2009; standard errors are computed by subsampling

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Table 8 Regression estimates of changes in living standards in case of repartnering

	Women				Men			
	No transfer	With private transfer	Total living standard	Total living standard with control group	No transfer	With private transfer	Total living standard	Total living standard with control group
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: no control								
All	20.8***	19.7***	12.7*	6.4***	33.8***	26.6***	14.7*	9***
Panel B: with controls								
Number of children								
0	-7.9***	-8***	-6.5***	-3.5***	-14.5***	-11.9***	-9.4***	-5.8***
1	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2	6***	6.1***	1.9*	1**	16.3***	13.6***	6.4***	6.2***
3 or more	6.3***	6.6***	-4.8***	-1.6***	29.2***	23.5***	0 (ns)	2.8***
Share of income (%) provided by man before separation								
< 20	83.2***	81.7***	50.9***	27***	23***	22.7***	11.2***	-4.4***
20–40	40.4***	38.2***	30.9***	25.7***	-17.3***	-16.1***	-14.6***	-16.4***
40–60	14.2***	12.8***	10.2***	11.1***	-13.5***	-12.4***	-11.5***	-10.7***
60–80	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
> 80	-7.1***	-5.6***	-4.8***	-5.9***	18.7***	15.6***	11.9***	9.1***
Quintile of income before separation								
1st	51***	49.7***	32.3***	18.4***	32.6***	35.8***	19.7***	9.7***
2nd	8.8***	9.2***	6.5***	6.8***	6***	6.6***	4.4***	4.6***
3rd	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
4th	-3.1***	-3.3***	-2.5***	-2***	-3***	-3.4***	-2.6***	-2.7***
5th	-14.5***	-14.5***	-12.8***	-12***	-11.5***	-13***	-10.5***	-10***
Cons.	0.2 (ns)	-0.2 (ns)	2.2*	-1.7***	19.4***	14.3***	14.2***	9.9***
N	11,511	11,511	11,511	23,022	13,672	13,672	13,672	27,344

Source: French exhaustive income tax returns database, divorced and separated women and men in 2009, repartnered in 2010; Standard errors are computed by subsampling

*Significant at the 10% level

**Significant at the 5% level

***Significant at the 1% level

Appendix 2. Tables for the literature review

Table 9 Changes in living standards (before–after divorce) (%) in the USA and Canada

Article	Unadjusted household income		Adjusted household income		Type of variation	Type of income adjustment ^a
	Women	Men	Women	Men		
American data						
Hoffman (1977)	− 29	− 19	− 7	17	Change in mean	(a)
Duncan and Hoffman (1985)	− 28 (W)	− 9 (W)	− 11 (W)	+ 10 (W)	Mean of changes	(b)
	− 46 (B)	+ 2 (B)	− 29 (B)	+ 40 (B)		
Burkhauser et al. (1991)			− 24	− 6	Median of changes	(c)
Smock (1993)	− 46 to − 43 (W)	− 8 to + 7 (W)	− 22 to − 21 (W)	+ 61 to + 93 (W)	Median of changes	(d)
	− 51 to − 45 (B)	− 29 to − 13 (B)	− 44 to − 35 (B)	+ 47 to + 80 (B)		
Smock (1994)			− 20 (B)	+ 61 (W)	Mean of changes	(d)
Peterson (1996)			− 27	10	Change in mean	(e)
Bianchi et al. (1999)			− 36	28	Median of changes	(c)
McKeever and Wolfinger (2001)	− 45		− 14		Median of changes	(d)
McManus and DiPrete (2001)		− 42 to − 40 (W)		− 20 to − 14 (W)	Mean of changes	(b)
				− 12 to − 11 (W)		(f)
				+ 29 to + 34 (W)		(d)
		− 58 to − 41 (B)		− 27 to − 3 (ns) (B)		(b)
				− 30 to − 3 (ns) (B)		(f)
				+ 30 (ns) to + 68 (B)		(d)
			Increase		Mean of changes (instrumentation)	(j)

Table 9 (continued)

Article	Unadjusted household income		Adjusted household income		Type of variation	Type of income adjustment ^a
	Women	Men	Women	Men		
Bedard and Deschênes (2005)					for all ever-divorced women; local effect)	
Ananat and Michaels (2008)			Increase and decrease		Quantile treatment effect (instrumentation or all ever-divorced women; local effect)	(c), (j)
Canadian data						
Finnie (1993)	− 30 (− 49)	− 11 (− 25)	− 14 (− 33)	+ 32 (+ 11)	Mean (median) of changes	(c)

Results for nonrepartnered women after their divorce are shown. For US data: *B* estimation for Blacks, *W* estimation for Whites

^a Method of adjustment: (a), this measure uses the Department of Agriculture’s “low-cost food budget”; (b), this measure uses “official US Department poverty standard”; (c), division by a poverty threshold (depending on the family size); (d), “per capita” (division by the number of people in the household); (e), this measure uses the Bureau of Labor Statistics’ lower standard budget; (f), ELES (“Expended Linear Extension System”) by Merz et al. (1994); (i), modified OECD equivalence scale; (j), Census Bureau equivalence scale (nb adults + 0.7 × nb children)^{0.7}

Table 10 Changes in living standards (before–after divorce) (%) in Europe

Article	Unadjusted household income		Adjusted household income		Type of variation	Type of income adjustment ^a
	Women	Men	Women	Men		
UK data						
Jarvis and Jenkins (1999)			− 18	2 (ns)	Median of changes	(h)
Uunk (2004)			− 36		Change in median	(i)
Andress et al. (2006)			− 28	1	Median of changes	(k)
Dutch data						
Poortman (2000)	− 46	− 31	− 31	4	Change in mean	(g)
Uunk (2004)			− 19		Change in median	(i)
Kalmijn and Alessie (2008)			− 38	ns	Mean of changes	(i)
German data						
Burkhaus et al. (1991)			− 44	− 7	Median of changes	(c)
Uunk (2004)			− 25		Change in median	
Andress et al. (2006)			− 33	− 2	Median of changes	(k)
Norwegian data						
Bratberg and Tjøtta (2002) ^b	− 4 (C) − 32 (NC)	+ 36 (C) − 1 (NC)			Median of changes	
Italian data						
Andress et al. (2006)			− 32	5	Median of changes	(k)
Uunk (2004)			− 3		Change in median	(i)
Ongaro et al. (2009)	− 23	25			Mean of changes (compared to the control group)	(i)
French data						
Uunk (2004)			− 32		Change in median	(i)
Jauneau and Raynaud (2009)			− 30	− 6	Median of changes	(i)
Belgian data						
			− 31 (L)	− 1 (L)		(i)

Table 10 (continued)

Article	Unadjusted household income		Adjusted household income		Type of variation	Type of income adjustment ^a
	Women	Men	Women	Men		
Mortelmans and Defever (2018) ^c			– 18 (S) – 6 (R)	+ 7 (S) + 2 (R)	Change in median	
European data Uunk (2004)			– 36 to – 3 (according to country)		Change in median	(i)

^a Method of adjustment: (c), division by a poverty threshold (depending on the family size); (g), Schiepers' equivalence scale (1993); (h), McClements "before housing costs" equivalence scale; (i), modified OECD equivalence scale; (k), square root equivalence scale

^b For Bratberg and Tjøtta (2002): *C* estimation for custodial parents, *NC* noncustodial

^c For Mortelmans and Defever (2018): the year after divorce: *L* lone parent, *S* single, *R* repartnered

Table 11 Sample sizes of previous studies

Article	Data	Number of observations	
Hoffman (1977)	PSID	182 women	110 men
Duncan and Hoffman (1985)	PSID	349 women	250 men
Poortman (2000)	SEP	198	161
Peterson (1996)	PSID	161	161
Burkhaus et al. (1991)	PSID	301 women	239 men
	GSEP	56 women	45 men
Finnie (1993)	LAD	2125 women	2375 men
Smock (1993)	NLSY, NLSYW	133 to 430 women	
	NLSYM	67 to 312 men	
Smock (1994)	NLSY	84 to 258 women	
	NLSYM	43 to 167 men	
Jarvis and Jenkins (1999)	BHPS	148 women	105 men
Bianchi et al. (1999)	SIPP	199 couples	
McKeever and Wolfinger (2001)	NSFH	472 women	
Bratberg and Tjøtta (2002)	KIRUT	538 to 2038 women	
		600 to 1881 men	
Uunk (2004)	ECHP	29 to 157 women	

