LUND UNIVERSITY
School of Economics and Management

Master program in Economic History

What are the Economic Consequences of Divorce? An income study focusing on divorced men and women in the UK 1992-2008

Sam Jenkinson

ehi14sje@student.lu.se

Abstract: Research has consistently show divergent economic outcomes between men and women following divorce. Typically men fare better with either small declines in income or even small gains, whereas women and children face tougher financial penalties. These findings however have not been consistent both in their amount and also their explanations and so valid questions remain. Through multivariate regression using the British household panel survey (BHPS) between 1992-2008, this paper seeks to examine key theories which attempt to explain the greater female income divorce penalty; including the unequal distribution of costs associated with children, propensity and association of working part-time and the implication of work place absences due to family care during marriage on human capital and lower incomes following divorce. This paper finds a consistent financial penalty of around 20% for divorced women and a small premium for divorced men which is sensitive to the inclusion of child custody within econometric models. In addition the penalty associated with divorced women appears sensitive to variables which seek to model lower human capital arising from reduced labour supply during marriage, though much more analysis and caution with regards to this finding and it's generalizability is advised.

Key words: Divorce, Gender, Human capital, Income

Introduction & History

Today and historically the topic of the gender disparities in the economic consequences of divorce has been a critical and much debated one. Underlying these debates has been concern over the rise of divorce witnessed broadly until the 1990s, the association between divorce, lone parenthood and poverty and also the frequent poorer educational and social outcomes for the children of divorce (Andreβ 2006, Assave et al 2007, Burkhauser, Duncan & Berntsen 1990, De Wilde 2003, Fausta et al 2009, Hoffman & Duncan 1985, 1988, Jarvis & Jenkins 1999, Peterson 1996, Regt et al 2012, Smock et al 1999, Uunk 2004, Uunk & De Wilde 2008, Weitzman 1985). Many current studies have consistently shown how financially men and women fair differently, though to different degrees across a variety of contexts, even after controlling for economically relevant characteristics (Andreβ 2006, Assave et al 2007, Burkhauser, Duncan & Berntsen 1990, De Wilde 2003, Fausta et al 2009, Hoffman & Duncan 1985, 1988, Jarvis & Jenkins 1999, Peterson 1996, Regt et al 2012, Smock et al 1999, Uunk 2004, Uunk & De Wilde 2008, Weitzman 1985). Typically women fair much worse than men on financial measures alone, with men's incomes either deteriorating less, or even increasing once they have less with whom to share. When one considers how important divorce is as a move into lone parenthood and the intendant association with child poverty, likelihood to seek social security and state welfare, the relevance and pertinence of questions over precisely how much and why is clear.

For divorcees financial support is available from three main sources; labour market earnings, welfare support and child or spousal maintenance payments from ex partners. In different contexts welfare support and child maintenance payments have been shown to narrow the gap between genders, however in most cases, with welfare and maintenance payments often low, the gender gap in the economic consequences of divorce persists (Andreβ 2006, , Assave et al 2007, De Wilde 2003, Jarvis & Jenkins 1999, Uunk 2004). Consequently what this means, and particularly in the United Kingdom, is that labour market earnings are the predominant source of income for divorcees and it is this difference between divorced men and women which this study seeks to quantify and explain.

This study seeks to examine and quantify firstly, the overall difference between men and women following divorce but also the link between the custody of children, reduced labour supply and loss of human capital during marriage with income declines for women following divorce. Typically it is much more likely that mothers retain custody of children following divorce and this can affect their incomes through a variety of ways, including the hours available to work, their financial cost, or simply the stress of working and raising a family alone. The cost of childcare and its availability can theoretically often also effect mothers labour supply leading to reduced, flexible or around school time hours which can have a relationship with reduced household income via available and suitable jobs ((Budig and England 2001, Budig et al 2012). Additionally many mothers can have work-place absences during marriage to raise a family, either fully, working part-time or taking a career secondary to their partners which can impact their incomes through reduced labour market experience and human capital. It is these three things which this study seeks to quantify with regards to the United Kingdom between 1992 and 2008, therefore providing a relatively large, compared to other UK studies, and long study of UK income data

These four research questions as to why and how much are highly relevant, as an analysis of the role of divorces as a route into lone parenthood and poverty in the 1980s and the years directly prior to the sample used here shows. In the year directly prior to this sample, 1991, single parent female families made up 17.5% of all families with dependent children and roughly a third, at 6.3% were from divorce (Lewsis & Kiernan 1996). Research on these individuals economic status shows acutely why this is relevant in that 59% were receiving state benefits, 60% of all families with children receiving means tested income support were lone mothers and only one in three of these received regular maintenance from fathers (Lewis & Kiernan 1996). When one also considers that this maintenance was also typically low, representing only 7% of income at the time of analysis, the questions over exactly what, quantitatively, the economic consequences of divorce are for women and the reasons why are important (Lewis and Kiernan 1996).
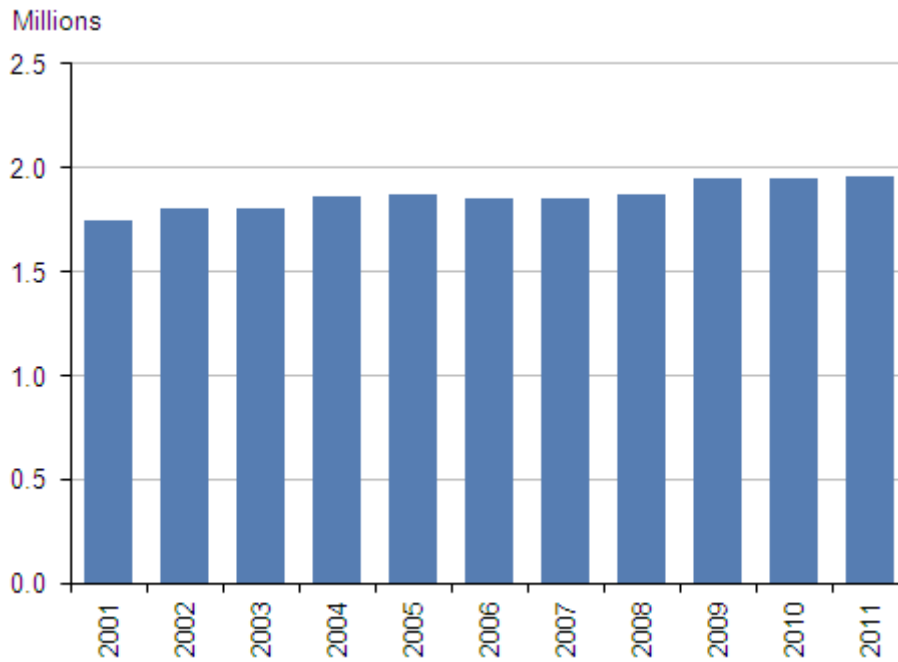
Figure 1 Lone Parent families in the UK. Source: Office for National Statistics (ONS) 2012.

Today many of these figures have increased, but the story is largely similar. Lone parent families, as can be seen from figure one, have steadily grown to almost two million people and representing 26% of all families with dependent children (Office for National Statistics, ONS, 2012). Additionally 92% of all lone parent families in the UK were female and only 8% male. When compared to other European countries the UK has both the highest rate of single parent households at 20.4% compared to a European mean of 9.1%, but also of single parent female households at 18.1% to a European mean of 9.1% (European Labourforce survey 2010). When one looks at the distribution of children within households the UK also has the highest number of children in single parent households at 28.1% of all children coming from single female homes compared to a European average of 16% (European Labourforce survey 2010). This means the UK population is arguably particularly prone to any negative effects of the economic consequences of divorce, with the highest number of single parent households, single female parent households and children within single parent households.

These figures make these research questions over how much and why even more important when one considers available research on the association of lone parenthood on the quality of life of the parents and children involved, beyond the financial reduction

associated with divorce. A study in Sweden found lone mothers have been shown to be at greater risk of premature death owing to the financial and emotional stress of parenting alone (Weitoft, Haglund & Rosén 2000). They have been shown to experience a greater volume of health and financial difficulties which, it has been argued, leads to a greater likelihood of mortality through suicide, violence and alcohol related deaths (Weitoft, Haglund & Rosén 2000).

In addition there has been ample evidence of the relationship between divorce and poor outcomes for the children of divorce. Studies have found not only an association between lone parenthood and a greater propensity for child poverty, but also an association between short term economic stresses, such as that associated with an income decline following divorce, and also the effect of lone parenthood on the quality of the home and emotional support (Miller & Davis 1997, Thomas & Sawhill 2005). In their 1997 study Miller and Davis (1997) found that the quality of emotional support and resources in the home, as rated by the interviewer for the National Longitudinal Survey of youth, was worse for lone parents, particularly at the middle income range and went down during moments of short term economic stress potentially having an association with child development (Miller & Davies 1997).

