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Alleviating the Childcare Constraint for Women: Empirical Evidence from the UK

Gabriella Cagliesi
International Business and Economics, University of Greenwich, London, SE10 9LS, UK
cm55@gre.ac.uk

and

Denise Hawkes
Doctoral School, Institute of Education, University of London, London, WC1H 0AL, UK
d.hawkes@ioe.ac.uk

The purpose of this empirical study is to use an interdisciplinary approach across labour economics, behavioural economics and social economics to explain female labour market statuses, in particular joblessness choices and conditions. We propose a new theoretical framework, based on Sen's capability approach, new derived variables for the British Household Panel Survey and a new empirical methodology to estimate the probabilities of different degree of attachment to the labour market. Our results suggest that the adding of these derived variables that allow for more constraints and opportunities, provides a richer and more refined view of factors affecting non employment and helps to recognize and explain better status of women. Our model predicts that being more embedded in a local community, having stronger values for family life and stronger ties with close "inactive" friends, facing potential income losses in changing labour market status (as measured by counterfactual labour income versus actual non labour income), are all factors that decrease the degree of attachment to the labour market and that the children constraint is key for female non participation in the labour market. Prospective financial losses (of receiving a labour income lower than non labour income if a carer became employed) increase the probability of keeping the status quo of cares, while potential labour income gains would increase the probability of attachment to the labour market. We then used the model to simulate different policy scenarios and find that incentives, in particular care subsidies, targeted at reducing constraints are more effective in promoting active participation in the labour market than punishments that create constraints via cuts in benefits. We finally evaluated the costs of these policies and we found that they are cost effective when weighted against the benefit of promoting engagement with the labour market. We suggest that the design of active labour market policies for mothers must take into account the main constraint of the cost of childcare.

Keywords*:* Labour Market Activity, British Household Panel Study, Behavioural Economics, Social Connections

JEL Classification: D03, D85, J22, J69, Z13

Abbreviations[1]

[1] BE= Behavioural Economics ; BHPS= British Household Panel Survey; CA = Capability Approach; SE = Social

1. Introduction

The increased participation of women in paid work has been one of the most dramatic changes undergone by the labour market in the last 50 years. Despite the improvement, the last few years have witnessed a pronounced slow down in female participation trend and recent research has showed that when compared to other developed countries, "around 1 million women could be considered 'missing' from the UK workplace[2] " and that if those out of work women could be fully utilized "the UK could deliver economic benefits of £15 to £21 billion pounds per year – more than double the value of all our annual exports to China [3]"

Women's participation is very important for two reasons: for the economy and for women themselves. For the economy, as the risk of secular stagnation makes it even more urgent to focus and promote women's participation to avoid shrinkage of the workforce. Japan's Prime Minister Mr Abe, in April 2013, made the promotion of working women a signature feature of the "Abenomics" growth strategy. For women themselves, because for many women the opportunity of working is a channel to gain autonomy, sense of identity, status, influence at home and in the society and it deserves attention as such.

In most countries women's participation rate shows a distinct M-shaped curve: it increases to dip around the years when they marry and have children, to recover after that life phase. Many of those women returning to work land into either part- time, temporary or low paid jobs. Many of those who stay in work often accept jobs that waste their abilities in the attempt to balance work and family life. For other women, however, staying at home is a genuine choice and it does not stem from lack of opportunities.

The purpose of this study is to study female labour market statuses to identify constraints and enablers of women's participation choices and ultimately to devise nudges and policies that would help non-working mothers to choose their status rather than to accept it and/or to re-engage with the labour market. In doing so we will depart from the more standard labour market view and consider the role that social, cultural and psychological factors, can play in affecting labour market decisions. In particular, we consider factors such as social relations and the degree of "embeddedness" in the surroundings, social relations because they can shape and constraint women's opportunities and choices. We also take into account that individuals enter into social relations with their own endowment of capabilities, idiosyncrasies, personality traits and cognitive biases. We recognize that social and environment norms and rules are not followed obediently but rather, they interact and are filtered by personal predispositions, beliefs and inner motives and we bring this into our analysis.

We offer a richer portrait in one other aspect also. We account for possible differences between inaction (non working mothers and carers) and action (employment and unemployment), following and extending in this way Finn and Heckman's (1983) approach who considered whether the unemployed and the inactive were behaviourally distinct statuses and found that indeed they followed different behavioural equations governing transitions.

Our results show that this interdisciplinary approach that enriches the dimensionality of women's decisions, enables us to explain and predict more accurately female's labour market statuses than the "traditional" human capital approach used in labour economics analyses. We simulated different policies and we gained useful insights that can hopefully inspire a more effective architecture of policies to promote work.

This paper is organized as follows. Section 2 gives a brief description of the interdisciplinary approach we apply to study female worklessness, providing references to past and recent literature. Section 3 defines the variables we created and used in order to apply the proposed interdisciplinary approach. Some of the variables are directly

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Economics

[2] http://www.fawcettsociety.org.uk/wp-content/uploads/2013/04/Fawcett -The-changing-labour-market.pdf

[3] Home Office, Home Secretary's speech on women and the economy, 4 November 2011: http://www.homeoffice.gov.uk/media-centre/speeches/home-sec-equality-speech

available from the BHPS but most of the variables we used in our study ought to be created from the BHPS to capture the essence of our new approach. Section 4 presents the econometric models, the hypotheses and the methodology used in the estimates. Section 5 presents and discusses the results of estimates and policy simulations, while Section 6 highlights the limitations of the study and draws some conclusions.

