Geographies of Motherhood

Sub-national differences in the involvement in paid work of mothers of young children: the cases of Germany and the UK

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Abstract

Pierre Walthery, discipline area of Social Statistics and Cathie Marsh Centre for Census and Survey Research

In this thesis I analyse subnational differences in the employment trajectories of mothers of young children in Germany (Bundesländer) and the UK (Government Office Regions and Metropolitan counties). The thesis combines longitudinal and spatial approaches to paid work, and focuses on mothers of children under 6 - arguably the group at the core of the social (re)production of gender differences in employment. One of its aims is to nuance the existing literature explaining the differences in women’s involvement in paid work in terms of national welfare and/or breadwinner regimes - by looking at the nature and extent of regional variations in the patterns of involvement that make these countries typical of such regimes. Its specific goals consist in testing the Latent Growth Curve (LCM) framework as an innovative method for modelling variations in participation in paid work over time, then in exploring three possible explanations for the regional differences observed. The respective role of regional differences in the family formation and social position of the maternal labour force, of the availability of suitable jobs in particular segregated jobs, and finally of economic histories in relation to women’s orientations to work is assessed. The results confirmed that LCM represents an innovative tool to understand variations of involvement in paid work over time, and revealed significant regional differences, beyond the ‘North South’ and East-West divides documented respectively in the UK and Germany. In both countries, results pointed at a combined effect of the three explanatory factors analysed. Whilst composition and labour demands effects went some way towards explaining some of the variations observed, at the same time additional regional variations were discovered once composition factors were taken into account. Finally the pattern of association between the remaining unexplained regional variation and aggregate attitudes of women towards paid work suggests an influence of long term trends in participation on present levels of involvement.
Declaration

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Chapter 1

Introduction

This dissertation is concerned with the way geographical location affects the transitions of mothers of children under the age of 6 between different states of involvement in paid work, including economic inactivity, parental/maternity leave, part-time and full-time employment, in Germany and the UK. I chose to focus on this group of women given its particular relevance to the study of gendered differences in economic behaviour. Mothers, more generally motherhood, lie at the core of the social (re)production of differences between men and women and the naturalisation / legitimation of the dominant gender order (Connell 2002) which is intricately related to women’s low participation profile in paid work in many parts of the world, as well as in Britain and Germany.

Indeed, in the two countries, many women play a secondary role in the economic sphere in comparison to men, by retreating from paid employment completely or partially for significant periods of time, although the pattern according to which this occurs is different in each case. The evidence of spatial disparities in the extent of this marginalisation process, which is the starting point of this dissertation, raises three types of issues. First at the societal level, from the point of view of social justice and gender equality, a better understanding of the mechanisms and patterns lying behind the spatial differentiation of this process is necessary if one is to tackle inequalities between men and women – but also between women over the country – more efficiently. At the policy level, beyond gender equality policies per se such an improved knowledge would lead to a better allocation of public resources, by allowing a better targeting of policies aimed at improving participation in employment – hence the viability of the welfare state. For these reasons, improving the employment rates of women – and more generally the work-life balance of working parents – has become a recognized objective by policy makers both at the national
and European levels. Finally, at the level of individual women, researching
the deeper explanations of participation and improving policy making in these
areas may lead to removing some of the obstacles they face when pursuing a
career, thus reinforcing their capabilities to do so and allowing them to suc-
cessfully participate in employment and reinforce their financial independence,
including in their old age, when they are at greater risk of poverty than men
given the lower level of their pension contributions.

In the following chapters, I provide evidence of significant regional vari-
ations in involvement in both countries from the point of view of its intensity
and its variation over time. In the UK, these differences cannot be reduced
to obvious interpretations in terms of the North-South divide. In Germany,
similarly, I find patterns of regional differences that go beyond the variations
between the former East and West Republics, in particular, within the 'old'
Bundesländer, that were part of the Federal Republic of Germany. Applying
for the first time a recently developed statistical framework to this field – latent
growth curve modelling – I show that a pluralist analysis of involvement, where
the respective roles of social position and family formation patterns, some char-
acteristics of the regional labour market such as horizontal segregation or male
unemployment, and the interplay of attitude to work and traditions of involve-
ment can altogether provide a credible explanation for regional variations as
a whole, but can also explain, to some extent, the relative differences of some
regions vis-à-vis each other.

Rationale

At an empirical level, mothers of young children are likely to experience the
highest degree of pressure resulting from the conflicting imperatives and de-
mands of unpaid caring and participation in paid work, and for that very reason
they were selected as the population of interest for this study. Studying the
factors that affect the economic behaviour of this particular group of women
at the regional level is working towards a better understanding of how space
reproduces the dominant gender order but can also contribute to its evolution.
This is especially true since the transitions mothers experience around the birth
of a child have repercussions for their future career well after it has happened,
as discussed below in Chapter 2. In that respect, by influencing participation
and making certain types of transitions costlier, regions could be defined by
the extent to which they widen or narrow the capability sets of women (Sen
1995), hence the extent of the freedom they enjoy to make decisions and fully
develop their potential. It remains true, however, that only a fraction of the employment-related transitions women undertake in their lives is studied here. Some of them can be initiated before the birth of their first child, and indeed continue well after them, and are affected by regionally distributed constraints and opportunities.

The present work focuses on regions, a decision motivated by the limitations in the dominant research paradigms that deal with the employment behaviour of women and for which nation states are assumed to be the pertinent units of analysis, irrespective of whether explanations rely on individualistic premises or instead on the role of institutions. Indeed, many analyses take place at the country or cross country levels, within which national institutions and government policies play a central role in determining participation patterns. As a result, a significant part of the scientific debate revolves around typologies of countries, meant to capture the essence of the relationship between institutions and the gendered division of paid and unpaid work, sometimes also broader social structures such as patriarchal orders. In many of these contributions, men and women are assumed to react to incentives/disincentives resulting from policy provision. Broader concepts such as gender regimes, orders, or arrangements, even if they add a cultural dimension or incorporate intimate relationships into the explanation of mothers’ employment behaviour, are routinely used with countries as the unit of analysis. Each country is supposed to represent or belong to a particular type or configuration of gender based domination. By focusing on regions, one can nuance such national narratives not only by bringing empirical evidence of internal heterogeneity within some of these types of welfare states or policy regimes (Esping-Andersen 1990; Lewis 1992) but also by drawing attention to additional factors that influence participation. In the context of this research, region is operationalised by Government Office Regions, Metropolitan Counties, and Countries in the UK and by Bundesländer as well as a few large cities in Germany.

**Expected contributions**

This research aims at producing three contributions to the current state of knowledge. In terms of methods, my main goal consists in augmenting the existing set of techniques used to model transitions in employment, by applying a latent growth curve model, a recent development in statistical modelling, to longitudinal data about participation in employment and working-time. As far as I am aware this technique has never been applied to employment transitions.
I also triangulate my results produced by these extensive methods (Sayer 1992) – modelling of individual and regional trends – with non systematic, intensive methods. Specifically, I use evidence from research in economic history as potential explanations for some of the regularities observed at the former stage, and their patterns of association with data about subjective attitudes.

In terms of \textit{empirical} contribution my goal is to obtain a regional overview of the differences in transitions over time where the longitudinal and subnational dimensions of participation are combined, specifically for mothers of children under 6. By using statistical modelling I also aim at taking stock of the regional differences using individual data in a multivariate analysis rather than using pre-existing aggregate statistics.

Finally, in terms of \textit{theoretical} contribution, I aim at providing an explanation of regional differences in involvement \textit{intensity} and \textit{variability} that is made of complementary layers of causality, as explained in the next section. The former refers to the overall level at which mothers take part in employment – literally the amount of time they spend doing paid work, whereas the latter encompasses the trend their transitions follow over time: increase, decrease or stability.

\textbf{Hypotheses and research design}

In order to account for the regional differences in involvement, I examine three research questions, each corresponding to a specific layer of causality. The \textit{first question}, which I call a ‘composition hypothesis’, considers the extent to which imbalances in involvement intensity and variability are the result of regional disparities in the characteristics of women, in particular their family formation pattern and social position. The former refers to the number and age of the youngest child in the family as well as whether a partner (whether spouse or not) is present, whereas the latter corresponds to the position of women on the occupational and educational ladders. These regional imbalances could be related to several reasons, such as internal or external migration, whether or not initiated by the mother of a young child herself or her partner.

The \textit{second question} considers, in addition to the former, the role played by the horizon of opportunities and constraints specific to a particular region, such as the availability of jobs compatible with the fact that most mothers remain the main carers of children, even when they are employed full-time themselves. Jobs can be suitable either because they are designed for second-
ary earners, such as for instance part-time positions in female industries such as the retail trade, or because they are associated with enough time flexibility, such as flexible working time provisions. Hence, differences in the distribution of industries across regions may contribute to creating such a horizon of constraints and opportunities for mothers, which may affect the intensity and variability of their involvement.

Finally, the third question considers whether in addition to these two factors, patterns of involvement may be related to regional variations in the orientations to work possibly in relation to traditions of female participation in paid work outside the home resulting from the concentration of industries that relied on a female workforce in some regions. This relates to an under researched area in which gender cultures, or moral rationalities (Duncan & Smith 2002) are seen as transmitted between generations of women, and to some extent can outlive the disappearance of the industries or institutions that triggered their emergence in the first place (Sackmann & Haüssemann 1994; Sackmann 1997; Stuyck et al. 2008). This third question is of a more interpretative nature, and only non systematic evidence was available to validate it.

The strategy I followed in order to answer these questions mostly consisted in secondary analysis of large scale government data, the 5 Quarter Longitudinal Labour Force Survey, pooled for 2001-2007 in the UK (Office for National Statistics 2008), and the Mikrozensus Panel 2001-2004 (Statistisches Bundesamt 2009) in Germany. Both datasets are characterised by a large sample size and a panel dimension allowing for the longitudinal analysis to be conducted at the subnational level. They were also chosen because both are the source of the European Labour Force Survey in each country, which guaranteed identical definitions of the main indicators of participation in paid work. The trade-off however consisted in the availability of a limited number of variables and waves. In addition, auxiliary data was also used: attitudinal evidence about the involvement in paid work of mothers was in the two countries, together with historical evidence about women's involvement drawn from the Census in the case of the UK.

A multilevel latent growth curve model was fitted to these data, which allowed involvement to be represented as growth lines. My main focus in this analysis was on the size and the significance of the regional-level variation in involvement intensity and variability in this model. The first question, about the role of regional imbalance in the characteristics of women, was operationalised by adding individual controls for social position and family formation.
in the model. Accordingly, regional aggregate indicators for female unemployment and horizontal segregation were used as proxy measures of the number and types of jobs available in order to answer the second question. Finally, the third question was considered by comparing the relative size of the variations for each individual region, with on the one hand aggregate data about attitudes towards paid work of mothers, and on the other, the results of a literature review of regional economic history. Given the amount of time required by the latter approach, the case study for the UK was prioritised and carried out in more depth than the German one.

Structure of the dissertation

In Chapter 2 I summarise the relevant findings from available empirical research in the UK and Germany, dealing with either the intensity of involvement – participation in employment and working-time – or its variability over time – employment and working-time transitions – of mothers of young children. The chapter then briefly reviews the combined effect of social/occupational class and family formation patterns on involvement, before moving to a review of the limited amount of research dealing with gendered patterns of participation within regions. The issue of the definition and regional boundaries in the two countries is also examined. Finally, I summarise the main shortcomings in the empirical evidence about maternal involvement at the regional level in the two countries.

In Chapter 3 I review existing theories of the economic behaviour of women and mothers, stressing the spatial assumptions these theories rely on when they are not made explicit. I first discuss individualistic theories, such as the human capital theory or contributions that have considered the role of attitudes and preferences, and relate them where relevant to the first research question which deals with the individual characteristics of women. In the second part, I consider theories about the role of institutions and more generally policy regimes, and how they constrain women’s involvement, including at the regional level. I also discuss the role policies such as tax systems, childcare and parental leave play in the national gender arrangements in the UK and Germany as a necessary background against which to draw regional comparisons. Finally I discuss theories which envisage the role of broader social and gender structures and their impact on geographies before reviewing the few authors who have worked on the hypothesis of a relationship between past and present levels of involvement. The specific contributions of human and economic geography,
In the Introduction, culturalist approaches are reviewed, in particular the relationships between economic structures and subjective dispositions.

In Chapter 4, I operationalise these questions and present the methods used in the research. The core concept of involvement in paid work is defined, as well as the pros and cons of using short-term transitions and separate datasets: the Longitudinal Labour Force Survey in the UK and the Mikrozensus-Panel in Germany. I then review sample design and data quality issues in both surveys. The rationale for using a dynamic model of participation – a latent growth model – over other longitudinal methods is also explained. The latent growth model is then formally presented, together with the control variables used in the model. Additional modelling issues, such as endogeneity arising from the choice of independent variables selected, or limitations in the geographical boundaries available are also reviewed.

The objective of Chapter 5 is to provide an introduction to the empirical part of the research by highlighting the main facts about involvement intensity, and variability over time of mothers of children under 6 in the UK, then testing a first application of the latent growth curve model and examine how well it fits the data which then paves the way in Chapter 6 for the comprehensive analysis of regional differences in involvement within the UK. Besides a descriptive introduction, this chapter presents and discusses the results of the model for the UK, focusing exclusively on the regional level. The three main hypotheses (differences in the composition of the regional labour force, job characteristics and economic history) are assessed. In order to discuss the third research question, attitudinal data about employment of mothers as well as census data about participation of women in paid work since 1840 are used.

In Chapter 7, I present the results about regional differences in involvement for Germany in a parallel fashion to those in Chapter 5 and 6 for the UK, but in a more concise way. A few basic data about the involvement of mothers of children under 6 and their transitions over time are presented, followed by the result of the growth model and a discussion of the results.

Finally, the Conclusion reviews the main findings in each country and discusses their implications. It also discusses the shortcomings of the dissertation, and the avenues for future research as well as its policy relevant findings.

In the next chapter I move to the first stage of this dissertation and review the literature about the empirical aspect of women’s involvement in paid work.
Chapter 2

Maternal employment transitions across regions and countries

In this chapter I review the existing literature about the patterns of involvement in paid work of mothers, focusing on empirical findings at the national, then at the regional levels with examples from the UK and Germany, countries which are analysed further in the dissertation. The goal of this chapter consists in highlighting the gaps in existing research, in particular as far as empirical data about women’s regional participation are concerned, in setting the scene for the next chapter, in which theories of women’s participation in employment are reviewed. One of the enduring shortcomings identified in the literature were a lack of combined longitudinal and spatial analysis at the regional level, together with the paucity of research based on individual rather than aggregate data. This analytical division between ‘empirical’ and ‘theoretical’ is in part artificial, but nevertheless useful for the clarity of the argument.

The presentation of the literature in the chapter is organised according to the type of empirical evidence it relies on: I begin with analyses based on cross-sectional data on working time and participation in employment, followed by studies of employment and or working-time transitions using longitudinal data. I found that if most contributions have highlighted that in Germany and the UK many mothers still tend to leave employment at the time of childbirth, only to return gradually afterwards, differences exist between the two countries in the timing of the return and whether this takes place within parental leave provision. In addition, research about regional differences in participation of mothers, in particular longitudinal research, is very limited. Less attention is paid in this chapter to the German situation than in the UK because of a lesser availability of relevant literature and also the fact that more emphasis
is put on the UK case study throughout this dissertation.

The chapter is organised as follows. In Section 1, I begin by reviewing the research on the lower intensity of involvement in paid work of mothers by comparison with men or women without dependent children. I then move on to the analyses of the longitudinal dimension of involvement by looking at working-time and employment transitions around the birth of children, before focusing on the broader implications these patterns of involvement have, in terms of gendered gaps in participation, job segregation and earnings. In Section 2, I review other factors related to participation, such as family formation patterns and social position, which may also have a spatial dimension. Finally, in Section 3, I examine the existing literature about regional differences in the employment of mothers, highlighting its shortcomings. This includes a description of the regional context in the two countries studied. I conclude the chapter by summarising the gaps in existing research.

2.1 Involvement at the national level

I propose to use the concept of involvement in this dissertation as an analytical tool to capture the multiple dimensions of engagement in paid work of mothers of young children. Involvement is meant to capture the actual amount of time spent doing paid work, including its absence, rather than follow the traditional distinction between employment status – i.e. whether or not a legal employment relationship exists – and working time. Mothers can be employed and temporarily not doing any paid work, such as is the case when they are on maternity or parental leave, even if this does not bear the same consequences on their future careers.

Involvement can be examined from two complementary perspectives. The cross-sectional aspect of involvement – its intensity – represents the ‘quantity’ of paid work carried out at any point in time whereas its longitudinal dimension – its variability – is meant to capture the changes (or the absence thereof) in these amounts over time. The implication of this definition will be further discussed in Chapter 4. Whereas it is mainly the second aspect, the transitions which are of interest here rather than cross-sectional snapshots, both will be reviewed, since for a long time the majority of the data available and the research it inspired was cross-sectional.
2.1.1 The intensity of involvement

It is commonly agreed that the total volume of paid work carried out by most women during their life is significantly smaller than that of men, as a result of the consistently unequal distribution of unpaid work, especially caring work, between both genders. These can be viewed as shortfalls in the total number of hours worked and the amounts subsequently earned that many women face when they once they have entered motherhood, deriving from the various periods of time they spend outside paid work or working part-time. This has also been described as a skills or human capital wastage, from either individual women’s or society’s point of view (Rubery et al. 1998; Tomlinson et al. 2005). As already mentioned, such shortfalls are traditionally analysed by using data about economic activity or employment rates on the one hand, working time on the other. These are reviewed accordingly in the next two sections.

Economic activity and employment rates In 1965, the rate of economic activity among women as a whole was 52.3% in the UK. This varied widely across age groups: whereas 75.2% and 60.3% respectively of women aged 16 to 20 and 21 to 25 were economically active, this rate then fell to 37.3 and 43.1 amongst the 26 to 30 and 31 to 35 age groups respectively, in which the majority of mothers are gathered, only to recover partially among those aged 45 and above (Hunt 1965). By 1980 however, economic activity among women had reached 69%, in line with a continuous trend initiated after the Second World War (Martin & Roberts 1984). In other words, fewer women tended to become full-time carers after their maternity leave ended, and ‘leavers’ tended to become ‘returners’ earlier than before.

While remaining clearly lower than men’s and childless women is, the economic activity and employment rates of mothers of dependent children have significantly increased in the recent decades (Martin & Roberts 1984; Dex et al. 1998; Jacobs 1999; Vlasblom & Schippers 2004). Employment rates of mothers with dependent children varied from between 47% at the beginning of the eighties to 58% in 1991 and 65% in 2001 (Martin & Roberts 1984; Twomey 2002; Hansen et al. 2006). In 2010, the same rate had increased to 66.7%. The contrast with fathers of dependent children remained high though – 88.4% of them were economically active in 2010 – thus an activity gap of about 25%². This long-term trend has been attributed to structural changes in Western economies, namely the gradual decrease in the importance of the manufacturing
industries, the traditional stronghold of male breadwinner identities, towards service-oriented activities, where women’s employment was stronger – rather than a feminisation of the workforce (Massey 1995; Walby 1997; Bruegel & Perrons 1998).

As one could expect the above gaps widen if we look at mothers of children under school age: 54% of mothers of children aged under 4 years old were employed in 2010\textsuperscript{3}. The same rate was 31% in 1980, 43% in 1991 and 54% in 2001, showing a steady progression, until a ceiling was seemingly reached during the last decade (Martin & Roberts 1984; Twomey 2002). At the same time however, the comparison with fathers of children of the same age shows that the activity gap has now widened from 25% to 38% in 2010\textsuperscript{4}. It has also been pointed out that the decrease in the activity rate of older men also plays a role in the narrowing of this gap during the second half of the 20\textsuperscript{th} century (Henwood & Wyatt 1986). Although this figure includes the long-term sick, it also provides an indication of the caring gap – the difference between the proportion of men and women caring for children or other dependent persons instead of being engaged in paid work.

Comparing these figures with their equivalent for Germany can be misleading and mask markedly distinct participation dynamics in the two countries for at least two reasons. Until the 1960s, the patterns reported for West Germany were similar to those observed in the UK. Women’s involvement in employment in the two countries began diverging afterwards: by 1980, whereas the economic activity rate of women reached between 65 and 70% in the UK, the same figure was between 50% and 53% in Western Germany (Gustafsson 1992). However, comparisons between the two countries should take into account the fact that since the reunification, German labour market statistics incorporate the two fundamentally different participation profiles of the former independent German Republics into one somewhat artificial national average. To give an idea, economic activity rates in the former German Democratic Republic were 73% in 1980 and 76% in 1989 at the time of the fall of the Berlin Wall, against 60% in the West (Schenk 2002).

Furthermore, from the beginning of the 1990s, German mothers could take parental leave for up to three years after childbirth. Until 2001, they were simultaneously entitled to a child-raising allowance (Erziehungsurlaub) conditioned by their not being engaged in paid work. More than three quarters of the households with qualifying children have been reported as taking up the leave (Fagan & Walthery 2007; Moss 2010). This also means that women in
these households will be reported as employed in the official statistics. Although it is the case that they remain formally employed and enjoy the right to be reinstated in their former position or an equivalent one, on the other hand they are not engaged in paid work for a significant period of time, which is likely to have an effect on their future career.

Thus, in 2009, according to the OECD, the female employment rate for Germany was 65.2%, which is very close to the 65.6% reported in Britain by the same source and could lead to the conclusion that participation patterns are broadly similar (OECD 2010). However, in 2006, ‘active’ employment rates, that is the proportion of employed mothers actually engaged in paid work was 56% among West German mothers, against 65% in the East. Differences in economic activity were much larger (68% in the West against 88% in the East) which is a sign of the high levels of unemployment prevalent in the New Bundesländer (17% against 4%) (Kreyenfeld & Geisler 2006). The same source shows that in 2006, 43% of mothers of children aged one to three were employed and engaged in paid work, whilst the figure was only 32% in the West. The latter figure represented a relatively modest increase from 1991 (about 5%), whereas it had decreased by 15% in the former DDR, as a result of the massive job losses that took place after the reunification.

**Working-time** In most European countries, the greater propensity of employment among mothers has been associated with a concomitant rise in part-time work. Part-time work tends to be the traditional re-entry door into paid work in the UK and Germany, preferred by women who were previously full-time carers. At the beginning of the 1980s in the UK, the Women and Employment Survey found that 68% of returns following an interruption in participation after childbirth were part time, irrespective of the duration of the period spent outside paid employment (Martin & Roberts 1984). If return back into paid work now take place earlier than before, within or not the umbrella of maternity leave provisions, the vast majority of them still involve part-time employment. 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 full-timers moved to part-time work (Dex & Ward 2007).

Data from the last decade shows that mothers in the UK and Germany were particularly likely to work part-time – around 40% of all mothers were in 2004 – by comparison with countries such as France, Sweden, Finland, or
Portugal where it is less widespread – under 25%\(^5\), but shared this feature with Belgium, Ireland and the Netherlands (Fagan & Rubery 1996; OECD 2006). In the UK, whereas the overall share of childless women working full-time remained around 50% during the last two decades, the picture was different for mothers of dependent children, 58.2% of which were working part-time in 2001. The same proportion was 64% among mothers of children under 5, and steadily increased during the 1990s, whereas it mostly remained stable among mothers with older children (Twomey 2002). By 2010 however, the rate of part-time work had slightly gone down for both employed mothers as a whole (55%) and mothers of under 5 (60%)\(^6\). This seemed to go together with a simultaneous trend towards a decrease in employment rates at the end of the last decade, but further research would be needed to establish whether this indicates that a threshold has been reached or instead, that this is an effect of the job losses occurring as a result of the current recession.

The levels of part-time work among mothers were not far from each other in Germany and the UK, at about 70% in 2009 (OECD 2010). However, the same limitations as those relative to maternal employment rates apply here. Full-time work was the overwhelming norm in the former DDR, whereas the opposite is true of the Old Bundesländer, making comparisons based on a German national average not very meaningful. This shows if we compare the proportion of mothers of children under 19 in part-time work in the two former countries in 2002: whereas 17% of West-German mothers who were in regular employment had a full-time job, this was only the case for 57% of them in the former DDR. The same figures among mothers of under 4 were respectively 52% and 20% (Ibidem).

The former proportion is likely to be an understatement, since it does not include mothers on marginal employment, involving – mostly but not only short part-time hours (less 16h per week), more likely to be found in the Old Bundesländer. The rise in this form of employment accounted for at least half of the decrease in economic inactivity among all mothers of children aged under four in the West between 1991 and 2002, at 13% and more than half in the case of those aged four to six. By contrast standard part-time work only increased among mothers of children aged four to six. In the East by contrast, the modest increase in standard and marginal part-time employment combined (between 4 and 5%) if all mothers are taken into account, rather than just those in employment. This happened as female employment shrank in the East, while it was expanding in the West (Merz 2004; Kreyenfeld &
Maternal employment transitions across regions and countries (Geisler 2006).

Now that the working-time patterns of mothers has been sketched in other countries, in the next section I review the evidence about the variations in involvement documented in the literature, that is the transitions carried out by mothers of young children that have been only imperfectly described in the above snapshot.

2.1.2 Variations in involvement

In this section, I review the existing evidence about the changes made by mothers of young children between different levels of involvement in paid work over time. The majority of the literature is concerned with the move between economic inactivity and employment, and between levels of working time – i.e. part-time versus full-time. Schematically, these transitions can be decomposed into 3 stages:

1. A move away from paid work before an anticipated birth;

2. A period of worklessness – i.e. not carrying out paid work – after the birth has taken place;

3. A resumption of paid work either in a full-time or a part-time capacity thereafter.

The duration of each stage may vary between a few months to several years and takes place in part or fully within the framework of an employment relationship, with the help of maternity or parental leave provisions. These provisions provide a framework that is specific to each country7 and within which these trajectories occur. In order to benefit from the right to return to their previous jobs, mothers are allowed to begin their maternity leave from a few weeks before the scheduled birth (8 in Germany to 11 in the UK), up to a few months after the birth (52 weeks in the UK, 13 weeks in Germany, of which 6 before the birth). At the end of the maternity leave, parents (in effect, mothers) are in addition entitled to parental leave, which may extend the period of worklessness for a further few months in the UK, up to three years in Germany (Moss 2010). More detail about the role of institutions and policies is available in the next chapter.

In Germany a significant proportion of mothers of young children spend several years outside paid work (while still employed) under the umbrella of
this long parental leave (Erziehungsurlaub) and the assorted child-raising allowance (Erziehungs geld) introduced in 1979, whose duration was gradually prolonged to three years during the 1990s as part of a policy to reduce the size of the workforce (Ostner 1994.; Ondrich et al. 1996). This policy was gradually reversed from 2001 onwards: the period during which a benefit is due was reduced from two to one year in 2007. Similarly, the original condition that the recipient should not be engaged in paid work was relaxed by allowing claimants to work for up to 30 hours in 2001. It is usually considered that German mothers tend to stay at home for longer periods of time than their British counterparts as a result (Moss 2010).

During the 1970s British women tended to begin their career as full-timers, quit their jobs shortly before becoming mothers, then gradually resume participation when their children reached school age, usually part-time (Martin & Roberts 1984; Joshi & Hinde 1993). In many cases, their employment relationship was severed, and statutory maternity protection only began in 1979. As a result, these returners lost their formal right to be reinstated into their job, a further disincentive for early returns to take place. These patterns of participation evolved during the 1980s and 1990s, and in parallel, maternity leave provisions were further improved in 1994 and 1999.

A growing proportion of mothers now tend to remain in employment at the end of their maternity leave, including on a full-time basis, or switch to part-time work without interruption of their participation. Among women born between 1946 and 1970 the proportion who quit their jobs after childbirth has been steadily decreasing (Jacobs 1999). The median duration of the period of economic inactivity following childbirth decreased from 70 months for women born in 1946 to 29 months for women born in 1958, that is about 2 years and a half (Dex et al. 1998). One year after the birth of a first child, 39% of the latter cohort had already re-entered the labour market, against 65% who did so within five years, and 84% within 10 years, still a clear progression by comparison with women born in 1946. Smeaton (1996) reports that the rate of return after one year had reached 57% among mothers born in 1970. The same rate was estimated at 71% among mothers of children born in 2000, of which 81% remained with the same employer. By the time children had reached three however only 33% had remained in continuous employment over that period (Dex & Ward 2007).

This story needs to be nuanced however: further empirical studies showed that returns to work are gradual, and that it may take mothers several years
Maternal employment transitions across regions and countries
to step up their participation again. Actually, activity rates of women begin
to recover gradually only by the time children reach the age of 7, against the
received idea that this tends to happen when children reach school age (four
or five depending on the location in the UK), which could be due to the (lack
of) job opportunities available (Paul 2006; Brewer & Paul 2006). However,
the fact that women tend to return earlier to the labour market than before
does not mean their subsequent participation is either continuous or definitive.
Career discontinuity – i.e. repeated interruptions of the participation in paid
work followed by short spells of part-time or full-time employment – might
indeed have been the rule rather than the exception for large numbers of women
(Jacobs 1999).

Comparative research confirmed that the duration of the gap before and
after childbirth tended to be longest in the case of German mothers. In Europe,
British women are amongst those most likely to return to paid work early
(within 3 years of a birth) and remain involved thereafter, second only to the
Scandinavian countries, whereas in Western Germany returns to work happen
after several years and not as systematically as in Britain (Gutierrez-Domenech
ticipation among West German women was higher than in Britain 3 months
before the birth of the first child, then decreased markedly and had not re-
covered 24 months after. It was about 34%, now about the same as Britain
(Gustafsson et al. 1996). However, the proportion of returners after 24 months
was clearly higher in the latter than in the former country. By contrast, the
transitions by mothers in Eastern Germany were closer to those occurring in
Scandinavia (Ibidem). If we take a broader perspective, indicators of the im-
pact of parenthood on the employment rates of women in the EU member
states show that both in 1998 and 2003, the UK was among the countries with
the highest effect, together with Hungary, the Czech Republic and Germany
(as a whole), and by contrast with the Nordic Countries, Belgium or Austria
(European Commission 2000a; 2005). These are likely to evolve as the amend-
ments to German parental leave provision introduced in 2002 seem to have an
impact.

In terms of working time, the available data suggest that part-time work,
which represents the most typical form of involvement among mothers, plays
a comparable role in the transitions mothers’ experience in the two countries:
during the 1990s, temporary or permanent part-time work constituted a way
to remain in paid work for up to 20% of mothers (but less so in Germany). The
second most likely trajectory involved returns to part-time work from economic inactivity (O’Reilly & Bothfeld 2002). These data do not differentiate between Old and New Bundesländer however, nor between mothers of young and older children. More recent data confirmed these trends – British women are more likely than their German counterparts to experience transitions, and when the latter group does, it tends to involve leaving employment (Fagan, O’Reilly & Halpin 2005).

Obviously, other types of involvement transitions may also occur that are more difficult to capture with traditional data, for instance between unemployment or government placement and training schemes, or between short and long part-time and full-time employment. Social reality is of course more complex than sociologists’ definitions and categories. Whereas the transitions that have been just described could be represented on a linear scale that would measure working-time in a literal sense, with economic inactivity considered as zero working hours, other types of transitions may be related to more subtle notions of involvement. Qualitative downgrading of the participation in paid work may occur as a result of moving from a high profile, demanding position to a care-compatible job without mothers necessarily going through a period of economic inactivity (Tomlinson et al. 2005). Furthermore these transitions may happen before a birth takes place. Some women may anticipate work-family balance tensions, and as a result orient their careers accordingly. This may or may not involve a change of employer, a switch between employment and self-employment, or time spent temping. Similarly, other women than mothers of young children may experience involvement transitions similar to those defined above: for example, those who reduce their participation in paid work in order to care for elderly or disabled relatives, or even to support a partner’s career.

This brief review has provided an indication of the way participation of mothers in paid work is structured at the national level in the UK and Germany. It has also showed the inherent complexity of such analyses, where indicators of working-time and economic activity, as well as the transitions between the states of participation they measure need to be simultaneously taken into account in order to provide an accurate view of the longitudinal dimension of involvement. In the next section, I review the broader employment context in which this is taking place.
2.1.3 Earnings inequality and gender segregation

Analyses of the low levels of involvement in paid work among mothers of young children, together with the underlying transitions from / to worklessness or part-time work have to be put in the context of the characteristics of the jobs involved, in particular in terms of gender segregation and pay gaps and the associated lack of mobility involved. There is ample evidence that the transitions highlighted above, in particular the time spent outside paid employment or in lesser type of jobs before or immediately after childbirth bear durable consequences on women’s subsequent employment participation, a fact which is also designated as ‘scarring effect’ (Fouarge et al. 2010). Research has consistently shown that as a result of career disruptions those women who have experienced full-time caring episodes are most likely to experience occupational segregation, overqualification, pay levels that are lower than men or childless women, and in the worst cases, poverty in later life. This can be made worse in countries such as Germany where until recently, the type of marginal job taken up by women did not accrue pension rights (Ginn & Arber 1996; 1999; Selton et al. 2011). These two aspects are briefly reviewed below.

Gender segregation Gender segregation is the uneven, sometimes disproportionate presence of one gender in a limited number of industries and occupations. The presence of mothers in segregated, female dominated jobs is usually associated with the transitions they experience either returning after a period spent caring full-time for dependent children or in anticipation of future births. In the UK, about half of the employed women were occupied in either administrative/secretarial, personal service or sale and customer service jobs, against 12% of men in 2002 (Twomey 2002).

Part-time working women are more likely to be found in segregated industries in the UK – such as in sales or service – than in Germany (Fagan & Rubery 1996; Elliott et al. 2001; Fagan, O’Reilly & Halpin 2005). As a result, the overall horizontal gender segregation is considered lower in Germany (Bettio & Verashchagina 2009b). By contrast with participation in employment however, occupational gender segregation patterns in Eastern and Western Germany, once markedly different, have converged significantly since reunification. One of the key differences was that whilst segregation was higher in the Democratic than in the Federal Republic, at the same time more women were employed in senior occupations in the East (Rosenfeld & Trappe 2002). The subsequent convergence was to a large extent brought about by the liquidation
process of former state owned companies and the resulting persistent gender imbalances in unemployment.

In the UK, gender segregation tends to be related to the occupational downgrading that occurs at the time mothers opt for jobs compatible with their caring duties, which is also more likely to occur when switching to a part-time job coincides with changing employers (Connolly & Gregory 2008; Manning & Petrongolo 2008). Older cohorts of previously full-time caring mothers were concentrated in low qualified part-time jobs, allowing for little upward mobility whereas childless women or mothers who returned to full-time employment tended to have access to a broader range of occupations and opportunities, in a fashion more comparable to men (Martin & Roberts 1984). For these generations of women, the number of breaks away from the labour market was found to play as much of a role on their subsequent occupational mobility as their level of qualification (Jacobs 1999).

Some improvement has been reported, with a decrease in the proportion of mothers experiencing downward occupational mobility before and after childbirth, especially among clerical and manual workers (Smeaton 2006). However, this does not take into account mobility within broad occupational classes traditionally used in multivariate analysis (Dex & Ward 2007). Within occupations requiring high qualification, professional jobs have been found to leave more flexibility to women willing to combine their jobs with childcare responsibilities, by contrast with organisation-based managerial careers (Crompton & Harris 1998). This seems to be reflected in the larger proportion of educated women in the former type of occupations rather than the latter, where the dominance of male-based work cultures may prevent women from assuming a career and caring responsibilities. This could also indicate that significant proportions of professional mothers still assume a traditional caring role within their household, whereas women successful in managerial positions are more likely to be childless.

However in another study combining data for the period between 1991 and 2005, British mothers were found significantly less likely than men to move to supervisory positions and significantly more likely to move to non-supervisory positions between the time of childbirth and when children reach school age (Paull 2006). This does not mean that mobility does not happen, but that if it does, this is at a later stage.
Earnings and the gender pay gap  Another persistent aspect of the transitions described above is that women’s aggregate earnings have been traditionally lower than men’s. The full-time gender pay gap (between men and women working full-time) was estimated at 14% in 2006-7, whereas on average female part-timers were earning 30% less per hour than male full-timers (Olsen et al. 2010). The overall gap was the highest of all EU member states in 2002, including Germany (Plantenga & Remery 2006). In the UK, segregated industries and occupations such as retail trade or personal services where ‘family friendly’ part-time jobs are located are often characterized by lower rates of pay (Olsen & Walby 2004; Olivetti & Petrongolo 2005; Olsen et al. 2010). In 2003, the average hourly wage of part-timers was shown to be 22% lower than that of full-timers, reflecting the increasing wage disparity in the UK between highly and poorly paid jobs (Ibidem). There are also indications that in Germany, spells of part-time work in segregated industries play a lesser role in explaining the gender pay gap than workplace segregation (Plantenga & Remery 2006). As with other aspects of mothers’ participation in paid work in Germany, the patterns of pay gap were different in the East and the West, with women’s pay still at 75% that of men at the time of reunification in the former case and 70% in the latter (Ostner 1994.).

Still in the UK, besides the fact that they tend to be employed in part-time jobs, there are indications of an additional pay penalty for women who interrupt their participation in paid work and thus significant differences in earnings between mothers and childless women (Joshi 2002; Blau & Kahn 2003; Olsen & Walby 2004). Specifically, it was found that women formerly working full-time who had stayed out of the labour market at some point were on the average earning 17% less than childless women or mothers who only stayed away from work for the duration of the maternity leave. However, no evidence was found of a direct additional impact of motherhood in explaining the gap among the lower paid part-time women (Ibidem:485). A recent study using BHPS data estimated that between 1991 and 2005, full time working mothers’ hourly earnings represented 73.7% of that of equivalent men. The proportion for part-timers was 66.1%. Differences were much lower for women with no children and slightly higher for women whose children had left the household. Some evidence was also found that wage growth over two years was slower for women than men at several key points in time such as the birth of the first child – as well as that of subsequent children – but also, more surprisingly when children reach school age (Paul 2006). In the UK, the pay
gap has also a regional dimension. For instance, the full-time gender pay gap is at 11% and below in the North East of England and Northern Ireland, against 20% and more in the South East and London (TUC 2007).

2.1.4 Family formation and class-related polarisations

So far I have looked at the evidence related to the transitions undertaken by mothers at the national level. Before moving to a review of the regional dimension of involvement, I briefly examine known differentiation in involvement that occur between mothers according to their family formation patterns as well as their socio-economic and ethnic circumstances. These are inescapable in their own right if one wants to understand the dynamics behind employment of mothers, but also since, as further developed in the next section, they are likely to have a spatial dimension. Most of the literature reviewed here focuses on the UK.

Family formation

Most of the research reviewed above has highlighted a connection between the number and the age of children within a family and the involvement intensity of women. Mothers with younger children or more children tend to be more likely to be either working part-time or economically inactive, in relation with the disproportionate share of unpaid work a majority of them still carries out. This applies to the UK as much as in Western Germany whereas by contrast it is not so unusual for mothers of young children and/or several children to be engaged in full-time work in the former DDR (Rosenfeld et al. 2004). This pattern is also related to the relationship status of mothers. In general single mothers in the UK are less likely to be involved in paid work than those with a partner, whereas the opposite tends to be true in Germany. Married mothers in Germany are more likely to retreat sooner from paid employment and less likely to return to work if their husband belongs to a higher occupational class (Kreyenfeld & Geisler 2006).

Socioeconomic differences

It is generally accepted that a polarisation exists between women along social class lines. This can be highlighted by the statistical connection between several factors such as the age of women at the birth of their first child, their educational/occupational level, and their subsequent patterns of return. In
both the UK and Germany, less educated women tend to have their children younger and as a result have accumulated less work experience, with again a slightly different picture in Eastern Germany (Rosenfeld et al. 2004). They spend longer period of time longer gap between the births of children and return to employment, and show weaker subsequent job attachment as well as intensity in labour force participation (McRae 2002; Joshi et al. 1996; Bruegel & Perrons 1998; Brewer & Paull 2006). They have also been shown to be more likely to return to part time work, rather than full-time (Elliott et al. 2001). In addition, low qualified women recovered to a lesser extent than those in professional and managerial occupations from job losses that affected the major British cities during the 1980s and 1990s (Bailey & Turok 2000).

By contrast, highly educated women tend to experience shorter breaks or even no break in excess of maternity leave and enjoy uninterrupted employment trajectories thereafter. They are also more likely to afford paid full-time childcare, especially if they are in a double earners household (Joshi et al. 1996; Dex et al. 1998). In 2001, the employment rate of mothers of children aged under 5 with post-secondary education (above A levels) was at 70%, which is 45% higher than those with qualifications under A levels (Twomey 2002). A report to the Equal Opportunities Commission showed that the proportion of women who were employed 3 years after the birth of a child born in 2000 was 70 percent, among the higher qualified, as against 49.7% among low qualified mothers (Dex & Ward 2007).

There is also differentiation within the broad occupational classes among highly educated mother who left employment for a few years, those with professional or occupation-specific qualifications (such as doctors) were likely to return sooner to employment after a birth than those with still high but more general qualifications, including degrees. The latter were also more likely to return, and to remain in full time employment (Elliott et al. 2001). The same pattern seems to hold for mothers who returned to part-time work, with those with an occupation-based degree more likely to have higher earnings than the other ones.

This polarisation might also hide more complexity than would appear at first. In the past, working class women were said to return to work early for economic reasons, whereas middle class women were more prone to stay out of the labour market (Lewis 1984). However, the opposite seems to be true now. It has been argued that this might be the result of antagonist trends, among which a greater pressure on the incomes of first-time buyers households
Gender and ethnicity

In the UK, research about the relationship between gender and ethnicity on the labour market is relatively recent, by comparison with the extent of the literature on gender segregation or the pay gap. In total, ethnic minorities were said to represent 6.3 percent of the population of working age in 1998 in Britain (Blackaby et al. 2002). There are mentions of overall ethnicity specific pay, employment and activity gaps (Blackaby et al. 1997; 2002). Unemployment is generally higher for ethnic minority women that white women (Dex & Ward 2007).

Whereas it is usually reported that Indian and Chinese women experience patterns of participation closer to those of white women, Pakistani and Bangladeshi women are repeatedly highlighted as the groups that are most exposed to higher inactivity rates (Byrne 1998; Dale et al. 2006). Research also showed the existence of wide differences in participation between age cohorts. Younger, British born women were shown to be significantly more likely to be active than the first generation women who came to Britain during the sixties or the seventies. The level of qualification, together with the degree of proficiency in English was also found to be strongly associated with the probability of being economically active (Dale et al. 2002).

On the other hand, Black Caribbean women tend to have high levels of economic activity retaining full-time employment through motherhood to a larger extent than white women - but in lower grade occupations. Prevalence of part-time work, also very low among the Pakistani/Bangladeshi group, seems to be highest among white women (Dale & Holdsworth 1998). Similarly, being partnered was not associated with a marked tendency to become inactive among the Black Caribbean group, whereas a large proportion of Pakistani and Bangladeshi women were found to become inactive once married, even in the absence of children (Dale et al. 2006).

Now that this broad picture of mother’s involvement in paid work has been drawn, I will move on to a review of its regional dimension.

2.2 Maternal employment across regions

In the previous section I reviewed existing research about women’s involvement in paid work – in particular its longitudinal dimension. Implicit to this
presentation was the fact that the dominant contributions to the field have been conducted at the national level. The predominance of a ‘national narrative’, particularly in international comparisons, is consistent with the level at which policy making (and political lobbying) takes place, together with the nature of most of the empirical data available collected until recently. This is particularly true of the UK, which remains a centralised state by comparison with its European neighbours, including France. Thus research on gender and employment tends to take place in a setting where central governments are informed of socio economic trends by social scientists working with national-level data in spatially blind approaches, in what could be seen as a mutually reinforcing process.

Conversely, research and data about the participation in paid work of mothers at the regional level has remained scarce and patchy. Sub-national analyses, even more so longitudinal studies, require surveys conducted on a large scale, which involve costs that not all governments are prepared to meet. Such spatial blindness is potentially damaging, given that involvement is always situated somewhere: decisions by mothers to participate in paid work are embedded in local environments characterised by specific job supply characteristics, configurations of childcare and transport facilities, and cultures of participation (Duncan 1991).

Of course spatial economic imbalances and the relationship between geography and gender have been amply researched in Britain, Germany as well as in other countries. But it is the combination of these two aspects that has been overlooked by labour market researchers analysing the participation of women in paid work. Especially, regions as an intermediary level between national and local analyses of gendered economic behaviour have been often neglected, the stress placed often on ‘local’ or ‘urban’ spaces. This issue is complicated by the absence of a clear analytical definition of regions.

I will now review these issues more in detail in the next three sections, starting with an administrative definition of regions in both countries, the main economic and social contrasts between them, and finally, their meaning in terms of mothers’ involvement in paid work.

### 2.2.1 Administrative regions in the UK and Germany

By contrast with the Countries and Local Authorities in the UK and the Gemeinde and Bundesländer in Germany whose institutional and geographical boundaries are relatively straightforward to grasp, the notion of ‘region’ re-
mains ubiquitous in both countries, with little formalised definition or clear sets of institutions attached to it.

At the international level, the European Union’s *Nomenclature of Territorial Units for Statistics* (NUTS) (European Commission 2010) provides a classification of subnational areas based on a compromise between population size and the presence of existing administrative boundaries. Three major levels coexist: ‘Major Socio-economic regions’ (NUTS-1, three to seven million inhabitants), ‘Basic regions for the application of regional policies’, NUTS-2 (800,000 to three millions), and NUTS 3, small regions for specific diagnoses (150 to 800,000 inhabitants). NUTS-2 is the level where major European public investments decisions such as the allocation of *Objective 1* subsidies are decided. In order to retain a basic degree of comparability between the two countries studied in this research, the regions analysed are close to the NUTS-1 level. The existence of such harmonised classification should not hide the fact that in Germany and the UK, regional realities are markedly different for a given NUTS level.

In the UK, usage of the term ‘region’ or more generally references to subnational spaces are limited. The country remains one of the most centralised among the major EU member states such as Germany, France, Spain or Italy. With the exception of the recent and limited devolution of powers to the Scottish and Welsh Assemblies and for different reasons, to the Stormont Parliament in Northern Ireland, most of the decision making powers in England are based on a two-tier principle whereby only Local Authorities have limited power besides the central government and the Westminster Parliament. As a result, regions as individual entities enjoy limited visibility in day to day politics.

Against this background, the main administrative regional entities in the country are the English ‘Government Office Region’ corresponding to the NUTS-1 level classification, which also includes the other countries of the UK: Scotland, Wales and Northern Ireland. Prior to the inception of the former in 1994, comparable historical boundaries had been in place since the end of the Second World War, such as the Standard Statistical Regions or before that, the Economic Planning Regions. However, the Government Office for the Regions enjoyed a limited and short-lived institutional existence as Regional Development Agencies between 1998 and 2010. These were abolished in the 2010 Comprehensive Budget Review (HM Treasury 2010). Other historical levels of geography such as counties, also known as Ceremonial Counties, are
Maternal employment transitions across regions and countries

still sometimes referred to in England but are hardly used in research or policymaking. The only exception to this is the Greater London Authority which was granted its own assembly and powers in 2000 and has retained them since.

Figure 2.1: Government Office Regions and former Metropolitan Counties

1-West Midlands Met. County
2- South Yorkshire
3- West Yorkshire
4- Merseyside
5- Greater Manchester
6- Tyne and Wear
7- Inner London
8- Outer London
9- South West
10- South East
11- Rest of West Midlands
12- East Midlands
13- East of England
14- Rest of North West
15- Rest of Yorks. & Humber
16- Rest of North East
17- Wales
18- Rest of Scotland
19- Strathclyde
20- Northern Ireland

Administrative boundaries of Government Office Regions and former Metropolitan Counties (in italic) of the UK. Source: EDINA/UKBorders 2008.

It is worth noting that in addition to this, the Office for National Statistics has developed an ad-hoc regional grouping that remains in use for the purpose of labour market analyses. It is made of the Government Office Regions in England, to which the former six Metropolitan Counties – urban areas granted limited autonomy between 1974 and 1986 – are added, which allows users to identify major urban areas throughout the country: Merseyside, West Midlands (Birmingham), Greater Manchester, South Yorkshire (Sheffield), West Yorkshire (Leeds-Bradford), Tyne and Wear (Newcastle), together with Strathclyde (South West Scotland including the Glasgow area) as shown in Figure 2.1. This is the level of geography that was retained for this research, given that
it has the merit of providing a way to account for internal regional diversity. More detail is available in Chapter 4.

In Germany, by contrast, if a similar lack of clarity exists about the definition of unambiguously ‘regional’ entities, the institutional structure of the country is markedly more decentralised than in the UK. The already mentioned Gemeinde (Municipalities) coexist with Kreise (Local Authorities), the 22 Regierungsbezirke (Government Districts), and the Bundesländer (Federal States) the latter being the NUTS-1 entities equivalent to the Government Office Regions which were chosen as the reference unit for this research. Although it could be argued that Regierungsbezirke could also qualify as regional entities, they belong to the second level of the NUTS nomenclature (NUTS-2), and would not lend themselves easily to be compared with the UK regions.

The German Bundesländer which are the main regional entities studied in this research have in common a history of political independence which spans over centuries, only altered by the unification of the German Empire during the second half of the 19th century, a trend that also coincided with the industrial development of the country. Centralisation peaked during the 20th century when the National-Socialist party came to power. After the Second World War, the new constitution of the Federal Republic of Germany drew on this history of regional independence and returned a significant degree of political autonomy to the Federal States. According to the German Grundgesetz (Basic Law), powers not explicitly attributed to the Federal Government belong to Bundesländer. However, while in some cases the Bundesländer that came out of the War respected historical boundaries (such as in Bayern) in several cases they were significantly altered, or some previously autonomous areas combined together (such as Baden-Württemberg), which affects attempts at drawing long-term historical trends from existing regional data (Fulbrook 1990).

Now that regional boundaries have been discussed, in the next section I will move on to the main factors that differentiate them from each other within the two countries.

2.2.2 Contrasted regional economic and social realities

To begin with, marked demographic contrasts are visible in both cases between regional entities. Table 2.1 summarises the population sizes and density in the regions within each country. As we can see, both vary widely and in some cases, such as the South East of England or Nordrhein-Westfalen in Germany, Bundesländer can have a population that is larger than several other European
countries or in the case of the Stadtstaaten of Bremen, Berlin and Hamburg which enjoy the legal status of State but are in effect metropolitan areas. In the UK, the population size of Government office Regions and countries varies by a 4.7 to 1 ratio, 3.3 in England. The smallest regions are Northern Ireland for the UK, the North East for England with respectively 1.8 and 2.6 million inhabitants, and the largest ones the South East and Greater London (8.5 and 7.8 millions).

Although all Bundesländer enjoy an identical status in German law, their demographic and economic weight varies considerably. More than half of the population of the country is concentrated in 3 of them: Rheinland-Westfalen (18 million inhabitants), Bayern (12.4 million) and Baden-Württemberg (10.7 million), whereas half of the other ones (including all of the New Länder) have populations of less than 3 million inhabitants (Statistisches Bundesamt 2006). Further demographic contrasts shape the German social landscape. As could be expected the city states (Stadtstaat) of Berlin, Bremen and Hamburg are characterised by high population density, larger contingents of migrants together with a younger population, whereas several other states, in particular in the East are less densely populated, and have older population less likely to
Maternal employment transitions across regions and countries come from a migrant, especially non white, background (Statistisches Bundesamt 2006). In addition, since the reunification, internal migration has followed an East-West axis, with the three largest Bundesländer at the receiving end of a flow of migrants from the East. This factor is likely to affect research into women’s employment patterns, since they are known to be more likely than men to have migrated (Fuchs-Schündeln & Schündeln 2009).