SEP Dutch Socioeconomic Panel, *PSID* Panel Study of Income Dynamics, *GSEP* German Socio-Economic Panel, *NLSY* National Longitudinal Surveys of Youth, *NLSYW* National Longitudinal Surveys of Young Women, *NLSYM* National Longitudinal Surveys of Young Men, *KIRUT* Norwegian dataset, *NSFH* National Survey of Family and Households, *LAD* Longitudinal Administrative Database, *BHPS* British Household Panel Survey, *ECHP* European Community Household Panel, *SIPP* Survey of Income and Program Participation

Appendix 3. The respective role of specialization and of number of children: a simple decomposition

In Section 2.3, we present a simple decomposition of changes in living standards (Eq. (1))

$$\frac{\text{Living standard after divorce}}{\text{Living standard before divorce}} = (1-\alpha) \frac{1.5 + 0.3n}{1 + 0.3n} \quad (1)$$

It shows that the variation in living standard for the custodial parent is barely influenced by the number of children (n), but much more sensitive to the within-couple earnings inequality α . Figure 4 illustrates graphically this point.

Another way to illustrate this result is to compute first the after–before ratio between living standards $= \frac{\text{Living standard after divorce}}{\text{Living standard before divorce}}$ and then the change in this ratio with one additional child, on the one hand, and a 10-percentage point increase in the share of man's earnings in couple earnings, on the other hand (Fig. 5). The ratio decreases by

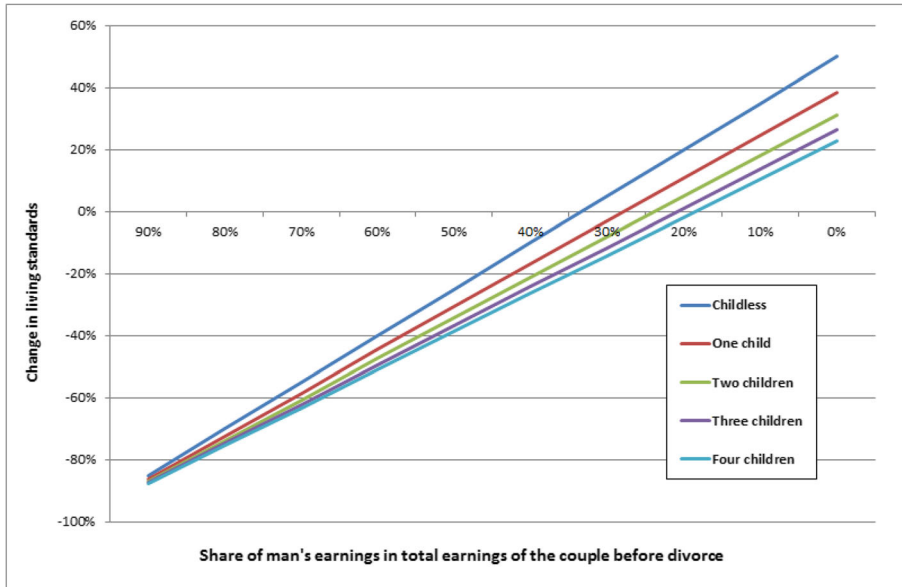


Fig. 4 Change in living standard for the custodial mother following divorce, according to within-couple earnings inequality, by number of children. While for a woman who earns as much as her husband before the divorce ($\alpha = 0.5$), her living standard will decrease from -31% (with one child) to -39% (with 4 children), and for a woman who earns 20% of the total income before divorce ($\alpha = 0.8$), it will decrease from -72% (with one child) to -75% (with 4 children). On the contrary, if she was the main income provider in the couple (if the husband earned, for instance, only 20% of the couple's income), the variation will be much more limited and go from 11% (with one child) to -2% (with 4 children)

7.7% when having one child instead of being childless but decreases only by 2.8% when having four children instead of three. On the contrary, within-couple earnings inequality has a much larger effect on the variation in living standards. When the share of man's earnings in total earnings of the couple before divorce increases from 40 to 50%, the ratio decreases by 16.7% and even by 50% when the share goes from 80 to 90

Appendix 4. Dataset and computation of weights

Dataset

For 2009, the official statistics (Ministry of Justice) report 130,601 divorces in France. Of these, the number of divorces in 2009 for people who married before 2008 ranges between 124,807 and 128,733. Our sample size of 126,250 falls within this interval.

We have information about 2008 earnings for at least 98% of the divorced couples who married before 2008 (column 3, Table 12). For PACS unions, the number of dissolutions reported in official statistics is 17,186 without any indication of the duration of the union. In our sample, we found 9760 couples in a PACS (column 3). Then, we have information about 2008 earnings for at least 57% of the couples who dissolved their PACS in 2009. It is probably even more if we take into account the fact

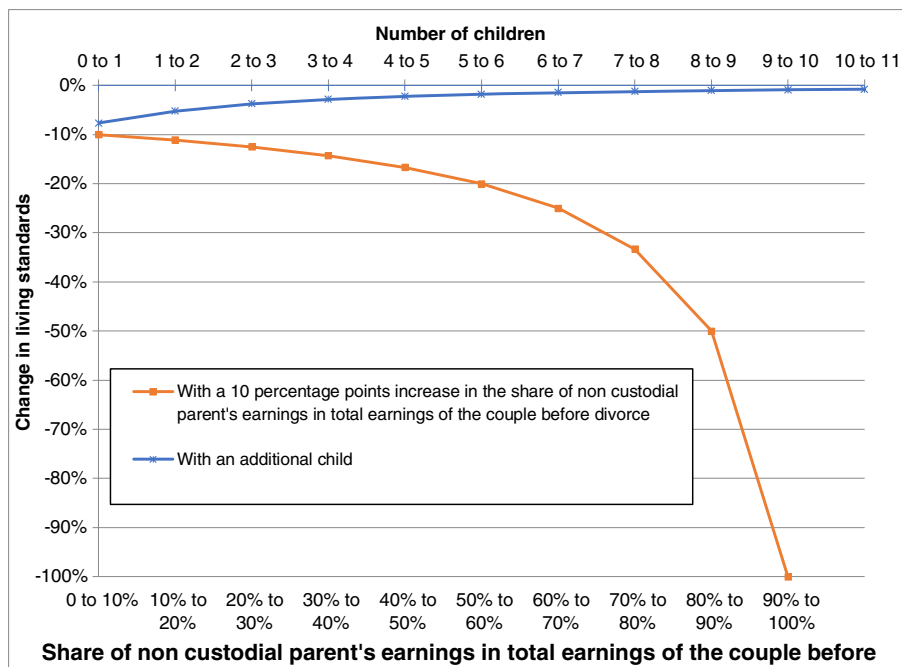


Fig. 5 Change in living standard for the custodial parent resulting from an additional child or a 10-percentage point increase in the within-couple earnings inequality. Interpretation: we compute the variation in the ratio (*living standard after divorce*/*living standard before divorce*) with an additional child or a 10-percentage point increase in the share of man's earnings in the total earnings of the couple

Table 12 Information about dataset creation

	Official statistics		Fiscal data (income and housing tax)			
	All	Married before 2008	Income tax (2008)	+ housing tax (2008)	+ housing and income tax (2010)	
	(1)	(2)	(3)	(4)	(5)	(6)
Number of divorces (%)	130,601	124,807 to 128,733	126,250 (at least 98%)	122,939 (at least 95%)	113,794	91,732
Number of civil union ("PACS") dissolutions (%)	17,186	?	9760 (at least 57%)	9442 (at least 55%)	9007 ^a	5557
Selection						
Married or in a PACS before 2008			X	X	X	X
Different-sex couples						X
Not cohabitating with other adults in 2010						X

^a Of which 7932 are different-sex couples

that we include only those who signed their PACS contract before 2008 (whereas the denominator includes all PACS dissolutions whatever the year of the contract).

