Does female breadwinning make partnerships less healthy or less stable?

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Abstract

Social norms can have a persistent influence on outcomes. Since the end of World War II, men have been the primary breadwinner in most households in the developed world, and US data from the late twentieth century suggests violation of this norm stresses partnerships. Is this still true? We examine whether female breadwinning makes partnerships less healthy or less stable using more recent US and Australian data. We find a much more modest association in both countries between female breadwinning and measures of relationship health or stability in OLS models for mixed-gender couples than has been found in prior studies. Transitions into female breadwinning are problematic mainly for cohabiting couples and especially so for younger people and less-educated men. These results suggest that social norms may be weakening, but mating market dynamics may also play a role. We find some evidence that cohabiting women in Australia who out-earn their partners subsequently re-partner with men who have higher earnings relative to themselves.

Keywords Marital dissolution · Satisfaction · Economics of gender · Social norms · Earnings differentials

JEL codes J12 · J16 · I31 · Z13

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1 Introduction

Examining histograms of women's share of earned income in mixed-gender households in the USA, Bertrand et al. (2015)—hereafter BKP—document a sharp decline in density beyond the 50% mark. They follow this observation with econometric evidence that female breadwinning is negatively associated with marital satisfaction and partnership stability. They argue that these results, based on data from a variety of national surveys fielded from the late 1960s through the early 2000s, are consistent with US residents' adherence to a norm that a wife should not earn more than her husband. The implication is that realizing female empowerment in practical terms within the household may create stress—possibly even for women themselves—and that this stress may act as an obstacle to social change.

Yet much has changed in the last 50 years, and this has not gone unnoticed by academics (e.g., Blau et al. (2006), who compiled the edited volume "The Declining Significance of Gender" in 2006). Simple statistics also reflect the changes. In 1967, only 46% of married women were employed and they contributed only about 26% of family income. In 2015, the comparable figures were 61% and 37%. Gender wage differences also declined significantly during this time period, with full-time, year-round female workers' wages hovering around 60% of comparable male wages in 1967 and 80% in 2015. Consequently, among increasingly prevalent dual-earner households, women earned more than their partners 17.8% of the time in 1987 and 29.3% of the time in 2015 (Bureau of Labor Statistics, 2017).

Social norms related to gender, power, and money seem to be adapting to reflect these changes. For example, while almost 50% of US respondents to the General Social Survey reported in 1986 that they thought it was better for men to earn the money and women to keep house, in 2016, only 27% of adults held that opinion (Allred 2018). However, social norms are multi-faceted and can have both contemporaneous and lasting effects, as documented in Charles et al. (2018). Have the changes in outward economic realities over the past 50 years led to commensurate reductions in individuals' adherence to traditional gender norms, or have individuals continued to adhere to traditional gender norms even as economic roles have in reality become less gendered, potentially causing stress for those individuals and the partnerships they form?

Using US data from 1968 to 2009, Schwartz and Gonalons-Pons (2016) find a positive link between female breadwinning and divorce risk for marriages formed in the 1960s and 1970s but not for marriages formed in the 1990s, suggesting that members of later birth cohorts may adhere to updated norms that do not stress partnerships experiencing female breadwinning. However, this mechanism remains speculative, as the data used by Schwartz and Gonalons-Pons do not include measures of marital stress or satisfaction. Such measures would capture the presumed mechanism connecting female breadwinning to partnership dissolution and are shown in Sayer and Bianchi (2000) to be stronger direct predictors of marital dissolution than measures of the economic power of the woman. Further, the analysis in Schwartz and Gonalons-Pons (2016) only considers marriages despite the trend away from marriages and towards cohabitations that may experience a different association between female breadwinning and partnership health.

In this paper, we estimate the relationship between female breadwinning and a suite of subjective and objective measures of relationship health and stability, using parallel

analysis of more recent data from two developed Western countries on both married and cohabiting mixed-gender partnerships. We begin by replicating BKP's analysis using their original data, and then we turn to data from the twenty-first century—specifically, data covering the period 1997 to 2015 from the National Longitudinal Survey of Youth 1997 (NLSY 1997) and the period 2001 to 2016 from the Household, Income and Labour Dynamics in Australia (HILDA) Survey.[1] With our more recent data, we broaden the analysis to examine cohabiting as well as married couples. We also more clearly distinguish between the implications of results from ordinary least squares (OLS) and fixed effects (FE) specifications. Our raw histograms are similar to those shown in BKP, but our econometric results do not mimic their findings either for the USA or for Australia. We find a much weaker link between female breadwinning and both marital dissolution and marital health, particularly in our OLS specifications, and present some evidence that female breadwinning has more significant consequences for young cohabiting couples. We also conduct a preliminary evaluation of whether mating market dynamics could drive the latter finding. Taken together, our results are consistent with a decline over time in the perceived relevance of a male breadwinning norm and with relationship health and partnership stability being more sensitive to female breadwinning among cohabiting couples than among married couples.

2 Replication of BKP

We begin by replicating BKP's results regarding the impact of female breadwinning on marital dissolution and satisfaction. We run identical models on their original samples and on sub-samples of their original data defined by age and education.[2] In all models, the focal independent variable is an indicator for whether the woman in the partnership earned more than the man in the recent past (henceforth termed "female breadwinning"), and the suite of control variables includes the natural log of his, her, and household income in that same recently-past period; separate dummy variables identifying female and male single-earner couple households in that same period; his and her age and quadratics thereof; and region/state dummies.[3]

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[1] Other recent studies applying the BKP method include Zinovyeva and Tverdostup (2018), who conclude using Finnish data that the post-50% drop-off in female income share is mainly a reflection of co-working spouses' pattern of reporting more equal incomes over time, and Wieber and Holst (2015), who find that the post-50% drop-off is significantly smaller in eastern as opposed to western Germany, a result they attribute to the less strict gender role norms in eastern Germany. Folke and Rickne (2020) take a slightly different approach, looking at the impact of job promotions on marital dissolution in Sweden. They find that women but not men who are promoted have double the probability of divorcing in the subsequent 8 years as compared to those who are not promoted and that this effect is strongest for couples who appear to have more conservative gender role attitudes.

[2] We thank BKP for sending us the code that enabled us to perform these replications. Note that we do not intend to replicate all models whose results BKP report in their paper: our concern is only with the models of relationship dissolution and satisfaction as predicted by female breadwinning plus controls.

[3] The NSFH results include controls for his and her race as well as education and, in the models of outcomes 1 through 3 as listed in the text, a dummy indicating the gender of the respondent. The PSID results include year dummies, one-interview-lagged income measures, and, in the specifications we replicate, controls for household composition and couple-specific fixed effects.

BKP's cross-sectional OLS regressions use reported earnings measures from 1986 and model the following outcomes from the National Survey of Families and Households (NSFH):

1. *HappyMarriage* (contemporaneous), identifying respondents who, in 1987/1988 when asked "Taking things all together, how would you describe your marriage?" reply "Very Happy" (7 on a scale of 1 to 7).
2. *MarriageTrouble* (over the past year), identifying respondents who in 1987/1988, when asked "During the past year, have you ever thought that your marriage might be in trouble?" reply "Yes."
3. *DiscussSeparation* (over the past year), identifying respondents who in 1987/1988 indicate they have "During the past year, … discussed the idea of separating?"
4. *Dissolution* (taking a value of 1 if the marriage observed at the time of the 1987/1988 interview is no longer intact at the time of the second interview which was conducted in 1992/1994, 52 to 88 months following the first interview). The sample is in this case restricted to those interviewed in the second wave.

BKP's fixed effects regressions use reported earnings from the prior calendar year and model marital dissolution for couples in the Panel Study of Income Dynamics (PSID).[4] Marital dissolution in the following year is reported in the PSID's marital history file (a separate file created by PSID administrators containing histories of marriages observed over the span of the survey years) or inferred by the absence of subsequent couple, but not respondent, surveys.

Table 1 shows the results of these models for the full samples used by BKP and for sub-samples of marriages with older (over 35, born mostly during the Second World War) and younger (under 35, born mostly in the late 1950s) women and with more-educated and less-educated partnerships. We see that in the OLS results using the NSFH, the primary marriages in which female breadwinning has either a negative effect on marital satisfaction or a positive effect on dissolution are those of highly educated individuals and those including women over the age of 35. OLS estimates based on the PSID sample (not reported here) do not yield statistically significant results, whether dissolution is measured one or, to more closely match the NSFH timeline and recognize that ending a marriage takes time, 2 years into the future. However, couple-specific fixed effects estimates from the PSID do indicate that female breadwinning and marital dissolution are positively related. BKP's preferred FE model includes an indicator for female breadwinning in the most recent period as well as a measure calculated from the previous wave. As shown in Table 1, only the lagged measure has a statistically significant coefficient.[5] The PSID sub-sample fixed effects results also differ from the NSFH results in that female breadwinning is positively associated with dissolution for less-educated, versus more-educated, and for younger,

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[4] Data related to relationship quality are not available in the PSID, which first measured phenomena akin to satisfaction or happiness in 2016, as part of a "Wellbeing and Daily Life" component.

