

# **Research Master Thesis**

## **Title:**

**Social investment in European welfare states: Towards more jobs and higher labour market participation?**

## **Subtitle:**

A panel data analysis of the effect of disaggregated social investment expenditures on labour market outcomes

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## **List of acronyms**

ALMPs	active labour market policies
ECEC	early childhood education and care
EPL	employment protection legislation
EU	European Union
FDI	foreign direct investment
GDP	gross domestic product
ICT	information communication technology
ICTWSS	Institutional Characteristics of Trade Unions, Wage Setting and Social Pacts
ISCED	International Standard Classification of Education
OECD	Organisation for Economic Cooperation and Development
SOCX	social expenditure
UN DESA	United Nations Department of Economic and Social Affairs

## **Acknowledgements**

This thesis has evolved from a research idea that emanated during the ESPAnet 2016 Conference from 1-3 September at Erasmus University Rotterdam, which focused on ‘reinventing the welfare state’ and ‘pathways to sustainability, equality and inclusion in European welfare states’. Over the months, this research idea has evolved into the document presented here. Throughout this process several people have been of significant help. I would first like to thank Sandra Groeneveld for commenting on the first written draft of the research idea. Her feedback has been of great help in narrowing down the scope of the research as well as thinking about the contribution of the ultimate study. Further, I would also like to thank my second reader, Alexandre Afonso, who was always in for a short chat about my progress and who reviewed and commented on the final research proposal. Last, I would like to express my gratitude for the time and effort invested by my first reader and supervisor, Olaf van Vliet. From the very beginning to the final stages of writing this thesis, he has been very helpful by, amongst others, suggesting relevant literature and approaches. Besides, the discussions and feedback sessions we have had together have been of great help in positioning the study within the literature, strengthening its scientific contribution as well as improving it in terms of style and structure.

## **Abstract**

Social investment has become a widely debated topic in academic and political arenas concerned with social spending and the future of the welfare state alike. To date there are, however, only a couple of studies that systematically analyse the outcomes of social investment policies. This study contributes to the social investment literature by empirically analysing the association between disaggregated expenditures on social investment policies and labour market outcomes in seventeen EU member states over the period 1990-2009, using pooled time-series cross-section analyses. It incorporates both cash and in-kind benefits for the measurement of expenditures on social investment policies and in estimating their effects on employment and labour market participation it distinguishes between effects for the overall, male and female population. The results suggest that higher expenditures on early childhood education and care as well as active labour market policies are associated with higher employment levels, in particular for the female population. Nevertheless, the effect of policies related to care seems to differ across welfare state regimes.

**Keywords:** Disaggregated social expenditures, employment, labour market participation, labour supply, social investment, welfare state



## 1. Introduction

Social investment has become a widely debated topic in academic and political arenas concerned with social spending and the future of the welfare state alike. This is to a large extent the result of the launch of the Europe 2020 Strategy in 2010 and the introduction of the Social Investment Package in 2013. The Europe 2020 Strategy for ‘smart, sustainable and inclusive growth’ (European Commission 2010) aims to get people out of poverty and social exclusion and increase employment. To help attain these goals the Social Investment Package was introduced in 2013. It provides “a policy framework for redirecting member states’ policies, where needed, towards social investment throughout life, with a view to ensuring the adequacy and sustainability of budgets for social policies and [social systems in general]” (European Commission 2013, 3).

Social investment is grounded in the belief that “both neoliberal welfare retrenchment and male-breadwinner employment-based social insurance are ill-suited to meet the post-industrial challenges of the knowledge economy and dual-earner familyhood” (Hemerijck 2017, 7). Fundamental changes in labour markets – notably the transition to post-industrial service-based economies (Iversen and Wren 1998; Wren 2013), changes in the demographic structures of societies, and the emergence of new social risks called for adjustments to the post-war welfare state (Esping-Andersen 1999; 2002; Ferrera and Rhodes 2000; Taylor-Gooby 2004; Bonoli 2005; Armingeon and Bonoli 2006; Hemerijck 2013). In combination with the post-crisis context of austerity and budgetary constraints, social investment has hence been presented as a strategy aimed at raising employment, reducing poverty and realising economic growth in an effective and efficient manner.

The ‘new welfare state’, or ‘social investment state’, has been defined as “an institution that puts the emphasis less on income replacement and more on the promotion of labour market participation through activation and investment in human capital” (Bonoli and Natali 2012, 9).<sup>1</sup> Instead of a ‘safety net’, this welfare state provides a ‘trampoline’ (Jenson and Saint-Martin 2003) that involves policies aimed at ‘preparing’ individuals, families and societies to respond to the new risks of the competitive knowledge economy, rather than policies aimed at ‘repairing’ damages after the occurrence of personal or economic crises (Morel *et al.* 2012; Hemerijck *et al.* 2016). Accordingly, the social investment approach has been formulated in terms of the reallocation of expenditures on passive transfers to expenditures on activating and capacitating policies such as education, life-long learning and

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<sup>1</sup> Another term used to refer to the ‘social investment state’ is the ‘workfare state’ (Rueda 2015).

active labour market policies (e.g. Giddens 1998; Esping-Andersen 2002; Armingeon and Bonoli 2006; Morel *et al.* 2012).<sup>2</sup>

Social investment policies generally turn out to be popular among the citizens of Europe, but support drops considerably when expenditures on them come in conflict with fiscal or budgetary trade-offs so relevant in the post-crisis era. The largest drop occurs when higher expenditures on social investment policies involve cutbacks in compensatory policies (Busemeyer *et al.* 2017). Moreover, different groups of people have conflictive preferences towards, and react differently to, changes in the provision of welfare through activating and capacitating social investment policies or passive transfers. The fact that citizens seem to be aware of potential trade-offs and resource conflicts in the allocation of social expenditures signals potential conflicts related to the distribution of resources across different groups of beneficiaries (Busemeyer and Neimanns 2017). These findings illustrate that while social investment might have been presented as a promising strategy to raise employment, reduce poverty and realise economic growth, it is likely to entail challenges with regard to the allocation of public resources – which, as a matter of fact, are limited in the post-crisis context of austerity – and public opinion.