2. Theoretical framework: the Interdisciplinary Approach

Most of the traditional analysis of labour market decisions has focused on the presumption that people have a tendency to take "action", by searching and wanting to work only based on pecuniary considerations: opportunity cost (of non working) relative to the advantage of leisure. Action stems from pecuniary/economic concerns. No mention is reserved to psychological costs and benefits or to personal needs and wants. We depart from this utilitarian approach to embrace the Capability (CA) proposed by (Sen, 1980 and Sen, 2002) in relation to labour market decisions. Sen's general approach considers three factors that influence how people convert opportunities into actual achievements: personal characteristics (e.g., physical conditions, gender, skills), social characteristics (e.g., social norms, power of relations, public policies), and environmental characteristics (institutions, infrastructures). In a similar way, we take into account physical, social, psychological and economic factors such as constraints, opportunities, cognitive biases, pecuniary costs and benefits of non working to gain some insights that are crucial in designing and implementing appropriate and effective labour market policies into employment. [4]

2.1 Homo econAmicus and socialis: the social sphere

The CA applied to labour market decisions leads to investigate employment perceptions, opportunities or lack of them, while including the above social and personal factors. In an empirical paper Burchardt and Le Grand (2002) used the BHPS and Sen's CA to distinguish non participation decisions that result from constraints beyond an individual controls' from those decisions that are the results of individual's preferences. In their study among standard labour economics variables, they include some social variables but they do not consider any behavioural and psychological factors and social relations. Their findings suggest that after taking into account several constraints, one tenth of the sampled non employed is unambiguously voluntary. Following Akerlof's (1980) social norm mode, Clark (2001) tests the effect of social norms on unemployment status. He finds that in terms of social comparison, the psychological cost of unemployment is less severe when unemployment is the norm used in social comparison used by unemployed people and that those individuals who are hurt less by the unemployment experience are less likely to search a job and are more likely to preserve their status.

Economists have included social influence in labour market theories in various way ranging from segmented market theory (Bowles and Gintis, 2011) to human capital theory (Becker, 1976), and job search and information models (Mortenson , 2003). All these approaches share common features in relations to the structural "embeddedness of relations": they assume that players are anonymous, they abstract from the history and positions of relations, and interpersonal links (ties) are typical and stylized. Granovetter (1985) points out that in this account of these social network leads to treat social influence as an external force rather than an on-going process in which people are affected and affect their own social environment. His theory of social embeddedness emphasises the importance of individuals' social capital and the role and structure of specific individual's personal relations (social ties) embedding economic life. Social networks and the strength of ties play an important role in labour market decisions (Goyal, 2007) and they can affect agents' behaviour in three ways: through the type and quality of information they channel, through conditioning their members with punishments and rewards, and through expectations of how other members will act (trust). Due to the endogeneity of social effects (interdependence of preferences) empirical studies of social interactions are limited by the reflection problem pointed out by Mansky (1993), problem that reduces the ability to draw correct inference from the data. In a recent empirical study, Cappellari and Tatsiramos (2010) took

[4] As eloquently put in Clark (2006:5) "Sen's CA has also been praised for broadening the informational base of evaluation, refocusing on people as ends in themselves (rather than treating them merely as means to economic activity), recognizing human heterogeneity and diversity (through different in personal conversion functions), drawing attention to group disparities (such as those based on gender, race , class, caste or age), embracing human and participation (by emphasising the role of practical reason, deliberative democracy and public action in forging goals, making choices and influencing policy), and acknowledging that different people, cultures and societies may have different values and aspirations."

this aspect into account and estimate the effect of social network on job finding rates by using a direct measure of social interactions. Despite the limitation of BHPS in providing network quality information, they were able to show that social connections operate as mechanism to channel information and that a higher number of employed friends is associated with a higher probability of becoming employed and that those who find a job via social connections have also a better chance to maintain an employment status.

To summarise: several empirical studies have tested traditional labour market model alongside with social network analysis to find that personal contacts are an efficient way of finding jobs and that the strength of ties matter. It has also been noticed that psychological predispositions influence sociality. Extraverted types have larger groups with more diverse elements, and tend not to be inclusive while individualist types, with high level of neuroticism tend to have smaller networks with more weak ties, and tend to keep their close network partners separate. (Kalish and Robins, 2006). This leads us to consider the other dimension of the homo socialis: his personal sphere

2.2 Homo Humanus: personal sphere

The rational economic paradigm, predicts that people make choices in lines with their preferences. However, a large body of literature from BE and Psychology presents evidence about people's "inconsistent" choices. Several reasons can contribute to display a perceived "incorrect rationality. Firstly decisions not necessarily reflect true preference because they can be affected by unaccounted subtle "internal" constraints such emotional states, personality traits, perception biases and fears of regret. Secondly preferences can have become "adapted" to unwanted and undesirable circumstances and shaped by social relations. Thirdly the cognitive reference framework used by agents to align preferences and choices is different from what economists have been assuming, especially under uncertainty, as theorized by Prospect Theory (Tversky and Kahneman, 2000). Research in different fields shows that an individual's preferences and decisions vary depending on life circumstances, emotional states, personality traits, and memories of past experience (Kahneman and Krueger, 2006) and cultural factors. In their theoretical paper, Dessi' and Zhao (2011) use available evidence on cultural differences to offer interesting insights on how economics and psychology interact and show that an oversensitivity to shame (a feature more pervasive in the Japanese than in the USA culture) would results in over-investing while overconfidence (more likely to be present in the USA business culture and practices) could actually result in underinvesting. An empirical application of Prospect Theory to labour market can be found in Goette, Huffman and Fehr (2002). By using a model of reference dependent preferences (RDP) they study how much loss aversion and diminishing sensitivity can affect workers' behaviour. They find that higher financial incentives increase labour supply but at the same time can cause workers to put less effort on the job.