[5] In Table 1, we provide FE estimates (column a) using the same sample as BKP but correcting the standard errors for singleton observations. We also provide FE estimates (column b) correcting for inconsistent age reporting. The results are robust to these minor edits. Note further that interviews were conducted annually from 1968 through 1997 and biennially from 1999 through 2007, meaning that the lagged measure of female breadwinning may be from 1 or 2 years prior.

versus older, respondents. Hence, while it is older and more-educated couples who are more likely to have problems than other types of couples when the wife out-earns the husband, transitions into female breadwinning—which drive the estimates in the fixed effects models—are evidently more stressful for younger and less-educated partnerships. These results are robust to alternative specifications including cubics in each partner's log earnings, a continuous measure of the woman's share of the couple's earnings, and controls for household composition.[6]

While at first glance the differences between the cross-sectional (OLS) and FE results may seem counter-intuitive, they could be seen as broadly consistent with declining relevance of the male breadwinning norm together with the phenomenon of positive assortative matching based on permanent income. This latter force—shown in Ciscato and Weber (2020) to have become stronger between 1967 and 2017 in the USA—is also shown in Binder and Lam (2018) to be capable of generating the sharp drop-off in density above the 50% point in a histogram of female income share, under the assumption that there is a population-wide gender gap in permanent income, an assumption that matches reality for the time period covered in this sample. That young couples transitioning into female breadwinning in the PSID are more likely to separate while young couples with female breadwinners in the NSFH are not may indicate that younger couples are not as stressed by female breadwinning in steady state, due to generational changes in social norms, but that a young partnered woman may perceive a transition into her breadwinning—in a world with higher male than female income on average and within partnerships—as a signal that she could find a higher-earning partner. Her youth and the youth of the partnership make such a prospect more realistic and the separation less personally costly than it would be for an older woman in a partnership of more years' duration. By contrast, only those partnerships containing older women are impacted by female breadwinning in the NSFH cross-sectional models due, we conjecture, to the greater importance of the male breadwinning norm for their cohort than for the younger cohort.

The cross-sectional results by education lend further support to this story. In a world where people prefer positive assortative matching on income, the increased inequality of individual incomes observed in the later decades of the 1900s should mean that more-educated women are more able than less-educated women to be able to find a higher-earning partner if they choose to dissolve their current partnership. Because the woman's access to higher-earning alternative partners (who themselves desire more highly educated women) may be greater in more highly educated couples, we see the negative effects of female breadwinning mainly for such couples in the NSFH cross-section.[7]

In the fixed effects specifications using the PSID, the effect of lagged female breadwinning is a positive and significant predictor of marital dissolution for less

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[6] BKP report that the FE results of breadwinning on divorce are generally positive but imprecise. Correcting the standard errors for singleton observations and for inconsistent age reporting, as mentioned in footnote 5, we find these effects to be statistically significant at the 5% level or better.

[7] While more education may provide women with greater access to higher-earning partners in a world where highly educated women are desirable to high-earning men, highly educated women's ability to achieve such a match will depend inversely upon the number of highly educated women relative to men. Ong et al. (2020) make this point and provide an alternative story of marriage-matching dynamics as women's incomes have risen in China.
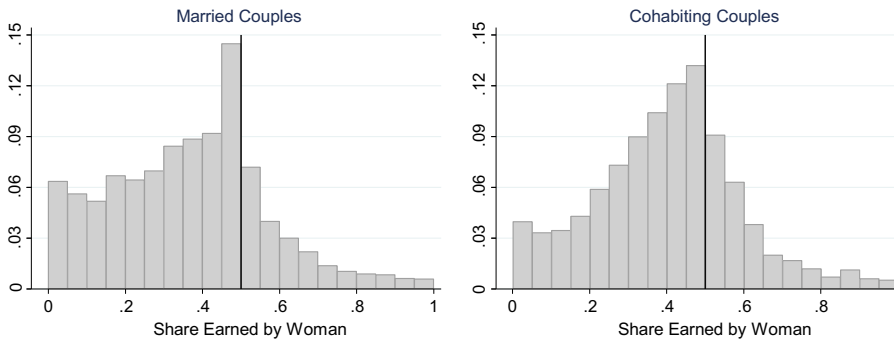
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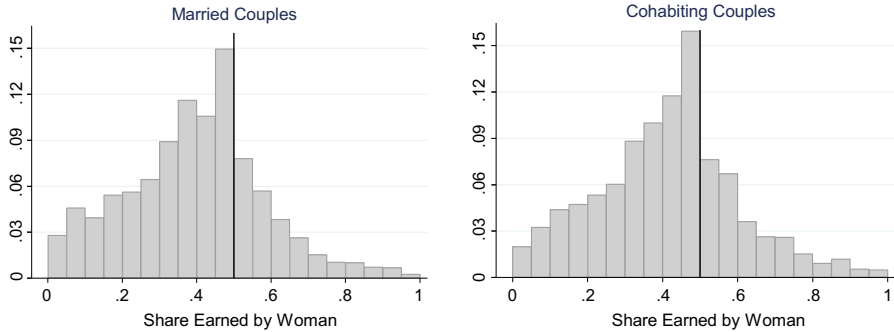
b Australia

Fig. 1 Distribution of relative income. **a** USA. The data are from the 1997–2013 waves of the NLSY97. The sample includes married or cohabiting mixed-gender couples where the man and woman both earn positive income, the respondent is not enrolled full-time in college, and both partners are between 18 and 58 years of age. For each couple, we use the observation from the first year that the couple is in the panel. Each bar captures a 0.05 relative income bin. The data capture 3078 married couples and 2623 cohabiting couples. **b** Australia. The data are from the 2001–2016 waves of the HILDA Survey. The sample includes married or cohabiting mixed-gender couples where the man and woman both earn positive income, are not enrolled full-time in school (if aged 18–23), and are between 18 and 62 (64 for men) years of age. For each couple, we use the observation from the first year that the couple is in the panel. Each bar captures a 0.05 relative income bin. The data capture 4515 married couples and 3094 cohabiting couples

educated but not for more educated women and their partners, running counter to the mechanisms suggested above. Further investigation reveals that in the PSID and NSFH data, between 33 and 51% of the women in less-educated partnerships who out-earn their partners earn all of the household's income, compared to only 20% of those in more-educated partnerships. It may be that the higher risk of dissolution associated with transitioning to female breadwinning for these less-educated partnerships arises from more impactful coincident stressors, such as the loss of job and/or health of the man. This conjecture is supported by the far higher incidence of poor male health reports in less-educated NSFH partnerships in which women earn all the money (10.4%, compared to 1.8% in highly educated female-breadwinning partnerships).[8] In addition, the relationship challenge presented by transitions into female breadwinning may be

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[8] However, more recent cohort data from the USA (NLSY97) do not support this explanation as the comparable figures are 2.6% and 1.3%, differing by only a factor of two rather than five.

Table 1 Replicating results from Bertrand, Kamenica, and Pan

	NSFH results (OLS)				PSID results (FE)	
	Dissolution	Happy marriage	Marriage trouble	Discuss separation	Dissolution[a]	Dissolution[b]
Full sample						
Wife earns more	0.0623**	− 0.0679***	0.0818***	0.0684***	0.0031	0.0035
	(0.0246)	(0.0262)	(0.0243)	(0.0190)	(0.0023)	(0.0024)
Lagged wife earns more					0.0050**	0.0077***
					(0.0025)	(0.0026)
Number of observations	3439	7659	7520	7507	72,169	69,454
Number of fixed effects					7893	6425
More-educated sample						
Wife earns more	0.1193***	− 0.0846*	0.0875**	0.0910***		− 0.0006
	(0.0374)	(0.0432)	(0.0415)	(0.0319)		(0.0041)
Lagged wife earns more						0.0042
						(0.0048)
Number of observations	1195	2540	2498	2492		8248
Number of fixed effects						748
Less-educated sample						
Wife earns more	− 0.0053	− 0.0389	0.0536	0.0250		0.0024
	(0.0432)	(0.0467)	(0.0417)	(0.0286)		(0.0029)
Lagged wife earns more						0.0094***
						(0.0033)
Number of observations	1266	2993	2934	2929		48,496
Number of fixed effects						4131
Older sample						
Wife earns more	0.0798**	− 0.0653*	0.1077***	0.1010***		0.0038
	(0.0318)	(0.0392)	(0.0348)	(0.0269)		(0.0027)
Lagged wife earns more						0.0015
						(0.0028)
Number of observations	1724	3869	3798	3791		40,362
Number of fixed effects						4047
Younger sample						
Wife earns more	0.0384	− 0.0803**	0.0424	0.0242		0.0025
	(0.0399)	(0.0328)	(0.0329)	(0.0266)		(0.0046)
Lagged wife earns more						0.0152***
						(0.0050)
Number of observations	1715	3790	3722	3716		28,695
Number of fixed effects						4254

In both the NSFH and the PSID, "More educated" means both partners have some college or more, "Less educated" means neither partner has more than a high school degree, "Older" means the wife is at least age 35, and "Younger" means the wife is less than age 35

All specifications include the log of the woman's earnings, the log of the man's earnings, the log of household earnings, dummy variables identifying households in which the woman earns all or none of the household income, and quadratics in each partner's age. The PSID specifications also include lagged values of all the income variables

The NSFH specifications include controls for region (3) and each partner's education (4) and race (3). In the case of the satisfaction measures, a dummy for the respondent's gender is also included

The PSID specifications include 33 year dummies and 56 region dummies

[a] Standard errors are adjusted to correct for singleton observations and are somewhat smaller than those reported by BKP

[b] Singleton observations are dropped and each partner's age has been adjusted to that first reported and incremented by wave to address the inconsistent age reporting in the PSID. The sample is then selected based on this age

Robust standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

stronger in less-educated couples due to the stronger adherence of such couples, compared with more-educated couples, to traditional gender-specific norms of behavior that deter female breadwinning, as found in prior work (Foster and Stratton 2018, p. 506). However, the sub-sample of more-educated couples with lagged income in the PSID is small relative to the sub-sample of less-educated couples, so the apparent difference in effect significance by education level in our FE specifications may be spurious.