In that respect, it is rather striking that, to date, there have only been a few studies that systematically examine the effects of social investment. This arguably limited evidence base has, for instance, led Nolan (2017) to position social investment as balancing on a ‘thin line between evidence-based research and political advocacy’. Already since the end of the twentieth century different scholars have noticed changes in the provision of welfare state policies in developed countries (Giddens 1998; 2001; Midgley 1999; Midgley and Tang 2001; Green-Pedersen *et al.* 2001; Esping-Andersen 2002; Lewis and Surrender 2004). More recently, scholars have also stressed the emergence of new ideas concerning social policy within an investment perspective (Jenson 2010; 2012a; Bonoli and Natali 2012; Morel *et al.* 2012; Hemerijck 2012a; 2013; Van Kersbergen and Hemerijck 2012) that might possibly even constitute a new welfare policy paradigm (Hemerijck 2015; cf. Hall 1993).<sup>3</sup> Nevertheless, most studies engaging with the investment perspective are predominantly descriptive and focus on the varying extent to which social investment policies have been implemented in different welfare states (e.g. Hudson and Kühner 2009; Nikolai 2012;

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<sup>2</sup> Note that reallocation does not *necessarily* have to involve substitution. The substitution of passive policies by active policies has predominantly been advocated by Anglo-Saxon scholars such as Anthony Giddens (1998), whereas others have stressed their complementarity (e.g. Morel *et al.* [2012]). See for an overview of the combination of passive, ‘old’ and active, ‘new’ social policies in different European welfare states for instance: Van Kersbergen *et al.* (2014). Still, it is a fact that resources are limited in the post-crisis context of austerity.

<sup>3</sup> See for a genealogy of the social investment perspective: Smyth and Deeming (2016).

Hemerijck 2013; Hemerijck *et al.* 2013; Kvist 2013; Kuitto 2016). The empirical, explanatory studies that do exist examine the relationship between social investment policies and poverty (Ghysels and Van Lancker 2011; Cantillon and Van Lancker 2012, Van Lancker and Ghysels 2012; Marx *et al.* 2012; Vaalavuo 2013; Van Vliet and Wang 2015; Hemerijck *et al.* 2016) or employment (Nelson and Stephens 2012; Taylor-Gooby *et al.* 2015; Ahn and Kim 2015; Hemerijck *et al.* 2016).

This study engages with the latter group of studies for two reasons. On the one hand, employment is considered a goal that needs to be realised first before poverty reduction can be attained. Employment functions as a way to secure income and realise social inclusion at the individual level. At the same time it enhances the carrying capacity and reduces the benefit dependency of the welfare state, which contributes to its sustainability (e.g. Hemerijck 2013; 2015) and thereby serves a collective purpose. The ultimate goal of social investment state has henceforth been described in collective terms such as “breaking the intergenerational chain of poverty” (Cantillon and Van Lancker 2013, 554) and realising “a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion” (European Commission 2010, 3). In short, the main goal of social investment can therefore be summarised as, first, increasing labour market participation to reduce social exclusion, second, getting people into work to realise high levels of employment and, ultimately, reducing poverty (Jenson 2012b; Hemerijck 2013).

On the other hand, the relationship between social investment and employment has less thoroughly been studied than the relationship between social investment and poverty, making it somewhat easier to identify gaps in the literature. A common finding from the aforementioned studies is that policies aimed at enhancing human capital and reconciling work and family are positively associated with employment. Nevertheless, the studies do not incorporate the full range of social investment policies that have been widely discussed in recent literature on social investment. In addition, not much attention has been paid to the role of labour market institutions that figure prominently in the literature on labour market economics. Moreover, the studies focus on employment exclusively. Yet, social investment is characterized by strong ‘supply-side intentions’; that is, policies aimed at raising labour market participation to combat social exclusion (Green-Pedersen *et al.* 2011). Labour market participation does not only concern those being employed, but also includes those participating on the labour market by searching for a job. For that reason, the research question of this study is:

*To what extent do social investment policies contribute to employment and labour market participation?*

The study aims to complement existing studies by empirically analysing the association between disaggregated expenditures on social investment policies and labour market outcomes in seventeen EU member states over the period 1990-2009, using pooled time-series cross-section analyses. With regard to the studies by Ahn and Kim (2015), Taylor-Gooby *et al.* (2015) and Hemerijck *et al.* (2016) it seeks to make three contributions. First, this study creates a more elaborate framework that incorporates both cash transfers and in-kind benefits and allows for the use of disaggregated expenditure data for all the social investment policies described in existing literature. Second, it engages with the literature on labour market economics to identify relevant control variables with regard to employment and labour market participation. Together with the availability of relatively new data this leads to the inclusion of different factors that have not simultaneously been incorporated in previous studies. Third, the study systematically accounts for age and gender differences with regard to labour market outcomes.

This study is relevant from a more practical and societal point of view as well. Estimating the effect of social investment policies on labour market outcomes using disaggregated spending data enables one to operationalise and identify the specific policies that account for cross-national differences or changes in the outcome of interest (Castles 2008). The study thereby generates findings about the effectiveness of social investment policies.<sup>4</sup> These findings are likely to find societal and practical resonance due to the current challenges that European welfare states face as well as those challenges ahead. After all, the aftermath of the recent economic crisis might constitute a window of opportunity for changes in economic policy that curtail the interest in social investment and possibly lead to a new paradigm shift (Hemerijck 2012b; Diamond and Liddle 2012; cf. Vis *et al.* 2011). Mainly due to the prioritization of crisis management, fundamental questions related to the sustainability of welfare state regimes have largely remained unaddressed (Diamond and Liddle 2012; cf. Van Kersbergen *et al.* 2014). Yet, if one is to argue about the prospects of social investment given current socioeconomic challenges and those ahead, a succinct judgement of its

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<sup>4</sup> It hereby directly engages with the question “What about the goodness of social investment as a policy goal?” raised by Ferrera (2016, 16). According to Ferrera (2016), there are no absolute yardsticks in the realm of evaluation this question. In the process of generating such an evaluation, this project simultaneously suggests relevant yardsticks.

effectiveness is required. In combination, these findings will feed contemporaneous debates – both academic and political – about the sustainability of the welfare state.