Indeed even today, in light of the number and greater likelihood of divorced mothers to need to access state support than fathers in the UK, the enforcement of child support payments remains a topical issue. Evidence of this can be seen in recent changes in 2010 to legislation from which the state has begun to tax child maintenance payments between ex partners using the governments' child support agency (Department for work and pensions 2015). Moreover partners failing to make adequate or on time payments may face consequences through negative amendments to their credit ratings (Department for work and pensions 2015). The justification has been to provide an incentive for ex partners to come to an amicable, private agreement without needing to turn to state support, a theme which has been common to British governmental policy towards divorcees welfare support historically and more generally today (DWP 2015).

Historically divorce or, before divorce laws, separation has also been relatively much easier for male divorcees, who have been able to support themselves to a much greater degree through individual labour market earnings and may even gain through

keeping a greater share of their income; for women and children, this support has varied across time and geography in relation to attitudes towards female involvement in the labour market, state support for the conditions of lone mothers and the ability and willingness to enforce maintenance payments from separated fathers (Thane 1978, Lewis & Kiernan 1996, Gordon 2001).

Divorce, desertion or separation as routes into female and child poverty are not modern inventions; marital breakup and desertion have long been associated with moves into poverty for women and children, as research into the development of and applicants to the poor law in Victorian England show. Deserted, unmarried and widowed mothers formed the majority of poor law applicants and their experiences of its indignity varied greatly by geography (Thane 1978). In some areas deserted wives and mothers were able to apply for poor relief; in some outdoor relief was available in which they were allowed to live in their own homes, in others deserted wives and children were subjected to the devastating conditions and shame of indoor relief in the workhouse (Thane 1978).

The scope, scale and type of support for deserted wives and families varied over time with the prevalence and support for ideas of the breadwinner family and also the preference, still prevalent today in the British welfare system, for a private financial solution between partners instead of a government welfare solution (Thane 1978, Andreβ 2006). These ideas coupled together to give a preference for male employment, as seen through the poor laws, union access for workers, and an aversion to legitimising family types beyond the breadwinner ideal through state support at any sufficient level. What this support meant is that able bodied men were more able to support themselves economically and subsequently, with support from deserting partners low and extremely patchy, state relief for deserted families meagre, brutal and varied, the outcome was of extreme hardship for deserted wives, mothers and their children (Thane 1978).

In the US during the 20th century federal aid programs were developed in a background of similar narratives of both concerns for the plight of deserted, lone and widowed women, mothers and children in poverty, and a tension between not wanting to encourage or legitimize family forms deemed unacceptable or unhealthy by mainstream opinion (Gordon 2001). In eligibility for benefits women were scrutinized on their eligibility, which varied under different acts and services depending on such criteria through the century (Gordon 2001). As well as this, the inequalities between men and

women in the labour market were compounded in much the same way as in 19th century Britain by either denial of or too low benefits and low or patchy maintenance payments. An example of this in action was the denial of benefits in the 1940s to agricultural or domestic workers, which both had a prominent gender and racial dimension, from access to federal aid programs under a series of amendments to the social security act (Gordon 2001). This meant that not only were womens wages likely to be lower, but access to income support of unemployment benefits was restricted to the most economically disadvantaged partner after the marital breakup, further compounding the gender inequity (Gordon 2001).

What these two brief histories show is that the problems of gender inequality in the economic consequence of divorce, or in these cases separation before divorce laws, have not been equal. Separation or desertion have long been roads into female and child poverty. Welfare support has often been too low to fill the gap along with preferences for a private solution or reticence about being seen to support single person households. As well as this, husbands have also been more able to support themselves economically through the Labour market. It is this difference this paper seeks to assess through contemporary economic data in order to quantify the difference, but also its determinants.

Previous Research

The substantial bulk of previous research on the distribution of the economic consequences of divorce has been consistent in showing a negative economic impact associated with divorce; however its distribution has not been evenly shared by men, women and their dependent children (Andreβ 2006, Assave et al 2007, Burkhauser, Duncan & Berntsen 1990, De Wilde 2003, Fausta et al 2009, Hoffman & Duncan 1985, 1988, Jarvis & Jenkins 1999, Peterson 1996, Regt et al 2012, Smock et al 1999, Uunk 2004, Uunk & De Wilde 2008, Weitzman 1985). Though of course direct coefficients and declines cannot easily be compared outside of the original study, due to differences in the measures and the methods used the picture by sex is a largely consistent one in which women bare the significant brunt, at least financially of the economic costs of divorce. Women in almost all of the studies presented in table one fair worse by financial means than men; men's incomes either decline to a lesser extent, or even gain once they have less people with whom to share (Andreβ 2006, Assave et al 2007, Burkhauser, Duncan & Berntsen 1990, De Wilde 2003, Fausta et al 2009, Hoffman & Duncan 1985, 1988, Jarvis & Jenkins 1999, Peterson 1996, Regt et al 2012, Smock et al 1999, Uunk 2004, Uunk & De Wilde 2008, Weitzman 1985).

Table 1 Economic Consequences of divorce from selected studies and countries

Country	Author(s)	Period	Total (n)	% change *	
				Women	**Men**
Austria	Uunk	1994-2000	52	-30	N/A
Belgium	Dewilde (2003)	1994-1996	N/A	7	N/A
	Andreβ et al (2006)	N/A	404	-20	0
	Uunk (2004)	1994-2000	63	-20	N/A
Denmark	Dewilde (2003)	1994-1996	N/A	-24	N/A
	Uunk (2004)	1994-2000	41	-13	N/A
Finland	Uunk (2004)	1994-2000	61	-13	N/A
France	Uunk (2004)	1994-2000	60	-32	N/A
Germany	Burkhauser et al (1990)	1983-1986	101	-44	-7
	Sorensen (1994)	1984	N/A	-80	N/A
	Dewilde (2003)	1994-1996	N/A	-6	N/A
	Andreβ et al (2006)	N/A	1437	-32	-2
	Uunk (2004)	1994-2000	157	-25	N/A
Greece	Uunk (2004)	1994-2000	34	-11	N/A
Ireland	Uunk (2004)	1994-2000	30	-26	N/A
Italy	Dewilde (2003)	1994-1996	N/A	-13	N/A
	Uunk (2004)	1994-2000	69	-3	N/A
	Andreβ et al (2006)	N/A	111	-33	5-7
	Faust & Maggiolaro (2009)	1994-2001	304	-14	21
Netherlands	Uunk (2004)	1994-2000	69	-19	N/A
Portugal	Uunk (2004)	1994-2000	71	-12	N/A
Spain	Uunk (2004)	1994-2000	67	-17	N/A
Sweden	Sorensen (1994)	1981	N/A	-63	N/A
	Andreβ et al (2006)	N/A	353	-20	-7
United Kingdom	Jarvis and Jenkins (1999)	1991-2004	253	-18	2
	Dewilde (2003)	1994-1996	N/A	-27	N/A
	Uunk (2004)	1994-2000	145	-24	N/A
	Andreβ et al (2006)	N/A	1114	-28	2-5
United States	Burkhauser et al (1990)	1983-1986	540	-24	-6
	Weitzman (1985)	1977-1978	275	-73	42
	Duncan & Hoffman (1985)	1969-1975	1128	-30	11
	Petersen (1996)	1977-1978	322	-27	10
	Sorensen (1994)	1986	N/A	-71	N/A

NA - Not provided or not analysed

*Different methods and models mean % changes are not directly comparable due to different methods, data types and variables. Purely descriptive.

Much of the research regarding the divergent economic trends following divorce for men and women came following the early seminal work by Weitzman (1985)

and other contemporary analysis of the economic consequences of divorce following changes to US divorce laws in the late 1970s and 1980s (Burkhauser, Duncan & Bernsten 1990, Peterson 1996, Hoffman & Duncan 1985, 1988, Weitzman 1985). These changes moved divorce settlements towards one of no fault divorce and consequently triggered a great deal of interest an analysis into not only their effects, but consequently the economic consequences of divorce more broadly.

Weitzman's findings had been contradictory to the expected effects of no fault divorce, which had aimed to seek a fair an equal distribution of assets following divorce, but had in fact, when considering incomes, created the alternative (Weitzman 1985). According to Weitzman (1985), by focusing primarily on easily dividable assets such as savings, property and other physical assets, the real assets of a marriage, in terms of wage earning potential were being ignored. What Weitzman was referring to is not only the distribution of the costs of marriage in the sense of children, their custody and their associated costs and difficulties with employment, but also the benefits of marriage in the sense of one partners superior wage earning potential, viewed as a product of said marriage. It is this theory which Weizman claims is behind the dramatic 71% decline for women and 41% increase for men in her sample in 1971 (Weitzman 1985). With one partner having taken a predominant role in raising a family, typically the woman, and the other freer to pursue a labour-market career as a result, there is a distinct earnings inequity once that partnership ends (Weitzman 1985).

What followed was both further analysis of the effect of no fault divorce but also much and significant criticism of Weizmann's figures ((Burkhauser, Duncan & Bernsten 1990, Peterson 1996, Hoffman & Duncan 1985, 1988). Indeed further analysis of Weitzman's own and similar US data have indicated the fall to be much closer in the region of a 27% for women's incomes and a 10% increase for men (Hoffman & Duncan 1988, Peterson 1996). As highlighted by Peterson these figures are much closer to others reported at the time after controlling for observable characteristics and differences between men and women (Peterson 1996).