3 Emergent hypotheses and empirical implications

BKP's stated interpretation of the finding that the wife's relative earnings positively relate to the probability of a couple's divorce is predicated on the assumption that one or both partner's utility functions include not only all the usual arguments but also a measure of the degree to which the partnership conforms to a social norm that the husband should be the primary breadwinner. Deviations from this norm presumably then reduce the stream of utility flows from the partnership for at least one of the partners and would lead a partnership to dissolve if this negative effect is large enough to push the perceived future value of the relationship below the perceived future value of the next-best alternative for either partner, after allowing for any mutually acceptable intrahousehold transfers. Notably, the other arguments to utility would reasonably include not only intangible phenomena like emotional support and sexual services but also material benefits, such as the income brought in by one's partner that one is then able to share.

However, even in cases where the present discounted utility flows from the present partnership fall below what one perceives would be expected should this partnership end, terminating a relationship is not a costless exercise. Termination costs (even if temporary) act as an additional reason to stay together and are arguably lower for cohabiting as compared to married couples: the latter, having taken steps to formalize their relationship before the law and before family and friends, must take steps to formally end their relationship. At

the same time, couples may self-select into cohabitation based on their more progressive beliefs compared to those couples who self-select into marriage.[9] This difference in ideologies may imply that cohabiting individuals lose less utility than married individuals do when their partnership violates conservative norms such as the male breadwinner model. If this is true, then despite lower dissolution costs for cohabiting than for married couples, female breadwinning in cohabiting couples may be less likely than in married couples to cause subsequent relationship dissolution.

The mechanism connecting female breadwinning to relationship dissolution, if the above utility-and cost-based arguments are correct, might manifest before actual dissolution in the form of lower measures of reported relationship satisfaction or health. Indeed, in the presence of dissolution costs, one might expect satisfaction levels to respond relatively quickly while dissolution may take some time. This logic suggests that models with longer time gaps are more appropriate for examining the link between female breadwinning and relationship dissolution and helps explain why BKP found significant results in regard to dissolution for the NSFH sample looking forward as many as 5 years, but needed to include lagged income measures to obtain a strong result using the more nearly annual reports from the PSID.

Summarizing the above arguments, we hypothesize that relative to married couples, cohabiting couples may find it less painful to violate norms and yet easier to dissolve, making the association between female breadwinning and relationship dissolution in cohabiting versus married couples an empirical question; that ceteris paribus, the higher earner in a couple has a weaker pecuniary reason to stay in the relationship; and that measures of subjective relationship health or satisfaction may be informative about the utility effects of norm-related, pecuniary, and other (e.g., emotional or sexual) factors driving the later choice of whether to stay in a relationship or dissolve it.

Identifying the causal impact of female breadwinning on relationship dissolution, however, is challenging. First, an OLS model of satisfaction or dissolution on female breadwinning would identify the impact of female breadwinning in large part by comparing outcomes for couples in which the man always earns more to other couples, a recipe for upward bias in the estimated effect of female breadwinning on partnership dissolution if unobserved characteristics of couples make them both more likely to have male breadwinners and more likely to stay together. Couple-level fixed effect models, by contrast, identify the impact of female breadwinning by using exclusively within-couple transitions in earnings dominance. Thus, FE models should mitigate the selection problem, although they are identifying the effect based only on couples that experience entry into or exit from female breadwinning during the data window. In the case of satisfaction measures, FE models are particularly attractive because they rely on intrapersonal rather than interpersonal utility comparisons for identification. Turning to FE estimation is not, however, without its problems. Breadwinning transitions within couples over time are not commonly observed in most panel data sets, and FE models exacerbate errors-in-variables problems. Over 60% of PSID couples examined in BKP never experience a change in female breadwinning, and many couples that

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[9] Indeed, we find cohabiting persons in Australia are about 10% more likely than married individuals to reply that they disagree or are at most neutral as regards a statement that "It is better for everyone involved if the man earns the money and the woman takes care of the home and children."

do experience breadwinning transitions experience only one or two across the survey window, which may be indicative of reporting errors or transitory shocks.[10] Such errors will tend to bias estimated effects towards zero.

Second, both the OLS and the FE specifications include not only a measure of female breadwinning but also control for his, her, and total household earnings. Thus, earnings are assumed to be exogenous, even though individuals choose whether and how much to work. A particular concern is that individuals who are or become unhappy in their relationship may take steps to become more financially independent before ending that relationship (Mazzocco et al. 2014 present some evidence of this behavior). Higher individual earnings could therefore be a consequence, not (only) a cause, of relationship dissolution. Longer intervals between the income and outcome measures should help mitigate this problem.

Bearing in mind the above framing of the problem and empirical concerns, in the remainder of this paper, we use multi-national data more recent than that used by BKP; examine separately married and cohabiting couples; apply both OLS and FE modeling and differentiate carefully between the implications of the two sets of results; model several aspects of subjective relationship health and satisfaction; and, recognizing that these subjective reports are likely potential leading indicators of dissolution, include more lagged measures of female breadwinning when modeling dissolution.

4 Extension: USA and Australia

We proceed now using data from the USA and Australia. We choose these data sets because both provide panel data, and while the USA and Australia are ranked similarly by the World Economic Forum[11] as regards gender parity, each data set is the product of a distinct sampling and survey approach. For the USA, we use the NLSY97, in which after sample restrictions,[12] we have a maximum of 21,395 observations on 5851 partnerships spanning the years 1997–2013 and supplemented by 2015 relationship data. These data constitute a sample of persons born between 1980 and 1984; none is older than age 33 when last observed. Only the respondent, and not his/her partner, is interviewed for the NLSY97. For Australia, we use the HILDA data (see Watson and Wooden 2012 for a description), in which after sample restrictions,[13] we have a maximum of 43,865 observations on 7702 partnerships spanning the years 2001–2016. These data include all persons of working age, and both the respondent and his/her partner are asked to complete questionnaires. All analyses are conducted separately for married and cohabiting couples. Sample sizes vary with the specification.

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[10] The same is true in the more recent panels employed here.

[11] http://reports.weforum.org/global-gender-gap-report-2016/rankings/.

[12] We restricted the NLSY97 sample to mixed-gender couples observed in non-overlapping, continuous relationships, who are over the age of 18, were not (if between ages 18 and 23) enrolled in high school or enrolled full-time in school in the prior year, and report age, education, and non-negative wage, salary, and self-employment earnings.

[13] We restricted the HILDA sample to mixed-gender couples observed in non-overlapping, continuous relationships, who were between the ages of 18 and 64/62 for men/women respectively, were not enrolled full-time in school, and report age, education, immigrant status, city status, household composition and non-negative wage, salary, and self-employment earnings. We note that Kidd (2017) performed a contemporaneous analysis using the HILDA data of the impact of female breadwinning on outcomes in Australia.

Sample means by marital status for the most inclusive set of explanatory variables for the full sample are reported in Appendix Table 5 for the NLSY97 and in Appendix Table 6 for the HILDA data.

The earnings measures used in our analysis derive from the tax reporting period preceding the interview date. The tax year in Australia runs from July 1 through June 30; the tax year in the USA coincides with the calendar year. In the case of Australia, the vast majority of interviews are conducted in the second half of the year, meaning that the income reports date from the period between 1 and 18 months prior to the survey date. In the case of the USA, interviews are bunched in the last quarter of the year or the first quarter of the following year, meaning that the income reports date from the period between 9 and 27 months prior to the interview date. Satisfaction is reported at the time of the interview; dissolution is captured by looking 12 months following the interview date.[14] To match our conjectured process whereby breadwinning status may drive feelings of relationship dissatisfaction which may subsequently cause relationship dissolution, we use these prior but fairly recent income measures to model satisfaction at the time of the interview, and to predict subsequent relationship dissolution, we use both these and even more distant income measures. Given that income is measured within a few months of satisfaction for some Australian observations, we note that reverse causality—i.e., relationship satisfaction driving relative earnings, rather than the reverse—may afflict our Australian results.