## 2. Literature review

Traditionally, comparative empirical studies on labour market outcomes have mainly focused on the role of labour market institutions and welfare programmes in relation to unemployment (e.g. Blanchard and Wolfers 2000; Belot and Van Ours 2004; Nickell *et al.* 2005). Some studies have also examined the association between traditional welfare programmes and institutions, on the one hand, and employment, on the other hand (e.g. Kenworthy 2003; Bradley and Stephens 2007; Huo *et al.* 2008; Abrassart 2015). Only fairly recently have studies started to specifically examine the effect of social investment policies on employment levels (Nelson and Stephens 2012; Ahn and Kim 2015; Taylor-Gooby *et al.* 2015; Hemerijck *et al.* 2016).

While the approaches adopted by these studies are much alike, they slightly differ in the estimation technique used and number of years included. Nelson and Stephens (2012) use pooled Prais-Winsten regression analyses to estimate the effect of ‘human capital investment policies’ on the employment rate of the working age population and employment in high quality jobs, operationalised as employment in knowledge-intensive services, in seventeen OECD countries during the period 1972-1999. They find that most of the policies associated with social investment are associated with both higher levels of employment and higher levels of employment in knowledge-intensive services.

Using a similar approach, but with one year lags for the independent variables and the inclusion of fixed effects, Ahn and Kim (2015) estimate the effect of social investment policies on GDP per capita, the unemployment rate, employment rate, and female employment rate of the working age population of fifteen OECD countries over the period 1990-2007. They conclude that ‘service-oriented’ social investment policies contribute to economic growth and labour market performance.

Taylor-Gooby *et al.* (2015) also use Prais-Winsten regressions with one year lags for the independent variables to estimate the association between social investment policies and employment in seventeen European countries over the period 2001-2007. Due to the limited number of years they study, they do not include fixed effects. Rather than studying variation within countries, their analysis hence studies variation between countries and only supports broad generalisations, because “the impact of different national policy emphases ... is not explored” (Taylor-Gooby *et al.* 2015, 95). They find that higher expenditures on social investment policies are associated with higher employment levels.

The most recent study available constitutes Hemerijck *et al.* (2016). Using fixed effect regression analyses with a lagged dependent variable, Hemerijck *et al.* (2016) estimate the impact of social investment policies on employment rates in OECD countries over the period 1980-2011. They do, however, not reflect on the countries actually included in their unbalanced time-series cross-section of data (Hemerijck *et al.* 2016, 68-69). Moreover, their use of a lagged dependent variable may suppress the explanatory power of other independent variables, resulting in coefficients that are biased downwards (Achen 2000; Keele and Kelly 2006). Hemerijck *et al.* (2016) find that “the measures of social investment tend to have at least a modest positive relationship with various employment rates” (2016, 70).

While most of the studies use disaggregated expenditures on different social investment policies, Ahn and Kim (2015) use aggregated expenditures. The use of aggregated expenditures on service-oriented social investment policies leaves them unable to argue which specific policies account for the observed differences or changes in the outcome of interest (Castles 2008). Moreover, their operationalisation of expenditures on social investment policies, in-kind social spending as a share of total social spending, excludes expenditures on cash benefits. As Hemerijck *et al.* (2016, 35-36) argue, strictly distinguishing between cash and in-kind benefits does not allow for the proper measurement of what social investment actually is, because it includes both.

Although the other studies do use disaggregated expenditures, they neglect several policies associated with social investment. Nelson and Stephens (2012) incorporate expenditures on active labour market policies (ALMPs), early childhood education and care (ECEC), and education, whereas Hemerijck *et al.* (2016) only include expenditures on ALMPs and ECEC. Taylor-Gooby *et al.* (2015) focus on similar policies but use different indicators. They include expenditures on training programmes of ALMPs only, the share of people of prime working age participating in lifelong learning (as an alternative to educational attainment or expenditures on education in general), and expenditures on maternity and parental leave.

In short, this means that several policies often grouped under the social investment approach, like maternity and parental leave, care for the elderly, and education (e.g. Vandenbroucke and Vleminckx 2011; De Deken 2014) are neglected.<sup>5</sup> Moreover, they leave space for the inclusion of social investment policies that have been mentioned, but so far not

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<sup>5</sup> Note that Nelson and Stephens (2012) constitute an exception with regard to expenditures on education, whereas Taylor-Gooby *et al.* (2015) constitute an exception with regard to expenditures on maternity and parental leave.

systematically examined in the social investment literature, such as policies for the disabled or (partly) incapacitated (Kvist 2016). In addition, although Hemerijck *et al.* (2016) and expenditures on ALMPs in general constitute an exception, the studies do not correct expenditures on the different social investment policies for the number of beneficiaries. Nevertheless, it has for some time been acknowledged that social expenditures are related to the number of people in need of and eligible for benefits and services (e.g. Kangas and Palme 2007; Vandenbroucke and Vlemincx 2011).

