Changes in Family Welfare from 1994 to 2012: A Tale of Two Decades

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The decades of the 1990s and the 2000s have provided startlingly different experiences for American families. While the 1990s were largely characterized by the continuation of the economic expansion that started in the 1980s, the experience of the "great recession" has dominated the decade of the 2000s. Our purpose in this paper is to document the changing welfare of American families across these two decades.

Earlier work (Hotchkiss, Kassis, and Moore, 1997) found that the rising female/male wage ratio from 1983 to 1993 was materially detrimental to the average dual earner family and roughly equivalent to the welfare loss of an hour of leisure per week. However, in that analysis, it was also found that, due to the wage changes of this period, families in which the wife was in a higher earning category than her husband were materially better off at the end of this period. [1]

The continued decline of the gender wage gap from 1994 through 2012 (as seen in Figure 1), begs for an updated analysis on the implications of this ongoing trend for the welfare of the average family across two very different time periods. There is every reason to suspect that this continued wage gap decline has contributed to the growing share of households in which the wife earns more than the husband.[2] We are interested in how family welfare has changed over time in light of these developments, and in the context of which family member is the dominant wage earner. *[Figure 1 near this paragraph]*

I. Methodology and Data

To obtain estimates of the changes in family welfare, family labor supply decisions are modeled in a neoclassical joint utility framework. This can be thought of as a reduced-form specification of family decision making, and it has the advantage of giving us a clear-cut

[1] The previous analysis only considered dual-earner families, whereas the analysis in this paper allows for the presence of a non-working spouse.
[2] See "Breadwinner Moms," http://www.pewsocialtrends.org/2013/05/29/breadwinner-moms/

expression of family welfare that allows for cross wage effects on each member's labor supply decisions, hence effectively capturing the impact of the declining wage gap (or any other wage or non-labor income changes) on married-household families.

The assumption of joint family utility (or, "collective" utility) is often rejected in favor of a bargaining structure for household decisions making (for example, see McElroy 1990 and Apps and Rees 2009). However, there is evidence that the choice of structure for household decision making has very little implication for conclusions in micro simulation exercises (see Bargain and Moreau 2003 and Blundell et al. 2007). The joint utility framework is used here in order to evaluate welfare changes of the family (as opposed to evaluating the utility of individuals).

Within the framework of the neoclassical family labor supply model, a family maximizes a utility function that represents the household welfare. Assuming, for simplicity, that there are two adult household members (husband and wife), the family chooses levels of leisure for each member and a joint consumption level in order to solve the following problem:

(1) $\max_{(L_1,L_2,C)} U = U(L_1, L_2, C)$

$subject\ to\ C = w_1 h_1 + w_2 h_2 + Y$.

Define T as total time available for an individual; $L_1 = T - h_1$ will be referred to as the husband's leisure, and $L_2 = T - h_2$ will be referred to as the wife's leisure; h_1 (h_2) is the labor supply of the husband (wife); *C* is total money income (or consumption with price equal to one); w_1 (w_2) is the husband's (wife's) market wage; and *Y* is non-labor income. Although we refer to L_1 and L_2 as the "leisure" of the husband and wife, respectively, they actually correspond to all uses of non-market time, including home production activities.

The solution to the maximization problem in equation (1) can be expressed in terms of the indirect utility function, $V(w_1, w_2, Y)$, which is solely a function of the wages of the husband

and wife and non-labor income of the family. Then, by totally differentiating the indirect utility function, we simulate the change in welfare across each decade that results from changes in optimal hours of work and consumption in response to changes in wages (dw_1, dw_2) and non-labor income (dY) over the time period (complete details are in our working paper):

(2) $V(dw_1, dw_2, dY) = -U_1 dh_1^*(dw_1, dw_2, dY) - U_2 dh_2^*(dw_1, dw_2, dY) + U_3 dC^*(wd_1, dw_2, dY)$

where U_1 (U_2) is the family's marginal utility of the husband's (wife's) leisure and U_3 is the family's marginal utility of consumption. Equation (2) makes it clear that the change in welfare not only depends on the individual labor supply responses, but also on the family's marginal evaluation of a change in leisure and non-labor income.

There are many divergent empirical issues raised in the literature related to estimating labor supply responses to wage changes, i.e., estimates of labor supply elasticities. The goal here is to produce reasonable labor supply elasticities that are consistent with the literature. Toward that end, the methodology adopted takes the simplest approach possible while maintaining basic theoretical and empirical integrity. Details of the estimation procedure, assumptions made, and their implications are found in our working paper. The estimation strategy allows for either one or both of the spouses to be non-working and follows the strategy employed by many others (for example, see Ransom 1987, Hotchkiss et al. 1997, Heim 2009, Hotchkiss et al. 2012).