Table 2.1: Regional population sizes, Germany and the UK

<table>
<thead>
<tr>
<th>Region</th>
<th>Pop.</th>
<th>Density</th>
<th>Region</th>
<th>Pop.</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nordrhein-Westfalen</td>
<td>17,872.7</td>
<td>524.3</td>
<td>South East</td>
<td>8,000.6</td>
<td>419.6</td>
</tr>
<tr>
<td>Bayern</td>
<td>12,510.3</td>
<td>177.3</td>
<td>East of England</td>
<td>5,388.1</td>
<td>282.0</td>
</tr>
<tr>
<td>Baden-Württemberg</td>
<td>10,744.9</td>
<td>300.6</td>
<td>South West</td>
<td>4,928.4</td>
<td>206.8</td>
</tr>
<tr>
<td>Niedersachsen</td>
<td>7,928.8</td>
<td>166.5</td>
<td>Outer London</td>
<td>4,406.0</td>
<td>3,517.0</td>
</tr>
<tr>
<td>Hessen</td>
<td>6,061.9</td>
<td>287.1</td>
<td>East Midlands</td>
<td>4,172.2</td>
<td>267.3</td>
</tr>
<tr>
<td>Sachsen</td>
<td>4,168.7</td>
<td>226.3</td>
<td>Inner London</td>
<td>2,766.1</td>
<td>8,663.3</td>
</tr>
<tr>
<td>Rheinland-Pfalz</td>
<td>4,012.7</td>
<td>202.1</td>
<td>Birmingham</td>
<td>2,555.5</td>
<td>2,834.4</td>
</tr>
<tr>
<td>Berlin</td>
<td>3,442.6</td>
<td>3,861.5</td>
<td>Gr. Manchester</td>
<td>2,482.3</td>
<td>1,945.4</td>
</tr>
<tr>
<td>Schleswig-Holstein</td>
<td>2,832.1</td>
<td>179.3</td>
<td>Ro3 North West</td>
<td>2,296.4</td>
<td>195.4</td>
</tr>
<tr>
<td>Brandenburg</td>
<td>2,511.5</td>
<td>85.2</td>
<td>Ro W. Midlands</td>
<td>2,137.9</td>
<td>224.3</td>
</tr>
<tr>
<td>Sachsen-Anhalt</td>
<td>2,356.2</td>
<td>115.2</td>
<td>West Yorkshire</td>
<td>2,079.2</td>
<td>1,024.6</td>
</tr>
<tr>
<td>Thüringen</td>
<td>2,249.8</td>
<td>139.1</td>
<td>Merseyside</td>
<td>1,362.0</td>
<td>2,112.1</td>
</tr>
<tr>
<td>Hamburg</td>
<td>1,774.2</td>
<td>2,349.5</td>
<td>South Yorkshire</td>
<td>1,266.3</td>
<td>816.2</td>
</tr>
<tr>
<td>Meckl.-Vorpommern</td>
<td>1,651.2</td>
<td>71.2</td>
<td>Tyne and Wear</td>
<td>1,075.9</td>
<td>1,992.2</td>
</tr>
<tr>
<td>Saarland</td>
<td>1,022.6</td>
<td>398.1</td>
<td>Ro North East</td>
<td>800.7</td>
<td>110.6</td>
</tr>
<tr>
<td>Bremen</td>
<td>661.7</td>
<td>1,636.8</td>
<td>Northern Ireland</td>
<td>569.7</td>
<td>70.9</td>
</tr>
<tr>
<td>Germany</td>
<td>81,802.3</td>
<td>229.1</td>
<td>North Yorkshire</td>
<td>5,222.1</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wales</td>
<td>1,799.4</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Scotland</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Northern Ireland</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


That there are regional variations in the structure and characteristics of employment within the UK and Germany does not need to be demonstrated. Both countries have their documented problems of uneven regional development, whether it is the North-South divide in the UK, or the gap between the former German Federal and Democratic Republics. In the UK, the internal geography is frequently summarised by a dichotomy which opposes ‘the South’ and ‘the North’, both areas clearly diverging with respect to economic and demographic indicators. Although the exact demarcation tends to be sometimes blurred, it is usually agreed that the former includes regions north of the river Severn, the West Midlands, together with Wales, Scotland and Northern Ireland. The South comprises the London area, the South East, the South West, the East of England and the East Midlands. In terms of economic
output, the position of London with its demographic and economic importance is unprecedented in Germany whereas larger numbers of cities such as Hamburg, München, Frankfurt, Stuttgart enjoy a more even economic weight within the country. Although not the focus of this dissertation, NUTS-2 regional variations in GDP per capita in 2008 were clearly wider in the UK than in Germany: they amounted to 23% of the national average in the former, against 15.8 in Germany (European Commission 2011).

Underlying the literature about the North-South divide is the uneven repartition of the human and economic costs of deindustrialisation and the benefits of restructuring of the British economy from the end of the Second World War onwards (Massey 1995; Fothergill 2001; Beatty & Fothergill 2005; Webster 2005; Rowthorn 2010). The gradual decline of industries in the North and the West Midlands – but also in London – together with the disproportionate growth of the financial service sector in the South East and London led to a situation whereby the ‘North’ is characterised by long-term non-employment – sickness benefits, an economy relying on public sector investments and aided private sectors investments in ‘fragile’ highly mobile sector industry (Rowthorn 2010). Areas such as the North East and South Wales, former strongholds of coal mining and heavy metalworking, the textile in the North West and part of Yorkshire, metal engineering and car making in South Yorkshire and the West Midlands – the Black Country – have seen a radical alteration of their economic and employment landscape. It is usually accepted that increases in service jobs that gradually compensated losses in other industries did not benefit most the people or the areas which suffered most from deindustrialisation. Whereas male blue collars jobs were destroyed, many of those created were in effect female white collar jobs. Additionally in order to assess the nature of job creation, both the sectoral dimension and the occupation dimension should be looked at simultaneously since service sector may mean health and business service as much as low qualified personal service (Begg 1993).

Regional economic disparities in Germany tend to also be presented as a dichotomy between the former German Democratic Republic and Federal Republic of Germany. Whereas in 2005 GDP per head was above €25,000 in the three major states of Nordrhein-Westfalen, Baden Württemberg and Bayern, and above €32,000 in Hamburg, Bremen and Hessen (Frankfurt), it did not reach €19,000 in any of the Eastern Bundesländer. The wealthiest among them, Sachsen, has its GDP per head still 20% below than in the poorest Western Länder: Berlin and Niedersachsen. Other parts of the former
Maternal employment transitions across regions and countries

DDR, such as indeed Sachsen and Thüringen, were more successful at bridging the wealth gap between regions (Statistisches Bundesamt 2006). For a large part, the differences in the economic fortunes of the two areas results from the liquidation of the industries of the DDR during the years that followed reunification.

As can be expected the industrial structure of the Bundesländer is contrasted. Financial and private services, together with high added value industrial production are strongest in the West, where they contribute to 55% of the regional GDP, against 44% in the East where construction and low productivity industries play a comparatively large role (Statistisches Bundesamt 2006). Significant differences also exist within the West, between the historic industrial heartland of Saarland and Nordrhein-Westfalen, Frankfurt (in Hessen), the heart of the banking and finance industries and the once mostly rural states of Bayern and Baden Württemberg. In the latter two states, high technology and tertiary sector industries have expanded since the end of the Second World War. By contrast, among the Eastern states, Mecklenburg Vorpommern and Brandenburg11 are characterised by a larger share of agricultural production than anywhere else in the country. Public sector is most present in the East, where wages are also on average 20% lower than in the rest of the country (Statistisches Bundesamt 2006).

On the other hand, poverty as measured by the proportion of the population receiving the Minimum Income (Sozialhilfe) and also housing benefit does not follow a clear East-West pattern. Instead it is highest at 7% or more in Bremen, Berlin, and Hamburg, and lowest in the more prosperous Bäden-Wurttemberg and Bayern at 2% or less (Ibidem). Major states such as Nordhrein Westfalen, but also most Eastern States occupy the middle ground, close to the national average of 3.1%. In the East Mecklenburg Vorpommern has the highest proportion of households receiving housing benefit (16%).

2.2.3 Gender and geographies

The amount of research on women’s employment at the regional level is limited in the two countries, with the notable exception of the already noted differences between former DDR and BRD in Germany. Existing work tends to either focus on large numbers of regions spread over several countries (such as within the EU space) or instead on a small number of ‘typical’ areas such as the North East and the South East in the UK, or alternatively, large urban or rural areas. This scarcity is surprising, given the size of the regional differences in female
Within the EU as a whole, the size of regional differences in female economic activity during the 1990s, measured at the NUTS-2 level, a lower level than the one studied in this dissertation, represented two thirds of what was observed at the national level. These oscillated between 25% in some Southern European countries to 65% and more in central Portugal, Scandinavia as well as the South and the Midlands of England (Elhorst & Zeilstra 2007). Beyond economic activity, wide regional imbalances in the employment rates and working-time of women could also be observed in Europe, alongside gender gaps in the same indicators, such as women to men employment and working-time ratios (Perrons 1998). More generally, regional differences in the employment rates of women tend to be bigger than for men across Europe (Villa & Smith 2009). At the same time, they remain comparatively small in Germany or the UK – representing respectively 7.6 and 8.4% of their national average between 2000 and 2006, by contrast with countries such as Italy, Romania or Spain (Ibidem). Such studies have limitations: the trade-off for being able to analyse many regions simultaneously is the absence of in-depth analysis of the dynamics at work in specific regions or groups of regions, and instead the reliance on statistical relationship between a region’s aggregate rate of employment and variables such as the size of public sector employment, or the degree of economic development.

Although no systematic research into the regional gender differences in involvement could be found for the UK, differences in involvement are nevertheless visible. In 2007, there was a 10% difference in the economic activity rates of women across Government Office Regions and Metropolitan Counties. Economic activity was highest in the South East, the South West and Scotland (around 77%), lowest in London and the North East (Office for National Statistics 2008b). The picture for mothers of dependent children was slightly different, not taking London into account where it is markedly lower than elsewhere in the country: economic activity ranged from 55-58% in Merseyside and the West Midlands conurbations, to around 68% in the South West and part of Yorkshire and the Humber1. Differences of a comparable scale could be observed in the employment rates of mothers of children under 6, which were lowest, at 45% (33% in Inner London) in the Birmingham conurbation and in some of the largest cities of the country. By contrast, it was highest in the South West, the North West (excl Greater Manchester) and Scotland.

1Unless stated otherwise, quoted figures are from LFS data pooled for 2007
The prevalence of part-time work among employed mothers also varied to a comparable extent: from 54-55% in the West Yorkshire and Tyne and Wear to 64% in the South West, and East Yorkshire. It tended to be lowest in places where economic activity among mothers was low, such as in Northern Ireland, Greater Manchester and Merseyside and medium to high where larger numbers of mothers were involved in paid work, as in the rest of the North West or the South West. Conversely, the proportion of mothers in full-time employment was low in the East of England and the South West (around 22%) and rose to almost twice that figure in some of the aforementioned large conurbations of Manchester, London and Birmingham, but also Northern Ireland.

It is regrettable that longitudinal analysis is not available at the regional level since it is likely that further differences in trajectories are lying behind these results. Still in the UK research has also focused on women in urban areas only and found evidence of gender imbalances in job losses in large cities between 1981 and 1991, which had disproportionate impact on low qualified women by comparison 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 leave the labour force altogether in particular in Glasgow, Manchester and seemed to particularly affect cities such as Liverpool, Manchester or Glasgow, by contrast with other ones such as Plymouth, Cardiff, Edinburgh and Bristol. This is attributed in part to their lower geographical mobility, whether in term of migration or commuting, as had already been reported previously for Liverpool and Manchester (Green et al. 1986). This could also contribute to the lower female economic activity rate in these areas: it has been estimated that 1,000 female job losses in major British cities resulted in 453 transitions into economic inactivity, whereas the figure for men is only 124 (Bailey & Turok 2000). A discussion has also taken place concerning the impact of rural settings on women’s income and job opportunities in the UK (Little & Austin 1996; Henderson & Hoggart 2003).

In Germany, differences in the employment patterns between women in the former DDR and BRD represent by far the main geographical contrast documented in the literature, with few exceptions (Sackmann & Haüßermann 1994; Sackmann 1997). Women in West Germany have traditionally been less involved by comparison with the UK or the Scandinavian countries (Gustafsson et al. 1996). In the Eastern part of the country by contrast, the opposite is true: women have been returning to work earlier after the birth of children, often full-time, a behaviour encouraged by the policies of the socialist times
Maternal employment transitions across regions and countries

(Ostner 1994.; Fisher 2010). Although these gaps have been narrowing since the Reunification, differences between the two former countries remain considerable: in 2002, close to one third of mothers of children under three in former Easter Germany were currently involved in full-time paid work, against 8% only of mothers in the West (Kreyenfeld & Geisler 2006). Although the underlying economic factors were different, it is interesting to see that similarly with the above, East German women were disproportionately affected by the massive job losses (and subsequent long term unemployment) that occurred after the reunification (Adler & Brayfield 1997; Beck et al. 2005).

Marginal employment is more present in the Western Bundesländer where women working in Minijobs – working less than 16 hours per week and not contributing towards their pension – are more likely to be found, where they represented between 68% and 72% of all those in such jobs (except in the City states). Although their number has been on the increase between 1999 and 2004 they are less common in Eastern Germany where their proportion is under 60% (Statistisches Bundesamt 2006). Conversely, more women were likely to be employed full-time in the East. In 2004 roughly 50% as many women were in full-time positions, less than 45% in the West. Public sector employment is also more prevalent among women in the east with at least 60% of women being employed by the state, against 50% and less in the West (Statistisches Bundesamt 2006). This pattern has persisted over time even though the initial boom in unemployment (especially long term unemployment) that followed reunification disproportionately affected women in the East (Adler & Brayfield 1997; Beck et al. 2005). One of the consequences of the changes that followed reunification is the sharp fall in the birth rate in the Eastern Länder (Statistische Ämter des Bundes und der Länder 2009).

Differences between western Bundesländer beyond the East-West divide are well visible and comparable with the UK, with employment rates of mothers ranging from 44% in Hamburg to 56% and more in the Southern Bundesländer of Bayern and Baden Württemberg. The latter regional contrasts between the Old Bundesländer – even more so between the new ones – have remained under-researched, with few exceptions (Sackmann & Haüssermann 1994; Sackmann 1997). At the same time however, quantitative data about the imbalances between German States, including those gender based are regularly published by Federal or State-level government bodies, which may be a by-product of the institutional structure of the country (Bundesministerium für Familie, Senioren, Frauen und Jugend 2010). As already mentioned, the literature
about regional difference in women’s employment beyond the East-West divide is scarce. However, there are mentions of a North-South divide, where women’s involvement in employment in the South is more developed, at its lowest in the former heavy industrial areas of Nordrhein-Westfalen, in a fashion comparable to the North East of England, higher in Southern Germany, and relatively low in the Northern States (Sackmann & Häussermann 1994; Sackmann 1997; Hummelsheim 2009). This is true of both the employment rate and the prevalence of part-time work.

2.3 Summary: empirical shortcomings

This chapter has provided a broad overview of the empirical evidence available on the intensity and variability of involvement in paid work of mothers of young children in Germany and the UK with a greater stress put on the latter. Beginning with the general facts about the evolution of their participation in employment and the prevalence of part-time work, it went on to a description of the literature about their post-birth transitions before moving on to the specific details of the regional differences in involvement that have been researched so far, which is the main focus of this dissertation. This highlighted the general trend in both countries wherein many mothers of young children tend to reduce or interrupt their involvement around the time of a birth, even if their behaviour is mediated by social class, family types and country-level factors, such as the characteristics of part-time jobs childcare, or parental leave provision. Examination of the literature about regional differences in these patterns of involvement confirmed that significant variation occurs within both countries, in each case according to its own specific pattern, which could not be reduced to the already documented North-South divide in the UK or East-West contrasts in Germany.

The depth of the latter review was limited by the scarcity of the existing literature dealing with regional differences in involvement from a gender perspective, which mirrors the limited amount of data available and more generally the fact that preoccupation for subnational analysis has been limited among researchers and policy makers, especially in the UK.²

²The divide between East and West Germany has drawn sustained attention but is a borderline case from the point of view of this research since both entities once existed as separate nations.

Now that a need for such combined analysis of longitudinal and spatial trends has been unearthed, in particular one that would rely on microdata
and would allow to describe women in regions rather than regions only, in particular one that would focus on mothers of young children, a parallel survey of the theoretical attempts at explaining these contrasts is necessary, and is the focus on the next chapter.
Chapter 3

Explaining mothers’ involvement across space and time

In this chapter I review the theoretical frameworks relevant for an understanding of the involvement in paid work of mothers of young children, focusing on those most meaningful for an analysis of regional differences. My main goal is to develop the rationale for the three research questions introduced earlier: the extent to which regional differences in involvement intensity and variability noted in the previous chapter can be related to imbalances in the composition of the workforce of mothers; to characteristics of the jobs available regionally; or to trends in women’s orientations to work, in relation or not to regional economic development paths. In order to do so, the chapter discusses theoretical frameworks ranging from orthodox economics and economic sociology, to some human geographers who, as someone once put it, had to reinvent themselves as sociologists given the latter’s lack of interest for the spatial dimension of social phenomena.

From a theoretical perspective, attempts to explain differences in involvement and their consequences have drawn on traditional paradigms in social sciences by either stressing the agency of women or by focusing instead on various aspects of the social structure that constrains their action. In effect however, the majority of approaches lie somewhere in between these two opposites. Accordingly, the contributions reviewed here include orthodox economics relying on the assumption of utility maximizing individuals, as well as theories of gender regimes, patriarchy and culture. Such a wide overview was made necessary by the fact that the behaviour of mothers of young children is unlikely to be the result of only one type of factor and the complex interplay of causal factors reflected in the research questions seems a more credible assumption.
The presentation is therefore organised around these three questions, discussing each time the underlying theoretical framework, and considering its spatial implications when they are not explicitly stated.

In the first section, I present the explanations of women’s economic behaviour that rely on individualistic assumptions, beginning with Human Capital theory, alongside Catherine Hakim’s manifest for a Preference Theory and a discussion of their limitations. In Section 2 I review theories that consider government policies and institutions – including the labour market and the role played by private employers – which define the horizon of constraints and opportunities and the ensuing boundaries put on mothers’ involvement. In the third section, I review some of the critics that have seen these approaches as too narrow, briefly considering the role of social structures (both from a gender and class perspective), gender regimes and culture. I then consider an alternative set of explanations coming from both economic sociology and feminist geography, according to which involvement is related to orientations to work themselves influenced by long term regional economic trends. However, before beginning with this analysis, it is necessary to briefly clarify the nature of regions as understood in this research and its implications.

Relativising regions?

In the previous chapter, we saw that mothers’ involvement is clearly differentiated across subnational spaces in both Germany and the UK, a fact that remains overlooked by the statistics and analyses currently available. This suggests that some of the mechanisms that lie behind mothers’ behaviour happen in a spatially differentiated way. In this view, ‘national’ labour markets should be understood as ‘collections’, that is:

- sets of overlapping gender, age, socio-economic, occupational and industrial specific areas; the dimensions of which are determined by the location of workplaces and residences, differential access amongst subgroups to transport and other resources (Green et al. 1986)

However, before going any further, it is important to consider that in essence, space or regions are not additional causal factors that one could simply juxtapose with those that are reviewed in the next sections. Instead I follow the view that space in itself is as much an inherent dimension to factors such institutions, social structure or class:
Region (…) is simply a ring drawn around one set of (…) intersections of elements (Bagguley 1990: 11)

(…) regions are not pregiven (…) nor are they unchanging. They are continually reproduced in shifting form(…) (Massey 1995: 188).

Investment decisions and job creation schemes, public subsidies (including the allocation of European funds), and the related problems they raise are different in different places, as we saw in the previous chapter. This is also the case of intangible factors such as gender cultures, orders or arrangements Pfau-Effinger (2004). In that respect, where the ring is drawn is – at least partly – arbitrary. To quote Doreen Massey again:

Geography matters, but it does not determine in itself any particular outcome (Massey 1995: 285).

In other words, regions are not causal, and assigning them identities or ‘fundamental natures’ is likely to result in fallacies, be they on economic or sociological grounds. This applies to Government Office Regions in the UK which enjoyed very limited power as governing bodies besides their role in the allocation of EU Regional Development Funds (Herrschel & Newman 2000). Similarly, whereas in Germany the boundaries of a few Bundesländer can be said to be rooted in history, the majority of them are the result of political decisions made at the end of the Second World War in the case of West Germany, or even after the reunification in the case of the former DDR.

I will now move to the discussion of the three research questions at the core of this research.

3.1 Agency, rational choice and preferences

This first section is dedicated to theories of involvement in paid work assuming one way or another that the cause for variations in involvement lies in women’s individual agency, whether it is rooted in their universal economic rationality or their more innate preferences. Given the limited space available, I focus on Becker’s human capital and Catherine Hakim’s preference theories as well as their most relevant critics. I chose the former given its far reaching influence on the economics of women’s labour market participation, and the second because
of the discussion it triggered among economic sociologists in the UK. I end this section by drawing a few conclusions on the spatial implications these theories are likely to have.

3.1.1 Human capital and household production

From the point of view of Gary Becker’s Human Capital and New Home Economics approach, gender differences in involvement in paid work result from the rational anticipation of women and men within households − whose preferences are assumed stable over time and can be observed from their outcome. Women and men try to maximize their utility by finding an adequate balance between leisure, unpaid care work and participation in the labour market. Specifically, they try to maximize their future earnings by investing in ‘human capital’ − skills valued on the labour market − acquired via participation in formal education and on-the-job training (Becker 1991). Since women anticipate that they will spend time caring for children and hence will earn less than men, they tend to invest less than men in their initial human capital, and instead choose to develop their caring skills. This is reinforced by the fact that they have to interrupt their participation in paid work around childbirth anyway, even for a short period of time, which triggers a further loss of human capital (Becker 1975). Even in the case where women and men within a household enjoy similar levels of human capital, women caring for children will have less ‘energy’ to dedicate to paid work. From that perspective Becker implicitly acknowledges the ‘double burden’ faced by many women who are employed full-time. As a result, they will tend to work fewer hours than men, which again lowers their productivity and their human capital especially if this involves working part-time (Becker 1991: 78).

Becker’s approach to the behaviour of women and households has been criticized as too simplistic and functionalist, if not tautological (Rees 1992; Walby 1997). It also failed to provide a reliable explanation for the marked increase in the number of mothers remaining in employment or undertaking careers at a high level in the last decades. Finally, conceptualising education and training as individual investments fails to recognize the massive public and private investments in education and training that made it possible for women (and men) to develop their skills (Blackburn et al. 2002).

Another criticism is that Becker’s assumption of exogenous preferences is too static. Research on endogenous or adaptive preferences proposed models reflecting the ways preferences adapt to changes in the course of an action
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(von Weizsacker 1971). Preferences at $t_0$ may or may not predict outcome at $t_1$, but preferences at $t_2$ will depend on whether preferences at $t_0$ have been realised they can be raised or lowered depending on the outcome, a behaviour that is sometimes labelled as the ‘sour grape factor’. Unmet preferences can be redirected towards substitutable goods (Welsch 2005): women with weaker initial labour market involvement – whatever the reason – could subsequently develop stronger preferences for participation, and conversely, depending on the difficulties they experience with attaining their goal. A similar argument was developed by Witt (2001). In his view, knowledge about how to satisfy existing wants – such as desire for more autonomy – may with time generate ‘acquired wants’ such as getting involved in paid work, that will require satisfaction in themselves, and enlarging an individual’s ‘wants basket’. Given the vast amount of information available on most goods, individuals will tend to focus information gathering on their existing wants, and on those that are subject to communication with others. This provides an explanation for generational transmissions of preferences, but also for their clustering among groups and social networks (Witt 2001).

Whatever the limitation of Becker’s original argument, it nevertheless has to be recognized that the concept of human capital and the related distinction between formal education and on-the-job training is relevant for understanding mothers’ involvement in paid work. The gaps in participation they experience around the birth of children may partially explain lower pay rates than men or childless women, especially if they return to the labour market in jobs for which they are overqualified and/or relying on skills that are more general with fewer training opportunities, thus reinforcing the likelihood of remaining in the same occupational category (Becker 1991: 35).

3.1.2 Preference theory and its critics

Catherine Hakim’s abundantly debated proposal for a ‘Preference Theory’ in the 1990s relies on assumptions close to those of Becker. In her view, individual agency is central to explaining women’s involvement in paid work. Participation can be predicted from their preferences and the relationship between them is essentially linear and unproblematic. She also seems to endorse the view that women’s employment status reveal their prior preferences, an idea that would sound familiar to many orthodox economists (Calhoun 2002; Hakim 2007). By contrast with Becker however, preferences or ‘work-life orientations’ vary between women instead of following a monolithic utility maximisation
The main contention of Preference Theory is that women belong to one of three ‘lifestyle preference groups’ (Hakim 1995). The majority of them are ‘adaptive’, and do not have strong preferences: depending on circumstances, they opt for part-time or casual work over continuous full-time employment when available. According to Hakim, this group represents between 40% and 80% of working-age women depending on the country. The other two groups are made of ‘work-centred’ and ‘home-centred’ women and would respectively represent 10% to 30% and about 20% of women. In her view, the existence of such groups explains the absence of statistical correlation between the high degree of job satisfaction expressed by women, and their occupation or working time - part timers and full-time. She goes on to claim that in the UK, the majority of women are satisfied with peripheral, low paid jobs, as a result of low expectations (Hakim 1998).

Unsurprisingly, these claims have been heavily criticised. Most of her critics have highlighted that she overlooked the role played by constraints faced by women, and more generally the complex relationship between constraints, personal preferences and behaviour. For instance, Ginn et al (1996) criticised her depiction of the relationship between preferences and constraints stressing the role played by caring for dependent persons, which impact on women’s future careers and opportunities, and hence on the space available to frame future preferences. In the particular area of working-time, in many cases, the fact that a large number of women continue to opt for part-time work, is likely to reproduce rather than transform the balance of economic power between men and women. It is also likely to reflect the action of a vast number of intertwined factors at individual, household, and institutional level ranging from personal economic motivation to peer pressure within social networks (Fagan & O’Reilly 1998; Fagan 2001). On the other hand as well, stated preferences and behaviour do not necessarily match. For instance, finding correspondences between gender role attitudes and the domestic division of labour within households is not straightforward (Crompton et al. 2005). At another level, interviews with part-time checkout operators illustrated the additional fact that women could be at the same time ‘satisfied with their employment’ but ‘dissatisfied with their job’, especially among working class mothers (Walters 2005: 211).

Personal preferences keep changing over time – some women express the view that motherhood changed their priorities – and identities can be adjus-
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ted as a result of constraints not matching initial preferences (Himmelweit & Sigala 2004). This is echoed in Walters’ proposal of modelling orientations to work and motherhood on a continuous and mobile scale of attitudes, for example according to the life stage (Walters 2005: 211). Others have also raised the question of the extent to which preferences are individual, in other words whether they can be distinguished from social norms and peers or family expectations. Sometimes it is also difficult to distinguish between an ‘objective need to work’, and women’s sensibility on general statements about what an acceptable standard of living should be (Himmelweit & Sigala 2004).

Finally some have contested the very possibility of a universal theory of preferences that would not vary according to women’s circumstances in what they saw as an essentialist portrayal of women’s behaviour (Crompton & Lyonette 2005). Walters’ depiction of classless women was viewed as unrealistic (Ginn et al. 1996; McRae 2003). For example, Crompton & Harris showed that women in higher occupations enjoyed more options for reconciling work and care than the lower qualified – such as opting for a ‘family friendly’ speciality for doctors – and hence to realise their preferences (Crompton & Harris 1998).

I will now consider the spatial implications of this discussion.

3.1.3 Summary: utilities, preferences and geographies

Although they do not explicitly consider the relationship between geography and women’s behaviour, both frameworks have spatial implications. The first one is that socio demographic imbalances could exist between regions: mothers sharing some of the individual characteristics described in the previous chapters (in terms of education level and social class) might be more likely to be found in certain areas than others. For instance, one could expect women with high levels of qualifications to migrate from one region to another in search of the jobs that match their earnings opportunities or class-related expectations. Migration can also play an indirect role given that women are known to be ‘tied migrants’ and that in couples, spatial mobility is triggered by men’s rather than women’s job opportunities. For instance, areas whose industrial structure could attract large numbers of working class men could at the same time have higher proportions of working-class mothers than elsewhere.

This does not only apply to internal migration, but also to immigration, which could also play a role in the clustering of mothers with specific characteristics in some British and German regions. Although a detailed discussion of migration is not possible within the space of this thesis, this factor needed
to be mentioned since it could be one of the contributing elements behind some of the regional heterogeneity in involvement. The point here is that it makes it clearer why an attempt at explaining regional differences in the involvement of mothers needs to take imbalances in their demographic and labour supply related-characteristics into account. This provides a rationale for the first research question in this research, the question as to whether composition effects, that is imbalances in the distribution of women according to their class or level of human capital, can account for some of the existing regional differences. Research on this topic is scarce, and the existing work has been carried out for women as a whole only (Little 2009).

In the case of Hakim’s Preference Theory, and more generally, orientations to work, it is likely that the size of the three ‘lifestyle groups’, if there are such groups, is unevenly spread within the UK space for the same reasons as stated above. In particular, ‘work-centred women’ would probably be likely to be found in large urban centres where public and private high level career opportunities for women are more common, although it could also be argued that inner cities host other groups of women some of which are likely to be home-oriented as well. The remaining 60% ‘adaptive women’ could be analysed in human capital terms – that is their involvement is likely to be influenced by costs and constraints to a much larger extent than the other two groups. However, the lack of more specific developments in Hakim’s work prevents us from drawing more specific conclusions in that direction from her work.

It should also be pointed that at this degree of generality, it is difficult to translate the above discussion into specific hypotheses about involvement intensity and variability, for instance whether changes in either the level of human capital or the family characteristics of mother would translate into stable involvement in paid work, whether this would be in part-time or full-time jobs, as well as the timing of the related transitions across regions. However, at the minimum it should be expected that since levels of involvement are related to individual resources – whether or not we see them through the prism of human capital – among which are education, occupational class, earnings and family type, differences between women across regions with regard these characteristics should be expected to contribute to explain regional differences in involvement, in what could be referred to as a ‘composition effect’ (Little 2009). Exploring this issue will be the first research question in this research.

This takes us to the next important point: from the point of view of utility maximisation and within-household specialisation, regions may be character-
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ised by different opportunity structures resulting in differences in the costs of participation (such as the availability of affordable childcare places or jobs that may be compatible with part-time or full-time caring or school times) which ultimately affects some mothers’ decision to get involved in paid work, given their specific level of human capital and anticipated earnings. This is why many authors, whilst implicitly accepting the human capital approach to involvement, decide to focus instead on the external factors that may affect the rational calculations of mothers. These approaches will be reviewed in the next section.

3.2 Policies, gender regimes and job supply

The aim of this section is to review the literature relevant to the second question examined in this dissertation, that is, to assess the research about the mechanisms through which regional differences in involvement are mediated by institutional arrangements – which include policies and labour markets. As already pointed out in the previous section, by increasing or decreasing the costs and opportunities attached to participation, these institutions affect the decisions made by mothers about their involvement – whether to work part-time or full-time, when to resume working, in which jobs.

This holds irrespective of whether these are analysed within a rational choice / utility maximisation framework, that is, irrespective of whether we believe that their impact is the result of incentives they create which affect the rational anticipations or the preferences of adaptive women by altering the cost structure and the earnings they expect from participation.

Even if such analyses do not accurately explain the behaviour of women, it remains that policies and institutions are likely to affect participation, for instance by making the supply of formal childcare unaffordable or scarce, by allowing sufficient time for women to look after their children while retaining attachment to employment or indeed by providing them with jobs which are compatible with their care duties. Given that in many cases these policies operate at the national level, the majority of the analyses in this area implicitly or explicitly assume that countries are the relevant units of analysis, whether taken in isolation or in international comparisons. A typical outcome of such research is typologies of countries based on these policy mixes.

I nevertheless mention these here given that they allow apprehending the national institutional background of Germany and the UK before beginning
to explore the regional dynamics. In addition, as will be seen below, there can be local and regional differences with regard to some of the aspects of these policies, as is for example the case with additional benefits paid by a few Bundesländer to parents on parental leave, or in the supply of childcare places in Germany.

The second part of the section focuses on the literature dealing with regional differences in the availability of jobs that are compatible with the constraints of motherhood – given that many women remain the primary carer for their child.

3.2.1 Welfare states typologies and key policy areas

It is widely acknowledged that the employment of women and mothers significantly varies across country-specific sets of institutions and policies. A broad range of research has described how both government and employers actions – whether they explicitly target women or not – play a significant role in explaining and potentially altering existing gendered patterns of participation in paid work. A large body of research has produced comparisons of these policy mixes in Western countries in particular the European Union, following Esping-Andersen’s (1990) seminal work and its typology of Liberal (among other the UK), Conservative (among others Germany) and socio-democratic welfare states (Esping-Andersen 1990). This original typology, built around the criteria of decommodification – the extent to which social protection policies shelter individuals from the market in times of need – has been dismissed as gender blind by feminist scholars. One of the recurrent criticisms was the non-inclusion of unpaid work in the typology, given that for women, autonomy may come thanks to the commodification, not decommodification of care work. Subsequent alternative typologies of welfare arrangements have been produced, such as that of ‘breadwinner’ regimes in which the UK was labelled a ‘Strong’, by contrast with the French ‘Amended’ and the Swedish ‘Weak’ regime, having to do with the poor quality of part-time jobs and the absence of support for working mothers (Lewis 1992). Further typologies have been proposed, altering or not the initial clusters, for example by adding to decommodification criteria such as access to paid work, women’s capacity to form autonomous households (also captured by the notion of defamiliarisation) to name only a few (Orloff 1993; Esping-Andersen 1999; Bambra 2007). However, this approach and more generally attempts at summarising complex policy mixes into typologies has been criticised as too simplistic, given
that countries form sometimes heterogeneous clusters when in depth criteria are chosen (Sainsbury 1999).

It is nevertheless interesting to note that although the origins and underlying principles of the British and German gender regimes differ markedly, overall neither one nor the other can be seen as significantly augmenting the capabilities of mothers of young children. This can be seen by looking at three key policy areas which are traditionally recognized as determinant in defining a horizon of constraints and opportunities for women to engage in paid work:

**Fiscal policies** may encourage / discourage women within couples to take up paid employment, for instance in relation to whether earnings are taxed at the household (joint taxation) or individual level. The latter case represents a disincentive for women to work or to work full-time. In that respect, with its combination of individual taxation and flat rate benefits, the UK tends not to discriminate by comparison with Germany where joint taxation still applies, and many benefits are earnings related. However simulation has suggested that the level of the marginal taxation rate limits the incentive for part-time working women to increase their hours, and this effect seems stronger in the UK (Bettio & Verashchagina 2009a).

**Childcare policies** Affordable formal childcare services, either provided or subsidised by the state, together with informal supply through family networks are often seen as the cornerstone of mothers’ participation in the labour market. The number of available places, their price and the relationship between opening hours and school times all contribute to raising or lowering the obstacles to women’s involvement in paid work. Limited public funding, as is the case in the UK, overall limited provision or restricted opening times, as is the case in Western Germany, hamper the capabilities of women to engage in paid work. A distinction needs to be drawn between full-time day care for children under school age and care for older children outside school hours, both in terms of cost and availability.

In the UK, provision for children under four is mostly private and one of the most expensive within the EU, close to 25% of an average salary, against 9% in Germany, clearly decreasing the chances of participation of mothers with lower income or with weaker social and family networks (OECD 2007). Even though provision has improved in the last decade in both countries – it was boosted from 1997 onwards in the UK by provisions of free part-time childcare for children aged 3, obstacles remain, and in addition, opening times often do
not fit the work schedules of parents employed full-time (Fagan, Donnelly & Rubery 2005; Bettio & Verashchagina 2009a).

Availability of full-time nursery places for children under four is usually not described as the main childcare issue in the UK, which of course does not mean that a mismatch is not occurring at the local level or that the needs of potential users are not met given the costs. An additional factor that is specific to the UK is that compulsory education starts when children reach the age of four, against six in Germany, which could to some extent be considered as universal free childcare from the age of 4, given that many schools also offer additional before and after school times. In Germany, children in formal day care attend Krippe until aged three, Kindergarten when aged between 3 to under 6 and Horte from school age onwards given that school times tend to only include the morning. Shortage of places is more acute in the former.

Even though childcare provision in the UK is mostly private, public spending was higher than Germany on both day care provision and pre-primary education. The latter represented 0.6% of GDP in 2003, against 0.4 in Germany. Public expenditure on day care in Germany (less than 0.1%, against around 2.5% in the UK) was among the smallest of all OECD countries, coming third after Mexico and Poland (OECD 2007). As a result, although attendance of day care by children aged four and five was similar at around 80%, the same numbers for children under four were above 20% in the UK against less than 10% in Germany (Ibidem).

In terms of spatial differences, there are ‘natural’ regional variations in the provision of childcare in both countries, according to population size and density. In the UK the distribution of day care places follows this pattern, with the densely populated areas of London and the South East attracting the largest numbers of both providers and places, followed by the North West (Brind et al. 2011). However, in Germany, where the childcare provision is the formal responsibility of local authorities, regional differences expand beyond this. This is particularly visible when examining provision in former Eastern and Western Bundesländer. In 2006, overall 8% of under four were in full-time care in Krippe in the Western part of the country, against almost 40% in the East. The gap was widest for children aged between two and three (16.7% against 72.6), and became negligible for children aged four and older (Lange et al. 2008).

Within each one of these two areas, additional differences could be observed: in the older Bundesländer, more children under three attended full
day care in Berlin (37%) and Hamburg (21%) than in the rest of the former Federal Republic where most other Länder stood at between 8 to 10%. Attendance was lowest in Nordrhein-Westfalen and Niedersachsen (Lower Saxony), and highest in Saarland and Rheinland-Pfalz. In the former DDR attendance among under three was lowest in Sachsen at 33%, and highest in Sachsen Anhalt at 50% (Ibidem). In Western Germany as well, a regional differentiation is also visible as far as care for older children is concerned: in addition to the New Bundesländer, the highest coverage can be found in Baden-Württemberg, Saarland and Rheinland-Pfalz (at least 90% of children, against 80% and less in the rest of the country). The lowest coverage can be found in the remotest part of Bavaria, as well as the Northern States of Schleswig-Holstein and Niedersachsen (80% and under).

In the UK, there does not seem to be many imbalances in the price of childcare, at least at the regional level. The only exception is London where prices are close to 25% higher than in the rest of the UK and may create a discrepancy for lower paid mothers or families who as a result may be even less able to afford childcare and involvement in paid work (London Assembly 2012). This is not to say, of course, that the overall location of childcare providers is not important. Qualitative research confirms that it does matter crucially; as also reported in this chapter, parents are trying to reconcile commuting to work, collecting children, but this seems to be the scope of a local rather than regional analysis (Hall et al. 2011).

**Time and leave policies** Maternity leave (and to a much more limited extent, paternity leave), in conjunction with parental leave and flexible working-time policies represent another resource that can enable mothers to balance caring and work by making it possible for them to retain their employment while looking after a young children. They can play a substantial role in securing mothers' attachment to the labour market. For instance, when maternity leave was introduced in the UK in 1979 (then gradually expanded) it was shown to influence earlier returns to work from three to five years after a birth to less than 12 months (Gregg et al. 2007). Claimants are now entitled to 12 months of which 39 weeks are paid (6 at 90%, the rest at a much lower flat rate). 57% of employers offer additional provision of some kind on top of this mandatory minimum. In Germany, the *Mutterschutz* last up to 14 months (four months until 2007), the first 14 weeks paid at full pay, the remainder at 65% of previous earnings, with a relatively high ceiling (Eurofound 2004;
OECD 2007).

Parental leave provides additional options to parents – in actual terms mostly mothers – for improving their work life balance by allowing them to take periods of time off to look after children after the entitlement to maternity leave has ended. Depending on the structure of incentives they offer they can either provide an institutional channel that will contribute to reinforcing women’s role as a secondary earner within households, or to help strengthen their position in the labour market (Fagan & Rubery 1996; Blau & Ehrenberg 1996; Gornick & Meyers 2003; Moss & O’Brien 2006). When they encourage full-time retreat from paid employment (or marginal employment) during long periods of time as was the case in Germany before 2001, they act in effect as an instrument to decrease the size of the workforce and affect the subsequent career prospects of mothers (Ruhm 1998; Plantenga et al. 2005). Instead when they allow for shorter periods of leave – less than a year – or provide for a numbers of days that parents may flexibly take at short notice even when their children are older, they may have a more positive impact on women’s further labour force participation (Ibidem). The amounts paid to parents claiming parental leave also play a significant role: more generous, earnings-based benefits are an incentive for mothers to work full-time prior to taking maternity/parental leave in order to build their entitlement and subsequently reduce their loss of earnings (Spiess & Wrohlich 2008). In some cases they provide incentives for fathers to take some part of the leave, easing the burden that is most of the time left to women alone.

Between 2001 and 2006 under the German parental leave (Elternzeit) women were entitled part-time or full-time leave with a right to be reinstated in their previous employment until children are aged under three. Since 2001, the Elternzeit comes with a right to work part-time, between 15 and 30 hours per week whereas previously only up to 19 hours were allowed – in effect it consists of a reversible right to part-time work which goes together with a allowance of 2/3 of previous earnings for up to two years - this however only applies to mothers in workplace with more than 15 employees (OECD 2007). Although no literature was found about regional differences in take up, it should be noted that since 2001 four Bundesländer (Bayern and Baden-Württemberg, Sachsen and Thüringen) offer flat rate benefits – the Landeserziehungsgeld – to mothers when their entitlement to Elterngeld has run out, in effect restoring a third year of parental leave benefits scrapped in the 2001 reform. It is to be noted that in the former two cases benefits are means tested, whereas in the
latter two it is granted only to parents whose children do not attend formal childcare (BMFSFJ 2005).

By contrast, in the UK, parents are only entitled to 13 weeks of unpaid leave, thus making it harder for women to sustain a career – as opposed to a source of income – while their children are young. At the same time, the right to request flexible hours introduced in 2003 is known to help significantly British women with work-life balance issues (DTI 2007). Interestingly, whereas 19% of German women resumed work as before after parental leave, against 55% who requested working on shorter hours, the equivalent for the UK is 35 and 40%. There is also a suggestion that flexible working-time provision is nevertheless more prevalent in the UK than in Germany – 70% of British women, against 60% in Germany declared they could vary their daily working time for family reasons (European Commission 2009).

One can see more clearly now how these provisions can affect both involvement intensity – by penalising / encouraging full-time work, or longer periods of care – and variability, similarly by making early returns easier or dearer. Although not developed further in depth in this research, it can expected that spatial discrepancies in the availability of subsidised childcare may impact in a spatially differentiated way on the involvement in paid work of mothers of young children. Irrespective of their origin, women adapt to these constraints that define different opportunity structures, by taking up part-time rather than full-time jobs, becoming/staying economically inactive or migrating to another region (Van Ham & Buchelz 2006; Ward et al. 2007: 348).

On the other hand, the direction of causality should not be taken as a given, at least in the case of childcare: is participation higher because more childcare places are available in some places than other, or is provision higher because the demand was higher in the first place? This question is not easy to answer since both probably influence each other over time, but one should keep this in mind when looking at participation data. I will come back to these aspects Chapter 7 when discussing the results of the model.

These three areas are obviously not the only ones that affect women’s participation in employment. Given the fact that many women find themselves towards the lower end of the earnings pyramid, policies that increase these earnings via the provision of better paid jobs in the public sector, or minimum wages tend to have a positive impact on participation whereas their tightening will have the opposite effect. The same has been said of workfare provisions, through their condition of entitlement (whether in time spent looking for jobs
or previous work requirement). I will now briefly discuss the private sector side of the discussion.

### 3.2.2 Segregation, competitive strategies and regions

Besides government policies and their impact on the cost of childcare and the legally protected caring time for employed mothers, the other obvious factor likely to impact on involvement taken into account in this research is the availability of suitable jobs. Suitable jobs are those that remain compatible with many mothers’ gendered constraints: picking up children from schools, carrying out part-time care if nurseries are unaffordable, all of which often translates into part-time employment.

At the local level, the location of these jobs also matters for mothers’ involvement because their commuting distances are likely to be smaller than men, owing to their domestic workload. Even when working full-time, women tend to be responsible for the ‘school run’ (Hanson & Pratt 1995; Preston & McLafferty 1999; Kwan 1999). As a result, the range of jobs accessible to mothers is narrower, and tends to be restricted to those available locally, which is reinforced by the fact that low qualified women tend to also rely on their local social network to find jobs. Hence, women in households more remotely situated from potential female jobs are more likely to be jobless (Hanson & Pratt 1991; Van Ham & Buchelz 2006). We saw in Chapter 2 that these jobs are likely to be found in segregated industries, more so in the UK than in Germany however. Such segregated industries include retail trade, catering, health, education, jobs traditionally labelled as ‘female’ as a result.

What matters for this dissertation is the extent to which such jobs are more likely to be found not so much in some local areas rather than others – they are by definition – but in some regions rather than other. Why could it be that some regions would be characterised by better spatial match between their female population and the jobs they are seeking. Whilst it is known that the public sector tends to employ larger numbers of women, there is evidence that overall public sector employment is less clustered than in the private sector employment around local areas and regions of the UK at either the NUTS-2 or Local Authority level (Prothero 2011). This means that demand side factors influencing the involvement of women are more likely to depend on variation in private sector jobs.

Two potential explanations are briefly reviewed here, the Varieties of Capitalism (VoC) approach which is mentioned since it can shed some light on
gendered differences in employment between the UK and Germany, as well as work by human geographers. This review will albeit be brief given that explaining the roots of differences in the industrial composition of regions falls beyond the goal of this research. According to the Varieties of Capitalism approach, competitive strategies pursued by firms and their associated recruitment policies may have consequences in terms of the employment opportunities for women. In coordinated market economies (CME) such as Germany, the stress tends to be put by employers on in-depth specific skills that are acquired at the occupational or sectoral levels and results to some degree from investments by employers themselves, which presupposes a degree of cooperation between firms at the sectoral level. This contrasts with liberal market economies (LME) where the emphasis tends to be put by employers on general skills. These strategies might have a differentiated impact on women since in CME, the employers will tend to be reluctant to invest in women’s skills, in effect practising statistical discrimination. As a result, women with higher initial training will tend to fare better in LME that in CME, whereas women with low skills will enjoy better quality jobs in the CME (Hall & Soskice 2001; Estévez-Abe 2005). However, like social policy based typologies, these have been criticised as oversimplified (Mandel & Shalev 2009; Rubery 2009).

The VoC approach may contribute to an understanding of spatial differences in female employment because it stresses that within sectors, competitive – and presumably human resources – strategies of firms may vary between countries, but also regionally (Crouch et al. 2009). Earlier on but in a similar fashion, the localisation of particular industries in specific areas of the UK had already been analysed as part of broader profit maximisation strategies of companies. Two examples often cited during the 1980s were the availability of regional aid, or a particular type of low qualified female workforce in a spatial division of labour which caused firms to invest production units in the North of the UK, in areas under economic reconversion while keeping activities requiring a more skilled workforce in the South East (Massey 1995).

On the other hand, in Germany, Sackmann (1997) attempted to relate the significant imbalances in involvement she observed to the regional composition of employment, in particular gender segregation, finding that there is not necessarily a correlation between horizontal segregation and the level of participation: instead she found that it is in regions where male and female workforce sectoral concentration tends to be more balanced that female employment rates (but not necessarily full-time employment) are highest such as
in the economically buoyant states of Bayern, Baden Württemberg and Hessen, as opposed to the more segregated northern states (Sackmann 1997). These results seem to suggest that the availability of female jobs does not necessarily play a similar role in the two countries, perhaps in relation to the fact that horizontal segregation is lower in Germany (Bettio & Verashchagina 2009b).

It is now time to summarise the main aspects of this section.

**Summary: constraints, opportunities and involvement**

In this section I have reviewed literature dealing with a broad range of factors that are traditionally associated with involvement, most of which had to do with government policies, and to a lesser extent the structures of employment and jobs available. These were meant to provide a better understanding of the institutional context in the two countries: in Germany where for a long time policy actively encouraged mother’s retreat from paid work, then gradually encouraged part-time work, in the UK where the private provision of childcare and the absence of parental leave provides strong incentives for women to work, but equally, as secondary earners.

All of these can be seen as defining a horizon of constraints which add to the cost of participation, such as for instance a scarcity of childcare places, or instead make it easier for women to combine paid work and caring duties – such as the local availability of flexible part-time jobs. Not all of these factors are playing the same role in Germany and in the UK. For instance, variation in the supply of childcare seems to have a regional dimension in Germany, whereas the high costs of the mostly private provision in the UK weaken the possible role of regional variations in the supply of places. On the other hand affordable part-time employment seems to play a crucial role for mothers of young children in the UK, whose availability might vary across regions. These factors lead us to the second research question addressed in this dissertation which consists in examining, on top of the compositions effects reviewed above, whether in the two countries the regional availability of jobs plays a role in accounting for the differences in involvement. In Germany, the role of regional childcare provision will be also considered.

This approach, as the previous one, has limitations. Comparative analyses of social policies and employers’ strategies of the kind reviewed above, although useful, consider only a narrow range of areas in which gendered economic behaviour is analysed. Most of them rely on the implicit assumption that women adjust their behaviour mostly or only as a result of economic factors and in
this view, income (direct or indirect) is the main driver of participation, which matches my second research question. Alternative approaches have considered broader frameworks through which involvement in paid work and more generally gender roles are (re)produced, without necessarily being seen as driven by utility maximisation. These will be reviewed in the next section, together with attempts to consider the spatial implication of such systems of gendered behaviour.

3.3 Orders, cultures and moral rationalities

In this section I review a third category of research relevant to the involvement in paid work of mothers of young children, which deals with the role of collective norms and representations, also known as gender cultures and regimes or orders, as well as its relevance for a regional analysis of involvement. This strand of the literature considers the relationship between involvement and both kinds of factors considered so far – individual strategies and orientations to work on the one hand, institutions and policies on the other – as part of higher level structures which reproduces gender roles within societies.

In order to document this question it is necessary first to review the most significant critics of the institutional analyses presented in the previous section, namely Walby, Connell and Pfau-Effinger, who each have stressed the necessity to examine gender relationships in a broader light than simply utility maximisation. I will move then to authors who have directly considered the spatial differentiation of gender roles and orientations to work with Duncan’s concept of gendered moral rationalities, and in particular how they have analysed interactions between patterns of regional development, household subsistence strategies and women’s participation in paid work outside the domestic sphere.

3.3.1 Patriarchy, gender arrangements and orders

It has been pointed out that institutions and policies such as the policies that support working mothers just described reflect the dominant conceptions about gender roles in a country (McRae 2002). For instance, in Britain, the view that a woman’s normal duties should include the care of young children, and additionally that the latter should be a private matter left to parents has long been implicitly prevalent among policy-makers, and similarly, in the same way as in Germany, the moral duty of mothers to look after their children full time during their first years in relation an idealised notion of the ‘good mother’
Explaining mothers’ involvement across space and time (Pfau-Effinger 1998). This makes it necessary to complement analyses of economic behaviour with an analysis of their broader context rather than just institutions and government policies. The theoretical frameworks proposed by Connell, Walby and Pfau-Effinger or those they inspired still reflect a preoccupation with the state seen both as a resource or a constraint, a view that is shared by several feminist authors, but at the same time they considerably widen the scope of the analysis of women’s behaviour.