Figure 1 (panel a, USA; panel b, Australia) plots histograms of female income share in the first observation of all couples in each data set, by marital status. This figure shows that in these newer data, the sharp drop-off after the 0.5 mark is still perceptible.

Given the sensitivity of these histograms to couples reporting the same income (see Binder and Lam 2018 for evidence from the USA, Zinovyeva and Tverdostup 2018 for evidence from Finland, and Eriksson and Stenberg 2015 for evidence from Sweden) and the increased likelihood that his income is overstated and hers understated when she earns more (see Murray-Close and Heggeness 2018 for evidence from the USA), we also present results (Fig. 2) excluding those couples who self-report the same earnings. Equal earnings are reported by about 6% of US couples irrespective of married or cohabiting status, the vast majority of whom are not self-employed; 5% of married Australian couples, all of whom are self-employed; and 2% of cohabiting Australian couples, most of whom are not self-employed. Figure 2 shows the woman's income share peaking closer to 40% rather than 50% for all but married couples in Australia. More noticeable in Fig. 2 is the fairly uniform income distribution for married women in Australia across the range of 0 to 50%, perhaps reflecting the relatively high fraction of married Australian women engaged in part-time work.

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[0] We restricted the HILDA sample to mixed-gender couples observed in non-overlapping, continuous relationships, who were between the ages of 18 and 64/62 for men/women respectively, were not enrolled full-time in school, and report age, education, immigrant status, city status, household composition and non-negative wage, salary, and self-employment earnings. We note that Kidd (2017) performed a contemporaneous analysis using the HILDA data of the impact of female breadwinning on outcomes in Australia.

[14] Like BKP, we do not classify as dissolved marriages we observe ending with the death of a spouse. We cannot, however, distinguish between cohabitations that end in separation and those that end in a death. Cohabitations that end in a marriage are not treated as dissolutions until/unless that marriage ends.

4.1 Dissolution: USA and Australia

We measure the effect of female breadwinning on partnership dissolution in several different ways, each of which is necessarily estimated on a subtly different sample. Most of the couple-year observations can be used when dissolution is measured in the year following the survey and female breadwinning calculated from that income report is the sole measure of female breadwinning in the model. When lagged measures of female breadwinning are included (as in most of BKP's PSID regressions), only couples observed for two consecutive years enter the sample. Finally, when we look at dissolution over the 5 years following the income report (to mimic BKP's NSFH analysis), the sample is further circumscribed. We run both cross-

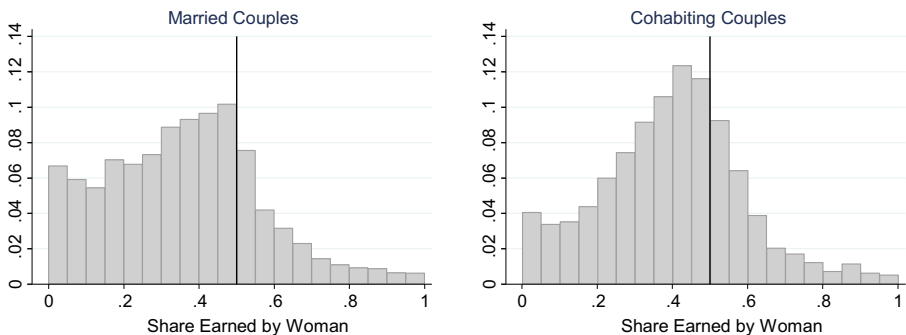**a** United States
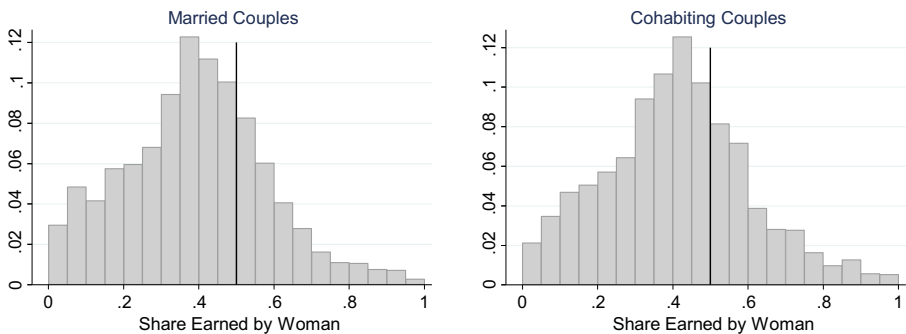
b Australia

Fig. 2 Distribution of relative income excluding those with matching income. **a** USA. The data are from the 1997–2013 waves of the NLSY97. The sample includes married or cohabiting mixed-gender couples where the man and woman both earn positive income, the respondent is not enrolled full-time in college, and both partners are between 18 and 58 years of age. For each couple, we use the observation from the first year that the couple is in the panel; 169 married couples and 167 cohabiting couples with matching earnings are dropped. Each bar captures a 0.05 relative income bin. The data capture 2909 married couples and 2456 cohabiting couples. **b** Australia. The data are from the 2001–2016 waves of the HILDA Survey. The sample includes married or cohabiting mixed-gender couples where the man and woman both earn positive income, are not enrolled full-time in school (if aged 18–23), and are between 18 and 62 (64 for men) years of age. For each couple, we use the observation from the first year that the couple is in the panel; 217 married couples and 55 cohabiting couples with matching earnings are dropped. Each bar captures a 0.05 relative income bin. The data capture 4298 married couples and 3039 cohabiting couples

sectional and fixed effects models including the focal dummy for female breadwinning plus controls that are comparable to those included in the original BKP models. All models are estimated with standard errors clustered at the couple level, thus yielding rather conservative p values.

Table 2 shows the coefficient estimates for the female breadwinning indicators using the simplest BKP specification. US results are reported in the top half of the table; Australian results appear in the bottom half. The first six columns show results for cohabiting couples and the latter four columns show results for married couples. Within each partnership type, we first present models of dissolution looking 1 year forward and then models of dissolution looking 5 years forward. We include female breadwinning indicators based on income from the year prior to the current survey wave, and in some specifications, from the year prior to the previous survey wave (labeled "lagged" in the table). Models of dissolution 1 year forward including only the current (and not the lagged) measure of female breadwinning are reported for cohabiting couples, given the substantial reduction in sample size when these (on average) relatively short-lived relationships are required to have lasted 2 or more years.[15]

Table 2 shows that in the more recent and younger US sample, there is no significant relation between female breadwinning and marital dissolution, but there is some evidence of a positive association between female breadwinning and the near-term dissolution of cohabiting relationships in both OLS and FE models.[16] The OLS results are robust to alternative specifications, including adding cubics in his and her log earned income and additional covariates even beyond those captured by BKP (specifically, controls for the respondent's disability and educational enrolment status, household composition (7 indicators), urbanicity (2 indicators), and measures of relationship duration, including for married couples a dummy variable indicating whether they had cohabited prior to marriage and the length of any such cohabitation). The only specification in which the coefficient on the indicator of female breadwinning becomes less statistically significant is one that controls for her share of household income. In these specifications, the continuous measure of her income share has a positive sign but is not generally significant, even at the 10% level. Mindful of Miller et al.'s (2019) concern regarding selection into the sample that identifies the fixed-effect estimates, we re-ran all OLS models on the FE samples that exclude singleton observations. For married couples in the USA, this procedure yielded a lagged female breadwinning measure with a negative and significant coefficient, indicating if anything a protective effect of female breadwinning for this selected

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[15] Forty percent of the cohabiting sample is lost by requiring information on lagged income, versus only 20% of the married sample. The coefficient on female breadwinning is not significant in the married sample when including only the current measure.

[16] The effect of female breadwinning is significantly different at the 10% level for the two types of unions (cohabiting as compared to married couples) in most of the specifications including lagged earnings measures. We generate this evidence by combining the married and cohabiting samples and running a model with a dummy for cohabitation plus a full set of terms interacting that dummy with all the regressors and examining the coefficient on the interaction term between female breadwinning and cohabitation. As the married and cohabiting samples are substantially different, similar results are obtained when testing for a difference between the coefficients reported in Table 2 assuming independence.