The no fault divorce laws in California which Weitzman (1985) and others discuss are representative of broader changes and trends in both divorce laws and settlements between partners across developed countries the decades following the 80s

(Ribot 2011). In most European contexts, and particularly the USA and Britain, the process of divorce has moved from one in which the post marital division focuses on long term alimony, child maintenance and maintaining pre marriage standards of living for spouses, to one in which a clean break is sought and both partners are expected to be dependent on their own labour markets earnings (Weitzman 1985 Ribot 2011). Ribot (2011) found that this was an increasing trend across developed countries which is in tension with ideas of a traditional division of labour within the household, which still persist, because of the potential inequities in labour market earnings upon divorce (Ribot 2011).

Since then studies have been conducted across various developed countries including individual studies and comparative studies, as can be seen from table one above. What is apparent is that the different economic outcomes between men and women vary greatly by geographic context. Much of this can be explained by the popular welfare typology and combinations with attitudes and support for female labour force participation; however the picture is still not consistent enough for one to be confident of claiming a fully representative figure both nationally and cross nationally (Andreβ 2006, De Wilde 2003, Uunk 2004,). As well as this, many of the studies have very small samples, something which to some extent this study seeks to ameliorate with the UK by being larger than the earlier ones, Andreβ excepted, and longer, covering 1992-2008.

Much of the difference in coefficients between countries, if not the difference between men and women appears to be explained using a variation of the popular 1990 Epsing-Andersen welfare (Andreβ 2006, De Wilde 2003, Uunk 2004). The most recent example of this Andreβ (2006) divided countries by the level and type of welfare, but then further by family type for high spending countries and alternative support network for low spending countries (Andreβ 2006). In this sense, a high welfare spending country like Denmark or Sweden would be classed as closer to a high welfare dual earner model of spending, whereas Belgium or Germany a high spending, with traditional division of labour (Andreβ 2006). In contrast the Anglo-Saxon market orientated countries such as the UK and Ireland would class as low spending, but with a preference for the labour market and private solutions to drops in income following divorce. The final group of countries, such as Italy, would be welfare spending and with the extended family or social networks as support following divorce (Andreβ 2006).

What they found through multivariate regression when controlling for observable characteristics, such as number of children and education was that a) women in countries such as Sweden where both partners typically worked full time during marriage suffered the least in total, but the income decline is the longest lasting and for both partners (Andreβ 2006). Other countries faired differently over all with significant declines for women in each, but with Germany, Belgium and Great Britain coming out largely the same (Andreβ 2006). Of interest from this study is the role of the division of labour within the households of countries fairing worse, in each it has been ascribed closer to a traditional division of labour. What this means, the authors argue, is that with one partners devoted to family care or working part time during marriage, they are less able to command higher wages following divorce (Andreβ 2006). When this is connected with the greater likelihood of child custody and its associated impediments to better or full-time employment through affordable or available child-care the picture is more difficult for divorced women (Andreβ 2006). Again this research fits with ideas of labour market earnings potential inequities being produced by a traditional division of labour in tension with the post-divorce economic reality and is therefore something necessary to control for in explaining income declines in this study. Andreβ et al compared countries by their dominant characteristics; however in the study we will compare families by their actual pre divorce habits and seek to quantify their effect.

Another important finding into the way women overcome the economic consequences of divorce is the role of remarriage and re-partnering. Research has long shown that those who re-marry move into cohabitation or recover, in terms of household income, better than those who stay single (De Wilde & Uunk 2008). Uunk and De Wilde tested the economic need hypothesis by which those women who suffer the greatest income declines are most likely to re-marry and found that across an eleven country European Union panel this was the case; not only this, but the greater degree of income decline, regardless of the level of welfare provision in a country, the greater the likelihood of re-marriage (Uunk & De Wilde 2008). This is important theoretically for this paper and therefore will be included in all models in order to show the different economic consequences by present relationship status following divorce.

An important question with regards to the economic consequences of divorce for women is with regard to any inherent differences between those who divorce and those

who do not; i.e would those who stay married have the same experience of divorce if they did? This is not a problem in models assessing the effect of an event on an individual's income, as a comparison between pre and post-divorce captures this, but for comparisons to married men and women across society in order to get a full picture of the economic status of divorce individuals, this is a problem as in this study. Research by Smock et al (1999) has shown how the economic effect of divorce is actually relatively pervasive for women; using endogenous switching regression models that those who stay married would have the same economic outcome as those who actually divorce. The reverse is however not true for those who divorce, their analysis shows that they would fare better than their divorce outcomes, but less well than those who chose to stay married (Smock et al 1999). What this confirms is, whilst their appear to be differences between those who divorce and those who do not had they stayed married, the association between divorce and income declines on women in their study is the same (Smock et al 1999)

Whilst the above has shown that economic inequities between men and women following divorce, though varying, are persistent in different contexts, when considering alternate measures to income, a different picture is visible. It has been show that non-monetary measures of wellbeing, such as ability to afford a holiday, to adequately keep and heat the home, or to afford to socialize on a weekly basis, often tell a significantly different story about post marital economic inequities (Assave, Betti, Muzzuxo & Mencarini 2007). Assave et al (2007) found the common gender income inequities across European countries, but at different levels in each, following divorce when considering monetary measures alone, but also found that when specifying models with primary and secondary deprivation measures as dependent variables, the gap was much less. The study was conducted using data between 1994 and 2001 and found that, for example for the UK and other countries of the liberal welfare typology, the gender gap was minimal when considering non-income measures (Assave 2007).

The authors postulate that the causes of this narrower gap when taking into account primary and secondary deprivation measures is associated with the new costs separating and divorcing husbands encounter, such as alimony payments (Assave et al 2007). Indeed, as they highlight, it is more likely for the male partner to leave the family home and face the costs of setting up a new home (Assave et al 2007).

That being said, whilst this is innovative in showing that, when considering these costs and their potential association with quality of life measures, there is a smaller gap, it has to be understood in the context of post marital gender income inequality. For instance, if a male divorcee is statistically more likely to have a higher income, at least initially, and much more likely subsequently too, he is much better placed to face these one off costs. Not only this, but their higher incomes may well likely persist beyond these one off costs of setting up a home, providing a lifelong advantage from their marriage; in this context, the size and causes of economic inequities of income following divorce remain paramount.

Other important research is that concerning the gender pay gap more generally and its commonly accepted components which are relevant for this study; in particular that associated with the motherhood penalty (Budig and England 2001, Budig et al 2012). Mothers have consistently been found to have lower incomes, even after controlling for labour market hours which may be affected by child care, losses of human capital due to maternity leave or long term work place absences and the number of children (Budig and England 2001, Budig et al 2012). This is relevant for this study as the majority of divorced women retain custody of any children from a marriage and so any associated labour market costs will most likely apply here also. This study also used per hourly wage, which would remove any effect of working part time. Unfortunately for this study, per hour wage is not available as a dependent income variable and so part time status will have to be controlled for, to see how much of the relevant penalties and income decline it accounts for. This is of even more relevance in light of the figures discussed above for female part time working in the UK.

Specifically concerning previous studies in the UK, while as previously stated the coefficients are not directly comparable as the measures and methods used vary, the size has varied to some degree presenting a conflicting picture. Each controls for age, education, number of children and current employment status however whilst the studies have covered similar or crossing over periods, the decline for women varies between 18% and 28% and only two have covered men, showing a small gain (De Wilde 2003, Uunk 2004, Jarvis and Jenkins 1999, Andreβ 2006). Typically the UK in each of these studies has represented the liberal welfare model, with little support designed specifically for divorcees, a preference for private financial solutions between partners and the Labour market as the

predominant source of income. In this sense, with the UK typically having high rates of part time working amongst married and divorced women and the highest number of single mothers, the income decline has been one of the largest in all of the studies covered above.

One of the benefits of this study is that the time period covered goes beyond that of earlier studies which covered only periods within and up until the year 2000. This study contains observations from the British Household Panel reaching from 1992 until 2008 and with a higher number of individuals then all but one of the previous studies. We take two different approaches, looking at the relationship between current marital status as a divorced man or woman to get a broader picture in society, as well as looking at a much smaller sample of only people who are married at time t and divorce at t+1. The benefit here is to get a fuller picture of the status and economic determinants associated with divorced individuals and also measure of those undergoing divorce.