From the point of view of Sylvia Walby’s theory of patriarchy, gender imbalances and the policies and institutions that reinforce them are the result of the constant domination of women by men, which she analyses within a Marxist framework. In her view, patriarchy should be seen as

\[(\ldots)\text{a system of interrelated social structures through which men exploit women (Walby 1989: 51).}\]

These structures are made of several elements such as the patriarchal division of labour within households, itself articulated within the capitalist mode of production; patriarchal relations within waged labour; the patriarchal state; male violence and patriarchal relations in sexuality; and patriarchal culture. In her view, patriarchal systems are diverse and evolve, thus Western societies have moved away from private patriarchies, where women were excluded from most public positions to a system where they have gained access in a subordinated way to the public sphere (Walby 1986: 228).

Walby was criticised for her structuralist approach by authors such as Hakim (2007), who consider that such approaches describe structures instead of actual women who live inside them. Another, more specific criticism was that she focused too much on institutionalised forms of patriarchy, instead of also examining the more diffused role that social structures play in framing individual behaviour (Connell 2002). In that respect indeed her work could be seen as a bridge between the above institutionalist research on welfare regimes and the more encompassing attempts at theorising gendered economic behaviour described below.

At about the same time, Connell proposed the more flexible concept of ‘gender regime’. In her view, gender structures represent a particular type of social structure that relies on the sexed body to buttress their legitimation: socially constructed differences between men and women are seen as reflecting a ‘natural’ order already visible in their bodies (Connell 2002: 9). These structures operate within gender regimes which represent any particular social
arrangements regarding gender (Ibidem), and may apply to nation states, institutions or smaller scale organisations. Such regimes are (re)produced through everyday practices and behaviours. This circular process mainly occurs in four areas of social life: power relations (both discursive and institutionalised), production relations (i.e. the gendered division of labour), emotional relations including sexual relations, and symbolic relations, that is, gendered meaning as it percolates through most of social life. Connell’s work seems to build upon a Foucauldian tradition of diffused, power structures and the post-structuralist conception of the centrality of language. Gender structures are continuously re-enacted, performed, and hence, do not exist outside the individual performer. In addition, gender orders are never perfect and may sometimes even be self-contradictory; resistance is possible through ambiguity and play with the identities prescribed by gender structures.

A third criticism of traditional institutionalist approaches to gender and paid work considers women’s involvement from the point of view of gender culture, building upon Connell’s contribution. Birgit Pfau-Enger (2004) proposed the notion of gender arrangement to describe the conflictual relationship between culture on the one hand and the institutions that reflect the dominant gender order on the other as mediated by individual and social actors (Pfau-Enger 2004; 2005). In other words, the (re)production of national gender orders reflects a permanently evolving balance of power between existing institutions (the gender order) and the conflicting representations about them of individual women and the groups that represent their voice. However, she considers that there is one dominant gender arrangement within a society (i.e. country), and that its main empirical manifestations lie ultimately within national institutions, even if she briefly acknowledges the likely existence of regional differences. Similarly, even if she stresses that gender cultures are dynamic, she tends to put more emphasis in the coherence rather than their dynamics and internal conflict. Finally, she considers involvement in employment mostly as a labour supply issue: in her view, employers adapt to the characteristics of the labour force in order to retain staff (Pfau-Enger 2004).

These approaches, in particular the latter two, have the merit of opening up the field of explanations: they view women’s behaviour in relation to individual preferences or their adaptations to policies and economic constraints as part of broader systems of collective representations and action that simultaneously affect several aspects of the life of women (and men). Most importantly they don’t view cultures or orders as static or homogeneous: the identification
of a dominant pattern does not preclude the existence of ‘deviant’ ones that conflict with mainstream representations. At the same time they still largely overlook the spatial implications of the existence of gender orders for the involvement in paid work, since no attempt is made to consider possible relationships between variation in gender orders, patriarchies or gender arrangements from a geographical perspective. These also focus on understanding the systems as a whole and its logic, rather than the individual behaviour of women and mothers, and rely on limited systematic empirical evidence. In that respect they are useful for understanding the logic of national systems at work in Germany and the UK, but cannot be operationalised as such for a regional analysis in this dissertation.

3.3.2 Orientations to work, and regional history

Beside the role played by the uneven regional distribution of institutional constraints and job opportunities, geographical differences in the relationship between orientations towards paid work of mothers and their actual involvement mediated by gender arrangements have been considered by a smaller number of authors. In the UK, Simon Duncan comes out as an example of such an approach where the relationship between gender, space and culture was analysed, whereas in Germany Rosalynd Sackmann carried out similar research, but received less echo, with more attention paid in the literature to the East-West divide instead. This could also be said of the work of Doreen Massey – even if gender was a secondary aspect of her work whereas for the former two authors, the empirical work was part of broader ambition of producing a theory of spatial differences in gendered economic behaviour.

Gendered moral rationalities and regional histories

One of the merits of Duncan’s (2007) approach is to focus on individual mothers rather than regions or geographies as a whole, articulating local constraints and opportunities, class and subjectivities. He proposed the concept of gendered moral rationalities to show how patriarchal orders combine together at the level of individual mothers (in particular single mothers) to influence their local horizons. Gendered moral rationalities (GMR) are:

(...) gendered because they dealt with notions of mothering, they were moral in providing answers about the right thing to do, and
they were rationalities in providing a framework for taking decisions. (Duncan 2005)

GMR bears affinities with Pfau-Effinger’s notion of gender culture reviewed above in that it provides a class-oriented resource for actions (Pfau-Effinger 1998; Duncan & Smith 2002). In Duncan's perspective, breadwinner models and the way they influence GMR are geographical constructs: conceptions of good or bad motherhood and ‘the right thing to do’ by women in terms of the balance between unpaid and paid work, maintained through social networks vary from place to place. Such gender orders and GMR can be mapped on both class and spatial lines using aggregate statistics for instance of participation in paid work or marital relationships.

However, gendered moral rationalities are defined at the local level, and not much is said about the distributions of these local trends within regions. The second type of difficulty is that not much is said either about the origins of GMR in a given place: what made them appear in a specific location in the first place, apart from class-based residential segregation? The third one is also empirical and has already been mentioned in the previous chapter: whereas Duncan’s work has the merit of relying on mixed methods, the quantitative side is exclusively made up of aggregate indices in a limited number of regions, which raises the issue of the ecological fallacy, in particular when complex combinations of causal factors such as for example between class and places example are used in the analysis.

Sackmann (1994, 1997) developed an analysis that could fill some of the gaps in Duncan’s work, albeit only for Germany. She studied the relationship between regional female employment rates at the level of Bundesländer and historical trends in participation, dating from the industrial revolution. She found that Southern and Northern Germany are characterised respectively by low levels of segregation and high levels female employment rates. She related this to differentiated path of economic development experienced by each region, which led to markedly different regional profile of women’s involvement. Industries such as home-based cigar-making or factory based jute production could lead to high levels of involvement at the same time as significant levels of autonomy for women in the production process, such as was the case in North Eastern Germany, Bielefeld as opposed to other areas such as in the Ruhr valley or North-Western Germany either dominated by male industries or the permanence of an agrarian economy.
One of the weaknesses of her approach however is that she does not provide an explanation for the persistence of these observed differences, only referring to cultural differences, which assumes that once women have stepped up their participation this trend is irreversible, and that involvement is not affected anymore by the economic factors that determined their emergence in the first place. Furthermore, her analysis tends to reproduce at the regional level the same kind of view as those developed at the country level in the previous section by Pfau-Effinger: that is to put considerable stress on the internal coherence of regional social systems exposing themselves to the risk of essentialism, a trap into which Duncan does not fall.

Such a relationship had already been mentioned by historians in the UK, but of course systematic evidence is unavailable:

Why did so many Lancashire women go out to work? By the turn of the century economic factors had become further reinforced by three generations of social conventions. It became almost unthinkable for women not to work’ (Burman 1979; Liddington 1979).

The same idea had been mentioned – but not systematically developed – 10 years earlier by geographers in Britain and more recently, although on a limited scale, in Belgium. These also tried to relate trends in involvement among women to long term regional patterns of industrial development (McDowell & Massey 1984; Stuyck et al. 2008). They highlighted that areas that had been characterised by the dominance of heavy industries, predominantly employing men were also those where female participation continued to be low even after the decline of these industries, and regional economic redevelopment. At the opposite end, areas which relied on cheap female labour in factories, predominantly in the textile industries were found more likely to have high participation levels. One of the difficulties is whether these long-term regional economic trends can be related to a greater prevalence of particular local gender moral rationalities or culture.

These approaches have in common the fact they highlight a limited number of ‘typical’ places with characteristic patterns of participation throughout the UK (Massey 1995; Jarvis 1997; Duncan & Smith 2002):

- The South East of England and the former metal manufacturing and shipbuilding areas of the North East and Wales are those where married/cohabitating mothers with dependent children tended to retreat the most from paid employment, and be part of households in which
Explaining mothers’ involvement across space and time

women either work part-time or are economically inactive. The rise of part-time work in the North East was associated with a change in the industrial composition of the region prior to which job opportunities for women were scarce (Dunford & Perrons 1986; Massey 1995). Focusing on a single region, Charles found that women in Wales were less likely to find managerial positions as a result of a combination of economic and cultural factors: fewer jobs, and a strong male breadwinner culture, related to the industrial past of the country, with a strong reported influence of family networks (Charles & Davies 2000). This also applies to Nordrhein-Westfalen and Saarland in Germany.

- The East Anglia and the Yorkshire, where involvement instead relies on comparatively high levels of economic activity, combined with high levels of part-time work among women. In the former case, the rise of female work was taking place against a tradition of seasonal female work in agriculture (McDowell & Massey 1984);

- This contrast with the North West, in particular North Lancashire, and the East Midlands also characterised by comparatively high levels of economic activity and full-time employment. At the turn of the 20th century, 80% of the textile industry in the UK was located in Lancashire, with a few subregional variations: most of the domestic production of hosiery in the Leeds area had moved to factory production relying on cheap female labour to operate the new machines (Hall 1973: 714). Still before the Second World War in some of these towns 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). High levels of female employment in the Potteries (East Midlands) were also reported. More complex patterns may emerge in agrarian areas where a tradition of both casual but persistent employment has been reported, and similarly, large urban areas such as London are probably difficult to analyse in that way given the economic diversity that has characterised them: service and financial sectors but also textile industries and poorly paid home work. Comparable trends were reported for the female workforce employed in the textile industries in the Bielefeld area (Sackmann 1997).
Summary and research question

This limited but consistent evidence of a relationship between orientations to work, involvement and industrial history is not unproblematic, and it leaves many questions open, and although it cannot be directly analysed, a quantitative framework could be used as a guideline to try and account for regional differences that remain unexplained by either the regional opportunity structures or individual characteristics of women.

In relation to the former discussion, the third research question focuses on the relationship between involvement and the orientations to work already discussed in Section 3.1. More specifically it considers the extent to which instead of being purely individual, as Hakim viewed them, orientations to work do not have a collective dimension that may reflect regional differences in gendered roles, whether or not we read them as part of broader gender regimes, and as a result are related to differences in involvement on the one hand. In turn, it considers whether there could be evidence of a relationship between these and enduring gendered traditions of involvement as reviewed in the previous section. This third question is obviously of a more speculative nature.

3.4 Summary

In this chapter I have reviewed three main strands of theoretical frameworks relevant to the understanding of maternal involvement in paid work: the first one was based on individual preferences, orientations to work and utility maximization; the second one focused on government policies, in particular parental leave and childcare, together with the availability of jobs and the last one considered instead broad societal gender arrangements and their impact on gender roles. In each case I have drawn their implications for regional analyses and the hypotheses for the analysis of regional differences have been sketched.

Having put these results together with the conclusions from the previous chapter, we now have gained a more complete picture of the gaps in knowledge about maternal involvement in paid work and their regional variation. At the empirical level, a regional account of such individual differences in transitions is necessary to complement the current evidence that is almost exclusively based on aggregate statistics. Such an account needs as much as possible to focus on transitions, given the absence of data combining geographical and longitudinal aspects of involvement, but also because the transitions carried
out during the time children are under school age are best suited to provide an accurate representation of regional differences in participation rather than just cross-sectional trends. At the same time, to get a better insight into the dynamics behind these differences, the contributions of individual factors and regional constraints and opportunities need to be taken into account. It is only then that a broader insight about the relationship between orientations to work and involvement and economic development could possibly be gained.

Before moving to the result of this analysis for the UK and Germany, the mains aspects of the methods and the data used in this research are described in the next chapter.
Chapter 4

Methodology and Methods

The aim of this chapter is to present the overall research design and the operationalisation of the three questions addressed in this research, namely the extent to which differences in involvement in paid work of mothers of young children could be related to regional imbalances in the education and family formation patterns of mothers, the availability of suitable jobs or a greater likelihood of male unemployment and to regional differences in the orientations to work of women, which could be related to long-term economic history of some regions. It also includes a description of the data, the populations of reference (of mothers and regions) and finally the modelling techniques. The results of the empirical work are presented in the next three chapters. The chapter also includes a discussion of the advantages and disadvantages of the methodological choices made, and a critical discussion of the research design, including the rationale for using quantitative methods.

In section 4.2, I present the overall research design, as well as a definition of the core concept of involvement in paid work, in both its cross-sectional and longitudinal dimensions. I then define more precisely the populations of interest, mothers with children under school age, as well as the actual meaning of ‘region’ in the context of this research. In section 4.3, I introduce the two main data sources used in the empirical analysis, the Longitudinal Labour Force Survey for the UK and the Mikrozensus-Panel for Germany and their related sampling and methodological issues. This is followed by a description of the variables used in the analysis as well as the additional datasets. In Section 4.4 I present in detail the modelling framework used in the research: i.e. a multilevel latent curve and growth mixture model of individual employment trajectories (periods of 15 months in the UK and 3 years in Germany) and also discuss how the three above questions translate in the context of this particular
model. Finally, in the last section I provide a critical discussion of the research: in particular its goal, methods as well as a narrative of the research design as it took place.

4.1 Defining mothers, involvement, and regions

In this section, I define the main concepts used in the research, beginning with the notion of involvement, followed by a discussion of the population of interest – mothers of young children – and finally the notion of ‘region’.

Involvement

As already introduced in Chapter 2, the single concept of involvement is used in this research to combine the traditional notions of working-time ‘transitions’ and ‘participation’ in employment used in analyses which tend to focus exclusively one of these aspects and its change over time. The advantage of the approach followed here is that it examines engagement in paid as a whole rather than focussing on a particular state of participation, and restricting the analysis to transitions from/to that state. Involvement literally refers to the amount of paid work somebody carries out as measured by the number of hours worked per week, both in the first and second job, at any given point in time as well as over time.

The first dimension, involvement intensity, refers to whether or not a mother is active in the formal economy (economic activity) and if she is, the amount of time she formally dedicates to paid work (employment and self-employment). Such a definition is of course likely to underestimate the number of hours dedicated to work – as opposed to those spent doing work – by not taking into account commuting time, nor informal overtime carried out at home, usually not recorded as ‘work’ in surveys. For the purpose of this research, this amount of time usually spent doing paid work has been simplified into 4 categories: No time spent doing paid work at all, small part-time hours (up to 15 hours per week), longer part-time (between 16 and 30), and standard full-time work (31 hours and more). Using these relatively broad categories implies that finer hour changes cannot be captured. However, some of it is likely to be related to the occupational level of respondents (i.e. short versus long full-time hours, the latter more likely to occur higher up the occupational pyramid), controlled for in the model presented below, at least for the UK. The same is also true of changes of jobs that do not involve a change
in working-time. Finally, it is important to note that the category of ‘not involved in paid work’ is heterogeneous and includes the unemployed, full-time carers and other economically inactive according to the ILO (long-term sick or students). It also includes mothers on maternity or parental leave but not those on temporary sick leave or holidays.

The second dimension, involvement variability, was defined as the changes in the above quantities over time. It can be examined either from the point of view of the number of changes – i.e. the stability of involvement – or of the differences between two times points, denoting upwards, downwards, or stable transitions, as well as from that of the transition path followed over a given period of time. It could also be argued (and this will be explored in future research) that ‘non-work’ involving some ‘activity’ that might lead at some point to paid work should be considered as an intermediate stage between ‘no’ and ‘a little’ involvement (such as, for example in the case of full-time caring mothers undertaking a degree before returning to paid work). Another crucial aspect that affects variability is the timeframe during which it is considered: the longer the period of observation stability of involvement is likely to decrease with time simply as result of the fact that experiencing any career change increases with time. In a similar fashion, the longer the time of observation during which mothers are followed from the birth of a child onwards, the more likely we are to observe an increase in participation, since most mothers caring full time for their children will eventually resume employment under one form or another. This issue is related to the next definition, that of mothers of young children. It could be argued that such a definition is imprecise, and it may be so. On the other hand, research has showed that the above categories are permeable (for example, that of student and unemployed), or that of long-term sick and economic inactivity (Webster 2005).

This conceptualisation raises two issues. The first one comes from the fact that respondents on maternity or parental leave are considered workless in the same way as those who were economically inactive, according to the above definition since their working-time is equal to 0. While it is true that they are not carrying out any paid work because of their caring for children and in that way have a lower participation profile, at the same time they retain an employment contract and the transitions they will be experiencing subsequently are likely to be different from those of mothers who had left their job for good. This is clearly the case with maternity leave: research reviewed in Chapter 3 showed that it increases attachment to the labour market and
help women remain in employment. However, it is also the case that not all women return to their previous job after a maternity leave and there is no reason why they should not be taken into account in this research.

The situation is different as far as parental leave is concerned. Whilst take-up in the UK is marginal, we saw in the previous chapter that in Germany women are entitled to continuous full-time or part-time paid parental leave (Elternurlaub) from the end of their maternity leave up until their child is aged three with a right to be reinstated in their initial job, and that many of them use this entitlement. However, research also mentioned in the previous Chapter (Spiess & Wrohlich 2008) has showed that the longer the parental leave the more likely it is to have a scarring effect on future involvement, which again may be differently distributed regionally, thus bearing similarities with the effect of periods of time full-time caring for children. To summarise this issue, whilst the measure of involvement used here will by definition lead to underestimating the proportion of women employed, and conversely inflate the number of upwards transitions, the fact that it is regional variations that are the focus here makes this bias an acceptable price to pay. This is especially true if the pattern of transitions out of maternity leave and/or parental leave differs between regions.

The second issue results from the fact that intensity of involvement is measured by a four category ordinal indicator instead of a continuous measure of weekly hours worked. As a result, the heterogeneity of working-time is likely to have been underestimated, and with it a few transitions relevant to this research. For instance, a woman moving from a position with long hours involving more than 40 hours per week to 32 hours would be clearly making a downward transition in terms of involvement, which might affect her future career. However, I nevertheless decided to focus on the working time status of respondents only (with the exception of the category of 'marginal part-time work', which remains analytical), in order not to add too much heterogeneity to the sample used in this research, already characterised by a large variety of transitions given the age range of children retained.

Mothers of young children

As already stated, the focus of this study is on the working-age mothers of young children and their transitions. This group of women is likely to experience the maximum level of pressure between employment-related imperatives and those resulting from caring from children, and lies at the core of the
(re)production of gender imbalances in society. Among the economic factors influencing the intensity of this pressure are the attention required by young children themselves and the lack of affordable alternative to maternal care in the two countries of interest, resulting from the limited public funding in the UK, and limited number of places in Western Germany. The age at which children traditionally enter full-time education is usually considered the cut-off point for the understanding of mothers’ transitions back to employment. This is reflected for instance in the fact that since the Barcelona Summit, the European Commission also considers that children under three on the one hand, and children aged from three to the compulsory education age form two distinct policy and statistical categories (European Commission 2002), the childcare targets allocated to the former being more lenient than to the latter, which implicitly acknowledges – and legitimates – that during these first three years full-time care is likely to be the exception rather than the rule.

We also saw in Chapter 2 that such a cut-off point was likely to be arbitrary, at least in the context of the UK. Most children enter full-time education at the beginning of the academic year that follows their fourth (or sixth in Germany) birthday, thus making it difficult to treat that year as different from the previous ones from the mothers’ viewpoint. It also remains to be seen whether women re-enter the labour market immediately after their children enter school or if a ‘buffer period’ of variable duration exists, for instance corresponding to job search or training not recorded as unemployment. As a result, the time when children reach the age of three seems likely to constitute, at best, the lower boundary of a more blurred period during which such a transition becomes increasingly likely rather than an actual cut-off point (Paull 2006; Brewer & Paull 2006). Given the fact that in Germany full-time education for children between 4 and 6 is not compulsory and that parental leave may delay the return to work up until the age of three, adopting a broader time span is preferable in order for the case studies to refer to the same realities. For all of these reasons, mothers of children under 6 and aged between 16 and 59 were selected as the population of interest.

It should be noted that although obviously ‘rooted’ in mothers, what we are actually looking at is a sample of transitions carried out by mothers over a certain period of time. More precisely, we are considering all transitions carried out by women of children aged 6. Four main types of change can be earmarked: decreases in involvement or interruptions of work altogether, which may or may not involve interruptions of employment, i.e. take place within the framework
of parental or maternity leave provisions. The latter may be temporary or definitive – this is contingent to the period of observation. Moves back to or increases in involvement in paid work are a symmetric type of transition, which similarly may or may not be temporary. A further type of transition cannot be characterized by a pattern as such, but instead by its absence: typically, casual work interrupted by periods of ‘worklessness’ – irrespective of the employment status of the respondent. Finally, transitions may also be characterized by the persistence of a state, also labelled *maintenance transitions* (Schmid & Gazier 2002), such as working at a given level of working-time or instead, the absence of paid work, which for most mothers involves caring full-time for their children and often their partner as well.

We should be aware of an inevitable degree of heterogeneity within the data, given that we are looking at transitions with various starting points in term of the age of these mothers’ youngest child: from mothers of five year olds to mothers of newborn babies. As a result, the changes undertaken by respondents are likely to vary accordingly: it is more likely to observe periods of full-time care among mothers of younger children, and by contrast, increases in their involvement among mothers of older ones. This is partially accounted for in the multivariate analysis, in effect narrowing these differences to those between mothers of children aged 0 to 2 on the one hand, and 3 to 5 on the other.

**Regions**

We saw in Chapter 2 and 3 that the concept of region is arbitrary and ubiquitous, situated between that of ‘country’ and ‘local’. Within the two countries of interest, regions were operationalised at the smallest level that was available, that is a modified version of the *Nomenclature of Territorial Units for Statistics* (NUTS) 1 digit areas: Countries of the UK, Government Office Regions in England, to which the large metropolitan areas of Birmingham (West Midlands) Leeds-Bradford (West Yorkshire), Greater Manchester, Liverpool (Merseyside), Glasgow and Clydeside (Strathclyde) in Scotland, as well as Tyne and Wear (Newcastle) would be added. In Germany, NUTS 1 areas are Bundesländer. However, thanks to the fact that the German data allow to identify respondents living in areas with more than 500,000 inhabitants, respondents living in München in Bayern, in Frankfurt in Hessen, and Stuttgart in Baden-Württemberg could be identified. This was not the case however of Bundesländer where more than one such city was present (i.e. Dortmund and
As a result of the size differences between regions, significant internal heterogeneity can be expected, that will doubtless limit the accuracy of the comparisons within each country and the conclusion that may be drawn from it. On the other hand some other regions, in particular large urban areas such as Manchester, London or Berlin or the smaller Länder within East-Germany are expected to show more internal homogeneity – at least in terms of the economic factors, probably less so in terms of the individual characteristics of mothers.

The presumed economic and social heterogeneity, resulting from the uneven repartition of industries and town and cities within these areas is reinforced by the fact that they do not enjoy the same status within both countries. In the UK, regions refer mainly to Government Office Regions (GOR), which are entities that do not enjoy any real political autonomy. To these English areas, other countries of the UK were added. The latter enjoy a clearly different status and have their own directly elected bodies together with their associated degree of political autonomy, that makes them better comparable in some respect to German Bundesländer. The latter by contrast are federal states rather than regions, political entities enjoying marked autonomy and significant formal and lobbying power within the framework of the Federal Republic. It should be kept in mind however, that both the history and the political significance of these states varies widely: given their size, but also the fact that the boundaries of some of them were redrawn at the end of the Second World War, and as recently as 1991 in the case of the former Democratic Republic.

4.2 Research design and hypotheses

In this section, I first review a few epistemological considerations relevant to this research, before presenting in further detail the strategy adopted to investigate the three research questions, including a first overview of the quantitative methods used.

As already mentioned, the overall goal of this research is to understand the dynamics of the regional differences in the way women increase or decrease their involvement in paid work during the interval between the birth of a child and the time she reaches the age of 6. As became obvious in the previous chapters, these transitions are the outcome of a highly complex set of factors, involving several layers of causality and geographies.
To name a few, after—sometimes, even before—the birth of a child, women adjust the time they spend doing paid work in relation to their preferences, which are framed against a background made up of national policies facilitating/hampering their participation in conjunction with the availability of suitable jobs. They are also influenced by the relationship between partners within the household, themselves embedded in local social and family networks, involving several generations of women, carrying normative representations about involvement in paid work. Given such a level of complexity, one has to remain modest regarding the knowledge that can be gained from using extensive (i.e. quantitative) research methods. Many important aspects involved in the behaviour of respondents such as feelings and emotions, conflicts, tensions, interactions with other people, or at another level class and gender structures cannot be observed directly and have either to be left aside or their existence has to be read from the data rather than observed directly.

My approach relies on the assumption that the behaviour of women I am interested in can be—to some extent—considered as an external object of inquiry, in the tradition of scientific realism instead of being seen as a mere social construct reflecting administrative categories and power relations. Most of the causal factors I set out to examine in the previous chapters cannot be observed directly, instead evidence of their action can be found from regularities in the behaviour of women (Sayer 1992). The existence of such regularities is the core reason why quantitative methods are relevant to this research: they can provide a powerful tool to identify and analyse these regularities, which should then pave the way for further, qualitative research, the latter better suited to identify the deeper causes at work behind the regularities observed. Limitations of time within this doctoral research made it impossible to also include qualitative research in the design of this research. At a later stage of the research, in particular when I discuss the third research question in Chapter 6 and 7, I used a secondary literature review to relate some of the results to the potential effect of real— but non observable factors.

**Empirical research strategy**

In order to explore the three questions described above, quantitative analysis of secondary data and more specifically, multivariate modelling was selected as the main method of empirical investigation (see Section 4.5 for a critical review), with the core notion of involvement in paid work defined as the target variable, in its two dimensions of intensity (the number of hours spent do-
ing paid work), and variability (changes in the former or the absence thereof over time). The nature of this research – analysing changes over time – required the use of large scale longitudinal datasets (more detail about these is provided in Section 4.4) and modelling techniques. In addition, the multiple facets of involvement, consisting in increases or decreases in participation and their respective duration, required a technique that would allow taking these aspects to be accommodated simultaneously, rather than relying on the often used event duration (or survival) analysis methods where only one aspect, either the end of a spell of employment, or its duration are analysed. What was required here was a method that would give a better summary of trajectories, thus their starting and end point but also the overall level at which they occur. For these reasons, recent developments in growth modelling (latent growth curve and growth mixture modelling) were selected as the modelling techniques. Such a modelling framework allows us to summarise the involvement of mothers as growth lines whose characteristics can be compared between regions. 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.

However, as already mentioned in Chapter 3, it was also felt that in order to rigorously analyse the findings about regional trends and involvement in the UK in the light of national research about women’s participation in paid work, at least one additional country needed to be taken into account. For this reason, in addition to the UK, German data was also analysed (using Bundesländer as the regional unit of observation). Due to the unavailability of harmonised dataset fulfilling all the requirements of this research, two separate datasets were selected, that were significantly different from each other. As a result, this research cannot claim to be really comparative, given that the realities observed, in particular the duration of the transitions among mothers, differed significantly between the two countries. To some extent however, this was a blessing in disguise, given that this made each country’s specific dynamics more apparent, instead of providing a false sense of security with harmonised data, which sometimes hides serious significant methodological flaws. As a result, I will refer to the analysis of the two countries as case studies rather than a comparative study.
Questions and hypotheses

The empirical part of the research consisted of four stages and three questions. In the first stage, I identified and described regularities in the way involvement in paid work of mothers varied across regions in Germany and the UK, the latter defined as amended NUTS-1 areas. This was achieved with the help of descriptive statistics, and by fitting a multilevel latent curve model to the two datasets, without covariates, which is explained in detail in Section 4.4. Doing this allowed me to identify regional-level variance of the intensity and variability of involvement and to test its statistical significance. This initial model was then to be used as the baseline to which the subsequent ones were compared in order to measure changes in regional variations that needed to be accounted for.

The second stage consisted in testing the ‘composition hypothesis’, that is the extent to which this regional variance in involvement intensity and variability was related to systematic differences in the work-related resources or family formation patterns of mothers (see Section 4.3 for more information about how these were operationalised). This was achieved by fitting a multivariate version of the latent growth curve model in the two countries, in which these variables were tested, and changes in the regional variance of involvement intensity and variability subsequently examined. Specifically, it was expected that in both countries:

- involvement intensity would rise with the level of education as well as for mothers who were currently – or had been in the past – working in a professional or managerial occupation;

- these mothers would experience both more stable trajectories at a high level of involvement, but at the same time, also sharper slopes, denoting a greater likelihood of working full-time;

Two related expectations were also tested at the regional level:

- that controlling for composition effect would reduce the overall regional variance;

- but also that it would reduce the differences between large urban areas and the other regions;

The third stage consisted in testing the ‘labour demand’ hypothesis, in other words the existence of a systematic relationship between involvement
intensity and variability on the one hand and opportunities and constraints for mothers on the regional labour markets on the other, that is the existence of jobs compatible with caring duties. This was achieved by fitting a model in which aggregate independent variables were introduced, measuring the regional unemployment rates, degree of horizontal gender segregation. Although not part of this research main focus, male unemployment was also tested in order to detect its potential relationship with the two former factors. In the case of Germany, for operational and substantive reasons it was decided not test directly for these variables in the model, and instead to compare the results of the model with composition effects controlled for with the same variables. In addition given the results of the literature review in Chapter 3, the proportion of children attending full-time day care was also examined, focusing both on children under three and those aged three to five. Obviously in the German case this doesn’t amount to formal hypothesis testing anymore. As above the existence of this relationship was tested by examining the significance of the regression coefficients, the subsequent change in residual regional variance of either variability or intensity of involvement.

Specifically, it was expected that:

- Involvement intensity and positive variability would increase with horizontal segregation, although in a moderate way (since segregated jobs, in particular in the UK, tend to be part-time jobs);

- Involvement intensity would decrease with female unemployment whereas variability would not necessarily be affected since unemployment is likely be an obstacle to finding jobs, as opposed to losing it;

Similarly as above, it was expect that the overall regional residual would decrease significantly, and maybe be cancelled when introducing these three variables. It should be noted however that for operational reasons, these factors were introduced listwise, in order not to cause convergence issues. Studying their combined effect is part of the plans for future research.

Finally, during the fourth stage of the analysis, which could also be labelled as a ‘retroductive’ one (Sayer 1992; Danermark 2002), I examined the relevance of the third research question, that is whether regional variations in the involvement of intensity and variability of mothers could be related to regional differences in the orientations to work of women and possibly as well to long-term trends in female participation in paid work, which could be due to regional industrial histories. Whereas the evidence about attitudes came
from additional quantitative data sources, the latter was provided by secondary literature review of qualitative, especially historical data. For this reason, this third question did not lend itself to formal statistical testing and is of a more interpretative nature. The specific hypotheses that were examined are as follows:

- Regions characterised by more positive attitudes towards women's involvement would also tend to have higher levels of involvement intensity and positive variability;

- Regions with a significant past in heavy industries (coal mining, metal-working, engineering) would tend to be characterised by both more negative attitudes and lower levels of involvement, whereas the opposite could be expected from regions with durable female participation in factories such as was the case in the textile industries; There could also be a parallel between region with a long term presence of agriculture and marginal employment.

Now that I have sketched the main stages of the research design and hypotheses, I will introduce the data and discuss data quality issues.

4.3 Data and variables

In this section I describe the main datasets used in the research: the Longitudinal Labour Force Survey (LLFS) and the Mikrozensus Panel (MZP). I also provide information about the auxiliary datasets used: the British Household Panel Survey and the European Social Survey. The MZP and the LLFS were chosen because of their large sample size, indispensable for subnational analyses while at the same time providing – even if in a limited fashion – panel data. In addition, both surveys are the national source for the European Labour Force Survey, thus insuring a minimal level of comparability between the variable and indicators they provide. However, as a number of aspects are not comparable, such as the period of time during which respondents are followed (15 months in the case of the UK, 36 months in the case of Germany), is the reason why this research consists of two case studies rather than an integrated comparative analysis.
4.3.1 Sample designs

**Longitudinal LFS** The Longitudinal Labour Force Survey is a single stage random sample survey of working-age residents in private households in the UK, geographically stratified by postcode. In England, Wales, and Scotland, sampling is carried out by selecting addresses from the Small Users Postcode Address File (PAF) (i.e. receiving less than 50 items of mail a day) using random starts and fixed intervals. The PAF is said to include about 97% of private households in the UK (Office for National Statistics 2007b). The LFS is conducted on a continuous basis. Interviews are evenly spread over a quarter in 13 weekly ‘stints’ drawn from 162 groups of postcodes. Whereas at the first wave interviews are conducted face to face, telephone interviews are used in the subsequent ones. About 32% of interviews are conducted with proxy respondents. The proportion of proxy interview is largest among respondents aged 16-19, men, non-whites, or those working on government schemes. Datasets typically available are January (year 1) to March (year 2), April (year 1) to June (year 2), and so on (Office for National Statistics 2007b).

The panel component of the LFS results from the fact that each respondent is interviewed for five consecutive quarters (15 months) in such a way that at any quarter information about 5 overlapping longitudinal samples – 55,000 households – is simultaneously gathered. Sample size is thus reduced to about 11,000 respondents in each one of the five quarters longitudinal datasets. These are the two main weaknesses of the LLFS: not only is sample size limited, but also the time dimension is restricted. The former was alleviated by appending several datasets in order to obtain a satisfactory sample size, while remaining within a time frame roughly similar to the one offered by the German dataset (see below). The latter aspect implies that only short-term transitions can be observed, which limits the comparability of the results between the UK and Germany. On the other hand, given that respondents are mothers of children aged 0 to 5, it could be argued that a 15 months period is likely to be enough to represent the main transitions (or absence thereof) among respondents: mothers not returning to paid work at the end of their maternity leave, mothers remaining ‘workless’ for at least 15 months in a row or indeed stepping their involvement up or down. Given that the data is mostly meant to be used to produce multivariate analysis, some of these issues should be alleviated given that the age of the youngest child is controlled for in the models presented in the next chapters.

The specific data used was made of 18 collated datasets of the five quarters
LLFS ranging from June 2001 to August 2007. Total unweighted sample size is 70,642 women of working age. Altogether, working-age mothers of children aged between 0 and 5 represented 14,052 observations at each wave, which translates into 70,260 cases of labour market involvement at any wave.

**The Mikrozensus-Panel** The Mikrozensus-Panel (MZP) is a recent ‘panelised’ version of the cross-sectional Mikrozensus (MZ) conducted since 1957 in the former Federal Republic of Germany, and 1991 in the former German Democratic Republic (DDR). The MZ is a mandatory administrative 1% one stage stratified random sample survey of the population living in small administrative areas of Germany (the Auswahlbezirk). Sampling frames are population registers, which are also used at a later stage to compute grossing weights and correct for non-response and attrition (Statistisches Bundesamt 2009) with the potential issue of their accurateness.

Population is stratified according to Bundesland, regions\textsuperscript{24} Kreis (Kreise are subregional administrative entities), Gemeinde size, Gebäude (dwelling) size\textsuperscript{25}. Actual PSUs are Auswahlbezirk, ad-hoc units made of 100 contiguous dwellings conglomerated and randomly attributed numbers from 0 to 99. Every four years, a sample of all Auswahlbezirke bearing the same number is drawn. 4 contiguous dwellings are drawn from the Auswahlbezirke and randomly attributed a number from 1 to 4. All household in each one of these are interviewed once for the first time during a four year period, then followed on during the next three years.

Whereas administrative authorities enjoy full access to MZ data, researchers are only allowed to use a reduced version of the dataset, the so called ‘Scientific Use’ or ‘faktisch anonymisiert’ (De facto anonymised) file, so as to minimize disclosure hazard. The latter is a 70% random sample drawn from the 1% original sample, stratified according to Bundesland, Regierungsbezirk, Gemeinde size, household size. The unweighted sample size was 5,339 mothers of children under 6 at each wave in 2001, thus 26,695 episodes of involvement across all waves. This smaller sample size limits the statistical power of some of the descriptive analysis presented in Chapter 7. The latter is not so much a consequence of the overall sample size in itself, but rather the uneven size of the Bundesländer, three of Rheinland-Westfalen, Bayern and Baden-Württemberg gathering half of the population of the country.
4.3.2 Data quality and weighting

Being an administrative survey, the MZP is regulated by a federal law, the Mikrozensusgesetz 2005 which makes participation mandatory. However, this only applies to a part of the questionnaire, whereas answers to a significant number of questions are voluntary. The latter are being further divided into non-mandatory questions asked to the full sample, and those only asked to a 0.45% subsample of the original sample. Since the decision to answer these voluntary questions is likely to be correlated with characteristics of the respondents, such as age or education, there are serious issues about the validity of the analysis relying of these variables. The option that was pursued – using only the compulsory set of questions – narrowed the range of variables to mostly those involving formal participation in the labour market. For instance, retrospective questions about participation in employment and occupation were not available.

In addition to these limitations, further issues of concern need to be mentioned. Even if the law ruling the MZ was passed at the federal level, its implementation and in particular the management of data collection is carried out by the Bundesländer. Significant differences may exist in the way interviews are conducted – i.e. depending on whether they are done by civil servants or private subcontractors – and this may affect the response rate, in particular to the non-mandatory questions. The fact that interviews are carried out during the last week of April that is not a Bank Holiday may also create a potential systematic bias toward respondents who for some reason would not be available at that time of the year (Statistisches Bundesamt 2009).

Attrition levels are high in the Mikrozensus: about one third of respondents are missing after 3 years, a fact that is known to be related to the residential mobility of respondents. Given that the PSUs are areas – the Auswahlbezirke – rather than households or individuals, the MZ does not keep a record of people moving home, who therefore may count as different respondents at different waves (in case they move to a household which was part of the sample). In addition, the transitions of movers are not followed (Statistisches Bundesamt 2009). It has been found that the risk of bias involved is greater for respondents experiencing a change in their labour market participation – since for instance taking a new job or leaving the labour market might be linked to residential mobility. Several strategies involving either probability weighting or loglinear models have been proposed in order to reduce this source of bias and should be taken into account (Basic et al. 2005). Although weights have been
designed in order to compensate for it, this causes some of the employment-related transitions to be lost. This included moves to areas with more suitable job opportunities, or carried out to support their partner's own career requirements. It is difficult to assess whether this results in over or underestimating the involvement level of respondents.

The Longitudinal Labour Force Survey on the other hand is a (centrally managed) stratified sample survey, which prevents some of the above issues from arising. One of its shortcomings, however, is that it is artificially balanced: observations for which employment-related information was missing at any wave were removed from the sample, which also indicates that respondents who moved houses were not followed (Office for National Statistics 2007a). Although this is compensated by weighting, households with a higher likelihood of either item non-response or geographical mobility are underrepresented in the sample, and most importantly their transitions. Quality controls have provided evidence of inconsistencies in the reporting of wave to wave transitions, with answers involving stability more likely to be accurate. Information about part-timers, women, and transitions involving moves from/to unemployment were more likely to be inconsistent (Clarke & Tate 1999).

**Weighting** The longitudinal LFS uses a system of calibration weights designed to correct estimates of both the cross-sectional and longitudinal estimates. Some research suggested that weighting provided a more efficient way to correct biases than modelling the source of error (Elliot 1999). The weighting system relies on a multistage iterative process whereby initial grossing weights calculated after cross-sectional population estimates by category of household tenure at wave 1 are calibrated to successive estimates of age and sex, economic activity by age region at wave 2, then again at wave 1 so as to minimise the deviation between them. These steps are repeated at the following waves. It should be noted that although these weights adjust for cross-sectional estimates at each wave, they do not adjust for the type of transition between them (Elliot 1999).

Cross-sectional weighting of the MZ Panel is made up of a household and an individual level component. The former reflects household size, nationality of the household reference person, whether the household is the domicile of the household reference person. For one person households, sex and age groups are also taken into account and are based on regional population projections (Statistisches Bundesamt 2009). Longitudinal calibration weights were also
produced using an iterative procedure analogous to the one just described for the LFS, with the nuance that separate weights were computed to reflect differences between the first wave and each of the subsequent ones.

4.3.3 Individual level variables

In this subsection I describe the variables derived from the MZP and the LLFS microdata that were used in the latent curve model described below. They were needed to test the first hypotheses – whether compositional imbalances in the characteristics of mothers across regions play a role in explaining differences in involvement, and further down the line, acting as control variables for the analysis of the other two questions. They roughly belong to two main categories: on the one hand, indicators of work-related resources (which could also be considered a proxy for social class), that is educational achievement and occupation, together with age (which could also capture orientation to work to some extent), and on the other hand family formation patterns, that is the age and number of children and whether respondents cohabit with a partner in the household. What needs to be remembered is that the rationale for using these variables is to control for their potential role in regional variations rather than to compare their effects at the individual level between the two countries (i.e. their regression coefficients). We are mainly interested in the regional variations, not in quantifying the effect of the independent variables per se.

Work-related resources

I use the term resources here in a loose sense to designate a number of factors that affect women’s position in the field of employment: formal education, occupation and age. Whereas some might be tempted to equate the former two with a measure of the level of human capital and income as discussed in the previous chapter, I consider here that occupation and education have a broader meaning and represent a measure of the career orientation of the respondents, which lies at the intersection of class and gender. Whereas initial education determines the broad level within which respondents are most likely to find a job, occupation and age provide a more direct indication of their actual achievement: the occupation reached by women at the time they have their first child as well as their age provides a measure of the place occupied by the sphere of employment in their life. For instance, younger mothers who did not have the opportunity to develop a career are more likely to be on a
pathway to become secondary earners or even full-time carers than those who have their children later in life.

As already seen in the previous chapter, occupational class also indicates an income level, which is related to what women and households can afford in terms of childcare. Finally, education has an impact distinct to the income and career opportunities it opens, and may also stand for some aspect of the work orientations of women, since we saw in the previous chapter that highly qualified women are more likely to see paid work as a significant part of their identity than those from a higher educational background. Although these variables are likely to be correlated, it seems appropriate to include them nevertheless 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.

Education was operationalised differently in the two countries: whereas in the LLFS, it was measured by the age at which respondents left full-time education, in Germany a three category indicator was used instead. The three categories were: secondary or lower, post-secondary vocational training, and tertiary education (degree or vocational), based on the ISCED classification. These indicators raised the same issues in both countries: younger women who were still engaged in full-time education when they had their first child might eventually have a higher educational attainment than measured at the time of the survey. In addition, in the UK, the nuance is lost between respondents who left full-time education for good, and those who became part-time students at a later stage.

Using a variable for occupation in a model where involvement is the dependent variable understandably raises the issue of the former being perfectly correlated with the latter: only employed respondents are asked about their occupation. This could be circumscribed in the LLFS since information about the previous occupation up to eight years before the interview was available for jobless respondents, but not in the MZP where the equivalent information is only available until one year before the interview for a subsample of voluntary respondents. The group of respondents who never had a job or who had been jobless for more than 8 years, represented 1,600 women, 12% of the overall sample, and 29% of women jobless at wave 1. In order to minimise the impact this group might have on the model, I decided to recode an indicator of occupation based on the SOC (Standardised Occupations Classification) 2002 classification which was made of four categories: professional and managerial
(including associate professionals); administrative, personal services and sales (meant to capture low qualified service occupations); elementary occupations; jobless for more than 8 years. Only the first category was introduced in the model, leaving all remaining respondents as the reference category, in order to control for the occupational group known to vary across regions especially urban/rural areas: higher level occupations tend to be more present in urban areas.

More generally, it is likely that some degree of endogeneity is present in the model: participation is affected by the occupational class of respondents, which can be influenced by participation itself, or because, as mentioned above, variables not included in the model may affect both factors simultaneously. In addition, such independent variables are likely to be related with each other – for instance the years of education with the occupational level or the number of children, thus leading to issues of multicollinearity which compromises the reliability of model estimates. There are no easy answers to this problem. Within the limited space of this dissertation, and given that my interest lies more in the structure of the regional residuals of the model rather than the exact value of the main effect coefficients themselves, I considered these an acceptable trade-off for being able to control to some extent for occupational differences between mothers and their likely differentiated impact across regions. Nevertheless, the extent to which coefficients of variables already in the model were altered when additional variables were introduced was constantly monitored during the model selection process, and no significant change (loss of significance, change of coefficient sign) was observed.

Family formation patterns

Accounting for family type in addition to education and occupation is needed since the both types of factors are only partially associated, but also given the heterogeneity within the sample of mothers, especially in terms of the age of their youngest child, which also impacts on the probability to have further children. Three variables were used in the model to control for the role of family characteristics: the number of dependent children in the family unit, as well as the age of the youngest child and the partnership status of the respondent. They were straightforward to implement in both datasets, given that the definitions of families and young children are similar. The main issues consisted in finding the adequate intervals for the categorical variables derived, since these could not be used as variables.
In the case of the *age of the youngest child* in the family, a binary indicator was used with having a youngest child aged under three as the reference category. Descriptive analysis showed that in both countries the rate of transitions in and out of paid work did not markedly change on a year-to-year basis, with only a slightly higher proportion of women who returned to work after their child reached the age of three. Three years was nevertheless retained as a threshold given that this is the age at which parental leave entitlement ends in Germany, and entitlement to free part-time childcare begins in the UK, as already discussed in Section 4.1.

The *number of children* in the family was also recoded as a dummy variable for the same reasons as already explained. The cut-off point chosen was one child versus two or more children. On the one hand, the most dramatic differences in involvement was between mothers of three children or more and the rest of the respondents (as shown in the descriptive analysis in Chapter 5), rather than between the latter and those of two children only. On the other, the relatively small number of mothers of 3 and more children (less than one quarter of respondents in the UK), together with the fact that for many mothers it is the second child that marks the real beginning of the ‘mummy’ track given the childcare cost incurred tipped the scale in the latter direction.

*Partnership status* was the third variable used in this category. Its main purpose was to test whether respondents had a partner with whom they lived (which was the reference category) i.e. whether they were single mothers or not, since this is traditionally recognized as an impediment to participation, in particular in the UK as we saw in Chapter 2. Whether respondents were married was not considered an issue here, even if it is often acknowledged that this can sometimes be considered as a proxy for the likelihood of the presence of traditional gender arrangements within a family. This variable is measured at the level of the family: the fact additional people might live in the household (i.e. parents, or extended family) was not taken into account here.

I will now review the aggregate data used in the model.

### 4.3.4 Aggregate datasets and variables

In addition to the individual variables just described, aggregate-level variables allowing to test the second hypothesis that is the role played by the regional differences in the availability of jobs for mothers, as a proxy for the level of opportunities to participate in paid work were also used in the model. Given the asymmetric nature of unemployment in Germany, this approach was not
used in the latter case study.

*Job availability* was measured by the regional-level rate of unemployment among mothers (of dependent children of any age) and the proportion of employed mothers working in gender-segregated industries. The former was straightforward to measure and was computed using data from the cross-sectional version of both the Mikrozensus and the Labour Force Survey, pooled for 2001-2004. Using it in isolation was likely to prove problematic, given that when jobs are unavailable, women sometimes become economically inactive instead of remaining formally unemployed and that using aggregate levels of female economic inactivity could not be envisaged for obvious reasons. In addition, controlling for both female unemployment and horizontal segregation allows us to take into account both the quantity and the quality of jobs available for women, since segregated jobs are likely to be of a worse quality for women than other jobs especially in terms of earnings (see Chapter 2). The impact of this factor was nevertheless expected to be different in Germany and the UK, given the lower level of gender segregation prevalent in the latter country. Finally, a third aggregate indicator was used, the regional level of male unemployment, indicating another type of incentive for women to take part in paid work, in case where their own partner is or could become jobless as a result of the regional economic environment.

Following Hakim, segregated industries were defined as those where at the national level more than 60% or less than 40% of respondents who were employed belonged to the same gender. These were computed using the two digit NACE industrial classification in Germany and SIC 2002 in the UK (Hakim 1992). It is thus based on the relative proportion of women in each sector – i.e. as a proportion of the marginal total and not the total number of women – and therefore, not affected by the number of men and women employed in each category of occupations. This indicator is 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 groups, not allowing for a more nuanced and accurate indicator across smaller industries (i.e. using three or more digits classifications) to be used (Blackburn et al. 2000; Charles 2003). Finally based on the above definition, a three category indicator of whether respondents were employed in ‘female’ or ‘balanced’ industries was built, that was then tabulated for mothers only within regions providing the corresponding proportions in each category for each regions.
Table A.1 in the Appendix summarises the distribution of these three indicators across regions for the two countries.

**Orientations to work**

In addition to the data just described, exploring the third research question, that is the relationship between regional differences in involvement, orientations to work and industrial histories required additional empirical data, mainly of two types: systematic evidence about the regional differences in the orientations to work among women, and non-systematic evidence about the long term regional trends of female involvement in paid work. In the British case, I used data from the Wave O (2006) of the British Household Panel Survey, in which several questions were asked about gender roles attitudes. The following question, that came closest to the topic of this research, was retained: ‘Do you personally agree or disagree that a pre-school child is likely to suffer if his/her mother works?’ Answers allowed ranged from ‘Strongly agree’ to ‘Strongly disagree’ on a 5 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 only female respondents, and was used as a proxy for the regional orientations to work of women. There are of course many issues with using such a simplified indicator: it gathers answers from women belonging to several generations, not all of them mothers of young children. In addition there is the risk of committing an ecological fallacy. I considered that however imperfect this variable might be, regional differences in their response patterns could capture information useful for the relationship between involvement and orientations to work, in particular given that the level of geography available is identical to the one used in the LFS, the only exception being Scotland where the distinction between Strathclyde and the rest of Scotland was not available.

Data for Germany was drawn from the European Social Survey Wave 2 (2004). Out of the three questions related to gender roles, the following one was retained: ‘A woman should be prepared to cut down on paid work for the sake of her family’, which is not as specific as the UK-selected questions. As above, answers were allowed on a five item scale ranging from ‘Agree strongly’ to ‘Disagree strongly’, and subsequently recoded into a three-category variable. Such data did not lend themselves as easily to regional analyses as those from the BHPS: data were not available for the additional level of geography used during the modelling stage (Stuttgart, München, Frankfurt am Main) which
is problematic given that some of the most atypical involvement patterns were found in these places. The other issue is that the limited sample size of the ESS did not allow me to use the attitudes of female respondents only, and as a result, reflect the attitudes of both men and women towards the involvement in paid work of mothers.

I will now turn to the Latent growth curve model fit to these data.