Matching with the information about the dwelling in 2008 (using the housing tax return⁵²) results in some losses (column 4). We get 122,939 formerly married couples and 9442 couples formerly in a PACS, i.e., at least 95% of divorcees and at least 55% of former PACS partners.

In a further step, we match the divorced couples with their 2010 income and housing tax returns (1 year after divorce). We recover 113,794 divorced couples (i.e., a loss of 7.5%) and 9007 former PACS couples (loss of 4.5%) (column 5).

To build our main sample, we select divorced and former PACS couples for which we recover at least one partner who did not marry/enter a PACS/cohabit in 2010. It includes 97,289 couples: 91,732 ex-married couples and 5557 former PACS couples (column 6).

This represents 132,094 individuals who were formerly married and 8039 who were formerly in a PACS union.

Finally, as we are also interested in labor supply after divorce, we focus on individuals aged between 20 and 55 years old. The upper age limit is set to 55 because, in France, withdrawals from the labor market may occur at this age. We exclude the highest percentile of the distribution of changes in living standards and end up with a main sample including 120,692 divorcees or former PACS partners (64,393 women and 56,299 men).

Weights and attrition correction

Among the divorces for which we collect the fiscal information in 2010 (column 5), we recovered the two partners in 2010 in 74% of cases and one partner (man or woman) in the remaining 26%. As French resident citizens have to fill in a tax return whatever their income (even when null), we may assume that the non-follow-up by the tax administration is random. But, we could also suspect nonrandom attrition if the non-follow-up is connected to a residential move because the divorcee joined another household (parents' home, for instance, or collective home) and is not immediately registered.

Since our coverage is almost exhaustive before divorce, we decided to reweight our database on this basis. We computed weights based on calibration margins (as a survey designer would do correct for nonresponse in a survey) using the "MACRO CALMAR" program developed by the French National Statistical Institute (INSEE). We use available information on earnings and dwelling in 2008 (the coverage of the population is almost exhaustive) to compute calibration margins. We then calibrate weights for men and women separately in order to keep couples for which only one spouse was recovered. We thus ensure that our reweighted sample is representative of the divorces and PACS dissolutions in 2009 in France.

⁵² "taxe d'habitation"

Appendix 5. Descriptive statistics

Table 13 Pre-divorce characteristics of treated

	Men		Women	
	Main population	Just repartnered individuals	Main population	Just-repartnered individuals
Number of children				
0	0.21	0.24	0.19	0.32
1	0.26	0.25	0.27	0.25
2	0.36	0.35	0.36	0.30
3+	0.17	0.15	0.18	0.13
Share of income provided by man before divorce				
< 40%	0.12	0.10	0.13	0.12
40–60%	0.35	0.37	0.34	0.40
> 60%	0.53	0.53	0.53	0.48
Quintiles of income before separation				
P20	23,420	25,894	22,763	24,428
P40	33,545	35,314	32,987	33,247
P60	42,613	44,069	42,394	40,876
P80	57,155	58,045	57,515	52,772
% OLF	0.03	0.02	0.16	0.13
% employed	0.97	0.98	0.84	0.87
Living standards (pre-divorce)	21,785	22,770	21,807	21,401
<i>N</i>	56,299	13,672	64,393	11,511

Appendix 6. Computation of social benefits

Welfare benefits include family benefits, minimum benefits, and housing allowances. Almost all these benefits are means-tested⁵³ over the period we study, and their amount increases with the number of children.

First, for family benefits, we calculate the four most important types (family allowances, school allowances, family income supplement, and child care support).⁵⁴ They represent more than 92% of all family benefits distributed. Though related to our topic, we did not impute family support allowance⁵⁵ due to the lack of information. Entitlement to this benefit is indeed conditional upon the absence of child support

⁵³ With the exception of family allowances at that moment and a part of child care support allowances

⁵⁴ Allocations familiales, allocation de rentrée scolaire, complément familial, prestation d'accueil du jeune enfant (PAJE)

⁵⁵ Allocation de Soutien Familial

payments. In our data, when no child support is reported, it is not possible to distinguish between a nonpayment and zero child support decided in the divorce judgment. However, this benefit is not systematically requested (and then rarely received) and it consists of very small amounts relative to the set of other family benefits (88 euros monthly per child in 2010).

Second, we compute minimum income for nonworking individuals. Some part of the minimum benefit is maintained in case of low-paid activity to encourage people on welfare to return to work.

Third, we compute housing allowances for tenants. These are means-tested allowances, and they depend on the number of children.

We assume a 100% take-up rate for these social and welfare benefits. We are aware that non-take-up may be substantial, especially for minimum income benefits. The computed amount of public transfers can then be viewed as an upper bound and may cause an overestimation of living standard in some cases.⁵⁶ However, people who divorce are generally more likely to receive advice from lawyers, social workers, or family mediators and thus to be informed about available public benefits, especially when they have children. For this reason, we believe that the take-up rate is likely to be very high for lone-parent families.

Appendix 7. Assessing the quality of matching

We use more than 40 economic and demographic covariates to match the divorcees with their still-married *twins*. Regarding the economic characteristics, we use all types of individual incomes for both men and women: wages, overtime work, unemployment benefits, pensions, and self-employment incomes—which are also split into profits from commercial and noncommercial occupations and farm profits. We also use information on the previous trends in men's and women's earnings not only 1 year before divorce but also 2 years and 3 years before (this information is reported in the fiscal tax data) and whether they were unemployed for a long period. Regarding demographic characteristics, we use the number and ages of children. These covariates are expected to be a good proxy for marriage duration, on which we do not have information for the whole sample. We also use information on housing situation (homeownership; type of home: house or apartment) and place of residence (Paris, Paris area “Ile de France” excluding Paris, and elsewhere).

Below, we check the quality of our matching on two aspects: the overlapping assumption and the balance of the covariates.

⁵⁶ A significant feature for the short-term consequences of separation is that welfare benefits may be a bit higher just after divorce compared to the following years for two main reasons. First, the minimum income benefit is temporarily increased the year following separation. Second, the means-tested condition may be a bit less restrictive just after divorce than the following years. Indeed, over the period we study, the means-tested condition the year N (the year after divorce) is based on the individual income of the divorcee during the year $N - 2$ (when she/he was married). So, for example, it does not take into account child support payments received the year just after divorce. These payments will be included in the means-tested conditions 2 years after divorce.

Overlapping assumption

The *overlapping assumption* states that for each observation in the treated group, one observation with similar characteristics can be found and matched with it. Presenting graphs of the propensity score for treated and for the population from which the *control group* is extracted is a usual way of verifying if this assumption holds. Since we extract our control group from a quasi-exhaustive dataset of married couples, the probability of finding a *twin* for each of our divorced couples is very high. For all our 24 subsamples of divorced individuals, we have no problem finding a nearest neighbor. Figure 6 gives a detailed illustration of the differences in propensity scores between treated, potential controls before matching and chosen controls after matching for childless men whose share of couple income was above 60%. We observe that the propensity score distribution for divorced couples is *overlapped* by the nondivorced one. It is then very easy to find a nearest neighbor for each divorced couple (Fig. 6).

Figure 7 presents the distribution of propensity score matching obtained for treated and controls only and for the corresponding four subsamples of men whose share of couple income was above 60% depending on the number of children before divorce. It is also noticeable that the propensity score of the nearest neighbor chosen (the control group) perfectly fits the divorced one (Figs. 6 and 7). This is not so surprising since the number of married couples used to find a nearest neighbor is above 10 million, i.e., more than 100 times the number of divorced couples to match with: the probability of finding a close neighbor is then very high. We do not present all the 24 graphs here, but we have similar results whatever the matching subsample.