Table 2 Female breadwinning and relationship dissolution

	Cohabiting						Married			
	1 year forward		1 year forward		5 years forward		1 year forward		5 years forward	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE
US sample										
Woman earns more	0.0119	0.0295*	0.0414**	0.0563***	−0.0050	0.0054	0.0098	0.0063	0.0185	−0.0091
	(0.0123)	(0.0152)	(0.0181)	(0.0218)	(0.0244)	(0.0088)	(0.0081)	(0.0088)	(0.0127)	(0.0103)
Lagged woman earns more			0.0139	0.0199			−0.0113	−0.0102		
			(0.0190)	(0.0230)			(0.0073)	(0.0073)		
Joint p value			0.0266	0.0345			0.2618	0.3048		
Number of observations	7433	5743	3437	2763	4021	2202	10,287	9633	7320	6418
Number of fixed effects		1690		846		673		2120		1503
Probability of dissolution	13.06%	7.84%	10.94%	6.88%	33.35%	1.32%	4.34%	3.24%	11.17%	3.29%
Australian sample										
Woman earns more	0.0005	−0.0120	−0.0008	−0.0032	0.0096	0.0021	−0.0001	−0.0048	0.0089*	0.0047
	(0.0083)	(0.0097)	(0.0106)	(0.0122)	(0.0172)	(0.0060)	(0.0031)	(0.0031)	(0.0049)	(0.0042)
Lagged woman earns more			0.0045	−0.0131			0.0026	0.0006		
			(0.0105)	(0.0103)			(0.0032)	(0.0036)		
Joint p value			0.9032	0.4447			0.6619	0.2969		
Number of observations	9875	8599	6041	5312	4590	3403	24,521	23,891	17,232	16,291
Number of fixed effects		2078		1260		842		3639		2509
Probability of dissolution	7.99%	4.54%	5.71%	3.99%	17.30%	0.82%	1.45%	1.22%	3.25%	1.33%

All specifications include the log of the woman's earnings, the log of the man's earnings, the log of household earnings, dummy variables identifying households in which the woman earns all or none of the household earnings, and quadratics in each partner's age. All FE specifications exclude singleton observations

All specifications with "lagged woman earns more" include lags of the log of the woman's earnings, the log of the man's earnings, the log of household earnings, and dummy variables identifying households in which the woman earns all or none of household earnings

All the Australian specifications include controls for state (7), year (13), and each partner's education (7), aboriginal and immigration status (3)

All the US specifications include controls for region (4), year (13), and each partner's education (5), ethnicity, and race (3)

Robust standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. "Joint p value" refers to the p value for a test that the coefficients on both measures of female breadwinning are jointly zero

sample. For cohabiting couples, the same procedure indicates female breadwinning has a positive and significant effect on relationship dissolution even excluding the lagged measure.

In the 1-year-forward models with lagged controls, the marginal effect of female breadwinning on the probability of dissolution of a cohabitation equates to approximately 38% of the baseline dissolution rate for cohabiters in the OLS specification and 82% in the FE specification. The baseline dissolution probability is generally greater for cohabiting as compared to married couples, but the magnitude of the effect of female breadwinning for cohabiters constitutes a larger fraction of the average dissolution rate for this population than for married couples. The indicator of female breadwinning is not significant in US specifications using a 5-year time horizon, perhaps indicating that a window of 2 years better accommodates the dynamics at play.

Results for Australia, shown in the bottom half of Table 2, demonstrate still less evidence of a significant relation between female breadwinning and dissolution. This relation is never significant for cohabiting couples either in the OLS or FE specifications reported or when using OLS on the FE sample. For married couples, in some OLS models using a 5-year time horizon, there is a weak positive relation, but this effect disappears when the OLS models are estimated on the FE sample. These results are robust to an array of alternative specifications including cubics in his and her log earned income, a continuous measure of her relative share of income, and a host of additional control variables including seven household composition variables, dummy variables for his and her disability and educational enrolment status, two dummy variables for urbanicity, and measures of relationship duration, including for married couples a dummy variable indicating whether they had cohabited prior to marriage and the length of any such cohabitation. In fact, for married couples, some FE models including both current and lagged income measures suggest there is a weak negative relation between transitions into female breadwinning and marital dissolution, indicating if anything a protective rather than detrimental effect of female breadwinning.

Based on these results, we conclude that, in general, social norms that are violated by female breadwinning may be less important to people born more recently than to those in the original BKP sample. We interpret our statistically significant results for cohabiters in the USA as consistent with the idea that the cost of terminating a cohabiting relationship is smaller than the cost of terminating a marriage, making it easier for people who have weaker reasons to stay in a partnership—such as women who out-earn their partners in a world with a positive male–female wage gap—to in fact exit. Thus, women in less committed relationships in the USA appear more likely to seek alternative partners when they out-earn their partner, particularly but not exclusively when transitioning into that state. In Australia, unlike in most US states, cohabiting (known as "de facto partnership") is recognized formally in family law, the tax code, social security and other institutions, a form of social normalization of the idea that cohabiters are in fact committed to one another. Therefore, ending such a relationship may be more costly than it is in the US, which, combined with the older average age of the Australian sample, may help to explain the lack of parallel results for Australia.

4.2 Relationship health: USA and Australia

Our measures of relationship health[17] for the NLSY97 are all recorded on a scale of 0 to 10 (rescaled as necessary so that higher values indicate a healthier relationship) and are based on answers provided by the responding household head only, so the answers of women and men are mingled in the data. These measures, the questions on which they are based, and the waves during which the data were collected are indicated below, where "P" stands for "this spouse/partner":

Close: "How close do you feel towards P?" Waves 2000–2008.

Care: "How much do you feel that P cares about you?" Waves 2000–2008.

NoConflict: "Overall what is your relationship like with P? … how would you rate your relationship with P?" Waves 2000–2008. Answer scale reverse-coded such that 0 is "a lot of conflict" and 10 is "no conflict."

Commit: "How committed would you say you are to P, all things considered?" Waves 2005–2008.

For the HILDA, we have responses from both partners. These measures, the questions on which they are based, their answer scales, and the waves during which the data were collected are indicated below:

Partner: "Please indicate … how satisfied or dissatisfied you currently are with … your relationship with your partner." Scale, 0–10. All waves.

Love: "How much do you love your spouse/partner?" Scale, 1–5. Waves 2003, 2006, 2009, 2012, and 2016.

NoProblem: "How many problems are there in your relationship?" Scale, 1–5. Waves 2003, 2006, 2009, 2012, and 2016. Answer scale reverse-coded such that 0 is "a lot of problems" and 10 is "no problems."

Needs: "How well does your spouse meet your needs?" Scale, 1–5. Waves 2003, 2006, 2009, 2012, and 2016.

Expect: "To what extent has your relationship met your original expectations?" Scale, 1–5. Waves 2003, 2006, 2009, 2012, and 2016.

Using the newer US and Australian data, we again run both cross-sectional (OLS) and FE models and include the focal dummy for female breadwinning in the year prior to the survey, plus controls that are as similar as possible to those included in the original BKP model. We also examine responses for men and women separately for the Australian data where we have responses for both partners. As we did with the dissolution models, we estimate standard errors clustered at the couple level and run an array of other specifications, reporting only the simplest BKP specification and discussing results that are robust across specifications. We tabulate the results from models that treat the above relationship health measures as continuous variables, but for comparison, we also discuss in the text the results from modeling—as BKP do—binary indicators of relationship quality, with (in most cases) responses taking the best

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[17] While there is no term that perfectly captures all the dimensions of relationship quality targeted by these measures, for expositional convenience and in line with common Western notions of what makes a healthy, high-quality, sustainable relationship, we use the term "relationship health."

possible value coded as 1, and all other responses coded as 0.[18] Tables 3 and 4 show the results for the USA and Australia, respectively.

Table 3 shows a lack of relation overall between female breadwinning and our measures of relationship health for the young US cohort, with the exception being the measure of commitment. Female breadwinning is negatively and significantly related to this measure for cohabiting couples in OLS models[19] and marginally so for married couples in the FE specification. When we model our relationship health measures as binary indicators rather than continuous variables (results available upon request), we again see only scattered effects. Out of 60 specifications, female breadwinning is significant in only six. The strongest effect, economically speaking, is a positive association with the "Care" variable for married couples in FE models. A reduction in reported closeness is observed in some OLS models, especially for cohabiting couples. The results of these models for cohabiting couples lend further credibility to the market dynamics mechanism proposed above whereby female breadwinning, particularly in cohabiting couples, signals that the woman may be able to find a higher-earning partner: a state of the world in which commitment or closeness in the current partnership may weaken.

Table 4 shows that for married couples in Australia (bottom panel) there is no significant relation in OLS or FE specifications between female breadwinning and our continuous measures of relationship health. When we use a binary measure of relationship quality, the only robust effect is that married men report fewer problems when transitioning into female breadwinning arrangements. The top panel of Table 4 shows that there is likewise no significant association between female breadwinning and relationship health as perceived by cohabiting women. There is weak evidence that cohabiting men report more love, and that their needs and expectations are better met, when are out-earned in the cross-sectional models. However, these effects are significant at only the 10% level and only in two of four specifications, and this association loses significance when we estimate these models on the FE sample. In the FE specifications, cohabiting men report significantly more problems and that their needs are less well met when the couple transitions into female breadwinning, results that persist when we use binary measures of relationship health. While broadly consistent with the market dynamics mechanism we conjecture to underpin our US results, these weakly significant results for cohabiting men are the exception to an overall lack of importance of the male breadwinning norm in these recent Australian data.

5 Robustness

To further dissect these results, we ran a series of sensitivity checks, described briefly here, using both the NLSY97 and the HILDA data. Full results for all specifications are available upon request from the authors.

We first re-ran our models on a sub-sample of the HILDA that was close in age to the couples in our NLSY97 sample: specifically, we selected those Australia-residing

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[18] In order to obtain a roughly even split of observations into the "0" and "1" categories, dummy measures for NoConflict in the NLSY97 data were constructed by assigning the value "1" to the top 2 or the top 4 values, rather than only the top value, of the original answer scale. The dummy measure for Partner in the HILDA data was similarly constructed by assigning the value "1" to the top 2 values of the original answer scale.