4.4 The model

In this section I describe the main features of the Latent growth curve model which lies at the core of the empirical analysis presented in the next three chapters. This technique was chosen for several reasons. First, since the goal of this research consists in looking at involvement over time as a whole rather than focusing on episodes of participation, their duration or end, this meant that modelling it as a trend over time drawn from repeated observations was more appropriate in this case. Involvement is better described as an overall trajectory, for instance given that instability is also interesting per se and may contribute to explaining some of the regional variation observed, as was the case for Manchester for example (see Chapter 6 for more detail). For operational reasons also, event-based or hazard modelling would not have been appropriate to model involvement. Given the diversity of transitions undertaken by mothers (i.e. from and to each state measured in the variable of involvement), modelling them as events would have required a large number of model to be analysed simultaneously, unless a smaller number of transition would have been arbitrarily selected as more significant than others and retained for the analysis. Furthermore, a non negligible number of mothers in the sample experienced several transitions during the period of observation, a characteristic likely to be missed by such techniques.

4.4.1 Latent curve versus growth mixture modelling

Latent Curve or Latent Growth Curve models (LCM) originate in quantitative psychology (Muthén & Asparouhov 2002; Muthén 2008) and offer a degree of flexibility which represents a significant improvement over other types of growth modelling techniques. Namely they mitigate the strict exigency of normality required by traditional growth modelling and allow for non-continuous dependent variables. Changes in involvement over time can be summarised by latent ‘curves’ or ‘lines’ whose parameters consist of an intercept denoting the
initial levels of working-time measured (i.e. the category of working time at the first wave in this case), a slope representing the change of working-time across the period of observation, as well as their covariance. This framework fits in particularly well with the two dimensions of involvement already mentioned: intensity and variability. These two growth parameters are latent variables, as opposed to directly reflecting the measurements at each time point as in traditional growth analysis, and could be thought of as factors derived from the quantities measured at each wave (Bollen 2002).

This family of models operates on a logic that is close to Structural equation modelling (SEM). Similarly to SEM conventions, the longitudinal model of involvement is traditionally represented by a measurement model which describes the relationship between the observed variables and the latent constructs, and a structural model where relationships between the latent constructs are described. Equation 4.1 expresses the measurement model of involvement over time. Although by convention latent variables are usually represented by Greek letters, I adopted this notation for the purpose of clarity, with \( I_w \) denoting the intercept (thus involvement intensity at Wave 1) and \( S_w \) the slope of the growth factor (i.e. denoting the variation in involvement over time).

\[
W^*_i = I_w + tS_w + \varepsilon_{it} \quad (4.1)
\]

with \((t = 0 \ldots 4)\) in the case of the LLFS. Equation 4.1 expresses that for the \( i \)th respondent the observed working-time value \( W_i \) at Wave \( t \) is a function of an intercept – the value of \( w \) at \( t = 0 \), a loading factor representing each time point, and finally the departure from this average value over the observed time span \( S_w \). By convention, the value of \( t \) at time 1 is set to 0, so that \( W^*_1 = I_w \). In addition, both the slope (variability) and intercept (intensity) factors are assumed to be normally distributed, which allows them to be described by a mean and a variance:

\[
I_w \approx N(\mu_{I_w}, \sigma^2_{I_w}) \quad (4.2)
\]

and

\[
S_w \approx N(\mu_{S_w}, \sigma^2_{S_w}) \quad (4.3)
\]

It should be noted that, as visible in the path diagram presented in Figure 4.1, since \( I_w \) and \( S_w \) are factors estimated from the five working time measurement, the relationship between each one of them and the factor is
measured by factor loadings as in traditional factor analysis. In the model presented above however, the factor loading of the intercept factor is arbitrarily set to 0 whereas, as we have just seen in the case of the slope, it was fixed to \( (t = 0 \ldots 4) \), in order for the two factors to represent a linear growth model. Non linear growth models can also be fitted either by allowing one or several factor loadings to be freely estimated, or instead by attributing them other values (i.e. for example so as to reflect a quadratic growth model). Such a model is briefly discussed in Chapter 6.

Figure 4.1: Latent growth curve / growth mixture models

For the sake of simplicity, and also because this was not explored in the model, I will leave aside the discussion of the covariance matrix of the model. We just need to remember that in addition to the variance \( \varepsilon_{it} \), we also have a covariance term \( COV_{Iw, Sw} \) estimated by the model, which reflects the fact that two terms are not independent. Respondents who were workless at Wave
1 will tend to either have a growth line with a flat or a positive slope, while the opposite is true of those who are full-time employed at Wave 1.

However the situation is a bit more complex in our case: the star in $W_{it}^*$ indicates that the model is not in fact a real measurement model since the observed variable is itself a latent variable. Indeed, a LCM of involvement based on categorical data relies on the assumption that behind each observed measurement of a category of working-time lies in fact continuous latent variables that in our case could be thought of as actual involvement (as real energy dedicated to paid work). The existence of such latent variables can be inferred through their influence on the observed variables (through a working-time category), which in turn only imperfectly capture their essence: for instance women may be working in demanding or less demanding full-time jobs even if those working in part-time jobs are likely to work more than those in full-time employment.

In order to adequately represent the model, the relationship between $W_{it}^*$ and $W_{it}$ (the working time category actually observed) needs to be made explicit and relies on the notion of thresholds. Thresholds can be expressed as the cumulative probability of the distribution of observations across the underlying latent variables $W_{it}^*$ that correspond to the categories of the observed ordinal variable $W_{it}$ (Mehta et al. 2004). In our case the relationship between $W_{it}^*$ and $W_{it}$ is defined by $C - 1$ thresholds $\tau_c$ where $c = 1, 2\ldots 4$, is the number of categories in the observed ordinal working-time variable.

$$P(W_{it} = c) = P(W_{it}^* \leq \tau_{c+1}) - P(W_{it}^* \leq \tau_c)$$

Or to put it otherwise $W_{it} = c$ when

$$\tau_c < W_{it}^* \leq \tau_{c+1}$$

For respondent $i$ with an observed working-time category $W_{it} = c$ at time $t$, the continuous latent variable $W*_{it}$ has a value comprised between the corresponding upper and lower levels of the thresholds $\tau_c$ (Joreskog 1994). The path diagram for this initial model is shown in Figure 4.1. The broken arrows represent the relationship between the ordinal observed variables and the corresponding continuous latent variable. The straight arrow represents the classic measurement model between the latent growth parameters and $W*_{it}$ . The twin headed curved arrow refers to the covariance between involvement intensity and variability. The dotted circle and arrows belong to the growth
mixture model developed further below.

A Growth Mixture model, which represents a further development of the one developed above, was briefly explored but was not subsequently retained for the last stage of the research given that it did not yield useful results. In this family of models the existence of latent trajectories is tested, which amounts to adding a latent class variable to the latent growth already identified. In the path diagram represented in Figure 4.1, this second model is represented. It assumes that the slopes and the intercept of respondents is different according to the category $k$ of the latent class $C$ they belong with $C = 1, 2, \ldots, K$. In this case, I only tested $K = 2$ and $K = 3$.

In the Growth Mixture Model, Equations 4.2 and 4.3 have become

$$I_{w_k} \approx N(\mu_{I_{w_k}}, \sigma_{I_{w_k}}^2) \tag{4.6}$$

and

$$S_{w_k} \approx N(\mu_{S_{w_k}}, \sigma_{S_{w_k}}^2) \tag{4.7}$$

where $I_{w_k}$ and $S_{w_k}$ respectively represent the intercept and the slope of the latent lines of involvement in each one of the $K$ classes. As will be showed in the next chapter however, in order for the model to be identifiable, not all of these parameters can be simultaneously estimated.

### 4.4.2 The regional model

There are two main ways in which the regional dimension can be added into this model. Multilevel modelling consists in adding a second level (regions) to the model, with the variance of each growth factor (intensity and variability) portioned between the levels. The other option, also known as ‘fixed effect’ modelling consists in adding a dummy variable for each region minus one.

Although multilevel modelling is a powerful tool, there are concerns expressed sometimes about situations when the number of higher level units is ‘small’. Although there is no agreed definition of what ‘too few’ Level 2 units is, some consider that 30 is a ‘safe’ choice (Snijders & Bosker 1999), the reason for this being the robustness of the standard errors of the higher level variance estimates becoming unreliable. By contrast, there is no such problem with the fixed effect model, which is usually considered more robust even if at the same time more rudimentary.

I decided to retain the multilevel framework for several reasons. First, as
explained below, the focus of this research lies on understanding the full range of regional distribution in involvement, as opposed to only comparing relative differences from an arbitrary baseline. Second, because there does not seem to be a consensus in the literature about the minimum number of clusters which would prevent us from testing the model with 20 regions but also given the fact that the whole population of regions is included in the model instead of a sample, and that interpreting the quality of the results using standard errors holds if an assumption is made about the existence of superpopulations. I nevertheless carried out a sensitivity analysis using regions as fixed effects in order to validate the results from the multilevel model, and the results did not differ markedly.

We can transform the model presented in equation 4.1 into a two level model (Duncan et al. 2006):

\[ W^*_{ir} = Iw_{ir} + tS_{w_{ir}} + \varepsilon_{tir} \]  

(4.8)

The difference between Equation 4.8 and 4.1 is that the two growth factors become

\[ Iw_{ir} = \mu_{Ib} + \zeta_{Iw_{ir}} \]  

(4.9)

and

\[ S_{w_{ir}} = \mu_{Sb} + \zeta_{S_{w_{ir}}} \]  

(4.10)

Let’s have \( Ib = Iw_r \) and \( Sb = S_{w_r} \) and \( \zeta_{Iw_{ir}} = \zeta_{Iw_i} + \zeta_{Ib} \) to retain a notation compatible with the representation of the model in the path diagram below in Figure 4.2.

Equation 4.8 states that the latent variable of involvement \( W^* \) at time \( t \) for respondent \( i \) in region \( r \) comprises an intercept and a slope that varies across respondents and regions and a variance that is made up of a component at each level (time, respondents and region). In Equations 4.9 and 4.10 the composition of the two factors representing involvement intensity and variability is clarified. Each one has of a regional-level mean, respectively \( \mu_{Ib} \) and \( \mu_{Sb} \), and a residual that is made of an individual and regional part (with \( \varepsilon_{ir} = \zeta_{Iw_{ir}} + \zeta_{S_{w_{ir}}} \)).

4.4.3 Adding control variables

The next stage involves controlling for the variables presented in the previous section: family characteristics, education, age, as well as regional-level measures of unemployment horizontal segregation. In the language of latent growth
curve modelling, adding control variables to the model amounts to regressing the two factors measuring intensity and variability against these. Thus, Equations 4.9 and 4.10 become:

\[
\begin{align*}
I_{w_{ir}} &= C_{Ib} + \beta_{Iw}X_{ik} + \gamma_{Ib}X_r + \zeta_{Iw_{ir}} \quad (4.11) \\
S_{w_{ir}} &= C_{Sb} + \beta_{Sw}X_{ik} + \gamma_{Sb}X_r + \zeta_{Sw_{ir}} \quad (4.12)
\end{align*}
\]

As above, let us have \(Ib = Iw_r\) and \(Sb = Sw_r\) and

\[
\zeta_{Iw_{ir}} = \zeta_{Iw_{i}} + \zeta_{Iw_{r}} = \zeta_{Iw_{i}} + \zeta_{Ib} \quad (4.13)
\]

Equation 4.11 and 4.12 describe the conditional part of the LCM model. Both factors measuring intensity and variability of involvement are now made of a constant term, a vector of individual-level variables \(X_{ik}\) with \(k = 1, 2 \ldots 6^{29}\) and \(X_r\), regional level variables with \(r = 1 \ldots 3\) together with their respective regression coefficients \(\beta\) and \(\gamma\). Finally, unexplained individual and regional variance is captured by the residual terms \(\zeta_{Iw}\) and \(\zeta_{Sw}\).

It should be noted that in Equations 4.11 and 4.12, a fixed effect model is considered, that is a model where the effect of the individual-level variables \(X_{ik}\) is assumed to be constant across regions. It would be reasonable to consider that it is not necessarily the case: for instance, educational achievement, or the number of children could have a different impact according to the region and/or whether respondents live in or near a large urban centre. In effect this would mean that the regression coefficients of the intercept and slope factors would vary between regions as shown in Equations 4.14 and 4.15

\[
\begin{align*}
I_{w_{ir}} &= C_{Ib} + \beta_{Iw}X_{ik} + \gamma_{Ib}X_r + \zeta_{Iw_{ir}} \quad (4.14) \\
S_{w_{ir}} &= C_{Sb} + \beta_{Sw}X_{ik} + \gamma_{Sw}X_r + \zeta_{Sw_{ir}} \quad (4.15)
\end{align*}
\]

Such a model is briefly discussed in Chapter 6.

Figure 4.2 shows the path diagram for the fixed effect model. It should be noted that the diagram represents the model as parameterised by the software package used in this research, MPlus (Muthén & Muthén 1998; Muthén & Muthén 2008). One of the differences lies in the fact that the individual and time levels of the model are represented together as the ‘Within’ level and that regional level is the ‘Between’ level. The straight arrows map the association
between the time invariant dependent variables and the slope and intercepts of the latent curve.

4.4.4 Model estimation strategy and research questions

The last aspects that we need to discuss are the constraints imposed on the model in order for it to be identifiable as well as the estimation strategy. To begin with the latter, as already mentioned, the main focus of the model lies in the regional level residual variance of involvement intensity and variability, and their variations as covariates are added. In other words, we are interested in monitoring respectively \( \zeta_{I_b} \) and \( \zeta_{S_b} \), which are the two parameters that capture the residual variations at the regional level. Specifically, in order to examine the first research question, the attention needs to be focused on these once all individual level variable (the \( X_{ik} \)'s) are introduced in the model and once again when the regional level covariates are added (the \( X_{ik} \)'s). Not only is the overall size of these parameters and their significance of interest, but also their relative change as variables are introduced stepwise in the model, together with their individual value for each region which will allow the examination the structure of the regional differences in involvement, and initiate the discussion of the third research question.

The other consideration that needs to be mentioned is the fact that identification of LCM models follows the same logic as Structural equation models: they have been labelled by some as ‘second generation SEM’ (Muthén 2008). In these frameworks, researchers are allowed to strike a balance between the constraints put on the model (i.e. the number of parameters whose values are set to be constant) and the number of estimated parameters. The model can thus be tailored ‘à la carte’ as required by the research questions as well as to fit the known structure of the data, rather than as a ‘package’ as is the case in traditional regression analysis. The necessity to put such constraints is due to the fact that the number of parameters to be estimated in a full model is too big and that the thresholds, means and variance of \( I_w \) and \( S_w \) cannot be estimated simultaneously. The following constraints and assumptions are made by default in MPlus and were not altered:

- The thresholds are held constant across time, and the means intercept and slope values of the level 1 are set to 0, which allows us to gain an idea of the joint distribution of the observed and latent variable of value while at the same time keeping the value of interest.
Methodology and Methods

Figure 4.2: Path diagram - latent curve model (full version)

Path diagram of the Latent Growth Curve model of involvement. W1...4: Working time at waves 1...4 (0 = economically inactive, on parental or maternity leave, unemployed; 1 = working less than 16 hours per week; 2 = between 16 and 30h; 3 = more than 30h); W*: continuous latent variable of working-time; Iw, Sw: individual-level intercept (intensity) and slope factor (variability) of the growth line; Xw: time invariant individual-level independent variables; Xb: time invariant regions-level independent variables.
• Individual and regional level variances of intensity $\zeta_{Iw_i}$ and $\zeta_{Iw_r}$ and variability $\zeta_{Sw_i}$ and $\zeta_{Sw_r}$ of involvement are assumed not to be correlated between themselves;

• The constant terms of both intensity and variability (i.e. their conditional means) in the regression are only estimated at the regional (Between) level $C_{Iw_r}$ and $C_{Sw_r}$, whereas their individual level component $C_{Iw_i}$ and $C_{Sw_i}$ is set to 0, which is already acknowledged in equations 4.11 and 4.12.

In addition, to keep the model parsimonious, I set the effect of all independent variables to be constant across time, with the exception of the age of the youngest child in the German model, where it was modelled as time-varying, in order to reflect the longer time frame of the dataset, and hence the greater likelihood for mothers to increase their involvement during the period of observation as their child reach the age of three (the end of the parental leave).

Before moving on the presentation of the results in later chapters, in the last section of this chapter, I review critically some of the aspects of this research.

4.5 Critical considerations

In this section I try to provide a critical assessment of some of the aspects of this research, which I believe should be part of any healthy methodological discussion. I review two main aspects. The first one concerns the implicit assumptions and objectives of this project as a product of a government body, as well as those related to the use of quantitative methods. The second one is a summary of the construction of the research design as it actually took place.

4.5.1 Doing applied quantitative research

This project was initiated along implicit organisational and political lines that need to be made explicit. The fact that it was funded by a government agency – the ESRC – as the outcome of an application process that bore similarities with competitive tendering is likely to have had an influence on the content of the research by reinforcing two types of implicit norms.

First, a degree of policy relevance seems to have been expected from the project, which implies that it had to be compatible with the broad political agenda pursued by the UK government at the time (2005). In this instance,
the sought-after policy objective seemed to have been about increasing the employment of women – hence the attractiveness of the concept of ‘returners’ in the original specification of the project. Helping potentially able and qualified women back into the workforce is considered as a means to achieve greater gender equality at the same time as improving the competitiveness of the British economy, together with the fiscal viability of the welfare state. These objectives are similarly pursued by the European Union under the Lisbon Agenda policy framework (European Commission 2000b: 99). In other words, this contributed to the view that economic inactivity in general and by women in particular is a social issue that needs addressing.

The use of *quantitative data analysis* as the main method of investigation was another precondition for the allocation of this studentship. The large number of units of observations involves in such techniques is usually considered as an warrant of the legitimacy of applied research findings, in the context of evidence-based policy-making and the imperative of an efficient spending of the taxpayer’s money. Although objectivity as a criterion of validity of such quantitative research is not made explicit, it is often implicitly present – for example when it is assumed that social phenomena can be externally measured and quantified through appropriate instruments – using a narrative similar to that of the exact sciences.

Doing quantitative analysis of Secondary data comes also at the cost of the control over the data collection process and the associated research design. As we have already seen, the initial definition of the research question was likely to have been influenced by the broad agenda of the research funding bodies, but that also applies to administrative agencies sponsoring employment related large scale surveys both in Germany and the UK – such as narrowing down the conceptualisation of work to a small number of categories and typologies. Specifically, both large scale datasets used in this research use mostly existing administrative definitions and measurement of paid work. The respondents’ attitudes, or their broader circumstances of participation – i.e. inherited social class, wealth, cultural capital, emotions and social networks are overlooked together with other substantial topics potentially important for this research agenda: formal or informal childcare provision, explicit information about the partner of the interviewee or her exact geographical location.

Besides the narrow prism through which involvement in paid work is looked at, additional sources of reductionism are present in this research some of which result from using specific modelling techniques. To name only one, regression
analysis relies on the assumption that a number of factors – the independent variables – are individually and additively associated with a single topic of interest, the dependent variable (even if the latent variable framework used allowed the relaxation of this assumption to some extent).

4.5.2 Telling the tale of the research process

In actual practice, any research project involves some degree of circularity and/or iteration between its different stages: research questions or hypotheses are redefined following exploratory empirical analysis, or additional data analysis is carried out to go beyond initial findings. However this process is rarely documented, particularly in quantitative social science where results are often presented embedded in a scientific narrative where stages follow each other in a linear sequence: theory, research questions, hypotheses, testing, discussion, and conclusion. Below I attempt to describe a sample of the way research design was actually built up, instead of forcing it into such a standard linear narrative.

First iteration: amendments to the initial project

The initial focus of this project as it was selected for funding by the ESRC was about the relationship between subjective behaviour – attitudes or preferences – with constraints and labour market participation of mothers, narrowed down to women ‘returners’ after a period of unpaid care for dependent children (Tomlinson et al. 2009). It was intended as a mixed-methods design, combining UK wide analysis of longitudinal data with qualitative case studies and interviews in the Manchester area. As the grant was awarded, the project was amended to fit my own research interests and additional dimensions were added to the initial design, such as a focus on space and geographies: national and subnational institutions constraining or enabling the economic behaviour of women. The initial stress on returners was broadened to encompass employment transitions of mothers of young children in order to better relate institutional constraints to a homogeneous group.

Second iteration: adapting data collection to new constraints

This new focus resulted in increased data collection constraints. Simultaneously looking at longitudinal, international and regional dimensions required a large size cross-national longitudinal dataset, or at least one that would in-
clude relevant retrospective measures of employment participation in order to account for moves in and out paid work by mothers. The only European-wide longitudinal dataset at the time was the European Community Household Panel Survey (ECHP), discontinued in 1999 whose limited sample size would not have allowed for simultaneous analysis of mothers of young children at a subnational level. The new EU wide panel survey - EU-SILC was too recent an initiative to provide an adequate number of waves for this study, not to mention similar issues with sample size.

A possible compromise solution could have lied within the European Labour Force Survey (ELFS) framework, known to provide larger sample sizes (Eurostat 2003). Although ELFS cross-national datasets available to researchers do not include longitudinal information, most national surveys at the source of the ELFS include a panel dimension, even if non-harmonised. On the other hand, given their strict focus on ‘hard’ indicators of labour market participation, these datasets were unlikely to provide indicators of attitudes towards labour market participation. The UK LFS is an exception to this in that it includes a few questions about working-time preferences (but not in its longitudinal version). I opted for this survey. This way I could access the actual longitudinal dimension, the trade-off being to lose the opportunity of using a fully standardised comparative dataset\textsuperscript{31}

The initial criteria for selecting the countries for the case study analysis focused on their specificity in terms of policy mix and economic structure: welfare state policies and institutions in the broad sense, varieties of capitalism and their association with labour market participation – breadwinner models or gender regimes, as developed in the previous chapter. The initial ambition at the beginning of this research was to look at three to four different countries reflecting the well documented social-democratic, conservative and liberal types. The UK was selected as a case of the latter regime, Germany as male breadwinner/conservative regime, and a Nordic country, with Sweden as the favourite candidate, as a dual earner regime. A former socialist country was also looked for in order to explore gendered employment patterns hitherto neglected in most Western-centred typologies. Apart from the data requirements highlighted above, the selected countries needed to be large enough to allow for significant distinct regional realities to be present, which left only the Czech Republic and Hungary, since the Polish LFS does not include longitudinal data, and Romania is too recent a member of the EU-LFS programme.
Third iteration: definitive population selection

Besides the UK, Denmark, Germany, Hungary were retained as initial countries to be examined.

In a number of countries that allow foreign researchers to use national datasets, temporary affiliation with a national research organisation already using the data is often required. Such is the case for instance of Germany and Denmark. Initial contacts with Danish and Hungarian potential partners – the Center for Comparative Welfare Studies at Aalborg University and the Hungarian Statistical Office proved unfruitful. In addition, a prohibitively steep learning curve was anticipated while acquiring a basic working knowledge of Hungarian, which was required to work with the data. There was also a concern in Denmark, that the geographic structure of the country – the fact that half of the population of the country lives in the Copenhagen area – might have made it difficult to investigate regional realities.

As a result, only a limited cross country analysis could be retained in the research design. Comparison was now limited to ‘liberal’ UK and ‘conservative’ Germany. The latter was eventually selected, given the relatively open access to data it offers, by comparison with many other European countries, its well documented regional structure, and the large sample size dataset feeding into the EULFS: the Mikrozensus-Panel (MZ-Panel).

Given the narrow focus of the Labour Force Surveys framework, a significant redesign of the research question had to be carried out: the idea to observe attitudes and preferences at the individual level had to be abandoned. As a result, the focus of the analysis shifted towards actual employment behaviour rather than on the relationship between these and attitudes at the individual level.

Fourth iteration: final framing of the research question

Choosing a multiple rather than a single country design restricted the options opened for triangulating the quantitative findings with qualitative evidence. A decision needed to be made between either a few regional case studies in each country or instead a more extensive comparative analysis of all of them based on aggregate quantitative analysis carried out at the same time or in parallel to the individual-level modelling could be carried.

The prospect of conducting interviews, already remote, was now unrealistic. Eventually, in relation to findings during the literature review, I finally opted for a limited systematic analysis using aggregate variables, which would then
be completed by a targeted further analysis of the relevant regional economic and historical literature dealing with the issue of women’s involvement in paid work.

4.6 Summary

In this chapter, I have presented the main methodological aspects of this research the main empirical part of which consisted of two cases studies of regional differences in participation in paid work of mothers of young children in Germany and the UK. In each case analysis involves statistical modelling of secondary data. First, I defined the notions of involvement intensity and variability in order to capture the amount of paid work carried out by mothers of children under 6, and its evolution over time. I also clarified the concept of region, based on NUTS 1 digit areas to which a few large urban areas such as Manchester in the UK or München in Germany were added. I then introduced the data, which consisted in collated datasets of the Longitudinal Labour Force Survey (2001-2007) for the UK, and the Mikrozensus-Panel 2001-2004 for Germany, reviewing their limitations and strengths. I proposed a multilevel Latent Growth Curve model where involvement is represented as growth lines, and the geographical variations as the residual variances of the second level of the model.

In the framework of this model, the strategy I subsequently followed in order to answer the research question consisted in adding first individual (the composition hypothesis), then regional level control variables (the job availability hypothesis) then examining their impact on the regional residual variance. During a third stage, I analysed the structure of the remaining residual variance and attempted to relate it to aggregate data on the gender-roles attitudes toward paid work of women and secondary literature analysis of the long term regional trends in involvement and their relationship with the industrial history of some regions in both countries.

In the next three chapters, I present and discuss in depth the results of this analysis, beginning with Chapter 5 where I spend some time presenting the UK sample, and introducing the latent growth model, followed by a comprehensive analysis of the regional differences in the country (Chapter 6) and a similar but shorter analysis for Germany.
Chapter 5

Fifteen months in the life of mothers of under six in the UK

The aim of this chapter is to prepare the ground for the regional analysis developed in Chapter 6 and 7 by describing the general characteristics of the involvement intensity and variability/continuity of mothers of children under six in the UK, based on data from the Longitudinal Labour Force Survey, then provide a first illustration of how individual transition patterns can be summarised in the Latent growth curve models described in the previous chapter, including an overview of the overall impact of social position and family composition on transitions when represented by such lines. At this stage, I do not expect that this ‘national’ labour supply model will bring about much new evidence about mothers’ involvement in paid work but rather that it will illustrate a new way to describe it, by focusing on processes and flows over time rather than outcomes and durations. This latter stage also constitutes the first step towards testing the ‘composition hypothesis’ carried out in the next chapter: by fitting a model where family types and social position have been controlled for, we will be able to assess how much of the variations of involvement is related to regional factors, once the regional dimension is included into the model.

Before to proceed however, it is necessary to summarise the main points learned in the previous chapters.

1. We have seen previously that in relation to motherhood, four main types of transitions can be earmarked: interruptions of work, which may or may not involve interruptions of employment, i.e. take place within the framework of parental or maternity leave provisions. The latter may be temporary or definitive which is contingent upon the period of observa-
tion. Returns to work are a symmetric type of transition, which similarly may or may not be temporary. A further type of transition cannot be characterized by a pattern as such, but instead by its absence: typically, casual work interrupted by periods of worklessness, irrespective of the employment status of the respondent. Finally, transitions may also be characterized by the persistence of a state, also labelled maintenance transitions (Schmid & Gazier 2002), such as working at a given level of working-time or instead, the prolonged absence of paid work, which for most mothers equates to the full-time care of children\textsuperscript{34}.

2. I proposed to conceptualise mothers’ employment patterns in terms of involvement, that is, a summary representation of the amount of time during which mothers are engaged in paid work. Involvement in paid work is meant to capture both the degree of continuity in participation, together with its intensity. Intensity is measured as either: full-time work (over 30 hours per week), long part-time (15 to 30 hours per week), short part-time (under 15 hours), or no paid work at all. The latter category covers mothers who are economically inactive according to the ILO but also those who are unemployed, on maternity, or parental leave – indeed interrupting their involvement in paid work for family-related reasons – even if temporarily and formally remaining in an employment relationship. More detail about this point is available in the previous chapter.

3. The data consists of 15 months in the (economic) life of mothers whose youngest child was aged 0 to five at Wave 1 between 2002 and 2007 in the UK as available in the Longitudinal Labour Force Survey. The sample is thus a collection of 15 months-long transitions ranging from those of mothers of newborn babies to those with of older toddlers or whose youngest child has already reached Foundation Stage 1 or even 2 in England. This choice results from the necessity to find a compromise between a dataset with an adequate sample size while retaining a longitudinal dimension. Selecting this age interval was done in order to encapsulate the variety of transitions mother of young children experience while their child is aged under six, rather than the alternative of only following a single cohort of women. As described in the previous chapter, the fact that in the multivariate analysis the age and number of children are controlled for should alleviate potential problems arising
from potentially comparing apples and oranges, i.e. heterogeneous transitions, within the same dataset

Plan of the chapter

In section 1 the two dimensions of involvement in paid work, intensity and continuity, are described for mothers in the UK, as well as the relationship between them, highlighting the complexity involved in dealing simultaneously with the different facets of involvement. Attention is also paid to differences arising between traditional concepts of participation in employment and the ones adopted in this research. In section 2, I show how trajectories can be summarised by Latent growth curve models, also briefly discussing why the more complex technique, and how well these match the observed transitions. In section 3 I further examine how the intercept and the slope of the growth lines, respectively denoting the overall level of involvement over 15 months (i.e. intensity) and departures from it (continuity) are affected by factors known to be related to women’s participation in employment.

5.1 Overall involvement patterns of mothers

In this section I revisit a few facts about the involvement in paid work of mothers in the UK using the sample of 15 months transitions from the LLFS. I first consider involvement intensity, and its two facets of participation in employment and working-time, before discussing the continuity of involvement, i.e. transitions, and the relationship between both. Finally, I carry out an initial bivariate analysis of how the family formation and education level of mothers relate to involvement thus conceptualised.

Involvement intensity

Looking at involvement at Wave 1 in Table 5.1 shows that at any time between 2002 and 2007, about half (52%) of mothers of under six in the sample were not engaged in any paid work. This figure confirms the well established fact, already documented in Chapter 2, that mothers of young children still have a very low employment rate, and that they remain at the core of the gendered division of labour – far from the impression left by the more optimistic figures for women in the UK as a whole still used in some international comparisons (OECD 2010). The equivalent figure for involvement differs by about 5% from the employment rate according to the ILO for the same period, reflecting the
methodological decision made here to recode unemployed respondents, or those on maternity or parental leave as workless. On the other hand the estimate of the ILO employment rate obtained in the longitudinal LFS is identical to the one derived from the cross-sectional LFS for the same period, indicating that our longitudinal sample is consistently representative of the population of mothers for the period 2002-2007.

Table 5.1: Involvement intensity of mothers in the UK

<table>
<thead>
<tr>
<th>Group</th>
<th>No paid work</th>
<th>&lt;16h</th>
<th>16-29h</th>
<th>FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>51.99</td>
<td>9.80</td>
<td>21.83</td>
<td>16.38</td>
</tr>
<tr>
<td>Age of the youngest child</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under two</td>
<td>63.08</td>
<td>7.33</td>
<td>17.75</td>
<td>11.84</td>
</tr>
<tr>
<td>2-3</td>
<td>47.54</td>
<td>10.47</td>
<td>23.76</td>
<td>18.23</td>
</tr>
<tr>
<td>4-5</td>
<td>39.64</td>
<td>12.96</td>
<td>26.04</td>
<td>21.37</td>
</tr>
<tr>
<td>Number of children</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>46.72</td>
<td>7.53</td>
<td>24.78</td>
<td>20.98</td>
</tr>
<tr>
<td>Two</td>
<td>49.66</td>
<td>11.71</td>
<td>23.61</td>
<td>15.03</td>
</tr>
<tr>
<td>Three</td>
<td>65.41</td>
<td>9.45</td>
<td>14.01</td>
<td>11.14</td>
</tr>
<tr>
<td>Partnership status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives with a partner</td>
<td>47.27</td>
<td>11.00</td>
<td>23.45</td>
<td>18.28</td>
</tr>
<tr>
<td>Single</td>
<td>65.41</td>
<td>6.41</td>
<td>17.22</td>
<td>10.96</td>
</tr>
<tr>
<td>Age left full-time education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compulsory age or below</td>
<td>59.37</td>
<td>9.64</td>
<td>19.57</td>
<td>11.43</td>
</tr>
<tr>
<td>17-19</td>
<td>46.43</td>
<td>10.55</td>
<td>24.79</td>
<td>18.23</td>
</tr>
<tr>
<td>20-22</td>
<td>44.04</td>
<td>9.86</td>
<td>24.26</td>
<td>21.84</td>
</tr>
<tr>
<td>23+</td>
<td>48.11</td>
<td>8.14</td>
<td>17.91</td>
<td>25.84</td>
</tr>
</tbody>
</table>

Percentage (Row %) of respondents by category of usual working time.  

If we now consider intensity of participation among the respondents who were engaged in paid work, we can see that again unsurprisingly, mothers of young children in the sample have indeed the lowest level of working-time, by comparison with other categories of women: more than 30% of all mothers of under six held short or standard part-time jobs altogether, whilst only 16% were on a full-time job. Relative to respondents engaged in paid work only, these figures become respectively 20, 45 and 34% – almost two thirds of mothers of under six work part-time. This trend can also be observed within each traditional working time category: the median number of hours worked by respondents in standard part-time jobs is 20 against 21 for women without dependent children, and 38 against 39 among full-timers. Similarly as above, these results remains consistent with working-time estimates from the cross-sectional LFS, even if the proportion of mothers of under six on full-time jobs is slightly larger when using traditional working-time indicator (37%).
Continuity

If we now turn to variations in involvement in Table 5.2, we can see that *continuity is more typical than change*: overall 60% of mothers did not alter the level of their participation over 15 months. At the same time, the proportion of those who did – i.e. who experienced at least one change in involvement – is almost identical to that of mothers who did not engage in paid work at all for at least 15 months. In other words, this leaves only one fifth of respondents in continuous employment over the period of observation, which clearly confirms the extent to which participation in paid work is disrupted by motherhood and its aftermath. Additional tables not included here also showed that if fathers of young children are *more* likely to experience continuity (i.e. less transitions) and full-time employment than mothers of under 6, mothers of older children are *less* likely to experience continuity – which resonates with reports that returns to employment might be gradual rather than taking place as soon as children reach school age (Paul 2006).

### Table 5.2: Involvement continuity of mothers in the UK

<table>
<thead>
<tr>
<th>Group</th>
<th>At least 1 change</th>
<th>Continuous involvement (Row percent)</th>
<th>Workless (&lt;16h)</th>
<th>(16-30h)</th>
<th>FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>39.85</td>
<td>39.85</td>
<td>3.24</td>
<td>9.12</td>
<td>7.93</td>
</tr>
<tr>
<td>Age of the youngest child</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under two</td>
<td>41.33</td>
<td>44.04</td>
<td>2.47</td>
<td>6.91</td>
<td>5.26</td>
</tr>
<tr>
<td>2-3</td>
<td>38.12</td>
<td>40.19</td>
<td>3.18</td>
<td>9.91</td>
<td>8.60</td>
</tr>
<tr>
<td>4-5</td>
<td>41.76</td>
<td>32.25</td>
<td>4.26</td>
<td>11.19</td>
<td>10.54</td>
</tr>
<tr>
<td>Number of children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>46.79</td>
<td>32.97</td>
<td>1.95</td>
<td>9.27</td>
<td>9.02</td>
</tr>
<tr>
<td>Two</td>
<td>40.57</td>
<td>37.63</td>
<td>3.94</td>
<td>10.26</td>
<td>7.60</td>
</tr>
<tr>
<td>Three or more</td>
<td>29.38</td>
<td>55.22</td>
<td>3.75</td>
<td>6.06</td>
<td>5.59</td>
</tr>
<tr>
<td>Partnership status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives with a partner</td>
<td>44.42</td>
<td>33.91</td>
<td>3.77</td>
<td>9.41</td>
<td>8.50</td>
</tr>
<tr>
<td>Single</td>
<td>28.45</td>
<td>57.30</td>
<td>1.35</td>
<td>7.65</td>
<td>5.25</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 age or below</td>
<td>34.93</td>
<td>47.47</td>
<td>3.17</td>
<td>8.86</td>
<td>5.57</td>
</tr>
<tr>
<td>17-20</td>
<td>47.12</td>
<td>30.71</td>
<td>3.30</td>
<td>9.92</td>
<td>8.95</td>
</tr>
<tr>
<td>21-22</td>
<td>50.09</td>
<td>23.84</td>
<td>3.22</td>
<td>7.91</td>
<td>14.93</td>
</tr>
<tr>
<td>23 or more</td>
<td>46.44</td>
<td>34.00</td>
<td>1.49</td>
<td>4.93</td>
<td>13.14</td>
</tr>
</tbody>
</table>

Percentage (Row %) of respondents by type of transition over 15 months. Base: all women with at least one child under six at Wave 1. Data: pooled UK Longitudinal LFS 2002-2007. Unweighted sample size: 13,784 observations.

Detailed examination of the data suggests that a high level of complexity among the observed involvement variability: more than half of the respondents who went through a change in involvement experienced at least another one (not shown) – an interesting finding in itself. In all, 549 different combinations
of involvement were observed over the five waves of observation, the most likely ones involving moves between standard part-time work and worklessness, or full-time and standard part-time work or the latter and marginal part-time (less than 16 hours per week), whereas the least likely involve moves between marginal part-time and full-time work. Even if we only kept the most likely transitions, gathering two thirds of respondents, we would still be left with more than 15 distinct combinations of involvement over 15 months. We can a glimpse of this diversity of transitions in Figure 5.1 below.
Figure 5.1: Sample of observed involvement transitions in the UK

Involvement in paid work over five quarters. (0 = economically inactive, on parental or maternity leave, unemployed; 1 = working less than 16 hours; 2 = between 16 and 30 hours; 3 = more than 30 hours per week). 50 randomly chosen mothers of at least one child aged under six. Data: pooled UK Longitudinal LFS 2002-2007 observations.
Accordingly straightforward transitions, such as ‘simple’ returns to paid work or entries into full-time worklessness represent less than one third of the observed moves. An attempt was made to split the sample into ‘leavers’ (one transition from part-time or full-time work to no paid work for the rest of the period of observations), ‘returners’ (conversely, one transition from worklessness to continuous paid work, but not necessarily continuous working-time, and ‘unstable’ (more than one transition involving worklessness at least at one at one wave). This showed that about 10% of all transitions involved leaving paid work for at least one wave whereas almost twice that number (17.5%) involved one move from worklessness to any level of working-time, still leaving more than two thirds of transitions involving other types of move. Although some of the observed transitions are partly due to moves in and out maternity or parental leave, this influence is limited: the proportion of women on maternity leave at any wave amounts to no more than a quarter of the respondents who experienced a change in their involvement.

Finally, another way to examine transitions consists in comparing the state of involvement of mothers who experienced a change between the first and last waves of observation (Table 5.3). Doing so shows that whereas about 85% of women who were previously workless at Wave 1 had entered paid work by Wave 5, the majority of them (40.77%) were in standard-part-time work. Overall however, only 42% of such ‘movers’ increased their participation, against 29% who decreased and another 29% who remained at the same level (not shown). This observation needs to be nuanced according to the initial level of involvement: the higher the working-time at Wave 1, the less likely respondents were to be workless at Wave 5. Table 5.3 shows the markedly asymmetric flows of respondents between standard part-time and full-time work: more than one third of mothers working full-time at Wave 1 had switched to standard part-time work at Wave 5, whereas only 24% did the opposite move during the time span of the survey which confirms that mothers previously working full-time tend to reduce their working-time while their children are under school age. Finally, marginal part-time work involving less than 16 hours per week, seems to be the second most volatile state of involvement, since only 21% of mothers who were involved at that level at Wave 1 were still working at that level after going through a change. Mothers initially working at that level of involvement were also the most likely of all to have moved away from paid work by Wave 5. A degree of caution is required here since the short time span covered by the transitions indicates that in most cases (except
maybe the case of respondents on maternity leave) no particular significance should be given to Wave 1 or Wave 5 as time points.

Table 5.3: Involvement variations over 15 months in the UK

<table>
<thead>
<tr>
<th>Wave 5 (Row percent)</th>
<th>No paid work</th>
<th>&lt;16h</th>
<th>16-29h</th>
<th>FT</th>
</tr>
</thead>
<tbody>
<tr>
<td>No paid work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;16hrs</td>
<td>14.82</td>
<td>27.47</td>
<td>40.77</td>
<td>16.94</td>
</tr>
<tr>
<td>16-29</td>
<td>21.53</td>
<td>16.74</td>
<td>38.19</td>
<td>23.55</td>
</tr>
<tr>
<td>FT</td>
<td>17.40</td>
<td>5.89</td>
<td>36.57</td>
<td>40.15</td>
</tr>
</tbody>
</table>

Respondents' level of involvement intensity at Wave 5 by involvement at Wave 1 (Weighted percentage). ‘No paid work’ includes economically inactive, unemployed, students, maternity leave, and long-term sick. Data: pooled UK Longitudinal LFS 2002-2007. Unweighted sample size: 6,026 mothers of at least one child aged under six who experienced at least one change in their involvement over 15 months.

Involvement, family formation and social position

As could be expected, both number and age of children are associated with the involvement intensity and continuity, making it more likely for women to be workless and not to experience a change in their level of involvement as shown in Tables 5.1 and 5.2. As their youngest child gets older, the more likely mothers become to be engaged in paid work at any time point, especially in part-time work. The association linearly increases from almost two thirds of mothers of under two who are workless at Wave 1 – in part mothers who did not resume paid work at the end of their maternity leave – to 40% for those aged four or 5. They also become more likely to be engaged in continuous paid work, but the likelihood of going through a transition remains unaffected.

As far as the number of children is concerned, the most noticeable differences in involvement intensity lie between mothers of one or two children and those of three and more, two thirds of which were workless at Wave 1 and half being so at five waves. Mothers of only one and those of two children mainly differ in the larger proportion (20% against 15% see Table 5.1) of the latter working full-time at some point at Wave 1, but not in their propensity of being in stable full-time work, a sign that a number of transitions out of and back into full-time work are taking place at that stage. More generally, as the number of children increases so follows the proportion of respondents in continuously workless.

There are also indications of a combined effect of both age and number of children on involvement taking place (not shown). As their children get older
mothers of one child under six become increasingly likely to be engaged in paid work, in particular full-time paid work, but at the same time they are more likely to become workless again when their child reaches the age of two or three. This result is likely to denote an entry into a period of full-time care in anticipation of the birth of a second child among some of them. Mothers of two children tend to experience a regular increase of their participation in paid work, but its pace does not seem to increase as their youngest child gets older. The increase in the number of transitions among those with two children the youngest of which is 4-5 also indicates that when children reach that age both returns back to work and increases in the level of involvement intensity (i.e. moving up from part-time to full-time work) are taking place. Unsurprisingly single mothers were much less likely than those living with a partner to be engaged in paid work and to experience a transition, and conversely, more likely to remain workless over the period of observation.

Finally, the educational level of the respondents was found to have a positive association with involvement intensity and a negative one with continuity. There were 10% more respondents who were workless at Wave 1 and who had left school at 16 or earlier than those who studied until 23, presumably towards a first degree or equivalent. The patterns of differences between the latter and respondents who completed full-time education after the age of 23 is not clear, possibly denoting heterogeneity within the latter group. On the other hand highly educated mother were found to be more likely to working continuously full-time, but also more mobile – 45% and above of those finishing full-time education at 20 or afterwards – experiencing at least one change over 15 months by contrast to only 34% of those completing compulsory education – which is likely to indicate more returns to work after maternity leave or stepping up of working-time at a later stage.

In this section, I have briefly summarised the basic patterns of involvement of mothers in the sample and revisited the effect of known factors such as family formation and education using bivariate statistics. This demonstrated both a need for an analytical tool capable of simplifying the complexity behind the analysis of involvement, and also for a multivariate model in which all the above mentioned factors would be tested simultaneously, which is carried out in the next section where the latent growth curve model is presented. It should be noted that this represents an original application of this methods to the field of employment studies.
5.2 Modelling involvement

As we have just seen, involvement of mothers of children under six in the UK remains complex to apprehend, in particular in its longitudinal dimension, given the large number of different transitions experienced by respondents, a fact that is reinforced by the short time span between waves of the LLFS. In order to tackle this complexity, in this section I propose to use Latent growth modelling, a technique in which the essential aspects of each respondent’s transitions over 15 months are summarised by trajectory lines. Subsequent analysis of the variation patterns of these lines allowed us to test the multivariate impact of respondents’ social position and family formation behaviour and, in the next chapter, to analyse their regional structure.

In Section 5.2.1, I briefly summarise the main features of these latent growth models presented more in depth in Chapter 4, including the two flavours relevant here, Latent growth curve, and Growth mixture modelling. Next, in Section 5.2.2 I present the results of three initial models, and discuss how it matches the trajectories of a selection of mothers in the sample. I also briefly discuss the possibility of grouping respondents according to their trajectory patterns following the growth mixture modelling approach in Section 5.2.3, before moving on to a brief analysis of the impact of social position and family formation on the parameters of the growth model in Section 5.3.

5.2.1 Latent curve versus growth mixture modelling

We saw in Chapter 4 that Latent growth models are based on the assumption that behind the distribution of observations in the four categories of each one of the ordinal working-time variables described above lies a latent variable capturing the mode diffuse involvement intensity at a given point in time. In other words, working full-time, part-time or being workless imperfectly reflect a more nuanced commitment to paid work. These five latent variables—one per wave—are then used as the basis from which two factors are estimated, that is the parameters of a latent growth line reflecting the variations in involvement followed by mothers during the 15 months long period of observation. Thus, the trajectories of each mother in the sample may be modelled as a line\(^{35}\) which constitutes a stylised representation of both the intensity and the continuity of her involvement over time.

As in traditional linear algebra, these lines can be summarised by an intercept \(Iw\) — the level of involvement intensity at Wave 1 — and a slope — the
overall growth rate $Sw$ or involvement variability. In order not to introduce confusion later on with the terminology used in the multilevel model, a $w$ was added, standing for ‘within’, or Level one. Since both slopes and intercepts are assumed to follow a normal distribution, they may be described by their mean $\mu_Iw$, $\mu_Sw$ and variance $\sigma^2_{Iw}$, $\sigma^2_{Sw}$. Once control variables are introduced later on, these will become the constant, and residual variance of the intercept and slopes.

This latent growth curve framework has additional attractive features. Firstly, it enables the slopes and intercept of the growth lines to be regressed against independent variables, thus to control for the effect of family formation patterns and social position on the variability and intensity of involvement, and more generally, on the shape of transitions over time. It also allows to go one step further and estimate latent clusters of respondents based on the shape of their growth lines, in a fashion similar to Latent Class Analysis (McCutcheon 1987). In this case however, these latent classes have continuous indicators — the slopes and intercept of the growth curve — and constitute in effect trajectory classes. The results of such a model are briefly explored in Section 5.2.3 below. A formal description of these models is presented in Section 4.4.1.

5.2.2 Overall trends in involvement in the UK

This section provides a first overview the growth model of involvement in paid work for the UK as a whole, leaving aside the regional dimension for now. In this discussion however, we focus on a single class model, Model 1 and its five main parameters as shown in Table 5.4: the intensity of involvement as denoted by the intercept ($Iw$) on the one hand, a slope ($Sw$) representing the direction and sharpness the trajectory undertaken by respondents on the other. Their covariance provides information about whether these two dimensions are related to each other. It should be noted that although they are presented in the same table, formally Model 1 is a latent growth curve model (which is the equivalent of a Growth Mixture Model) whereas Model 2 and three

If we first look at intensity of involvement in Model 1, we can see that the intercept mean ($\mu_Iw$) was constrained to 0, in order for the model to remain identifiable (Muthén & Muthén 2008). In this kind of model, information about the distribution of involvement intensity is thus provided by the variance of the intercept. The metric of these parameters is not directly interpretable since they refer to model-predicted levels of ‘latent involvement’ rather than the observed categories of full-time, part-time work or do not work\textsuperscript{36}. One
can see nevertheless that the variance is large by comparison with the set value of 0 – likely to reflect the wide variety of levels of involvement intensity experienced by the respondents in the sample. Finally, another output of the model is provided by the thresholds, that is the probability, for an observation to be in one of the categories of the observed working time variables when the intercept value is set to $0^{37}$. The substantive interest of this information is however limited.

Table 5.4: Growth modelling of involvement in the UK$^a$

<table>
<thead>
<tr>
<th>Model</th>
<th>1$^b$</th>
<th>2</th>
<th>3</th>
</tr>
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<tr>
<td>Entropy</td>
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Latent class 1 means$^d$

- $\mu_{Iw} = 0$ - $\mu_{Sw} = 0.22 (0.02)$
- $\mu_{Iw} = 1.31 (0.09)$ - $\mu_{Sw} = 0.57 (12.17)$

Latent class 2 means

- $\mu_{Iw} = 15.56 (0.41)$ - $\mu_{Sw} = -9.15 (13.77)$
- $\mu_{Iw} = -0.02 (0.01)$ - $\mu_{Sw} = -31.05 (1.60)$

Latent class 3 means

- $\mu_{Iw} = 3.53 (3.16)$ - $\mu_{Sw} = 0.01 (4.19)$
- $\mu_{Iw} = 15.56 (0.41)$ - $\mu_{Sw} = -9.15 (13.77)$
- $\mu_{Iw} = -0.02 (0.01)$ - $\mu_{Sw} = -31.05 (1.60)$

Intercept (intensity)$^e$

- $\sigma_{Iw}^2 = 55.79 (2.01)$ - $\sigma_{Iw}^2 = 11.27 (.31)$ - $\sigma_{Iw}^2 = 17.09 (57.68)$

Slope (variability)

- $\sigma_{Sw}^2 = 1.26 (.08)$ - $\sigma_{Sw}^2 = 0.95 (.04)$ - $\sigma_{Sw}^2 = 0.73 (5.57)$

Intercept-slope covariance

- $-3.32 (.25)$ - $-6.4 (.06)$ - $-1.98 (20.55)$

$P(W_i = 0)$

- $0.65 (.05)$ - $11.43 (.41)$ - $-0.53 (1.52)$

$P(W_i < 15h)$

- $2.61 (.06)$ - $13.50 (.41)$ - $1.49 (.00)$

$P(W_i = 15 - 30h)$

- $6.99 (.10)$ - $17.50 (.42)$ - $5.38 (.89)$

---


$^b$ Model 1 is a Latent growth curve model, and therefore, does not have latent classes.

$^c$ The size (i.e. probability) of each Latent class is based on the most likely class membership computed in the model.

$^d$ $\mu_{Iw}$ and $\mu_{Sw}$ are the means of the intercept (intensity) and slope (variability) of the growth lines.

$^e$ The intensity $\sigma_{Iw}^2$ and variability $\sigma_{Sw}^2$ variances as well as their covariance are constrained to be equal between latent classes in order for the model to be identifiable.

---

The second indication provided by Model 1, is that the slope – the departure from a given level of involvement at Wave 1, and denoting the degree of continuity in involvement– is positive but seems small: on average at each quarter, respondents experience a .2 unit increase in involvement – overall mothers of young children tend to scale up their participation in paid work over time,
but this is so to a limited extent. From these values, it would be tempting to conclude that either only a minority of mothers of children under six experience a change in their involvement over a period of 15 months, or alternatively that for most them this change is incremental, i.e. most transitions occurring in the sample would consist in limited adjustments, for instance, between standard and marginal part-time work, or between worklessness and the latter. This would constitute a surprising finding – given the non negligible levels of return to full-time work by mothers on maternity leave – more generally transitions between worklessness and standard full-time work that were visible in the descriptive results presented above. This may also signal many differences between individual trajectories mutually neutralising each other. The highly significant variance, and its size in relation to the slope mean suggests that indeed a non negligible amount of heterogeneity among mothers transitions over time is the correct interpretation – which is also congruent with the graph of a set of transitions that was presented in Figure 5.1 above.