Further, none of the studies systematically distinguish between overall, male and female employment rates. While female employment (Hegewisch and Gornick 2011) and labour market participation (Jaumotte 2003) have been the subject of empirical studies, the social investment literature has been accused of (so far) neglecting outcomes for women and focusing on the stereotypical male worker model rather than the worker and carer model (Esping-Andersen 2009; Daly 2011; cf. Lewis 2001; Stratigaki 2004), thereby taking gender equalities in the household and labour market for granted and devaluing unpaid family work (Saraceno 2015). Ahn and Kim (2015) and Hemerijck *et al.* (2016) are exceptions, however. Both studies estimate models with the employment rate of the female population of working age as a dependent variable, whereas the latter, moreover, estimates models that focus on the employment rate of those aged 15-24 and 55-64 specifically. Notwithstanding the fact that these studies do estimate separate models for the female population, they do not systematically estimate them for the overall, female *and* male population. One could argue that results obtained for the female population only make a substantive contribution when contrasted to those obtained for the male population.

Lastly, the discussed studies seem to neglect the role of labour market institutions that figure prominently in the literature on labour market economics and are known to influence employment and labour market participation, such as unemployment benefits, social assistance and minimum income benefits, employment protection legislation, trade union density, and the tax wedge (e.g. Freeman 1988; Nickell and Layard 1999; Bradley and Stephens 2007). Taylor-Gooby *et al.* (2015) are the only ones to control for employment protection legislation and trade union density, whilst Nelson and Stephens (2012) are the only ones to control for the generosity of unemployment benefits. They, however, use gross replacement rates, whereas time series for net replacement rates are available (Van Vliet and Caminada 2012). Time series data for net replacement rates of social assistance and minimum income replacement rates have been available for a short time as well (Wang and Van Vliet 2016).



### 3. Theory

#### 3.1 Central concepts

There exist different conceptions of social investment that highlight different constituent parts of the entire ‘package’ of ideas, policies, and theories that it covers.<sup>6</sup> Central to the notion of social investment is that the economic sustainability, or ‘carrying capacity’, of the welfare state depends on “the number and productivity of [current and] future taxpayers” (Hemerijck *et al.* 2016, 2; cf. Esping-Andersen 2002). In Hemerijck *et al.* (2016) and Hemerijck (2017) social investment is hence presented as a life course multiplier of productivity and growth.<sup>7</sup> It is possible to discern a relatively large group of studies within the literature on social investment that adopt such a life course perspective on social investments and their returns (Kvist 2013; 2015; 2016; Hemerijck 2015; Kuitto 2016; Hemerijck *et al.* 2016). What these studies have in common is that they present social investment as a broad policy package consisting of specific welfare policies aimed at different stages of the life course, usually (early) childhood and youth, prime or working age, and old age. The central aim of these social investment policies – the returns of which usually materialise throughout different phases of a life course, after different life events (e.g. becoming unemployed or getting a child), life stages (e.g. the returns of schooling reaped while working), and during transition between stages (e.g. from working to retiring) – is to mobilise the productive potential of citizens.

Although several scholars have written about what they believe to constitute social investment policies, no inclusive framework exists. Several scholars have distinguished between ‘compensatory’ and ‘investment’ policies (Nikolai 2012), ‘old’ and ‘new’ welfare policies (Vandenbroucke and Vleminckx 2011; Häusermann 2012; Hemerijck *et al.* 2013), ‘service-oriented capacitating’ and ‘benefit-transfers compensating’ social spending (Hemerijck 2013), and cash benefits and benefits in-kind (Jensen 2008; 2010; Nikolai 2012; Ahn and Kim 2015). Some have gone even further by distinguishing the group of (social) investment policies into policies aimed at maintaining or restoring the capacity of labour market participants, policies facilitating the entrance of new labour market participants, and policies investing in the capacity of new labour market policies (De Deken 2014), or policies aimed at skill preservation, skill mobilization and skill creation (Kvist 2016). Activating and capacitating policies generally grouped under social investment policies include: active

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<sup>6</sup> Hemerijck *et al.* (2016) discuss five different, albeit not necessarily conflicting, conceptualisations.

<sup>7</sup> Or, as Kvist (2013, 95) puts it, “[a life course perspective on social investment policies and their returns] takes into account that human capital is produced over the life course by families, firms and various state interventions”.

labour market policies, family policies (including both maternity and parental leave), education policies, as well as childcare, elderly care and care for the frail, whereby care usually refers to home-help (Nelson and Stephens 2012; Vandenbroucke and Vleminckx 2011; Kvist 2013; De Deken 2014; Hemerijck *et al.* 2016).<sup>8</sup>

It should first be noted that strictly distinguishing between cash and in-kind benefits is undesirable and too limited, for social investment covers policies that include both types of benefits (Hemerijck *et al.* 2016, 34-40). Second, further distinguishing between groups of social investment policies is also undesirable since multiple policies could be grouped under more than one category. Put differently, some policies can fulfil different functions and cannot exclusively be assigned to a specific category (De Deken 2014). Early childhood education and care (ECEC) policies constitute a relatively clear example. On the one hand, ECEC enhance cognitive development, allowing better skill acquisition and higher productivity in the longer run. On the other hand, such policies also have a more immediate impact in the short run by allowing more young parents, particularly women, to participate on the labour market. It should thus also be noted that the effects of specific social investment policies may manifest themselves in multiply ways.

Acknowledging these arguments, this study distinguishes five broad ‘social investment policies’ that consist of multiple policy programmes and cover both cash benefits and in-kind benefits. The five social investment policies are: early childhood education and care (ECEC), family policies, active labour market policies (ALMPs), care for the elderly and frail, and education. ECEC policies cover both pre-primary education and formal day-care services (OECD 2011). Family policies are taken to include maternity and parental leave as well as at-home childcare and help (Hegewisch and Gornick 2011). ALMPs consist of different subprogrammes that can be grouped under training, subsidised employment, public employment services and activation (Boone and Van Ours 2006; 2009). ECEC policies and policies aimed at care for the elderly and frail cover in-kind benefits only, whereas family policies, ALMPs and education policies cover both cash and in-kind benefits.