[19] This result is robust to estimation using the FE sample.

Table 3 Female breadwinning and relationship health in the USA

	OLS Close	FE Close	OLS Care	FE Care	OLS NoConflict	FE NoConflict	OLS Commit	FE Commit
Cohabiting								
Respondent's response								
Woman earns more	−0.0488	0.0476	−0.0232	−0.0609	−0.0977	0.1293	−0.1872**	−0.1279
	(0.0704)	(0.0893)	(0.0630)	(0.0762)	(0.1398)	(0.1885)	(0.0953)	(0.1778)
Number of observations	3901	2760	3904	2764	3906	2770	2357	1568
Number of fixed effects		951		952		954		611
Married								
Respondent's response								
Woman earns more	0.0051	−0.0022	0.0336	−0.0239	−0.0563	−0.1979	0.0235	−0.1229*
	(0.0684)	(0.0598)	(0.0552)	(0.0518)	(0.1352)	(0.1496)	(0.0593)	(0.0685)
Number of observations	5972	5378	5972	5379	5970	5377	4440	3872
Number of fixed effects		1486		1487		1486		1313

All specifications include the log of the woman's earnings, the log of the man's earnings, the log of household earnings, dummy variables identifying households in which the woman earns all or none of the household earnings, and quadratics in each partner's age. FE specifications exclude singletons

All specifications include controls for region (4), year (13), and each partner's education (5), ethnicity, and race (3)

Robust standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 4 Female breadwinning and relationship health in Australia

	OLS Partner	FE Partner	OLS Love	FE Love	OLS No-Problem	FE No-Problem	OLS Needs	FE Needs	OLS Expect	FE Expect
Cohabiting										
Man's response										
Woman earns more	0.0904	0.0558	0.0561*	−0.0199	0.0230	−0.1728*	0.0784*	−0.1501*	0.0845*	−0.0806
	(0.0697)	(0.0632)	(0.0328)	(0.0577)	(0.0574)	(0.0911)	(0.0462)	(0.0788)	(0.0469)	(0.0792)
Number of observations	9521	8227	2978	1446	2978	1450	2978	1450	2976	1448
Number of fixed effects		2015		555		558		558		556
Woman's response										
Woman earns more	−0.0242	−0.0333	0.0438	0.0116	0.0127	−0.0700	0.0085	0.0217	−0.0405	0.0210
	(0.0754)	(0.0676)	(0.0372)	(0.0617)	(0.0628)	(0.1004)	(0.0491)	(0.0679)	(0.0515)	(0.0826)
Number of observations	9755	8440	3103	1506	3105	1508	3105	1508	3102	1505
Number of fixed effects		2052		581		582		582		580
Married										
Man's response										
Woman earns more	−0.0595	−0.0195	0.0136	0.0225	−0.0123	−0.0189	0.0215	0.0098	−0.0031	0.0301
	(0.0532)	(0.0361)	(0.0240)	(0.0253)	(0.0404)	(0.0254)	(0.0340)	(0.0335)	(0.0333)	(0.0330)
Number of observations	30,493	29,608	9490	7958	9488	7964	9484	7958	9476	7950
Number of fixed effects		4150		2544		2547		2546		2543
Woman's response										
Woman earns more	−0.0882	−0.0309	−0.0150	0.0203	0.0324	0.0544	−0.0385	0.0399	−0.0281	−0.0113
	(0.0556)	(0.0358)	(0.0284)	(0.0266)	(0.0400)	(0.0457)	(0.0372)	(0.0347)	(0.0370)	(0.0361)
Number of observations	30,946	30,075	9621	8090	9639	8110	9639	8111	9623	8084
Number of fixed effects		4215		2586		2590		2590		2590

All specifications include the log of the woman's earnings, the log of the man's earnings, the log of household earnings, dummy variables identifying households in which the woman earns all or none of the household earnings, and quadratics in each partner's age. FE specifications exclude singleton observations

All specifications include controls for state (7), year (13), and each partner's education (7), aboriginal and immigration status (3)

Robust standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

couples in which at least one partner was born after 1977 (all respondents in the NLSY97 sample were born between 1980 and 1984). See Appendix Table 7 for relationship health results using this sample. We find that in cohabiting relationships in Australia that satisfy this age restriction, men report more problems and less meeting of their needs when the couple transitions into female breadwinning, as is the case for the full sample. The women in these young cohabiting partnerships also report a range of negative signals of relationship health when they are in, or transition into, a state of female breadwinning. Female breadwinning is associated with women in young cohabiting relationships in Australia reporting less satisfaction with their partner in both OLS and FE models, less meeting of expectations in the cross-section, and more problems when transitioning. Female breadwinning continues to be associated with more relationship problems for young cohabiters when we re-estimate the OLS models using the FE sample. Despite this, and mirroring the full sample, we find no evidence of higher dissolution risk for these young cohabiters. Married couples in Australia that satisfy the age restriction above report being less satisfied with their partners, and married women report marginally less love of their partner (although this effect disappears when using the FE sample), when the prior year featured female breadwinning, but we see no significant change in relationship satisfaction in the FE models. We do find some evidence of higher 5-year dissolution rates in OLS but not FE specifications for couples where these younger women earn more than their partners. We conclude from the above results that compared to our full-sample results, female breadwinning is more negatively associated with relationship health for young partnerships in Australia and in the largest number of dimensions for young cohabiting women.[20]

Breaking down the NLSY97 results by gender of the respondent (see Appendix Table 8), we find that in the USA, it is women, not men, whose responses drive the aggregate negative association between female breadwinning and commitment shown in Table 3. In addition, it is female, not male, respondents for whom there is a significant positive correlation between female breadwinning and cohabitation dissolution in our FE specifications looking 1 year forward. For married women, by contrast, we see a significant negative correlation between 1-year lagged female breadwinning and relationship dissolution, indicating if anything a protective effect of female breadwinning. Coupled with the evidence from the young Australian sample, this leads us to further conjecture that the relationship health effects we observe in our younger samples may originate primarily in the mind of the woman. These findings support our prior hypothesis that female breadwinning in younger partnerships may serve as a signal to the woman that she could do better in the market for partners.

To explore this possibility further, we examined the choices of individuals who changed partners over the course of the survey. These results are based on small and selected samples and moreover are complicated by the Great Recession that more strongly affected the USA than Australia during the survey period. Unemployment rates as reported by the OECD for men aged 25–54 in Australia ranged from 2.9 to 5.6% over

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[20] Australian women are more likely than Australian men to disagree with the statement, "It is better for everyone involved if the man earns the money and the woman takes care of the home and children" (69.7% of women versus 58.7% of men disagree). This gender difference is greater for those in this younger sample (72.8% versus 59.5%) and especially for cohabiting couples in this younger sample (75.5% versus 60.2%). Thus, the negative association between female breadwinning and relationship health for young, cohabiting women is not attributable to these women adhering to more conservative social norms.

the 1999–2016 time period while those for a similar population in the USA ranged from 2.9 to 9.3%. In addition, the Great Recession in the USA hit men harder than women.

In light of this, and recalling again the small samples that impede our ability to draw firm conclusions from these explorations, it is perhaps not surprising that individuals in the US transitioning out of a cohabiting relationship during our window of observation were 3 percentage points more likely to experience female breadwinning and 8 percentage points more likely to experience earnings by only a single partner in the subsequent relationship. This is true even though on average real total household earnings in the subsequent relationship (relative to the prior one) increased for men and decreased for women. These results may be due in part to the unusual recession-era scarcity of men with sufficiently high incomes to out-earn a partner and/or to the dynamics highlighted in Ong (forthcoming) in which women with very high incomes and a preference for male breadwinning face high partner search costs, which may lead to these women settling for what they would consider suboptimal matches.

In Australia by contrast, women transitioning out of a cohabiting relationship were 3 percentage points less likely to be breadwinners in their subsequent relationship, even as their average earnings increased, consistent with our conjecture. These women also partner with men less likely to be unemployed: the average fraction of time their original partners were unemployed was 6.8%, compared to 4.0% among their subsequent partners. By these measures, Australian women leaving cohabitations do seem successful at "upgrading" in terms of the relative economic power of their next partner. Men in Australia transitioning out of a cohabiting relationship were slightly less likely to be the primary breadwinners in their subsequent relationship (a 1 percentage point drop), even as their average earnings rose, although they were also less likely to be unemployed (unemployment for this group stood at 4.5% when with the prior female partner, versus 3.5% when with the new female partner). In new partnerships for married individuals of both genders, female breadwinning is more prevalent than in the prior married partnerships. Hence, this small-N exploration reveals that among all gender-by-union-type groups in Australia, female cohabiters are the only group for whom the new partnership is less likely than the previous partnership to feature female breadwinning.