Finally, the covariance between the slopes and intercepts, thus the relationship between intensity and variability of involvement is negative and strongly significant: the higher the initial level of involvement in paid work, the more likely are respondents to decrease it and conversely. This is probably due to the fact that as was seen earlier, many transitions involve part-time work whether increases or decreases in involvement, in what amount to a ‘regression to the mean’. A majority of mothers in the sample who were not doing any paid work at the beginning of the period of observation will eventually return to work at some point whereas at the same time the full-time employed tend to reduce their scale down their involvement to part-time hours.

**Predicted and observed transitions**

Before to examine the impact of social position and family formation on the growth model of involvement, it was necessary to perform a ‘reality check’ and examine how the model-generated growth lines match the empirical transitions patterns such as those visible in Figure 5.1 above. The plain lines in Figure 5.2 represent 42 actual transitions drawn from the sample of mothers. The dotted lines by contrast represent the latent growth line predicted by the growth curve model. It should be noted that this representation is approximative as one can see from the fact that estimated and observed ‘flat’ lines do not necessarily match each other. This is due to the fact that the intercept and slopes of the estimated growth lines were scaled in order to be contained within same
interval as the values of the categorical working-time variable, ranging from 0 to 3. The estimated individual intercepts and slopes are deviations from the estimates of the baseline model 0 in the case of involvement intensity, and .22 in case of variability.

We can get a better understanding of the strengths of the technique, as well as some of its weaknesses. One can see that in most cases, the general direction and level of involvement observed are reflected by the slopes and intercepts of the lines, including a few of those involving more than one change, such as in Graph 2 or 34 in Figure 5.2. For instance large changes (i.e. move from worklessness to full-time work) at one wave, followed by another move back to worklessness 9 month afterwards translates into a flat line, but at a level close to that of continuous part-time work. Similarly, a move from part-time to full-time work, followed by a return to part-time, and eventually, full-time work again (Graph 2) is modelled by a gentle increase in the growth lines that does not reach the full-time level. There are times however when the general pattern is missed by the model. Such is the case of Graph 14 or Graph 24. In the latter case, a decrease (from standard part-time work to worklessness) then two waves thereafter move to part-time work, which may indicate a sequence of unemployment is captured as a flat line. In the former case, and perhaps more surprisingly, an increase from marginal part-time to longer part-time, followed by a move to worklessness at the next wave time translates into a gently decreasing line. This seems to indicate that ‘plateaux’, continuity between waves is necessary in order for the model to record involvement levels properly.
Figure 5.2: Observed and model-predicted involvement transitions in the UK

Involvement in paid work at each wave (0 = economically inactive, on maternity leave, unemployed; 1 = working less than 16 hours; 2 = between 16 and 30 hours; 3 = more than 30 hours per week). 42 actual trajectories of mothers of at least one child aged under six and the corresponding growth line predicted by Model 1 in Table 5.4; Data: pooled UK Longitudinal LFS 2002-2007.
As expected, these results in themselves do not yield much substantive information, in the absence of other groups with which to draw comparisons of involvement continuity and intensity. However, identical models fit to a sample of fathers of young children and childless mothers (not shown) yielded growth lines that were characterised by flatter slopes, an indication that increases in involvement from a presumably low initial level of participation could be the dominant message that can be drawn from these results.

In the next section, I briefly present an attempt at further refining these initial results by exploring whether the existence of distinct trajectory classes was supported by the data.

5.2.3 Alternative models

Different classes of trajectory?

Based on the knowledge gathered in Section 5.1, an exploratory analysis of the relevance of a growth mixture model, which would allow identifying several 'latent trajectories' of involvement, was carried out. The outcome was not deemed satisfactory enough and this option was not pursued further. Results are shown as Model 2 and model 3 in Table 5.4, respectively a two and three latent class model. Although the applied literature seems to consider the issue of identifying classes to be merely a technical one, this question deserves more attention to the extent this has a direct impact on the postulated nature of the latent variables – do the results presented below uncover real groups of respondents, or a convenient data reduction device (Bollen 2002).

The fit statistic, the sample-size adjusted Bayes Information Criterion sBIC (Yang & Yang 2007) as well as the traditional BIC indices (not shown) (Schwarz 1978) for these two additional models confirmed that the two class version represented a significant improvement over the single class one, although some caution is still required when making such assessment (Bauer 2003). The entropy criterion (Celeux 1996) also indicated a reasonably good quality of the classification of respondents in each class. This model allowed us to identify a 'continuity' class (characterised by a low a value of .02 of the slope factor) and an 'increase' class where a sharper positive slope (1.31) is visible. The two classes identified in the model are nevertheless of a limited substantive interest, given that the absence of statistical significance of the slope estimate in the stability class, which indicates that the variability of trajectories of respondents in that class remain heterogeneous.
A limited confirmatory analysis was nevertheless attempted. Two strategies were followed in order to try and make the model reflect the data more faithfully. The first one consisted in identifying three classes, based on presumably typical trajectories (involvement increase, decrease and continuity, the former two designed in order to catch the returns to and departure from paid work). A second strategy consisted in trying to uncover a ‘transition’ alongside a ‘continuity’ class, the latter being subsequently divided into further classes of stable workless mothers on the one hand, and stable part- or full-timers on the other. Neither of them yielded significant result, either because of the size of the classes identified, or because identification problems were encountered.

These results are nonetheless interesting. They confirm that only a limited number of mothers experience a ‘clear’ trajectory during the period of observation – a sharp decrease or increase in their working-time, and that instead, many of them experience ‘some sort of change’ without an easily identifiable dominant pattern. For these and other (technical) reasons, I decided to proceed with the single class model for the remainder of the analysis. This was deemed an acceptable trade-off with model accurateness, given that the main purpose of this model is to set up a baseline against which, first, control variables, then regional differences, can be weighed. At the same time, given the visible heterogeneity of transitions and the fact and that the regression analysis might not reflect the differentiated impact of family formation and social position on stable trajectories and on transitions, I decided to repeat some of the analysis with a subsample made of transitions only – i.e. respondents who experience a change in their level of involvement over 15 months.

Non linear growth models

The models discussed so far are based on the simple assumptions that involvement variability follows a linear pattern over time. Going back to Figure 5.2 presented in the previous chapter, we can see that there could be also a case for testing a non linear growth model, given the sharpness of some of the trajectories or their complex pattern, as visible for example in Graph 12, 16 or 19. As explained in Chapter 4, the parameterisation of the model would necessitate to free the factor loadings of the slope factor (involvement variability), which were set from 0 to 4 in the linear model, that is to have them estimated.

During an exploratory analysis, several such non linear models were tested but in the end were not retained given the mixed results they yielded in addition to their lack of impact on the regional results developed in the next
chapter. The exploratory analysis consisted in testing models in which two, three and four out of the five slope factor loadings were freed. With the exception of the latter, which failed to converge, all models tested represented a significant improvement in fit (as measured by the sample-sized adjusted BIC) over the linear one presented above which suggests that to some extent a quadratic growth model could be suitable to these data. The results are presented in Table B.1, in the Appendix. The best fitting models were those where three slope loadings had been estimated (Models B-D), and among these the one where only the first and the last loading remained fixed (Model C).

However, at the same time, all of these models bar one saw both the intercept and slope variances increase, suggesting that estimating non linear growth parameters does not perform very well as far as tackling the residual heterogeneity in the data. At the other end, model D where the last three loading, were estimated drastically reduced the intercept variance but failed to do so with the slope variance, while at the same time the sample size-adjusted BIC suggests that is does not represent an improvement over the linear growth model. Finally, non-linear model were also tested in the multilevel case discussed in the next chapter (not shown). In addition to yielding similar results for the individual level slope and intercept variance parameters than those just reviewed, this also failed to affect the regional-level results. For all these reasons, in addition to the necessity to limit the number of estimated parameters in order to avoid convergence issues with the full regional models.

5.3 The role of family type and social position

In this section I present the impact of social position and family formation on the modelled involvement intensity and continuity presented in Section 5.2.2. Since the main goal of this research consists in analysing regional divergences, and also given that the substantive association of these factors with mothers’ involvement has already been documented in previous research (see Chapter 2 and 3), I will not dwell much on these main effects. Instead I will be focusing on how the effect of these factors translate into the growth model as an introduction to the next chapter, where these variables are used to control for composition effects of in the analysis of regional contrasts. I begin by a brief reminder of the rationale behind the selection of dependent variables used in the model, then discuss the results proper.
5.3.1 Control variables

Before testing the composition hypothesis in the next chapter and look at the impact of control variables on the regional differences in involvement, in order to account for the most likely factors influencing mothers’ participation in paid work. More detail about this selection is available in Chapter 4. One of the difficulties encountered with fitting such a model is that, given the large number of factors influencing involvement, and that only a limited number among them can be used in the regression, it is likely that unobserved heterogeneity will remain, leading to bias in the estimation of the effects of the control variables. For instance, it is likely that the income of a respondent’s partner interacts with her level of involvement, as is also the case of ethnicity. However both measures are not directly available in the dataset, or would involve too few respondents and/or could cause selectivity bias (for instance of respondents without a partner, or with a partner without an income).

It is also likely that some degree of endogeneity is present in the model – for example, participation is likely to be affected by the occupational class of respondents, which is also the result of participation itself, or because as mentioned above variables not included in the model may affect both factors simultaneously. The same could be true to some extent of educational level, in the case of young mothers having to leave full-time education in order to earn a living. In addition, such independent variables are likely to be related with each other – for instance the years of education with occupational level or the number of children, thus also causing multicollinearity, leading to some these estimates not to be reliable.

There are no easy answers to these problems. Within the limited space of this dissertation, and given that my interest lies more in the structure of the regional (level 2) residuals of the model rather than on the exact value of these main effect coefficients themselves, I considered these an acceptable constraint. However, the extent to which existing the coefficients were altered when additional variables are introduced in the model was constantly monitored during the model selection process, and no significant change (loss of significance, change of coefficient sign) was observed.

Family formation patterns were controlled for by three variables:

Age of the youngest child which allows drawing a distinction between mothers of very young children, requiring sustained care, from those already more independent. In the UK, it is also likely that the provision of free childcare for up to 20 hours per week for children aged three and above
could reinforce the impact of this factor. This variable was measured as a dummy with zero to two years as the reference category, against three to five;

**Number of children** This factor is known to heavily affect women’s participation in employment, as was visible above in Section 5.1 as well as Chapter 2. This factor was operationalised by a dummy variable with one child as the reference category, and two and more otherwise. Even if the descriptive analysis showed that the largest contrasts in the involvement of mothers occurred between families where up to two children are present, as opposed to those with three or more children, at the same time the vast majority of respondents in the sample (three quarters) have either one or two children and thus it made more sense to focus on the differences between them.

**Partnership status**, since the employment participation of single mothers is notably lower than those married or cohabitating. This was captured by a dummy variable, having a partner as the reference category.

Social position was measured by another three indicators:

**Educational attainment** was controlled for by using the age at which the respondents left full-time education measured as a continuous variable. This indicator, was meant to represent a proxy for the career expectations of respondents for economic (time invested in pursuing studies) as well as cultural reasons (the positive image of pursuing a career among highly educated women.

Whether respondents were **currently employed in professional or managerial occupations**, or had been up to eight years before the survey. The reference category was any other occupation, including those who never had one. This was meant as a way to complement the effect of education and reduce unobserved heterogeneity in the model. I used as a single dummy variable, as opposed to controlling for the full range of the occupational ladder as a way to reduce the risk of endogeneity present in the model. In addition, controlling for this particular occupational class was consistent with testing composition effect in urban areas, known to provide skilled jobs opportunities in the service sector.

**Age** The age at which women decide to have children was considered as another indicator of their social position since it is well known that women
who invest in career tend to delay the timing of their first birth.

The results for this model are presented in the next section.

5.3.2 Results

We can now turn to the impact of the independent variables on involvement of the full sample of mothers (Table 5.3.2 which presents the results of the latent curve model fit to the full sample, as well as the subsample of respondents who experienced at least one transition. A full version of the models is available in the appendix. A graphical representation of the effect of the variable is also presented in Figure 5.3. We can see that the expected relationship could be observed between the level of involvement, occupational class and family characteristics. Mothers of very young children or those who had more than one child were more likely to show a lower involvement level – i.e. a lower intercept of their growth line – over the period of observation than respectively those with older children or first-time mothers. At the same time, they had significantly sharper slopes, confirming that overall mothers at a lower level of participation tend to have a ‘mechanistic’ tendency to return to work at some point while their youngest child remains under six. Similarly, those married or cohabitating with a partner had a higher level of involvement – denoting the difficulty of combining paid work and motherhood when no additional source of income or support with childcare is present.

In the model fit to the full sample of respondents (Model 4), both controls for education and occupation show a strongly significant relationship with the overall level of involvement. Looking at the impact of occupational class, one can see that by comparison with any other mother, respondents who are or have been occupied in professional or managerial occupations in the last eight years are also more likely to have a higher overall level of involvement. This is further confirmed with the variable accounting for education: each additional year of full-time education increases the value of the intercept to a larger extent than any other covariate in the model. Finally, by contrast with the above results higher social position at least as measured by educational level is associated with more continuity: given that the mean slope parameter is slightly positive, a negative coefficient thus makes this parameter get closer to 0. However this is not the case of social class.

The overall pattern of association between the independent variables and the rate of change in involvement is weaker, both in terms of the strength of
Table 5.5: Involvement, family formation and social position

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<tr>
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<th>Model 5</th>
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Standardized regression coefficients, five waves (15 months) Latent growth curve model of involvement in paid work (4 categories of working-time). Model 4 is fit to the full sample and Model 5 to respondents who went through at least one change during the period of observation. Data: pooled Longitudinal LFS 2002-2007. Base: 13,784 and 5,940 transitions.
the coefficient and the number amongst them who are statistically significant. Neither age, occupation, nor educational level seem related to the slope of the growth line. Family composition is more strongly associated with this parameter however: having an older child has a negative impact on the slope of the growth line, possibly because when mothers of have older children they also are already involved at a higher level of intensity, therefore less likely to further increase their participation. This interpretation is reinforced by the fact that the opposite effect is observed with the variable controlling for whether respondents are single mothers.

Figure 5.3: Involvement, family formation and social position in the UK

As far as the subsample of transitions is concerned (Model 5 in Table 5.3.2) we can see that the result are broadly similar to the above, with the notable exception of the occupation: respondents who are or have been in a professional/managerial occupation are clearly experiencing a sharper increase in involvement while at the same also enjoying higher level of intensity at Wave one, which probably reflect the likely prevalence of full-time work among them. This should be interpreted as the fact that even when experiencing a transition, mothers in high social position or more favourable family situation are likely to
be caught in the sample working or working at a relatively high level of working
time a possible sign that returns to work happen earlier, and that decreases
in participation are less common than among other mothers of children under
six. Another result is that the coefficients for the age of the youngest child
and occupational class are higher than in the previous model (twice as big
for occupation), which is seems to indicate that stable respondents have an
‘obscuring’ effect of on the estimation of change over time.

Overall, these results should come as no surprise and confirm the well
known impact labour supply variables have on women’s participation in em-
ployment. Again, the main merit of this model is to provide a basic model of
participation, against which regional variations can be compared. It is how-
ever interesting to see the way these otherwise well documented labour market
processes translate within the framework of a growth model, and the added
value of being able to measure simultaneously these effects on the intensity of
involvement in paid work, and its variations over time.

5.4 Summary

In this chapter I have sketched a descriptive overview of the involvement in
paid work of mother of children under 6 in the UK at the national level, both
from the angle of its intensity and its continuity over time. Most of the res-
ults confirm the literature reviewed in Chapter 2 and 3, in some case bringing
additional evidence about this particular subgroup of women, in particular as
far as the longitudinal dimension of involvement is concerned. We saw that
clear transitions such as returns back to work or entries into full-time workless-
ness represented a minority of the trajectories observed, the dominant pattern
being that of complex sequences often including both marginal and standard
part-time work, together with worklessness. These confirmed the need stated
in Chapter 2 two for a method allowing to summarise this complexity and
make it more intelligible.

I then presented a first application of the latent growth framework de-
veloped in Chapter 4, in its two variants of Latent Growth Curve and Growth
Mixture, the former consisting in using a unique growth line to summarise all
the transitions present in the data, the other one in identifying several lat-
ent involvement trajectories. The former approach was finally adopted, and
further analysis showed it provides a reasonably good fit of the observed tra-
jectories of the respondents. Finally, for illustration purposes I conducted a
limited analysis of the impact of family characteristic and social position (education, age and occupation) on the growth model, showing that they tend to have a more pronounced effect on intensity than variability of transitions. Unsurprisingly, mothers with more constraints and less resources tend to have lower levels on involvement intensity, whereas those with older children tend to enjoy trajectories that are more stable than average.

Keeping these results in mind it is now time to turn to the regional analysis of involvement.
Chapter 6

Babies and places: geographies of involvement in the UK

6.1 Introduction

In the previous chapter I presented an initial overview of the characteristics of involvement in paid work of mothers of young children at the national level in the UK which included a first presentation of the Latent Growth Curve modelling framework. In this chapter I move on to the next step of the UK case study and provide an in-depth analysis of the regional differences in the two dimensions of involvement defined above: the level at which mothers engage in paid work – intensity – together with the extent to which they experience changes across time – variability. The analyses presented in this chapter rely both on bivariate descriptive statistics and a multilevel version of the model presented in the previous chapter. Its aim is to answer the three research questions defined in the previous Chapters: whether involvement differentials could be related to regional imbalances in the composition of the labour force of mothers; whether differences in the quantity and the nature of the jobs available at the regional level might account for them; in addition, whether evidence may be found that orientations to work and regional histories of gendered involvement could play a role as well.

These three sets of questions should not be seen as mutually exclusive, but instead as analytical layers complementing each other, each one adding up to the understanding of involvement. The first two rely on traditional statistical modelling, attempting to reduce the unexplained regional variations in involvement by adding control variables into the growth model presented in the previous chapter at the individual or regional level. The last one, by
contrast, relies on non systematic evidence, including findings from historical research, in an attempt at triangulating the quantitative results.

The chapter is organised as follows: in Section 6.2, I draw a detailed regional picture of involvement, looking both at countries of the UK and English regions. This is then followed by an initial assessment of the regional differences in involvement computed by a Latent Growth Curve model in Section 6.3. In Section 6.4 I discuss the composition hypothesis by comparing results from the empty and full models and assessing the amount and pattern of variance reduction between them. This is followed in Section 6.5 by the labour demand hypothesis which is tested by adding controls for regional level differences in jobs available to mothers, but also male unemployment, and similarly examining its impact on the regional variance. Finally, in Section 6.6 I consider the third research question and the role of orientations to work.

6.2 Assessing involvement across regions

In the previous chapter I have drawn a descriptive picture of the involvement in paid work of mothers of children under six in the UK, using cross-sectional and longitudinal data. Specifically:

- Looking at involvement from a cross-sectional perspective shows that at any time between 2002 and 2007, about half of the mothers in the sample were jobless, a quarter working standard part-time (between 16 and 30 hours per week), less than one fifth full-time, and 10% on short part-time (less than 16 hours per week).

- Over a period of 15 months, two fifths of the sample remained jobless while not on maternity leave anymore, whereas about another two fifths experienced some form of transition. Among the remaining mothers, stable full and part-timers were distributed evenly, but represented less than 10% of the full sample each.

- The analysis confirmed an association between the intensity of involvement, and the variability of participation in paid work: mothers continuously involved were more likely to work full time at any wave than those who experienced a change in their working time even if they had been in paid work at all waves. In turn, the latter tended to be employed at a higher level of working time than mothers who experienced a period of worklessness at one of the waves.
- A small majority among mothers who experienced a transition kept working the same number of hours after 15 months. Another third scaled down their participation, whereas only one quarter increased their involvement. This however does not indicate whether a change of employer took place at the same time.

- Beside the significant minority of mothers undertaking clear transitions, such as a return to work or a move to a period of worklessness, the analysis also confirmed the existence of a high degree of heterogeneity among the respondents' transitions, with the majority of them involving more than one move over a period of 15 months.

Against this background, this section is dedicated to the description of the regional disparities in involvement of mothers as observed in the Longitudinal Labour Force Survey (LLFS) data looking both at their intensity and variability. I draw a distinction between the patterns observed at the level of UK countries and then those specific to the English Government Office Regions, on the ground that countries of the UK have their own economic and social histories and more recently, some degree of political autonomy, by contrast with the more centralised England. On the other hand one might also argue that crucial similarities between the socio-economic characteristics of a number of English Government Office Regions and UK countries are also apparent. For instance, a significant portion of Wales is made up of areas formerly dominated by the coal and metalworking industries, and characterised by a relative high level of poverty and public sector employment, bringing them close to the North East of England in that respect. I will dedicate more space to the analysis of involvement variability since combining large sample size and a longitudinal dimension represents one of the strengths of the LLFS.

### 6.2.1 Involvement intensity

In order to assess the regional differences in involvement intensity of mothers of children under 6 it is necessary to simultaneously examine the two dimensions of working-time and participation in employment. Figure 6.1 summarises these two aspects by plotting regional employment rates and the proportion of part-timers (16 to 30 hours per week) among mothers of children under 6, which shows the relationship between them. This picture is however partial since, depending on the region, mothers not employed on standard part-time work will either work on marginal part-time (such as is the case in the South East)
or instead on full-time (as in Manchester). More comprehensive information is available in Table A.1 in the Appendix.

Countries of the UK The involvement of mothers of children under 6 in three out of the four UK countries stands out as different from the majority of the English Government Office Regions as is visible in Figure 6.1. At around 58%, altogether mothers in Scotland are characterised by the highest levels of employment in the UK, slightly higher in the North Eastern part of the country than in Strathclyde, which is also the most populated part of Scotland. At the same time the contrasted prevalence of part-time work suggests that the types of jobs involved in both parts of the country are likely to be different. The employment of mothers seems to rely to a larger extent on jobs involving longer hours in Strathclyde than in the Rest of Scotland. This is the result of a relatively high prevalence of both full-time and standard part-time work in Strathclyde, whereas the rate of both standard and marginal part-time work (less than 16 hours per week) is higher and closer to the national average in the rest of the country, around 22%, against 16%. Relative to men also, the participation in employment of mothers in Scotland is also among the highest in the UK.

By contrast, mothers in Northern Ireland are characterised by a employment rate that is close to the national average, at around 54%, but at the same time which is associated with one of the highest rates of full-time work of the UK, second only to Inner London, and conversely a very low rate of part-time work. This combination is interesting in that in other places of the UK that are characterised by a high employment rate, the general trend is to have instead a high comparative level of part-time work. Finally, mothers in Wales have a pattern of involvement distinct from Northern Ireland and Scotland, but similar to the one prevalent in England, actually lying within the English average both in terms of employment rate (54%) and prevalence of full-time and standard part-time work (19%). The only exception is the employment participation relative to men, which is high by comparison with England, and likely to be related to the prevalence of male joblessness in the country.
Figure 6.1: Standard part-time work and employment rates in UK regions

Employment rates (ILO definition) and proportion of respondents working 16 to 30 hours per week by Government Office Regions, Metropolitan Counties and countries of the UK. Base: all mothers of children under six; N: 13,784. Data: 5 Waves Longitudinal LFS 2002-07. Inner London not shown due to its low employment rate (36.8%). The red lines represent the average figures for the UK.
English regions  Looking now at the same data for England, four main configurations of involvement intensity emerge, some of which are similar to the ones just described. At one end of the spectrum, mothers in the West Midlands and the North West (not including the large conurbations of Birmingham, Greater Manchester and Liverpool) have levels of participation in employment that are clearly higher than in the rest of the country. These are close to those observed in Scotland with, at the same time, levels of part-time and full-time work around the average for the UK. At the other end, Greater London, and to a lesser extent Birmingham and the Leeds-Bradford conurbation have low levels of employment among mothers (under 50%), but again with a contrasted picture in terms of working-time: in the former two areas low participation goes together with comparatively high prevalence of full-time work, whereas the opposite is true in South Yorkshire where part-time work, in particular marginal part-time is more common (at 24%, one of the highest rates of the UK).

If we focus instead on working time, we can see that three types of areas are characterised by a high prevalence of part-time work, including marginal part-time work. Mothers in the South East of England, including East Anglia, have employment rates close to the national average, between 50% and 55%, at the same time as a high prevalence of part-time work, especially marginal part-time. Mothers in the South West also seem to rely heavily on part-time employment, although at the same time they are characterised by high employment rates, close to those in Scotland. At the other end of the continuum, Liverpool and Manchester are characterised by employment rates close to the national average, together with a comparatively high proportion of mothers of young children being employed full-time. It does not need mentioning that London, especially Inner London (not shown on the graph), represents a league of its own, with both the highest levels of full-time work in the country together with the lowest levels of employment (36.8%).

6.2.2 Involvement continuity

At this stage, we are still left with a static picture of a reality that by essence is dynamic, and should be complemented by an overview of the regional differences in involvement variations over time. I consider three main aspects here: the degree of stable or maintenance transitions which are visible in Figure 6.2; the outcome of transitions (Figure 6.4) as well as their number (Figure 6.3). This should provide a few hints about the employment dynamics at work
within regions in the UK.

The first conclusion is that a correspondence is visible in Figure 6.2 between the areas characterised by high levels of either working-time or employment among mothers of young children and those similarly characterised by high levels of respondents continuously engaged in paid work over 15 months, indicating that this is stable involvement that lies at the core of regional involvement intensity differentials. This is understandable even for statistical reasons since women in a given continuous state of involvement are more likely to be captured in cross-sectional snapshots of the labour market at that level. Thus it is not surprising to see that, whereas London, South Yorkshire and the West Midlands are all characterised by high proportions of mothers who are not involved in paid work for periods of at least 15 months in a row, 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.

Figure 6.2: Involvement variability over 15 months in the UK

The second conclusion is that there is some limited evidence of a correspondence between the degree of involvement intensity, and the variability of involvement, as denoted by the proportion of mothers engaging in either none, one or more than one transitions (Figure 6.3). Regions where mothers’ in-
Volvement tends to be more static than elsewhere are those where the degree of involvement intensity tends to be low, as is the case in London, Birmingham and South Yorkshire, which reflects the fact that the dominant group in these areas is made up of stable carers. At the opposite end, some of the regions characterised by high levels of involvement intensity also tend to be those where more mobility is visible. Such is the case for instance of the Rest of the West Midlands and North-Eastern Scotland. It is of course not possible to determine whether these high levels are due to job mobility or working-time flexibility within the same job. At the other end, Strathclyde is characterised by a higher than average degree of stability and the Rest of the North West does not stand out with respect to the number of mothers’ transitions. In the South East and the East of England, by contrast, a relatively high likelihood of experiencing transitions is combined with a high prevalence of stable part-time work, especially involving less than 16 hours per week.

The third conclusion is that there is no clear correspondence (Figure 6.4) at the aggregate level between the intensity of involvement and the outcome of the transitions undertaken between Wave 1 and Wave 5 of the LLFS - whether they lead to increases, decreases or instead are associated with stable levels of involvement. For instance, Scotland is characterised by comparatively low proportions of involvement decreases over time among respondents who went through a transition, together with the already discussed high level of continuous intensity. However the same is also true in the case of the West Midlands, where we already know that involvement intensity is low. Northern Ireland shares a similar pattern of transition type, together with Merseyside and the Birmingham conurbation, where a decrease in involvement is visible, but again without any clear pattern of association with the other indicators reviewed. At the opposite end, one can find areas as diverse as Wales, Scotland and the North East, all of which tend to be characterised by a higher than average proportion of mothers increasing their involvement, but with heterogeneous aggregate levels of either employment or working-time.

Greater Manchester and Northern Ireland are two interesting cases that stand out in the analysis. Whereas both are characterised by unremarkable employment rates (between 50% and 55%, closer to 50% in the case of Manchester), at the same time the latter is characterised by a high degree of stability, whereas the opposite is true of the former. In Northern Ireland, only 25% of mothers of young children experience at least one transition over 15 months, against a national average of 40%. At the same time, a clear majority
of these transitions lead to decreases in involvement (41% against a national average of 30%). Together with the large proportion of mothers employed on stable full-time, this creates a unique pattern.

Manchester, by contrast, is characterised by a much higher proportion of mothers experiencing at least one transition, in fact the highest in the country at 46%, corresponding to small proportions of stable carers and a high proportion of stable full-timers over 15 months. Although the type of transitions observed at the aggregate level is unremarkable, identical to the national average, the combination of both aspects results in mothers in Manchester being probably among the most likely to be involved in paid work at any time, even if not necessarily in a stable fashion. A closer scrutiny of the actual transitions undertaken reinforces this conclusion. There is a higher proportion of mothers already engaged in paid work, who step up their working-time at some point, in Manchester than in the rest of the country. They typically move from standard part-time to full-time work, 34% against a national average of 22%, or even from marginal to long part-time work. However, the small number of observations involved requires a cautious approach.
Summary

In the above section, we have learnt that there are significant spatial variations in the overall level of involvement in paid work of mothers of children under 6 seen within both countries of the UK and English regions. This holds both from the point of view of working time or participation in employment. Higher than average levels of involvement intensity were found in Scotland, the Rest of the North West and of the West Midlands and to a lesser extent, the East Midlands. By contrast, in the large urban areas of Greater London, the Birmingham area, Greater Manchester, and Merseyside, lower than average levels were observed, made of a low employment rates but at the same time higher numbers of mothers working full-time. Most other areas, whether in the North East, Wales or the South of England, stood somewhere in between these two opposite poles.

This overview has also shown diverse patterns of involvement variability over time across regions: in some areas of the South apart from London, the norm is a move towards part-time or marginal part-time work, whereas in Inner London and part of the North East, mothers tend to be more likely to move to full-time work. It is also worth noting that at the aggregate level there is no clear relationship between the number of transitions undertaken by...
mothers, involvement intensity nor the outcome of their transition: regions in
which mothers have a high degree of involvement are no more/less likely to
either increase or decrease their participation, whereas the opposite is true at
the \textit{individual} level, as we saw in the previous chapter.

This section has further demonstrated that the complex patterns of in-
volvement in the data highlight the need for a method which is able to both
summarise them while retaining their most salient aspects. This leads us nat-
urally to the Latent Growth Curve models presented in the previous chapter,
which allowed us to summarise complex longitudinal patterns of participation
and to take into account their regional dimension. In the following section I
introduce the initial results of this analysis where longitudinal and regional
aspects of involvement are jointly modelled. A first assessment of the overall
importance of geographies is also presented.

6.3 Multilevel modelling of regional differences

In this section I begin the analysis of the patterns of involvement in paid work
where intensity and variability are taken into account, while simultaneously
allowing for an assessment of the regional dimension. Table 6.1 presents the
result of the multilevel model without control variables, which confirmed the
existence of significant regional level variations in involvement. I will begin
with a brief reminder of the technique used before moving to a description of
the results.

Within the latent growth curve modelling framework presented in the pre-
vious chapter, individual involvement trajectories over 15 months are concep-
tualised as growth lines. We also saw that the lines predicted by the model
achieved a good level of accuracy when summarising transitions of the mothers
in the sample, which should be retained as a significant result of this research.
In Chapter 4, we saw that the initial level of involvement intensity is captured
by the line's \textit{intercept} ($Iw$), and change over time or variability as its \textit{slope}
($Sw$). The $w$ denotes the individual or ‘within’ level of analysis, and both
intensity and variability are described by a mean and a variance. To the indi-
vidual means and variances of intensity/variability discussed in the previous
chapter, the multilevel version of the model adds another set of means and
variances of intensity and variability and their covariance, this time defined
at the \textit{regional} level. Following the same terminology as employed previously,
these are called respectively $Ib$ and $Sb$, with $b$ standing for ‘between’. Al-
though in theory there are 10 parameters to compute, in effect only seven are estimated in order for it to remain identifiable. As a result, the mean value of involvement variability is estimated at the between level only, whereas the variance and covariance are computed at both individual and regional levels. Finally, as previously, the mean intensity is constrained to 0, also for identification purposes. The parameters of interest at this stage are the regional intercept and slope variance (\(\sigma^2_{Ib}\) and \(\sigma^2_{Sb}\)) and their covariance, shown in Table 6.1, which provide an initial indication of the extent and the pattern of the regional structure of involvement.

The results show that both for the full sample and the subpopulation of mothers who undertook a transition, statistically significant regional differences were observed at the .05 level. In both cases, it is mostly the variance of involvement intensity that is statistically significant, meaning that it is mostly differences in the propensity for women to work part-time, full-time or instead not to carry out any paid work at Wave 1 that constitute the most salient feature of the regional differentials. However, as the descriptive analysis has showed earlier, this is likely to capture the differences in stable involvement between regions, given that overall maintenance transitions are the most common ones. At the same time significant differences were also observed as far as the level of involvement intensity of respondents who changed their working-time at one of the waves is concerned. We can also notice in passing that, as expected, the individual level results are close to those presented in the previous chapter in the single level model, including the mean variability value now estimated in the regional part of the model.

By contrast, geographical differences in involvement variability, that is the departures over time from this initial level – the slope factor in the growth model \(\sigma^2_{Sb}\) – are only statistically significant at the .1 level. Although they appear much smaller than the previous ones, their standardised values computed in another version of the model not shown here indicated that in fact their value is very close to that of involvement intensity variance. However, their weak statistical significance does not signify the absence of noticeable differences in maternal transitions between individual regions, as we shall see.

Next we need to assess how the model describes the regional patterns of involvement that were analysed in the Section 6.2. Figure 6.5 presents a graph in which the predicted variance of intensity and variability are plotted against each other for each individual region. The two sets of lines represent the upper and lower limits of the .95 confidence interval of the corresponding parameters
Table 6.1: Involvement variations across regions of the UK

<table>
<thead>
<tr>
<th></th>
<th>Transitions only</th>
<th>Full sample</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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<tr>
<td><strong>Main effects (individual level parameters)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept (intensity) mean $I_w$</td>
<td>Constrained to 0</td>
<td></td>
</tr>
<tr>
<td>Slope (variability) mean $S_w$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept variance - $\sigma^2_w$</td>
<td>8.56*** (.37)</td>
<td>54.50*** (2.27)</td>
</tr>
<tr>
<td>Slope variance - $\sigma^2_w$</td>
<td>.88*** (.04)</td>
<td>1.20*** (.08)</td>
</tr>
<tr>
<td>Slope-intercept covariance</td>
<td>-1.96*** (.10)</td>
<td>-3.21*** (.24)</td>
</tr>
</tbody>
</table>

**Regional-level parameters**

|                  | Constrained to 0 |                |
| Intercept (intensity) mean - $I_b$ |                |                |
| Slope (variability) mean - $S_b$ | .18*** (.02) | .21*** (.02) |
| Regional intercept variance $\sigma^2_{I_b}$ | .03* (.01) | .66* (.27) |
| Regional slope variance $\sigma^2_{S_b}$ | .00+ (.00) | .00+ (.00) |
| Slope-intercept covariance |                |                |

Means, variance and covariance of the individual- and regional level intercepts (intensity) and slopes (variability). 5 waves latent growth curve models of involvement, 4 categories working-time status of mothers of children under 6.  

* Subsample of respondents who experienced a change in their involvement over 15 months. Data: pooled Longitudinal LFS 2002-07.  

* Significant at .1  

** at .05;  

*** at .001. Standard errors between brackets.

The means slope and the mean intercept), represented in order to give an idea of the importance of the regional deviations from the mean value. Once again, the metrics of the plot do not have a substantive interest, since we are only interested in the relative differences between regions.

We can see that the results confirm what we learned in Section 6.2 and provide a reasonably faithful picture of the combined regional employment trends just highlighted. The initial picture that emerges, however, sheds additional light on the previous analysis. It appears clearly now that most of the geographical variation is concentrated within a limited number of areas, less than half of all regions and countries of the UK. By contrast, the remaining areas – all of them English regions – have residual involvement intensity and variability that do not depart markedly from the parameter estimates. Another conclusion is that of an asymmetry of the regional differences in involvement intensity. Indeed, in a majority of the GOR and countries of the UK that can be considered outliers, mothers tend to be overall less involved than average over the period of observation. In only two or three of them, among which Greater Manchester and Strathclyde and the Rest of the West Midlands, is the overall involvement intensity significantly higher than average.

By contrast, a more even distribution of involvement variability over time—whether increase or decrease in participation—can be observed, which probably
reflects the lower significance of the mean slope parameter in Table 6.1, since only four or five regions, such as West Yorkshire, Northern Ireland, Wales, Inner London and maybe also the South East stand out in that respect. A clearer picture of the transitions can be obtained by looking at the subsample of mothers who experienced at least one change in their involvement over the period of observation (Figure 6.6) in which we notice that, on top of what has already been observed, mothers in the West Midlands and Strathclyde have their own specific pattern of change, that is a decrease from an already low level of involvement. The difference between that picture and the former is in part due to the uneven spread of stable mothers across regions.

It is also now clear that the areas with high levels of involvement intensity and transitions are not necessarily contiguous, which confirms one of the interesting conclusions to be drawn from this chapter: there is no clear overall North-South divide in the participation in employment of mothers of young children. Although it is in the North, in the North West of England, parts of the West Midlands and the South West of Scotland that mothers display the highest levels of involvement intensity else in the UK, mothers with the lowest levels of intensity can be found not only in the London area, but also in Sheffield. In terms of transitions, mothers in the South East and the South West show a similar behaviour to those in Leeds-Bradford or Liverpool, being more likely to scale down their participation.

I will not dedicate much space here to analysing the specific positions of individual regions on the graphs, since this would be in part redundant with the previous section. These pictures are nevertheless important because they provide a baseline against which the impact of the individual and regional level factors may be assessed in the rest of this chapter. For instance, the North West of England, including Greater Manchester, together with Scotland and the Rest of the West Midlands have the highest values of involvement intensity on the graph, which fits in well with the earlier analyses. We can see that the model strikes a trade-off between participation in employment and working-time which nuances the regional aggregate data previously shown in Figure 6.1. For instance, the fact that respondents in Greater Manchester have one of the highest regional levels of intensity is likely to correspond to the average aggregate employment rate combined with a comparatively high propensity for working full-time at any wave. Mothers in Strathclyde, for their part, have a very high employment rate, even if combined with a higher proportion of part-time work.
Figure 6.5: Predicted spatial contrasts in involvement in the UK – full sample

Regional values of involvement intensity (intercept factor) and variability (slope factor) residual variances (latent growth line model of involvement), full sample. The red lines represent the mean values of each parameter; intensity was constrained to 0 and variability is .215. N = 13,784. Data: 5 Waves Longitudinal LFS 2002-07.
Turning now to the regions at the opposite end of the spectrum we can observe that mothers in *Greater London*, and the *Sheffield* area are both characterised by a low level of involvement intensity, and a degree of variability over time that is higher than in most areas, which again confirms what we saw earlier in terms of either participation in employment or prevalence of part-time work. If we look at the differences between involvement levels at Wave 1 and 5 (Table not shown), one can notice indeed that in Inner and Outer London a significant proportion of mothers at Wave 1 tend to increase their participation to Full-time at Wave 5, whereas in South Yorkshire, the dominant move is towards part-time work. London in particular is characterised by a complex combination of a large number of mothers on stable worklessness and also a significant number moving from worklessness to full-time work, even if for a short period of time. A degree of caution is, however, needed here, given the small number of observations involved.

When only considering variations in involvement (the slope factor), shown in Figure 6.5, one can see that in Inner London and Wales mothers tend to increase their participation over time. In West Yorkshire and Northern Ireland, by contrast, and to a lesser extent, the South West, respondents tend to reduce their participation overtime, which seems to match an observed trend towards resuming paid work (after an interruption) at less than 16 hours per week. The picture of regional trends in transitions is, however, more precise in Figure 6.6, where only respondents who experienced a change in their involvement are taken into account.
Figure 6.6: Predicted spatial contrasts in involvement in the UK – transitions only.
Although the main pattern of variations is confirmed, it also shows that in Northern Ireland and West Yorkshire mothers who decrease their working-time tend to do so from a comparatively high level of intensity - which may, for instance, signal a complete retreat from paid work at some point. A similar trend has now also become apparent in the Birmingham conurbation. The opposite is true of Wales and Strathclyde where it appears that it is mothers with a low level of involvement who tend to return to paid work in larger numbers or at a higher level than elsewhere. More generally, comparing Figure 6.5 and Figure 6.6 provides an indication of the differences between regional trends related to mothers in stable involvement, and those related to transitions per se. For instance, we can see that the Rest of the North West and South Yorkshire have very similar patterns of transitions, although they show opposite trends as far as stable involvement is concerned. Now that we have gained a better understanding of the basic structure of the regional differences in involvement, we need to consider them in the light of the questions and hypotheses formulated in Section 4.2 in Chapter 4, that is the extent to which they can be related to systematic regional differences in the social position and family formation patterns of mothers themselves - the composition hypothesis - or instead to the number and type of jobs available regionally or regional differences in orientations to work.

### 6.4 Testing the composition hypothesis

In this section I examine the composition hypothesis by introducing individual control variables in the model and I also assess their overall impact on the intensity and variability of involvement, as well as the differentiated impact on individual regions. Specifically, the following hypotheses are considered at the individual level:

- involvement intensity is positively associated with the level of education as well as working or having worked in a professional or managerial occupation and negatively with greater family constraints (more/younger children);

- Mothers with a higher level of education/occupation should have more stable trajectories at a higher level of involvement, and sharper increases, denoting a greater likelihood of returning to full-time work;

Two hypotheses were also tested at the regional level:
• Once family formation patterns, and social position (education, occupation) are held constant, the overall regional variance should decrease;

• Similarly, some of the relative regional differences should wane, in particular the differences between large urban areas and the rest of the regions;

The preliminary analysis conducted in the previous chapter showed that, as expected, the behaviour of women in a higher social position or with fewer or older children translated in the model into higher levels of involvement over 15 months – larger intercept values of the growth lines – together with flatter trajectories (slopes), meaning more stability over time. Conversely, mothers with less favourable family formation patterns (i.e. more or younger children), or from a presumably less favourable social background showed lower overall levels of involvement, at the same time as sharper transitions. The first hypothesis of this research contends that the observed spatial contrasts in involvement could be due to differences in the social position and family types of mothers of young children, in other words to the fact that mothers with given skills or occupational levels, family formation behaviours (such as for example larger or smaller families) and their traditionally associated pattern of employment participation could be concentrated in some regions, among other as a result of internal and external migration within the UK. For instance, one could expect that women with high skills levels and/or in professional occupations would move to large urban centres such as London, Birmingham, Manchester where jobs matching their qualifications are more likely to be found. Although it is generally considered that female employment-related migration is less prevalent than that of men, it is also likely that this affects women to different degrees according to their position on the occupational ladder, as we saw in Chapter 2.

The overall strategy followed here consisted in examining the reduction in regional variance in involvement intensity and – even if its variance parameter was not found to be significant – variability that would occur as variables controlling for these characteristics were introduced. This was achieved by comparing the value and statistical significance of the respective slopes and intercepts estimates in the full model with those in the empty model. The effect of these variables on the individual variance of the main regional outliers previously identified, such as for instance Greater Manchester or London, is assessed. Details of the variables used in the model and their operationalisation have already been presented in Chapters 4 and 5. For this reason, they are only briefly recalled here:
Family formation behaviour was measured by three variables:

- Age of the youngest child in the family: dummy variable with 0-2 years as the reference category, against 3-5);

- Number of children: (dummy variable with two children as the reference category, more than 2 otherwise), since this factor is known to heavily affect women's participation in employment;

- Partnership status: dummy variable, partnered as the reference category.

Social position was captured by another three indicators:

- Educational attainment was controlled for with the age at which respondents left full-time education.

- Whether respondents were currently employed in professional and managerial occupations, or have been so in the last 8 years (reference category: any other respondent).

- Age is indirectly related to their social position, in that educated women are more likely to have children later on in life.

The discussion of the main (i.e. individual) effects of these variables on involvement intensity and variability has already been presented and will not be repeated here in detail\(^\text{42}\). In the previous chapter we saw that control variables showed that the well documented behaviour of women in a higher social position or with fewer/older children were translated in the model into higher levels of involvement over 15 months – larger intercept values of the growth lines – together with flatter trajectories (slopes), meaning more stability over time. Conversely, mothers with less favourable family formation patterns (i.e. more and/or younger children), or from a presumably less favourable social background showed lower overall levels of involvement, at the same time as sharper transitions.

6.4.1 Overall results

Table 6.2 presents the impact of each one of these variables as they were introduced stepwise in the model. Each line of the table represents a model with an additional control variable. The main conclusion to be drawn here is that controlling for the individual characteristics of mothers in the sample only marginally reduced the size and significance of regional variations in maternal
involvement intensity. In addition, this only occurred when family formation variables were introduced without control for social position. When the latter variables were added, the residual variance increased, hinting at the existence of further regional heterogeneity.

Table 6.2: Composition effects and involvement intensity in the UK

<table>
<thead>
<tr>
<th>Model</th>
<th>Full sample</th>
<th>Transitions only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Involvement intensity</td>
<td></td>
</tr>
<tr>
<td>1 Empty model</td>
<td>.66* (.27)</td>
<td>.034* (.002)</td>
</tr>
<tr>
<td>2 Age</td>
<td>.59* (.22)</td>
<td>.039* (.002)</td>
</tr>
<tr>
<td>3 Is single</td>
<td>.57** (.19)</td>
<td>.042* (.002)</td>
</tr>
<tr>
<td>4 Child older than 2</td>
<td>.56** (.19)</td>
<td>.042* (.002)</td>
</tr>
<tr>
<td>5 More than 1 child</td>
<td>.53** (.18)</td>
<td>.042* (.017)</td>
</tr>
<tr>
<td>6 Age left FT education</td>
<td>.69* (.28)</td>
<td>.043* (.016)</td>
</tr>
<tr>
<td>7 Professional and managerial</td>
<td>.69* (.29)</td>
<td>.045* (.018)</td>
</tr>
</tbody>
</table>

Variations in the involvement intensity regional variance by variable introduced stepwise in the model. 5 waves latent growth curve models, 4 categories working-time status of mothers of children under 6 in the UK. Data: pooled Longitudinal LFS 2002-07.

Accounting for family formation reduced the unexplained regional differences in involvement intensity in the model by approximately 24% (.53 against .66), whereas additionally controlling for social position unearthed additional variance, pushing it back to close to its original value (.69), which marked an increase of 25%. This hints at the existence of regional differences that could be obscured by imbalances in the repartition of the family formation patterns of mothers across regions, which is the opposite effect to the expected one. Since we only controlled for whether respondents were employed in a professional or managerial occupation or had been so at any time during the last 8 years, this suggests that significant regional differences lie in the involvement patterns of mothers of an average age, belonging either to the ‘manual’ or the ‘personal services’ class, who left full time education at the age of 16 and a half (the average age), and had one child under 2. In other words, unexplained regional differences in the behaviour of these women remain.

Interestingly, the opposite trend is seemingly at work on the regional variance among the subsample of mothers who went through a working-time transition. A 23% increase in the regional variance occurred by comparison with the initial model as controls for family types were introduced from .034 to .042. However this later decreased when the variables accounting for social position we included, from .042 to .036. In other words, the initial level of involvement from which mothers undertake a transition remains differentiated
across regions even when socio-demographic differences are accounted for. The other conclusion is that since the relative reduction of variance is equivalent to the one that occurred in the model fitted to the full sample, this indicates that the composition effect seems to hold equally for mothers who remained continuously involved over 15 months.

I will now examine the regional breakdown of these overall trends.

6.4.2 The composition effect across regions

Let us now turn to the changes in the spatial structure of the intercept residuals as variables were introduced stepwise in the model. In order to maximize the clarity of the graphs, only regions identified as outliers in Section 6.3 are presented here. Figures 6.7 and 6.8 show the stepwise changes in the regional variance in involvement intensity in the full sample then among the subsample of mothers who experienced a change in their level of involvement as individual variables were introduced.

Figure 6.7: Composition effect across regions of the UK – full sample

We can immediately notice the differentiated impact of the control variables between regions in Figure 6.5. In only a few regions could the overall pattern just highlighted – an initial reduction in variance due to family form-
ation controls offset by either education or occupational class – be recognized. Furthermore, it is only in a very limited number of cases that the control variables significantly reduce the unexplained regional variance of intensity below its original level, altering the relative position of one region vis-à-vis another. Among regions with a marked tendency for mothers to decrease the intensity of their involvement, only South Yorkshire sees a reduction in this unexplained variation, leading it to come below that observed in Outer London. The same holds for the decrease in unexplained involvement in the Birmingham area, relative to East Anglia. At the other end, the same is true of the Rest of the West Midlands, whose unexplained variation has now become lower than in Northern Ireland.

By contrast, in Greater London and East Anglia on the one hand, Strathclyde, Greater Manchester and Lancashire/Cheshire on the other the reasons why mothers show respectively low or high levels of involvement are not accounted for by the model and these regions retain their position of outliers. Furthermore, in the same areas, the variance has significantly increased to levels well above those in the initial model, hinting at the existence of significant regional differences in involvement for a given type of family formation and social position.

If we complement these results by examining the equivalent model for respondents who experienced a transition (Figure 6.8), we can see that in most cases the pattern of regional differences remain unchanged affected, in regions where mothers tend to have a lower than average level initial level of involvement. Turning now to the regions in which mothers had a higher than average level of involvement when going through transitions, some degree of reduction in regional heterogeneity occurs when controlling for occupation, with the notable exception of Northern Ireland, where an exceptionally high level of unexplained involvement is unearthed. Thus some of the specificity of the Rest of Yorkshire, and to a lesser extent, Greater Manchester or West Yorkshire, but this reduction is small compared to the original level of the variance.

In conclusion, we have seen that in three regions, differences in the nature of the labour supply of mothers, in particular their occupational class went some way towards accounting for their atypical levels of involvement intensity initially identified. These are the West Midlands and South Yorkshire on the one hand, that is the two regions with the lowest proportions of mothers in professional or managerial occupations in the UK, and the Rest of the West Midlands on the other, where, by contrast, this proportion is higher than
the national average. This reduction remains nevertheless limited. In the majority of regions with atypical (high or low) levels of involvement intensity, it is the opposite that is true and higher variance than in the empty model was uncovered by adding control variables showing noticeable differences in involvement intensity for given family types and social positions. In other words, we are still left with the task of explaining why mothers in London, Manchester and East Anglia, and, to a lesser extent, Strathclyde and the Midlands differ in their economic behaviour.

I will now briefly turn to the description of additional models where possible random composition effects are tested at the regional level before moving to the broader regional context in an attempt to further explain these results.

6.4.3 Random composition effects

In order to ascertain the robustness of these results, an exploratory analysis was carried out to detect the possible existence of random compositional effects, to examine whether some of the individual-level variables tested above might have a differentiated impact on involvement across regions, which might better account for the residual regional involvement intensity parameter. A significant
random effect was only found in the case of education (the years at which respondents left full-time education). Its small size, combined with its absence of impact on the significance of the residual regional variance did not justify integrating it in the main model discussed in this dissertation. Some of the results nevertheless suggest that more work will be needed in the future in order to explore this random effect, in particular in its interaction with the slope factor.

Examining the significance of a random effect for a given variable in the context of the models presented above amounts to testing whether the regression coefficient measuring its impact on involvement intensity/variability has a regional component, which differs in a statistically significant way from 0. So far indeed, the impact of the composition effect had been measured by whether or not the overall regional residual was significantly different from 0, whereas the regression coefficient themselves did not vary between regions.