We make use of the Current Population Survey (CPS) from 2012 and 2003 for the analysis in this paper. The CPS is administered by the U.S. Bureau of Labor Statistics each month to roughly 60,000 households and has a longitudinal aspect that allows us to match observations from the outgoing rotations groups (those for whom detailed labor market information is available) in March, April, May, and June to the March supplement survey in order to obtain detailed non-labor income for each family. We use multiple months of data in

order to expand our sample size. We restrict the sample to eliminate outliers, the self-employed, and those likely to be contemplating retirement (see the full working paper for details).

Based on husbands' and wives' hourly wages, families are placed in one of three groups: (1) husband and wife have similar wages (within 0.2 log points, or 20 percent, of one another), (2) the husband's wage is greater (0.2 log points higher) than his wife's wages, and (3) the wife's wage is greater (0.2 log points higher) than her husband's wage.[3] Separate utility function parameters are estimated for families in each of these groups for both 2012 and 2003. For those cases where husband or wife is not working, their predicted wages are used to classify them with respect to family type. [4] Wages and non-labor income are in real terms, reflecting the end-point of each decade. Select sample averages by family type are shown in the top half of Table 1.

[*Table 1 near this paragraph]*

As expected, labor supply is lower for both husbands and wives across all family types in 2012 than in 2003. Families in which the wife earns the higher wage have the fewest children; the highest non-labor income; and the highest education, wages, and age among wives. The change in real wages (dw1 and dw2) are average wage changes, calculated based on a family member's age and education. Generally, real wages and non-labor income were rising in the 1990s (more so for women) and declining in the 2000s (less so for women).

II. Results

The maximum likelihood labor supply parameter estimates, estimates of marginal utilities and labor supply elasticities are all contained in the working paper and are as expected. Income

[3] Using wage differentials between husband and wife of 0.15 and 0.25 log points resulted in practically identical results and conclusions.

[4] Parameter estimates from a standard selectivity-corrected wage equation (Heckman 1974) are used to predict market wages for nonworking men and women based on their observable characteristics.

elasticities are negative for both husbands and wives; cross-wage elasticities are negative (indicating that husband's and wife's leisure are substitutes); and own wage elasticities are positive, except for a couple of instances for the husband in the earlier time period, when his own wage elasticity is a very small negative number. The estimated own- and cross-wage elasticities are consistent with estimates found in the literature for both men and women (see the working paper for references).

A. Changes in Family Welfare, 1994-2003

With regard to changes in family welfare, the results for the two different time periods are dramatically different from one another. These changes are illustrated in Figure 2. The 1994-2003 period is characterized by generally rising wages and non-labor incomes with the female wage rising more that the male wage for both the full sample and all sub groups (see Table 1). In the full sample, unsurprisingly, this leads to a significant rise in family welfare equivalent to about $204 per week for the average family (in 2012 dollars). This indicates that the average 2003 family is better off with the 2003 wage and non-labor income package than it would have been with the 1994 wage and income package. The family type in which the wife earns the higher wage enjoyed the largest dollar equivalent welfare gain over this time period -- about $254 per week. However, the period from 1994-2003 was good for all family types considered.

[Figure 2 near this paragraph]

To isolate the impact of the rising female/male wage ratio we also calculate the welfare change holding non-labor income constant. This amounts to setting all dY terms in equation (2) to zero and re-calculating dV. For the typical family in the full sample, the wage changes for this period were responsible for approximately 36% ($74/$204) of the welfare change, implying that the larger share of the welfare gain was due to non-labor income increases. The ordinal ranking

of welfare changes of the sub groups was not changed by setting non-labor income to zero, with families in which the wife earns the higher wage experiencing the greatest welfare gain over the time period. Each of the values is statistically different from one another across family types based on a standard z-test.

B. Changes in Family Welfare, 2003-2012

While overall average real hourly wages are modestly rising during this period, once we control for age and experience, the calculated real wage changes for men and women are mostly negative (see Table 1, and Rios-Avila and Hotchkiss 2014 for an illustration of this phenomenon more generally). The exception is among women who earn a higher wage than their husbands. The female/male wage ratio continues to rise during this period as husbands' wages fall by a greater amount than their wives' wages. This, along with the declining non-labor income produces declines in calculated family welfare for the full sample of about $105 per week (also in 2012 dollars) -- regardless of subgroup, all families experience welfare losses that fit within a fairly narrow band of $102-$111 per week; while these values are substantively very close, they are statistically different from one another, based on a standard z-test.