Finally, we conducted sensitivity checks (available upon request) by level of education, an approach motivated by prior findings that behavior within mixed-gender couples that relates to gender norms can differ markedly by education level (e.g., Foster and Stratton 2018). As above with the BKP samples, we define less-educated couples in the USA to be couples in which neither partner has more than a high school education. We define less-educated couples in Australia to be couples in which the woman has no more than a high school education and the man has no more than a vocational education. Those not classified as less-educated couples are classified as more-educated couples.[21]

In the NLSY97, more-educated married couples report feeling their partner cares more when the partnership transitions into female breadwinning. Otherwise, results on marital health measures for more-educated couples are not robustly statistically or

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[21] That gender norms differ by education level is evident from the Australian data. The HILDA data indicate that those classified here as less educated are 15 to 16 percentage points (or about 25%) less likely to disagree with the statement, "It is better for everyone involved if the man earns the money and the woman takes care of the home and children," than are those classified here as more educated.

economically significant. However, more-educated cohabiting partnerships that feature female breadwinning are statistically more likely to dissolve. For more-educated cohabiting couples in Australia, we find female breadwinning to be associated with men reporting more love for their partners in OLS but not FE models, a result that disappears when using the FE sample. Married women in more-educated partnerships featuring female breadwinning report slightly less satisfaction with their partners, in both OLS and FE models. No robust significant effects are seen on partnership dissolution for more-educated Australian cohabiting or married couples.

In the NLSY97, we see less reported commitment and a marginally higher likelihood of dissolution for less-educated cohabiting couples in the presence of female breadwinning, but otherwise no significant results. By contrast, less-educated cohabiting men in Australia report less love for their partner, less satisfaction with the relationship, and that their needs are being less well met, when their partnership transitions into female breadwinning.[22] Women in less-educated married couples in Australia, on the other hand, report fewer relationship problems particularly when transitioning into a state of female breadwinning. There is no consistent evidence of a relation between female breadwinning and dissolution of either cohabiting or married partnerships in Australia for less-educated couples.

We conclude based on these results by education level that female breadwinning is generally inconsequential, and sometimes positive, for more-educated couples in our more recent data, with the exception of a much higher dissolution risk for more-educated US cohabiters transitioning to female breadwinning. Our results further show that in the USA, it is less-educated couples who drive the lower commitment reported in cohabitations featuring female breadwinning. We see these results as consistent with our prior hypothesis that the importance of a male breadwinning norm has declined over time, but with the caveat that this shift is happening more in the minds of more-educated people. This conjecture is further supported by the evidence in Australia that men in less-educated cohabiting partnerships are more likely to feel relationship stress in association with female breadwinning.

The relation between female breadwinning and relationship health and stability may also depend on the reason why the woman earns more. Female breadwinning that is a consequence of other more serious problems, such as the man's job loss and/or health shocks, may be more or less damaging and more research is needed to fully understand this possibility. As a first look at this question, we incorporated a variable capturing the fraction of time the man spent unemployed as well as his disability status in the year during which breadwinning status is measured. The format of the NLSY97 is such that this information is only available when the respondent is a man. The only result to change for cohabiters is that, controlling for disability and unemployment status, men feel their partner cares more when she becomes the breadwinner. Controlling for these variables does not change the results for married men in the USA. Including these variables in the model for Australia modestly affects the degree to which female breadwinning influences the health and stability of marriages. Married women report caring less for their partner in the OLS specification, but married men and women report somewhat fewer problems and marriages appear less likely to break up when

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[0] That gender norms differ by education level is evident from the Australian data. The HILDA data indicate that those classified here as less educated are 15 to 16 percentage points (or about 25%) less likely to disagree with the statement, "It is better for everyone involved if the man earns the money and the woman takes care of the home and children," than are those classified here as more educated.

[22] These results are also observed in OLS estimates on the FE samples.

there is a transition to female breadwinning, holding constant his current and lagged employment and disability status. No changes in relationship health or stability are observed in the results for cohabiters in Australia.

These results indicate that the modest negative effects of female breadwinning estimated in our main models are unlikely to be upwardly biased due to picking up the negative effects of omitted coincident stressors such as male health or labor market shocks. If anything, overall, female breadwinning per se appears to be even less damaging to relationship health and stability once such stressors are controlled.

6 Conclusion

We find that the effects of female breadwinning on partnership dissolution and relationship quality found in Bertrand et al. (2015) are concentrated in partnerships in which women are more able to access higher-earning alternative partners. In more recent data, female breadwinning is less impactful overall in the cross-section, suggesting that the norm of the male breadwinner has become less relevant. The effects of transitions into female breadwinning are concentrated in cohabiting partnerships. Cohabiters not only may hold attitudes more accepting of female breadwinning as compared to married individuals but also face a lower cost of switching partners. It is in particular younger cohabiting women, as well as their partners to a lesser extent, who report more problems with their relationship when women become the household breadwinners. Women may see this switch as a signal that they have better re-partnering opportunities. We find some preliminary evidence that female breadwinners leaving cohabiting partnerships in Australia go on to re-partner with relatively more economically successful men, although the same is not true in the USA, where the Great Recession hit harder.

Some differences by education level are also observed, perhaps because of the generally inverse relation between educational attainment and adherence to traditional gender norms. There is weak evidence that men in more-educated partnerships are more satisfied when their partner is the breadwinner, although female breadwinners are less so. Less-educated cohabiting couples in the USA, by contrast, report being less committed to their relationship and are marginally more likely to break up in the presence of female breadwinning. Less-educated cohabiting men in Australia also report less satisfaction, though perhaps surprisingly, there is no evidence that this dissatisfaction leads to higher rates of relationship dissolution.

Our results are subject to limitations necessitated by the constraints of the data sets available as well as the possibility of reporting errors. One concern, as noted by Murray-Close and Heggeness (2018), is that men's errors when reporting their income may be larger and more positive than women's. If true, women's share of household income should be higher in at least some households than what we observe in our data. The most obvious problem this may create is mis-classification of some households' breadwinner as the man when in fact it is the woman, which would reduce the apparent differences between male- and female-breadwinning households and thereby bias our estimates towards zero. Most prior studies, including BKP, also suffer from this potential source of bias. Another concern is that female breadwinning is relatively uncommon and may be indicative of a transitory shock rather than an enduring shift. If this is the case, then fixed effects estimates of the impact of female breadwinning on relationship stability and

health would tend to be biased towards zero. Attempts to control for shocks to health and unemployment act to very modestly change the association between female breadwinning and relationship health, but further investigation is warranted.

Overall, we interpret our results as being consistent with a decline over time in the importance of compliance with the male breadwinning norm for relationship health and stability, particularly for more-educated couples, and with the continued relevance of partner-market dynamics in a world in which the average man earns more than his partner. With cohabitations becoming increasingly common, the market dynamics to which cohabiters are particularly sensitive will be relevant to a larger and larger fraction of adults. Future work might track partnerships that form after a female-breadwinning partnership dissolves further through time in order to examine these dynamics in more detail.

Appendix

Table 5 NLSY97 sample statistics

	Married couples		Cohabiting couples	
	Mean	Std. Dev.	Mean	Std. Dev.
Wage and salary and self-employment income				
Woman earns more	0.254	0.435	0.334	0.472
Man's real earned income (000's 2016$)	45.368	35.029	31.044	29.485
Woman's real earned income (000's 2016$)	23.401	23.546	19.615	21.039
Couple's real earned income (000's 2016$)	68.768	44.766	50.658	40.897
Man has no earned income	0.040	0.197	0.093	0.290
Woman has no earned income	0.228	0.420	0.213	0.410
Woman's share of couple's earned income	0.330	0.265	0.386	0.300
Respondent is a woman	0.559	0.497	0.521	0.500
Man's characteristics				
Age	28.217	4.238	26.899	4.781
Hispanic	0.222	0.416	0.241	0.428
Black	0.127	0.333	0.209	0.406
Other race	0.103	0.304	0.128	0.334
Race is missing	0.066	0.249	0.078	0.268

Table 5 (continued)

	Married couples		Cohabiting couples	
	Mean	Std. Dev.	Mean	Std. Dev.
Enrolled full-time[a]	0.017	0.131	0.013	0.113
Education (base case: less than high school)				
High school	0.592	0.491	0.567	0.496
Some college	0.046	0.209	0.052	0.222
AA degree	0.119	0.324	0.066	0.248
BA degree	0.083	0.276	0.035	0.183
Grad degree	0.012	0.111	0.006	0.074
Disabled[a]	0.005	0.071	0.006	0.079
Woman's characteristics				
Age	26.658	3.701	25.174	4.116
Hispanic	0.234	0.423	0.244	0.430
Black	0.111	0.314	0.177	0.381
Other race	0.107	0.309	0.134	0.341
Race is missing	0.057	0.232	0.078	0.268
Enrolled full-time[a]	0.027	0.161	0.026	0.158
Education (base case: less than high school)				
High school	0.558	0.497	0.568	0.495
Some college	0.058	0.233	0.068	0.251
AA degree	0.145	0.352	0.086	0.281
BA degree	0.086	0.281	0.035	0.185
Grad degree	0.017	0.130	0.006	0.078
Disabled[a]	0.010	0.097	0.013	0.113
Household characteristics				
Number of children age 0–2	0.376	0.532	0.299	0.509
Number of children age 3–5	0.423	0.599	0.337	0.556
Number of children age 6–9	0.334	0.599	0.291	0.569
Number of children age 10–14	0.133	0.409	0.123	0.394
Number of children age 15–17	0.014	0.121	0.011	0.111
Number of other dependents	0.155	0.538	0.197	0.579
Number of other adults	0.234	0.709	0.365	0.853
Resides in (base case: an urban area)				
A city	0.326	0.469	0.400	0.490
A rural area	0.237	0.425	0.177	0.382
Ever cohabited in relationship	0.465	0.499	1.000	0.000
Months married to date (with this partner)	48.801	35.247		
Months cohabiting to date (with this partner)	12.645	19.236	37.920	29.716
Number of observations	13,962		7433	