It is reasonable to believe that factors such as education, occupation, or even partnership status could have a differentiated impact on involvement across space, for instance reflecting the fact certain jobs corresponding to certain qualification levels are more likely to be found in some regions rather than others. The existence of such a random effect could have several consequences on the models tested so far: it could decrease the size or the significance of the regional variance or alter the structure of the individual unexplained regional residuals in either involvement intensity or variability shown in Figure 6.7 above.

The results of this analysis, which are presented in Table B.4 in the Appendix, show that neither family formation\(^1\) nor occupation variables have a significant random effect on involvement at the regional level. However, the regional effect of education is significantly different from 0, even if very small (\(< .001\)). Once this variable was introduced in the model, the residual variance decreases noticeably, but at the same time its significance increased. The same results also suggest that the random effects are negatively correlated with both involvement intensity and variability. It should also be noted that with the only exception of the model in which the random effect for occupation was tested, none of them represented an improvement in fit as measured by the sample-size adjusted BIC. Finally, another noticeable impact of the model where the education is tested is that the regional slope variance has become

\(^{1}\)The model in which the random effect for the number of children was tested did not converge
significant – which could mean that an interaction effect is present in the model between these two parameters. Further work is needed in order to explore this finding more in depth.

6.5 The regional economic context

In this section I now move to the second set of hypotheses of this research and discuss namely that the broader regional economic environment determines the intensity and variability of mothers’ involvement in paid work, through variations in the number and the nature of suitable jobs for mothers, what economists call the demand side of the labour market. The argument has two facets which are explained in more detail in Chapter 3. The first one relies on the simple assumption that the characteristics of the jobs available at the regional level influence the participation of mothers of young children. These variations not only determine the number of jobs theoretically available, but also the extent to which they are suitable (related to the degree of working-time flexibility they allow, whether or not they conflict with school/nursery schedules, and the commuting time they involve), which may have a comparable limiting impact on participation. Of course, a detailed study of such availability was beyond the scope of this project.

The following regional aggregate indicators were thus used:

- Unemployment rates of mothers, assumed to be a negative measure of the quantity of jobs available;

- The degree of horizontal segregation, as an indicator of the availability of jobs compatible with the constraints of the respondents – i.e. being the main carer of young children. This was measured by the proportion of women employed in ‘female’ industries, that is employing at least 60% of women nationally (2 digits SIC codes). More operational details are available in Chapter 4.

Although related, these two indicators are not identical: whereas the former measures whether local conditions can adversely affect the quantity of jobs available to women, the latter is meant to account for their ‘suitability’, that is the extent to which they would suit mothers who are looking for jobs compatible with their caring role – usually identified in the public sector or female industries (private services, hotels and restaurants). A large share of the part-time jobs taken up by mothers in the UK is found in the low-skilled personal
services, or semi-skilled public sector employment, whereas a minority of skilled jobs may also be found either in the public sector, or in the private sector, in the latter case often in the financial/business services (See Chapter 2 for more detail).

Depending on the regional mix of such jobs and the dominant skills profile of mothers, both aspects may impact on the shape of involvement transitions. Specifically this meant considering the following hypotheses at the regional level:

- Higher levels of horizontal segregation should be associated with greater involvement intensity and modest upwards variability given the prevalence of part-time work jobs among women;

- Involvement intensity should be negatively associated with the regional level of female unemployment whereas variability should moderately be affected since unemployment is likely to signal obstacles to finding jobs;

- Similarly as above, it was to be expected that upon testing these effects the overall regional residual would decrease, and possibly would lose its statistical significance.

In addition, although not part of the aims of this research, the relationship between male unemployment and involvement at the regional level was also examined to capture the (perceived) likelihood for mothers to live in an area of ‘employment poverty’ which could make it necessary for them to engage in paid work as a result of actual or anticipated economic precariousness. Higher levels of male joblessness in some areas may signal respondents with an increased likelihood of having a partner that is not or under-employed or who might become so in the future. This in turn may act as an incentive for mothers of young children to remain in or go back to paid work earlier than they would have in other circumstances - irrespective of the degree of suitability of these jobs to them. Above all this was used as a test of the robustness of the indicator of female unemployment, given that as already noted in Chapter 4, for operational reasons, these variables were introduced listwise, in order not to cause convergence issues. Studying their combined effect is part of the plans for future research.

In operational terms, this means investigating the extent to which there is a relationship between levels of unexplained regional variance in involvement intensity and the indicators chosen to measure the availability of jobs for mothers at the aggregate level. Given its limited significance, and also for technical
reasons, the effect of factors will not be tested on variations in involvement variability. Their impact on transitions will be assessed indirectly by analysing
the impact on the subsample of mothers who experienced a transition during the period of observation.

Testing the existence of these systematic relationships amounts to measuring the association between the regional involvement intensity \( (Ib) \) analysed in the previous section and these aggregate variables. Technically this translates into adding an additional regression into the model, in which \( Ib \) becomes an independent variable and is regressed against the regional indicators. The impact of these variables can then be measured by the significance of their regression coefficients themselves and by their effect on the residual variance of involvement intensity \( \sigma^2_{Ib} \), for both the full sample and the subpopulation of respondents who went through a transition.

It should not be forgotten that these relationships are only computed for a small number of observations – the 20 English GOR and UK countries – and that the outcome of this analysis should be seen at best as a very rough approximation of a relationship which is not necessarily linear if it exists. This is especially true here, given that we already know that only about one half of the regions stand out with atypically large or a small value of involvement intensity, with the rest showing very similar values. A further limitation is that modelling constraints allowed for only one of these variables to be tested at a time, thus not allowing for taking into account of any joint effects.

Results

The main results\(^2\) of this analysis are shown in Table 6.3. Even if each variable introduced in the model improved its overall fit, the main conclusion we can draw is that there is limited evidence in favour of the second hypothesis as far as the full sample of mothers is concerned since only one indicator was found significant. At the same time, more of them we found significantly associated with involvement intensity in the subsample of respondents who went through a transition, since the residual variance became non significant after the control for male unemployment was added to the model. In the case of the full sample, the added value of this approach was found to be limited since introducing regional covariates did not reduce the relative regional heterogeneity, to the contrary, which is the opposite effect than expected.

In the case of the full sample, Table 6.3 shows that a significant association

\(^2\)The full results can be found in Tables B.2 and B.2 in the Appendix.
Table 6.3: Regional job availability and involvement intensity

<table>
<thead>
<tr>
<th>Regional-level variables tested</th>
<th>Sample</th>
<th>In transition$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\gamma$</td>
<td>$\sigma^2_{\beta}$</td>
</tr>
<tr>
<td>1. No regional covariate</td>
<td>—</td>
<td>(.29)</td>
</tr>
<tr>
<td>2. Horizontal segregation</td>
<td>-.06**</td>
<td>.42**</td>
</tr>
<tr>
<td></td>
<td>(.02)</td>
<td>(.15)</td>
</tr>
<tr>
<td>4. Male unemployment</td>
<td>-.12</td>
<td>.57**</td>
</tr>
<tr>
<td></td>
<td>(.19)</td>
<td>(.20)</td>
</tr>
<tr>
<td>5. Female unemployment</td>
<td>-.39</td>
<td>.48**</td>
</tr>
<tr>
<td></td>
<td>(.27)</td>
<td>(.17)</td>
</tr>
</tbody>
</table>

Regional level regression coefficients and residual variance of the intercept (involvement intensity) for each aggregate variable introduced (listwise) in the model. Standard error between (). 5 waves latent growth curve models, 4 categories working-time status. $^a$ All mothers of children under 6 in the UK; $^b$ All mothers of children under 6 in the UK who went through at least one change in involvement over 15 months. Data: pooled LLFS 2002-07.

was found in only one instance: a negative relationship between the proportion of mothers employed in female industries which in this case reduced the overall regional variance by about 40% - but not its significance. This relationship would suggest that regions in which higher numbers of women are employed in segregated industries, in particular in the private sector$^{45}$ tend also to be those with lower levels of involvement intensity. This could confirm the fact that such ‘female’ private sector jobs are not necessarily designed to maximize the level of involvement of mothers – sometimes low qualified jobs in the private service industries are designed in the assumption that they will be taken up by secondary earners, and hence are typically part-time rather than flexible full-time jobs.

At the same time we can also see from the second column in Table 6.3 that a positive relationship exists between regional variations in involvement intensity and the same variable for the subsample of mothers who experienced a transition. In other words, areas where mothers tended to change their level of involvement at some point while already engaged in paid work are also those where such female jobs are available. Given that on average these transitions tend to be positive (as marked by the value of the slope factor in Table 6.1, a possible explanation is that employers of female workforce may be more likely to offer flexible working-time provisions including reversible working-time provisions (Fagan & Walthery 2011).

Looking now at the other significant results for mothers who experienced a
working-time transition in Table 6.3 suggests that in areas that are worse off according to measures of male and female unemployment, mothers similarly tend to initiate transitions, at an overall level of involvement that is higher than elsewhere – possibly indicating a trend to step up their participation over time. This is what one could expect in the former two cases – adverse economic conditions that may affect male breadwinners making it less affordable for mothers to opt out of participation in paid work, but not in the latter: respondents in areas where higher levels of female unemployment are observed should be expected to be less likely to be involved rather than more – fewer jobs being presumably available. It should however be kept in mind that even when controlling for individual characteristics as I did here, there is still a risk of committing an ecological fallacy – attributing to individual behaviour a relationship that in fact takes place at the aggregate level, given that I do not take into account different ways in which individual mothers might react to these factors.

Finally, none of the variables introduced had a marked impact on the distribution of unexplained levels of involvement intensity between individual regions, and for this reason, this aspect will not be considered in detail here. Indeed there are signs that the relationship is not straightforward. To take only one example, the distribution of segregated jobs across regions in Table A.1 shows that a few areas with high levels of horizontal segregation also have the largest negative unexplained values of involvement intensity in the model. Such is the case of Inner London and the Birmingham area, where between 73.6% and 79.5% of women are employed in female industries against a national average of 68%. However, this relationship is more complex: two significant outliers at each end of the distribution of residuals, Outer London and Greater Manchester, have the lowest values of segregation of all regions considered.

**Summary**

In this section, we saw that controlling for the characteristics of the regional labour markets in the model reduced the size of the unexplained differences in involvement intensity in some cases, hinting at a potential, but limited relationship at the aggregate level between these differences and aggregate horizontal segregation in the case of the full sample. It is however in the case of the subsample of respondents who experienced a transition that the strongest relationships were noticed. The three indicators tested as well as the above measurement of horizontal segregation, together with male and female
unemployment had a strongly significant positive relationship with regional involvement intensity.

All in all these results are compatible with an explanation whereby the existence of segregated, possibly low quality jobs in the private sector may have an overall negative impact on involvement – not so much on participation but on working-time. At the same time some of these employers may offer a degree of flexibility which allows some mothers to increase their working-time incrementally. Male unemployment also pushes some women into paid work as a household strategy to protect against the loss of income of the main earner. The relationship between involvement intensity in transitions and female unemployment is however more problematic. Additional testing would be required to further consolidate these results, for instance by examining interaction effects between aggregate variables such as the spread of public sector employment and male unemployment, or by controlling for the latter factor at the individual level. Given the wide variation between the size of the regions, and the limitations to this additional layer of modelling these results should be taken as a starting point for future research rather than an invitation to draw strong substantive conclusions.

At the end of the discussion of the first two research questions, a significant portion of the regional differences, whether it is their overall level or the relative differences between regions vis-à-vis each other still cannot be accounted for by systematic differences in variables traditionally associated with participation in employment. It is now time to discuss the relevance of the third question, in which regional variations in involvement are linked to the orientations to work of women on the one hand, and their possible relationship to the economic history of some areas.

### 6.6 Further geographies of involvement

In this section I discuss the third research question, and review the evidence in support of the existence of a relationship between the spatial patterns of involvement analysed above, the subjective orientations to work of women and the long term regional economic histories, as discussed in Chapter 3.

My core argument is about whether the relationship between the employment trajectories of mothers and their orientations to work could also be related to *traditions of involvement*, that is, on habits related to notions of what normal/appropriate gendered behaviours are, resulting from sedimented his-
In other words, besides the impact of immediate economic factors, in some areas mothers could be more likely to get involved in paid work because combinations of factors have encouraged the participation of their grandmothers, mothers and of their relatives across generations, thus naturalising involvement and giving a sense of ‘things having always been that way in living memory’. Of particular interest here are the changes in participation that were triggered from the 19th century onwards as a result of the Industrial Revolution, which caused large numbers of women to work in factories or workshops outside their homes, instead of fulfilling the Victorian ideal of ‘fée du logis’ (the angel in the home). In that way, past and present could be related to each other by subjective orientations towards involvement in paid work. Such a relationship is of course ‘fragile’ in that it is contingent on the coincidence of these traditions with the level of geography available to be observed as well as the fact that no other major ‘shock’ impacting on women’s labour force participation has occurred.

Obviously, this three-way relationship cannot be directly observed, in particular as far as extensive methods such as statistical modelling are concerned (Sayer 1992). The nature of this question implies switching from an approach of regional differences based on systematic empirical data to one that relies on non-systematic, more qualitative evidence. The strategy I chose to follow here consisted in comparing three ‘maps’ of gendered economic behaviour across regions and countries of the UK (Massey & Allen 1984,1994; Massey 1995; Duncan 1991; Duncan & Smith 2002), with the results of the model presented in Section 6.3. The first one of these maps records the regional differences in attitudes of women towards the employment of mothers of young children. The second one records the contrasted industrial histories of regions of the UK and compares it with the results from the previous sections. Finally, the third one complements the latter by focusing on long term trends in women employment in the UK based on Census data in order to buttress the historical evidence.

The specific hypotheses that were examined are as follows:

- Regions characterised by more positive attitudes towards women’s involvement should be expected to have higher levels of involvement intensity;

- Regions with a significant past in heavy industries (coal mining, metal-working, engineering) would tend to be characterised by both more negative attitudes and lower levels of involvement than regions with known
long term high levels of female participation such as was the case where the textile industries were predominant. Marginal employment could be more prevalent in regions where agriculture has remained significant for longer periods of time.

In the next section, I begin the review by considering evidence about regional disparities in orientations to work of women, and the extent to which it matches the differences in involvement observed earlier. I will then move to the issue of long term economic history and their impact on women's participation.

6.6.1 Maps of subjectivities: attitudes and involvement

The hypothesis of an association between levels of involvement and orientations towards paid work comes partially reinforced in Figure 6.9, drawn from Wave O of the British Household Panel Survey (2005) in which the attitudes of women towards the paid employment of mothers of young children are mapped across regions of the UK (more technical detail is available in Chapter 4). We can see that in regions with high residual levels of participation, women tend to show attitudes towards the paid employment of mothers of young children that are either more positive or neutral (or both) than in other areas. Women in Greater Manchester, the Rest of the North West and, to a lesser extent, Scotland, are amongst those with the highest degree of openness towards the employment of mothers of preschool children, whereas, by contrast, reprobation towards it is highest in Inner and Outer London, Wales, East Anglia and Northern Ireland. Thus there appears to be a rough convergence between the observed participation patterns of mothers, even after having controlled for social position and family formation patterns, and the collective representation of women about how they should behave when they have young children, in several areas of interest. This brings further weight to our hypothesis of a link between gendered ideologies.

This confirmation is however partial and the relationship between these two dimensions is not as simple as it seems. In Northern Ireland, for instance, the attitude of women towards the paid work of mothers appears to be amongst the most traditional in the UK whilst, as we saw earlier, mothers in this country tend to have levels of stable involvement that are not particularly low, together with a prevalence for part-time work. Some of this could be accounted for by the fact that in Northern Ireland, more than anywhere else in the UK, mothers are more likely to decrease their involvement at any time during the period of
Figure 6.9: Women's gender roles attitudes across regions of the UK

Proportion of female respondents who agreed, neither agreed nor disagreed, and disagreed with the following statement: ‘a pre-school child is likely to suffer if his/her mother works?’. Base all women of working age by Government Office Regions and countries of the UK. Data: British Household Panel Survey Wave O (2006). Unweighted sample size: 8,460 obs.

observation (Figure 6.6), but the high degree of involvement intensity would remain unexplained, even considering that tight social networks may increase the supply of informal childcare and make limited participation in paid work easier (Ackah & Heaton 1996). This contrasts in an interesting way with the situation in Wales, where a relatively high prevalence of traditional views expressed by women is mirrored by low levels of stable involvement, but where at the same time rate of re-entries into paid work, also visible in Figure 6.6 are the highest observed in the UK – possibly hinting at the impact of adverse economic circumstances – in particular, low levels of male employment.

Finally, in a number of areas that were characterised by relatively low levels of involvement intensity in the model or that were decreasing over time, such as Sheffield (South Yorkshire), West Yorkshire or Merseyside, one would have expected to observe traditional gendered views. However, it is the opposite that was observed: women in the Merseyside and West Yorkshire were amongst those expressing the least traditional opinions about participation of mothers of children under six, whilst in the South Yorkshire the proportion of respondents showing progressive views were higher than within average, even if comparably high levels of traditional views were expressed at the same time. No evidence
of a generational divide could be found in these areas among women.

Having reviewed this first map of attitudes towards paid work and its similarities with the regional trends in involvement, I will move to the next two maps in which involvement and elements of industrial history are discussed.

### 6.6.2 Three worlds of mothers’ involvement?

As we saw in Chapter 3, three types of areas can be highlighted in terms of women’s involvement in paid work, whose existence was diagnosed among other by Massey (1984) or Duncan (1991, 1995). A first type of area is characterised by comparatively high historical levels of female participation in paid work such as Lancashire, including Greater Manchester where the cotton industries flourished, and parts of the West Midlands, the latter in relation to the long term presence of female employment in pottery making (Holdsworth 1997). From Figure 6.5 in Section 6.3, one can immediately notice the similarities between these and some of the residual levels of involvement intensity detected earlier. The ‘Cotton Belt’, Greater Manchester and to a lesser extent the Rest of the North West, known for their historic high levels of participation among women in paid work (including married women with children) in textile factories, including in full-time jobs are also those that stand out with higher than average levels of involvement. This is also the case of the Rest of the West Midlands, which includes the area highlighted above, where pottery making employed a significant female workforce in Staffordshire towns. Even if the combination of economic activity and working-time is not necessarily identical within these areas, they still remain characterised by involvement levels amongst the highest of the UK.

By contrast, at the other end of the spectrum, female participation has been traditionally low in areas where industries with a strong male breadwinner culture such as metalworking and coal mining were predominant until recently. This was the case in the North East, South Wales, and Sheffield and possibly also Birmingham, hence low levels of participation could be expected in these areas. The distribution of the residual variance of involvement intensity above showed that mothers in and around Sheffield and Birmingham had involvement levels in line with these expectations. In Birmingham, for instance, for a large portion of the 20th century, car manufacture and engineering industries where women were virtually absent played an important role in the local economy. However, at the same time, these examples that fit in the picture contrast with some of the others that typified the male breadwinner industries of the past.
the North East of England and Wales – where the low levels of participation expected were not found, but instead were close to the national average. Even if they have levels of involvement intensity that are low by comparison with the North West and the Rest of the West Midlands, they are clearly not the lowest observed, being closer instead to those observed in the South East of England.

In rural areas marginally touched by the industrial revolution such as the parts of East of England or the Yorkshire, female employment was not necessarily low but reflected the enduring tradition of ‘negligible employment’ complementing the household production or assisting with seasonal work (McDowell & Massey 1984), low participation was also expected. However, it might be less obvious to expect a single pattern of participation in areas of this type, together with the wealthier South, in particular the South East, where female participation in paid work, although non negligible, did not take place in a fashion that would alter existing gender arrangements. In addition East Anglia is a diverse region and includes a major pole of economic development around Cambridge.

Nevertheless, the results above show that these areas tend to be characterised by employment rates close to the national average, at the same time as higher than average prevalence of marginal part-time work, both in East Anglia and the South East. In the South East as well, one may also notice a trend towards a decrease of involvement over time in Figure 6.5, which can be a sign of a higher prevalence of casual or interrupted involvement, a trend which is not visible to the same extent in East Anglia. Although it would be tempting to put the South West in the same category given the persistent prevalence of agriculture and seasonal industries, its economic ties with London and the economic role of the Bristol areas makes this less likely.

Finally, no clear expectations could be formulated in areas where conflicting trends had been reported, such as Strathclyde or London. Neither of them, with both markedly low and high levels of involvement, fits easily into the picture just described. While Glasgow was characterised for a long time by the presence of male breadwinner industries, together with women-employing textile factories, there is no evidence of an asymmetric decline: both shrunk during the second half of the 20th century, and hence it is difficult to explore the reason for the higher than average level of female involvement. Subregional analysis shows that economic activity rates among women (Scottish Government 2010) are particularly high (over 80%) in only a small number of local
authorities, accounting for less than 20% of the population of Strathclyde. Inner Glasgow, for its part, has the lowest rate. One possible clue for this could lie in the role of the public sector, which is clearly more present than in other areas and employed 46% of mothers of young children in Strathclyde between 2002 and 2007 (not shown).

For their part, mothers in Inner- and to a lesser extent, Outer London were characterised by one of the lowest levels of involvement intensity in the country, which could not be related to any factor controlled for in the model, whether at the individual or aggregate level (with maybe the exception of the proportion of women employed in segregated industries). On the one hand being the capital and the centre of the financial service industry, London is expected to attract highly qualified women working as professionals, known to have a high degree of commitment to paid work. However, the complex economic history of London, with its mix of public and private service employment, makes it difficult to identify a dominant economic picture based on its industrial history that would be relevant to present women’s employment. Although for obvious reasons it had been leading the trend for an increased demand for service jobs for women, first as domestic servants, and then later on as low qualified office clerks (Hentwood & Wyatt 1986) as well as teachers (in the case of middle class women), London also has a history of industrial female employment, including the textile industry. The latter existed in the West End of London during the 19th century, where one third of the employed workforce was said to be in textiles in 1901 (Hall 1973; Langton & Morris 1986). Massey also argued in 1984 that there remained significant amounts of hidden employment - women whose working conditions could withstand the comparison with the sweatshops of the 19th century. It is however hard to believe that this would represent such a large number of mothers of young children so as to offset the opposite trend just mentioned among highly qualified professional (even assuming that some of these would not actually live in London).

Historical evidence about women’s involvement

Data from the Census allows us to further examine the long term regional trends in women’s employment participation and to bring additional light into this discussion, even if the picture it provides should be taken with caution, as with any long term time series. Figure 6.10 shows women to men ratios of employment rates across Standard Statistical Regions between 1841 and 2001, with a close up on the same data for the period 1971-2001 in Figure 6.11.
These were preferred over raw employment rates, in order to give a picture in terms of gendered employment patterns, and also to correct for some of the changes in definitions or geographies that occurred in the Census.

Figure 6.10: Gendered employment trends within the UK 1841-2001

The picture that emerges from Figure 6.10 partially confirms the previous analysis. We can see, for instance, that, relative to men, women’s participation in employment remained consistently higher in Lancashire than almost anywhere else in the country for most of the 19th and the first half of the 20th century, and that, by contrast, the opposite was true in Wales and the North East whose economies relied on traditional male industries, as well as East Anglia. The ratio was also low in areas where service industries were well developed, such as the South East (not shown). The fact that the West Midlands (where the distinction between Birmingham and the rest of the region could not be retained) and Strathclyde were both characterised by women to men levels of participation that remained close to the national average is also compatible with a picture of some regions being more heterogeneous than others, metalworking and shipbuilding together with textiles in the Glasgow area, engineering and the sweated female labour on the one hand, pottery work on the other in the Rest of the West Midlands.
It also becomes visible in the graph that some of the other expectations expressed above in terms of enduring regional gender differences in employment were met until the 1971 Census. For instance in the North East, the West Midlands, and even Strathclyde, the women’s employment rate had remained clearly below that of men. What is also clear is the marked trend towards a convergence of involvement over time and across regions. Figure 6.11) allows us to zoom in onto the last 40 years.

Figure 6.11: Gendered employment trends within the UK, 1971-2001

Beside the continuous shrinkage of regional differences, the gendered patterns of participation just depicted had remained stable in only two cases. Stability was observed in the North West, where women remained amongst those most employed relative to men of the UK, and East Anglia at the opposite end of participation, whereas the West Midlands still occupy the same average position, close to the national rates. In the majority of cases, however, it was been altered during the wave of economic mutation of the last quarter of the 20th century. A number of regions seemed to have experienced a transformation of their pattern of gendered employment: in both the North and Strathclyde women’s participation increased relative to men, but this was due in part to a decrease in men’s employment, caused by the large number
of job losses that occurred at the time, since women’s employment remained clearly under the national average. In London the decrease in participation is true both in absolute and relative terms, for reasons that are not immediately obvious. We are also probably reaching here the limits of this analysis, based on data that are only partially comparable with those used in the model.

6.6.3 Summary

The number of correspondences observed between the results of the Latent growth curve model, as well as the additional evidence shown above suggests that there could be indeed some ground in the hypothesis of a relationship between patterns of gendered economic history, present levels of involvement and the attitudes of mothers towards their participation in paid work rather than being the product of mere coincidence. It would be tempting to move one step further to characterise these correspondences as ‘worlds’ of women’s involvement, to paraphrase Esping Andersen’s expression. These would be defined by the present levels of involvement (especially from a longitudinal perspective) as well as the coexistence of specific traditions of involvement, gendered sets of attitudes towards paid work (in relation to specific employment context, the result of regional economic policies and private investors decisions) (Massey 1995). A conceptualisation in terms of such worlds would hold in the cases of the North West, including Greater Manchester and Lancashire, East Anglia, Wales, South Yorkshire or the Rest of the West Midlands. It could also remain compatible for regions that have undergone significant economic change in the last 40 years, such as the North East or Strathclyde. It is reasonable to believe that the persistence of an economically disadvantaged environment over several decades in these regions might have gradually – out of economic necessity among the most stretched out households – altered traditional gender orders by making it necessary for mothers to engage continuously in paid work. This is, of course, a conjecture.

There are, however, also serious objections to this interpretation. Whether one is entitled to label areas as ‘world’ remains debatable, and the theoretical appeal of this interpretation should not lead us to underestimate the number of questions it leaves unanswered. First, the historical and attitudinal evidence used above lacks accuracy. Most of it originates from women of all ages rather than mothers of young children, and does not exactly cover the same geographical areas, in addition to the numerous shortcomings of the Census data. Obviously, perfect matches between these trends and our results were unlikely.
in the first place given that the deindustrialisation and economic changes that occurred in many areas from the 1960-80s onwards (or earlier in the case of the textile industries) brought about by specific paths of economic redevelopment in each region, which should not necessarily be read in terms of a reproduction of historical trends (Massey & Allen 1984, 1994).

Furthermore, the analysis is in part based on a relationship between aggregate variables, including the regional residuals of the growth models, and regions that are likely to be made up of smaller ‘worlds’ themselves, for instance at the level of Travel to Work Areas (Green et al. 1991). Anything happening in a way that cannot be observed at the regional level is left out of this analysis. Such is the case, for instance, of Dundee, where a strong participatory culture has been reported among women employed in the jute industry (McIvor 2001) but remains hidden in the unremarkable data for the region it is part of.

Another weakness of this analysis is that, even if it takes into account the job supply, by contrast with the demand-oriented theories of involvement reviewed in Chapter 3, the economic context still tends to be overlooked. If past economic necessity on the part of both working-class women and some employers relying on their cheap labour, did indeed gradually frame orientations to work or gendered moral rationalities and propensity to get involved in paid work up to the present, they still depend on the existence of suitable jobs for mothers now. Given the economic heterogeneity of the regions, the processes and mechanisms through which these differentiated matching process takes place in contemporary Britain needs further investigation. In particular the recent evolution in the economic/institutional environment that developed in the regions since the 1980s deserve a more careful analysis. For instance, what are the public or private investment decisions that led to the further development of jobs compatible with caring for young children in areas with high levels of participation such as Greater Manchester or South West Scotland? In 1984, Massey predicted a decrease in such jobs, based on the reluctance of private investors to employ the more unionised and politically active women in Manchester. If that was the case, what led to the maintenance of the Northwest specificity on the job supply side?
Conclusion

The first case study of this research, this chapter has examined regional differences in 15 months long transitions in paid work of mothers of children under 6 in the UK, and explored three explanations for their pattern. The first conclusion that emerged from the analysis is that very significant differences in the involvement of mothers across countries and regions of the UK are visible which could not be reduced to the traditional North-South divide. The bulk of these contrasts consisted in differences in involvement intensity: whether mothers tend to be working full-time, on short and long part-time, or were not currently engaged in paid work, in particular those among them who remained involved at the same level during the period of observation. Regions where mothers show a higher than average level of involvement intensity are Greater Manchester and the Northwest, as well as the West Midlands, with the exception of the Birmingham conurbation together with Strathclyde, whereas lower involvement levels of involvement intensity are noticeable in London, the South Yorkshire, East Anglia and the West Midlands (former Metropolitan County). More limited evidence was found of regional differences in variability trends – whether involvement decreased or increased over time. In terms of transitions, Mothers in Wales tended to experience increases in their involvement over time whereas the opposite was true in Northern Ireland. It should also be noted that most of the residual regional variance is concentrated in less than half of the regions and countries of the UK.

In only a small number of regions did controlling for the existence of regional imbalances in social position and family formation patterns reduce the unexplained regional heterogeneity in involvement intensity of mothers, whether they experienced stable levels of involvement, or went through a transition. To the contrary, larger relative regional contrasts were unearthed in some cases when control variables were added, in particular in relation to education and occupation. This suggests that the obvious explanation for the regional differences in involvement in terms of occupational imbalances between regions, if relevant, is limited to a few areas. The only exception here is involvement variability over time; the regional differences are better accounted for by the control variables, but the importance of this result is restricted by the limited significance of these parameters in the first place.

Some evidence was also found of the individual role played by regional differences in the number and characteristics of jobs available to mothers, and to a lesser extent, men. Regional levels of horizontal segregation were found
to have a negative impact on involvement intensity, and also on the level at which mothers experienced a transition. Both male and female unemployment had a significant positive effect on the latter. Taken together, these results suggest that the existence of ‘female’ jobs, while reinforcing low to moderate levels of involvement, in particular in part-time jobs, could at the same time help some mothers increase their working-time incrementally. The effect of male unemployment, for its part, seems to indicate that economic uncertainty provides an incentive for mothers to increase their degree of involvement. None of these factors, however, cancelled out the regional differences.

Finally, although not systematic, some evidence was found of a relationship between regional involvement differentials, the attitudes of women towards maternal employment, and trends in regional economic histories in some areas. It appears that in some areas such as the North West and part of the West Midlands the combination of positive attitudes towards involvement and higher than average levels of participation could be related to trends dating back to the 19th century, which resulted in large numbers of women, including married women working outside the home in factories, whereas the opposite was found in areas historically reliant on male industries such as Wales, Birmingham or the Sheffield area. These factors failed to explain other significant regional outliers, in particular London and the North East. Although the existence of alternative explanations cannot be excluded, this adds weight to the relevance of research in which constraints, subjectivities, and economic behaviour are associated.

This chapter has also demonstrated the simultaneous relevance of these three complementary layers of explanation, which indicates that regional differences in involvement in the UK are contingent on a complex set of factors, and suggests that explanations relying only on one cause, such as national institutions or economic factors only capture a limited part of the story. I will consider the further theoretical implications of these results, as well as future research avenues in the conclusion to this dissertation, in particular those related to some of the weaknesses of the research, resulting, among other, from the limitations of the data, the most important of which are the absence of individual information about attitudes and the short time span considered.

I will leave for now the results for the UK and move on to the German case.
Chapter 7

East is East? Spatial patterns of involvement in Germany

7.1 Introduction

This chapter is dedicated to the second case study of this research: the analysis of regional differences in the employment transitions of mothers of children under 6 in the Federal Republic of Germany. As in the previous two chapters, its goals are to provide a map of the regional differences in maternal involvement in paid work, regions understood in this case as Bundesländer, in addition to a few large urban areas: München, Frankfurt and Stuttgart, and to test likely explanations for these contrasts. I first consider the role of regional imbalances in family formation patterns and social position – the composition hypothesis – that could for instance result from migration. This is followed by a discussion of the possible role of job availability as well as childcare provision, which constitutes the second research question of this dissertation. I then put the results of this initial analysis into a broader perspective by considering, as before, the existence of a possible relationship between disposition towards paid work, and the industrial and institutional past of the German Bundesländer. It should be noted however that this second case study is not as developed as the previous one. The space available in this dissertation did not allow an analysis of a similar depth to be carried out. In addition there is a lack of relevant literature, in particular that dedicated to regional differences within either the old and New Bundesländer.

The chapter is organised as follows. In the rest of the introduction I recall a few essential points about the data and methods used in the analysis which have been already developed in Chapter 4. In Section 7.2 I describe the basic
characteristics of the involvement in paid work of German mothers, including bivariate analyses related to their family formation behaviour, before introducing a growth model of their involvement over time similar to the one developed in the previous chapter for the UK. In Section 7.3 I present an assessment of the importance, and the main characteristics, of the regional differences in involvement, whereas Section 7.4 is dedicated to an in-depth discussion of the hypotheses in relation to these.

**Population and target variables**

In this short reminder of the main characteristics of the method I used, I will begin by summarising the population of reference, followed by the definition of involvement used in the analysis. I then present the data, and highlight the analytical strategy I followed.

As in the previous chapter, the population of interest is made up of mothers of children under 6. The data available for Germany allows for mothers to be followed over a period of three years, which means that the maximum age difference between the children of the respondents is 5 years (either between children aged 0 and 5 at Wave 1, or children aged between 3 and 8 at Wave 4). The population covers mothers on maternity leave (child aged under 1), those of children under 3 who may be on parental leave (still called Erziehungsurlaub at the time), together with mothers of older children of primary school age at the end of the period of observation. This heterogeneity results from the compromise reached between the sample size required by the statistical model and the need to cover as much of the duration of the experience of mothers of young children as possible, that is, the time span during which children remain under school age and its immediate aftermath.

The measurement of participation in paid work I use relies on the concept of involvement. Involvement in paid work can be used to characterise the intensity and variability of participation. Involvement intensity refers to the amount of time spent doing paid work, and is operationalised by a four-category indicator of working-time: not doing any paid work, working marginal part-time hours (less than 16 hours per week, part of what is known as ‘Minijobs’ in Germany), part-time up to 30 hours per week, and full-time. The variability of involvement, that is variations in involvement intensity over time, was measured by changes occurring in these categories between the four waves of observation, spanning over a period of three years. Typical changes include leaving maternity/parental leave and going back into paid work, whether part-time or
full-time, or working-time increases as children get older. An inconvenient of
this framework is that transitions between economic inactivity and unemploy-
ment are not recorded as a change in involvement. This should be kept in
mind when discussing the results for Eastern Germany, where unemployment
is markedly higher than in the West (between 10% and 20%) even if the bound-
ary between unemployment and economic inactivity has often been shown to
be porous (Elhorst 1998).

Data and data quality

The main dataset used in this chapter is the Scientific Use File - Datei zur wis-
senschaftlichen Nutzung - of the 2001-04 Mikrozensus-Panels. The Mikrozensus
is a 1% administrative survey of the German population, designed as a rota-
ting panel made of four yearly waves. The SUF is a 70% random subsample
drawn from this original sample. By comparison with the UK Labour Force
Survey, the strength of the MZ-Panels is that respondents are followed over a
period of three years, which allows us to cover continuously the period of
motherhood during tension between the imperatives of paid work when care
of children is strongest. It also provides a sample size that is large enough for
a regional-level analysis.

The geographical units of analysis are NUTS-1 areas, which correspond to
the 13 Bundesländer and three Stadstaat of Berlin, Hamburg, and Bremen.48
A significant disadvantage of this level of geography is that it reflects the
disproportionate size of the three major Bundesländer: Nordrhein-Westfalen,
Bayern and Baden-Württemberg, by comparison with the other ones in the
country, the Eastern States in particular, thus leaving no choice but to compare
large, presumably heterogeneous areas with smaller, uniform regions. As an
imperfect remedy, the MZ-Panels provide identifiers for respondents who live in
urban areas with more than 500,000 inhabitants, which allowed me to further
add the major urban centres of Stuttgart, the capital of Baden-Württemberg,
Frankfurt in Hessen, and München in Bayern (Statistische Ämter des Bundes
und der Länder 2009)49

Research strategy and hypotheses

The strategy followed in this chapter consisted of an initial stage during which
a latent growth curve model of involvement over time was tested with the data.
Similarly as in the previous chapter, the overall intensity of involvement over
three years is represented by the intercept of a growth line, and the variation
over time as its slope. The second stage consisted in adding a regional level to the model, in order to detect statistically significant variations in either involvement intensity or variability across the areas defined above. At a third stage, the slopes and the intercept of the growth lines were regressed against explanatory variables, and their impact on the regional variation in either intensity or variability inspected. This allowed me to test whether regional variations in involvement intensity and/or variability could be due to a ‘composition effect’ whereby differences in involvement are related to regional imbalances in the characteristics of mothers that are known to be related to their participation in paid work. Finally, once composition effects are controlled out of the model, the remaining regional differences are examined at the light of the hypothesis of a relationship between economic and institutional history and subjective dispositions towards paid work.

I will now move on to a description of the involvement of mothers in Germany.

7.2 Involvement in paid work in Germany

In this section, I briefly recall the main characteristics of maternal involvement in paid work in Germany already presented in Chapter 2 before moving to a descriptive analysis focused on the population of interest in this research, that is, mothers of children under 6, based on data from the 2001 cross-sectional Mikrozensus. This initial analysis of involvement is broken down according to its two facets of intensity and variability over time. It will then be followed by a presentation of the first results of the latent growth curve model fit to the MZ-Panel data.

7.2.1 German mothers and involvement in paid work

In the literature review presented in Chapter 2, we saw that a superficial analysis could lead us to believe that German women tend to have cross-sectional rates of employment that are not very different anymore from their British counterparts: in 2009, the employment rate among the latter was 65.6% against 65.2% in the former, with part-time employment rates of women at respectively 38.1% and 38.8%. Both countries also ranked similarly in terms of the employment gap between men and women (OECD 2008; 2010). However, this initial impression is misleading. Until recently, participation in paid work by German women, in particular among mothers of under 6, was markedly
lower than the UK and remained significantly so among mothers of young children: in 1999 for instance, there was still a 6% gap in the employment rates of mothers of under 6 between two countries. In addition, of all couples with children under six that year, 41% in Germany against 23% in the UK were made up of a full-time employed man and a full-time carer (OECD 2001). In 2002, 66% of mothers of under 3, and 45.3% of those with children between 3 and 5 were either not economically active or on parental leave (Kreyenfeld & Geisler 2006). Some background information is necessary to clarify these figures.

As in other countries, the gradual increase in women’s employment in Germany was paralleled during the 1990s by a comparable rise in part-time work. However, a specific feature of part-time work in Germany is that a significant share is made up of ‘Minijobs’ or ‘negligible employment’ (geringfügige Erwerbstätigkeit), earning less than €500 per month, or involving working time of less than 16 hours per week, that are overwhelmingly taken up by women. Employees holding such jobs are only partially contributing to the social insurance system and sometimes omitted from labour market statistics. In 2002, 13.9% of all German mothers were employed in such jobs, a proportion that is unsurprisingly higher among mothers of young children, and only begins to decrease among mothers of children aged 10 or older (Kreyenfeld & Geisler 2006).

These cross sectional patterns reflect specific longitudinal dynamics. The enduring tendency among German mothers to leave paid work until children are well into school age has been documented (Gustafsson et al. 1996). Between 1973 and 1993, only 35% of German women who were employed before the birth of their first child were back into paid work five years after against more than 50% of British women (Gutierrez-Domenech 2005). It is usually considered that the three years long parental leave provision available to German mothers plays an ambiguous role here (Rubery et al. 1998). On the one hand, it may prevent some women from becoming completely disconnected from the labour market by offering them the incentive of returning to their previous job after two or three years but at the same time it reinforces the tendency to retreat from paid work or, work in marginal employment for a long period of time (Kenjoh 2005; Kreyenfeld & Geisler 2006; Spiess & Wrohlich 2008). Until 2001, during the first two years of the parental leave, mothers were entitled to an income related child-raising allowance (Erziehungs geld), changing to a means tested benefit thereafter, neither of which could be combined with paid work.
This was amended twice, for children born from 2001, then 2007 onwards in order to provide better incentives for mothers to return earlier to their job. In addition to this, the scarcity of childcare provision especially for children under three represents a serious obstacle to further participation (OECD 2007). The fact that education for children under 6 in Germany remains non compulsory, should also be mentioned as part of this picture (OECD 2006).

I will now describe the involvement patterns of mothers of children under six based on the MZ-Panel data.

**Involvement intensity in Germany**

Focusing first on the cross-sectional dimension of involvement, one can see in Table 7.1 that the overall proportion of mothers who were not involved in paid work irrespective of their employment status – ‘workless’ – at the first wave is about 59%, not very far from the figures reported above when only women currently engaged in paid work are taken into account (Thévenon & Horko 2009). The differences between these results and those from the OECD reported earlier are due to the fact that respondents on parental leave at Wave 1 in the sample are coded as workless. Still at Wave 1, 22.8% of workless respondents were on parental leave (not on maternity leave), a much higher proportion than in the UK. The remaining 40% of respondents were unevenly spread between those on marginal part-time work, longer part-time hours (two thirds of them) and full-time work, about 10% of them, a figure markedly lower than the UK. It should also be noted that not all women on marginal part-time work are considered to be in the administrative category of negligible employment, since this proportion reaches only 10% (Table A.4). We can now have a look at the association between this pattern of involvement and family formation and social position, dimensions that will be tested further below in the model.

As could be expected, having more and/or younger children has an adverse impact on the involvement intensity of mothers. Less than one third of respondents whose youngest child is under three were currently engaged in paid work, which is again clearly less than the UK. However, their degree of involvement rapidly increased as their youngest child became older: by the time he/she has reached the age of three to five years, a return to work was well under way and only 43% of mothers were still not involved in paid work. These include first-time mothers of children under 6 who left paid work again as they had further children, although it has also been shown that couples tend
to concentrate the birth of children during the period of initial parental leave (Spiess & Wrohlich 2006): having another child before the end of the three years period entitles women to an uninterrupted period of paid parental leave.

The impact of a second child on the participation in paid work of mothers seems limited. Proportions of mothers involved were almost identical to those with only one child, except for a slightly more pronounced tendency among the former to work on marginal part-time work rather than full-time. Instead, as in the UK, the main contrast was observed between mothers of up to two children and those of three or more, who were clearly more likely to be workless. That for the latter group of mothers the fall in the proportion of those engaged in full-time work was negligible is probably due to the fact that those remaining involved are also more likely to be those with a stronger attachment to paid work, thus more likely to be working full-time.

Table 7.1: Maternal involvement intensity in Germany

<table>
<thead>
<tr>
<th>Age of the youngest child in the family</th>
<th>No paid work</th>
<th>0-16h</th>
<th>16-29h</th>
<th>30h+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 3</td>
<td>70.20</td>
<td>12.03</td>
<td>9.59</td>
<td>8.19</td>
<td>41.20</td>
</tr>
<tr>
<td>3 to 5</td>
<td>43.24</td>
<td>17.59</td>
<td>22.10</td>
<td>17.08</td>
<td>58.80</td>
</tr>
<tr>
<td>Total number of children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 child</td>
<td>57.13</td>
<td>12.37</td>
<td>16.02</td>
<td>14.48</td>
<td>38.74</td>
</tr>
<tr>
<td>2 children</td>
<td>56.60</td>
<td>16.83</td>
<td>16.06</td>
<td>10.51</td>
<td>43.44</td>
</tr>
<tr>
<td>3 or more</td>
<td>69.13</td>
<td>12.50</td>
<td>8.88</td>
<td>9.49</td>
<td>17.81</td>
</tr>
<tr>
<td>Partnership status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives with a partner</td>
<td>59.55</td>
<td>15.83</td>
<td>14.57</td>
<td>10.05</td>
<td>84.49</td>
</tr>
<tr>
<td>Not cohabitating</td>
<td>56.26</td>
<td>6.17</td>
<td>15.81</td>
<td>21.76</td>
<td>15.51</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between 16 and 25</td>
<td>75.24</td>
<td>9.66</td>
<td>7.77</td>
<td>7.33</td>
<td>17.83</td>
</tr>
<tr>
<td>Between 26 and 30</td>
<td>66.17</td>
<td>16.39</td>
<td>10.31</td>
<td>11.13</td>
<td>26.97</td>
</tr>
<tr>
<td>Over 30</td>
<td>52.27</td>
<td>14.83</td>
<td>19.20</td>
<td>13.69</td>
<td>55.20</td>
</tr>
<tr>
<td>Educational attainment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>68.15</td>
<td>15.00</td>
<td>6.72</td>
<td>10.12</td>
<td>22.34</td>
</tr>
<tr>
<td>Post-secondary</td>
<td>54.64</td>
<td>15.01</td>
<td>18.93</td>
<td>11.41</td>
<td>58.88</td>
</tr>
<tr>
<td>Tertiary</td>
<td>46.39</td>
<td>16.79</td>
<td>16.94</td>
<td>19.88</td>
<td>18.78</td>
</tr>
</tbody>
</table>

Finally, looking at age and education as an indicator of social position, a pattern could be observed that was similar to the British case: older mothers, particularly over 30, and those with a post-secondary qualification, probably belonging to the same group – highly educated women are known to defer
the time of their first birth - were more likely to be involved in paid work, and when so, at a higher level of working-time than those who qualified from secondary school only. This was especially true of mothers with a degree or higher who were the least likely to be workless, and the most likely to be working full-time.

**Involvement variability in Germany**

Turning now to the longitudinal dimension of involvement, we can see that overall about one third of the respondents remained workless during the three years covered by the survey, whereas one half experienced a change in their involvement during the same period. The latter figure is higher than among mothers in the UK sample, and is likely to reflect the fact that the time span of the survey is longer, and hence change is more likely to occur. However, this figure drops by 3% when only women not on parental leave are taken into consideration – suggesting that parental leave may make transitions more likely whether it is in or out of paid work. As a result of the weight of these groups, the proportion of mothers in continuous paid work over three years hardly reaches 6% of all respondents and, again by contrast with the UK, is only marginally larger than those on continuous part-time.

Looking now at the pattern of association between involvement over time and the characteristics of respondents we can observe relationships comparable to those just described. One can see that mothers of children under three or those with more than two children (at least one of whom is under 6) were markedly more likely to be continuously workless over three years. Conversely, mothers of three and more children were also clearly less likely to experience a change in their participation. Although mothers of older children tended to be more engaged in continuous paid work, this was proportionately more likely to be the case with marginal part-time work.

Partnership status, and in particular, being single, was not related to a reduction of the continuity or the intensity of involvement, by contrast with the UK. To the contrary single mothers were clearly less likely to be continuously workless, more likely to experience a transition (likely to be a return to work) and to be working continuously full-time than those living with a partner, whether married or not. As we will see below, this can reflect in part the specificity of mothers in Eastern Germany - where participation in paid work is known to be higher at the same time as extra-marital births. However, participation in paid work of single mothers is also high in the rest of
the country, in any case higher than in the UK: in 1996 for instance 58% of single mothers in West Germany were employed full-time, against 54% for the married (Drobnič 2000).

Finally, as already hinted at in the previous section, older and / or better educated mothers were in general more likely to experience a transition, and almost in a symmetric fashion, less likely to be continuously workless over three years, which can be interpreted as their being more likely to return to work or to do it earlier. For instance, degree holders were more than twice as likely to be working continuously full-time as either those with a secondary or post-secondary qualification.

Besides the stability of involvement, one can also examine the nature of the transitions experienced by mothers, i.e. whether they translate into an increase, a decrease or a status quo of their level of involvement (figures not shown) by looking at the differences in the level of involvement at Waves 1 and 4, that is transitions carried out while their youngest child is aged from 0 to 5, until he/she reaches the age of 3 to 8. For some mothers this means the transition carried out right at the end of the parental leave, whereas for others this will signal their next move.
During that time, about one half of the respondents went through an increase in their level of involvement, whereas the other half was evenly split between those experiencing a decrease, and those ending up at the same level at Wave 1 than Wave 4 after a transition. Broken down into the subgroups of women reviewed above, it should not come as a surprise either that women who became mothers later or who were highly educated were much more likely to experience an increase in their involvement over time than the rest of the sample. At the same time, however, family formation indicators showed the opposite trend – women with heavier family burdens were also more likely to experience an increase in their involvement over time.

Having introduced this brief overview of involvement of mothers in Germany, which confirmed already documented characteristics of their economic behaviour but also the appropriateness of the instrument used in this research, I will now move on to the next section, in which the latent growth curve model of maternal involvement for Germany is proposed.

7.2.2 Modelling involvement

In this section, I present a few initial results from the latent curve model of involvement that was fitted to the MZ-Panel data. Its main purpose was to set the stage for the regional analysis carried out in the rest of the chapter, and as such its substantive interest is limited. It only provides some baseline information about national trends of involvement against which regional differences will be contrasted. I will first recall the main characteristics of the latent growth model, before presenting the results, and briefly providing an appraisal of its relevance for modelling the transitions observed in the MZ-Panel data.

Modelling involvement across the four waves of the MZ-Panel was achieved using the latent growth curve modelling framework explained in detail in Chapter 4. A path diagram for this model can be found in Figure B.1 in the Appendix. The assumption behind this family of model is that to the observed categories of working-time correspond continuous and unobserved latent propensities of getting involved at this particular level and of which working time represents only a rough approximation. These four latent variables are then used to compute respondent-level slope and intercept factors that measure involvement variability and intensity, and allow to summarising each respondent’s transitions over time as a growth line. These intercepts and slopes can be summarised each by a mean and a variance. Thus, there are 5 parameters of interest in the model: the mean level of involvement intensity
(i.e. intercept), and its variance, not to be confused with the mean value of involvement variability (slope) over time and its variance. Since both are likely to be related (workless mothers are more likely to experience an increase in their involvement than those already working full-time), their covariance also needs to be taken into account. In practice, however, not all of these parameters can be estimated simultaneously in the same model. By convention, the mean intercept is fixed to 0 so that the other parameters can be estimated.

As in Chapter 5, I attempted to fit a growth mixture model to the MZ-Panel data, which similarly raised identification issues and, as a result, is not shown here. For the same reasons, results from both the full sample and the subsample of respondents who experienced a working-time transition are shown together where it is relevant to have a more precise understanding of the nature of changes in involvement. Let us now turn to the results of this initial latent growth curve model in Table 7.3.

