



## **Lost in space? Regional differences in the employment transitions of mothers of young children in the UK**

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### **Abstract**

This paper explores regional differences in the involvement in paid work of mothers of children under 6 in the UK. It has two aims: firstly, to investigate the extent of sub-national heterogeneity in the transitions occurring during the initial years of motherhood, since previously this heterogeneity has mainly been analysed at the national level. Secondly, this paper quantifies the relative contribution of composition effects, regional labour market characteristics and gender-roles attitudes in explaining contrasts in transitions between ‘worklessness’ and full-time, standard part-time and marginal part-time work. Based on latent growth modelling of longitudinal Labour Force Survey data, the results highlight significant differences in trajectories between regions and show that regional differences can only be adequately explained by combining these three layers of explanations. This has consequences for the literature in both economics and sociology: multidisciplinary approaches should be encouraged together with more emphasis on the spatial dimension of economic behaviour.

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## Introduction

It is generally agreed that given current dominant gender roles, women remain the main carers for children in many households, and that this has a significant impact on their involvement in paid work - especially as long as children remain under school age. This translates into a series of downwards transitions, which usually involve scaling down their hours, or even leaving employment altogether for a few years. If these have been amply analysed over the last 20 years, most contributions exclusively considered countries as the relevant spatial unit of analysis. This is regrettable given both the extent of subnational differences and the growing amount of data available for such analyses. Unsurprisingly, existing research has given rise to explanations which emphasize the role played by national government policies to provide (dis)incentives for women with caring responsibilities, sometimes in conjunction with individual or household-level strategies. A good understanding of this issue is important for gender equality policies. Female participation in the workforce is also important for helping to increase tax revenue, alleviating child poverty, and reducing the risk of poverty in old age among women.

This contribution bridges some of these gaps by presenting evidence about the heterogeneous trends in the employment transitions of mothers of children under school age, and by modelling the respective role of economic constraints and cultural factors in their spatial context. This shows that a complex combination of these factors at regional and county level are relevant, rather than just economic incentives. Its original contribution consists in simultaneously testing the role of three sets of factors in a single statistical model: firstly, imbalances in socio-demographic characteristics (composition effects); secondly, the regional characteristics of the labour market for women, especially the prevalence of segregated jobs given their salience for part-time employment in the UK; and thirdly, regional differences in gender-roles attitudes. Combining these three causal layers permitted the weighing of the extent to which these spatial differences are due to a combination of ‘hard’ economic factors and ‘soft’ cultural reasons at the individual and regional level. This was achieved by using latent growth models - a class of models allowing the measurement of change over time and which has not been applied to the field before.

The paper is organised as follows. In Section 1, the extent of regional differences in participation is presented, together with the relevant literature. In Section 2, the models, their operationalisation and the data used are described. Results are presented in Section 3, and discussed in Section 4. The conclusion sketches future

research avenues and policy implications.

## 1 Mothers, involvement and space

For the purposes of this paper, female employment is conceptualised as *involvement in paid work*, consisting of: involvement intensity which refers literally to the time spent doing paid work, and variability, the changes over time in intensity. As they become mothers, large numbers of women undertake transitions that affect these two dimensions. In most cases these usually begin with a move from paid work into ‘worklessness’ before a birth, followed by a resumption either in a full-time or a part-time capacity, possibly followed by a further increase in working-time later on. The duration of each stage may vary from a few weeks to several years. The stages might take place in part, or fully within, the umbrella of maternity or parental leave provisions (Gornick & Meyers 2003). British women have long been known to begin their career as full-timers, leave their jobs shortly before becoming mothers, then gradually resume employment (usually part-time) as their children reach school age (Martin & Roberts 1984, Joshi & Hinde 1993). In Europe, they are amongst those most likely to return to paid work within 3 years of a birth and remain involved thereafter, second only to Scandinavian women (Gutiérrez-Domenèch 2005). As maternity leave provisions have been expanded, a growing proportion of mothers have remained in employment after a birth, including on a full-time basis (Jacobs 1999, Dex et al. 1998). This translates into higher cross-sectional levels of involvement. In the UK, employment of mothers with dependent children increased from 47% at the beginning of the eighties to 58% in 1991 and 65% in 2001 (Twomey 2002, Hansen et al. 2006). In 2010, this rate was 66.7%, possibly indicating a ceiling level. It is considered that obstacles such as the price of childcare continue to hamper further progress in women’s involvement in employment.

Whether upwards or downwards, most of these transitions are likely to involve part-time work (O’Reilly & Bothfeld 2002), which in the UK tends to imply low quality jobs in the service sector (Fagan, Donnelly & Rubery 2005). In 2000, more than 85% of mothers who were not employed when their child was aged 10 months and who returned to work within three years did so part-time, whereas about one quarter of those previously in full-time work moved to part-time hours (Dex & Ward 2007). After the birth of a child it may take mothers several years to step up their involvement again. Activity rates begin to recover by the time children reach the age of 7, against the conventional wisdom that this happens en masse when children

start going to school (at age four or five). This could be due to the (lack of) job opportunities or the presence of younger siblings in the family (Paull 2006, Brewer & Paull 2006). After going back to work, career discontinuity might be the rule for significant numbers of women, and not only in relation to additional births (Jacobs 1999).

