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ISSN: 2365-9793

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ABSTRACT

Same-Sex Couples and the Marital Surplus: The Importance of the Legal Environment*

Same-sex couples' marital surplus, their excess total income over that predicted by their work times and predicted wages, increases little as the duration of their relationship lengthens. When/where same-sex marriage is legal, it rises sharply as duration increases. The availability of legal domestic partnership or civil union has no effect on the surplus. The likelihood of home ownership conditional on demographic characteristics also increases with partnerships' duration only when/where same-sex marriage is legal. These results, based on data from the American Community Survey 2013-17, support the notion that greater legal protection enhances partners' incentives to invest in their relationship.

JEL Classification: J12, J16, K30

Keywords: gains from marriage, same-sex partnership, home ownership

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* We thank Dan Black, Kitt Carpenter, Lisa Dickson, Marcus Dillender, Frances Hamermesh, Shelly Lundberg, Michael Martell, Dario Sansone, Barnard undergraduate students, participants in seminars at several universities, and especially Gerald Oettinger and Steve Trejo for helpful suggestions.

I. Introduction and the Problem

With rising pressures for legalizing same-sex marriage in the U.S., a plethora of studies examining how gays/lesbians are treated in various markets arose. Much of the focus was on discrimination in labor markets (Badgett, 1995 and Black *et al.*, 2003, are two early examples), not specifically looking at marriage. The importance of persistent preferences and community standards in affecting these outcomes has also garnered attention (Brodeur and Haddad, 2018).

More recently the focus has altered to considering various aspects of same-sex partnership or marriage. The impacts on opposite-sex marriage rates and fertility have been examined (Dillender, 2014; Trandafir, 2015), as have those on employment (Burn (2018); Delhomme, 2019; Sansone, 2020); partners' labor supply and household bargaining (Oreffice, 2011; Hansen *et al.*, 2019), including effects of taxation (Isaac, 2018); and even on mental health (Anderson *et al.*, 2019) and sexually transmitted diseases (Francis *et al.*, 2012).¹ All of these considerations are important in understanding the position of this particular minority group in American society and generally. No doubt legalization has had or will have major implications for how **individuals** in this minority are treated in the labor and other markets. The essential question, however, may rather be: How does legalizing same-sex marriage alter a **couple's** well-being both in and beyond the labor market? The push for legalization presumably stems from its proponents' beliefs that, more than legal or unsanctioned same-sex partnerships, it will directly improve the well-being of members of this minority within this crucial domestic relationship.

With the complete legalization of same-sex marriage in the U.S. in *Obergefell v. Hodges* (2015), and with the legal sanctioning of the view that marriage choice is a civil right (*United States v. Windsor*, 2013), federal policy has placed same-sex marriage on the same legal footing

¹There has been a substantial focus on these topics outside the United States too, e.g., Plug and Berkhout (2004) on wage discrimination, and Chen and van Ours (2018) on subjective well-being by type of relationship.

as opposite-sex marriage. While this change is recent, the legalization of same-sex partnership, going back at the state level to California in 1999, and of same-sex marriage in Massachusetts in 2004, has generated a substantial number of same-sex partnerships and marriages that are or at least could have been legally sanctioned. This increasingly lengthy history allows studying how such partnerships have fared over time under an increasingly tolerant legal system. In particular, we can examine how couples' benefits from legalized same-sex marriage differ from those from legalized same-sex domestic partnership, and how benefits from the latter differ from those when even partnerships are not legally sanctioned.² Thus we consider in a new context the idea that marriage is a commitment device that protects and induces couples' investments in their relationship (Matouschek and Rasul, 2008).

II. Theoretical Motivation—the Marital Surplus

The idea of marital surplus—the excess value of a marriage beyond the partners' threat points—goes back at least to McElroy and Horney (1981). How the distribution of the surplus between the partners occurs and how it affects how each spends money and time has been examined by, e.g., Chiappori (1992). A marital surplus can be viewed as any extra income or efficiency in using time (in household production or leisure) produced by the couple's prior investment in their relationship. Presumably it is greater the longer the couple has been together and the more effort the partners have expended in developing their relationship—investing in activities that raise the surplus. But while the concept has been used often, its extent has not been examined directly, only inferred from the changes in behavior that it might engender.

²The opinion in *Perry et al. v. Schwarzenegger et al.*, 704 F.Supp.2d 921 (2010), one of the cases that fed into the *Windsor* decision, stated that one purpose of marriage was to “create stable households.” The second author's expert report in that case argued that legalizing same-sex marriage would give the partners incentives to create marital capital in a way that the then-legal domestic partnerships in California could not:

<https://docs.justia.com/cases/federal/district-courts/california/candce/3:2009cv02292/215270/284>.

With this view in mind, consider a couple operating in T periods, with certainty that it will survive through Period T . In Period 1 it chooses to spend some of its resources investing in the relationship. We do not need to consider how the surplus that is produced is split—just that a surplus is created by the couple’s efforts. The couple maximizes the following joint utility function:

$$(1) U = U(C_1 - I, S_1) + \sum R_t U(C_t, S_t),$$

where R is a discount factor, I is investment in the relationship in the first period, C is the gross value of the household production that is generated by the partners’ endowments of human capital and time and their efficiency in combining these; and S is the marital surplus. S_1 is its initial value, presumably positive because of the assortative matching that generates the relationship (since if it were not positive, the match would not have occurred). Investment in the first period increases the surplus after Period 1, so that:

$$(2) S_t = S(I, S_1), t = 2, \dots, T^*,$$

with $\partial S_t / \partial I, \partial S_t / \partial S_1 > 0$, $\partial^2 S_t / \partial^2 I < 0$, and T^* some specific horizon.