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<sup>8</sup> According to Kvist (2016) policy programmes involving housing, long-term care, minimum incomes, sickness and disability have not been examined systematically in the social investment literature. It is, however, strongly questionable to what extent these policies constitute activating and capacitating investment policies. Kuitto (2016) argues that preventive health care should be included because health status is one of the important factors for capacitating people and combatting poverty. Since the standard sources for cross-country disaggregated social expenditure data do not allow for distinguishing between preventive and curative health care spending, social expenditure on health care can be classified as neither fully capacitating nor fully compensating, making it unsuited for inclusion. The problem of demarcating social investment policies has been nicely captured by Nolan (2013, 465) who states that “with a definition of ‘investment’ broad enough to include anything that might conceivably facilitate higher labour force participation or contribute (directly or indirectly) to the health and productive capacity of the workforce, what is it legitimate to exclude?”

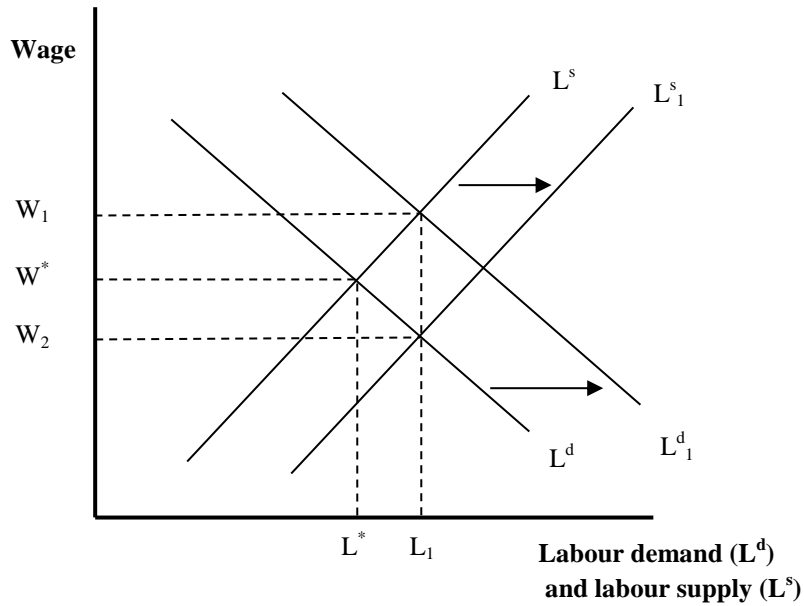
### 3.2 Causal mechanisms and hypotheses

While some social investment policies have rather direct, short-term impacts, others only reveal their impact over the medium or long term (Begg 2017). Despite the fact that the life course perspective has figured so centrally in the social investment literature, it should – in addition – therefore be noted that measuring long-term effects or returns is analytically difficult; the causal chain between an initial independent variable (e.g. education) and the dependent variable of interest (e.g. employment) may be so long that testing the effect is impossible or undesirable (Hemerijck *et al.* 2016, 34-40). Consequently, the hypotheses that have been formulated below refer to such short-term impacts only.

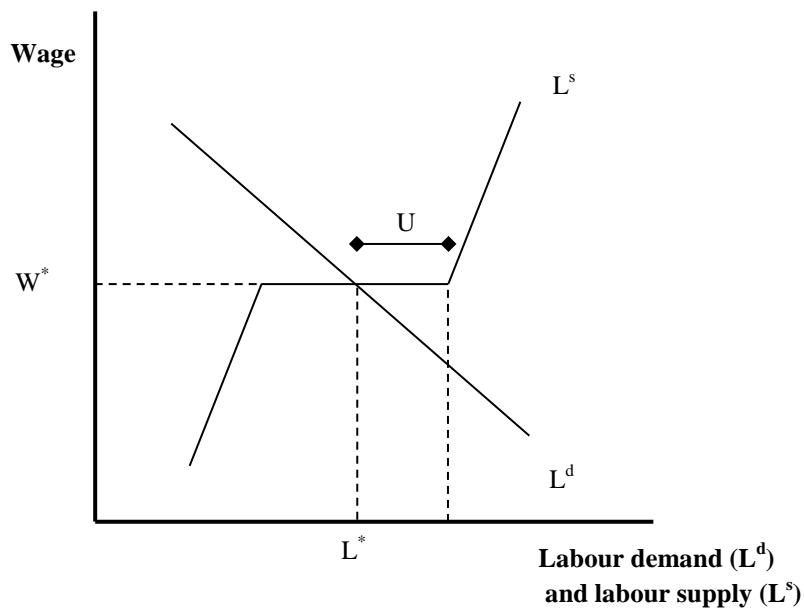
In general, labour market outcomes can be affected through two mechanisms. On the one hand, there might be changes in the demand for labour, leading to increases in employment in the case of an aggregate downward sloping demand curve. On the other hand, there might be changes in the supply of labour. In the case of an aggregate upward sloping supply curve, such increases in the supply of labour also lead to increases in employment. These situations are depicted in Figure 1, where an increase in the demand of labour (depicted by an outward shift of the demand curve  $L^d$ ) leads to an increase in the equilibrium wage from  $w^*$  to  $w_1$  and increase in the equilibrium level of employment from  $L^*$  to  $L_1$ , and where an increase in the supply of labour (depicted by an outward shift of the supply curve  $L^s$ ) leads to a decrease in the equilibrium wage from  $w^*$  to  $w_2$  and increase in the equilibrium level of employment from  $L^*$  to  $L_1$ .