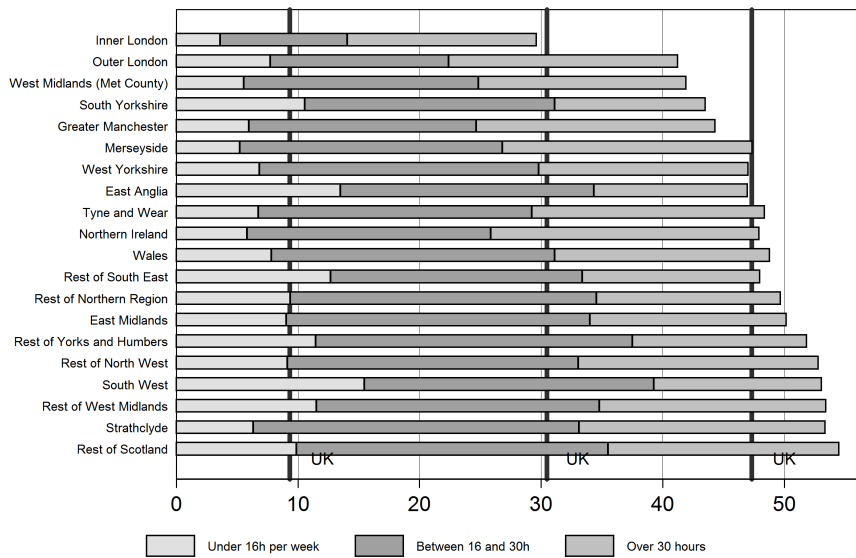
## 1.1 The regional dimension

While mothers' transitions have been analysed at the national level almost exclusively, a large share of the literature on regional employment imbalances has focused – often in a gender neutral fashion – on the North-South divide - the gradual decline of manufacturing industries in the North and the West Midlands together with the disproportionate growth of the service sector in the South East (Massey 1995, Fothergill 2001, Beatty & Fothergill 2005). Male blue collar jobs were destroyed, and many of those that were subsequently created were female service jobs - not necessarily good quality ones (Begg 1993, Fagan 2001). Research has also found evidence of gender imbalances in job losses in large cities between 1981 and 1991. This had a disproportionate impact on poorly qualified women, when compared with men with the same level of education or highly qualified women (Bailey & Turok 2000). The former were also less likely to find new jobs and more likely to leave the labour force altogether in some places such as Glasgow and Manchester, but not in other places such as Plymouth, Cardiff, Edinburgh and Bristol. This is attributed in part to their lower geographical mobility, whether in terms of migration or commuting (Green et al. 1986) and contributes to the comparatively low female economic activity rate in these areas. It has been estimated that each 1,000 female job losses in major British cities resulted in 453 transitions into economic inactivity, against only 124 for men (Bailey & Turok 2000). A discussion of the impact of rural settings on women's income and job opportunities has also taken place (Henderson & Hoggart 2003).

This lack of research on regional differences in women's involvement is surprising given the relatively high availability of cross-sectional data. In 2007 for instance, there was a 10% gap in the economic activity rates of women across Government Office Regions and former Metropolitan Counties. Rates were highest in the South East, the South West and Scotland (around 77%), and lowest in London and the North East (ONS 2008). Figure 1 shows that employment rates of mothers of children under 6 was lowest in large urban areas - 33% in Inner London and 45%

in the Birmingham conurbation. It was highest in the South West and the North West (excluding Greater Manchester) at above 50%. These rates are close to those observed in Scotland with, at the same time, overall levels of part-time and full-time work around the UK average. By contrast, Greater London, and to a lesser extent Birmingham and the Leeds-Bradford conurbation, have low levels of maternal employment (under 50%), but with a contrasting working-time picture. In the former areas low participation goes together with a higher prevalence of full-time work, whereas the opposite is true in South Yorkshire where part-time work, in particular marginal part-time work is more common (at 24%, one of the highest rates of the UK). By contrast, mothers in the South East and East Anglia enjoy employment rates close to the national average, with a high proportion of part-time work, especially marginal part-time work. Mothers of young children in the South West seem to rely heavily on part-time employment, although they are also characterised by high employment rates. In contrast, employment rates in Liverpool and Manchester are close to the national average, but with a comparatively high proportion of full-time employment.