In this very simple model, what happens if T increases to $T^{**} > T^*$, perhaps because expected longevity rises, divorce is made more difficult and the parties cannot reallocate the marital surplus, or because legal protections of the partnership are increased? With greater T , the parties have more incentive to invest in the marriage in Period 1—to increase the marital surplus—so that the surplus thereafter is higher. Moreover, the actions that the parties take to alter the surplus themselves increase T —reduce the likelihood that the partnership dissolves. This discussion implies that any legal change that makes a partnership more secure will enhance the partners’ incentives to invest in the relationship and thus to increase the marital surplus in future periods. We should observe that, at the same stage of a partnership—the same duration since its inception—

those that have functioned when and where the partnership is legally sanctioned will have developed a greater marital surplus.

III. Data, Sample and General Estimates

Starting in 2013 the American Community Survey (ACS) has contained information on whether a couple is of the same-sex or not. We thus include in the samples from the 2013-17 yearly ACS all same-sex couples whose members state that they are married, distinguishing by whether they are gay or lesbian. With information on the year they state that they were married, we know the duration of their relationship. This duration clearly exceeds the amount of time that most couples could have been legally married, so henceforth we refer to the couple as a partnership. To reduce errors in matching partners in these data, we exclude all couples residing in group quarters and all for which the indicator of marital status was flagged in the ACS.³ Finally, in order to avoid including couples with a possibly temporary relationship and to increase the homogeneity of the sample, we restrict it to couples with both members between ages 25 and 74 inclusive (deleting 11 percent of the original sample of same-sex couples).⁴

These restrictions generate samples of 9,453 gay and 10,110 lesbian (i.e., 19,563 same-sex) couples in which both partners state that they are a couple. Some may not be legally married—in their state at the time of the survey, they could not be; but all responded in the ACS that they are married. The fraction same-sex among all couples in these samples is 0.0073, somewhat higher than the fraction of people in the 1990s who were viewed as gay/lesbian under a stringent definition (Black *et al.*, 2000).

³In all the couples in the samples that we use each partner listed the same duration of partnership.

⁴This exclusion has no qualitative impact on any of the results obtained here.

Table 1 presents statistics describing married opposite-sex couples (for contrast), all same-sex couples, then gay and lesbian couples separately. For all groups the statistics show the averages of the characteristic across the two partners. Given the sample sizes, all the inter-group differences are statistically significant. The biggest difference between the opposite- and same-sex couples is that the latter are much better educated, with over half having at least a college education, compared to 40 percent among members of opposite-sex couples. They are also less likely to be members of one of the larger American minority groups (more likely to be non-Hispanic whites); and their relationship (their statement of the length of time that they have been married) is much shorter than that of opposite-sex couples—9 versus 21 years.

Among same-sex couples the most striking difference is that members of lesbian couples are on average younger than members of gay couples, have not been together quite so long, and are less likely to have at least a college degree. They are more likely to be non-Hispanic whites, but also more likely to be African Americans. While none of these differences is large, their statistical significance suggests examining gay and lesbian couples separately in estimating models describing the marital surplus.⁵

While the notion of marital surplus has been used often in the literature, it has been inferred from its effects on spending, time use (particularly labor supply) or marital stability. Its magnitude and development have not been examined directly. We propose to do exactly that—to chart how marital surplus varies with the length of the couple’s relationship and with the legal protections, if any, under which it operates. Assume that the members’ earning potential—what the observer expects the partners to earn or to receive in other forms of income—is described by $W_1(X_1)$ and $W_2(X_2)$, where the X are large vectors of characteristics describing each partner i ’s ($i = 1,2$) human

⁵As in Jepsen and Jepsen (2002), the differences in characteristics (age and education) between members of same-sex couples are greater than those between members of opposite-sex couples.

capital and any discrimination or favoritism faced in the labor market. Then the marital surplus S enjoyed by the couple can be viewed as the excess of their total income over the incomes that they would receive separately:

$$(3) S(D) = Y(D) - [H_1W_1(X_1) + H_2W_2(X_2)],$$

where D is the duration of the partnership, H_i are hours worked by the partner, and Y is the couple's total income.

The idea here is that marital surplus is measurable as the excess of income over what would be expected given the partners' choices about how much to work and their past and current earnings ability conditional on all of their observable characteristics. A successful partnership allows members of the couple to enhance their income-generating capacities by having specialized in the past and by currently specializing in various household tasks; by having made and currently making choices about how to spend other non-market time in ways that enhance their incomes; and by engaging in activities together that enhance their utility and that offer them the ability to develop their human capital in ways that is not predictable based on their observable characteristics (Hamermesh, 2002). Presumably these utility-enhancing investments are made early in a relationship that is expected to be long-lasting and will taper off as the relationship lengthens. Thus their impact should be such that $S'(D) > 0$, $S''(D) < 0$.

The description in (3) suggests an estimating equation in which the W are proxied by all the information available to the econometrician about the partner's characteristics. In the ACS this means information on age, education, race/ethnicity and location. For the partnership we include the state of residence, whether and where in a metropolitan area the couple resides, and the year of inclusion in the ACS. For each partner we include a vector of single years of age (49 indicators for each partner), a vector of indicators of each partner's educational attainment (23 indicators for

each partner) and his/her race/ethnicity (4 indicators for each partner). Also included are each partner's usual weekly working hours (0 for non-workers). We calculate D as the years elapsed between the time the couple reported having gotten married and the year it was included in the ACS, and we use ACS sampling weights.

To account for the expected shape of $S(D)$, we add a quadratic term in D after first estimating a linear relationship. Column (1) of Table 2 lists estimates of:

$$(4) \ln(F) = g(D) + \alpha X,$$

where α is a vector of parameters describing the impacts of all the demographic characteristics on family income (F), and g is a function of the stated duration of the partnership.⁶ Equation (4) thus measures the response of the logarithm of family income to the duration of the partnership among the 19,563 same-sex couples, including the large vectors of covariates describing their demographics. The estimates show evidence of an increase in the surplus with duration of the partnership, but the impact of additional years together is tiny: Even at the average of 9 years into a relationship family income, conditional on all the covariates, is only 1 percent higher than in a new same-sex relationship. Moreover, as the estimates in Column (2) show, there is no evidence of the predicted concave relationship between the surplus and the duration of the partnership.