Theoretical Background

Important to any study of the economic consequences of divorce is a theoretical mechanism for how these potential negative costs for women and children can come to be. In this respect what is important is the economic theory of why people may marry and the subsequent division of labour which may theoretically occur thereafter during a marriage. The seminal works by Becker on his theory of marriage (Becker 1973, 1974, 1985) are central here in viewing marriage in the classical economic framework of maximising household gains through specialisation. What this refers to is a specialisation via the division of labour within the household, with one member, typically the female focusing on household labour and child care to a larger degree and the male focusing more on labour market activity (Becker 1973, 1974, 1985). This may not necessarily mean that one partner is unemployed and responsible for family care, though that would be its most extreme form; alternative possibilities can be one partner working part-time hours or flexible hours. Alternatively other examples could be if one partner makes a career decision based on the others, such as moving for a partner's job or even hours or location determined by child care, the school day or school location. What this means is that in either scenario one partners career choices, typically the wife's are subject to the family and other partner's career. This specialisation, arguably, allows each to focus more on one particular type of work with potential positive human capital and wage earning effects for the labour market specialist and negative labour market ones for the household specialist (Becker 1973, 1974).

In this sense marriage can be seen as a partnership to maximise overall household gains through the wage earning ability of one partner by allowing a greater focus on their labour market work and human capital accumulation. The implication here is that the higher wage earning ability of one partner is a consequence of both partners division of labour (Becker 1973, 1974, 1985 Weitzman 1985). Arguably their work performance can benefit and consequently their wage growth; if they lack the childcare commitments or responsibilities they are less likely to need to leave work for child care emergencies, less tired from child care responsibilities and due to the absence of childcare commitments less tied to the normal 9-5 work schedule. Indeed, the potential inequalities in earnings abilities, is the theoretical mechanism which Weitzman (1985) refers to in explaining the significant drops in income experienced by women and children following divorce; the traditional division creates wage earning inequities which have pernicious consequences following

divorce when the benefits and costs of marriage have to be shared. Indeed one of the main expectations of this study is that those women, who prior to divorce worked part time, will have a greater income decline.

This theoretical model of the functioning of a marriage is theoretically difficult for women and children due to the changes in divorce law and settlement trends already mentioned above (Weitzman 1985 Ribot 2011). If in a traditional division of labour within a marriage one of the major household assets is the earnings potential of one partner, but divorce settlements seek a clean break between partners, focusing only on present tangible assets such as the household, the labour market specialist is at a distinct advantage. They will keep their wage earning potential and be, arguably, better off in any post-divorce settlement in which both partners are dependent on the labour market for future support.

The role of children here is also of theoretical importance for potential divergent economic consequences of divorce for men and women. As discussed already, being responsible for children, particularly as a lone parent comes with its own potential labour market difficulties (Budig and England 2001, Budig et al 2012). Children pose several potential employment difficulties, including the high cost and availability of child care and also the potential attachment to daytime or school hours which can place restrictions on the number and time of hours worked. Having children may also impact earnings due to potential absences from work. When children are sick one parent typically is called away, therefore affecting workplace presenteeism. Additionally, being a lone parent also has potentially theoretical implications for overall productivity resulting from the fatigue and stress associated with parenting alone (Budig and England 2001, Budig et al 2012). This is of particular significance for this study and it is expected that controlling for children and their number will ameliorate some of the penalty associated with women and the premium with men. Not only this, but owing to the proportion of part time workers in the UK, particularly amongst single mothers and women, it is expected that controlling for labour supply, in the form of part time hours will further narrow the gap between divorced men and women in overall household income.

Of importance here again in explaining the expected outcomes in the UK is the Welfare state paradigm (Andreß 2006, De Wilde 2003, Uunk 2004, Jarvis and Jenkins 1999). As already discussed the level of welfare support in the UK is lower than other

European countries. It is typically means tested and low focusing on specific problems such as unemployment, sickness and disabilities (Andreβ 2006, De Wilde 2003, Uunk 2004, Jarvis and Jenkins 1999). The aim is not to provide a specific standard of living or support post-divorce incomes, but to alleviate the worst of poverty or unemployment and is therefore limited (Andreβ 2006, De Wilde 2003, Uunk 2004, Jarvis and Jenkins 1999). What this means is that the drop for women may be large without a safety net to support or supplement incomes on the level found in other European countries (Andreβ 2006, De Wilde 2003, Uunk 2004, Jarvis and Jenkins 1999).

Data, Methodology and Sample Selection

i)   Data Source

The British Household Panel Survey (BHPS) is a longitudinal panel study following British households annually between 1991 and 2008. The sample began in 1991 with a representative sample of British Households and aimed to follow the same individuals until 2008 when it merged with a new panel study, Understanding families. Unlike cross sectional studies, this data allows us to monitor the association of divorce with income over time and capture the changes in income following the event, avoiding any upward biases commonly associated with cross sectional studies. The study now forms part of the European Community Household Panel and so is comparable in data collection to other studies of this type completed in Britain and other countries at different points, making the findings particularly suited to any subsequent comparison. This study seeks to use waves from 1992-2008 which contain a rough sample of 5500 individuals from 10,000 households in total.

The time frame available gives an opportunity to looks at the association between income and divorce over a considerably longer time frame than used elsewhere. The study follows individuals in the initial samples households and also all individuals joining those households, however if they subsequently leave following a divorce or some other event, they are not followed; meaning only the relationship of divorce with income on original sample members can be assessed. This also means that we are often not

observing direct couples divorcing, as partners who were not part of the original sample are not followed once they leave and there simply are not enough of both who stay. Another consideration or difficulty here is that a number of individuals have not been observed at each wave; this is in addition to sample attrition in that often individuals are missing for a particular year, but return later on. The consequence of this is increased difficulty for the model focusing on the association of divorce with income on for individuals observed directly before and after the event as there are only a small number of people with observations either side.

The interviews are conducted on an annual basis and the key variables for this question, such as current marital status; i.e cohabitation, marriage and divorce are surveyed at each annual interval, but also through a retrospective history meaning the data collected at each point is relevant to this research question. Others change between years, but the key variables of household income, marital status, family and economic characteristic stay the same, allowing us to capture the key independent and dependent variables.

ii)   Sample Selection

Each wave of the BHPS has over 12 files with various information from each relevant for this study. Most can be aggregated via a unique ID between waves, however many are not and so need to be connected within each wave by determining variables which are unique and constructing new ones so that they can be connected in cross sections for each year and then between years. Many files have different values for unique information per individual to others and so it has not been a standardised process with much variation in practice between years. As a result, due to the complexity, size and also time constraints associated with a thesis, an alternative route to constructing the data has been chosen to including every year of observation between 1992 and 2008.

Instead cross sections have been constructed with time points every five years between 1992 and 2008; the first year of observation therefore being 1992, 1997, 2002, and 2007, giving four cross sections which then are connected. As well as this, the final year included in the sample, 2008 has been chosen also due to the presence of divorces in 2007; by including 2008 it makes it possible to view one year of information following those divorces and increasing the number of observations of divorces.

An important benefit of constructing the data in this way is that it allows for a much longer study of income and divorce and also something which practically is much more suitable given time constraints

The sample then needed to be cut down to just those people of interest to the research question. The full sample of all 5 time points contained married and other individuals who did not divorce at all and would therefore be unsuitable. This is because those who stay married have been proven to have different characteristics then those who do not, which are associated with income and therefore may make estimates of their differences overly biased (Hoffman & Duncan 1995). Instead the sample has been cut down to just those who divorce between 1993, one year after the first observation and 2008 so that the date of the divorce can be used to check the association between divorce and income.

There were many people who had experienced divorces before 1993, for which the data source includes the date and so could have been included in the sample. This has not been carried out, however, due to the way in which the BHPS has collected this information; for many, the date was not available or has simply been put as 1991 if no information was available (the year before this sample started) and so it is not possible to know when the divorce actually happened. To include these and use this date would simply not work as the time since divorce would be highly inaccurate and therefore biasing any estimates on time since divorce with income and would be highly too prone to error.

It is also important to recognise that the date of divorce itself for many couples is not the mechanism for any association with income decline, as most would actually have already separated prior to a legal divorce. One option which was attempted was to use the dates of separation instead of divorce to select the sample for use here in order to capture this potential relationship with income, but unfortunately, the difference in size of sample was simply too great. A significant number of people who divorced have not had a date of their separation collected and it could both affect any models though small sample size and potential selectivity bias between those who have a date and do not.

The sample was also restricted to those individuals who have just one divorce. There were some who had multiple divorces, but again, due to the risk of unobserved heterogeneity akin to that between those who don't divorce and those who do, these individuals have been censored so that only those with one divorce during the sample have been included.

Of considerable importance is also the way in which this information has been collected. Marital histories which include the dates of any divorces, as separate from current marital status, were not collected in every single wave of the BHPS. They were collected in waves 2, 11 and 12, with wave 11 acting as a retrospective history. This gives a potential selectivity bias in that the many of the marital histories present are only those within the sample who stayed until wave 11. This has implications for the applicability of any estimates, as there could be specific characteristics in common between those who stay and income which are different than those who leave.

Another potential weakness of this sample is the higher proportion of women following sample selection, as can be seen from the descriptive statistics by gender in the appendix; the sample is very heavily weighted toward women, something which was not present in the full sample. Reasons for this appear to be that men are much more likely to leave the family home following a divorce and so are much more likely to be uncontactable. In addition, as was commented by Jenkins and Jarvis in (1999,) during the 90s and 2000s in the UK there was concerted push to catch fathers who were in arrears with child support payments, which may have contributed to fathers being unwilling to participate. In either case this appears to have reduced the number of men in the sample to roughly 61% female and 39% male.