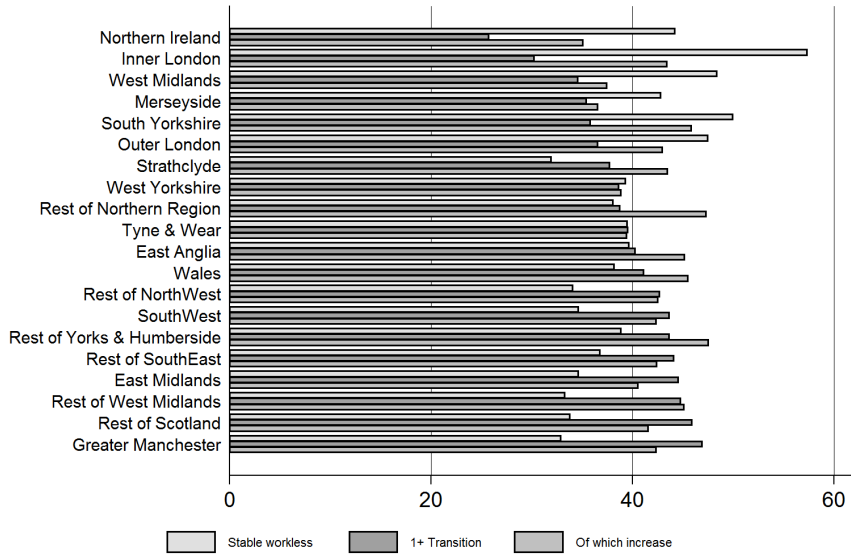
Figure 1: Regional employment of mothers



% of all mothers of children under six working under 16h per week, between 16 and 30h and more than 30h across Government Office Regions, Metropolitan counties of England and countries of the UK. Data: LFS 2001-04. Lines marked 'UK' denote the national average.

Figure 2 seems to indicate that stable involvement states seem to lie at the core of these regional differences. Whereas London, South Yorkshire and the West Midlands are characterised by high proportions of mothers not involved in paid work

Figure 2: Regional involvement variability



Percentage of mothers of at least one child under six remaining workless (not employed or on maternity leave); with at least one change in involvement; of which an increase over 15 months. Unweighted sample size: 13,784. Data: 5 Waves Longitudinal LFS 2002-07.

for at least 15 months, these are also the areas where cross sectional employment rates are lowest, the opposite being true of the Rest of the North West and the West Midlands.

However, no correspondence is visible between the number of transitions undertaken by mothers and overall levels of employment and full-time work. For instance Inner London, the Birmingham area, and Northern Ireland are all characterised by comparatively few maternal employment transitions. While this seems to be due to mothers who remained workless for at least 15 months in the former two cases, stable episodes are more evenly spread across involvement states in the latter. Conversely, Greater Manchester, Scotland (outside Strathclyde) and the South East are characterised by more transitions, each also involving specific combination of involvement states.

## 1.2 Explaining regional differences in involvement

Such heterogeneous regional involvement patterns suggest that the underlying mechanisms determining participation also operate in a spatially differentiated fashion. Unfortunately, the field tends to be populated by theories which (most of the time) do not consider the spatial dimension of involvement. Three possible explanations

of this regional diversity are tested in this study. The first two explore variations in maternal involvement within an economic cost/benefit framework. Mothers tend to be in paid work when the disadvantages of participation are offset by its benefits, with a significant amount of research characterising the factors that affect either these costs or the individual decision making process. In the third paradigm, participation is seen as resulting from the interplay of institutions and norms which frame women's sense of self and attitudes towards paid employment. From an orthodox economics perspective, women's participation decisions are related to their amount of human capital. Whether due to anticipating future births or as a result of previous ones, many mothers tend to have levels of marketable skills yielding lower wages than their male partner, and will tend to specialise in unpaid work and lesser form of formal employment, if any (Becker 1991). In its narrowest sense, involvement can be understood as depending on whether their marginal rate of productivity offsets the price of alternative childcare provision. A related framework - abundantly debated among British sociologists - has considered the role of fixed exogenous preferences (other than utility maximization) in framing participation of a minority of women either as career or home oriented (Hakim 2003).

Accounting for these innate individual differences is operationalised as a composition hypothesis: some of the regional variations in involvement result from imbalances in the distribution of the sociodemographic characteristics of mothers that affect their potential earnings, namely their social position and family formation patterns. For instance women with higher levels of formal education could be more likely to be found in large urban areas where white collar service employment is more readily available. The same could also be true at the other end of the service jobs scale (Fagan 2001). Therefore, controlling for these factors should explain the regional variations in involvement, both in terms of intensity and variability. This effect is expected to be limited in size - given that no major demographic regional imbalances are reported in the UK - and should merely be noticeable in large conurbations such as London, Birmingham or Manchester, where most of the (im)migration effect is likely to be felt. Research on this topic has been carried out for women as a whole only (Little 2009).

On the other hand, significant attention has been paid to the external opportunities and constraints affecting the cost of participation. These include legal provisions resulting from public policies, leading to typologies of national 'regimes' (Lewis 1992, Sainsbury 1999) in areas such as time and leave policies (Gornick & Jacobs 1998) and formal childcare supply (Fagan, O'Reilly & Halpin 2005, Bettio

& Verashchagina 2009). Although undeniably important for clarifying the national context of involvement, this literature is of limited interest here since the policies analysed do not vary regionally in the UK. Imbalances in the costs of formal child-care could represent a partial exception however - it has been reported that their high level in London put an extra pressure on involvement (London Assembly 2012).