Columns (3)-(6) present the same estimates as in Columns (1) and (2), separately for gay and lesbian couples. The estimates are qualitatively like those for the aggregate of same-sex couples. The linear effects are quite small, around 0.1 percent per annum, and only very marginally statistically significant. There is also no evidence of the expected concavity in the relationship of family income to the duration of the same-sex relationship.

⁶The ACS provides two measures of total income, family and household income. The estimates using them unsurprisingly differ little from each other; to save space we present here only those based on $\ln(F)$.

IV. Partnership, Marriage and the Law

The results for same-sex partners suggest little evidence that the partners are investing in the relationship. But in a sense the results for same-sex couples should not be surprising: Over one-fourth of same-sex couples in this sample could never have been in a legally-sanctioned relationship, either domestic partnership or marriage, up to the time when they are included in the ACS. Only 65 percent of them were ever together at a time when same-sex marriage was legal in the jurisdiction where they resided. The comparisons in Section III are thus among same-sex couples, many of which could not have been married legally or even have been in a legal alternative relationship (domestic partnership, civil union or similar) during much of the time that they state they were married.

To examine how differing legal institutions affect the development of the marital surplus among same-sex couples, we create indicators of the legal environment in each jurisdiction (state and the District of Columbia) for each year, from 1999, when domestic partnership was recognized in California, through 2015 and later, when same-sex marriage was legalized nationwide. Let $T_{s,Alt}$ be the year when alternative partnerships were legalized in jurisdiction s , $T_{s,Same}$ when same-sex marriage was legalized there. For years before 2012, we use the classifications created by Dillender (2014), while for 2012 and later use those constructed by Hansen *et al.* (2019).⁷ We assume that if the couple was together at the time of legalization it could have been legally married from that time forward.⁸ We make a similar assumption for couples that were together at the time when

⁷Based on Hansen *et al.* (2019) we also code same-sex partnerships as being legal in New York City beginning in 1997.

⁸A number of states legalized same-sex marriage in the fourth quarter of 2014. Most of the partnerships that began in 2014 could not have been entered into under this regime in those states. We thus treat the effective date of legalized same-sex marriage in those states as being 2015, as in all other states that had not legalized the institution before *Obergefell*.

domestic partnership was legalized where they resided, with it converted to the possibility of same-sex marriage when this greater level of legal protection was instituted in the jurisdiction.

Let t_M be the year a couple in the ACS reports itself as having gotten married, and t be the year the couple is included in the ACS. Then for each couple we can calculate:

$$(5) D_{Same} = \begin{cases} t - t_{s,Same} & \text{if } t_M \leq t_{s,Same} \\ t - t_M & \text{if } t_M > t_{s,Same} \end{cases}$$

We can make the same calculations for D_{Alt} , so that D can thus be decomposed as:

$$(6) D \equiv D_{Pre} + D_{Alt} + D_{Same},$$

where D_{Pre} is the length of the relationship pre-legalization. D_{Same} is thus the number of years the couple was together since same-sex marriage became legal in the jurisdiction, and D_{Alt} the number of years together since domestic partnership became legal but before same-sex marriage was legalized there. In estimating our basic model, we include D , D_{Alt} and D_{Same} , with the parameters on the latter two variables thus indicating whether the presence of legislation sanctioning same-sex relations provided any extra fillip to commitment beyond the passage of time in a relationship.

Table 3 presents the distributions of D_{Same} and D_{Alt} in this sample of same-sex couples. Over half of the partnerships came into existence at a time when domestic partnership or same-sex marriage was not legal. Relatively few existed at any time when alternative relationships alone were legal in a jurisdiction; but over 13 percent were functioning for at least 5 years under this legal regime, and the mean of those that were in existence under these laws for at least one year is 5.2 years. Only 6.5 percent of the partnerships existed for 5 or more years under a regime allowing same-sex marriage. The majority (clearly, all those observed in 2016 and 2017, after *Obergefell*) endured for between 1 and 4 years at a time when same-sex marriage was legal, with a mean of 2.5 years among those that we can view as possibly legally married for at least one year. Of the average duration of partnerships of 9.37 years shown in Table 1, 1.68 years passed under a

legalized marriage regime, 1.19 years under a legalized partnership regime, and 6.50 years without legal protections.

Column (1) of Table 4 re-specifies the basic estimating equation by adding D_{Same} and D_{Alt} to the equation shown in Column (1) of Table 2, with the same large vectors of covariates included. Sampling weights are used, and standard errors are clustered on the state indicators. The results are striking: Extra duration of an alternative legal arrangement does nothing extra to increase family income (conditional on all the locational, racial/ethnic and human capital covariates). Indeed, the impact is negative. Additional years of a relationship that could be legally sanctioned as marriage, however, add substantially and statistically significantly to the surplus, about 1 percent for each extra year of a marriage beyond the effect of an extra year of a partnership without the possibility of such legal sanction.⁹ The effect of an additional year under legal same-sex marriage is statistically significantly larger than a year under legal partnership or no sanction at all. The exogenous variation that identifies these effects stems from differences by years of the duration of the relationship under the three regimes (no legalization, legal domestic partnership, legal same-sex marriage) within states and in the year the couple is observed.¹⁰

This specification essentially measures the impact of exposure to an additional year of the possibility of same-sex marriage (or partnership) out of a fixed number of years in the relationship. We are essentially inferring the results of an intention to treat with legal protection, as we cannot know which couples in the sample are legally married (or legally partnered). This may explain the

⁹The evidence that hours worked are affected by the nature of the same-sex partnership means that some of the impact of hours usually worked by each member of the couple on family income partly reflects the impact of the legislation. To examine this possibility, we re-estimate the basic equation excluding usual hours. The estimated impact of D_{Same} on family income hardly changes, falling to 0.00921 (s.e. = 0.00342).