<table>
<thead>
<tr>
<th>Table 7.3: Latent growth curve model of involvement in Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transitions</strong></td>
</tr>
<tr>
<td><strong>Intercept (intensity) mean</strong></td>
</tr>
<tr>
<td>Slope (variability) mean - $Sw$</td>
</tr>
<tr>
<td>Intercept variance - $\sigma^2_{Iw}$</td>
</tr>
<tr>
<td>Slope variance - $\sigma^2_{Sw}$</td>
</tr>
<tr>
<td>Covariance slope-intercept - $cov_{Iw,Sw}$</td>
</tr>
<tr>
<td>n</td>
</tr>
</tbody>
</table>

| Intercept (intensity) and slope (variability) means and variances, 4 waves latent growth curve model of involvement, 4 categories working-time status of mothers of children under 6 in Germany (Not working; under 16h per week; between 16 and 30h; more than 30h). Data: Mikrozensus-Panel 2001-04. Significant at: * at .05; ** at .01; *** at .001. |

We can see that, as in the UK, both variations in involvement intensity and variability are strongly significant at the individual level. Again, the value of the intercept mean (denoting involvement intensity) and slope (involvement variability) are not of much interest here. While the former is set to 0 in order for the model to be identifiable, the latter only shows that on average all German mothers of children under 6 tend to moderately increase their involvement after three years. The value of this slope parameter is not comparable with its UK equivalent given the differences between the two samples. Here the slope is twice as big as with the UK data, which may be due to the fact already mentioned above, that the time span covered by the data is larger here. The age range of the youngest child in the family in the German sample is also wider than in the LLFS: 0-8 against 0-6 and a half, thus likely to capture more
returns to paid work and/or to full-time employment than in the UK. Another result that is similar to the UK is the significant negative relationship between intensity and variability: the more mothers are involved in paid work, the less likely they are to experience a change, and in particular to reduce their participation. The covariance between intensity and variability is smaller than in the UK although the slope is sharper. This may be related to the fact that relative to its mean, the slope variance in the German sample is three times smaller than the UK (2.5 against more than 7). This may indicate a weaker relation between the two, or the fact that German mothers are more stable in their involvement over time.

In order to gain a visual impression of how well the model fits the data, a sample of 50 actual transitions was drawn from the sample and plotted against the corresponding predicted growth line. Results are shown in Figure B.2 in the Appendix. We can see that observed transitions tend to be sharp. They tend to involve either leaving paid work altogether or instead moving to full-time work, as opposed to more cases revolving around stable part-time work in the UK, which could be again a reflection of the wider time span in this sample. As a result as well, the match between the latent growth lines and the observed transitions appears sometimes approximative, which could also be due to the fact that there are only 4 waves of observations available. This seems to be particularly true of respondents who experienced several sharp changes during the period of observation, such as one year out of paid work, preceded and followed by one or several years of full-time work (such as in Graph 2, 43 or 16 in Figure B.2). However, in the majority of cases we can see that the latent growth line provides a reasonably satisfactory approximation of the respondent’s trajectory: sharp increases, decreases or overall stability.

After this brief introduction to the growth model of involvement fit to the MZ-Panel data, I will now move on to the next and main stage of the analysis and examine the regional differences in involvement.

7.3 Involvement across Bundesländer

Below, I present an initial account of the regional differences in the involvement of mothers of young children in Germany. In order to provide the reader with an understanding of the geographical economic and social imbalances in the country I have sketched the broad characteristics of the regional structure of the country in Section 2.2.1 in Chapter 2 and these will not be repeated here.
In the first section, I present the results from a multilevel version of the latent growth model of the involvement of mothers of children under 6, preceded by a short methodological reminder of the characteristics of this model which takes into account the clustering of respondents within Bundesländer. I then provide an assessment of the statistical significance of the regional differences in involvement, and a map of how these geographical contrasts are spread across Germany.

**Intensity and variability across regions**

In this section, I present an overview of the regional differences in involvement. The limited number of observations and the disproportionate size of a few Bundesländer meant that no reliable estimates of their transitions could be calculated, except for the four biggest ones (Bayern, Nordrhein-Westfalen, Baden-Württemberg), which is not relevant in this case. As a result, the regional overview of the transitions will not be as precise as in the previous chapter.

The results presented below are based on an extension of the model presented in the previous section. We saw that involvement in paid work over three years – as roughly measured by the four-category indicator of working-time at each wave – could be represented by latent growth lines, with the intensity of involvement understood as their intercept and variability as their slope. In this section, we move one step further by decomposing the variance of each of these terms into a portion that is clustered within respondents ('individual' variance), and another one that is clustered between the Bundesländer and German cities, the second level of the analysis. This will enable us to assess whether this regional part of the variation in involvement is significantly different from 0; then, more qualitatively, by comparing its individual values for each Bundesland with each other in order to gain a more complete view of the structure of regional differences. This also opens the door for the assessment of the role played by a composition effect of family formation and social position in these regional patterns later on in this chapter.

The first result visible in Table 7.4 is that, in Germany, statistically significant variations in involvement intensity and, by contrast with the UK, not in its variability over time, exist between Bundesländer. In other words German mothers differ from one region to another in the amount of paid work they carry out at the beginning of the periods of observation, but overall, not so much in the way this involvement varies over time. However, and this is in-
**Table 7.4: Latent growth model: regional results – Germany**

<table>
<thead>
<tr>
<th>Individual level parameters</th>
<th>Transitions only</th>
<th>Full sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept (intensity) mean - $I_w$</td>
<td>Constrained to 0</td>
<td></td>
</tr>
<tr>
<td>Intercept variance - $\sigma^2_{I_w}$</td>
<td>3.05*** (.18)</td>
<td>13.44*** (1.08)</td>
</tr>
<tr>
<td>Slope (variability) mean - $S_w$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope variance - $\sigma^2_{S_w}$</td>
<td>.76*** (.08)</td>
<td>.85*** (.10)</td>
</tr>
<tr>
<td>Covariance $cov_{I_w,S_w}$</td>
<td>-1.15*** (.08)</td>
<td>-1.37*** (.10)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional-level parameters</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept (intensity) mean - $I_b$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional intercept variance $\sigma^2_{I_b}$</td>
<td>.03* (.02)</td>
<td>.47** (.15)</td>
</tr>
<tr>
<td>Regional slope variance $\sigma^2_{S_b}$</td>
<td>.01 (.00)</td>
<td>.00 (.00)</td>
</tr>
<tr>
<td>Covariance intensity/variability $cov_{I_b,S_b}$</td>
<td>.01*** (.01)</td>
<td>.04* (.02)</td>
</tr>
</tbody>
</table>

Individual and Level 2 (Bundesländer + Stuttgart, Frankfurt, München) intercepts (intensity) and slopes (variability) means and variances, 4 waves multilevel latent growth curve model of involvement of mothers of children under 6 in Germany. No covariates added. Data: MZ-Panel 2001-04.

Interesting, the involvement intensity of mothers who went through a transition, although showing the same trend, is weakly significant ($P = .044$). This suggests that the bulk of the regional differences in involvement intensity is likely to be due to mothers whose involvement remained stable over time, whether it is full-time, part-time or equal to 0, even if the results are likely to be affected by the high level of attrition observed in the sample and its likely correlation with employment-related transitions. The second type of information we can gather from the table is that regional variations represent a small portion of the overall variation in involvement intensity (3% of the total variance of involvement intensity), but that, however, they are larger than in the UK – 1%. This is also true of differences in intensity among mothers who altered their involvement during the period of observation, since in their case the regional part represents only 1% of the total variation captured by the model.

Finally, an interesting result that is specific to Germany is the significant positive correlation between intensity and variability of involvement at the regional level among women who experience a transition: this signals that regions where women tend to have comparatively high levels of involvement intensity (such as in Eastern Germany) are also those where a higher level of increase over time could be observed.
Mapping involvement across Germany

Let us now turn to the regional distribution of involvement intensity across Bundesländer, shown in Figure 7.1. These are the values of the variance of involvement intensity for each region (the mean parameter was constrained to 0). By contrast with the previous chapter, regional differences in involvement variability are not represented here, given that they are not significant, very small and close to each other. As in the previous chapter the metric of the variance is not meaningful here since it represents the probability distribution of the latent factor of intensity, expressed on a logit scale.

![Figure 7.1: Patterns of involvement intensity within Germany](image)

Predicted regional values of the variance of involvement intensity (intercept factor) of the latent growth line model. Full sample, includes mothers whose involvement did not vary over time; transitions, only those who experienced a change in their working time over 15 months. Mean intensity was constrained to 0. Unweighted sample sizes: 4,921 and 1,780. Data: MZ-Panel 2001-04.

For both the full sample and mothers who went through a transition, one can notice the following regional pattern of differentiation:

- In the Länder of the former DDR, mothers tend to have levels of involvement intensity that are clearly above those in the rest of the country. Whereas in the states of Mecklenburg-Vorpommern, Brandenburg, and Thuringen, their behaviour remains close to each other in terms of both the level of involvement in general, mothers in Sachsen and Sachsen-Anhalt are characterised by lower levels of intensity than in the rest of...
Eastern Germany, which is also true of that at which they experience a transition. Mecklenburg-Vorpommern stands out with at the same time a high overall level of intensity and a low level among mothers who experienced a transition, which could be related to the level of unemployment, the second highest of all the regions considered.

- Unsurprisingly most old Bundesländer have lower levels of involvement intensity than the above states, but with some noticeable heterogeneity. The lowest levels of involvement were observed in Nordrhein-Westfalen, Baden-Württemberg, Hessen and Schleswig-Holstein. Together with Bayern, these areas (apart from Schleswig-Holstein) are also those with the lowest level of involvement intensity among mothers who experience a transition – hinting at the fact that in these areas return to work takes place at a lower level than elsewhere.

- By contrast, in the three major urban areas of München, the city-states of Hamburg and Berlin, and to a lesser extent, Frankfurt, involvement intensity is the highest in Western Germany. Mirroring the above, with the exception of Frankfurt, this holds also for mothers who experienced a change in their involvement over time.

**East vs. West**

As one could expect, the East-West divide is the clearest pattern of regional differentiation in Germany. All New Länder are characterised by overall levels of involvement intensity that are well above the German average. East-German mothers are more involved in paid work, that is they are both more likely to be employed and to be so at higher levels of working-time than elsewhere in Germany. The cross-sectional statistics in Table A.3 in the Appendix confirm that the employment rate of mothers of children under 65, is clearly higher in the New Bundesländer than in the West, at 50% and above in most cases whereas they lie at 42% or below in the old Bundesländer (with the two exceptions of Bayern and Baden-Württemberg). At the same time, on average, East German mothers are twice as likely to work full-time, at 70% or above, against under 30% in most old Bundesländer.

The pattern of change over time captured by the model, that is the involvement intensity of mothers who experience a transition, is also the highest of the country (Figure 7.1). This suggests that the changes over time mothers experience in the New Länder are likely to involve transitions towards longer working
hours than in the West: returns from parental leave to full-time rather than part-time work and/or changes from part-time to full-time work while children are still under 6. Descriptive statistics (not shown) indeed indicate that close to half of East German mothers in the sample who were workless at Wave 1 were back to full-time work after 3 years against 14% in the West. However the limited significance of the regional variations in involvement intensity for this subsample should warn us against too definitive interpretations.

It is also visible that, in the model, unemployment held down the level of involvement intensity of mothers in East Germany. Unemployment among mothers is above 12% in most Länder, above 20% in Sachsen-Anhalt, one of the poorest Eastern states. It needs to be reminded that the model does not differentiate between economic activity and unemployment: the distinctive position of the Eastern Länder that appears in Figure 7.1 is only based on participation in employment and working-time, however active their search for a job. On the other hand, some of the jobs that are recorded in the MZ-Panel are in effect temporary government schemes which contribute to inflating the actual employment figures (Blien & Wolf 2001).

Further differentiation

Within the two former countries, additional heterogeneity could be observed, which constitutes one of the interesting findings of this chapter. In the West, mothers in the largest cities such as Hamburg, Frankfurt Berlin and München, and to a lower extent Saarland, were characterised by levels of involvement intensity relatively close to each other and clearly different from the rest of Western Germany. A look at the descriptive statistics in Table A.3 in the Appendix suggests a contrasted pattern. Whereas mothers in the four cities have relatively low employment rates, below 55%, a larger number are employed full-time (at 40% and above) by comparison with the rest of Western Germany. Berlin and Frankfurt have the highest proportion of full-time working mothers, whereas in Hamburg and München larger numbers of mothers tend to be employed part-time, including on marginal part-time work.

At the opposite end of the graph, the former industrial areas of Nordrhein-Westfalen, together with Bremen, Hessen (without Frankfurt) and Schleswig-Holstein, with Baden-Württemberg and Bayern (their respective largest urban concentrations left aside) not standing very far are those in which values of involvement intensity are the lowest of the country. This is the result of a combination of low employment rates and high proportions of marginal part-time
work, involving less than 16 hours per week: very low employment rates and high marginal part-time work in Bremen and Nordrhein-Westfalen in which sometimes more than 35% of mothers of under six are employed, and similar proportions but for higher employment rates at 55% and above in Baden-Württemberg or Bayern. There is not much contrast in involvement intensity among mothers who experienced a transition. It is particularly low in Baden-Württemberg and Bayern where employment rates are high, and is likely to reflect that returns back to work are more likely to happen in these areas than elsewhere, but at a low level of working time, given the high proportion of mothers employed in marginal part-time work.

In a few of the above cases, areas ranking comparatively high in terms of involvement intensity with the full sample of mothers did not rank so high anymore when only respondents who experienced a transition are taken into account. For instance, in Frankfurt, by contrast with all the other aforementioned major urban areas, mothers tend to go through transitions involving low levels of involvement (Figure 7.1), whereas the opposite is true of Bremen, which cannot be explained directly from the data at this stage.

The new Bundesländer are close to each other in terms of involvement with two nuances. One can notice that mothers in Sachsen are less involved than in the other states while at the same time their unemployment rate is the lowest of the five new Bundesländer. Mothers in that area seem to be more likely to be in continuous unemployment and less likely to go through a transition involving a high level of involvement but the small number of observations weakens these figures. This is unlike Sachsen-Anhalt where unemployment is very high, to such an extent that mothers’ employment rate is close to that in the West.

We now need to move one stage further and attempt to explain these regional patterns, in particular the extent to which they could be due to differences in family formation behaviour and the social position of mothers of young children, or factors related to the economic structure of the Federal states.

7.4 Accounting for regional differences

In this section, I review the possible explanations for the regional differences in involvement just described. First I consider whether systematic heterogeneities in family formation behaviour and social position across Bundesländer
can account for some of the contrasts observed. This was achieved by adding covariates to the model presented in Table 7.4 and examining their impact on the respondents' growth lines, in particular the regional level residual variance. In a second stage I further discuss the relationship between the remaining spatial differences, the subjective dispositions in favour or against the paid work of women, and their relationship with the institutional and economic history of some of the Bundesländer, such as their long-term patterns of economic development, and the policies followed in the DDR after the end of the Second World War. As already mentioned, given the particular situation of Germany, made of two areas with specific dynamics, as well as for operational reasons, I did not attempt to test directly in the model for the existence of a relationship between Bundesänder-level indicators of jobs characteristics and regional variance. Instead I compare the results of the model tested for composition effects with aggregate statistics of segregation, unemployment and childcare provision.

7.4.1 Involvement, social position and family formation

Before presenting the results from this analysis, a short methodological reminder is necessary. So far, intensity and variability of involvement have been modelled as two factors – the intercept and slope of growth lines, that were described by a mean value (the average level of intensity/variability across all respondents) and a variance (the average difference between each respondent’s own level of intensity/variability and the mean), the latter representing the imprecision with which the model computed the average level of intensity and variability of involvement. This variance was then decomposed into a part due to individual differences across time, and a regional part (similar differences for all individuals between regions). Statistical testing of the latter confirmed the existence of significant regional differences in involvement intensity.

Examining the role of regional imbalances in the social position of mothers or their family formation patterns in the context of this model means regressing the two factors measuring involvement intensity (intercept) and variability (slope) against the relevant set of control variables. By doing this we are able to see if a reduction of the individual and/or regional variance occurs. The latter would be a sign that indeed imbalances in mothers’ characteristics between regions can account for some of the differences observed in Figure 7.1 in the previous section. However, besides investigating factors that might reduce the overall regional variance, we are also interested in looking at whether this
reduction occurs disproportionately in some areas, affecting also the structure
of the regional differences (such as for instance the urban specificity observed).
Since the rationale for choosing these variables has already been developed,
I will only briefly go through them again here. More operational details are
available in Chapters 4 and 5.

*Family formation* behaviour was measured by three dummy variables:

- the number of children present in the family at Wave 1 (one, or two and
  more, the former being the reference category)

- The age of the youngest child in the family (dummy variable with three
to five years old as the reference category). This indicator was introduced
as a time-varying variable given the time span of the survey.

- Whether respondents (married or not) were cohabitating with a partner
  (reference category) or were lone mothers

*Social position* was measured by another two variables:

- The age of respondent – a proxy for the extent to which respondents are
career-oriented, thus also their occupational class, assuming that such
mothers wait for their career to be established before having their first
child\textsuperscript{53}.

- Education level, either secondary, post-secondary (non-university further
  education), tertiary (degree and higher), with the former as the reference
category, as a proxy for cultural capital. Highly educated women are
known to be more likely to be employed in higher-level occupations and
working time

All but one of these factors was assumed to remain constant over time,
in which case the corresponding variable at Wave one was used in the model.
Whereas this seems a credible assumption in the case of indicators of social
position\textsuperscript{54}, this is less so as far as the age and number of children are
concerned, especially the former. This was an acceptable simplification with the
UK sample, given the shorter time span of the survey, which does not hold
anymore here. German mothers were followed over three years, and the age
of children may have a differentiated impact on their involvement over time
(for example when reaching their third birthday and the entitlement to par-
ental leave ends). In order to better account for this, the age of the youngest
child was introduced as a time varying variable. In the model, this amounts
to four additional regressions in which the latent variable of working-time at each wave is regressed against the dummy variable accounting for the presence of children under 3 in the family (instead of the intercept and slopes factor of the growth lines). This way, we can take into account its differentiated impact at each time point. The path diagram for the model can be found in Figure B.1 in the Appendix.

The four following hypotheses were tested in the model (more detail is available in Chapter 3 and 4):

- involvement intensity is expected to increase with the level of education;
- similarly, mothers with a high level of education were expected to experience both more stable trajectories at a high level of involvement, and sharper upwards transitions, denoting a greater likelihood of working full-time;
- at the regional level controlling for composition effects should reduce the overall regional variance;
- it should also reduce the differences between large urban centres and the other areas;

The results of the amended model are presented in Table 7.5 below. These are of three types: the effect of the time-varying variable (age of the youngest child in the family) on latent involvement at each wave; the (respondent-level) regression coefficients of social position and family formation on involvement intensity and variability and their respective residual variance; finally the residual, Bundesländer-level variance. Since the former two are of limited interest here, I only briefly analyse them in the next subsection before moving on to a discussion of the regional results.

Control variables and individual growth characteristics

When comparing the results in Tables 7.4 and 7.5, one can see that, overall, the control variables accounted for a 40% reduction in the individual-level variance of involvement intensity, and about the same of involvement variability. The reduction is comparatively larger than in the UK where it amounted to about 20%. The results for the full sample are almost identical to those for the model fit to the subsample of mothers who went through a working-time transition.

It is worth noting that when control variables are taken into account, involvement variability (and its variance) and the slope of the growth lines are
Table 7.5: Involvement, family formation and social position: Germany

**Time varying variable**

<table>
<thead>
<tr>
<th>(Child is 0-3, effect at: Wave 1)</th>
<th>Transitions only</th>
<th>Full sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$-1.52^{***}$ (.07)</td>
<td>$-1.95^{***}$ (.11)</td>
</tr>
<tr>
<td>(... Wave 2)</td>
<td>$-1.12^{***}$ (.09)</td>
<td>$-1.61^{***}$ (.11)</td>
</tr>
<tr>
<td>(... Wave 3)</td>
<td>$-1.22^{***}$ (.12)</td>
<td>$-1.74^{***}$ (.12)</td>
</tr>
<tr>
<td>(... Wave 4)</td>
<td>$-1.72^{***}$ (.23)</td>
<td>$-2.36^{***}$ (.24)</td>
</tr>
</tbody>
</table>

**Individual-level results**

*Intercept (intensity) factor regression coefficients*

<table>
<thead>
<tr>
<th></th>
<th>Transitions only</th>
<th>Full sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>2+ children</td>
<td>$-0.55^{***}$ (.13)</td>
<td>$-0.84^{***}$ (.20)</td>
</tr>
<tr>
<td>Age</td>
<td>.00 (.01)</td>
<td>.05** (.02)</td>
</tr>
<tr>
<td>Is single</td>
<td>.17 (.14)</td>
<td>.63** (.21)</td>
</tr>
<tr>
<td>Post-secondary education</td>
<td>$-0.24$ (.19)</td>
<td>.44$^+$ (.25)</td>
</tr>
<tr>
<td>Degree or beyond (base: secondary)</td>
<td>.28 (.30)</td>
<td>$1.60^{***}$ (.43)</td>
</tr>
<tr>
<td>Intercept variance - $\sigma_w^2$</td>
<td>$2.33^{***}$ (.17)</td>
<td>$9.60^{***}$ (.52)</td>
</tr>
</tbody>
</table>

*Slope (variability) factor regression coefficients*

<table>
<thead>
<tr>
<th></th>
<th>Transitions only</th>
<th>Full sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>2+ children</td>
<td>.14 (.08)</td>
<td>.06 (.07)</td>
</tr>
<tr>
<td>Age</td>
<td>$-0.00$ (.01)</td>
<td>$-0.01^+$ (.00)</td>
</tr>
<tr>
<td>Is single</td>
<td>.14$^+$ (.08)</td>
<td>.14$^+$ (.07)</td>
</tr>
<tr>
<td>Secondary education</td>
<td>.36$^*$ (.11)</td>
<td>.32*** (.08)</td>
</tr>
<tr>
<td>Degree or beyond (base: secondary)</td>
<td>.40$^{**}$ (.15)</td>
<td>.42** (.13)</td>
</tr>
<tr>
<td>Slope variance - $\sigma_s^2$</td>
<td>.55$^{**}$ (.07)</td>
<td>.60*** (.09)</td>
</tr>
<tr>
<td>$cov_{Iw,Sw}$</td>
<td>$-0.83^{**}$ (.07)</td>
<td>$-0.74^{**}$ (.06)</td>
</tr>
</tbody>
</table>

**Regional-level results**

<table>
<thead>
<tr>
<th></th>
<th>Transitions only</th>
<th>Full sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>$cov_{Ib,Sb}$</td>
<td>$-0.26$ (.27)</td>
<td>$-0.09$ (.20)</td>
</tr>
<tr>
<td>Intercept mean - $Iw$</td>
<td>$Constrained$ to 0</td>
<td></td>
</tr>
<tr>
<td>Slope mean - $Sb$</td>
<td>.00 (.00)</td>
<td>$-0.02$ (.04)</td>
</tr>
<tr>
<td>Intercept variance - $\sigma_b^2$</td>
<td>$0.04^+$ (.02)</td>
<td>.62$^*$ (.24)</td>
</tr>
<tr>
<td>Slope variance - $\sigma_s^2$</td>
<td>0 (.00)</td>
<td>0 (.00)</td>
</tr>
<tr>
<td>n</td>
<td>1,780</td>
<td>4,921</td>
</tr>
</tbody>
</table>

Intercept and slope variances; regression coefficients, 4 waves multilevel latent growth model of involvement of mothers of children under six. Observed categories: Not working; under 15h per week; between 15 and 30h; more than 30h. Data: MZ-Pan Panel 2001-04. Individual-level intercept and slope means and regional-level intercept mean constrained to 0 and not shown. A fuller version is presented in Tables B.5 and B.6 in the Appendix.
not significantly different from 0 anymore. In other words, on average, there are no significant variations in transitions between mothers over three years once sociodemographic factors are taken into account, which seems to indicate that most of the differences can be summarised by the intercepts of the growth line – involvement intensity over time.

As was expected, family formation characteristics have an impact on the trajectories of mothers of young children: the larger the number of children in the family, the lower the involvement intensity of the mother. This is, however, not true of the variability of involvement, which is not related to the number of children in the family. In the same fashion, having children under 3 reduced the overall involvement in paid work at each wave. However, the negative impact was larger – by 22% – at the last wave than at the first one which confirms that it was justified to model this factor as a time-varying process. Given that this effect is averaged between individuals, this could reflect the fact that still having children under 3 after three years means in some cases having had another baby, hence reducing participation more dramatically than at Waves 2 and 3.

An interesting result is that being a lone mother does not have a negative impact either on the level of involvement, nor on the transition mothers go through, once family size is taken into account. To the contrary, lone mothers tend to be more intensively involved and experience stronger increases than those with a partner, which is also the only family characteristic that affects involvement variability. This result, in stark contrast with the UK, confirms the descriptive analysis discussed above as well as previous studies (Klett-Davies 1997).

Finally, social position, as indirectly measured by the education level and the age of mothers, has the expected effect on both involvement intensity and variability: the more educated the respondent, again the higher their involvement intensity, and the sharper their increase over time. This is particularly true of respondents who held a qualification from tertiary education. In a similar fashion, involvement intensity of mothers tends to be higher as they get older.

A final remark is that none of these variables seems to affect the level at which mothers undertake a change in their involvement. When fit to the subsample of transitions, only the number of children in the family has a significant impact on this level, which suggests that the control variables are better at explaining stability than change in the employment trajectories of
German mothers. This may signal unobserved heterogeneity in the model, but also the effect of parental leave that might level the level of involvement at which mothers return to employment. I will now turn to the analysis of the impact of the control variables on the size and the structure of the regional variance.

Composition effects and regional variance

One of the main conclusions that can be drawn from Table 7.5 is that, as far as the full sample is concerned, significant regional variance in involvement intensity remained after the control variables were introduced in the model, even if it lost some of its significance by comparison with the model without covariate (P=.011, against .001). This does not hold for the subsample of transitions: regional differences in the level at which mothers alter their working time and/or leave/re-enter paid work have become only significant at the .1 level. This is a modest finding, since the initial significance was already limited (p=.04), but seems to suggest that regional differences in family size could go some way towards explaining differences in the level at which mothers go through a transition.

A second conclusion is that, as in the UK, the value of the residual variance increased with the introduction of covariates, from .470 to .623, a 33% difference, and this happened gradually with each new variable introduced in the model (see the Appendix for more details). These results suggest that in Germany as well, when social position and family types are taken on board, more heterogeneity is present than initially observed. We could conclude here that there is indeed a composition effect at work in Germany, but that it reveals additional regional variance that is masked by demographic imbalances between Bundesländer. Considering the reference categories of the dummy variables used in the model, this indicates that mothers with children aged 3 to 5, of an average age (30), with a secondary education, a partner and one child show more regional disparity in their involvement than when all mothers are looked at together.

Finally, we need to have a look at the extent to which the effect of the control variables have altered the structure of the differences between regions, i.e. whether the change in the total variance is driven by a limited number of them or to the contrary, more evenly spread around the country. Table 7.2 shows the change in regional variance brought about by each incremental inclusion of the main independent variables from the initial model without
covariates to the full model with all the control variables, for the full sample of mothers.

One can see that regional imbalances in family composition contribute to hiding differences in the behaviour of mothers when the number of children and their age are held constant, in this case, mothers of 2 or more children, one of whom at least is under 3. Indeed, in almost every Bundesland, family characteristics tend to increase the size of the regional variance. This added heterogeneity is then reduced once social position is taken into account, a sign that the above differentiated behaviour for a given family type, is partially due to the education and age of mothers: the size of the residual variance decreases when variables for age and education are introduced in the model. This reduction does not, however, bring the variance down to levels lower than in the initial model, in most cases.

The fourth conclusion that one can draw from the table is that in only a few Bundesländer do social positions and family formation patterns affect involvement in a noticeably different way. First, the model performs best mostly in Eastern Germany, but also in Stuttgart. This suggests that some of the differences in mothers' trajectories could be related to a composition effect in these areas. In Thüringen, Sachsen and to a lesser extent Mecklenburg-Vorpommern, the initial level of involvement shrunk to a smaller level than the one initially observed in the empty model, a reduction which also took place gradually as more variables were introduced, by contrast will all other regions and cities of the country. In these three East German States, the higher levels of involvement initially observed seem to be due to smaller numbers of families with very young children, as well as lower numbers of low educated mothers. This seems to be a sign that some migration effect could be at work in these areas. In Sachsen-Anhalt and Brandenburg, by contrast, the model behaved in a comparable way to Western Germany. The reasons for the specificity of Stuttgart cannot be identified at this stage.
Figure 7.2: Composition effect and regional involvement intensity

Bundesländer-level residual variance of involvement intensity (intercept factor), two level latent growth curve model of involvement in paid work, after controlling for each type of variable introduced stepwise in the model. Data: MZ-Panell 2001-04.
On the other hand, the model fared worst in Schleswig-Holstein and Berlin, at either end of the spectrum of the spatial variation in involvement within West Germany. In these states, when family characteristics, age and education are held constant, mothers tend to be less involved than initially thought. In several other cases, such as Bayern and Baden Württemberg, introducing controls for social position did not improve the heterogeneity uncovered by the family formation variables.

Finally, in a few cases, the relative position of each Bundesländer vis-à-vis each other came out affected in a few cases: in Schleswig-Holstein and Bremen, when their socio-demographic characteristics are controlled for, mothers tend to be actually less involved than in Nordrhein-Westfalen, as previously thought. At the other end, when their characteristics are taken into account, mothers in Berlin tend to be less involved than most other German cities analysed here.

In general, the model fares worse in the case of the large urban centre of Frankfurt (the only case where the value of the residual became negative after introducing control variables), München, Berlin and Hamburg, but also Bremen all of which (except from the latter) were also characterised by higher than average levels of involvement. What shows in these areas, is that when demographic differences are held constant even more differences (i.e. unexplained tendency to be more involved than anywhere else in the country) can be observed: again, women with low education, one very young child, with a partner and of an average age are more involved in these areas. It is also interesting that a similar trend may be observed in Bremen, otherwise characterised by one of the lowest raw levels of involvement.

It is interesting to note the absence of a visible impact of migration in the model in the destination state, that is, the ‘big three’: Baden-Württemberg, Bayern and Nordrhein-Westfalen, which is likely to be due to the size of the ‘native’ population of mothers. It could also be that migration flows – i.e. migrants with a high and low involvement profiles – cancel each other’s footprint in their destination area. A deeper analysis would be needed to investigate this conjecture, since this issue is not part of the main objectives of this research.

The findings so far

At the end of this section, we are left with findings comparable to the ones found in the previous chapter: testing for a composition effect in order to reduce the imbalances in the population of mothers between regions elucidates some of the regional differences in involvement but their contribution is limited,
and significant unexplained spatial variation still remains, along the same lines as initially identified: East against West Germany, most city states and large cities against the rest of the other Western Bundesländer, and to a lesser extent also North against South-Western Germany.

It is now time to discuss additional explanations for these remaining contrasts. I deliberately chose not to attempt a systematic explanation for these that would be based on adding regional level variables, such as unemployment rates: the nature of the clustering and the large differences in size between the regions would make any such attempt meaningless. As a result, in the next section, I move to a non systematic and more qualitative presentation, where the second and third research question – the relationship between dispositions and participation – are considered.

7.4.2 Involvement and regional constraints

In this section I will compare the results presented above, in particular those visible in Figure 7.2 with available data about horizontal segregation, female unemployment, and childcare provision, in order to discuss the second set of hypotheses tested in this dissertation, namely that:

- Involvement intensity should be higher in regions where the proportion of women employed in segregated industries is high, although in a limited way given that segregated jobs tend to be part-time;

- Regions with lower levels of involvement intensity should be those with high regional female unemployment rates (given that it would be less likely for women to get involved by finding a job);

- Similarly, involvement intensity should be higher in regions where childcare provision is more important;

However, given that these variables were not tested in the model, these hypotheses were not formally tested and therefore cannot be disproved which is the reason why only a limited discussion will take place here.

**Horizontal segregation** does not seem to be associated in an obvious fashion with involvement intensity at the regional level. If we look at the distribution of female unemployment in Table A.4 in the Appendix. Regions characterised by a high level of segregation could be found at both end of the distribution of residual regional employment. Such is the case for instance of
Schleswig-Holstein, the region with the lowest level of residual involvement, where at the same time close to 42% of women work in segregated industries, which is amongst the highest proportions in Germany. However, in Sachsen-Anhalt in former DDR where a similarly high proportion of women work in segregated industries (close to 42%), mothers of young children have one of the highest unexplained regional level of unemployment, the exact opposite being true of Mecklenburg-Vorpommern. This seems to confirm the existing literature presented in Chapter 3 in which segregation is not seen as salient in Germany than in the UK although precaution is needed.

**Regional levels of unemployment among mothers** as visible in Table A.3 in the Appendix, seem to be positively associated with involvement at the regional level, which may sound counter intuitive, but seems to simply reflect the fact that it is highest in Eastern Germany where other factors are having an impact on involvement intensity, such as those reviewed in the next section. The same seems to also be true of male unemployment, which will not be discussed here.

**Regional levels of childcare provision** in particular provision for children under three, as presented in Figure 7.3 seem positively associated with unexplained regional levels of involvement intensity. This is particularly visible in the case of the new Bundesländer, but also within Western Germany, areas such as Saarland and Hamburg which are those with the highest levels of unexplained involvement intensity are also those where provision for under three is highest. Interestingly also, in these two areas, provision for children between two and three is higher which could indicate that women are more likely to return early from parental leave.

At the opposite end, Schleswig-Holstein and Nordrhein-Westfalen are characterised by both limited provision and low involvement. Although Figure 7.3 does not allow us to examine differences between large cities present in the model, additional data shows that provision is strongest in cities identified than in the rest of the Old Bundesländer. Available data at the Kreise (NUTS-3) level shows, indeed, that in 2008, full-time childcare availability for children under 3 stood between 5% and 10% in Bremen and Düsseldorf (Rheinland-Westfalen) – at the lower end of the regional distribution of involvement. At the same time, it stands between 10% and 20% in the other three cities (Frankfurt, Stuttgart, and Hamburg) where involvement was higher, against less than 5% in the rest of the Kreise. This contrast becomes even more pronounced for
children between 3 and 6 (Bundesministerium für Familie, Senioren, Frauen und Jugend 2010). It is also interesting to notice that Sachsen, which has the lowest degree of involvement of all the new Bundesländer, is also characterised by the lowest level of childcare provision for children under three, at the same time as an additional benefit for mothers on parental leave. The same doesn’t seem to apply to Thüringen however, where the same kind of benefit is available, but where involvement is in line with the other new federal states.

Although the above relationship would suggest that a higher supply of childcare, in particular for under three allows mothers to be involved at a higher level, caution is required, since there may be a ‘chicken and egg’ problem: whether more increased female employment triggered a demand for childcare or the opposite cannot be determined here and further research would be needed.

Figure 7.3: Children in day care by age group and Bundesländer

![Chart showing children in day care by age group and Bundesländer](image)

Proportion of children of a given age group in day care (respectively Krippe and Kindergarten) by Bundesländer. Data: Statistisches Bundesamt and Bundesministerium für Familie, Senioren, Frauen und Jugend 2006.

7.4.3 Accounting for gendered geographies

In this section, I discuss the relevance of taking into account the subjective dispositions and attitudes of mothers towards paid work and their broader context of production/reproduction in order to shed some light on the remaining
regional differences in involvement in Germany. This raises similar questions as in the previous chapter: are some of the contrasts in involvement matched by comparable differences in the gender-roles attitudes across regions? If so, could these be related to the socio-economic history of some of the areas considered, such as, but not only, long term trends in industrial development? More precisely it could be expected that

- Regions characterised by positive attitudes towards women's involvement should have higher levels of involvement intensity;

- Regions with a significant past in heavy industries (coal mining, metal-working, engineering) should show both more negative attitudes and higher levels of involvement, whereas the opposite could be expected from regions with known long term presence of female employment such as in the textile industry;

As already mentioned, such a discussion suggests an approach that is 'case-' rather than 'variable-based': in other words most of this discussion will focus on sets of factors that are uniquely relevant to one area or group of areas, rather than systematically looking at the impact of variables across all areas.

**Gender roles attitudes and regional contrasts in involvement**

Figure 7.4 below provides an overview of the attitudes of the German population towards the employment of mothers, proxied by a measure of agreement/disagreement with the statement that "women should be prepared to cut down on paid work for sake of family". If we compare this graph with Figure 7.1 previously discussed, a degree of correspondence between the unexplained levels of involvement and the attitudes of women towards participation in paid work becomes visible. It is clearest in Eastern Germany, where high levels of involvement matched attitudes in favour of stronger involvement of women, but it also follows the contrasts identified in Figure 2 between the three areas where some composition effect could be observed and the remaining two with increased unexplained levels of involvement. Similarly, areas such as Nordrhein-Westfalen or Schleswig-Holstein show both the most traditional attitudes towards involvement in paid work and low levels of involvement.

More generally we can observe three types of regional configurations: in former Eastern Germany, the proportion of women who disagree that they should be prepared to cut on paid work for the sake of their family is markedly
larger than those who agree. This is especially true of Sachsen-Anhalt and Brandenburg. At the opposite end, in North Western Germany, together with Bavaria a majority of women tend to agree that their family duties should take precedence over their involvement in paid work. Finally, in a third group, although traditional views about involvement prevail, there is also a larger proportion of female respondents who disagree with them than in the rest of Western Germany, suggesting a degree of internal heterogeneity. Saarland seems to be a special case, with a large proportion of respondents who do not have strong views about the issue. We are unfortunately left in the dark as far as the cities of München, Frankfurt and Stuttgart are concerned: given the level of geographies available in the ESS they are conflated within their respective Land.

Figure 7.4: Gender roles attitudes across Bundesländer

Proportion of respondents (aged 16-64) who agree/disagree that women should be prepared to cut down on paid work for the sake of family by Bundesländer. Data: European Social Survey Round 2, Edition 3.2. Unweighted size: 2,821 obs.

East vs. West

Former Eastern Germany is probably the area where a relationship between the former country’s past socio-economic environment and mothers’ dispositions towards paid work is the most straightforward to establish. It is generally
acknowledged that the policies pursued by the successive governments in the DDR during the postwar period durably affected women's employment behaviour. These policies were driven by the explicit goal of maximising the employment participation of the whole East German population in the low productivity, employment intensive industries on which the economy of the country was based (Adler & Brayfield 1996; Rosenfeld et al. 2004). At the same time, this was coupled to natalist policies that relied on the assumption, as was the case in Sweden, that providing extensive childcare facilities was the best way to increase birth rates while keeping mothers in the workforce. Thus, during the postwar area several generations of East German women lived in a context characterised by institutional, material and ideological support for their involvement in paid work, including comprehensive provision of affordable childcare. It seems reasonable to consider that with time and generations, many women developed a distinctive 'natural' disposition towards participation in employment that built upon sedimented histories of participation across several generations of mothers and daughters.

This may be the case, but one still needs to understand why the return to conventional male breadwinner behaviour did not take place as it did in several other former socialist countries. Some have pointed out that the religious background of North-West Germany may have played an indirect role in preventing a 'backlash' against these policies facilitating work-family balance (Hummelsheim 2009). By contrast with other former socialist countries, such as Poland, the dominant religion before the war was Protestant, with a stronger moral compulsion of paid work, including that among women. However, overall the relationship between women's employment and religion in Germany is unclear and will not be discussed here. Of course, there are discordant voices in this general assessment. First, not all women saw the end of the socialist work ethos and their unemployment as a problem and either adapted swiftly to the new situation or welcomed the change as more consonant with their work orientations (Rudd 2006; Fisher 2010).

The persistence of high involvement is especially interesting when considering the disproportionate share of unemployment that women took at the time of reunification. In 1993, at the peak of the economic slump that followed, women in Former Eastern Germany were twice as likely to be unemployed as men and three times as women in the West (Beck et al. 2005). East German women have more positive attitudes towards paid work, and there are indications that these attitudes do not seem to have changed, since the reunification,
to the contrary (Adler & Brayfield 1997; Lee et al. 2007). Even though the evidence would allow us to draw a direct causal connection between attitudes and involvement, these results are compatible with those found for Manchester in the previous chapter. Areas with historically high levels of involvement in paid work by mothers show some resilience, even when the initial economic conditions that saw this emergence are not met anymore, and they match similarly more positive attitudes towards paid work than in other areas.

**Male breadwinner industries vs. urban economies**

Within Western Germany, the evidence in favour of the existence of a relationship between attitudes towards women’s participation, involvement, and industrial past is less convincing than in the previous case, at least at the level of geography used in this research. On the one hand, there is a partial match between the regional distribution of attitudes towards the employment of women and the residual levels of participation in a number of key Bundesländer where involvement is low. Bayern, Nordrhein-Westfalen, and Saarland were among the Bundesländer expected to show a higher prevalence of traditional views about women’s employment. The latter two, because of the long-term prevalence of male-breadwinner based industries, and the former because of the strong role played in the past – and still played by agriculture. Within Nordrhein-Westfalen the ‘Ruhrgebiet’ is where the heart of the German coal and metalworking industries were once located, and which has experience a decline since the 1970s.

Our original expectation is met in only two of these areas. Both Bayern and Nordrhein-Westfalen indeed combine traditional views about women’s employment, as suggested by higher proportions of respondents who agreed that women should cut down on paid work for the sake of their families, and low proportions of those who disagree, mildly or strongly with the statement (in both regions, respectively 55% and 21%). These are matched by comparatively low regional-level involvement intensity which corresponds to a combination of low employment rates and similarly small number of hours worked. The fact that the cross-sectional employment rate for mothers is higher in Bayern (without München) than in Nordrhein-Westfalen, is compatible with Massey’s prediction that areas with a predominantly agricultural tradition will be characterised by high marginal participation of women in paid work (Massey & Allen 1984,1994), in this case, less than 30% employed in full-time jobs. However, the proportion of women working full-time and part-time is almost
identical in Nordrhein-Westfalen, which slightly undermines this explanation.

A partial correspondence between patterns of involvement and attitudes could be seen in the case of Schleswig-Holstein and to a lower extent, Niedersachsen. These two areas, the former in particular have been described as areas where industrialisation developed late and unevenly, in a fashion that did not seem to have altered economies based on agricultural production in small farms (Kaelble & Hohls 1987; Sackmann 1997). Interestingly, these areas share with Bavaria, the largest proportion of people with traditional views about the employment of mothers. Thus, these areas could constitute case not so dissimilar from the East Anglia in the UK, where employment rate is not necessarily among the lowest, but where working-time tends to be low, a sign of the marginal role of women’s work.

Clearly, the hypothesis does not hold in Saarland, which is a region whose economy was also dominated by metalworking industries. The area has the lowest proportion of respondents who thought that women should cut down on paid work when required by their family duties (37%, close to the numbers observed in Eastern Germany). Some prudence is nevertheless required here given the small number of observations. There are no immediately available explanations for this, except from the fact that the process of economic reconversion, that has taken place in this State, has been described as more employment-intensive than in the former area (Bauer & Otto 2006). A question that would deserve further investigation is the extent to which this process of economic reconversion might have had an impact on the attitudes about women’s employment participation – besides participation itself, which is characterized by comparatively high rates of employment and full-time work (Table A.3 in the Appendix).

As far as German cities are concerned, the evidence at our disposal is scarce and does not really allow us to discuss whether mothers in an urban environment have distinctive attitudes towards involvement, given that the data for München, Frankfurt and Stuttgart is missing. We can only see that in Hamburg and Berlin the views in favour of the paid employment of mothers are strongest – in the old Bundesländern these have the smallest proportion of respondents both who agree that mothers should cut down on paid work for the sake of their family at the same time as of those who disagree (hence a small proportion of those without clear views about the issue). At the same time, in Bremen, more traditional views, closer to those that prevail in Nordrhein-Westfalen can be observed, which constitutes another instance
of a match between negative attitudes towards female employment and low regional involvement.

More comprehensive research into the reasons why some of these cities have enabled the employment of mothers more than others is beyond the scope of this dissertation. In order to complement these findings additional factors would need to be looked at. For instance, the role of the migrant workforce should be considered. As in the UK, the impact of migration has been left out of the picture so far, mostly for operational reasons, also because of the high degree of internal heterogeneity within this category. However, there is a hint that this factor could play a part in accounting for the low urban employment rates in some cases: indeed the high comparative level of employment in German cities is made of low or unremarkable employment rates, and high levels of full-time work (with the exception of Stuttgart). First there is a strong urban component in the proportion of non German mothers in the sample. Against a national average of 16%, around 30% of respondents in Stuttgart and Berlin and around 40% in München and Frankfurt are not German\(^1\). There is also a strong Turkish component in the migrant population in the five above mentioned cities: 11% and above against a national average of 6% whereas formal employment rates among Turkish mothers was 23% against more that 50% among German mothers. It is also lowest in Bayern and Niedersachsen but comparatively high in Nordrhein Westfalen, where male Gastarbeiter represented a significant part of the industrial workforce until the 1970s.

7.5 Summary

In this chapter I have presented the second case study of this research and explored the extent and possible explanations for the regional differences in involvement in paid work of mothers of children under 6 in Germany. Beside the well publicised differences between the East and the West of the country, additional contrasts could be observed within each one of the former countries. Unsurprisingly, the former differences consist in markedly higher levels of participation within the former German Democratic Republic than in the West, both in terms of involvement intensity, i.e. employment rates and proportions employed in full-time work, but also variability over time. As far as the other differences are concerned, unemployment seemed to have been

\(^{1}\text{All figures in this paragraph: own calculations based on the cross-sectional MZ 2001, not shown}\)
playing a part within the East whereas the pattern of differentiation is more complex within the West, in particular between major urban areas, including the City States of Bremen and Hamburg, and the rest of the Bundesländer. Using the same latent growth curve model as in the previous chapter to represent the involvement transitions of German mothers over three years, these differences translated into statistically significant regional contrasts in involvement intensity, but not in their variation over time. Data quality issues, in particular, high levels of attrition in relation to residential mobility may have an impact on the latter results.

As with the case study for the UK, three questions have been reviewed: first, the composition hypothesis, according to which regional differences in the family formation patterns of mothers, as well as their educational level, could account for the differences observed, and second, the extent to which characteristics in the regional labour market and, especially in the case of Germany, the provision of childcare. The third one considered whether a relationship between attitudes towards employment of mothers, in relation or not to the regional economic history, could account for them. Some evidence was found that compositional effects were at work, especially in Eastern Germany. In particular, composition effects were seen to account for most of the regional differences in the level at which involvement transitions occur over time. On the other hand, relative differences between individual Bundesländer were mostly not affected by the control variables, especially in the North Western part of the country. In addition, and although these were not part of the model tested, whereas there does not seem to be a clear association between regions with high levels of involvement (controlling for compositional effects), a relationship seems to exist between the latter and the provision of childcare for under three, although the actual causal mechanism at work needs to be ascertained.

As far as the third research question is concerned, the clearly different attitudes to work of both men and women in the Eastern part of the country, in conjunction with the known policies of compulsory work and comprehensive childcare provision pursued by the government of the former DDR seem to represent a case in point that past economic circumstances (even if driven by government policies), attitudes towards paid work, and present degree of involvement are closely related. In the rest of the country, however, the relationship between attitudes and participation seems instead to follow a divide between large urban areas and the rest of the Federal States, with only lim-
ited evidence of a relationship between these and elements of their respective economic history. A few signs were available in the West of the country that past economic circumstances could be related to attitudes and participation, in particular in Nordrhein-Westfalen and the North Western States whereas by contrast mothers in the former industrial area of Saarland seem to have moved away from this pattern. I will consider the broader implications of these findings in the conclusion that follows this chapter.
Chapter 8

Conclusion

In this final part, I review the objectives of the research as they were stated at the beginning of the dissertation, and examine the extent to which they were met. I also discuss some of the main weaknesses of this research, and consider some of the implications of its findings before proposing a few avenues for further research.

My first objective was to improve the knowledge about the involvement in paid work of mothers of young children by producing longitudinal evidence specific to this group, in particular from a regional perspective, in an attempt to upgrade the often vague and non specific data still used in research or policy documents about women. The research successfully brought to light evidence of the specific circumstances of mothers of children under 6, showing that differences in involvement cannot be summarised as a North-South divide in the UK, no more than simply an East-West divide in Germany. To name a few of the trends that were observed: mothers in South-West Scotland, the North West and parts of the West Midlands in the UK tend to have high levels of involvement intensity, by contrast with those in the Sheffield area, East Anglia, Birmingham or London. Mothers in Wales and Northern Ireland seem to be going through markedly different transitions, upwards and downwards respectively. In Germany, the main findings were about the high level of involvement of women in cities, together with a North-South divide, in addition to the markedly high levels of involvement intensity in the former German Democratic Republic.

My second objective consisted in applying the recently developed Latent Growth Curve modelling framework to the analysis of involvement in employment, in particular involvement transitions, in this case of mothers of young children. The results presented in Chapters 5, 6 and 7 show that this frame-
work represents an innovative complement to other methods and provides a convenient way to summarise employment trajectories into and away from paid work, and between different categories of working time. The method provides a practical tool that could be used to represent trends in individual transitions between groups, including graphically. One of its strengths is that it can combine the main dimensions of involvement, intensity and variability over time into a unified framework even if this comes at the cost of the precision of some of the results. This framework also lends itself well to more complex analysis such as indeed those involving multilevel modelling as I showed in Chapters 6 and 7.

Turning to the three main questions I addressed in this research, significant results were obtained. *Firstly*, although the impact of social position and family formation on involvement was found in both countries, it only marginally reduced the level of unexplained regional variations. When it occurred, this reduction was focused in a limited number of individual regions. Such is the case of the Eastern Bundeslandér of Thüringen and Mecklenburg-Vorpommern in Germany, where social position goes some way towards explaining the comparatively high levels of involvement. In the UK this tends to be more true of regions with low unexplained levels of involvement intensity, as in the South Yorkshire and the West Midlands. The bigger picture, however, is that overall controlling for social position and family formation, rather than reducing it revealed additional regional variation in intensity. These appeared when family formations, class and education were held constant, and was true in both countries, with some nuances.

In addition, in the UK, a pattern of association was visible between the remaining unexplained levels of involvement intensity and aggregate variables measuring the characteristics of the regional labour market. Horizontal segregation and the level of male unemployment accounted for the differences in the level of transitions of mothers, but less so of the level of stable involvement over the period of observation. These would suggest that the availability of gender segregated jobs in the private sector tends to reduce the level of involvement, a result that needs to be read in terms of working-time rather than participation in employment), whilst at the same time offering opportunities for women to increase their involvement at some point, confirming that these jobs might help reproduce rather than change dominant gender arrangements. The same analysis also brought evidence of a positive relationship at the regional level between involvement intensity levels of male unemployment, suggesting that
in some cases women could step up their involvement where the income of the main earner is or is perceived to be under threat.

Finally, my results show that there is an interesting correspondence between unexplained levels of involvement intensity and gender roles attitudes on the one hand, and in several cases between the former and historical evidence of high levels of involvement among women even if one cannot ‘prove’ such a relationship. This evidence is more convincing in the case of the UK than of Germany, where attitudinal data was not available for the level of geography of interest (large urban centres), but nevertheless confirmed such a relationship between the Eastern and Western parts of the country. In the UK the relationship seems to hold for the areas where high levels of intensity were observed in England (mainly the North West), and in some areas where it was by contrast low, such as East Anglia, Birmingham and South Yorkshire. The former areas had been characterised by comparatively high levels of female employment in factories from the second half of the 19th century and well into the 20th, in textile or pottery making industries, whereas the economy of the latter relied either on male industries where the stay-at-home wife contributed the male breadwinner’s social status. Areas where agriculture remained important seemed to have instead been characterised (and still are) by high or average levels of participation, but at a low level of working-time, such as was the case of East Anglia. Although further analysis is required, the same correspondence is likely to be present in the North-Western Bundesländer in Germany. Finally, although a match between attitudes and regional involvement levels could be found in London and the South East, this did not match known clear trends in the employment of women, nor did it in the Southern states of Bayern and Baden Württemberg, possibly denoting a significant degree of internal heterogeneity within these areas.