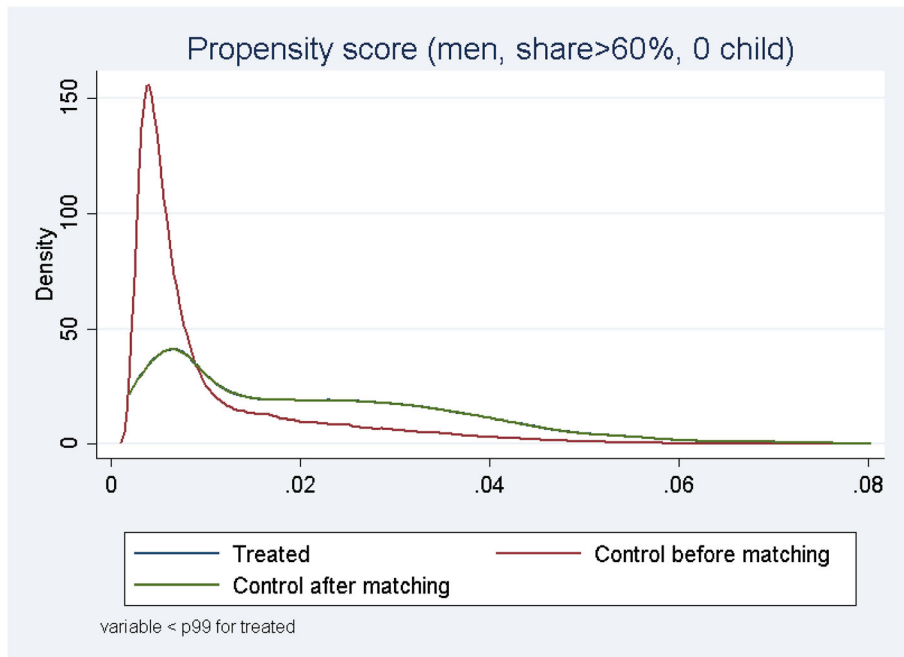


Fig. 6 Propensity score matching (men, man's share in total income > 60%, 0 child). Source: French exhaustive income-tax returns database, 2009

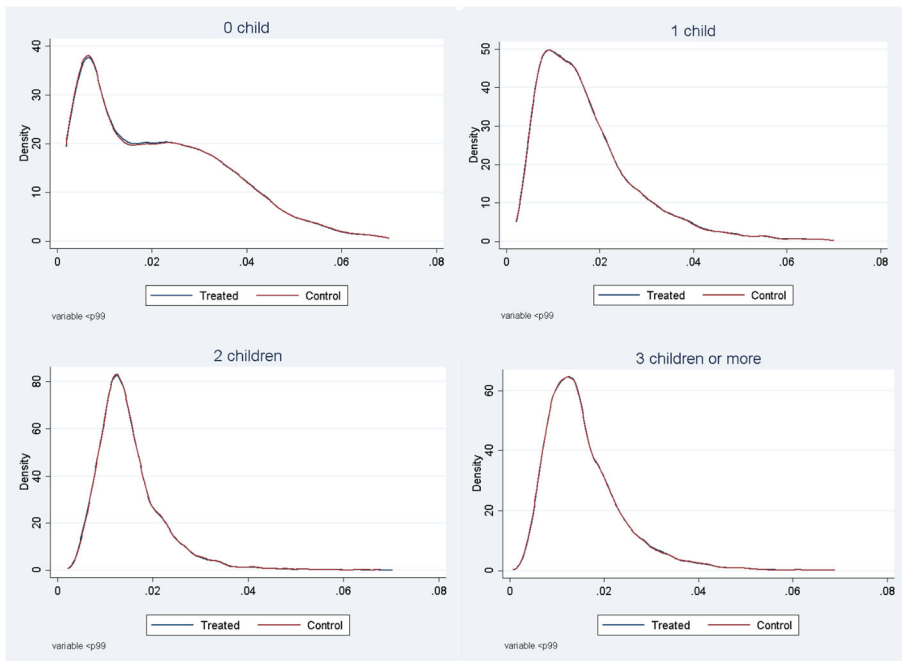


Fig. 7 Propensity score matching by the number of children (sample of men, man's share of total income > 60%). Source: French exhaustive income-tax returns database, 2009

Balance of covariates

The second point to check is whether the matching correctly balances the covariates. Our purpose is to balance numerous characteristics of the couple in 2008 (before the divorced couples split): age of each ex-partner, place of residence, homeownership, married (vs. PACS), house (vs. apartment, etc.), number and age of child(ren), number of dependent persons, and a wide range of earnings for both men and women (labor income, unemployment benefits, pensions, self-employment incomes—detailed in profits from commercial and noncommercial occupations and farm profits) and earnings from previous year and for 2 years and 3 years before. To assess the balancing, all differences in means were tested with a t test and turned out to be nonsignificant at the 10% level. In this kind of subsamples we have (with a very large number of observations), the t test is generally considered to be too demanding because the large number of observations leads to the conclusion that small differences in means are significant. An alternative method for testing the equality between the means is to compute “standardized differences” (also referred as “normalized differences”; see Imbens and Wooldridge 2008).

For the 4 samples where the man was providing more than 60% of the couple's income, Tables 14 and 15 give the means of all covariates used in the matching for the treated (divorced couples) and the control group and the standardized differences. Table 16 presents the distribution of the standardized differences for all the 24 subsamples. Whatever the subsamples, they turn out to be very small, with a maximum below 0.08 and a median below 0.04. Since the rule of thumb is to conclude to nonsignificant

Table 14 Means of covariates and standardized differences (sample of men, share > 60%, 0 and 1 child)

	0 child			1 child		
	Divorcees	Control group	Standardized differences	Divorcees	Control group	Standardized differences
Share of man's earnings in total earnings	0.8	0.8	− 0.002	0.8	0.8	0.002
Married	0.9	0.9	− 0.002	0.9	0.9	0.006
Paris	0.1	0.0	0.026	0.0	0.0	− 0.003
Ile-de-France (except Paris)	0.2	0.2	− 0.017	0.1	0.1	− 0.025
Age (men)	41.8	41.6	0.015	42.1	41.9	0.019
Age (women)	39.4	39.3	0.011	39.2	39.2	0.008
Total declared income (1 year before divorce)	41,222.5	41,306.1	− 0.002	45,926.8	45,141.8	0.017
Man's labor income (1 year before divorce)	25,408.7	25,639.5	− 0.008	27,971.3	27,635.1	0.011
Woman's labor income (1 year before divorce)	7247.9	7280.7	− 0.004	8288.2	8167.6	0.014
Homeowner	0.4	0.4	− 0.002	0.5	0.5	0.020
Living in a house	0.5	0.5	0.000	0.6	0.6	0.008
At least 1 1-year-old child	0.0	0.0	0.000	0.0	0.0	0.010
At least 1 2-year-old child	0.0	0.0	0.000	0.1	0.1	− 0.001
At least 1 3-year-old child	0.0	0.0	0.000	0.1	0.1	− 0.002
At least 1 4- to 6-year-old child	0.0	0.0	0.000	0.2	0.2	0.005
At least 1 7- to 9-year-old child	0.0	0.0	0.000	0.1	0.1	0.006
At least 1 10- to 14-year-old child	0.0	0.0	0.000	0.2	0.2	0.014
At least 1 15- to 17-year-old child	0.0	0.0	0.000	0.2	0.2	− 0.016
At least 1 18- to 25-year-old child	0.0	0.0	0.000	0.2	0.2	− 0.012
At least 1 child more than 26 years old	0.0	0.0	0.000	0.0	0.0	− 0.007
Woman's earnings (2 years before divorce)	6422.5	6410.1	0.001	7630.4	7693.9	− 0.007
Man's earnings (2 years before divorce)	20,918.0	21,449.1	− 0.021	24,753.3	24,537.2	0.007
Woman's earnings (3 years before divorce)	5066.8	5166.4	− 0.013	6530.2	6713.1	− 0.022
Man's earnings (3 years before divorce)	18,589.1	19,116.1	− 0.024	22,226.2	21,944.8	0.011
Tax paid	2749.7	2781.1	− 0.003	2472.1	2277.0	0.020
Number of children	0.0	0.0	0.000	1.0	1.0	0.000
Long-term unemployment (men)	0.0	0.0	0.014	0.0	0.0	− 0.004
Overtime work (men)	618.0	656.1	− 0.026	674.3	698.1	− 0.016
Pensions (men)	548.4	554.4	− 0.002	406.3	395.5	0.004