We found these studies inspiring and we believe that labour market status and choices (particularly "inaction") can be explained by referring to some BE principles mostly in relation to how to form judgment (a person will form judgment about probability of finding a job based on perception and recollection of past events and experience and loss aversion) and how to make choices (a person's choices are influenced by the framing of options available, her reference point and her status quo, her personality and values and she will make decisions based on some simple rules of thumb called heuristic). Applying BE principles to labour market can help to explain some "irrational" behaviour as expression of low self esteem, fears of precariousness of jobs, conformity to norms, negativity dominance effect (prospect of financial losses in giving up government benefits, looms bigger than prospect of financial gains of labour income). Enlarging the set of individuals' constraints to include socio and personal factors, it enables our agents either to regain rationality (intentional and instrumental) or bounded rationality, but most importantly, independently of the degree and class of rationality, it enables our agents to be more "human" and hence credible than the mechanic, mathematically predictable homo economicus and to be much closer to us than what the homo economicus actually is. This improved "closeness" is not confined to positive analysis but it is vital to design more informed government policies, capable of taking into account people's reference points and the role of social influence, so as to devise intelligent policy framing and nudges.

3. Empirical Approach: the Variables

We present here the variables we used in our models to take into account perspectives and angles of the interdisciplinary approach discussed above. The BHPS provides a broad and detailed range of information so some of the variables we used were directly extracted from the survey. However to control for personal characteristics and social factors many other variables ought to be created either as combinations of existing variables or as

interaction terms. We organized them in "direct factors" and "interaction terms". Due to the novelty of these variables, we think it is important to describe them accurately so as to facilitate the interpretation of the results later in section 5, but we limit here to the ones that turns out to be statistically significant in the Multinomial Probit Model referring the interested reader to Tables A1. A.2 of the appendix of Cagliesi-Hawkes (2013) for a full description of all the variables created for the two stage estimation process.

The explanatory variables included in the switching model and in the multinomial model, excluding interaction terms and squared terms, have been checked for the cross-correlation. The results for those found to be significant at 5% are reported in Table A.7 and in Table A.8 in the appendix. Overall with the exception of the reservation wage and wanting to change, the correlations are not very high and not important in the models for all groups of active and inactive women. This suggests the correlations are driven by the differences between the three groups of women rather than explaining difference within the groups.

3.1 Variables: direct factors

In line with the CA, we propose to explain labour markets statuses and choices by looking at three main conversion factors (personal characteristics, psychological factors, and social factors) that can affect an individuals' real opportunity set (refined functioning set) and thus, ultimately, influence her achieved functionings (attainments) by acting either as constraints or opportunities. The first set of factors are grouped under the umbrella of "labour market variables or human capital factors" since they are typically included into standard labour marker models. These variables are: age, education, employment history, parents' employment and non employment status, physical condition, marital status, etc. The second set of conversion factors includes variables that capture BE principles (such as loss aversion, status quo, confidence), variables that reflect personal beliefs and values, and variables that are related to psychological traits and subjective perception of well being. The third set refers to the respondents' social characteristics, social capital and strength of embeddedness and social relations. Social norms and "close ties" represent vital additional elements of the analysis. The new identified constraints interact with each other in contributing to shape agent's decisions.

The standard labour economic variables used in the Multinomial Probit estimates include (0,1) dummy variables to account for age (young people age 21-24 *(Age2124*[5]*)*, those aged 25-49 *(Age2549)* and older people aged 50-64 *(Age5064)*), educational qualifications (no qualifications (*Noquals*), at least one GCSE or equivalent (*Gcse*), at least one A-Level or equivalent (*Alevel*), more than A-levels (*Higher*)), parenting child/children of different age groups starting from the under two years old group (*Rnch02)*, up to the 16-18 years old group (*Rnch1618)*, being a lone parent (*Loneparent*). In addition we have considered two dummies as historical indicators of labour market attachment of the respondent's parents at the time when the respondents were fourteen years old (*Mumnotwork*, *Dadnotwork)*.

Many other variables related to the labour market were indirectly included via the use of an estimated derived variable (*Prospect*) which is obtained as the difference between the estimated (counterfactual) labour income of non working female and their estimated non labour income. This variable should capture the extent of prospective financial gains or losses of changing labour market status into employment when not employed. To take into account the loss aversion principle and capture the negativity dominance effect (people act more to avoid losses than to obtain gains) we split the variable Prospect into *Prospectpos* and *Prospectneg*. The former includes only prospective financial gains (e.g. only positive values of the variable prospect), while the latter includes only prospective financial losses. A difference in their coefficients would indicate the differential (asymmetric) effects of facing prospective financial gains in changing labour market status into employment. Following BE approach, the variable *Prospectpos* and *Prospectneg* do not enter linearly but as Value function of gains and losses.[6]

The BE variables, proxies for personal attitudes and propensions are included in levels and also in terms of pairs of

[5] As the sample is restricted to women only we have excluded those age 16 to 20 given the simultaneous nature of various life course events: labour market participant, entry to young motherhood and education/training, for example for a young mother caring and possibly education, for a young student the complication of part-time employment, making the direction of causality more difficult to assess within the age group. This age group is considered within another paper when looking at men where the carer category is virtually nonexistent.