The availability of suitable, often segregated, jobs is seen as the other main factor affecting the regional cost structure of participation. Women tend to enter such segregated industries - which include retail, catering, health, education - often moving to part-time employment, especially when this involves changing employer (Connolly & Gregory 2008). The geographical location of these jobs matters since mothers' commuting distances are known to be smaller than men's: even when working full-time, women tend to be responsible for the 'school run' (Preston & McLafferty 1999, Kwan 1999). Women in households farther away from potential employers are more likely to be jobless (Hanson & Pratt 1991, Van Ham & Buchel 2006). Finally, while it is known that significant numbers of women have jobs in the public sector, there is evidence that overall these are less spatially concentrated than private sector employment (Prothero 2011). This means that demand side factors that influence the involvement of women are more likely to depend on variation in the availability of private sector jobs.

The second hypothesis tested here considers the role of the availability of jobs on maternal involvement. It was expected that regions with a high prevalence of segregated, i.e. 'female' jobs together with a low level of female unemployment, would offer more opportunities to mothers. . In regions with more female jobs, the involvement levels of mothers of young children should be higher. Similarly, in regions where fewer such jobs are available, mothers would be less likely to be involved in paid work. This should contribute to significantly explaining the remaining regional heterogeneity. Controlling for female unemployment and horizontal segregation takes into account both quantitative and qualitative aspects of the regional labour market, since segregated jobs are likely to be of poorer quality, especially in terms of earnings variations in involvement.

In the literature reviewed above it has been assumed that women adjust their behaviour as a result of economic factors and that their or their household's direct or indirect income is the main driver of participation. A third strand in the literature has instead focused on the impact of social structure on gender cultures, in particular, attitudes and representations, and the extent to which they shape women's sense of identity and ultimately, involvement in paid work. Examples of such



approaches are Connell’s concept of gender regime as well as Pfau-Effinger’s gender arrangements and cultures (Connell 1985, Pfau-Effinger 2004). Most share the idea that involvement and representations of motherhood reflect collective norms and a gendered balance of power resulting in the economic domination of women. Unfortunately the spatial dimension of these gender structures has also been overlooked.

The concept of gendered moral rationalities (GMR) represents one of the few attempts to link representations of motherhood and gender structures with place, by showing how patriarchal orders are embedded in the representations of individual mothers (in particular single mothers) and how they influence their local horizons (Duncan & Edwards 1999, Duncan & Smith 2002). GMR are geographical constructs: conceptions of good and bad motherhood and ‘the right thing to do’, maintained through social networks. A few issues remain. First, GMR are defined at the local level, and not much is said about the distributions of these local trends within regions. Then, little is said about the production of GMR in a specific location, apart from class-based residential segregation. Finally, the empirical evidence seems mostly made up of aggregate indices applied to a limited number of regions, which raises the issue of the ecological fallacy.

The third hypothesis considers the role of representations of motherhood as an additional layer of explanation of regional differences in involvement. A positive relationship can be expected between the presence of regional gender cultures favourable to working mothers and the involvement of mothers of young children. Regions with higher prevalence of progressive views about gender roles should be characterised by higher levels of involvement intensity and upwards / stable transitions. Controlling for this should account for a significant part of the remaining regional variations in involvement.

## 2 Data, methods and operationalisation

This framework allows for representing transitions as lines. As far as the regional dimension is concerned, Government Office Regions and Metropolitan Counties regions within the UK were identified as providing the best available compromise between size of population and availability of longitudinal information.

### Data

Simultaneously examining the spatial and temporal dimensions of involvement in paid work requires a large number of observations, hence the choice of the Longitud-

inal Labour Force Survey (LLFS) for this paper. Although the sample size of the individual datasets is modest, combining them together is straightforward. The LLFS is a single stage sample survey of working-age residents in private house-holds in the UK (ONS 2007b), conducted on a continuous basis. Respondents are interviewed for five consecutive quarters. The LLFS is an artificially balanced panel: observations for which employment-related information was missing at any wave were removed from the sample, and respondents who moved houses were not followed which may lead to an underestimation of transitions (ONS 2007a). The specific data used was constructed from 18 collated datasets, from June 2002 to August 2007. Total un-weighted sample size is 14,052 working-age mothers of children aged under 6, which translates into 70,260 instances of labour market involvement. This age range was chosen given that studies have shown that the timing of return to work tends to be spread over time (Paul 2006), hence strictly focusing only on children under school age would give only a partial overview of the involvement patterns of mothers of young children. The limited panel dimension of the LLFS doubtless represents a weakness. However, a 15 months period is likely to capture the most crucial transitions (or absence thereof) among mothers of very young children: returning or not to paid work at the end of their maternity leave, remaining ‘workless’ for at least 15 months in a row, or indeed stepping up or down. It is important to keep in mind that as a result of the short period of observation the starts and ends of the periods should not be given particular substantial meanings. Given that the data is mostly used in multivariate analysis, heterogeneity in these transitions should be not be an issue.