As with the earlier time period, we set non-labor income to zero (dY=0 in equation 2) in order to isolate the impact of wage changes alone. For the full sample, wage changes alone only account for 10% ($11/$105) of the welfare decline. Families were much more negatively impacted during this period by non-labor income changes than by wage changes. When we look at the three subgroups holding non-labor income to zero, we find, not surprisingly, that families in which the wife earns more than the husband experience the smallest welfare decline, which, in fact, is not statistically different from zero (note that female wages rose modestly for this group).

III. Conclusion

Our findings confirm that even though the decades of the 1990s and 2000s are in many ways different, the continued closing of the female/male wage gap has allowed families in which the wife earns a higher wage than her husband to fare relatively better, in terms of welfare improvements, across both decades. The 1994-2003 period, being one of generally rising wages and non-labor income, allowed all families to experience welfare gains. By contrast, the predominantly declining wages and non-labor income of the 2003-2012 period left all families worse off, as would be expected.

Considering these results along with those found for the 1983-1993 period in Hotchkiss, Kassis, and Moore (1997) we find that the material well being of the American family has been in decline for two-thirds of the entire period of 1983-2012.[5] The expansion of the 1990's, captured in our data in the 1994-2003 period, was the only period in recent decades in which the American family has experienced welfare gains from changes in wages and non-labor income. No matter a person's political leaning, this can't be good news. Across all three time periods, change in non-labor income only exacerbates the impact of changes in wages. This means that for the majority of the time period, real wage declines have significantly negatively impacted family welfare. If we are concerned about the welfare of working families, considerable effort needs to be undertaken to identify the cause of declining real wages in the American labor force.

[5] Hotchkiss and Moore (2002) found a modest rise in welfare during the 1980s among families in the very top of the income distribution.

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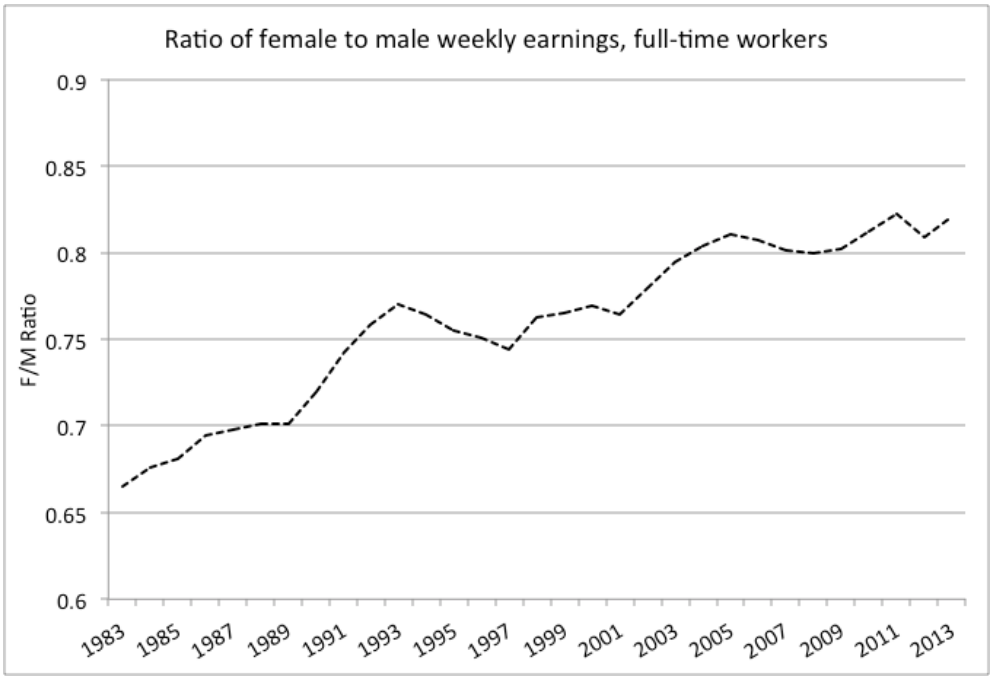
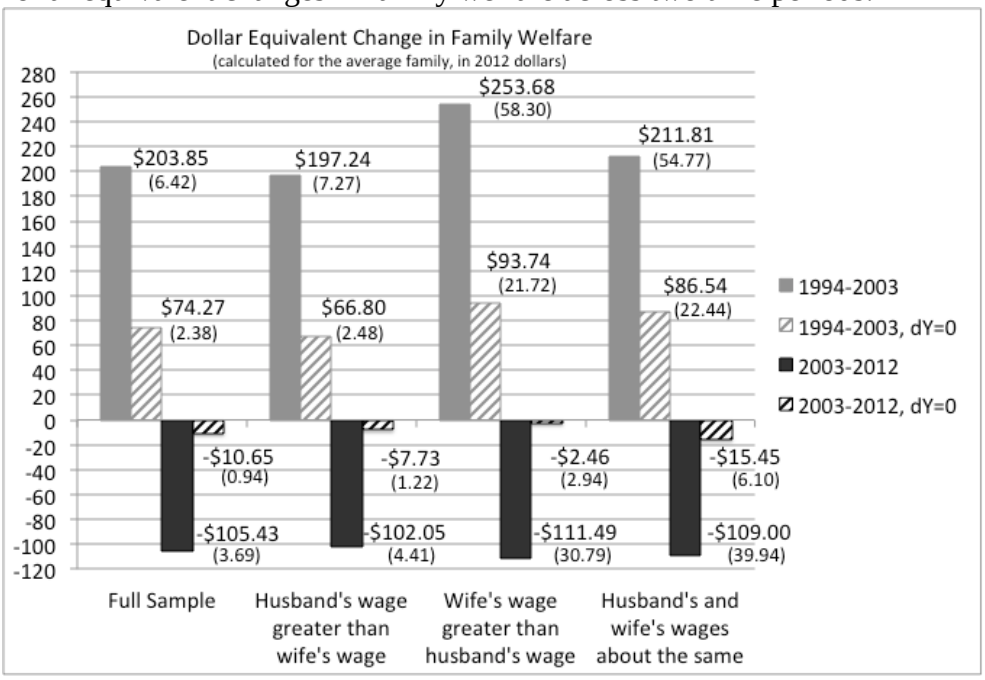
Figure 1. Median male and female weekly earnings of full-time workers and the female/male earnings ratio.