[6] Note explaining the value function

gain and losses to take into account Prospect Theory's principle of asymmetric reaction to losses and gains. Level and changes of the attributes are derived from different sections of the BHPS and higher values indicate a stronger presence of the attribute and of its change. So for instance levels of *Risk* indicate how respondents have felt recently, while the variables *Gainoptimism* and *Gainconfidence* indicate whether respondents have experienced recent improvement in mental and physical well being and in self confidence. [7]

Psychological traits are indirectly derived from a set of questions that allowed us to create indexes for the Big Five Traits. However, only conscientiousness and neuroticism (*Consci and neurotic)* were statistically relevant. Again higher values indicate stronger presence of the trait. Values are derived from a set of questions that ask about the importance of having certain things in life: including: importance of having children, good partnership and good friends (all used to derive *Vfamilylife*). The larger the value the greater importance the individual places on this value.

The satisfaction variables are also included in levels and in terms of pairs of gain and losses. All of these variables are derived from the battery of life satisfaction questions. In terms of levels of satisfaction the measure include: satisfaction with spouse or partner, social life, use of leisure time (*Sfamilylife*). A larger value corresponds to more satisfaction.[8]

An agent's degree of exposure and embeddedness to her local surroundings may affect the influence that local area conditions have on her labour market choices and behaviour. A more embedded individual is likely to be more aware about local social norms and to be influenced by them. The variable (*Moreembbed*) is a dummy variable representing those who report being most similar to those within their local neighbourhood, reporting belonging to the neighbourhood, having local friends, obtaining advice locally and feeling similar to their neighbours. Whilst the local area may have some influences on the individual it is likely that closest friends may have a stronger influence in terms of employment. The BHPS asks a range of questions about the respondent's three closest friends including how frequency of contacts and whether each friend is employed or not. It is therefore possible to calculate a network social norm derived on the worklessness rate of the respondent's three closest friends. *Propnetemp* is the proportion of the reported friends who are employed and *Propnetnotemp*, its complement (the proportion of the reported friends who are not employed). A network non employment rate of above 30% can be considered as an indication of a friendship group characterized by a social norm of non employment.

In a standard approach, the regional or local "labour market social norm" (ie. high or low rate of worklessness) provides direct information on local economic constraints and opportunities which are most likely beyond agents' controls. We assume that a regional non employment rate of above 30% can be considered as an indication of an area characterized by a labour market social norm of non employment (*inter20).*

We also included a set of variables related to opportunities and capabilities (other than financial income). The variable *Capabilities* is an index created adding five 0-1 dummy variables each one recording current access or ownership of some good and services (access to a car, to the internet, ownership or shared ownership of house, have a mobile phone, satellite and landline). We also use information on whether the individual feels financially better off or worse off than last year (*Betteroff, Worseoff*).

3.2 Variables: Interaction terms. Labour market "social network norm" and personal views

Extending Akerlof (1980), we created some interaction terms to capture the interaction between labour market "norms" and the agent's views about those norms. We hypothesized that the labour market statuses of friends (ie. the social network norm) interacts with an individual's views and values and can influence her labour market decisions by either reinforcing or weakening her motivation and efforts in finding employment. Thus the effect of

[7] In creating and using these variables one has to keep in mind that the responses are subjective and respondents have reference dependent preferences and thus, depending on the position of the neutral status quo, changes can be perceived as gains or losses in a different way by different people.

[8] Here again evaluating while experiencing (living an experience while being affected by current emotions without knowledge how the experience will end) is different from evaluating using memories and this difference has a role in influencing and distinguishing degrees of happiness versus well being. We used these variables without making such a distinction

the social network norm (for instance high non employment) on agents' choices is filtered by the agent's preferences, values, motives and beliefs, about the social rule itself.

Hence personal views and aspirations (agents reference point), could influence an agent's beliefs in adhering to the social norm and her emotional costs to conforming to it. For instance, a respondent who attributes little or zero importance to having a fulfilling job is more emotionally detached (or less emotionally attached) to the labour market than a respondent for whom having a fulfilling job is extremely important[9] and this disposition would make it hard to engage her with the labour market. [10]

The influence of social relations depends not only on own values, motives and personal attitudes, but also on the strength itself of the "closeness" of these relations. Stronger ties (higher number of closest friends seen more often) with an active network (when all close friends are in the labour force) may increase the likelihood to "conform" to the "working" norm thus affecting our agent's labour market choices (*Ginteractie* is the interaction term capturing this effect) and her dispositions of wanting to switch from worklessness into working or from inaction into labour force.

To quantify these possible effects we created four mutually exclusive dummies that are similar to the previous ones except that in this case respondents' working aspirations and motivations are paired against the working "norm" of their three closest friends. Each of the four dummies (*ConformNetNW, DeviateNetNW, DeviateNetW, ConformNetW)* assumes value one when the condition occurs and zero otherwise.

The interaction term *ConformNetNW* represents the condition of a woman with a "detached" labour market attitude and with a high percentage of closest friends in non employment (at least 1/3 are workless). The not employed status of close friends can reinforce her "detached" attitude so that a respondent falling in this category may not suffer to conform to her friends' workless status. When reference point and status quo coincided, it would be hard to prompt the women falling in this category changes into working.