Table 14 (continued)

	0 child			1 child		
	Divorcees	Control group	Standardized differences	Divorcees	Control group	Standardized differences
Unemployment and pre-retirement benefit (men)	779.1	799.5	−0.006	736.2	736.7	0.000
Long-term unemployment (women)	0.0	0.0	0.020	0.0	0.0	0.002
Overtime work (women)	115.2	108.2	0.016	109.1	104.7	0.011
Pensions (women)	383.9	382.4	0.001	227.3	199.7	0.018
Unemployment and pre-retirement benefit (women)	734.7	770.4	−0.016	783.6	786.7	−0.001
Self-employment earnings	3277.1	3449.2	−0.009	3935.8	4034.9	−0.005
Profits from noncommercial occupations (men)	1738.9	1763.9	−0.002	1912.6	2208.9	−0.017
Profits from noncommercial occupations (women)	166.5	168.8	−0.001	218.0	236.3	−0.006
Profits from commercial occupations (men)	1293.1	1384.0	−0.010	1745.8	1570.8	0.017
Profits from commercial occupations (women)	56.8	67.5	−0.011	148.7	166.4	−0.008
Farm profits (men)	188.0	262.9	−0.024	246.6	240.9	0.002
Farm profits (Women)	1.7	4.3	−0.009	20.5	14.9	0.010
No activity (men)	0.0	0.0	−0.003	0.0	0.0	0.002
No activity (women)	0.3	0.3	−0.010	0.3	0.3	0.005
Standard of living before divorce	24,658.7	24,704.8	−0.002	22,630.7	22,331.9	0.015
UC OECD	1.5	1.5	0.000	1.9	1.9	−0.021
UC square root	1.4	1.4	0.000	1.7	1.7	0.010

differences when they are below 0.25, it thus confirms that our treated and control groups have identical means for all our matching variables.

It may be useful to go beyond the means and confirm that the matching results in similar distributions of covariates in the treated and control groups. Figure 8 shows that this is the case. After matching, the distributions for the treated and control groups are so similar that they are often impossible to distinguish. In Figs. 9, 10, 11, 12, and 13, for some variables, we compare the distributions of the treated and control groups.⁵⁷ As it turns out, the differences between the covariate distributions are definitively very small and the distributions are often impossible to disentangle one from another for the four subsamples defined by the number of children of men whose share in the couple's income was higher than 60%. Findings for all our matching variables and for all the 20 other subsamples are similar, and no subsample presents any distinctive feature.

⁵⁷ It allows to avoid the *scale effect* due to the introduction of the individuals eligible for the control group and thus gives a better view of the potential differences between groups.

Table 15 Means of covariates and standardized differences (sample of men, share > 60%, 2 and 3 children)

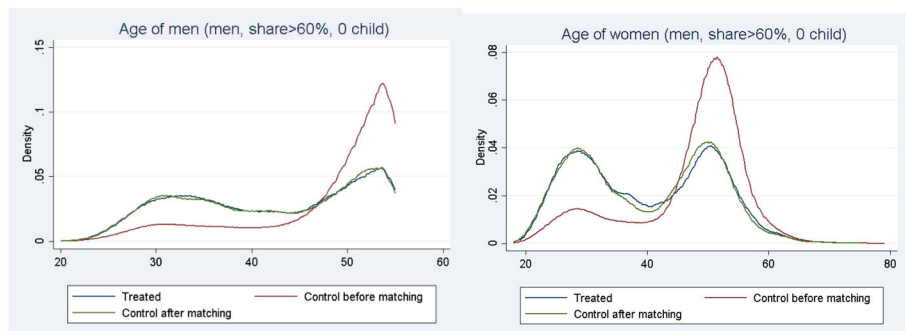
	2 children			3 children		
	Divorcees	Control group	Standardized differences	Divorcees	Control group	Standardized differences
Share of man's earnings in total earnings	0.8	0.8	− 0.003	0.9	0.9	0.006
Married	1.0	1.0	− 0.001	1.0	1.0	0.010
Paris	0.0	0.0	0.003	0.0	0.0	0.005
Ile-de-France (except Paris)	0.1	0.1	− 0.003	0.1	0.1	− 0.001
Age (men)	41.6	41.6	0.008	41.9	41.8	0.022
Age (women)	38.9	38.9	0.002	39.0	38.9	0.008
Total declared income (1 year before divorce)	49,636.4	49,298.4	0.007	41,524.3	40,952.1	0.012
Mans' labor income (1 year before divorce)	30,322.9	30,286.3	0.001	26,434.7	26,249.5	0.006
Woman's labor income (1 year before divorce)	8961.9	8781.4	0.019	5629.5	5574.0	0.007
Homeowner	0.6	0.6	0.009	0.5	0.5	0.003
Living in a house	0.7	0.7	0.003	0.7	0.7	0.006
At least 1 1-year-old child	0.0	0.0	− 0.001	0.1	0.1	− 0.007
At least 1 2-year-old child	0.1	0.1	− 0.009	0.1	0.1	0.008
At least 1 3-year-old child	0.1	0.1	0.002	0.1	0.1	− 0.019
At least 1 4- to 6-year-old child	0.3	0.3	0.007	0.4	0.4	− 0.015
At least 1 7- to 9-year-old child	0.4	0.4	− 0.013	0.5	0.5	− 0.009
At least 1 10- to 14-year-old child	0.5	0.5	− 0.003	0.7	0.7	0.004
At least 1 15- to 17-year-old child	0.3	0.3	− 0.004	0.4	0.4	0.007
At least 1 18- to 25-year-old child	0.2	0.2	0.003	0.3	0.3	0.017
At least 1 child more than 26 years old	0.0	0.0	0.011	0.0	0.0	0.027
Woman's earnings (2 years before divorce)	8388.1	8310.3	0.008	5015.2	4925.6	0.011
Man's earnings (2 years before divorce)	27,684.4	27,676.3	0.000	24,441.9	24,437.4	0.000
Woman's earnings (3 years before divorce)	7616.0	7605.3	0.001	4445.3	4252.9	0.024
Man's earnings (3 years before divorce)	25,200.4	25,284.5	− 0.003	22,247.9	22,353.8	− 0.004
Tax paid	2407.1	2302.6	0.009	1333.0	1215.6	0.012
Number of children	2.0	2.0	0.000	3.0	3.0	0.000
Long-term unemployment (men)	0.0	0.0	0.004	0.0	0.0	0.004
Overtime work (men)	667.5	660.7	0.005	654.8	650.1	0.004
Pensions (men)	302.3	276.3	0.011	305.1	269.9	0.018

Table 15 (continued)

	2 children			3 children		
	Divorcees	Control group	Standardized differences	Divorcees	Control group	Standardized differences
Unemployment and pre-retirement benefit (men)	609.3	575.0	0.011	765.8	752.0	0.005
Long term unemployment (women)	0.0	0.0	0.017	0.0	0.0	-0.001
Overtime work (women)	106.0	101.9	0.010	75.8	73.2	0.007
Pensions (women)	119.5	120.2	-0.001	160.0	183.3	-0.018
Unemployment and pre-retirement benefit (women)	667.2	694.7	-0.013	531.4	538.0	-0.004
Self-employment earnings	4725.4	4759.8	-0.001	4419.1	4334.8	0.004
Profits from noncommercial occupations (men)	2564.9	2689.8	-0.005	2621.2	2652.6	-0.001
Profits from noncommercial occupations (women)	239.0	260.9	-0.007	238.6	281.9	-0.012
Profits from commercial occupations (men)	1837.0	1794.3	0.004	1515.7	1335.8	0.019
Profits from commercial occupations (women)	175.2	174.4	0.000	74.7	92.4	-0.015
Farm profits (men)	310.6	262.8	0.014	267.8	334.4	-0.016
Farm profits (women)	13.6	15.2	-0.003	19.5	28.8	-0.011
No activity (men)	0.0	0.0	-0.023	0.0	0.0	0.000
No activity (women)	0.3	0.3	-0.018	0.4	0.4	0.003
Standard of living before divorce	21,769.8	21,677.9	0.005	17,650.6	17,505.5	0.011
UC OECD	2.2	2.2	-0.005	2.7	2.7	0.008
UC square root	2.0	2.0	0.000	2.3	2.3	-0.002