This is a serious drawback to applicability of estimates from this study and means any conclusions need to be caveated with the observation that they only apply to those who stayed in the sample. There is serious risk of selection into, or out of the sample due to reasons such as low income; arguably as Jenkins and Jarvis argue; if people are leaving to avoid paying their child support, this could be because their incomes are low. This is an important problem as it could mean that those who stay are the ones for whom the economic consequences of divorce are less severe, subsequently upwardly biasing any estimates for divorced men.

In addition all missing observations of income have been removed along with those outside the 18 – 60 age range. Missing observations of the dependent variably are clearly of no use and those outside of this range have different issues which could bias any estimates of income. With regards to those below 18, there household income will be the same as their parents anyway and so is not relevant; furthermore they are extremely unlikely to have experienced a divorce and are also likely to be in full time education and so incomes will be much lower than the remaining sample anyway. With regards to the elderly, it is well established that moves into retirement and pensions and associated income changes of their own which can therefore mask or bias any association between divorce and income.

Another category removed has been those who are self-employed. Whilst they are still theoretically relevant, their incomes are subject to extreme variation, particularly considering the independent variable is net current household income in pounds per week. This causes problems as it confused estimates that are just associated with common fluctuations in income associated with self-employment with changes resulting from divorce. As result of this, these and others have all been removed to give a sample of those who have one divorce between 1992-2008 , aged between 18 and 60, who stay in the sample and are not self-employed. A full set of statistics on the two samples by sex and also by marital status mixed with sex can be seen in the appendix;

iii)   Models

The first set of models seeks to assess the situation of divorced men and women within the sample more broadly then just assessing those with observations directly before and after divorce. This will be done by comparing individuals within the sample by current **a)** marital status whilst controlling for other relevant economic characteristics and then **b)** observing changes to the divorce financial penalty or premium as the research question variables are added in the subsequent four models as can be seen from models 1 to 4 below. The model used is a pooled OLS regression model, or constant coefficients model checking coefficients across all cross sections.

Model one; Gender differences

$$Income_{it} = \beta1 + \beta marital status/sex_{it} + \beta age_{it} + \beta age_{it}^2 + \beta Education_{it} + \beta Employment_{it} + \beta Years since divorce_{it} + u_{it}$$

Model one focuses on the basic differences between individuals by marital status mixed with sex after controlling for educational and employment differences. As we saw within the descriptive statistics, men and particularly divorced men, appeared to have higher education and were more likely to be employed; with this in mind it is expected that there will be a greater decline associated with being a divorced female, but due to educational and employment differences observed within the descriptive statistics it should be lower than the 24% penalty when compared to married men.

Model two: No of Children

$$Income_{it} = \beta1 + \beta marital\ status/sex_{it} + \beta age_{it} + \beta age_{it}^2 + \beta education_{it} + \beta employment_{it} + \beta years since divorce_{it} + \beta no\ of\ children_{it} + u_{it}$$

This model is designed to capture the effects and costs associated with having children. The descriptive statistics showed that divorced women are much more likely to have children living with them and divorced men the most likely not to have children within the home of all groups. In this sense it is a major advantaged enjoyed by divorced men within the sample as they are potentially avoiding the theoretical costs associated with them. It is expected that this will remove any premium associated with divorced men.

Model three: Labour Supply

$$Income_{it} = \beta1 + \beta marital\ status/sex_{it} + \beta age_{it} + \beta age_{it}^2 + \beta education_{it} + \beta employment_{it} + \beta years since divorce_{it} + \beta no\ of\ children_{it} + \beta labour\ Supply_{it} + u_{it}$$

Model three is designed to test the theory that one of the problems facing divorced women is the need to work reduced hors due the limits posed by having children through available child-care and school time hours etc. As we saw in the descriptive statistics a high number of divorced women worked in part time jobs, particularly relative to men, and so this model is designed to capture this effect and quantify how much of the penalty associated

with divorced women is due to this. It is expected that this will reduce it, but that the penalty will likely remain to some significant degree afterwards.

Model four: Type of job

$Income_{it} = \beta1 + \beta marital\ status/sex_{it} + \beta age_{it} + \beta age_{it}^2 + \beta education_{it} + \beta employment_{it} + \beta years since divorce_{it} + \beta no\ of\ children_{it} + \beta labour\ Supply_{it} + \beta jobtype + u_{it}$

This model is designed to check the how much of the premium or penalty associated with divorced men and women in turn is due to them being in different job categories. Each job category is expected to have different determinants of pay, such as managerial, technical and professional being higher paid and skilled, partly skilled and unskilled being less well paid in that order. The expectation here is that because dud to married and divorced men being more likely to be in the higher paying groups, they will see less change.

Model 5: Time since divorce

$Income_{it} =$
$\beta1 + \beta marriage_{it} + \beta age_{it} + \beta age_{it}^2 + \beta education_{it} + \beta Time\ since\ divorce_{it} + u_{it}$

Model 5 is designed to interact with gender with the time it takes to recover from divorce. We know theoretically that women have greater declines and so it is expected that the first category of 1-3 years will show the greatest decline for women, which will be ameliorated in the subsequent categories of 3-5 years and 5-10 years.

Model 6: Balanced Sample

$Income_{it} = \beta1 + \beta marriage/sex_{it} + \beta age_{it} + \beta age_{it}^2 + \beta education_{it} + \beta children_{it} + \beta time\ since\ divorce_{it} + \beta pre - marriage\ labour\ supply_{it} + u_{it}$

In this model the sample is reduced to only those people with two time points either side of the date they divorced. The basic model above will be ran but with the addition of their pre-divorce labour supply in order to test the theory that those who have reduced human

capital due to absences from the labour market are the ones who lose out the most. The reduced sample and its characteristics can be seen in the appendix.

The first 5 models do have several problems however for estimation due to inherent biases that need to be considered. Whilst some bias has been removed by focusing only on those who have one divorce between 1992 and 2008, some remains. The current marital status variable being used to assess the economic status of divorced men and women only measures the effect of those who stay in this state and is therefore subject to selectivity which could bias estimates. Not only this, but within the pooled sample they are being compared to married men before they divorce and also those who re-marry. This needs to be considered when reviewing estimates from these models, as there are likely to be unobserved differences between those who re-marry and do not also associated with income, which are likely to bias these estimates. This is important caveat to any conclusions drawn from these first models regarding the broader economic situation of divorcees.

In order to try to ameliorate this weakness a further separate model **(Model 6)** has been estimated looking at just those individuals for whom there are direct observations in two time points either side of their divorce in order to review the associated income change more closely with the event. This also allows the possibility to test theories in relation to reduced labour supply during marriage effecting as will human capital and post-divorce outcomes. Unfortunately, as can be seen in the descriptive statistics for this second model, the number of people with observations either side is relatively small. As mentioned previously not only do a number of people leave the sample, but for many there is information missing in particular waves, even though they are present later on. This could theoretically have been improved by using more waves of data, but due to time constraints this has not been possible.

Current Net Household Income

In previous uses of the British Household Panel Survey, net household income was not available and so previous studies had to impute this based on income liabilities for tax. From 1999 this has subsequently changed and has been updated for all previous waves before wave 7 in 1999 and has been collected from wave 8 onwards and so current net household income is used here. Current Net Household Income is in pounds per week and

includes total household cash income from all household members. This includes money earned from employment, self-employment, investments, savings, pensions, social security and also maintenance payments (but only receipt). It is also post tax and so all income taxes, national insurance contributions, local and council taxes have already been deducted.

Income has been equalized using the modified OECD scale and adjusted to January 2010 prices to take into account household composition within income and inflation over the sample. The OECD scale is important to capture any changes associated with household composition and income, such as more or less members and their financial needs. This is important as following divorce women typically retain custody of any children and so this must be taken into account via household composition.

Modified OECD Equivalence Scale	
Head	0.67
Subsequent Adults	0.33
Each Child aged 0-13	0.2
Each child aged 14-18	0.33

There are a number of different versions of these scales, with different measurements given to each different member of the household and there is not necessarily a clear assessment of which is most appropriate. Previous studies have used the McClements scale for the UK, citing its use by the UK Governments Department of Work and Pensions, however this has since changed and the official scale now used is the Modified OECD scale show above and so this has been used here, but sensitivity checked by using the McClements scale also.

Net current household income already includes maintenance payments from ex partners however these have not been deducted from partners who pay them. This was collected from 1992 onwards and has been measured on a weekly basis so that it can be deducted from current net household income, which is also a pound per week variable. The effect can be seen clearly for divorced men in the descriptive statistics in the appendix where current net household income before and after maintenance deductions have been taken, reducing the mean and median income for divorced men by £20 and £12 respectively. These clearly are small sums, however not all divorced men have children and the effect will be lost.