¹⁰Some couples at times and in states that did not sanction domestic partnerships or same-sex marriage might have entered into such arrangements by traveling to jurisdictions that did so, but that are coded as not in our data. This difficulty would bias the estimated impact of D_{Same} toward zero, implying that we understate the impact of legalizing same-sex marriage.

discrepancy between the fraction gay/lesbian couples among tax-filing couples in 2015 estimated by Fisher *et al.* (2018), 0.0048, and the fraction among same-sex couples in the ACS 2015, 0.0073.

This discussion suggests, as would be expected, that the fraction actually treated (who avail themselves of the opportunity for legal marriage) is less than those who might do so—that the treated group, which we cannot observe, is a subset of those for whom the laws can be viewed as having created an intention to treat. Would the estimates in Column (1) differ if we could observe which couples are legally married? Perhaps, especially given Dutch evidence that legalization of same-sex marriage causally leads some existing partnerships to dissolve and others to become formal marriages (Chen and van Ours, 2019). But arguably knowing and using only the intention to treat is superior to knowing which couples were legally married, since the latter group is selected, perhaps consisting of those same-sex couples with partners who see greater advantages to being legally married. We thus measure the impact of offering couples the opportunity to marry, not the impact of their choice whether to take advantage of the opportunity.

This demonstration of the importance of the partnership being legally sanctionable as marriage does not arise from different annual increases in the surplus among longer lasting compared to new legal partnerships, a possible concern given the nature of sorting/matching among same-sex couples. Column (2) of Table 4 adds indicators for the first year of legality of same-sex marriage and of same-sex domestic partnership. Neither indicator is significantly nonzero, and the estimate for the initial year of legal same-sex marriage is tiny. These results support the conclusion that legal same-sex marriage allows the growth of the marital surplus as the duration of the relationship increases after it is formed, not that it jumps up once the couple could be legally married.

It is also possible that legalization encourages new partnerships of couples that are, other things equal, less successful than those couples whose relationship has been legal for one or more years. If so, the coefficients in Column (1) overestimate the growth in the marital surplus with the duration of same-sex marriage. To examine this possibility, we include in Column (3) indicators of whether the relationship has been newly legally sanctioned, either as marriage or domestic partnership. To some extent the concern that newly sanctioned relationships differ from ones that have endured as legal longer is correct: The coefficient estimates on both indicators are negative, and both t-statistics are greater than one (but not statistically significant by usual standards). Nonetheless, adding these indicators to the estimating equation increases rather than decreases the estimated effect of an additional year of legal same-sex marriage on the surplus.

With these re-specifications failing to alter the conclusions based on the estimates in Column (1), we disaggregate the sample by gender. Columns (4) and (5) of Table 4 show the estimates of the model of Column (1) separately for gays and lesbians.¹¹ They suggest that the positive effect observed for all same-sex couples arises chiefly because additional time spent under the protection of same-sex marriage increases the marital surplus of gay couples. Additional years of a legally sanctioned lesbian marriage increase the surplus, but not statistically significantly. Moreover, the increase is only one-third as rapid as among gay couples and is statistically significantly smaller.

¹¹Quadratic terms in D , D_{Same} and D_{Alt} are not statistically significant individually or jointly; but for both D_{Same} and D_{Alt} they suggest the expected concave relationships.

V. Robustness and Selection Considerations

A. *Alternative Specifications*

The estimated positive effects of duration on the surplus cannot arise because the longer-partnered individuals were older and had more time to accumulate assets and generate non-wage income than unpartnered individuals: All the estimates have accounted for the ages of both partners. Other problems may, however, be inducing positive biases to the estimated impacts of the duration of eligibility for legal marriage on the estimated surplus. The simplest ones have to do with the choice of sample and possible mis-specifications. The estimates in Table 4 are based partly on some very long-duration same-sex partnerships, since partners as old as 74 are included in the sample. Also, in many of the older couples one or both partners are not in the labor force. To check whether the results in Section IV are generated by comparisons of the behavior of older to other couples, we re-estimate the equation described in Column (1) of Table 4, restricting the sample to couples with both partners ages 25-59. This eliminates 32 percent of the sample; but the estimated effect of additional years under a same-sex marriage regime actually increases, to 0.01498 (s.e. = 0.00340).¹²

In 66 percent of same-sex partnerships both partners report being in their first marriage. Restricting the sample to those couples and re-estimating the model in Column (1) of Table 4 yields a larger estimate of the impact of D_{Same} , 0.01429 (0.00377). Yet another potential difficulty is that the longest-duration partnerships that existed under the possibility of legal marriage come from Massachusetts. To examine possible biases, we remove the roughly 5 percent of the sample resident there, so that the distribution of D_{Same} includes no observations with more than 9 years,

¹²The estimated impact of additional years under an alternative partnership regime remains negative, statistically insignificant and nearly zero; that of additional years in an unsanctioned relationship is only one-fifth the size of that estimated in Column (1) of Table 4, and nowhere nearly statistically significant. The same greater effect of additional years of legalized same-sex marriage is produced if we restrict the sample to couples with at least one spouse working.

and only 4 percent with at least 5 years of access to same-sex marriage. When re-estimating the equation in Column (1) of Table 4, none of the estimated parameters changes very much; and that on D_{Same} increases to 0.01228 (s.e. = 0.00652). That increase makes sense, since, as Footnote 11 noted, the relationship between S and D_{Same} is slightly concave. Disproportionately deleting longer same-sex marriages increases the estimate of the impact of D_{Same} in a linear specification.

Another potential problem is that the vector X has not accounted for the presence of children in the household. Having children might induce the partners to invest more in their human capital in order to provide for their offspring and might be correlated with the duration of the relationship. To examine the effect of this possibility on the estimated impact of D_{Same} , we re-estimate the basic equation adding the integer variable, number of children in the household. Its addition reduces the estimated impact of D_{Same} to 0.00893 (s.e. = 0.00323), only slightly less than in the main results and still highly significant statistically.