## Modelling strategy

This paper focuses on transitions between four involvement states or levels: marginal (less than 15 hours per week) and standard part-time work together with full-time work (more than 30 hours per week), analysed within a latent growth modelling framework (Muthén & Asparouhov 2002). In such models, transitions are summarised as growth lines and the observed episodes of involvement are assumed to be the manifestation of unobserved latent variables - in this case ‘real’ involvement or dedication to paid work. These growth lines of involvement are described by two parameters; an intercept, that is the initial level of involvement, representing involvement intensity, and a slope representing the change in intensity over time., both used simultaneously as outcomes in a regression. This allowed other variables

to be controlled for, and provided estimates for the residual variance of each of these terms. These variance terms were split into a portion attributed to individual (i.e. respondent) level and another one to the regional level, in a two-level growth model. The goal of the analysis is to explore the factors that decrease the unexplained regional variations, so these two parameters lie at the core of the analysis. The main effects of the control variables at the individual level are of lesser interest.

## Variables and operationalisation

The individual factors included in this analysis were initial education (measured as the age at which the respondents left full-time education), occupation (up to eight years before the current spell of joblessness for mothers currently not employed) and age, which are traditionally seen as measures of human capital. While initial education determines the broad range of occupations within which respondents are most likely to find a job, age and occupation provide a more direct indication of their actual achievement. Although likely to be correlated, these were nonetheless included since not all highly educated mothers will develop a career and conversely, not all mothers in high occupations have a high level of formal education. Family formation patterns adding to the pressures of participation (the age and number of children and whether respondents were single mothers, traditionally an impediment to participation in the UK), were also controlled for.

The availability of jobs for mothers was measured using the regional-level rate of maternal (of dependent children of any age) unemployment and the proportion of employed mothers working in female industries. Both were computed from the cross-sectional LFS, pooled for 2001-2004. Segregated industries were defined as those where nationally more than 60% or less than 40% of employees belonged to the same gender. These were computed using the two digit SIC (Hakim 1992) and represent only an approximate measure of segregation – sometimes also labelled concentration (Blackburn et al. 2000), since it is based on the proportion of men and women employed at the level of the major industry groups.

Finally, gender-roles attitudes were measured using information about the orientations to work among women from Wave O (2006) of the British Household Panel Survey. The following question was retained, ‘Do you personally agree or disagree that a pre-school child is likely to suffer if his/her mother works?’. Answers ranged from ‘Strongly agree’ to ‘Strongly disagree’ on a five item scale. The variable was subsequently recoded into three categories: ‘Agree’, ‘Neither agree nor disagree’,

‘Disagree’. A two-way table of this variable by region was produced, keeping the proportion of female respondents who agreed. There are of course issues with using such a simplified indicator, among others the fact that it gathers answers from women belonging to several generations, not all of them mothers of young children.

### 3 Model results

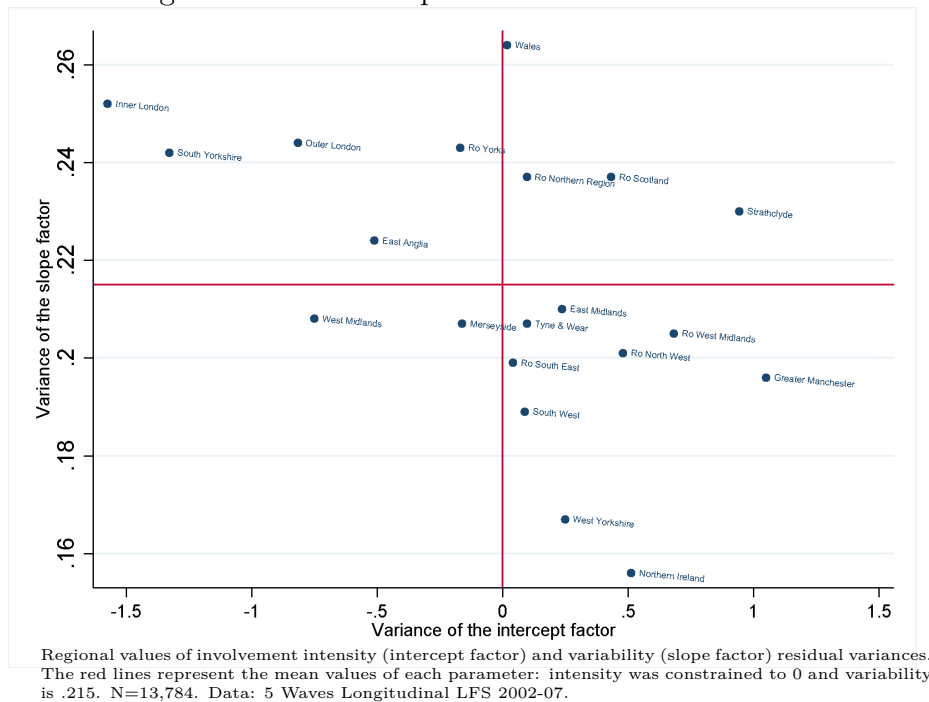
The first column of Table 1 shows the results of the raw latent growth model of involvement before control variables were introduced. The slope value is close to .2 which denotes an overall increase in involvement over 15 months, a result which is not very surprising: mothers of children under six are likely to step up their participation over time eventually, for instance by returning to work after their maternity leave, or further increasing their working time as their children get older. As expected, the individual variances of both involvement intensity and variability are strongly significant, and so is the regional level variance of involvement intensity, which confirms the descriptive analysis presented above. However, the variance of involvement variability is not significantly different between regions, which is likely to reflect the fact that the transitions most visible over 15 months are stable trajectories which are captured by initial levels of involvement, rather than the slope of the growth line.