Table 16 Distribution of standardized differences over the 24 subsamples

Gender	Share of couple income provided by man before separation (%)	Number of children	Maximum	Mean	Median	P25	P75
Women	< 40	0	0.0512	0.0162	0.0125	0.0061	0.0236
		1	0.0457	0.0155	0.0147	0.0047	0.0211
		2	0.0426	0.0151	0.0136	0.0035	0.0244
		3p	0.0785	0.0187	0.0134	0.0055	0.0256
	40–60	0	0.0303	0.0131	0.0140	0.0075	0.0168
		1	0.0277	0.0091	0.0079	0.0038	0.0130
		2	0.0325	0.0088	0.0073	0.0042	0.0113
		3p	0.0538	0.0144	0.0110	0.0048	0.0239
	> 80	0	0.0356	0.0132	0.0099	0.0039	0.0222
		1	0.0257	0.0098	0.0101	0.0040	0.0146
		2	0.0293	0.0094	0.0090	0.0051	0.0119
		3p	0.0697	0.0104	0.0069	0.0028	0.0150
Men	< 40	0	0.0572	0.0193	0.0159	0.0055	0.0317
		1	0.0494	0.0188	0.0154	0.0100	0.0265
		2	0.0507	0.0233	0.0237	0.0114	0.0337
		3p	0.0775	0.0328	0.0342	0.0136	0.0488
	40–60	0	0.0360	0.0096	0.0072	0.0035	0.0139
		1	0.0281	0.0089	0.0072	0.0021	0.0139
		2	0.0250	0.0080	0.0062	0.0036	0.0111
		3p	0.0616	0.0209	0.0167	0.0056	0.0358
	> 80	0	0.0265	0.0089	0.0076	0.0022	0.0130
		1	0.0252	0.0107	0.0102	0.0056	0.0163
		2	0.0231	0.0066	0.0051	0.0022	0.0094
		3p	0.0473	0.0097	0.0084	0.0044	0.0124


Fig. 8 Age of men and women (sample: man's share > 60% and no child). Source: French exhaustive income-tax returns database, 2009

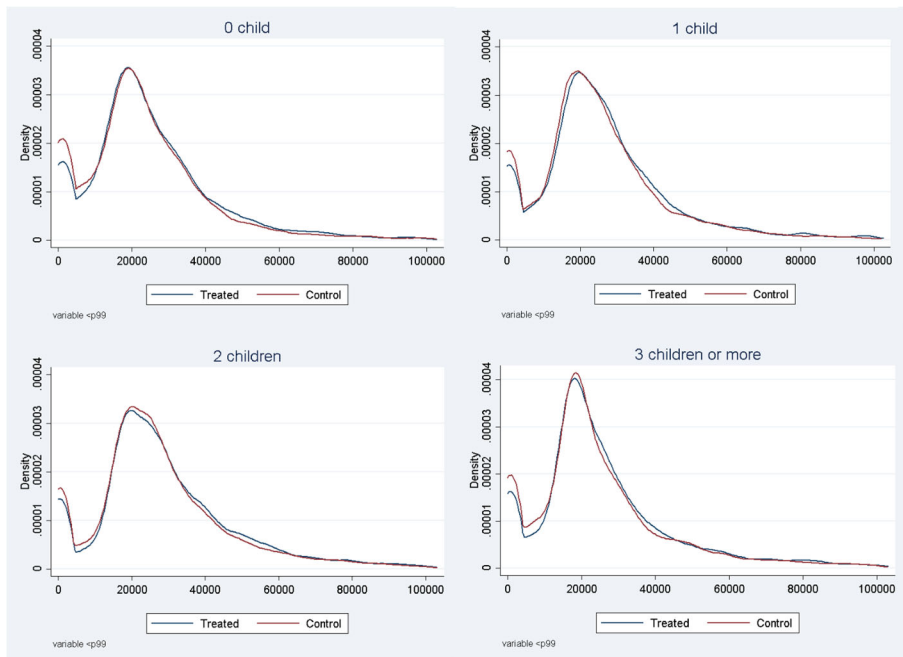


Fig. 9 Man's labor income 1 year before divorce (sample of men, man's share of total income > 60%). Source: French exhaustive income-tax returns database, 2009

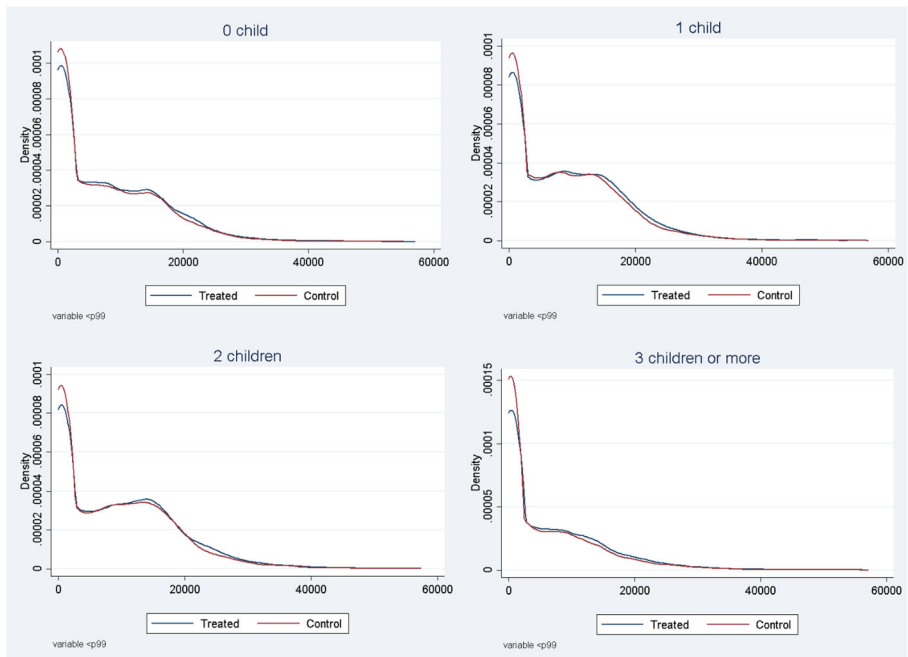


Fig. 10 Woman's labor income 1 year before divorce (sample of men, man's share of total income > 60%). Source: French exhaustive income-tax returns database, 2009

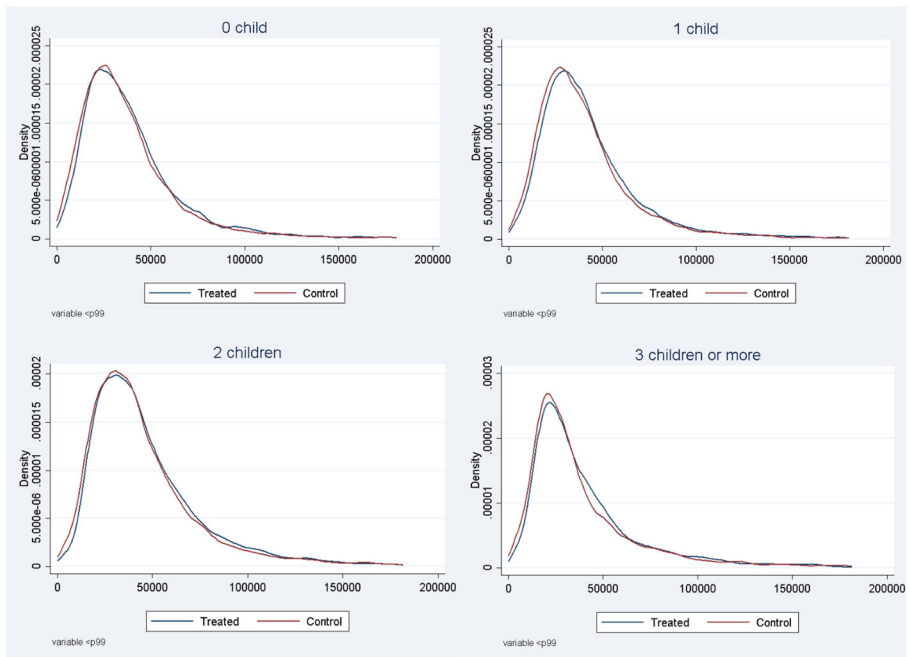


Fig. 11 Total declared income 1 year before divorce (sample of men, man's share of total income > 60%). Source: French exhaustive income-tax returns database, 2009