Still another possibility is that the results are driven by behavior in one ethnic group. Re-estimating the basic model for the 68 percent of same-sex couples in which both partners are non-Hispanic whites, the estimated impact of D_{Same} is 0.01017 (s.e. = 0.00384), of D_{Alt} is -0.00598 (s.e. = 0.00261), and of D is 0.00112 (s.e. = 0.00074). Estimating the model over the 15 percent of same-sex couples in which neither partner is a non-Hispanic white, the impact of D_{Same} is 0.02475 (s.e. = 0.01366), of D_{Alt} is -0.00180 (s.e. = 0.00431), and of D is 0.00381 (s.e. = 0.00167). While the estimates are larger among minority same-sex couples, their pattern is like that among majority same-sex couples and cannot be responsible for the results in Column (1) of Table 4.

Given evidence that gays/lesbians sort into same-sex friendly occupations (Plug *et al.*, 2014), it might be that such sorting occurs differentially depending upon whether same-sex marriage has been legalized and the time since legalization. To examine this possibility we re-

estimate the basic equation in Column (1) of Table 4, including indicators for each partner's occupational category (private or public, self-employed, etc.).¹³ Including vectors of indicators of each partner's class as a worker (or not) barely changes the estimated impact of same-sex marriage legalization, to 0.01076 (s.e. = 0.00342).

Another potential problem is that tolerance of same-sex relationships might have been increasing after *Obergefell*, so that our observation that household incomes of same-sex couples rise with the duration of eligibility for same-sex marriage merely reflects increasing tolerance and concomitantly higher labor-market and other returns. Delhomme (2019) provides tabulations by state and year of Pew Foundation polls of respondents' attitudes toward same-sex marriage. These polls do show that tolerance rose during this period, with 53.3 percent of respondents supporting or even strongly supporting same-sex marriage in 2013, rising to 55.2 in 2014, to 57.6 in 2015, to 57.2 in 2016 and to 64.5 in 2017.¹⁴

To examine the possibility that more favorable attitudes rather than the lengthening applicability of state and federal legalization are producing the basic results, we re-estimate the model including indicators of attitudes toward same-sex marriage in each state and year (strongly support, support, oppose or strongly oppose). The estimate of the impact of years since legalization of same-sex marriages changes barely perceptibly, to 0.01056 (s.e. = 0.00336). Moreover, the vector of indicators of attitudes is statistically insignificant with parameter estimates that are tiny.

¹³Detailed information on occupational category is available, but its inclusion in the regression leads to a substantial reduction in sample size because most cells are very sparsely occupied.

¹⁴Obversely, the percentage opposing or strongly opposing same-sex marriage fell during this period from 38.6 to 29.9.

B. Selection

Non-random selection into partnerships could be generating the results in Section IV. For example, perhaps those same-sex partnerships that began before same-sex marriage was legalized are based on differences in the extent of assortative mating compared to those partnerships that began afterward. We can examine differences in the correlations of the main observable determinants of predicted incomes—age and education. We do this using couples only in the first three years of their partnerships to obviate issues of selection out of the relationships and to retain reasonable sample sizes. Also, to avoid partnerships that occurred after same-sex marriage was legalized nationwide, the comparison is restricted to couples observed in the ACS in 2013 or 2014. These restrictions leave 1,029 couples that could possibly have been legally married when or after same-sex marriage was legalized in their jurisdictions and 970 couples whose partnership was formed before it was legal where they currently reside.

Divide the members of these couples into those with or without at least a college education (roughly half of the partners in each group). The within-couple correlation of the indicator of having this much education among partners in couples formed before legalization is 0.42; among couples formed afterward the correlation is 0.35. Partners' ages, on the other hand, are slightly more highly correlated among post-legalization couples ($r = 0.79$) compared to couples formed before legalization ($r = 0.75$). These comparisons provide no strong evidence that couples formed once same-sex marriage was legal were better or worse matched along observable characteristics and thus might have been more or less able to generate a more rapidly increasing partnership surplus in the early years of the potential legality of their relationship.

Another possible difficulty is that couples might migrate to states that are friendly to same-sex partnerships, so that the legal regime facing a couple might be endogenous. The ACS only

provides information on the partners' location one year before their inclusion in the survey. Deleting the 1.3 percent of couples in which one partner lived elsewhere a year before their inclusion in the ACS hardly changes the estimates in Table 4, with the parameter on D_{Same} increasing slightly (to 0.01153, s.e. = 0.00326).¹⁵

Another selection issue—non-random departure from marriage—might also alter the results, since we know that the more rapid development of marital surplus reduces the likelihood of the couple splitting up, perhaps because the partners remain happier with each other (Lundberg, 2012; Guven *et al.*, 2012). Non-random selection out of marriage might be generating the estimated growth of the marital surplus with duration; but the slight concavity that we observe is not consistent with non-random selection. Involuntary selection out of marriage—through death of one partner—is also not producing the results here: the estimate on the variable D_{Same} is larger when couples with even one partner age 50 or over are deleted.

Among same-sex couples the majority of the longer-term relationships proceeded before legality. The estimated slow increase in the surplus before legality is if anything upward biased by any selection out of the partnership among couples whose surplus has been rising more slowly. With only 6.5 percent of the same-sex couples having possibly been legally married for more than 4 years, it seems unlikely that non-random selection out of the partnership is generating the sharp increases in surplus that are observed over the first few years of access to same-sex marriage.

¹⁵There is no significant difference in these one-year migration rates between couples located in states where same-sex marriage was sanctioned before *Obergefell* (1.24 percent) compared to those where it was legalized through *Obergefell* (1.35 percent). Estimating the model over these two roughly equal-sized sub-samples yields similar estimates of the effect of D_{Same} in each; and restricting the former sample to ACS respondents in 2013, 2014 and 2015 also does not alter the estimated impact of D_{Same} .