The contributions of individual regions to these spatial variations are presented in Figure 3. It appears clearly now that most of the geographical variation of involvement intensity is concentrated in less than half of all regions and counties of the UK. The remaining areas, all of them in England, have residual intensity and variability that do not depart markedly from their mean estimates. The asymmetry of regional differences in involvement intensity is another interesting finding. Indeed, in the majority of the outlier regions (Inner and Outer London, South Yorkshire, the West Midlands and East Anglia) mothers tend to be less involved than on average. In only a few of them (Greater Manchester, Strathclyde, the rest of the West Midlands and the North West) is the overall involvement clearly higher than average.

#### Composition effects

The second column of Table 1 shows the impact of composition effects on involvement intensity and variability. Social position and family formation patterns affect involvement as expected; additional constraints such as more children translate into

Figure 3: Predicted spatial contrasts in involvement in the UK



lower involvement intensity and negative trends in variability over time. The most common trajectory for mothers in the sample consists of stable worklessness. Being in or having held a professional or managerial occupation has the strongest positive impact on involvement intensity, whereas the number of children has the strongest negative one. Only two factors, having children older than two and being single, are significantly associated with increases in involvement over time in opposite directions, respectively positive and negative. This could seem counter-intuitive, but should be read in conjunction with the intercept coefficients, which show that if the latter group is more likely to increase its involvement it is from a position where it is significantly lower than average, whereas the opposite is true of the former.

An unexpected impact of composition effects, is that when they are accounted for, the unexplained regional variance of involvement intensity unexpectedly increases. If there is indeed a composition effect, more rather than less heterogeneity can be observed between mothers of young children across regions, which can indicate either individual unobserved heterogeneity, or regional level factors to be examined. The second finding is that the relative position of each region vis-à-vis each other was very close to that shown in Figure 1, with Greater Manchester, Inner and Outer London still standing out. By contrast, composition effects seem to account for some of the initial differences in the West Midlands and South Yorkshire.

Table 1: Two-level latent growth model of working-time of mothers of children under 6

	1	2	3	4	5
Log Likelihood	-54064.1	-52846.5	-52840.8	-52838.1	-52833.7
aBIC	108191.8	105832.8	105834.0	105835.0	105832.7
<i>Individual level parameters</i>					
Mean intensity	Set to 0				
Mean variability	.22*** (.02)	.20*** (.01)	.19*** (.01)	.19*** (.01)	.19*** (.01)
Intercept Variance	54.80*** (2.31)	42.72*** (1.94)	42.77*** (1.93)	42.78*** (1.93)	42.81*** (1.95)
Slope Variance	1.21*** .08	1.02*** (.08)	1.02*** (.08)	1.02*** (.08)	1.03*** (.08)
Covariance	-3.3*** (.24)	-2.53*** (.23)	-2.53*** (.23)	-2.53*** (.23)	-2.54*** (.23)
Individual level factors impact on involvement intensity (intercept)					
Youngest child 3-5 (Under 2)	-	1.95*** (.07)	1.94*** (.07)	1.95*** (.07)	1.95*** (.07)
2+ Children (One child)	-	-2.69*** (.16)	-2.68*** (.16)	-2.67*** (.16)	-2.67*** (.16)
Single mother (Partnered)	-	-2.19*** (.12)	-2.17*** (.12)	-2.17*** (.12)	-2.17*** (.12)
Age	-	.12*** (.01)	.12*** (.01)	.12*** (.01)	.12*** (.01)
Age left FT education	-	.15*** (.02)	.15*** (.02)	.15*** (.02)	.15*** (.02)
Prof/manag (Any other occup.)	-	3.23*** (.14)	3.23*** (.14)	3.23*** (.14)	3.23*** (.14)
Individual level factors impact on involvement variability (slope)					
Youngest child 3-5 (Under 2)	-	-.24*** (.03)	-.24*** (.03)	-.24*** (.03)	-.24*** (.03)
2+ Children (One child)	-	.03 (.04)	.03 (.04)	.03 (.04)	.03 (.04)
Single (Partnered)	-	.12** (.04)	.12** (.04)	.12** (.04)	.12** (.04)
Age	-	0 (0)	0 (0)	0 (0)	0 (0)
Age left FT education	-	0 (.01)	0 (.01)	0 (.01)	0 (.01)
Prof/manag (Any other occup.)	-	-.02 (.04)	-.02 (.04)	-.02 (.04)	-.02 (.04)
<i>Regional level parameters</i>					
Intercept variance	.50** (.17)	.69* (.28)	.33* (.14)	.20* (.09)	.09 (.06)
Slope variance	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)
Regional-level factors impact on involvement intensity (intercept)					
Maternal unemployment rate	-	-	2.31** (.74)	1.55* (.69)	1.06* (.52)
% mothers in segregated jobs	-	-	.21** (.08)	.16+ (.09)	.09 (.07)
Segregation & unemployment	-	-	-.06** (.02)	-.05** (.01)	-.03* (.01)
Paternal unemployment rate	-	-	-	.39** (.15)	.32** (.1)
Child suffers if mother works	-	-	-	-	-.08** (.03)