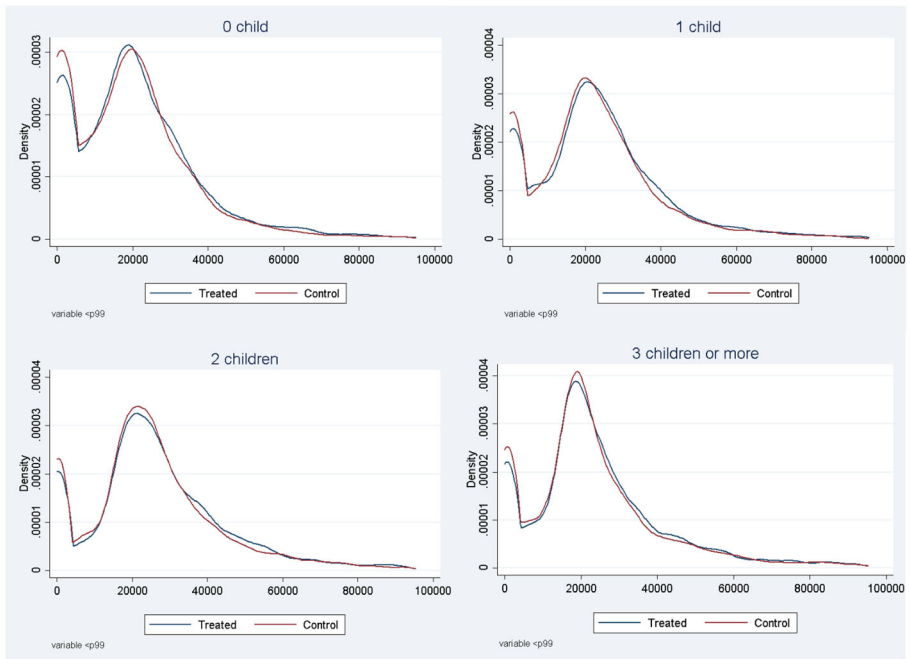


Fig. 12 Man's labor income 2 years before divorce (sample of men, man's share of total income > 60%). Source: French exhaustive income-tax returns database, 2009

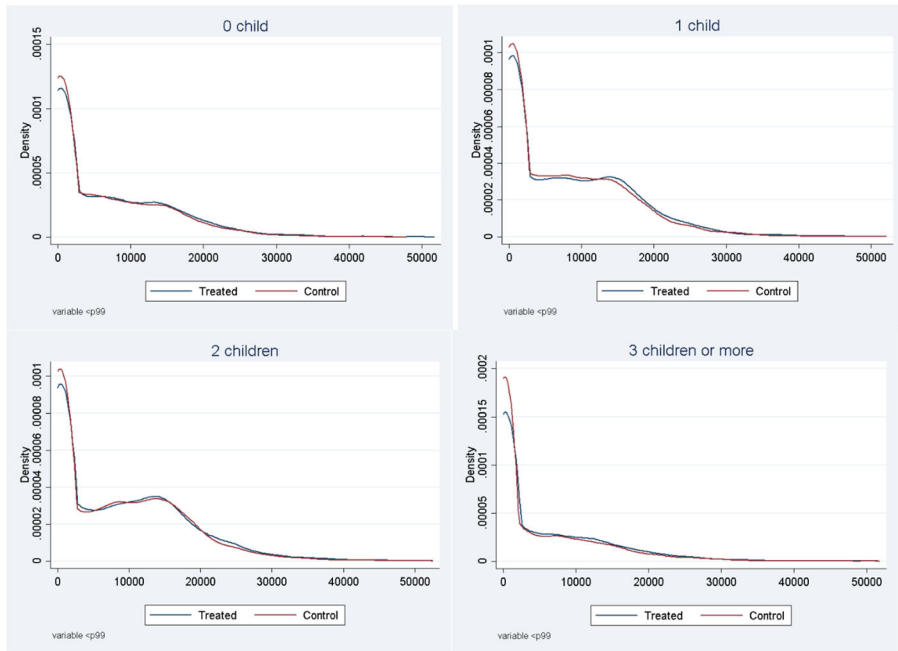


Fig. 13 Woman's labor income 2 years before divorce (sample of men, man's share of total income > 60%). Source: French exhaustive income-tax returns database, 2009

Appendix 8. Presence of unemployment benefits after divorce

Table 17 Receipt of unemployment benefits after divorce for individuals receiving no unemployment benefits before divorce, women and men (linear probability models)

	Divorcees (1)	Divorcees with control group (2)	Divorcees (3)	Divorcees with control group (4)
Treated		3.0***		2.4***
Control	9.7***	6.7***	8.4***	6.0***

Sample: Individuals who had no unemployment benefits and a nonzero individual income before divorce

***Significant at the 1% level

References

- Aassve A, Betti G, Mazzucco S, Mencarini L (2007) Marital disruption and economic well-being: a comparative analysis. *J R Stat Soc Ser A* 170(3):781–799
- Abbas H, Garbinti B (2019) De la rupture conjugale à une éventuelle remise en couple : l'évolution des niveaux de vie des familles monoparentales entre 2010 et 2015. *France Portrait Social*
- Ananat EO, Michaels G (2008) The effect of marital breakup on the income distribution of women with children. *J Hum Resour* 43(3):611–629
- Andress H-J, Borgloh B, Brockel M, Giesselmann M, Hummelsheim D (2006) The Economic Consequences of Partnership Dissolution—A Comparative Analysis of Panel Studies from Belgium, Germany, Great Britain, Italy, and Sweden. *European Sociological Review* 22(5):533–560
- Angelov N, Johansson P, Lindahl E (2016) Parenthood and the gender gap in pay. *J Labor Econ* 34(3):545–579
- Bedard K, Deschênes O (2005) Sex preferences, marital dissolution, and the economic status of women. *J Hum Resour* 40(2)
- Belmokhtar Z., Mansuy J. (2016) En 2013, neuf prestations compensatoires sur dix sous forme de capital, *Infostat Justice*, n°144
- Bertrand M, Kamenica E, Pan J (2015) Gender identity and relative income within households. *Q J Econ* 130(2):571–614
- Bianchi SM, Subaiya L, Kahn JR (1999) The gender gap in the economic well-being of nonresident fathers and custodial mothers. *Demography* 36(2):195–203
- Bianchi S, Lesnard L, Nazio T, Raley S (2014) Gender and time allocation of cohabiting and married women and men in France, Italy, and the United States. *Demogr Res* 31(8):183–216
- Boheim R, Ermisch J (2001) Partnership dissolution in the UK - the role of economic circumstances. *Oxf Bull Econ Stat* 63(2):197–208
- Bonnet C, Solaz A, Algava E (2010) Changes in labour market status surrounding union dissolution in France. *Population* 65(2):273–308
- Bourreau-Dubois C, Doriat-Duban M (2016) Covering the costs of divorce: the role of the family, the state and the market. *Population* 71(3):457–477
- Bratberg E, Tjøtta S (2002) Income effects of divorce in families with dependent children, Working paper in Economics, University of Bergen, n° 20/02
- Bratberg E, Tjøtta S (2008) Income effects of divorce in families with dependent children. *J Popul Econ* 21: 439–461
- Browning M, Chiappori P, Weiss Y (2014) *Economics of the family*. Cambridge University Press
- Burkhauser R, Duncan G, Hauser R, Berntsen R (1991) Wife or frau, women do worse: a comparison of men and women in the United States and Germany after marital dissolution. *Demography* 28(3):353–360
- Carrasco V., Dufour C., 2015, Les décisions des juges concernant les enfants de parents séparés ont fortement évolué dans les années 2000, *Infostat Justice* n° 132