The dummy *DeviateNetNW* is for a respondent who values a gratifying job and whose social connections are for a high percentage non employed (for example students). On the other hand, the dummy *DeviateNetW* represents that category of those women who are emotionally detached from the labour market but have all working close friends. It could be the case of some carers who may have worked before and chose to be at home. If status quo is not employment it may be difficult to prompt changes into employment. Finally the dummy *ConfomrNetW* is for the category of respondents who value a fulfilling job and whose closest friends are all employed. The social connection can reinforce their attitude and possibly these respondents would suffer if their status quo were not in line with their attitude, and they would be willing to change it.

4. Methodology and Econometric Models

We used a two-step approach and estimated two models: in the first step we use an endogenous switching regime model to estimate labour earnings of employed women versus non labour earnings of the not employed female and their counterfactuals. The second type of model considers the status of inactive non working carer (mothers) versus the two labour market active statuses of unemployment and employment. It is estimated as a multinomial model to

[9] Attributing low importance to a fulfilling job can be explained in terms of personal motivation or in term of low aspiration and self- esteem. For instance, a woman may genuinely not be interested in working because she prefers and finds it more fulfilling to pursue other activities over working, such as for instance looking after children. However, in some other instances, a woman may consider a fulfilling job not to be so important because she perceives she cannot aspire to having a fulfilling job (cognitive dissonance bias).

[10] If the respondent 's reference point (emotional attachment or detachment) is in line with her status quo and with a local social norm of non employment then this respondent would most likely not suffer from conforming to the social rule, and it would be hard to prompt changes of her status quo. On the other hand if a respondent is emotionally attached to the labour market (she attributes high importance to a satisfying job) and her status quo is non-employed and local social rule is high worklessness, the respondent would suffer from adhering to the social norm and hence she would be more disposed to changes her status quo into employment.

provide probabilities of belonging to one of the three some specified categories (non working carers,unemployed and employed).

4.1 The Switching Regime Model

The switching regime equation model is not presented here but the full model and its detailed results can be found in Cagliesi and Hawkes (2013). Here we briefly explain the basic idea behind the switching regime model which is composed by two earning equations defining the two regimes and by one switching criterion equation which determines in which regime an individual falls. This first model enables us to account and "correct" for self-selectivity [11]and to create a variable (*Prospect*) which is used as an instrumental variable in the multinomial Probit second model to avoid problem of endogeneity between statuses an earnings.

As explained earlier, the variable *PROSPECT* represents prospective financial gains or losses if a workless female changed the status quo into employment. The variable is constructed by subtracting the estimated (counterfactual) labour income of non-workers and their estimated non labour income coming from the two earning equations. In this way, the *Prospect* variable can be used as instrumental variables for the expected wage differential in order to circumvent and solve the endogeneity issue created by income variables.

The explanatory variables in the regime equations include mainly traditional labour market variables and labour market experience while the switching equation has among the explanatory variables to capture opportunities and other social and personal factors relevant to make the decision. In fact, among people who are more similar in relevant aspects and opportunities, the status of employment versus non employment can be a matter of personal preferences and choices, and unaccounted constraints.

The switching criterion function which determines in which regime an individual falls is a latent variable with dichotomous realizations (1 for when an individual is not employed and 0 for when she is employed). This function has a "well being "or utility interpretation: it is the additional satisfaction that individual would get by choosing one regime instead of the other. The utility gain is partly random across individuals and partly depends on other specific factors. In particular, in our model the criterion function depends on expected benefit, (as measured by the differences between non work and work earnings), on personal constraints, psychological, social, environmental factors, values, opportunities. The switching equation is thus and endogenous switching since it has among the explanatory variables the differences in earnings between the two labour market statuses (working versus non working). The interest here is to understand whether or not relative earnings are significant in the decision function and to what extent. The model was estimated by using the full-information ML method, (FIML) to fit simultaneously the binary (switching equation) and the continuous equations (regime 1, and regime 2) and to correct for selectivity bias by taking into account of the correlations between all error terms.

4.2 The Multinominal Probit Model

The second model we use aims to study different categories of non employment versus employment; in this stage we use a Multinomial Probit of the following form:

1)

$$P_{im} = \Pr[Y_i = m \mid LMV_i, BEV_i, f(PROSPECT_i), SatV_i, SNV_i, INTERACTION_i]$$

Where:

[11] In general, models that aim at explaining earnings face a self-selectivity problem. For some individuals labour market decisions represent optimal choices given their observed and unobserved preferences, for some others, their labour market status it is not the result of an optimal choice but rather the suboptimal results of (observed and unobserved) factors, and for some others it is just a random outcome. If this is ignored, people for whom it was random are compared to those for whom it was not (being it optimal or suboptimal). Self-selection decisions can thus arise if there is simultaneity between labour market decisions of an individual and its observed income. In our model this simultaneity is even more evident because income factors are explicit included in the switching criterion equation to represent the net gain or loss from the choosing between the two regimes. This class of self-selection models falls in the general class of endogenous switching regime models

P_{im} is the probability for individual *i* to fall in the category *m*, with m=1,2,3 and with 1=non working carers, 2=unemployed, 3=employed
LMV_i is a set of labour market variables for individual *i*
BEV_i is a set of behavioural variables for individual *i*
$f(PROSPECT_i)$= is the value function of prospect, with prospect indicating financial gains of losses for individual *i* (i.e. theoretical expected benefits of losses) of changing status from worklessness into employment obtained from the previous switching models; this variables is an instrumental variable for differential earning.
$SatV_i$ is a set of subjective well being variables for individual *i*
SNV_i is a set of social relations and network variables for individual *i*
$INTERACTION_i$ is a set of interaction terms explained in section 3.2.for individual *i*

5. Results and discussion

We will not discuss the full results of the switching model here but we limit here our discussion of the switching model to the gains we achieved by using the proposed interdisciplinary approach (Table 1). Full results of the Probit model (equation 1) are reported in Table 2, while in Table 3 we present some marginal effects (MES) derived from those estimated coefficients.