<sup>a</sup> Sample size adjusted BIC + Significant at: .1 \* .05; \*\* .01; \*\*\* .001. Intercept and slope variances; regression coefficients. Data: Pooled longitudinal LFS 2002-2007. Individual-level intercept and slope means and regional-level intercept mean are constrained to 0 and not shown. N=13,784. Thresholds values available on demand.

## Regional-level factors

Column 3 of Table 1 shows the impact on involvement intensity of the regional differences in the availability of jobs for mothers, as measured by the prevalence of segregated ‘maternal’ jobs as well as maternal unemployment.<sup>1</sup> It was found that these characteristics of regional labour markets explain about half of the variance of involvement intensity after individual factors were controlled for, reducing it from 0.69 to 0.33. This confirms the role of differences in the opportunity structure that mothers experience at the regional level. On the other hand, introducing these regional covariates did not alter the position of each region relative to each other in terms of the unexplained variation in involvement. Mothers in London, East Anglia, South Yorkshire and the Birmingham area remain with atypically low levels of involvement, in contrast with those in Manchester Scotland and the rest of the West Midlands.

However, and somewhat surprisingly, a positive relationship was found between regional rates of female unemployment and levels of involvement intensity. A possible explanation could be that higher regional rates of unemployment signal a greater willingness among women to take part in paid work and register as unemployed rather than become economically inactive. In order to further explore this relationship, an interaction term between segregation and unemployment was introduced in the model, showing a significant and negative relationship with involvement intensity. This would tend to confirm that the involvement of mothers of young children is lower in regions where more mothers are employed in female jobs when unemployment is high, but in other regions this indicator captures heterogeneity. Finally in a fourth model, a control for paternal unemployment was also added in order to account for the added worker effect which could contribute to this relationship (Lundberg 1985, Harkness & Evans 2011). Women would enter or remain longer in paid work in regions where actual or fear of loss of income of the main breadwinner is more prevalent. This could also be where female employment is high, which seems in part confirmed by the reduction of the size of the coefficient from 2.31 to 1.55. The other unexpected result to come from Model 4 is that the effect of the availability of female jobs becomes almost non significant as if again it is in regions with high levels of male unemployment that mothers’ involvement is greater. Perhaps this is because better quality jobs are not available.

Finally, the fifth column of Table 1 shows that unexplained differences in involvement are further reduced by another half when regional differences in women’s

attitudes about employment of mothers are taken on board; to the point where they become no longer statistically significant. There is a clear positive association between areas with low level of involvement intensity and those in which a high proportion of women think pre-school children suffer when their mothers are employed. In other words, regions where women tend to have more positive attitudes about working mothers are also those where involvement remains atypically high, even after controlling for the individual characteristics of mothers.

## 4 Discussion

The above results have confirmed the main thrust of this article: first, that there are considerable regional differences in the employment transitions of mothers of young children within the UK and that a combination of economic factors and gender-role attitudes can provide a credible explanation for these. The fact that accounting for composition effects revealed additional, rather than reduced regional differences in involvement may come as a surprise, and will need to be further investigated. On the other hand, composition effects help to explain part of the lower than average intensity of participation in the West Midlands Metropolitan area as well as in South Yorkshire, but not in London (low) nor Greater Manchester (high), where additional urban heterogeneity was uncovered. The findings also suggest that there are no homogeneous urban vs rural effects in the participation of mothers in paid work; contrary to prior expectations. This may have to do with unobserved heterogeneity in the model. Introducing further occupational differentiation in the model rather than a simple dummy variable for professional and managerial occupations might help explaining this. However, doing so might increase the risk of endogeneity in the model, since doing so would create a group in majority made of mothers who have never worked.

By contrast, the greater role played by regional-level economic factors in accounting for these differences was correctly anticipated. However, their effect only partially matched what was expected. To begin with, the availability of segregated jobs does not seem to play a major role in explaining involvement differences, since it becomes non-significant as soon as either gender roles attitudes or fathers' unemployment levels are taken on board. The other finding is that mothers tend to be involved in paid work at higher levels in regions where fathers are more at risk of being unemployed, which suggests that economic necessities arising from perceived or actual male unemployment could be a bigger driver of involvement -



the added worker effect. This also seems to indicate that supply side factors - how willing mothers are to participate in paid work - play a significant part in explaining regional differences in participation. The results also show that the positive relationship between involvement and regional maternal unemployment, initially puzzling, is similarly gradually eroded as gender roles attitudes and the added worker effect are included: regions where female unemployment is higher are also those where women are more likely to go out to seek work, halving the effect size. A further halving occurs in areas where male unemployment is also high.