- Charles K, Stephens M (2004) Job displacement, disability, and divorce. *J Labor Econ* 22(2):489–522
- Cigno A (2012) Marriage as a commitment device. *Rev Econ Househ* 10(2):193–213
- Costemalle V (2017) Formations et ruptures d'unions : quelles sont les spécificités des unions libres ? France Portrait Social Insee Références
- Dehejia R (2005) Practical propensity score matching: a reply to Smith and Todd. *J Econ* 125(1–2):355–364
- Dewilde C, Uunk W (2008) Remarriage as a way to overcome the financial consequences of divorce - a test of the economic need hypothesis for European women. *Eur Sociol Rev* 24:393–407
- Duncan G, Hoffman S (1985) A reconsideration of the economic consequences of marital dissolution. *Demography* 22(4):485–497
- Durier S. (2017), Après une rupture d'union, l'homme reste plus souvent dans le logement conjugal, Insee Focus, n° 91
- Feijten P, Van Ham M (2010) The impact of splitting up and divorce on housing careers in the UK. *Hous Stud* 25(4):483–507
- Ferrari G, Bonnet C, Solaz A (2019) Will the one who keeps the children keep the house? Residential mobility after divorce by parenthood status and custody arrangements in France. *Demogr Res* 40 - Article 14:359–394
- Finnie R (1993) Women, men, and the economic consequences of divorce: evidence from Canadian longitudinal data. *Can Rev Sociol Anthropol* 30(2):205–241
- Foster G, Stratton L (2020) Does female breadwinning make partnerships less healthy or less stable? *J Popul Econ* forthcoming
- Garbinti B, Jeandidier B, Lim H (2016) Les justifications empiriques de la compensation financière après divorce. *Can J Law Soc* 31(2):183–202
- Garbinti B, Goupille-Lebret J, Piketty T (2020) Accounting for wealth inequality dynamics: methods, estimates and simulations for France. *J Eur Econ Assoc*
- Heckman JJ, Ichimura H, Todd PE (1997) Matching as an econometric evaluation estimator: evidence from evaluating a job training programme. *Rev Econ Stud* 64:605–654
- Henman P, Mitchell K (2001) Estimating the cost of contact for nonresident parents: a budget standards approach. *J Soc Policy* 30:495–520
- Hoffman SD (1977) Marital instability and the economic status of women. *Demography* 14(1):67–76
- Holden K, Smock P (1991) The economic costs of marital dissolution: why do women bear a disproportionate cost? *Annu Rev Sociol* 17:51–78
- Imbens, G. W., and Wooldridge J. M. (2008): Recent developments in the econometrics of program evaluation, NBER Working Paper no. 14251
- Jarvis S, Jenkins SP (1999) Marital splits and income changes: evidence for Britain. *Popul Stud* 53:237–254
- Jauneau Y, Raynaud E (2009) Des disparités importantes d'évolutions de niveau de vie, Les revenus et le patrimoine des ménages. Insee
- Johnson WR, Skinner J (1986) Labor supply and marital separation. *Am Econ Rev*:455–469
- Kalmijn M, Alessie R (2008) Life course changes in income: an exploration of age and stage effect in a 15-year panel in the Netherlands. *Netspar Panel Papers*:10
- Lafortune J., Low C. (2019), Collateralized marriage, mimeo
- Leopold T (2018) Gender differences in the consequences of divorce: a study of multiple outcomes. *Demography* 55(3):769–797
- Manting D, Bouman AM (2006) Short- and long-term economic consequences of the dissolution of marital and consensual unions. The example of the Netherlands. *Eur Sociol Rev* 22(4):413–429
- Martin H, Périer H (2018) Les échelles d'équivalence à l'épreuve des nouvelles configurations familiales. *Rev Econ* 69(2):303–334
- McKeever M, Wolfinger NH (2001) Reexamining the economic costs of marital disruption for women. *Soc Sci Q* 82(1):202–217
- McManus PA, DiPrete TA (2001) Losers and winners: the financial consequences of separation and divorce for men. *Am Sociol Rev* 66(2):246–268
- Merz, J., Gamer, T., Smeeding, T. M., Faik, J., & Johnson D. (1994). Two scales, one methodology - expenditure based equivalence scales for the United States and Germany. FFB-Discussion paper 08, Research Institute on Professions (Forschungsinstitut Freie Berufe (FFB)), Leuphana University of Lüneburg.
- Mortelmans D, Defever C (2018) Chapter 9. Income trajectories of lone parents after divorce: a view with Belgian register data. In: Bernardi L, Mortelmans D (eds) *Lone parenthood in the life course*. Springer Open, pp 191–211
- Mulder CH, Wagner M (2010) Union dissolution and mobility: who moves from the family home after separation? *J Marriage Fam* 72(5):1263–1273

- Ongaro F, Mazzuco S, Meggiolaro S (2009) Economic Consequences of Union Dissolution in Italy: Findings from the European Community Household Panel. *European Journal of Population / Revue européenne de Démographie* 25(1):45–65
- Peterson R (1996) A re-evaluation of the economic consequences of divorce. *Am Sociol Rev* 61(3):528–536
- Politis DN, Romano JP, Wolf M (1999) *Subsampling*. Springer, New York
- Ponthieux S, Meurs D (2015) Gender inequality. In: Bourguignon F, Atkinson A (eds) *Handbook of income distribution*. Elsevier
- Poortman A-R (2000) Sex differences in the economic consequences of separation. *Eur Sociol Rev* 16(4):367–383
- Poortman A-R (2005) Women's work and divorce: a matter of anticipation? A research note. *Eur Sociol Rev* 21(3):301–309
- Rault W., Bailly E., 2013, Are heterosexual couples in civil partnerships different from married couples?, *Popul Soc*, n° 497
- Romano JP, Shaikh AM (2012) On the uniform asymptotic validity of subsampling and the bootstrap. *Ann Stat* 40(6):2798–2822
- Rosenbaum P, Rubin D (1983) The central role of the propensity score in observational studies for causal effects. *Biometrika* 70(1):41–55
- Sayn I, Jeandidier B, Bourreau-Dubois C (2012) La fixation du montant des pensions alimentaires: des pratiques et un barème. Ministry of Justice. Infostat Justice 116
- Smith I (2003) The law and economics of marriage contracts. *J Econ Surv* 17(2):201–225
- Smock P (1993) The economic costs of marital disruption for young women over the past two decades. *Demography* 30(3):353–371
- Smock P (1994) Gender and the short-run economic consequences of marital disruption. *Soc Forces* 73(1): 243–262
- Solaz A, Jalovaara M, Kreyenfeld M, Meggiolaro S, Mortelmans D, Pasteels I (2020) Unemployment and separation: evidence from five European countries. *J Fam Res*, forthcoming. <https://doi.org/10.20377/jfr-368>
- Tach LM, Eads A (2015) Trends in the economic consequences of marital and cohabitation dissolution in the United States. *Demography* 52(2):401–432
- Uunk W (2004) The economic consequences of divorce for women in the European Union: the impact of welfare state arrangements. *Eur J Popul* 20:251–284

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Affiliations

Carole Bonnet¹ · Bertrand Garbinti² · Anne Solaz¹

Carole Bonnet
carole.bonnet@ined.fr

Anne Solaz
anne.solaz@ined.fr

¹ INED, French Institute for Demographic Studies, Aubervilliers, France

² Banque de France, CREST, Paris, France