Issues and weaknesses

Besides the findings highlighted above, this research and its results suffer from a number of weaknesses. First, although they provide an undeniable insight into the longitudinal involvement dynamics of mothers, the limited number of waves available in the data limits the significance of the results. Given existing evidence showing that increases in involvement, and in particular returns to work after childbearing are gradual, mothers should be followed over a longer period of time than the one available in this research, for instance until their youngest child has reached the age of 8 to 10. This would also allow us to
better understand and maybe distinguish between trajectory types and hence overcome one of the issues reported in Chapter 5, the difficulties encountered when attempting to fit a growth mixture model where classes of trajectories could be identified.

Another weakness of the design also results from the data. It is likely that in both cases, the number of transitions is underestimated, and moreover that certain types of transitions are overlooked. In both the UK and German cases this arises as a result of the fact that respondents who experienced a transition over time tend to drop out from the sample, and no attempt is made at re-contacting them. This attrition may happen as a result of residential mobility, which may be associated with job mobility, resulting in an underestimation of transitions in some mothers’ careers in the sample or more commonly, in their partners’, given that women tend to be tied movers. Although both datasets are weighted, these only correct for wave to wave cross-sectional discrepancies, but do not guarantee that the sample is representative of transitions.

A more fundamental limitation consists in the arbitrariness of the definition of regions and, as a result, their heterogeneity. Apart from the major urban areas in the two countries, the size of the regions, whether in terms of population or area varies widely. In both countries, very large areas such as the South East of England or the Land of Nordrhein-Westfalen have populations larger than several other European countries, and hence considering them as regions on the same footing than the North East of England or Saarland is misleading. In addition, as mentioned in Chapter 3, the former Bundesland encompasses both areas with a strong tradition of male breadwinner industries at the same time as with female employment. This does not only affect the attempt at relating regional industrial history to the present level of involvement, but also more generally the analysis of the role of aggregate variables.

A fourth limitation is the scarcity of the evidence available to triangulate the regional differences in involvement predicted by the model, and unexplained by the control variables. Data about attitudes were only available at levels of geography that only partially match those used in the model. This is an issue in the German case given that data where women had the most atypical behaviour are precisely those where no attitudinal data is available. The most serious problem is the scarcity of historical data about involvement. Since this topic has not been studied systematically, one has to rely on existing historical case studies where not all areas or industries have been covered equally, not to mention that it is relatively recently that the theme of gender
and women’s work has attracted the interest of historians.

The advantages of latent growth modelling have been already highlighted. However, this method has a number of downsides. The most obvious one is its lack of precision due to the lack of directly meaningful metric of the latent variables, which means that whilst it is appropriate in order to gain ‘impressionistic views’ of participation, at the same time it needs to be complemented by additional data analysis in order to translate results into the conceptual categories used by the general public and, most importantly, policy makers.

Preferences, habitus and dispositions

I would like to consider a few implications of the evidence found in Chapters 6 and 7 that support the existence of a relationship between attitudes, involvement and economic history, according to which regionally differentiated patterns of involvement in paid work might persist over some time. These results are limited, and more convincing in the case of the UK than of Germany, but provide some indication that, for instance, in areas where in the past the involvement of women was triggered by economic necessity or by external reasons, still showed atypically high levels of participation at present. In parts of the UK, during some of the 19th and 20th centuries, the conjunction of low male wages or unemployment, together with the emergence of industries relying on the equally low paid work of women and children contributed to pushing women out of their house and into factory work, a reality that seemed to have affected several generations of them in Lancashire and Greater Manchester, and probably other areas such as Dundee, or even the West End of London. A comparable situation seemed to have developed in Germany, in Bielefeld. A different type of circumstance was the enforced compulsory duty to work promoted by the government of the former German Democratic Republic, which promoted women’s work and provided support for working mothers. What made these circumstances exceptional is not the fact that women worked – many working-class women and children worked and the former rarely became full-time housewives during the same period – but the fact that within a given area they did it ‘en masse’ outside the home, in a fashion that gave more prominence to their involvement and contributed to a weakening of their traditional position as secondary earners.

There is evidence that these accidental circumstances durably affected women’s – and men’s – behaviour and became natural and ‘normal’. In Eastern Germany the empirical evidence presented in Chapter 7 shows such gendered
conceptions persist, more than 20 years after the Reunification. Furthermore this is not only true of the perception, but also the actual behaviour even in a context of generalised unemployment. Although for obvious reasons the evidence is scarcer, and less systematic, historical literature shows that women who went to work in factories developed attitudes and behaviour which were seen at the time at odds with their duties as housewives. Although at the individual level these could be interpreted as an example of Duncan’s (2002) gendered moral rationalities, the long term historical trends add another dimension to these: it is not only that women negotiate locally the ‘right thing to do’ in terms of their involvement in paid work within their social and family networks, it is also that women seem to be more likely to develop particular gendered moral rationalities in particular regions, adding a structural dimension to the local one.

Research in cognitive psychology, studying mental processes has shown that most human behaviours are habit- and repetition-driven. Rational calculation and reflexivity happen in a limited fashion only, given the amount of mental resource they require. Change may occur, but their permanence is conditioned to them becoming part of an individual’s set of routine behaviours (Bargh & Chartrand 1999; Bargh & Williams 2006). This idea that behaviours that have become habits are not questioned anymore and tend to be repeated could provide a convincing explanation for the mechanisms at work behind the persistence of paid work among women, even after the conditions that triggered it do not exist anymore. Habit-driven behaviour nuances rather than invalidates Duncan’s framework since it does not negate the existence of reflexivity.

This approach is also interesting in that it opens the door to a conceptualisation of mothers’ involvement in paid work in terms of habitus (Bourdieu 1990). Habitus is defined as a set of ‘dispositions’ internalised by individuals and framed by successive repetitions of events – encounters, influences – happening in personal histories. It determines individual actions through the elimination of possible futures by the agent itself (Ibidem). For this reason it is a ‘structuring structure’: while perceptible at the individual level, it is the embodiment/incarnation of a social structure. In this view, agents creatively participate in their own domination by ‘inventing’ actions in line with the dispositions inherited from the habitus. A comprehensive theoretical discussion is out of place here. However, interpreting the results of this research according to this framework is interesting. Women’s work, in particular mothers’, developed out of economic necessity, reflected their working-class position
characterised by low economic resources, but at the same time contributed to giving them autonomy from their partner – thus promoting an alternative gender order. Seen from this perspective, women’s transitions in/out the labour market are more intelligible in terms of socially-constructed dispositions than individual orientations to work.

One last remaining question is that of the durability of these ‘involvement habitus’, and more generally of the conditions of their reproduction. If one can accept that there is some persistence in the involvement of women over time, it is nevertheless understandable that this behaviour may change again over time if circumstances become completely different. Therefore, it would be interesting to research the conditions i.e. in terms of jobs available that allowed women to remain involved in paid work, and their variations between places. Similarly, it would also be very interesting to follow the future trend in women’s involvement when circumstances change. Two cases in point are the former German Democratic Republic, and former male breadwinner areas that have experienced deindustrialisation, such as Saarland in Germany or the North East of England. This would avoid falling into the trap of ‘sociological laziness’ which consists in assigning static cultural identities to areas without trying to understanding their conditions of production.

Finally, it should also be recognized that the fact that the correspondences observed in this research might have been accidental: whereas the historic areas of Lancashire and Greater Manchester roughly correspond to administrative boundaries used for statistical purposes here, this is not the case of many other areas, such as the already cited Dundee and Bielefeld. In other words, the results of the research are only valid at the regional level. As a result, what is observed here should not be interpreted as a geographical pattern, in line with the definition of region briefly discussed in Chapter 3.

Policy prospects

This research was not specifically designed to provide evidence directly relevant to policy making. However, in the light of my findings, it is clear that the regional dimension cannot be ignored by policy makers, even if its size remains small by comparison with individual levels factors. The fact that controlling for individual differences and common indicators of labour market characteristics did not reduce the regional variance is an indication that additional factors play a role, whether or not the evidence brought about durable disposition to work and ‘habits of gender’ is judged to be credible enough. With respect to
this dimension, my findings seem to illustrate the existence of regional level dynamics than cannot be captured either by local level analyses nor traditional country studies. They also strengthen the argument in favour of greater decentralisation of government powers in order for policies to be tailored closer to regional realities. With respect to this aspect, the recent abolition of English Regional Development Agencies represents a step in the wrong direction.

More generally, evidence from this research could prove useful in order to put to the agenda a greater awareness to spatially differentiated responses to policies, and thus assist with better allocation of public resources. This should not be understood as invalidating existing policies aimed at improving work-life balance or childcare provision, but instead as highlighting the need for a greater awareness of the specific regional context where policies are implemented. This may take the form of focusing future research on target groups such as indeed mothers of children under three in working-class areas and examine their spatially contrasted responses across regions. This prospect would be easier to envisage in Germany where decentralized policy making is already taking place at the level analysed in this study.

**Future research**

This dissertation and its findings have opened the door for additional research in several directions. First, further exploration of the potential of latent growth curve modelling for employment and labour market research needs to be carried out. Specifically, testing the relevance of this technique is needed with longitudinal data where respondents are followed over longer periods of time than was available in the surveys used here. Typically, in the case of mothers of young children that would involve following respondents yearly for eight to ten years in order to reflect the fact that returns to work take place gradually, but other substantive areas would be also relevant, such as comparing trajectories out of given states (unemployment, full-time education). Such an exploration would also provide a basis for further testing of the growth mixture framework where the existence of several latent trajectories could be tested between respondents.

Another direction could consist in exploring the relevance of modelling additional states of participation other than the four chosen in this dissertation. This could involve using continuous indicators of working-time, but could also consist in adding categories to the one used in this research for instance by taking into account long hours (although this is likely not to be relevant for
mothers), but also intermediary states between non involvement and actual paid work, such as indeed parental/maternity leave or unemployment, which would allow to further refine models of participation over time. A necessary step needed to validate the technique is to apply it to other populations than mothers. This could typically include workers recently dismissed, students entering the labour market, older worker reaching the end of their careers, or recipients of welfare to work programmes.

As for the involvement of mothers themselves, this research could be expanded in several directions. The population of mothers could be further targeted, for instance in terms of their starting point - mothers on maternity leave, or mother of children who have reached school age, and their subsequent participation patterns in paid work followed across regions. This would assume that Labour Force Survey data would still be used for this purpose given the sample size required. Another interesting approach would be to use a large scale longitudinal study, such as the Millennium Cohort Study and follow involvement trajectories of mothers from birth onwards over a longer period of time, in order to identify maternal career profiles according to social position for instance.

Thinking of the spatial dimension of involvement, several avenues could also be explored. Using other geography level could be an interesting way to complement the above results. Using data with smaller levels of geography such as Local Authority Districts in the UK or Kreise in Germany would be highly more desirable, although only a few datasets would meet the necessary requirements. This would not only allow for a more precise control for actual job constraints and availability, would probably make it possible to take into account other important factors such as the availability of childcare, even if at the cost of not being able to use attitudinal data anymore. Comparing urban areas within a country could be also an interesting option for instance in order to further understand the specificity of London by comparison with other metropolitan areas in the country.

Another avenue would consist in refining/augmenting the regional indicators used in the model. At another level, measures of the characteristics of the regional labour market could be made of employment poverty indicators as a way to capture the number of job opportunities available in a given area, with the same logic as those developed in the design of the employment component of the English Index of Multiple Deprivation. One would however need to compute these separately for women or use a gendered ratio. At the very
least, an indicator of joblessness could be used in order to account for hidden unemployment, as far as men are concerned.

As far as gender roles and orientations to work are concerned, an obvious next stage of this research would be to integrate the measures of attitudes directly into the model in order to formally test the association discussed in Chapter 6. Another pathway could consist in testing additional indicators, such as indeed those used by Duncan et al (2002), for instance a family conventionality index based on the proportion of extra marital births or instead the ratio of employed mothers to employed childless women, in combination with the attitudinal data already available. These would control for regional heterogeneity, which has not been done in this research.

A third research avenue concerns the further exploration of the relationship between present and past involvement, with or without a focus on attitudes and orientations to work. This could be carried out using either extensive or intensive research strategies. Going down the intensive path would mean focusing on the recent economic development history of the regions that were expected to show high or low degrees of participation among mothers: in the UK, Lancashire, Greater Manchester and the West Midlands outside Birmingham, on the one hand, Tyne and Wear, Sheffield and Wales, in particular South Wales on the other. In Germany, similarly, more research should be gathered about Saarland, Bayern and Baden-Württemberg, in order to examine how the regional economic development impacted on women’s employment opportunities. Ideally, this should also include an analysis of the differences between major German cities and their differences, in particular Bremen, Hamburg and the rest of the other West German cities. Pursuing an extensive approach could also lead to interesting research avenues, for instance by focusing on a sample of regions in European countries, classifying them into types based on their former industrial histories, considering especially former male / females industries, and analysing the resulting differences in female employment.
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Notes

1 Differences in definitions may alter the comparability of these results. The 1980 Woman and Employment Survey on which the data for 1984 are based was a sample of women of legal active age, whereas the survey reported by Hunt was of women aged 16-65.


5 Female employment remains low in the latter countries.


7 Although there is now a minimal set of rules defined at the European level under the Parental Leave Directive.

8 In Britain, this decline happened earlier, between 12 and 3 months before the first birth instead.

9 Segregation has been measured in various ways, and reviewing them here is not relevant. One has to be aware, however, that significant discussion has been taking place regarding the relevance and accurateness of gender segregation indicators (Blackburn et al. 1995; Watts 1997; Blackburn et al. 2002).

10 Although France has been known as a centralised state for a long time, some of the power have been devolved to Départements and Régions in the last 30 years.

11 Berlin’s hinterland.

12 Such an approach however seems to move the burden of the explanation towards elasticities instead of preferences, but raises similar questions about their variability and origins.

13 They are described by Hakim as ‘focused on competitive activities in the public sphere: career, sport, politics or the arts’ (Hakim 2003). This view completely disregards the fact that women in lower type of occupation may also develop strong work orientations.

14 This was nevertheless implicitly acknowledged by Hakim when she stated that her interpretation was merely valid in countries where a ‘new scenario’ is in place, that is, mostly the UK and the USA – allowing women to enjoy a ‘genuine’ choice. She considers that in Scandinavian countries, traditionally considered closest to having achieved gender equality, women are not offered the real choice to work part-time (Hakim 1995).

15 Among researchers favouring the concept of patriarchy, a tension has often been perceptible between theories attempting to embrace only or mostly domination of women by men, and those instead trying to tie patriarchy together with other economic/social inequalities. The latter could take the shape of a criticism of capitalism, with an ambivalent relationship to Marxism, seen either as a resource, an ‘unfinished materialist analysis’, or a ‘containment strategy’ (Delphy 2005).

16 Quoting Archer’s notion of cultural integration, Pfau-Effinger insists that gender cultures should not be seen as static or homogeneous.

17 The stress put on the role of institutionalised social actors is understandable in the context of Germany given the role played by collective actors such as trade unions, it is probably less so in the case of UK.

18 Although only a small number of mothers in the sample for the UK had a second job (2.07% of all of them, 3.85% of those who were employed in the UK in 2001 (Source: LFS, own calculations), it was felt that not taking them into account could introduce a bias later on in the analysis, given the small number of full-time working mothers. The categorisation of respondents into full-time and part-time thus relies on this definition of working time.

19 In addition, alternative models fitted to a sample which excluded mother on maternity leave at Wave 1 did not yield estimates, in particular involvement variability estimates, very different from the ones presented in Chapter 5.

20 This is less likely to hold for mothers of children aged 3 born in spring or summer, since they would experience a longer period of time with a reduced childcare burden.

21 Traditionally in Germany the term region refers to Regierungsbezirke, the lower level of administrative and statistical geography.

22 Although marginal, this also includes NHS accommodation. Students aged over 16 living in halls of residence are recorded at their address of residence.
A small proportion of household in Scotland, North of the Caledonian Canal are sampled using the telephone book and interviewed only via telephone, given the low population density in these areas.

Either conglomerate of Kreise or 'Kreisefrei' cities of 500,000 inhabitants, or 250,000.

Four categories are used: dwellings made of 1 to 4, 5 to 8, 9 or more households, communal accommodation made of at least 15 persons (ibidem:21).

For the sake of precision, it should be noted that answers to the question about highest educational achievement was in fact voluntary for respondents aged 50 and over. The ensuing loss of observations (less than 10 respondents) was deemed acceptable.

According to the Varieties of Capitalism approach reviewed in the previous chapter, this is truer of the UK than Germany, in relation to the stress likely to be put by employers on general skills, possibly as a result of the competitive strategies pursued by firms (Estévez-Abe 2005).

Strict comparability between the two countries was not an issue, and therefore converting SIC 2002 industries into NACE classification was not carried out.

The number of variables is identical in the model for Germany and the UK, which is due to the fact that whereas occupation is absent in the German model education is measured by two dummy variables instead a continuous one in the UK model.

Namely the Office for National Statistics and the Statistisches Bundesamt.

It has been argued elsewhere that the apparent 'cleanliness' of such readily available data sets actually hides a number of methodological flaws that hinder the accuracy of inference attempts – at least in some countries quote.

Statistical authorities from the Czech Republic confirmed that access to the LFS microdata could not be granted to foreign researchers (Email from 2 April 2007) and Swedish data only allowed for 4 monthly waves.

The number of different types of transition is obviously related to the length to the period of observation.

It is in theory possible that mothers at the end of their maternity leave choose to take up unpaid parental leave. However, only a small number of respondents in the sample did so.

Although the term 'latent curve' is the one used in the literature irrespective of the actual shape of the growth function, it is more appropriate in our case to call it a latent line. I do not consider quadratic or exponential growth here.

The estimation of these levels is not trivial, especially in the case of 'unclear' trajectories such as when for instance a respondent leaves paid work at one wave before entering it again subsequently.

Given that thresholds are constrained to be equal across waves, this amounts to the joint probability for an observation to be in a given category at all waves.

Retaining a model with two or more classes would have required limiting the number of independent variables at the next stage, given that there is a limit on the number of parameters that can be simultaneously estimated within the multilevel framework presented in the next chapter.

It should be noted that the regression coefficients are standardised, hence cannot be directly added to their respective mean parameter.

Although Glasgow city represents a significant proportion of the population within Strathclyde, the cross-sectional economic activity rates of mothers there is the lowest of Scotland. By contrast, it is eastwards in the tourism/agriculture oriented Argyll and Bute also characterised by high levels of public sector employment or in its wealthy northern suburbs of East Dunbartonshire (commuters to Glasgow) and East Renfrewshire that economic activity rates are significantly higher than the Scottish average (Scottish Government 2010).

We should also remember that the regions in the model do not represent a sample but the whole of the population of regions in the UK.

Slight variations in the size of the coefficient could be observed due to the change from single level to a multilevel model, and were considered negligible.

Although in a few cases, effects could be observed among mothers in the remaining ones, these were on the same scale as the original variance – very small.
The individual relationship between a respondent’s level of involvement and her partner’s joblessness could not be tested given the small number of observations: only less than 5% of the respondents are in such a situation. In addition research findings are ambiguous, showing also a positive relationship between male and female unemployment.

Another model not shown in the table with controls for the proportion of mothers employed in the public sector did not yield significant results.

Such historical analysis is limited due to data reliability issues, for instance changes in the occupational and industrial classifications used in the censuses (Coppock 1973). In the case of women, attempts at measuring and comparing long term trends in their labour market participation are hampered by changes in definitions, and the constant overlooking of their part-time and casual work during both the 19th and the 20th century. Part-time work has only been recorded in the Census starting from 1951 whilst there was a continuous tendency to record women as unoccupied — depending on the activity in case of seasonal part-time work or when the activity was not considered as proper paid work (Gates & Marks 1974; Higgs 1987). Gender bias was still a matter of discussion among geography researchers during the 80s (Rose & Ogborn 1988). Until recently, mainstream geography textbooks hardly mention women specifically (Butlin & Dugosh 1990). Furthermore, the results are not corrected for changes in the age of compulsory education. Finally, the geographies only imperfectly match those used currently in the LFS: for instance, Leeds-Bradford or Sheffield could not be distinguished from the Rest of the West Riding of Yorkshire. Similarly the boundaries of London changed as the city expanded during the 19th century.

It is obviously impossible to estimate the extent to which there was also a regional differential in the under reporting of the work of women, which could have been the case in some rural areas.

To be precise, the administrative city-state of Bremen is made of the two cities of Bremen and Bremerhaven.

This was possible in Bundesländer where only one such city is present; the same approach could not be followed in Rheinland-Westfalen where at least four such large cities exist.

Single mothers are an exception to this, their employment rate being markedly higher in Germany (Klett-Davies 1997).

In effect, this could be seen as the third level since the individual level is made of the measurements of working-time at each wave and thus individual respondents represent the second one.

The small number of observations makes it necessary to be cautious when interpreting results such as unemployment rates, given the small number of observations involved.

The two are obviously related. However, not all educated women go on to take up high level jobs, and conversely not all older mothers are employed in professional or managerial occupations. More direct measurement of occupational class was not possible, since the Mikrozensus does not include questions about previous occupations for more than one year, and furthermore this question is only asked to a subsample of voluntary respondents.

Since age variations are limited to three years this was unlikely to have a differentiated impact over time on involvement.

Unfortunately, sample size did not allow selecting the subpopulation of women only.

Data is drawn from the second module of the European Social Survey for Germany. Unfortunately, questions specifically addressing the employment of mothers of young children were not available, and the closest indicator that could be used here consisted in a measure of agreement/disagreement with the statement that "women should be prepared to cut down on paid work for the sake of family". Although this does not explicitly refer to the presence of children, the allusion seems sufficiently clear here to be used as a proxy. Both proportions of respondents agreeing and disagreeing are shown, since there are sometimes wide differences in the proportion of respondents without strong opinion on the matter between regions.

Historically the religious divide in Germany has traditionally consisted in a predominantly protestant North (East and West) and a Catholic South, in Bayern or Baden-Württemberg. It is usually claimed that in the latter, traditional family values would discourage mothers from engaging in paid work, whereas the opposite would be true in the
North (Pfau-Effinger 1998; Hummelsheim 2009). There is no evidence of such a relationship, to the contrary in our data.

58 Although in relative terms, the value for Bayern stands closer to the median value for Western Germany.
Appendix A

Descriptive tables
Table A.1: Regional employment characteristics of mothers of under 6 in the UK

<table>
<thead>
<tr>
<th></th>
<th>Employment</th>
<th>Working time</th>
<th>Segregation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employed</td>
<td>Unemployed</td>
<td>&lt;16h</td>
</tr>
<tr>
<td>Inner London</td>
<td>36.8</td>
<td>3.4</td>
<td>12.3</td>
</tr>
<tr>
<td>Outer London</td>
<td>46.5</td>
<td>3.6</td>
<td>18.8</td>
</tr>
<tr>
<td>West Midlands</td>
<td>48.0</td>
<td>4.9</td>
<td>13.3</td>
</tr>
<tr>
<td>South Yorkshire</td>
<td>49.4</td>
<td>3.1</td>
<td>24.3</td>
</tr>
<tr>
<td>Greater Manchester</td>
<td>50.6</td>
<td>3.2</td>
<td>13.5</td>
</tr>
<tr>
<td>Merseyside</td>
<td>50.7</td>
<td>1.2</td>
<td>11.0</td>
</tr>
<tr>
<td>East Anglia</td>
<td>52.1</td>
<td>2.4</td>
<td>14.5</td>
</tr>
<tr>
<td>West Yorkshire</td>
<td>52.8</td>
<td>3.0</td>
<td>28.8</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>54.1</td>
<td>2.3</td>
<td>14.0</td>
</tr>
<tr>
<td>Tyne and Wear</td>
<td>54.2</td>
<td>3.4</td>
<td>12.2</td>
</tr>
<tr>
<td>Rest of South East</td>
<td>54.3</td>
<td>3.3</td>
<td>16.1</td>
</tr>
<tr>
<td>Wales</td>
<td>54.6</td>
<td>2.8</td>
<td>26.5</td>
</tr>
<tr>
<td>Rest of Northern Region</td>
<td>54.7</td>
<td>2.7</td>
<td>18.9</td>
</tr>
<tr>
<td>East Midlands</td>
<td>55.9</td>
<td>3.5</td>
<td>18.0</td>
</tr>
<tr>
<td>Rest of Yorks and Humber</td>
<td>56.3</td>
<td>4.2</td>
<td>22.1</td>
</tr>
<tr>
<td>Rest of North West</td>
<td>57.8</td>
<td>2.1</td>
<td>17.3</td>
</tr>
<tr>
<td>South West</td>
<td>58.6</td>
<td>3.3</td>
<td>29.2</td>
</tr>
<tr>
<td>Rest of West Midlands</td>
<td>58.9</td>
<td>2.6</td>
<td>21.6</td>
</tr>
<tr>
<td>Strathclyde</td>
<td>59.1</td>
<td>4.2</td>
<td>11.9</td>
</tr>
<tr>
<td>Rest of Scotland</td>
<td>60.3</td>
<td>4.2</td>
<td>18.2</td>
</tr>
<tr>
<td><strong>UK</strong></td>
<td><strong>53.1</strong></td>
<td><strong>3.2</strong></td>
<td><strong>19.7</strong></td>
</tr>
</tbody>
</table>

* Row percentages, by Government Office Region, Metropolitan Counties and country. Women with at least one child aged under six in the family: In employment or unemployment. Base: respondents of working age. |

a By category of usual weekly working time (First and second job). Base: respondents in employment. |

b Employed in SIC 92 sub-major industries in which (nationwide) at least 60% or between 40% and 60% of women are employed. Base: respondents in employment. |

<table>
<thead>
<tr>
<th>Region</th>
<th>Employment Women</th>
<th>Employment Men</th>
<th>Unemployment Women</th>
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**UK**                          | .72              | .70            | .66               | .41              

Ratio of: the employment and ILO unemployment rates; proportion working full time among women with at least one child under 6 years old in the family to those of mothers without children under 18 or working-age men, by by Government Office Region, Metropolitan Counties and country. Source: Pooled Quarterly Labour Force Survey 2001-2004 (yearly data). 25,803 obs.
Table A.3: Regional employment participation of mothers in Germany

<table>
<thead>
<tr>
<th>Region</th>
<th>Employed (all)</th>
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<td>24.86</td>
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</table>

Proportion of women with at least one child under 6 years old in the family / community of living: in employment; in employment (excl. those on parental leave); ILO unemployed; working less than 16h per week; between 16 and 30 hours per week; more than 30 hours per week by Bundesländer. Source: Mikrozensus 2001. N=21,286
Table A.4: Regional job characteristics of mothers in Germany

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<th>Bundesländer</th>
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<th>Female Balanced occupations</th>
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<td><strong>20.56</strong></td>
<td><strong>56.97</strong></td>
<td><strong>18.71</strong></td>
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</table>

Proportion of women with at least one child under 6 years old in the family in: temporary employment; negligible employment (working less than 16h per week or earning less than 500€ monthly); working in female or balanced industries and occupations (employed in respectively two digits NACE industries and ISCO-88 occupations where at the national level more than 60% or between 40 and 60% of women are employed), by Bundesländer. Source: Mikrozensus 2001.
Table A.5: Employment of mothers relative to men in Germany

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<th>Full-time work</th>
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<td>Men</td>
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<td>1.29</td>
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</table>

Ratio of: the employment and ILO unemployment rates; proportion on temporary work contracts; proportion working full time among women with at least one child under 6 years old in the family / community of living to those of mothers without children under 18 or working-age men, by Bundesländer. Source: Mikrozensus 2001. N=21,286
Appendix B

Model results and path diagrams
Table B.1: Alternative non linear Latent Growth Curve model

<table>
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<tr>
<th>Model</th>
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<th>C</th>
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<td>( \tau_0 )</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.55*** (0.04)</td>
<td>0</td>
</tr>
<tr>
<td>( \tau_1 )</td>
<td>1</td>
<td>0.9*** (0.07)</td>
<td>1.19*** (0.08)</td>
<td>1.89*** (0.03)</td>
<td>1</td>
</tr>
<tr>
<td>( \tau_2 )</td>
<td>2</td>
<td>2.23*** (0.07)</td>
<td>2.59*** (0.08)</td>
<td>2.59*** (0.04)</td>
<td>1.71*** (0.01)</td>
</tr>
<tr>
<td>( \tau_3 )</td>
<td>3</td>
<td>3</td>
<td>3.61*** (0.05)</td>
<td>3</td>
<td>2.35*** (0.02)</td>
</tr>
<tr>
<td>( \tau_4 )</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2.54*** (0.03)</td>
</tr>
</tbody>
</table>

**Means**

| \( \mu_{Iw} \) | 0 | 0 | 0 | 0 | 0 |
| \( \mu_{Sw} \) | .22*** (0.02) | .02*** (0.02) | .25*** (0.02) | -.02*** (0.03) | -.07 (0.06) |

**Variance**

| \( \sigma_{Iw}^2 \) | 55.79*** (2.01) | 57.03*** (2.08) | 60.80*** (2.3) | 69.80*** (3.01) | 23.53*** (3.12) |
| \( \sigma_{Sw}^2 \) | 1.26 (0.8) | 1.25** (0.08) | 1.28*** (0.07) | 1.30*** (0.02) | 1.53** (0.05) |
| \( \text{cov}_{Iw,Sw} \) | -3.32 (25) | -3.49*** (0.02) | -4.19*** (0.03) | -4.68*** (0.04) | -0.00 (0.08) |

Intercept (involvement intensity) and slope (involvement variability) means and variances; 5 waves Latent Growth curve models. Observed categories: working-time status of mothers of children under 6 (Not working; under 15h per week; between 15 and 30h; more than 30h). Data: Longitudinal LFS 2001-2007. Intercept means are constrained to 0. N=13,784

<sup>a</sup> Log Likelihood  <sup>b</sup> Number of estimated parameters  <sup>c</sup> Sample size adjusted BIC  
<sup>d</sup> \( \tau_0 \ldots \tau_4 \) are factor loadings of the latent slope factor  
<sup>e</sup> Significant at .1 * at .05; ** at .01; *** at .001;  
<sup>f</sup> Standard errors between brackets.
Figure B.1: Multilevel latent growth curve model of involvement (Germany)

Path diagram of the Latent Growth Curve model of involvement for Germany. WT₁...₄: Working time at waves 1...₄ (0=economically inactive, on parental or maternity leave, unemployed; 1=working less than 16 hours; 2=between 16 and 30 hours; 3=more than 30 hours per week); I₁...₄: continuous latent variable of working-time; IW, SW: individual-level intercept and slope factor of the growth line; Xₙ: time invariant independent variables; t: time-varying independent variable; IB, SB: regional-level intercept and slope factors;
Observed involvement transitions at Waves 1-4 and latent growth lines of involvement in paid work (0 = economically inactive, on parental or maternity leave, unemployed; 1 = working less than 16 hours; 2 = between 16 and 30 hours; 3 = more than 30 hours per week. Random sample of 50 women with at least one child aged under 6 in the family. Data: Mikrozensus Panel 2001-2004.

Figure B.2: Sample of predicted and observed involvement transitions
### Table B.2: Multilevel latent growth model for the UK – full sample

<table>
<thead>
<tr>
<th>Model</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Likelihood</td>
<td>-54064.134</td>
<td>-53768.965</td>
<td>-53625.659</td>
<td>-53540.36</td>
<td>-53293.878</td>
<td>-53153.478</td>
<td>-53096.533</td>
</tr>
<tr>
<td>BIC</td>
<td>108223.581</td>
<td>107642.775</td>
<td>107375.224</td>
<td>107223.689</td>
<td>106749.788</td>
<td>106488.051</td>
<td>106393.222</td>
</tr>
<tr>
<td>aBIC</td>
<td>108191.802</td>
<td>107607.818</td>
<td>107333.911</td>
<td>107176.02</td>
<td>106695.763</td>
<td>106427.67</td>
<td>106326.486</td>
</tr>
</tbody>
</table>

**Intercept (intensity) factor regression coefficients**

| Age | .23*** (.01) | .19*** (.01) | .15*** (.01) | .21*** (.01) | .18*** (.01) | .17*** (.01) | .16*** (.01) |
| Is single | -2.49*** (.12) | -2.83*** (.13) | -2.98*** (.14) | -2.64*** (.13) | -2.71*** (.13) | .07*** (.07) | .23*** (.07) |
| Child 3-5 | 1.59*** (.07) | 1.62*** (.07) | 1.84*** (.07) | 1.75*** (.07) | .07*** (.07) | .23*** (.07) | .23*** (.07) |
| 2+ children | -2.88*** (.13) | -2.64*** (.11) | -2.70*** (.11) | .07*** (.07) | .23*** (.07) | .23*** (.07) | .23*** (.07) |
| Age left FTE | .36*** (.03) | .36*** (.03) | .36*** (.03) | .36*** (.03) | .36*** (.03) | .36*** (.03) | .36*** (.03) |

**Slope (variability) factor regression coefficients**

| Age | -.01 (.01) | -.01 (.01) | .00 (.00) | .00 (.00) | .00 (.00) | .00 (.00) | .00 (.00) |
| Is single | .08 (.04) | .13** (.04) | .14** (.04) | .14** (.05) | .14** (.05) | .14** (.05) | .14** (.05) |
| Child 3-5 | -.24*** (.03) | -.25*** (.03) | -.24*** (.03) | -.25*** (.03) | -.25*** (.03) | -.25*** (.03) | -.25*** (.03) |
| 2+ children | .17*** (.03) | .17*** (.03) | .17*** (.03) | .17*** (.03) | .17*** (.03) | .17*** (.03) | .17*** (.03) |
| Age left FTE | .01 (.01) | .01 (.01) | .01 (.01) | .01 (.01) | .01 (.01) | .01 (.01) | .01 (.01) |

**Int. variance - \( \sigma^2_{int} \)

| 54.80*** (2.3) | 51.25*** (2.2) | 51.11*** (2.1) | 49.00*** (2.1) | 46.19*** (1.9) | 45.12*** (1.9) | 44.32*** (1.8) |

**Slope variance - \( \sigma^2_{slope} \)

| 1.21*** (.08) | 1.16*** (.08) | 1.13*** (.08) | 1.11*** (.08) | 1.07*** (.08) | 1.05*** (.08) | 1.06*** (.08) |

**Covariance -3.26*** (.24) | -3.01*** (.23) | -2.94*** (.22) | -2.77*** (.22) | -2.55*** (.22) | -2.52*** (.22) | -2.56*** (.23) |

**Regional-level results**

| Covariance | -0.1 (.01) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) |
| Intercept mean - \( b \) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) | -0.0 (.00) |
| Slope mean - \( b_s \) | -0.22*** (.02) | -0.04*** (.09) | -0.38*** (.09) | -0.27*** (.09) | -0.27*** (.09) | -0.19 (.14) | -0.17 (.15) |
| Int. variance \( \sigma^2_{int} \) | -0.50** (.17) | -0.59** (.22) | -0.57** (.19) | -0.56** (.19) | -0.53** (.18) | -0.69** (.28) | -0.69** (.29) |
| Slope variance \( \sigma^2_{slope} \) | -0.00 (.00) | -0.00 (.00) | -0.00 (.00) | -0.00 (.00) | -0.00 (.00) | -0.00 (.00) | -0.00 (.00) |

* Sample size adjusted BIC
* Base: cohabiting (incl married)
* Base: Child in 0-2.
* Base: One child
* Base: all other respondents
* Significant at .1
* at .05; ** at .01; *** at .001

Intercept and slope variances; regression coefficients, 4 waves multilevel latent growth model. Observed categories working-time status of mothers of children under 6 (Not working; under 15h per week; between 15 and 30h; more than 30h). Data: MZ-Panels 2001-2004. Individual-level intercept and slope means and regional-level intercept mean are constrained to 0 and not shown. N=13,784
Table B.3: Multilevel latent growth model of transitions – UK

<table>
<thead>
<tr>
<th>Model</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log likelihood</td>
<td>-35935.888</td>
<td>-35869.396</td>
<td>-35865.933</td>
<td>-35801.568</td>
<td>-35748.159</td>
<td>-35732.477</td>
<td>-34702.673</td>
</tr>
<tr>
<td>BIC</td>
<td>71949.981</td>
<td>71834.375</td>
<td>71844.829</td>
<td>71733.477</td>
<td>71644.039</td>
<td>71630.054</td>
<td>69587.825</td>
</tr>
<tr>
<td>aBIC</td>
<td>71921.382</td>
<td>71799.420</td>
<td>71803.518</td>
<td>71685.812</td>
<td>71590.018</td>
<td>71569.677</td>
<td>69521.093</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intercept (intensity) factor regression coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Is single</td>
</tr>
<tr>
<td>Child 3-5</td>
</tr>
<tr>
<td>2+ children</td>
</tr>
<tr>
<td>Age left FTE</td>
</tr>
<tr>
<td>Prof/manag</td>
</tr>
</tbody>
</table>

| Intercept variance - \( \sigma_{Iw}^2 \) | 8.56*** (.37) | 8.40*** (.36) | 8.40*** (.36) | 8.15*** (.36) | 7.94*** (.37) | 7.93*** (.37) | 7.70*** (.36) |

<table>
<thead>
<tr>
<th>Slope (variability) factor regression coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Is single</td>
</tr>
<tr>
<td>Child 3-5</td>
</tr>
<tr>
<td>2+ children</td>
</tr>
<tr>
<td>Age left FTE</td>
</tr>
<tr>
<td>Prof/manag</td>
</tr>
</tbody>
</table>

| Slope variance - \( \sigma_{Sw}^2 \) | 0.88*** (.04) | 0.88*** (.04) | 0.88*** (.04) | 0.87*** (.04) | 0.85*** (.04) | 0.85*** (.04) | 0.80*** (.04) |

| Covariance \( cov_{Iw,Sw} \) | -1.96*** (.10) | -1.94*** (.10) | -1.94*** (.10) | -1.88*** (.10) | -1.83*** (.10) | -1.83*** (.10) | -2.01*** (.10) |

**Regional-level results**

| Covariance | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Slope mean | 0.18*** (.02) | .34** (.11) | .27** (.11) | .14 (.12) | .19 (.12) | .09 (.21) | -.57* (.23) |
| Intercept variance | 0.03** (.01) | .04** (.02) | .04** (.02) | .04** (.02) | .04** (.02) | .04** (.02) |
| Slope variance | 0.00 (.00) | 0.00 (.00) | 0.00 (.00) | 0.00 (.00) | 0.00 (.00) | 0.00 (.00) |

---

*Sample size adjusted BIC * Base: cohabiting (incl married) * Base: Child is 0-2. * Base: One child * Base: all other respondents. * Significant at .1 * at .05; ** at .01; *** at .001. * Standard errors between brackets.

Intercept and slope variances; regression coefficients, 4 waves multilevel latent growth model. Observed categories working-time status of mothers of children under 6 who experienced at least one transition over 15 months (Not working; under 15h per week; between 15 and 30h; more than 30h). Data: Pooled Longitudinal LFS 2001-2004. Individual-level intercept and slope means and regional-level intercept mean are constrained to 0 and not shown. N=5,940
Table B.4: Multilevel latent growth model for the UK — Random effects

<table>
<thead>
<tr>
<th>Model</th>
<th>Random effect ($\beta_r$):</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Child aged 3-5</td>
<td>Partnered</td>
<td>Education</td>
<td>Prof/managerial</td>
</tr>
<tr>
<td>LL$^a$</td>
<td></td>
<td>-53865</td>
<td>-54309</td>
<td>-538622</td>
<td>-53087</td>
</tr>
<tr>
<td>Parameters$^b$</td>
<td></td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIC$^c$</td>
<td></td>
<td>107960</td>
<td>108846</td>
<td>107952</td>
<td>106402</td>
</tr>
<tr>
<td>aBIC$^d$</td>
<td></td>
<td>107883</td>
<td>108770</td>
<td>107876</td>
<td>106325</td>
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</table>

Note: individual-level regression coefficients omitted

Covariances (regional level)

<table>
<thead>
<tr>
<th></th>
<th>$\text{cov}_{\beta_r, Ib}$</th>
<th>$\text{cov}_{\beta_r, Sb}$</th>
<th>$\text{cov}_{Sb, Ib}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.002 (.004)</td>
<td>.000 (.001)</td>
<td>-.032* (.014)</td>
</tr>
<tr>
<td></td>
<td>-.004 (.032)</td>
<td>-.001 (.004)</td>
<td>.003 (.020)</td>
</tr>
<tr>
<td></td>
<td>-.004* (.002)</td>
<td>-.001*** (.000)</td>
<td>-.008*** (.001)</td>
</tr>
<tr>
<td></td>
<td>.009 (.011)</td>
<td>-.015 (.009)</td>
<td>-.025 (.049)</td>
</tr>
</tbody>
</table>

Main effects

<table>
<thead>
<tr>
<th></th>
<th>$\mu_{Ib}$</th>
<th>$\mu_{Sb}$</th>
<th>$\mu_{\beta_r}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>0</td>
<td>-.041 (.147)</td>
<td>.016 (.011)</td>
</tr>
<tr>
<td>R2</td>
<td>0</td>
<td>-.169 (.165)</td>
<td>-.354*** (.066)</td>
</tr>
<tr>
<td>R3</td>
<td>0</td>
<td>-.541*** (.090)</td>
<td>.018*** (.002)</td>
</tr>
<tr>
<td>R4</td>
<td>0</td>
<td>.186 (.152)</td>
<td>.040** (.014)</td>
</tr>
</tbody>
</table>

Regional variances

<table>
<thead>
<tr>
<th></th>
<th>$\sigma^2_{Ib}$</th>
<th>$\sigma^2_{Sb}$</th>
<th>$\sigma^2_{\beta_r}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>.148** (.050)</td>
<td>.509*** (.123)</td>
<td>.363** (.125)</td>
</tr>
<tr>
<td>R2</td>
<td>.007+ (.004)</td>
<td>.005 (.005)</td>
<td>.017*** (.005)</td>
</tr>
<tr>
<td>R3</td>
<td>.000 (.000)</td>
<td>.004 (.003)</td>
<td>.000** (.000)</td>
</tr>
<tr>
<td>R4</td>
<td>.000 (.000)</td>
<td>.004 (.003)</td>
<td>.003 (.002)</td>
</tr>
</tbody>
</table>

Parameter estimates of four random effect Latent Growth Curve models of involvement (five waves). Means, variances and covariances of: Intercept factor (involvement intensity — $I_b$), slope factor (involvement variability — $S_b$), individual-level variable whose random coefficient is tested in the model ($\beta_r$); Observed categories: working-time status of mothers of children under 6. Data: Longitudinal LFS 2001-2007. Intercept means are constrained to 0. N=13,784; Reference categories: Model R1: Child is 0-2; Model R2: cohabiting (incl married) Model R4: Base: all other respondents.

$^a$ Log Likelihood  $^b$ Number of estimated parameters  $^c$ Bayesian Information Criteria  $^d$ Sample size adjusted BIC;  $^*$ Significant at .1; ** at .05; *** at .01; **** at .001; Standard errors between brackets.
Table B.5: Multilevel latent growth model for Germany – full sample

<table>
<thead>
<tr>
<th>Model</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Likelihood</td>
<td>-16295</td>
<td>-13150.7</td>
<td>-13132.1</td>
<td>-13111.2</td>
<td>-13097.2</td>
<td>-13021.6</td>
</tr>
<tr>
<td>BIC</td>
<td>32675.04</td>
<td>26414.48</td>
<td>26393.47</td>
<td>26367.95</td>
<td>26356.1</td>
<td>26237.17</td>
</tr>
<tr>
<td>Sample size-adjusted BIC</td>
<td>32643.27</td>
<td>26370</td>
<td>26342.63</td>
<td>26310.76</td>
<td>26292.55</td>
<td>26160.91</td>
</tr>
</tbody>
</table>

Time varying variable: Child is 0-3

<table>
<thead>
<tr>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 3</th>
<th>Wave 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.98*** (.115)</td>
<td>-1.61*** (.113)</td>
<td>-1.69*** (.121)</td>
<td>-2.27*** (.23)</td>
</tr>
<tr>
<td>-2.00*** (.109)</td>
<td>-1.64*** (.111)</td>
<td>-1.73*** (.12)</td>
<td>-1.61*** (.106)</td>
</tr>
<tr>
<td>-1.94*** (.111)</td>
<td>-1.58*** (.112)</td>
<td>-1.67*** (.118)</td>
<td>-1.74*** (.116)</td>
</tr>
<tr>
<td>-1.94*** (.111)</td>
<td>-1.57*** (.111)</td>
<td>-1.66*** (.117)</td>
<td>-1.74*** (.116)</td>
</tr>
</tbody>
</table>

Intercept (intensity) factor regression coefficients

<table>
<thead>
<tr>
<th>2+ children</th>
<th>Age</th>
<th>Is single</th>
<th>Post-secondary</th>
<th>Degree or beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.79*** (.201)</td>
<td>.08** (.024)</td>
<td>.58** (.212)</td>
<td>.44+ (.245)</td>
<td></td>
</tr>
</tbody>
</table>

Intercept variance - $\sigma_{Iw}^2$ 13.44*** (1.075) 10.26*** (.744) 10.05*** (.608) 9.96*** (.649) 9.91*** (.645) 9.60*** (.523)

Slope (variability) factor regression coefficients

<table>
<thead>
<tr>
<th>2+ children</th>
<th>Age</th>
<th>Is single</th>
<th>Post-secondary</th>
<th>Degree or beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td>.03 (.071)</td>
<td>.00 (.006)</td>
<td>.14* (.068)</td>
<td>.32*** (.081)</td>
<td></td>
</tr>
</tbody>
</table>

Slope variance - $\sigma_{Sw}^2$ .85*** (.104) .63*** (.097) .62*** (.093) .62*** (.092) .62*** (.091) .60*** (.091)

Covariance $cov_{Iw,Sw}$ -1.37*** (.101) -.69*** (.065) -.68*** (.06) -.68*** (.062) -.69*** (.062) -.74*** (.057)

Regional-level results

<table>
<thead>
<tr>
<th>Covariance $cov_{Ib,Sb}$</th>
<th>Slope mean - $Sb$</th>
<th>Intercept variance $\sigma_{Ib}^2$</th>
<th>Slope variance $\sigma_{Sb}^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>.04+ (.023)</td>
<td>.09** (.034)</td>
<td>.47** (.147)</td>
<td>.40+ (.003)</td>
</tr>
<tr>
<td>.02 (.042)</td>
<td>.04 (.133)</td>
<td>.73** (.236)</td>
<td>.00 (.003)</td>
</tr>
<tr>
<td>.02 (.044)</td>
<td>.07 (.207)</td>
<td>.77** (.247)</td>
<td>.00 (.003)</td>
</tr>
<tr>
<td>.03 (.048)</td>
<td>.00 (.208)</td>
<td>.92** (.292)</td>
<td>.00 (.001)</td>
</tr>
<tr>
<td>.01 (.049)</td>
<td>.00 (.208)</td>
<td>.80** (.294)</td>
<td>.00 (.001)</td>
</tr>
<tr>
<td>-.02 (.044)</td>
<td>.00 (.208)</td>
<td>.62* (.244)</td>
<td>.00 (.002)</td>
</tr>
</tbody>
</table>

a Base: One child, b Base: secondary education. * Significant at .1; ** at .05; *** at .01; **** at .001. Standard errors between brackets. Intercept and slope variances; regression coefficients, 4 waves multilevel latent growth model. Observed categories working-time status of mothers of children under 6 (Not working; under 15h per week; between 15 and 30h; more than 30h). Data: MZ-Panel 2001-2004. Individual-level intercept and slope means and regional-level intercept mean are constrained to 0 and not shown. N=4,921
Table B.6: Multilevel latent growth model of transitions – Germany

<table>
<thead>
<tr>
<th>Model</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Likelihood</td>
<td>-9214.14</td>
<td>-9024.6</td>
<td>-9009.78</td>
<td>-9008.4</td>
<td>-8999.57</td>
<td>-8956.65</td>
</tr>
<tr>
<td>BIC</td>
<td>18503.12</td>
<td>18153.98</td>
<td>18139.3</td>
<td>18151.51</td>
<td>18148.83</td>
<td>18092.93</td>
</tr>
<tr>
<td>Sample-size adjusted BIC</td>
<td>18471.35</td>
<td>18109.5</td>
<td>18088.47</td>
<td>18094.32</td>
<td>18085.29</td>
<td>18016.68</td>
</tr>
</tbody>
</table>

Time varying variable: Child is 0-3

| (Effect at: Wave 1) | -1.47*** (.07) | -1.51*** (.06) | -1.49*** (.07) | -1.49*** (.07) | -1.52*** (.07) |
| (.. Wave 2) | -1.06*** (.10) | -1.11*** (.10) | -1.09*** (.09) | -1.08*** (.09) | -1.12*** (.09) |
| (.. Wave 3) | -1.13*** (.12) | -1.18*** (.11) | -1.16*** (.11) | -1.15*** (.11) | -1.22*** (.12) |
| (.. Wave 4) | -1.61*** (.21) | -1.66*** (.22) | -1.64*** (.23) | -1.61*** (.23) | -1.72*** (.23) |

Intercept (intensity) factor regression coefficients

| 2+ children⁹ | -.54*** (.13) | -.57*** (.13) | -.56*** (.14) | -.55*** (.13) |
| Age | .01 (.01) | .01 (.01) | .01 (.01) | .00 (.01) |
| Is single | .16 (.14) | .17 (.14) | .14 (.14) | .01 (.01) |
| Post-secondary⁸ | -.24 (.19) | -.13 (.08) | -.14 (.08) | -.12 (.08) |
| Degree or beyond | .28 (.30) | .36** (.11) | .40** (.15) | .45** (.19) |

Intercept variance - σ²_Iw | 3.05*** (.18) | 2.48*** (.18) | 2.40*** (.17) | 2.40*** (.17) | 2.40*** (.17) | 2.33*** (.17) |

Slope (variability) factor regression coefficients

| 2+ children | .11 (.08) | .11 (.08) | .12 (.08) | .14+ (.08) |
| Age | .00 (.01) | .00 (.01) | .00 (.01) | .00 (.01) |
| Is single | .13+ (.08) | .14+ (.08) | .15+ (.08) | .16+ (.08) |
| Post-secondary | .36** (.11) | .40** (.15) | .45** (.19) | .50** (.23) |
| Degree or beyond | .40** (.15) | .50** (.19) | .55** (.23) | .60** (.27) |

Slope variance - σ²_Sw | .76*** (.08) | .58*** (.07) | .58*** (.07) | .58*** (.07) | .58*** (.07) | .55*** (.07) |

Covariance cov_Iw,Sw | -1.15*** (.08) | -.86*** (.07) | -.84*** (.06) | -.85*** (.06) | -.83*** (.07) |

Regional-level results

| Covariance cov_Ib,Sw | .01** (.01) | .01+ (.01) | .01* (.01) | .01* (.01) | .01* (.01) | .00 (.01) |
| Slope mean - Sb | .39*** (.03) | .21*** (.03) | .02 (.14) | .00 (.25) | .08 (.26) | .26 (.27) |
| Intercept variance - σ²_Ib | .03* (.02) | .05* (.02) | .05* (.02) | .06* (.03) | .05* (.03) | .04+ (.03) |
| Slope variance - σ²_Sb | .01 (.00) | .00 (.00) | .00 (.00) | .00 (.00) | .00 (.00) | .00 (.00) |

a Base: One child. b Base: secondary education. + Significant at .1 * at .05; ** at .01; *** at .001. c Standard errors between brackets. Intercept and slope variances, regression coefficients, 4 waves multilevel latent growth model. Observed categories working-time status of mothers of children under 6 who experienced at least one transition over three years (Not working; under 15h per week; between 15 and 30h; more than 30h). Data: MZPanel 2001-2004. Individual-level intercept and slope means and regional-level intercept means are constrained to 0 and not shown. N=1,780