Ehi14sje Sam Jenkinson

Current Net Household income minus maintenance payments

n	Mean	0.05	0.1	0.25	0.5	0.75	0.9	0.95
2850	459.5	153.5	199.1	282.1	403.1	575.1	767.4	920.7
lowest	-80.42	-44.83	-23.39	-19.2	-18.1			
highest:	2325.52	2418.54	2578.87	3752.56	4709.09			

As can be seen from the above table, there are some significant outliers shown by the numbers well above and below the 5th and 95th percentiles. The observations shown here is minus those who are self-employed, under 18 and over 60 who often having highly fluctuating incomes, and so the existence of these outliers is concerning. This leads to expectations that these outliers could have an effect on the accuracy of any estimation and likely heteroscedasticity. As a result of this logged income will be used in the model to attempt to normalise the variance and when sensitivity checking the robustness of any estimates, these outliers above the 5th and 95th percentiles will be removed test the robustness of the estimates.

There are also a small number of observations as minus values. No explanation is given in the BHPS documentation, but assumptions are that this is potentially due to the nature of weekly income variables fluctuating, particularly for people on low or temporary/zero hours contracts and the effect of the scale. Most negative incomes were for self-employed people, however a small number remain. An examination of who they are to see if there is anything consistent, such as unemployment does not show anything clear; many are employed and it does not appear to be through deductions made by maintenance as none have had maintenance deductions. As a result of this, due to a lack of theoretically valid reasons to exclude them from the sample, they have been left in; as mentioned above however, they will be removed for sensitivity analysis to test for the robustness of any model estimates.

Another problem with this variable is due to it being only pounds per week variable. Due to being for such a short time it is arguably subject to strong variation from temporary problems which would not appear in annual income, such as short term unemployment, lack of hours in a particular week or temporary jobs without sick pay. As a result of this observations are subject to any bias from events which would not show up in annual income variables and this needs to be born in mind when considering estimates. One other reason for choosing this variable over annual income is that maintenance

payments are also weekly and so fit perfectly already for deduction. There is also an argument that, if one of the consequences of divorce is short term economic stress, pounds per week income is more likely to pick this up if it is associated with divorce.

iv)   Descriptive Statistics

The tables in the appendix show descriptive statistics for each variable by sex in the first table and by marital status mixed with sex in the second. Absolute numbers, percentages of total men/women and also mean incomes and ages are presented for comparison.

Firstly, by sex it is clear that men have higher mean incomes and more advantageous circumstances in almost each variable. Men have a higher percentage cohabiting and married than women, indicating that they are more likely to find a new partner then stay as divorced; though arguably this again could be subject to stayer's bias so caution is advised. Women within the sample appear more likely to stay separated or divorced and also have lower levels of education than men; indeed greater numbers identifying as no education, only up until 16 and then slightly higher numbers of men at each other advanced educational level. Men are also more likely to be employed, more likely to have less children, more likely to work full time and more likely to be in higher paying professional or managerial jobs. Interestingly, however women do seem to predominate in the skilled non-manual service sector type jobs.
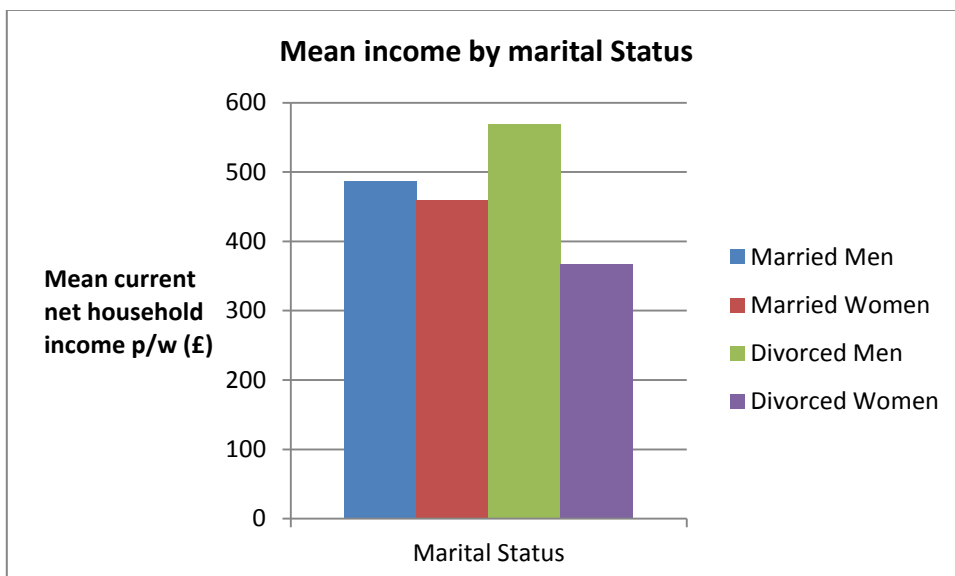
For divorced women and men the differences are even more pronounced then between the sexes across the whole sample. As can be seen from the graph presented above, divorced women on average have 36% less per week then divorced men and also less than all other groups by 25% and 20% to married men and women respectively. When looking at the characteristics involved, it is much the same picture presented above between the sexes, but more pronounced. Divorced women have an alarming proportion of individuals identifying as having no education, but also more at just age 16 education then divorced men. In addition they are much more likely to have children and also to have more children living with them then divorced men. With regards to work they are more likely to work part time and more likely to be in partly skilled occupations and unskilled occupations then men.

Interestingly there are high proportions of divorced men and women found within the disabled and long term sick category. Exact causes of this are hard to specify but arguably it could be that those with health problems find it harder to find a partner, or perhaps the stress of divorce etc. has caused sickness or depression.

The final variable years since divorce can be seen below and has been categorised instead of being a continuous variable. This is in order to control for those who have not yet divorced and to avoid losing missing observations by losing them. The reference category is those who have not yet divorced and subsequent time categories since divorce to take into account the short and long term relationship between divorce and income.

Years Since Divorce		
Cat	Men	Women
Pre Divorce	544	821
1-3 years	184	265
3-5 years	99	178
5-10 years	195	328
10-15 years	83	143

Concerning the three theoretical variables of interest there are a large number of divorced women working part time, but also an even larger number of married women, which could potentially indicate that many had gone full time upon marriage. With regards to divorcees working part time, this could be indicative of problems with unaffordable or

unavailable child care associated with the UK. This will likely lead to lower incomes for divorcees and so it will be interesting to quantify how much the addition of part time into the regression reduced the divorce penalty commonly found for women.

Further concerning the hypotheses divorced men are much less likely to have children living with them then divorced men and so it is expected that any premium associated with being a divorced man will have a lot to do with this and again will become clear once this is controlled for in the regression.

In the labour market there are differences too with women more likely to be in the skilled non-manual service sector typed jobs than in other skilled jobs or professional and managerial jobs, which could control for some of the difference between sexes.

Results

For full tables of results, coefficients and P values see appendix. The chosen level of significance for this paper is 0.05.

i)   Model one: Gender differences

Model one by current marital status shows divorced women with roughly 19% lower earnings then married men, but also a small premium for divorced men of 12% compared to married men. This model takes into account the previous differences in education observed in the descriptive statistics between men and women and also divorced men and women.

With regards to education both no education and having education only to GCSE, something more common amongst divorced women, are associated with heavy and significant negative coefficients with income. Whereas those of the reference category and undergraduate and post-graduate were more associated more with married men and divorced men, further highlighting inequities between divorced women and the rest.

ii)   Model two: Children

The second model after controlling for children shows that there is a negative financial relationship across the sample associated with children and income that is significant. It also eliminates the entire premium associated with divorced men, indicating that the benefit here was the unfair distribution of the costs of children following marriage. As we saw in the descriptive statistics divorced men are the least likely of the whole sample to live with children and so associated costs are arguably not relevant to them. Those with children ear significantly less at all frequencies of children.

Interestingly, however the penalty associated with being a divorced woman has increased to roughly 24% and remained significant. This is potentially because the effect of many divorced women not having children was hiding higher a higher penalty for divorced women.

iii)   Model three: Labour Supply

In this model employment status and labour supply were highly correlated, with VIF correlation scores both near to 5. When testing both and using both together, it has been found that the direction and significance of estimates remains the same, but there is some slight variation of the size of coefficients by 1-2%. As a result of this labour supply has been used instead to capture the association of the reduced labour supply observed in the descriptive statistics with income.

Firstly working part time is significant and reduced income by roughly 17%. In addition to this the premium penalty associated with divorced women has been reduced to 18% from 24%, a decline of 6% associated with the reduced labour supply relative to married men of divorced women.

iv)   Model four: Job Type

Model four controls for the different job sectors between divorced men and divorced women observed in the descriptive statistics. The penalty associated with divorcees has

increased to 20% and remains significant; however the job category variable has shown that the categories with the most women and divorced women included fair worst. Skilled non-manual jobs earn less than the professional and managerial/technical which include more men. In addition the partly skilled and unskilled sectors are also much lower.

v)   Model 5: time since divorce

The fifth model takes into account time since divorce, but also interacts with sex to see the income changes over time for both men and women following divorce relative to pre divorce observations. What can be seen from the years since divorce variable is the trajectory with the major decline in women's incomes happing in the first 3 years after divorce with a penalty of roughly 20% compared to married men. This then reduces to 17 3-5 years before dropping to roughly 12% from 5 years on wards.