Supply curves may, however, be characterized by flat segments, which occur when there is a disproportionately large amount of people that are willing to supply their labour for a particular wage level (i.e. have a similar reservation wage). In such cases, the aggregate supply of labour at a particular wage level may be larger than the aggregate level of demand at that wage level, leading to unemployment ( $U$ ) (e.g. Pencavel 1986, esp. 31-44; Boeri and Van Ours 2013, esp. 8-14; Borjas 2013, esp. 42-45). This situation is depicted in Figure 2. In addition, the occurrence of market failures and presence of labour market institutions cause labour markets to function imperfectly (Boeri and Van Ours 2013). The main implications thereof are that changes in the aggregate demand and aggregate supply of labour do not necessarily lead to increases in employment. Instead, unemployment levels and thus overall labour market participation may be affected.

**Figure 1** Graphical representation of the effect of an increase in the demand for and supply of labour on the equilibrium wage and employment level



**Figure 2** Graphical representation of a labour market with a supply curve with a flat segment



Social investment policies can be expected to raise employment via the two mechanisms explicated above. On the one hand, policies aimed at enhancing human capital and reconciling work and family stimulate labour market participation, which simultaneously leads to an increase in the demand for labour in related jobs in the service sector (Ahn and Kim 2015, 111-112). This mechanism is particularly likely to apply for those policies provided through in-kind benefits. The provision of care and education enables people that would provide care through non-market arrangements to find a job or remain in their job, whilst at the same time fuelling the demand for people to provide these services at care and education institutions like crèches, kindergartens, schools, and old people homes, or at home. On the other hand, social investment policies can also increase the supply of labour. This mechanism is likely to apply to both cash and in-kind benefits. The provision of care, work-leave arrangements like maternity and parental leave, ALMPs, and education are likely to both stimulate participation and lead to fewer exits from the labour market, thereby leading to higher levels of labour supply than in the absence of such policies.

Due to the costs associated with childcare effective wages are affected when opting for the provision of childcare through market arrangements. This leads some family members – usually mothers – or relatives to leave the labour market in order to take care of the child(ren) instead (Heckman 1974; Blau and Robins 1988; Connelly 1992; Attanasio *et al.* 2008). After researching the causal relationship between female labour market participation and the availability of childcare Chevalier and Viitanen (2002) claim that women could be constrained in their participation by the lack of childcare facilities. Through expenditures on pre-primary education institutions and formal day care facilities, states are able to influence the availability of ECEC and can hence stimulate labour market participation – in particular that of women:.

Hypothesis 1: Higher expenditures on early childhood education and care positively affect employment

Parental leave arrangements grant parents time off work to care for new-born children. It generally constitutes an extension of (mandated) maternity leave: job-protected leave from employment during childbirth. In most countries maternity leave consist of a period prior to and immediately after giving birth, granted by employers to allow mothers to prepare for and recover from childbirth (e.g. Waldfogel 2001; Ray *et al.* 2010). Childbirth may change the preferences of parents – particularly mothers – and lead them to prefer

leisure to work, because this allows them to spend time with their new-born child. In the absence of maternity and parental leave, particularly women are likely to quit employment. In the presence of such leave arrangements people are *ceteris paribus*, however, more likely to utilise this period and return to work once it ends (Klerman and Leibowitz 1997), particularly if they earn high wages, enjoyed high education and received job-specific training (Desai and Waite 1991). Besides, parental leave may also delay the return to work (Klerman and Leibowitz 1997), but empirical findings indicate that such delays do not increase the probability of either leave-taking or returning, for without the leave arrangements they would still have taken leave and return, albeit enjoying leave for a less optimal period (Baum 2003).

Empirical studies have indeed found that family policies foreseeing in paid leave raise female employment rates (Ruhm 1998; Rønsen and Sundström 2002) and reduce exits from the labour market by new mothers (Joesch 1997; Hofferth and Curtin 2003), albeit often resulting in part-time employment (Gutiérrez-Domènech 2005). At the same time, leave arrangements may make female employees – particularly those with specific skills and from the higher social class – less attractive to employers than their male counterparts, thereby reducing their employment prospects (Shalev 2008; Mandel and Shalev 2009). Overall, one can, however, expect a positive association between expenditures on maternity and parental leave and (female) labour supply. Through the provision of home-services after childbirth, states are in addition also able to fuel labour demand for such caregivers, which are usually women:

Hypothesis 2: Higher expenditures on family policies positively affect employment

ALMPs are, on the one hand, aimed at maintaining labour market participation by keeping people from becoming inactive and protecting human capital and, on the other hand, stimulate employment and participation by aiming to put unemployed and excluded people back into work (Calmfors and Skedinger 1995; Nickell 1997). While the former is mainly attained through training and activation, the latter is predominantly achieved through subsidised employment and public employment services. ALMPs have also been described as policies aimed at correcting the disincentives for effective job search caused by passive labour market policies like unemployment benefits through monitoring and – in case of insufficient effort – possibly sanctioning recipients of such benefits. Several studies have found benefit sanctions involving a reduction of the benefit level to be effective by significantly and substantially raising the transition out of unemployment (Van den Berg *et*

*al.* 2004; Abbring *et al.* 2005; Lalive *et al.* 2005). In terms of post-unemployment effects, Arni *et al.* (2013) found that warnings do not affect subsequent employment stability but do reduce post-unemployment earnings, whereas actual benefit reductions lower the quality of post-unemployment jobs in terms of both job duration and earnings.

From a review of OECD countries' experiences with ALMPs, Martin and Grubb (2001) conclude that job search assistance such as counselling is particularly effective, but only when combined with increased monitoring of job seekers and enforcement of work tests. Public employment services play a central role in this. They argue that self-employment programmes often indicate positive effects, but apply to a small proportion of the unemployed only, and stress that hiring subsidies often involve substitution effects. In a more recent review of OECD studies about ALMPs since the Great Recession, Martin (2014) stresses the role of strict benefit conditionality and indicates that activation policies have barely been successful in activating recipients of long-term sickness and disability benefits.