VI. A Different Indicator of Partners' Commitment

The results thus far have relied upon measuring the surplus family income over what would be predicted given extremely detailed demographic information describing each partner. That the surplus rises with the length of time that the partners could have been together under a legal regime of same-sex marriage indicates the importance of the legal environment in affecting partners' commitment. The surplus income, however, is a very general measure, not a specific indication of the effect of legislation on an outcome that explicitly signifies the role of commitment. Partners' home ownership is a specific measure; and given the transaction costs of owning rather than renting, it does indicate commitment. In this section we thus examine how home ownership among same-sex couples varies with the legal environment that they face.

A. Home Ownership and the Legal Environment

The ACS includes a question about whether a respondent is a renter or an owner (or has an owner-occupied unit under contract). Among the same-sex couples (with partners ages 25-74) 76.1 percent list themselves as owners, a percentage that varies only slightly across the five years in the sample. Using this (binary variable) as an indicator of commitment that might increase with greater duration of a relationship and perhaps to a greater extent when/where same-sex relationships are legally sanctioned, we estimate the same equations for which Table 4 presented results. The estimated parameters are shown in Table 5, with Column (1) listing results of an equation specified exactly as that underlying the results shown in Column (2) of Table 2, and the results in the other columns corresponding to those in Columns (1), (3), (4) and (5) respectively of Table 4.

The estimates for the simple quadratic in partnership duration (Column (1)) demonstrate that the incidence of ownership rises with duration at a decreasing rate (and in this sample is

monotonically increasing over the entire length of the partnerships).¹⁶ Column (2) shows the results for the analog to the main equation discussed in the previous section. As in the estimates shown in Table 4, additional years of a partnership increase the outcome (here, raise the likelihood of home ownership). Spending more of those years under a regime of legalized domestic partnership has no significant positive impact on the likelihood of ownership, just as it did not on a household's surplus income. Additional years of the partnership when same-sex marriage is legal, however, significantly increase the likelihood of home ownership—the same direction as their effect on surplus income shown in Table 4. The results here are a remarkable confirmation of those demonstrated for a different outcome in the previous section.

Column (3) of Table 5 asks whether the results in Column (2) might be attributable to partnerships forming when alternative arrangements, or same-sex marriages, were legalized. Clearly this kind of selection is not producing the results: The estimated impacts of additional duration of a partnership under legal regimes of domestic partnership or same-sex marriage hardly change between the columns; and the estimated impacts of indicators of entry into a relationship in the year when legalization occurred are statistically insignificant. Results in the final two columns separate gay and lesbian couples. As in Table 4, the impact of legalization of same-sex marriage has a greater impact upon the increase in gay couples' likelihood of home ownership with duration, although here the estimates do not differ statistically from those for lesbian couples.

¹⁶Including family income as an additional regressor changes the relationship to partnership duration by less than 1 in the third significant digit in the estimated parameters on D and D^2 . The impact of family income is, not surprisingly, positive and very significant statistically, even with all the covariates included. This same absence of change when family income is added to the equations pervades all the results presented in this section.

B. Robustness of the Estimates of the Legislative Impact on Home Ownership

To examine the robustness of these estimates, we consider the same issues as in Section V.A, presenting the estimated impacts of D_{Same} , in each case using the equation described in Column (2) of Table 5 as the base. Eliminating couples with at least one partner age 60 or over raises the estimated impact of a year of legalized same-sex marriage to 0.01506 (s.e. = 0.00425). Restricting the sample to couples with both partners in their first marriage hardly changes the estimated impact of D_{Same} , 0.01279 (0.00370). Using couples that reside outside Massachusetts produces a larger estimate than in Table 5, 0.01693 (s.e. = 0.00313).

Accounting for the presence of children in the household slightly reduces the estimated impact of D_{Same} to 0.01193 (s.e. = 0.00345), Restricting the sample to non-Hispanic white couples changes the estimated impact of D_{Same} to 0.01266 (s.e. = 0.00371), while restricting it to couples with neither partner non-Hispanic white raises the estimated impact of years under a legal same-sex marriage regime to 0.01743 (s.e. = 0.00628), Accounting for attitudes toward same-sex marriage using the Pew polling results also has only a minute impact on the estimated effect of D_{Same} , with the parameter estimate becoming 0.01280 (s.e. = 0.00370). These results all follow very closely the same pattern as the robustness checks in Section V.

VII. A Test for Non-random Correlated Variation

Additional years of a same-sex relationship spent under a regime of legal same-sex marriage increase the household's income beyond what is predicted by large vectors of their demographic characteristics and increase the likelihood of home ownership. Additional years spent under legalized alternative arrangements for same-sex couples add little to these outcomes. What if, however, other unmeasurable determinants of income and home ownership happen to be correlated with the timing and location of the passage of legislation sanctioning same-sex marriage

(or alternative arrangements), a correlation that might be generating the estimates in Tables 4 and 5?

A. A Placebo Test Using Opposite-sex Couples

To account for this potential difficulty, we estimate the same equations as in those tables, except we do so over the samples of opposite-sex married couples from the ACS 2013-17, again with both partners under age 75. We present these estimates in Columns (2)-(5) of Table 6. In Column (1) we list the estimates describing the marital income surplus as a quadratic function of the duration of the marriage. This equation is specified exactly like that in Column (2) of Table 2, but the results are completely different. The surplus (family income in excess of that predicted by very large vectors of demographic covariates) rises monotonically, but at the predicted decreasing rate, as the duration of the marriage increases¹⁷ Among same-sex couples there was a much weaker relation between this outcome and the duration of the couple's reported time together.

To examine the apparent effects of legal sanctioning of same-sex relationships on opposite-sex couples, Column (2) presents estimates of the basic equation describing household income, and Column (4) presents estimates describing home ownership, both based upon couples with both partners under age 75. Extra years of an opposite-sex marriage spent at times and in locations where same-sex marriage was legal increase the income surplus and increase the likelihood of home ownership. There are positive, but statistically insignificant effects of additional years of such marriages spent under regimes of legalized alternative arrangements for same-sex partners.