Note: Authors' calculations, U.S. Bureau of Labor Statistics, Current Population Survey (http://www.bls.gov/cps/earnings.htm#demographics)

Figure 2. Dollar equivalent changes in family welfare across two time periods.



Note: About the same wage means husband and wife wages are within 0.2 log points of one another; husband wage greater (wife wage greater) means that the husband's (wife's) wage is greater than the wife's (husband's) wage by more than 0.2 log points. Bootstrapped (250 iterations) standard errors in parentheses.

Table 1. Estimated utility function parameters and labor supply elasticities.

	2003				2012			
Spouse relative wages:	All	w1>w2	w2>w1	w1≈w2	All	w1>w2	w2>w1	w1≈w2
Husband Average Characteristics								
Husband working = 1	0.79	0.81	0.73	0.78	0.78	0.80	0.73	0.77
Husband wage (w1), incl. imputed	23.40	27.13	15.27	19.17	24.31	28.24	16.17	19.99
Husband hours (h1), if working	42.76	43.07	42.16	42.58	42.52	42.89	41.73	42.43
Husband age	44.63	44.37	46.17	44.28	46.28	46.03	47.31	46.14
Husband black = 1	0.06	0.05	0.09	0.08	0.07	0.05	0.10	0.09
Husband college graduate = 1	0.32	0.36	0.26	0.27	0.36	0.41	0.28	0.31
Wife Average Characteristics								
Wife working = 1	0.65	0.54	0.88	0.79	0.64	0.53	0.87	0.75
Wife wage (w2), incl. imputed	16.34	12.81	26.35	18.83	17.30	13.33	28.17	19.62
Wife hours (h2), if working	36.74	35.18	38.72	38.25	37.04	35.64	38.77	38.40
Wife age	42.51	42.31	43.81	42.20	44.34	44.15	45.35	44.08
Wife black = 1	0.06	0.04	0.08	0.07	0.06	0.04	0.09	0.08
Wife college graduate = 1	0.30	0.25	0.45	0.33	0.38	0.32	0.56	0.41
Family Average Characteristics								
Family non-labor income (Y)	651.31	587.90	989.28	591.03	625.31	642.18	668.63	546.83
Number of children less than 18	1.03	1.14	0.81	0.91	0.97	1.07	0.77	0.84
Number of families	16,606	10,097	2,593	3,916	16,644	10,045	2,861	3,738
Change in husband's wage (dw1)	$1.08	$1.25	$0.73	$0.87	-$0.24	-$0.17	-$0.36	-$0.35
Change in wife's wage (dw2)	$1.27	$1.22	$1.41	$1.29	-$0.16	-$0.27	$0.22	-$0.15
Change in family non-labor income (dY)	$101.94	$101.47	$114.56	$94.81	-$92.99	-$91.28	-$102.56	-$90.25

Notes: Dollar values are in real 2012 dollars for comparison. Simulated wage changes from the previous decade are gender, age, and education specific. w1≈w2 means husband and wife wages are within 0.2 log points of one another; w1>w2 (w2>w1) means that the husband's (wife's) wage is greater than the wife's (husband's) wage by more than 0.2 log points.