5.1 Results and discussion: Switching regime model. Gains in using interdisciplinary approach

The switching model is also used to calculate overall predicted probabilities of being non employed and to compare them to sample mean. Following a similar approach as in Burchard and Le Grand (2002), we compared each respondent's estimated probability against the estimated sample mean and defined as high probability (of being non employed) a probability that is above this mean, and as low probability one that is below it. By mapping high and low probability against actual status, we identified four types of individuals: Type High probability of non employment and actually non employed; type high probability of being non employed and actually employed; type low probability of non employment and actually non employed and finally type low probability of non employment and actually employed. The interesting cases are those when predicted probability of being of a certain type differs from actual status, since this discrepancy can be due either to unaccounted, unobserved constraints, or to personal choices and efforts. To account for the value of the first row of the table shows the results when the switching model includes only the traditional labour market variables (the 19 variables indicated in the first group "Labour Market Variables" in Table A.1) while the second row reports the figures for the full "multidisciplinary" model.

<Insert Table 1 here>

From looking at Table 1 we can notice that our model tracks the sample mean very closely, and the average estimated probabilities are virtually the same as the sample percentages. Table 1 reports the results for each nested stage. First of all, we can notice that the full model tracks the sample mean very closely (the average estimated probabilities of the full model are virtually the same as the sample percentages) and the performance has improved when we moved from the traditional approach into the multi dimensional**.** In other words, as more dimensions are added (behavioural, subjective well being, social) an increased number of females are identified as "constrained" or affected by additional dimensions. Reflecting on this result, we can say that new constraints and opportunities cumulate with old traditional ones to give a richer and more refined view of factors affecting non employment. Adding new variables to allow for more constraints and opportunities helps to recognize better status within "similar" groups (people with similar characteristics and constraints and hence similar high or low probability) and to identify more accurately those people whose status in not in line with the predicted (being employed against the odds or being voluntary non employed).

By looking at the status within "similar" groups we can see that the full model offers the following picture: 93.2% of the non employed were predicted to be have high probability to be in this status (the non employed account for the 92.7% of all people with high probability of being so) and that 96% of the employed were predicted to have a low probability of non employment (the employed account for the 97% of all people predicted to be employed). Thus, the figures of the full model are slightly different from those obtained using only a traditional approach suggesting

that a richer approach with BE variables, social factors, etc. could be a promising route to identify better those people whose status in not in line with the predicted probabilities**:** those people who are employed against the odds (the employed who have high probability of not being employed) and those people who are " voluntary" non employed (the non employed with low probability of being so).

When we consider the former group, we can see the percentages related to this typology of respondents increases as we move from the partial into the full model (from 5.3% to 7.7% and from 2.3% to 3.4% in the last column). These increases indicate that a richer approach allows us to obtain the following: firstly, to add to those "lucky" employed as identified by the traditional human capital characteristics, those individuals who, according to their preferences, values, social factors, would prefer not to be employed, and secondly, to recognize better that the status of those "lucky" employed as identified by the traditional model, can actually be explained not only in terms of financial needs but also in terms of personal values, aspirations, determination, social influence. A similar conclusion can be reached by looking at the "voluntary non- employed" category (those who are jobless but are predicted not to be so).

The decreases in the relevant percentages related to this category (from 6.3% to 3% and from 13,8 to 6.8% in the last column), can be interpreted as follows: as we consider personal factors such as values, satisfaction, preferences and social influence, we are able to recognize better than more people may prefer their non employment status not to work so that the "real involuntary non employed " are fewer than the traditional approach would suggest (6.8% in Table 2 is indeed closer 7.6% than 13.8% where 7.6% is the sample unemployed figure).

5.2 Results and discussion: the Multinomial Probit Model

In tables 1 the focus was on non-employment. However non employment has a range of types including those actively seeking work, who are part of the labour force (unemployed) and those not necessarily actively seeking work such as those who have caring responsibilities. Our results suggest that for some people status is a choice sometimes even against the odds and for other is a suboptimal condition due to personal constraints (they are selected into the condition), to unaccounted constraints or to random factors. Table 2 report the results of the multinomial probit regression where the employed who are the most attached group to the labour market, are taken as the reference category, while Table 3 reports the MES of some selected variables allowing to "quantify" effects of those variables on the probabilities of being a non working mother.

<Insert Table 2 here>

A negative coefficient indicates that that variable reduces the probability to maintaining the Status Quo, acting as an enabler to change it and become more attached to the labour market. A positive coefficient indicates that variable acts as a constraint and it increases the probability of keeping the Status Quo. As expected the types of constraints and enablers of non working female categories (carers and unemployed) are rather different except for some social and behavioural variables. These common variable (loss of confidence, inter20, prospective losses, conformnetNw, deviatNetW, neuroticism, capabilities) exert the same kind of effects on carers and unemployed female, albeit with different intensity.