One might be concerned that the samples of opposite- and same-sex partners are inherently different, if for no other reason than, as shown in Table 1, the average duration of the former is

¹⁷Given that marriages that are less successful are more likely to terminate and given the length of opposite-sex marriages in this sample, there may be some upward bias in the cross-section relationship between earnings and these marriages' duration (Korenman and Neumark, 1991).

over twice that of the latter. To account for this potential non-comparability, we re-estimate the models shown in Columns (2) and (4) using only opposite-sex couples married fewer than 20 years. This cuts the sample in half and yields a mean duration of reported marriage of 9.47 years, almost identical to that of the entire sample of same-sex couples.¹⁸ Estimates over this reduced sample are shown in Columns (3) and (5) of Table 6. The only major change resulting from excluding long-term married opposite-sex partners is that the estimate on D_{Alt} becomes more positive and statistically significant. The estimated effects of D_{Same} on both outcomes remain significantly positive.

B. The Net Effect of Legislation on Same-sex Couples

The results in this Section suggest that the apparent relationship between the time a same-sex couple has spent under a regime of legalized marriage and the couple's income surplus and likelihood of home ownership may be due to correlated non-random factors affecting these outcomes. To infer whether there is any special effect on same-sex partnerships of legalizing same-sex marriage (or alternative protections for them), we calculate:

$$(7a) \quad \Delta_{Same} = (\beta_{SameSex,Same} - \beta_{OppSex,Same}),$$

and

$$(7b) \quad \Delta_{Alt} = (\beta_{SameSex,Alt} - \beta_{OppSex,Alt}),$$

where the $\beta_{SameSex,k}$ are the parameter estimates from Tables 4 and 5, and the $\beta_{OppSex,k}$ are from Table 6.¹⁹

¹⁸Not surprisingly, the distributions of D_{Same} and D_{Alt} are quite similar in this sample to those in the sample of same-sex couples, with 42.6 percent of these opposite-sex couples observed under regimes without or with just-enacted same-sex marriage, and 69.4 percent observed in regimes without or just-enacted alternative legal protections.

¹⁹The estimated Δ_i are equivalent to interaction terms of the D_i with an indicator of same-sex couples in equations specified over both types of couple and in which a full set of interactions of all the covariates is also included.

Table 7 lists estimates of the Δ_i . Columns (1) and (2) are based on comparisons of the marital income surplus and the incidence of home ownership to all married opposite-sex couples, Columns (3) and (4) to those opposite-sex couples whose marriage occurred fewer than 20 years in the past. There is no evidence that additional years of a relationship spent under alternative legal arrangements, such as domestic partnerships, raise the values of the outcomes; indeed, the impact on the income surplus is significantly negative. Additional years of a relationship spent under a regime of legalized same-sex marriage, however, significantly increase both the income surplus and the likelihood of owning a home.

Using the estimates of Δ_{Same} based on the comparisons in Columns (3) and (4) of this table, consider the estimated effect of moving from a regime where same-sex marriage has just been enacted to one where such marriages have been legal for 3 years (e.g., comparing the situations in most states from 2015 to 2018). This is equivalent to moving from the 17th to the 87th percentile of the distribution of D_{Same} in the sample of same-sex couples. These 3 additional years together with the possibility of strong legal protection raise the couple's surplus household income by 1.7 percent, and they increase its likelihood of owning a home by 3.6 percentage points (on a mean of 76 percent).

VIII. Conclusion and Implications

Among same-sex partners, unlike among opposite-sex partners, there is almost no relation between the duration of their partnership and the excess of their family income, conditional on their demographic characteristics. The same is true for their likelihood of home ownership. If more of their time together was spent with the possibility of legalized alternative arrangements, that too does not increase income or home ownership. Access to additional time in a legally sanctioned same-sex marriage, however, increases the excess of household income over its predicted value,

identified as a marital surplus; and it also increases the likelihood of home ownership. Stated differently, taking two otherwise observationally identical same-sex couples who have been partnered for the same length of time, the couple whose partnership spent more time under the institution of legalized same-sex marriage has a higher family income and a greater probability of owning a home. The findings are consistent with the role of increased certainty about the length of a horizon leading to increased commitment to the relationship and growing incentives to invest in activities that raise the benefits from it.

While much of the discussion about the benefits of legalization of same-sex marriage has dealt with access to partners' health insurance or issues of inheritance, the fundamental ability to develop a relationship is a basic economic benefit from legalization. It does not arise when alternative partnerships are legalized, indicating that only with legalized marriage do the same benefits accrue to same-sex partners that have been available to opposite-sex partners since Western legal systems were established. The results here, coupled with prior evidence that legalization does not reduce marriage rates among opposite-sex couples and does not lower fertility, suggest that legalizing same-sex marriage increased the well-being of same-sex couples without reducing the well-being of opposite-sex couples. Legalization appears to be generally welfare-enhancing.

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Table 1. Descriptive Statistics of Couples, ACS 2013-17*

	Opposite-Sex	Same-sex		
		All	Gay	Lesbian
Average partners':				
Marriage Duration	20.71 (13.86)	9.37 (12.44)	9.70 (12.51)	9.06 (12.33)
Age	49.55 (12.63)	48.87 (12.35)	49.66 (11.98)	48.17 (12.59)
% HS Grad	23.8	15.7	15.5	15.9
% Some College	29.3	27.8	26.4	29.0
% College	22.7	25.8	28.2	24.0
% Graduate Degree	14.9	25.7	24.9	26.4
% Non-Hispanic White	71.5	74.7	73.7	75.5
% Hispanic	13.1	11.6	12.8	10.6
% Afr.-American	7.1	6.6	5.4	7.7
% Asian-American	6.4	4.4	5.6	3.3
N =	2,668,134	19,563	9,453	10,110

*All couples with both partners ages 25-74, with available demographic and income information, marital indicator not flagged, and not living in group quarters. Standard deviations in parentheses.