Dummy variables to control for wave and region are also included in the analysis. Data from the 1997–2013 waves of the NLSY97, supplemented with relationship data from 2015

[a] Disability and enrolment status can only be determined for the respondent, not the partner

Table 6 HILDA sample statistics

	Married couples		Cohabiting couples	
	Mean	Std. Dev.	Mean	Std. Dev.
Wage and salary and self-employment income				
Woman earns more	0.239	0.427	0.270	0.444
Man's real earned income (000's 2016 AU$)	85.400	72.878	66.751	52.660
Woman's real earned income (000's 2016 AU$)	39.798	42.488	40.127	35.232
Couple's real earned income (000's 2016 AU$)	125.199	88.032	106.878	69.868
Man has no earned income	0.041	0.198	0.037	0.189
Woman has no earned income	0.189	0.391	0.160	0.367
Woman's share of couple's earned income	0.368	0.193	0.406	0.181
Man's characteristics				
Age	44.468	10.065	35.847	11.123
Immigrant from northern Europe or an English speaking country	0.115	0.320	0.113	0.316
Immigrant from another country	0.130	0.336	0.043	0.203
Of aboriginal descent	0.010	0.098	0.034	0.181
Enrolled full-time	0.011	0.103	0.033	0.177
Education (base case: 12 years)				
Post-bach	0.072	0.259	0.037	0.190
BA/honors	0.068	0.252	0.043	0.202
Diploma	0.173	0.378	0.123	0.328
Cert III/IV[a]	0.106	0.308	0.075	0.263
11 years	0.101	0.302	0.154	0.361
10 years	0.042	0.201	0.065	0.246
≤9 years	0.127	0.332	0.169	0.375
Disabled	0.100	0.300	0.090	0.286
Woman's characteristics				
Age	42.187	9.729	33.644	10.659
Immigrant from northern Europe or an English-speaking country	0.095	0.293	0.098	0.297
Immigrant from another country	0.141	0.348	0.054	0.226
Of aboriginal descent	0.011	0.105	0.038	0.192
Enrolled full-time	0.018	0.133	0.045	0.208
Education (base case: 12 years)				
Post-bach	0.050	0.218	0.048	0.214
BA/honors	0.091	0.287	0.051	0.220
Diploma	0.202	0.402	0.190	0.393
Cert III/IV	0.109	0.312	0.088	0.284
11 years	0.144	0.351	0.176	0.381
10 years	0.067	0.251	0.066	0.248
≤9 years	0.185	0.388	0.165	0.371
Disabled	0.108	0.311	0.104	0.305

Table 6 (continued)

	Married couples		Cohabiting couples	
	Mean	Std. Dev.	Mean	Std. Dev.
Household characteristics				
Number of children age 0–4	0.381	0.685	0.287	0.594
Number of children age 5–9	0.338	0.641	0.183	0.494
Number of children age 10–14	0.331	0.639	0.156	0.464
Number of other dependents	0.264	0.574	0.076	0.308
Number of other adults	0.238	0.589	0.194	0.596
A child is disabled	0.053	0.224	0.040	0.196
Another HH member is disabled	0.047	0.212	0.034	0.182
Resides in (base case: an urban area)				
A city	0.675	0.468	0.650	0.477
A rural area	0.126	0.332	0.106	0.307
Ever cohabited in relationship	0.578	0.494	1.000	0.000
Years married to date (with this partner)	15.249	11.000		
Years cohabiting to date (with this partner)	1.658	2.491	4.968	5.568
Number of observations	33,053		10,812	

Dummy variables to control for wave and state are also included in the analysis. Data from the 2000–2016 waves of HILDA

[a] The Australian education codes used here are defined further at https://www.aqf.edu.au/aqf-levels

Table 7 Relationship health in Australia for persons born after 1977

	OLS Partner	FE Partner	OLS Love	FE Love	OLS No-Problem	FE No-Problem	OLS Needs	FE Needs	OLS Expect	FE Expect
Cohabiting										
Man's response										
Woman earns more	−0.0571	0.0044	0.0115	−0.0805	0.0142	−0.2763**	0.0259	−0.2728**	0.0576	−0.1637
	(0.0796)	(0.0830)	(0.0376)	(0.0882)	(0.0725)	(0.1345)	(0.0598)	(0.1204)	(0.0621)	(0.1307)
Number of observations	4885	4030	1575	524	1578	532	1577	530	1573	528
Number of fixed effects		1180		226		230		229		228
Woman's response										
Woman earns more	−0.1825**	−0.1973**	0.0295	−0.0055	−0.0975	−0.3736**	−0.0233	−0.0821	−0.1020*	−0.0982
	(0.0881)	(0.0906)	(0.0338)	(0.0573)	(0.0803)	(0.1567)	(0.0550)	(0.0891)	(0.0608)	(0.1244)
Number of observations	5079	4210	1679	580	1677	580	1678	580	1673	576
Number of fixed effects		1214		251		251		251		249
Married										
Man's response										
Woman earns more	−0.2057**	−0.0396	0.0137	−0.0118	−0.0243	0.0444	−0.0032	0.0583	−0.0321	0.1417
	(0.0884)	(0.0732)	(0.0370)	(0.0543)	(0.0840)	(0.1325)	(0.0692)	(0.0887)	(0.0701)	(0.0948)
Number of observations	5479	5221	1890	1315	1890	1317	1892	1318	1886	1313
Number of fixed effects		988		513		514		514		512
Woman's response										
Woman earns more	−0.1731*	−0.0019	−0.0761*	−0.0784	0.0288	−0.0042	−0.0221	−0.0200	−0.0784	−0.0945
	(0.0916)	(0.0736)	(0.0436)	(0.0644)	(0.0839)	(0.1219)	(0.0718)	(0.0912)	(0.0736)	(0.0953)
Number of observations	5617	5361	1927	1333	1930	1339	1928	1339	1924	1331
Number of fixed effects		1015		520		523		523		519

All specifications include the log of the woman's earnings, the log of the man's earnings, the log of household earnings, dummy variables identifying households in which the woman earns all or none of the household earnings, and quadratics in each partner's age. FE specifications exclude singleton observations

Controls for state (7), year (13), and each partner's education (7), aboriginal and immigration status (3) are also included

Robust standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 8 Relationship health in the USA by gender of respondent

	OLS Close	FE Close	OLS Care	FE Care	OLS NoConflict	FE NoConflict	OLS Commit	FE Commit
Cohabiting								
Man's response								
Woman earns more	0.0248	0.1123	−0.0039	0.0009	−0.0343	0.3137	−0.0474	0.2846
	(0.1089)	(0.1325)	(0.0945)	(0.1077)	(0.2123)	(0.2768)	(0.1666)	(0.2744)
Number of observations	1814	1273	1813	1273	1814	1276	1123	719
Number of fixed effects		433		433		434		281
Woman's response								
Woman earns more	−0.1377	−0.0201	−0.0843	−0.1024	−0.0770	−0.0124	−0.3260***	−0.4177*
	(0.0962)	(0.1240)	(0.0820)	(0.1093)	(0.1889)	(0.2604)	(0.1171)	(0.2365)
Number of observations	2087	1487	2091	1491	2092	1494	1234	849
Number of fixed effects		518		519		520		330
Married								
Man's response								
Woman earns more	−0.0262	0.0258	0.0684	0.1178	0.0247	−0.2653	0.0589	−0.0362
	(0.0871)	(0.0969)	(0.0704)	(0.0737)	(0.2223)	(0.2723)	(0.0742)	(0.0779)
Number of observations	2464	2201	2464	2200	2464	2201	1895	1638
Number of fixed effects		619		618		619		556
Woman's response								
Woman earns more	0.0363	0.0043	−0.0005	−0.1140	−0.1284	−0.1628	−0.0010	−0.1560
	(0.0921)	(0.0808)	(0.0745)	(0.0708)	(0.1687)	(0.1808)	(0.0813)	(0.0991)
Number of observations	3508	3177	3508	3179	3506	3176	2545	2234
Number of fixed effects		867		869		867		757

All specifications include the log of the woman's earnings, the log of the man's earnings, the log of household earnings, dummy variables identifying households in which the woman earns all or none of the household earnings, and quadratics in each partner's age. FE specifications exclude singletons

Controls for region (4), year (13), and each partner's education (5), ethnicity, and race (3) are also included

Robust standard errors in parentheses: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

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