Coefficients	Model 5			
	Estimate	t-value	P (>|t|)	sig
Intercept	5.87	31.9161	< 2.2e-16	***
Marriage				
Married ref -				
Cohabiting	0.040944	1.2549	0.209627	
Divorced	-0.09081	-3.2541	0.001151	**
Separated	-0.14656	-3.6409	0.000277	***
Education				
Education till 18 ref -				
Age 16 (GCSE	-0.23752	-5.6407	1.86E-08	***
Undergraduate	0.18146	4.8604	1.24E-06	***
Post-Graduate	0.46372	6.4524	1.29E-10	***
No Education	-0.33796	-12.0606	< 2.2e-16	***
Age	0.009221	1.0226	0.306582	
Age*	-5.2E-05	-0.4783	0.632454	
Years since Divorce				
Pre Divorce ref-				
female married	-0.15594	-4.9274	8.82E-07	***
Male 1-3 years	0.022435	0.4484	0.653878	
female 1-3 years	-0.20439	-4.5969	4.48E-06	***
male 3-5 years	0.044694	0.7069	0.479681	
female 3-5 years	-0.17052	-3.3824	0.000729	***
male 5-10 years	0.078469	1.5967	0.110441	
female 5-10 years	-0.12408	-3.0026	0.0027	**
male 10-15 years	-0.03372	-0.4986	0.618072	
female 10 - 15 years	-0.12499	-2.2874	0.022246	*
Sensitivty analysis				
Breusch Pagan	0.3048			
Adjusted R squared	0.13551			
DF	2818			

Model 6: Reduced Labour Supply during marriage

The aim of this particular model was to test the theory that the reason why divorced women earn less is due to loss of human capital associated with theories of a traditional division of labour within the household previously mentioned. In order to test this theory the sample was further restricted from that of the previous models; only those with

observations in two time sections with a divorce in between were selected. This allowed the possibility to create dummy variables for characteristics prior to divorce.

In order to test this, a dummy variable was created for individual's labour supply prior to divorce as either full or part time.

What can be seen in the two models for **model 6** is that the penalty before including pre-divorce Labour supply is of a similar magnitude to the others at 18% when controlling for age, education and employment status. When pre-divorce labour supply is included the penalty is no longer significant, but at a much lower level of 9% and is suggestive that much of the difference here between divorced men and women in this sample is simply due to labour supply.

In previous models current employment status had been correlated to a small degree, below 5, with part time labour support and had been removed. This was a similar case in this model, but lower and still below 5. With this in mind the decision was made to leave both in to control for current employment and also previous labour supply in hours to try to answer the theoretical question about reduced labour supply.

Caution is needed with this model however, as the sample has several drawbacks. Firstly the selectivity involved in reducing this sample has several steps which have made it very selective and specific. Firstly as we already know it is only those with a divorce between 1992 and 2008 and so is not generalizable to the broader population. Additionally the sample is very small due to the difficulty in finding individuals at two of the five year cross section time for individuals with a divorce in-between. This involves selectivity bias as to those who left the sample, but also those who missed particular years. These could arguably be due to divorce from partners moving following divorce into new homes or other circumstances which could mean the sample here is subject to stayers bias.

That being said it is an interesting finding which fits with theoretical positions outlined by both Weitzman (1985) and Becker (1973,1974,1985). Working part time during marriage is indicative of the traditional division of labour with one taking a reduced Labour supply and the other working full time.

This needs further analysis, likely with all years of the BHPS or a bigger sample in which more pre-divorce characteristics associated with marital labour supply can be included. Though interesting and informative of a potential reason for the penalty, it is not generalizable outside of the very small highly select sample in which it originates. Moreover it also needs to take into account the duration of reduced labour supply, this simply shows that they worked part time prior to divorce and it is associated with a significant income decline or at least the decline in the comparable model for divorced women more generally.

Sensitivity Analysis

Through visual of residuals and Breusch pagan tests it is clear that this sample is subject to heteroscedasticity, with some models much more susceptible then others. In order to solve this problem income was logged in order to normalise the distribution which improved both the adjusted R squared of all models and also the severity of heteroscedasticity, at least visually. The problem still remains however and seems to be primarily caused by significant outliers at both the high income, but also much more significantly the low incomes.

When testing the models for robustness they were ran with those at above the 95 percentiles and below the 5 percentiles removed to give a more normal distribution of income. This significantly improved the adjusted R Squared values for all models and altered to a small degree some of the coefficient values; however the direction and significance levels of the key variables discussed remained the same.

The decision was made not to move to this distribution however and remove these lower value and higher values. There appears to be no theoretically sound reason to move them as they are within the parameters set in the sample selection for age, no self-employment and having just one divorce between the time frames.

Conclusions

Before going on to make concluding remarks about the findings here, several caveats which limit the generalisability of these findings, but also may affect the accuracy of the estimates need to be re-stated to encourage caution. Firstly with regards to the sample itself; with regards to models 1-5 the sample itself applies to only those within the highly

selective sample having a divorce between 1992 and 2008 and does not apply to self-employed people. Additionally it is subject to stayer's bias, which may have upwardly biased income estimates for divorced males. This can be seen in the higher proportion of men in the sample and the theoretical reasons highlighted by Jenkins and Jarvis (1999) on their study using the BHPS in the 1990s. Many of those men would have owed child support and there was considerable public attention at the time and afterwards in Britain about catching these people. In addition it is much more likely that men would leave the marital home and so there is a real chance that these measures are indeed upwardly biased by those with higher incomes.

In addition the measure used to assess the status of divorcees was current marital status in each of the 5 year cross sections. As discussed this is also arguably subject selectivity with those with characteristics that influence low incomes also influencing the propensity for individuals not to re-partner. If this is the case then they would be downwardly biased and the results would be more applicable to those more likely to stay divorced, whatever their characteristics.

In addition, the methodology used has not captured the association of the event of divorce with individual drops in income following divorce. Instead the models and design has focused on the penalties and premiums associated with those classifying as divorced men and women within the sample and why they earn differently to their married male counterparts. Whilst this does not give a direct individual association with change following divorce, it is illuminating as to the differing contributory factors influencing those lower incomes of those people within this sample classifying as divorced men and women. Furthermore, in addition to these caveats, the findings have been very similar to those of other studies conducted on UK data, with the exception of the final model, and so a measure of confidence is appropriate here as a result.

With regards to the findings, from models 1-5 the penalty associated with divorced women has remained relatively static at between -18% and -20%, with exception of model two before labour supply and job type were controlled for. This is in common with other findings presented in the previous research, though at the lower end of other estimates. The most important thing for the penalty here appears to be the inclusion of labour supply, which brought the penalty down by 6% from the prior model. The inclusion

of other characteristics for which divorced men and women differ; education, children and job type failed to reduce the penalty below 18% in spite of the differences observed within the descriptive statistics section.

With regards to men, the initial premium observed for divorced men in the descriptive statistics and also model one was eliminated after controlling for custody of children. Those who have children earn consistently less for having children and also each additional child; it is the absence of children which appears to be associated with the higher incomes for divorced men relative to married men here. This is suggestive of an unequal distribution of the costs of divorce, in spite of maintenance payments being included in income measurements.

Concerning the final models on the subject of pre-divorce labour supply, caveats need to be made again before any concluding remarks can be made. This sample is both very small and highly selective which means its results are not strictly very generalizable. The selectivity was discussed with the model and means that one should be extremely careful in claiming how representative its findings are beyond the highly select individuals included. In addition the measure used for pre-divorced labour supply is only reflective of one year. Of much more interest would be to include a much more detailed analysis of reduced labour supply to get a more detailed measure of reduced human capital associated with more traditional divisions of labour within a marriage. As a result of this the findings may well be spurious and to do with the nature of the people within this second sample who have a high rate of part time working prior to divorce. That being said, the findings are suggestive of what could be a more useful research into the penalties observed within this sample for divorced women. The model made the penalty much lower, and more importantly statistically insignificant. With more time and scope it would have been useful to create more cross sections to add into the sample in order to get more couples with which to assess these findings. It would also have been possible to calculate a much fuller measure of reduced human capital by making a measure related to how long they were either out of the labour market or had reduced labour supply; that however was not possible and so this measure was used as a compromise.

With regards to implications for previous research and theories discussed above, the findings from the models show consistent findings for income penalties for

divorced women common to in size to all other UK studies but at the lower range and also in the same direction to other studies of the economic consequences of divorce. With regards to theory, they confirm that the distribution of the costs of children are not shared evenly, something consistently argued by other authors (Andreβ 2006, Assave et al 2007, Burkhauser, Duncan & Berntsen 1990, De Wilde 2003, Fausta et al 2009, Hoffman & Duncan 1985, 1988, Jarvis & Jenkins 1999, Peterson 1996, Regt et al 2012, Smock et al 1999, Uunk 2004, Uunk & De Wilde 2008, Weitzman 1985). In addition the propensity, particularly in the UK, for women to work part-time is significant in reducing the penalty to some degree and is informative of the potential relationship between the difficulties of lone parenthood and unaffordable or unavailable childcare. What is more the final model, for all its limitations, is also informative of potential further explanation of the penalty associated with divorced women. It fits with theories highlighted by Weitzman (1985) and Beckers theory of the family (1973, 1974 and 1985) and is suggestive about what more research could have been done here with more time and for further research more generally.