Table 2. Estimation of the Relation Between the Marital Surplus and Stated Partnership Duration, ACS 2013-17, Dep. Var. ln(Family Income)*

Ind. Vars.:	All		Gay		Lesbian	
Duration	0.00109 (0.00049)	-0.00006 (0.00134)	0.00119 (0.00087)	-0.00201 (0.0234)	0.00065 (0.00067)	-0.00029 (0.00197)
(Duration/10) ²	-----	0.00003 (0.00003)	-----	0.00008 (0.00005)	-----	0.00002 (0.00005)
Adj. R ²	0.439	0.439	0.427	0.427	0.454	0.454
N=	19,563		9,453		10,110	

*Standard errors in parentheses. Includes for each partner usual weekly working hours, indicators of race/ethnicity, indicators for each year of age, for each level of educational attainment, for year in sample, for state of residence, and for metropolitan/rural location by type.

Table 3. Same-sex Partnership Duration Pre-Legal or While Partnership or Marriage Allowed, Percent Distributions, ACS 2013-17 (N = 19,563)

Duration (Years)	D_{Same}	D_{Alt}
0	35.1	76.5
1-4	58.4	10.2
5-9	5.0	9.7
10-14	1.5	3.6

Table 4. Marital Surplus Since Partnerships Legal (Same-sex Partners), ACS 2013-17, Dep. Var.: ln(Family Income)*

	All	All ^a	(All) ^b	Gay	Lesbian
D _{Same}	0.01057 (0.00333)	0.01032 (0.00396)	0.01290 (0.00403)	0.01675 (0.00602)	0.00545 (0.00502)
Initial year of legality	-----	0.00168 (0.01810)	-0.02585 (0.01677)	-----	-----
D _{Alt}	-0.00356 (0.00163)	-0.00548 (0.00205)	-0.00380 (0.00166)	-0.00457 (0.00274)	-0.00222 (0.00264)
Initial year of legality	-----	-0.02188 (0.02728)	-0.06806 (0.06081)	-----	-----
D	0.00120 (0.00052)	0.00115 (0.00054)	0.00092 (0.00054)	0.00127 (0.00084)	0.00073 (0.00068)
Adj. R ²	0.439	0.439	0.440	0.428	0.454
N=	19,563	19,563	19,563	9,453	10,110

*Standard errors in parentheses clustered on states. Includes for each partner usual weekly working hours, indicators of race/ethnicity, indicators for each year of age, for each level of educational attainment, for year in sample, for state of residence, and for metropolitan/rural location by type.

^aIn Column (2) the legality variables are for observations with no duration during the time of legality (included as 0 in Table 3).

^bIn Column (3) the legality variables are for observations where the relationship began in the first year of legality—were entered into when partnerships or marriages were recognized.

Table 5. Housing Ownership Since Partnerships Legal (Same-sex Partners), ACS 2013-17, Dep. Var.: Own House*

	All	All	All^a	Gay	Lesbian
D _{Same}		0.01272 (0.00364)	0.01301 (0.0406)	0.01462 (0.00352)	0.01172 (0.00525)
Initial year of legality		-----	-0.00327 (0.01368)	-----	-----
D _{Alt}		0.00216 (0.00188)	0.00206 (0.0194)	-0.00191 (0.00226)	0.00606 (0.00224)
Initial year of legality		-----	0.00397 (0.04202)	-----	-----
D	0.00397 (0.00078)	0.00128 (0.00043)	0.00125 (0.00048)	0.00124 (0.00048)	0.00121 (0.00045)
D ²	-0.00006 (0.00002)	-----	-----	-----	-----
Adj. R ²	0.220	0.221	0.221	0.206	0.247
N=	19,563	19,563	19,563	9,453	10,110

*Standard errors in parentheses clustered on states except in Column (1). Includes for each partner usual weekly working hours, indicators of race/ethnicity, indicators for each year of age, for each level of educational attainment, for year in sample, for state of residence, and for metropolitan/rural location by type.

^aIn Column (3) the legality variables are for observations where the relationship began in the first year of legality—were entered into when partnerships or marriages were recognized.

Table 6. Marital Surplus Since Same-Sex Partnerships Legal (Opposite-sex Married Couples Partners), ACS 2013-17*

	Dep. Var:	Ln(Family Income)			Homeowner	
		All	All	D<20	All	D<20
D _{Same}	-----		0.00288 (0.00157)	0.00485 (0.00182)	0.00872 (0.00166)	0.00713 (0.00115)
D _{Alt}	-----		0.00001 (0.00035)	0.00053 (0.00038)	0.00496 (0.00253)	0.00358 (0.00117)
D		0.00629 (0.00050)	0.00380 (0.00009)	0.00363 (0.00036)	0.00278 (0.00014)	0.00737 (0.00032)
D ²		-0.00005 (0.000001)	-----	-----	-----	-----
Adj. R ²		0.409	0.409	0.188	0.193	0.188
N=		2,668,134	2,668,134	1,281,714	2,676,303	1,285,609

*Standard errors in parentheses clustered on states except in Column (1). Includes for each partner usual weekly working hours, indicators of race/ethnicity, indicators for each year of age, for each level of educational attainment, for year in sample, for state of residence, and for metropolitan/rural location by type.

Table 7. Difference in Impacts of Extra Years of Partnership Under Different Legal Regimes on Measures of Commitment, Same-sex vs. Opposite-sex Couples, ACS 2013-17*

	Same-sex couples compared to:			
	All married opposite-sex		All with D<20	
	Income surplus	Home owner	Income surplus	Home owner
Years Under Regime of:				
Same-sex marriage	0.00769 (4.85)	0.00400 (2.38)	0.00572 (3.09)	0.00559 (4.57)
Domestic partnership	-0.00357 (9.59)	-0.00281 (1.11)	-0.00409 (9.51)	-0.00142 (1.20)

*Absolute values of t-statistics in parentheses below the estimated differences. The calculations are based on the estimates in Tables 4, 5 and 6.