For non working carers the traditional labour market variables confirm that having children and being a lone parent imply always an increase in the probability of being carer. While the main enablers of women's participation into labour market are: higher education and having had a non working mothers. This last effect could be a consequence of the change in employment status and the role in the household for women over the past 30 years. Interestingly unemployed female are not affected by any of the above labour market variables.

The coefficients of the value function of prospective financial gains and losses variable have the expected sign and show the presence of asymmetric effects, as predicted by Prospect Theory, (asymmetric effects imply loss aversion and prompt a bigger reaction to losses than to gains). Prospective income gains are an enabler and they increase the probability of becoming more attached to the labour market than to be inactive. Vice versa: financial losses act as constraints and discourage changes, making it more likely to preserve the Status Quo than to be part of the labour force. However, the pain or disutility of the loss is felt as bigger than the satisfaction of an equal in size gain.

Looking at the BE and social variables, the first thing to note is that there are some interesting idiosyncrasies across

the different types of non working categories. To take just one example is the variable measuring value for family life. The presence of this value increases the probability of being while it does not affect unemployed women (who are affected instead by the satisfaction with family life. Other specific variable that increase the probability of being carers are the degree of embeddedness in local community and having stronger ties with close "inactive" friends (not all employed. The results suggest that policies focused on areas where high levels of inactivity is present, working with large friendship groups within these areas could be used to motivate groups of individuals into work.

The two interaction terms increase probabilities of both carers and unemployed. This is not surprising.
As explained, *ConformNetNW* represents disposition of those women people happy (or not unhappy) with their status, in the sense that they "conform" or "fit" with the friends' social rule of high non employment because for them having a fulfilling job has little importance or none. This may represent situation of those women who have left their jobs to become mothers and are embedded in the community (maybe having a network of similar non employed friends) and choose to be out of work. The fact that carers choose their status can also be seen through the effect of two other interaction term *DeviateNetW*. This dummy represents that category of those women who are emotionally detached from the labour market but have all working close friends. In this scenario the respondent's reference point deviates from the friends' working norm but she would not suffer from deviating from it. It could be the case of some carers who may have worked before and chose to be at home. If the respondent's reference point and status quo coincided then it could be difficult to engage her in changing the status quo, despite the working rule environment. This is not surprising for carers (due to choices or due to constraints) are relatively more detached from the job but it is surprising for unemployed but it can help to explain long term unemployment (people adapt to their status quo and are more "sensitive" to things and events that confirm it and less "sensitive" to events that would prompt and stimulate changes as suggested by Prospect Theory indicating the presence of a "confirmation bias") and or a cognitive dissonance bias .

The probability of both unemployed and carers is also influenced by current available opportunities: an increase in availability of material capabilities and opportunities (such as a house, a car, the internet, a mobile phone etc..) increases the odds of belonging to other categories than being unemployed (with the exception of cares).

Oss of confidence is a limiting factor for both carers and unemployed. An asymmetric effect is also confirmed here: people react to a loss of confidence but they do not react to a gain in confidence (as predicted by Prospect Theory people are more sensitive to losses than to gains.

Overall our results indicate that the use of a cross disciplinary approach of labour economics, behavioural economics and social network analysis can generates significant benefits in terms of policy making and policy prescriptions because it provides useful insights into inaction that can better orientate the design of effective labour market policies. For instance a deeper understanding of how social networks impact worklessness decisions and attitudes, and affect employment perceptions, social mobility, and human capital investments, can have crucial implications for the labour market policies, subsidization of education and decision on unemployment benefits.

<Insert Table 4 here>

<Insert Table 5 here>

5.3 Summary of main results of the study

We summarize here some of our main findings discussed above:

- Adding more dimensions (behavioural, social psychological) to the analysis improves predictions of labour market statuses because it enables to identify better the "constrained" females, and to predict better a female's status within "similar" groups.

- Joblessness people who are more conscientious (in getting information, in filling in forms) and have friends in similar conditions (higher chances of sharing information) have higher probabilities to become more attached to the labour market.

- Social influence works as follows: people tend to associate themselves with friends having similar labour market attitudes. Social environment matters in reinforcing personal attitude producing a sort of confirmation bias effect that suggests that social influence is more effective across similarly minded people.

  People adapt to their status quo and are more "sensitive" to things and events that confirm it and less "sensitive" to events that would prompt and stimulate changes (confirmation bias and confidence bias).

- A stronger attitude to take more risk reduces the probability of being carers but it does not affect the probability of unemployed. This finding can explain attitude of people in long term unemployment: they may postpone or reduce efforts to look for a job for fear of the risk of not to be able to find it.

- Prospective financial losses (of receiving a labour income lower than non labour income if a carer became employed) increase the probability of being a carer while potential labour income gains would always decrease it but the prospect of financial gains would not affect unemployment (those more potentially "attached" to the labour market).

- Among the inactive females, carers are those who place high value for family life, are more embedded in local community and have stronger ties with close "inactive" friends, relative to the unemployed females, they seem to choose their status by having little interest in changing it.

Results MEs
Results simulations

6. Limitations and conclusions

In this empirical study we have used a new cross-disciplinary approach among labour economics, behavioural economics (BE) and social economics to explain agents' functioning over employment, unemployment and across various inactivity categories in the labour market. Using concepts of capabilities and refined functioning proposed by Amartya Sen we develop and test a model of non-employment that is much broader than those usually estimated within labour economics. We find that, in addition to standard labour economics variables, BE and social factors are potentially important in explaining non employment. In addition there are important differences found between the inactive groups (in particular carers) which explains our focus on women, across the different types of inaction and between age groups.