Bibliography

Andreβ, H. Borgloh, B. Brocklel, M. Gisselmann, M. Hummelsheim, D. *(2006) "The Economic Consequences of Partnership Dissolution: A comparative Analysis of Panel Studies from Belgium, Germany, Great Britain, Italy and Sweden".* European Sociological Review, Vol 22, issues 5 pp 533-560

Assave, A. Betti, G. Muzzuco, S, Mencarini, L (2007) *"Marital Disruption and economic well-being: A comparative analysis".* Journal of the Royal Statistical Society, 2007 170 part 3 pp781-789

Becker, Gary S. (1985). "Human Capital, Effort, and the Sexual Division of Labor." *Journal of Labor Economics*, Vol. 3, No. 1, pp. S33–S58.

Becker, Gary (1973) *"A Theory of Marriage: Part l".* Journal of Political Economy. Vol 81, issue 4 pp 813-34

Becker, Gary (1974) *"A Theory of Marriage: Part ll"* Journal of Political economy, Vol 82 issue 2

Becker, Gary (1991) *"A Treatise on the Family"*. Cambridge, Mass: Harvard University Press.

Bridges, Kimberley (2013) *"Importance of Human Capital in recovery from Divorce"* . Journal of Financial Planning. November, pp 40-47

Budig, Michelle & Paula England (2001), '*The wage penalty for motherhood.*' American Sociological Review, 66:204-25.

Budig, M,. Misra, J.. & Boeckmann, (2012). *"The Motherhood Penalty in Cross-National Perspective: The importance of work, Family Policies and Cultural Attitudes".* Social Politics , Vol 19 no 2 pp 163-193

Burkhauser, R. Duncan, D. Hauser, Richard. Bernsten, Roland. (1990) *"Economic Burdens of Marital Disruptions: A Comparison of the United States and the Federal Republic of Germany"*. Review of Income and Wealth. Series 36, No 4,. December 1990.

Bumpass, L & Sweet, J (1989), *"Children's Experience in Single Parent Families: Implications of cohabitation and Marital Transitions".* Family Planning Perspectives, Vol 21, No. 6, pp 256-260

Clark, A. Georgellis, Y. *"Back to Baseline in Britain. Adaptation in the British Household Panel Survey".* Economica, Vol 80, pp 496-512

Cherlin, A. Furstenberg, F. Chase-Linsdale, P.L. Kiernan, K. Robins, P, Morrison, D, Teitler, Julienn, "Longitudinal Studies of the Effects of Divorce on Children in Great Britain and the United States", Science, New Series Vol 252, No 5011 (Jun 7 1991) pp 1386-1389

Dewilde, C (2002) '*The Financial Consequences of relationship dissolution for women in Western Europe"* in Ruspin & Dale (2011) *"The Gender Dimension of Social Change: The Contribution of dynamic research to the study of womens life courses" pp 81-111.* The Policy Press, Ed 1, Bristol.

Fausta, O. Mazucco, S. Maggiolaro, Silvia (2009). '*"Economic consequences of union dissolution in Italy: findings from the European Community Household Panel".* European Journal of Population, Vol 25, issue 1 pp 45-65

Gray, J. S. (1997), 'The fall in men's return to marriage: Declining productivity effects or changing selection?' Journal of Human Resources, 32: 481-504.

Gordon, L (2001) *"Who Deserves help, Who Must provide?".* Annals of the American Academy of Political and Social Science. Vol 577 pp 12-25

Hale, K. Neidermeyer, A. Pearson, T & Riley, Richard (2008) "Understanding the factors influencing the income gap between divorcees" in Journal of Financial Planning. Dec. Vol 21, issue 12 pp 62-70

Ehi14sje Sam Jenkinson

Hoffman, Saul & Duncan, Greg (1995), "*The Effect of Incomes, Wages and AFDC Benefits on Marital Distuption".* Journal of Human Resources, Vol 30 issues 1 pp19-41

Hoffman, Saul & Duncan, Greg (1988) "What are the Economic Consequences of divorce?" Demography. Vol 25, No 4 pp 641-645

Hoffman, Saul & Duncan, Greg (1985), "*A reconsideration of the Economic Consequences of Marital Dissolution", Demography, Vol 22, No 4.*

Jarvis, S. and Jenkins, S. P. (1999). '*Marital Splits and Income Changes: Evidence for Britain."* Journal of Population Studies, 53, 237–254.

Korenman, S. & Neumark, D. (1992), 'Marriage, motherhood, and wages.' Journal of Human Resources, 27: 233-55.

Petersen, Tron et al (2011) "*The Male Marital Wage Premium: Sorting VS. Differential Pay'* Industrial relations labor relations review, Vol. 64 No2 (January 2011)

Lewis, J & Kiernan K. (1996) "*The Boundaries Between Marriage, Nonmarriage, and Parenthood: Changes in Behaviour and policy in postwar Britain.*" Journal of Family History, Vol 21, No3, 372-387

Miller, J & Favis, D. (1997). "*Poverty History, Marital History, and Quality of Children's home environments".* Journal of Marriage and Familly, Vol 59, No.4 pp 996-1007

Petersen, Richard.(1996) "*A Re-Evaluation of the Economic Consequences of Divorce".* American Sociological Rebiew, 1996, Vol. 61 (528-536).

Regt, S (2012). "Financial Consequences of relationship dissolution: A longitudinal comparison of formerly married and unmarried cohabiting men and women". Sociology (2012) 47 (1) 90-108

Ribot, J (2011). "*The financial consequences of divorce across Europe".* ERA forum (2011) 12:71-87
Waves 1-18, 1991-2009 [computer file]. *7th Edition.* Colchester, Essex: UK Data Archive[distributor], July 2010. SN: 5151, http://dx.doi.org/10.5255/UKDA-SN-5151-1

Ruggeri, K & Bird, Chloe. (2014) "Single Parents and employment in Europe: Short Statistical Report No 3". Prepared for European Commission Directorate General-justice and fundamental rights. April 2014/ just/2011/Gend/pr/1081/A4

Sorensen, A(1994) "Women's Economic Risk and the Economic Position of Single Mothers. European Sociological Review, Vol 10, No2 (Sep 1994), pp 173-188

Smock, P. Manning, W. Gupta, Sanjiv (1999). "The Effect of Marriage and Divorce on Women's Economic Well Being". American Sociological Review, 1999, Vol 64 (December: 794-812.)

Thane, Pat. "Women and the Poor Law in Victorian and Edwardian England", History Workshop, No.6 (Autumn, 1978) pp 29-51

Thomas, A. Sawhill, I (2005). "*For Love and Money, the Impact of Family Structure on Family Income".* The Future of Children, Vol 15, No 2, Autumn pp 57-74.

Weitroft, G,. Haglund, B. Rosén,. Mans. (2000) "*Mortality among lone mothers in Sweden: A Population Study".* Lancet, Vol 355 pp 1215-1219

Weitzman, Leonore (1985) "*The Divorce Revolution: The Unexpected Social and Economic Consequences of Divorce for Women and Children in America"* The Free Press, Macmillan, Printed USA.

Websites;

Institute for fiscal studies
http://www.ifs.org.uk/wheredoyoufitin/about.php

Ehi14sje Sam Jenkinson

Last accessed 18/03/15

Office for National Statistics, 2012 "Lone Parents with Dependent Childre"

http://www.ons.gov.uk/ons/rel/family-demography/families-and-households/2011/sum-lone-parents.html

Data;

Bardasi, E. et al. , *"British Household Panel Survey Derived Current and Annual Net Household Income Variables, Waves 1-18, 1991-2009"* [computer file]. *9th Edition.* University of Essex. Institute for Social and Economic Research, [original data producer(s)]. Colchester, Essex: UK Data Archive [distributor], April 2012. SN: 3909, http://dx.doi.org/10.5255/UKDA-SN-3909-2

University of Essex. Institute for Social and Economic Research, *British Household Panel Survey: Waves 1-18, 1991-2009* [computer file].*7th Edition.* Colchester, Essex: UK Data Archive [distributor], July 2010. SN: 5151, http://dx.doi.org/10.5255/UKDA-SN-5151-1

Pronzato, C., *British Household Panel Survey Consolidated Marital, Cohabitation and Fertility Histories, 1991-2009* [computer file]. *3rd Edition.* University of Essex. Institute for Social and Economic Research, [original data producer(s)]. Colchester, Essex: UK Data Archive [distributor], January 2011. SN: 5629, http://dx.doi.org/10.5255/UKDA-SN-5629-1