Kluve (2010) and Card *et al.* (2010; 2015) have provided meta-analyses of 100 to 200 evaluations of active labour market programmes. They find that job search assistance programmes are more likely to have a positive impact than public sector employment. Programmes that emphasise human capital accumulation, like formal classroom and on-the-job training programmes, often have the strongest impact. These programmes, however, have insignificant or negative impacts in the short run, but display relatively positive impacts in the medium term of two to three years after completing the programme. Card *et al.* (2010; 2015) further stress that studies based on unemployment data often present more positive results than studies based on employment or earnings data, which might suggest that reductions in the number of unemployment follow from cancellations from the unemployment register rather than successfully finding a job (Aktinson and Micklewright 1991; Card *et al.*, 2007b). Lastly, they find that ALMPs have stronger effects among women as well as participants that enter from long-term unemployment. Martin and Grubb (2001) likewise found that formal classroom training, on-the-job training, job search assistance and subsidies to employment appear to aid women in particular. One could hence expect a positive effect for ALMPs – particularly for women:

Hypothesis 3: Higher expenditures on active labour market policies positively affect employment

Unlike childcare, the provision of care when parents or relatives become frail and are in need of care has received much less attention. Although one might expect the provision of care for the elderly and frail through non-market arrangements to have a negative effect on the employment of these caregivers, empirical studies find no evidence of lower chances to be employed. Those caring for old and frail relatives – usually women – turn out to take unpaid leave, rearrange their work schedules, or – predominantly – reduce their number of working hours instead (Stone and Short 1990; Wolf and Soldo 1994; Ettner 1995; 1996; Johnson and Lo Sasso 2006; Keck and Saraceno 2009).<sup>9</sup> *Ceteris paribus*, expenditures on care for the elderly and frail are therefore unlikely to raise the employment of such (female) caregivers by affecting the supply of labour. Nevertheless, these expenditures are likely to affect the demand for formal caregivers operating through formal arrangements. Moreover, if care for the sick or disabled constitutes rehabilitative care, it might even raise the supply of labour amongst those being cared for. One can therefore expect a positive, although probably modest, effect of expenditures on care for the elderly and frail on labour market outcomes that holds for women in particular:

Hypothesis 4: Higher expenditures on care for the elderly and frail positively affect employment

Expenditures on education can mainly be expected to have a positive effect on the quality of a county's labour force – and thereby also employment – over the medium to long term. Nevertheless more quantitative effects can be specified as well. The social investment paradigm rests heavily on the argument that the world is rapidly changing so that a skilled and flexible labour force constitutes the key to productive and economic growth (Nolan 2013, 462; Lundvall and Lorenz 2012, 236). Besides, the current phase of capitalism is often characterized as a 'globalizing learning economy' (Achibugi and Lundvall 2001; Lundvall and Lorenz 2012) in which knowledge becomes obsolete more rapidly than before and where the need for manual labour power has been replaced by the need for skills relevant to the service-based knowledge economy (cf. Nickell and Bell 1995). Such an economy is therefore associated with the need to invest in education in order to stimulate labour market participation and employment (Giddens 2000, 73; Iversen and Stephens 2008; Busemeyer and Nikolai 2010; Kenworthy 2010, 443; Nikolai 2012, 93). In short, expenditures on

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<sup>9</sup> Across cultural and institutional contexts there are, however, differences in the prevalence of intergenerational care and the adjustment of working hours (Spiess and Schneider 2003; Haberkern and Szydlik 2010).



education policies essentially concern investments in human capital that, on the one hand, increase job opportunities and, on the other hand, increase future productive capacity (Mincer 1958; Schulz 1961; Becker 1964). Moreover, expenditures on education usually account for expenditures on teacher salaries as well. Although it is analytically unfeasible to investigate the more qualitative, long run effect, one might expect a modestly positive effect of expenditures on education on labour market outcomes on the shorter run:

Hypothesis 5: Higher expenditures on primary, secondary and tertiary education positively affect employment

The hypotheses formulated above explicitly specify positive effects for social investment policies on employment. As noted, changes in the aggregate demand for or supply of labour do not necessarily lead to changes in the level of employment, whilst affecting overall labour market participation nonetheless. Moreover, some authors even suggest that certain social investment policies might be more likely to affect the supply of labour, and thus labour market participation, instead of employment. Following a review of empirical studies, Raffass (2017) concludes from a more macroeconomic point of view that the ‘activation turn’ of OECD states – so strongly reflected in the social investment approach – since the 1990s through welfare-to-work and activation policies and programmes like ALMPs has mainly enforced a ‘duty to activation’ (i.e. supplying labour to the formal labour market) rather than a ‘right to work’ by abandoning the commitment to full employment. Likewise, Saraceno (2015) explicates how the social investment approach focuses on how to support women to enter and remain – i.e. be active and supply labour – in the labour market, while it at the same time accepts that women retain the main responsibility for unpaid family work, essentially limiting their possibilities for actual employment. Due to potential limits to or paradoxes in the social investment approach as well as a lack of complementarity between different national policies, social investment policies might hence merely influence labour market participation rather than impacting on actual employment.

## 4. Data and methods

### 4.1 Employment to population ratio and labour market participation rate

To examine the macroeconomic effects of social investment policies, the study relies on the use of employment to population ratios and labour market participation rates as dependent variables. These ratios are computed using OECD (2016a) data. The employment to population ratio, or employment rate, expresses the share of employed people in a specific age group as a percentage of the total number of people in that specific age group. Likewise, the labour market participation rate expresses the share of the sum of all employed and unemployed people in a specific age group as a percentage of the total number of people in that specific age group.