Whilst the analysis presented above should be viewed within the context of some potentially important limitations. Firstly all of the measures used are not collected directly for the purpose but are derived variables constructed from data collected from a large household survey. This means that the data may not be measuring BE biases or does not capture psychological effects. Secondly the results clearly need to be considered within the content of the potential of endogeneity such as the endogeneity issue of social relations (Mansky's mirror effect), and of other variables crossing the personal and social spheres. Having stated this clearly this also points to the potential for additional research in see if these effects could be truly considered as causal effects. This can be addressed once we move from the static model to the panel data where temporal dimension can be used to attempt to address these issues.

Despite the limitations, our results suggest that the proposed redesign of the benefit system and additional support for those not currently employed needs to allow for a degree of heterogeneity in the client basis. The existing Work Programme in the UK is supposedly designed to take account of heterogeneity in broad groups including: lone parent, disabled and young unemployed. A closer look at the work programme suggests that actual tailored support is limited and in fact the programme offered do not consider the potential benefits of exploiting social connections and insights from behavioural economics. This may explain the lack of benefit to the participants on the Work

Programme, which recently reported that being on the Work Programme actual did not promote employment and in some cases actually reduced the chance of finding employment (DWP 2012). The results above suggest that a consideration of factors wider than the standard labour economic variable when designing labour market policies may provide fruitful returns. In terms of the Work Programme this would mean looking beyond the crude groups used: such as lone parent and disabled, taken from labour economics, to considering refined identification of support on a more individualised basis, informed by social connections and behavioural economics.

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APPENDIX

<Insert Appendix TABLE A. 1 here>
<Insert Appendix TABLE A 2 here>
<Insert Appendix TABLE A.3 here>
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<Insert Appendix TABLE A.8 here>

Table 2 (Only statistically significant coefficients at 5%)

Iteration		04:00	log	likelihood	=	-1168.43		
Multinomia	Probit		regression	Number	of	obs	=	3526
	Wald		chi2(60)	=	998.93			
Log	likelihood		=	-1168.43	Prob	>	chi2	=
	notworkfd		Coef.	Std. Error	Z	P>|z|	[95% Conf. Interval]	
1	|							
	age1624		-1.316	0.652	-2.020	0.044	-2.593	-0.038
	age2549		-1.447	0.298	-4.860	0.000	-2.031	-0.863
	mumnotwork		-0.247	0.104	-2.360	0.018	-0.451	-0.042
	higher		-0.252	0.125	-2.010	0.044	-0.498	-0.007
	rnch02		1.103	0.138	8.020	0.000	0.833	1.373
	rnch34		0.613	0.143	4.270	0.000	0.332	0.894
	rnch511		0.266	0.071	3.720	0.000	0.126	0.406
	rnch1215		0.191	0.097	1.980	0.047	0.002	0.381
	loneparent		0.419	0.163	2.570	0.010	0.099	0.739
	consci		-0.036	0.011	-3.330	0.001	-0.058	-0.015
	gainconfidence		-0.052	0.042	-1.240	0.216	-0.134	0.030
	lossconfidence		0.096	0.043	2.200	0.027	0.011	0.181
	risk		-0.030	0.014	-2.080	0.038	-0.058	-0.002
	vfamilylife		0.077	0.015	4.990	0.000	0.047	0.107
	inter20		1.804	0.324	5.560	0.000	1.168	2.440
	ginterACTtie		-0.444	0.168	-2.640	0.008	-0.773	-0.115
	ConformNetNW		1.190	0.129	9.260	0.000	0.938	1.442
	DeviateNetW		1.208	0.165	7.300	0.000	0.884	1.532
	Moreembed (*)		0.212	0.123	1.720	0.085	-0.029	0.454
	Value Function							
	(Prospectneg)		-0.049	0.004	-13.450	0.000	-0.056	-0.041
	Value Function							
	(Prospectpos)		-0.016	0.002	-7.210	0.000	-0.020	-0.012
	capabilities		-0.198	0.043	-4.590	0.000	-0.283	-0.114
	neurotic		-0.212	0.077	-2.750	0.006	-0.363	-0.061
	c.neurotic#c.age2549		0.180	0.084	2.150	0.032	0.016	0.345
	_cons		-1.612	0.571	-2.820	0.005	-2.732	-0.493
2	|							
	lossconfidence		0.149	0.055	2.700	0.007	0.041	0.257
	sfamilylife		-0.047	0.020	-2.380	0.017	-0.085	-0.008
	inter20		1.751	0.470	3.730	0.000	0.830	2.672
	propnetunemp		0.761	0.254	3.000	0.003	0.264	1.258
	prefanet1		0.632	0.199	3.180	0.001	0.242	1.022
	prefanet3		0.723	0.243	2.980	0.003	0.247	1.199

	worseoffp	0.694	0.159	4.370	0.000	0.383	1.006
	Value Function						
	(Prospectneg)	-0.028	0.005	-5.230	0.000	-0.038	-0.017
	Value Function						
	(Prospectpos)	0.003	0.003	0.910	0.363	-0.003	0.009
	capabilities	-0.382	0.055	-6.900	0.000	-0.490	-0.273
	Neurotic (*)	-0.205	0.112	-1.830	0.068	-0.425	0.015
	c.neurotic#c.age1624	0.372	0.178	2.090	0.037	0.023	0.722
	_cons	-0.925	0.708	-1.310	0.192	-2.313	0.463
3	|	(base	outcome)				

(*) statistically significant at 10%