This significant and robust effect of attitudes towards motherhood on involvement also confirmed what was expected: that there seems to be significant regional differences in gender roles attitudes and that these are related to the intensity of participation in paid work. The underlying mechanisms need however further investigation. Finally in a fourth model, a control for paternal employment was also added in order to account for the added worker effect which could contribute to this relationship (Lundberg 1985, Harkness & Evans 2011).

An alternative approach developed by (Sackmann & Haüssermann 1994, Sackmann 1997) also explored by geographers (McDowell & Massey 1984, Jarvis 1997, Stuyck et al. 2008) consisted in relating current regional levels of female employment to historical trends in participation dating from as far back as the industrial revolution, assuming that contrasted paths of regional economic development led to enduring profiles of women's involvement. Areas that had been characterised by the dominance of heavy industries were also those where female participation continued to be low, even after the decline of these industries and subsequent regional economic redevelopment. Conversely, areas which relied on female labour outside the home were found to be more likely to have persistently high participation levels.

Going back to Figure 3 above, we can find a number of regions with patterns of participation that reflect those in their industrial history. An obvious case is the North West, in particular North Lancashire and Greater Manchester, characterised by comparatively high levels of economic activity and full-time employment among women. At the turn of the 20th century, 80% of the textile industry in the UK was located in Lancashire, with a few subregional variations relying on cheap female labour to operate the new machines (Hall 1973, 714). Just before the Second World War, in some of the towns that are now part of Greater Manchester (i.e. Rochdale, Bury, Oldham), up to a quarter of men and two thirds of women were employed in the textile industry (Lawton & Pooley 1992, 285).

The South Yorkshire and Birmingham areas, formerly centres for male industries,

are characterised by lower than average levels of maternal involvement. However, neither the former metal manufacturing and shipbuilding areas of the North East and Wales, where married mothers tended to retreat the most from paid employment, have distinguishable involvement patterns. This could be caused by a rise of part-time work in the North East which was associated with a change in the industrial composition of the region (Dunford & Perrons 1986, Massey 1995) in the context of persistent male underemployment. It could also be the case that these gender roles do not always translate into quantity, but rather the quality of jobs and career opportunities available to women (Charles & Davies 2000).

Finally East Anglia and the Yorkshire are grey zones, where involvement among women relies on comparatively high levels of employment in agriculture, combined with part-time work. In the former, the rise of female work took place against a tradition of both casual but persistent seasonal female work in agriculture (McDowell & Massey 1984), but the evidence in favour of this interpretation is thin, especially given the heterogeneity of these regions: East Anglia also hosts the technological hub of Cambridge. Similarly, large urban areas such as London are difficult to analyse given the economic diversity that has characterised them over the last century: service and financial sectors but also textile industries and poorly paid home work. In addition, as previously stated, the cost of formal childcare and possibly unobserved heterogeneity may contribute to explaining the specific gender roles orientations visible in the capital.

This explanation raises issues, chiefly about the persistence of these disparities: once women have stepped up their participation it is assumed that this trend is irreversible, and that involvement is not affected any more by the economic factors that determined their emergence in the first place. It also puts considerable emphasis on the internal coherence of regional social systems at the risk of falling into essentialism: the trends observed above are also visible as a result of the superposition of historical economic geographies and current administrative boundaries for which statistical data is available. Further research into these correspondences is therefore needed.

## Conclusions

This paper has highlighted the empirical reality of pre-recession regional differences in the involvement in paid work of mothers of young children in the UK, and has demonstrated that it is only by combining several layers of explanations together,

that these can be fully accounted for, at least from a statistical perspective. It has showed that beyond individual anticipations and the factors affecting it which lie at the core of orthodox economics, representations of motherhood and beyond them, social and gender structures do matter. It has also brought more empirical flesh to sociological and gender theories that have, to date, been based on limited systematic data; for example, aggregate indicators of Duncan & Edwards (1999) gender moral rationalities. At the same time, this paper represents only a starting point and further research is needed. A way forward would be to bring about more evidence about the etiology of gender-role attitudes and their correspondence between patterns of participation, either at other levels of geography, or in other countries where sufficient regional data is available. From a policy-making perspective, these findings also reaffirm the importance of regional realities which suggests that the recent demise of regional development agencies are a step in the wrong direction. Even if they stress the importance of supply side factors for maternal employment, these results obviously do not mean that work/family policies, in particular those aiming towards the improvement of formal childcare, would not make a difference to mothers.

## Notes

<sup>1</sup>Given its lack of significance the residual variance of involvement variability – the regional portion of the variations in slope – was not used in this part of the model

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