To distinguish between different outcomes for men and women, the study accounts for gender: overall, male and female employment to population ratios and labour market participation rates are computed. The logic behind this is that social investment has particularly promoted the labour market participation of women (e.g. Esping-Andersen 2002), but in doing so focused on the stereotypical male breadwinner model rather than the worker and carer model by stressing ways in which women can be supported to participate in the labour market rather than ways in which the role of men within the family can be changed (Esping-Andersen 2009; Daly 2011; Saraceno 2015). Besides testing gender-effects, the study also aims to account for age effects. In order to control for the possibly disturbing effects of extended periods of schooling and early retirement on employment to population ratios and labour market participation rates, this study focuses on the population of prime working age, i.e. those aged 25-54, specifically.

The dependent variables can also be written as equations. The employment rate, or employment to population ratio, can be expressed as follows:

$$\text{Employment to population ratio} = \frac{\text{total employed}_{i,j}}{\text{population}_{i,j}} \times 100 \quad (1)$$

whereby  $i$  refers to a specific age group (in this case those aged 24-54) in country  $j$ . The labour market participation rate can be expressed in a similar manner:

$$\text{Labour market participation rate} = \frac{(\text{total employed} + \text{total unemployed})_{i,j}}{\text{population}_{i,j}} \times 100 \quad (2)$$

Here,  $i$  again refers to a specific age group (i.e. those aged 24-54) in country  $j$ .

## 4.2 Expenditures on social investment

To examine the extent to which different states have allocated resources to social investment policies, the study relies on data from the OECD Social Expenditure Database (SOCX) (OECD 2016b) and OECD Education and Training Database (OECD 2014a). These databases contain social expenditure data on specific welfare state programmes. The SOCX database distinguishes between public and private expenditures, of which the latter can be distinguished into mandatory and voluntary private expenditures. Mandatory private social expenditures – which accounts for roughly 25% of all private social expenditure and mainly applies to maternity and parental leave, paid sick leave, disability pensions, and in some countries also old age and survivor pensions – are mandated by law (Adema *et al.* 2011, 23). In essence, they are therefore public expenditures in disguise. Since mandatory private social expenditures are structured according to the same level of detail as public social expenditures in the SOCX database, expenditures on social investment policies are operationalised as the sum of public and mandatory private social expenditures.

The operationalization of the independent variables strongly follows Vandenbroucke and Vleminckx (2011) but somewhat differs in the categorisation of social investment policies, the exact policy programmes included (already described in the conceptual section) as well as the number of groups and exact proxies used to adjust total expenditures for the number of targeted or potential beneficiaries (discussed below).<sup>10</sup>

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<sup>10</sup> Vandenbroucke and Vleminckx (2011) distinguish five types of ‘new’ public welfare spending: parental leave, covering both maternity and parental leave; elderly care, covering residential care and home-help services; childcare, covering day-care, home-help services and pre-primary education; ALMP, covering employment services and administration, training, job-rotation and job-sharing, employment incentives, supported employment and rehabilitation, and direct job creation; and primary and secondary education, covering funding from public, private and international sources for all current and capital expenditures of or for public and private institutions. Subsequently, they weigh expenditures on childcare by the number of children aged 0-4, expenditures on ALMP by the number of unemployed, and expenditures on primary and secondary education by the number of children aged 5-19. These three measures are then compared to GDP per capita. This study distinguishes five similar spending categories, termed ‘social investment policies’. Two of them differ in terms of the policy programmes included. Instead of elderly care, this study uses care for the elderly and frail. In addition to the operationalization of Vandenbroucke and Vleminckx (2011) this also includes residential care and home-help services as well as rehabilitation services for the sick and (partly) incapacitated. With respect to education, this study includes expenditures on post-secondary non-tertiary secondary education and tertiary education as well. In terms of the proxies used to adjust total expenditures for the number of targeted or potential beneficiaries, this study uses different proxies for four of the categories. Following the characteristics of the SOCX database expenditures on early childhood education and care (ECEC; termed ‘childcare’ by Vandenbroucke and Vleminckx 2011) are weighted by the number of children aged 0-5. As a result of this and because of the the additional stage of education included, expenditures on primary, secondary and tertiary education are weighted by the number of people aged 6-24 in this study. Vandenbroucke and Vleminckx (2011) did not weigh expenditures on family policies (which they termed ‘parental leave’) and elderly care. Based on the average duration of maternity and parental leave across OECD countries, this studies weighs expenditures on family policies by the number of children aged 0-1. To allow for better comparison, expenditures on care for the elderly and frail are weighted, but in the absence of an adequate proxy this study uses the total population for that.

Early childhood education and care (ECEC) (SOCX category 5-2-1) covers both pre-primary education and formal day-care services (OECD 2011). To get a good comparison of support for early care and education services across different national and institutional settings, account has been taken of cross-national differences in the compulsory age of entry into primary school. As a result, the SOCX expenditure figures refer to spending on ECEC for all children aged 0-5 (Adema *et al.* 2011, 98-99). Family policies are taken to include maternity and parental leave (category 5-1-2) as well as home-help and accommodation services (category 5-2-2). It excludes family allowances (5-1-1), which are generally considered ‘old’, compensating policies (Vandenbroucke and Vleminckx 2011; De Deken 2014).

ALMPs cover seven programmes aimed at “the improvement of beneficiaries’ prospects of finding gainful employment or to otherwise increase their earnings capacity” (Adema *et al.* 2011, 99). It covers public employment services and administration (category 6-0-1), training (6-0-2), job rotation and job training (6-0-3), employment incentives (6-0-4), supported employment and rehabilitation (6-0-5), direct job creation (6-0-6), and start-up incentives (6-0-7).<sup>11</sup> Since data on benefit sanctions and availability requirements is not publicly<sup>12</sup> or only cross-sectionally (Danish Ministry of Finance 1998; Hasselpflug 2005; Venn 2012) available, only the effect of expenditures on the different programmes can be estimated. Care for the elderly and frail includes residential care and home-help services from the SOCX categories ‘old age’ (1-2-1) and ‘incapacity-related benefits’ (3-2-1) as well as rehabilitation services for the sick and (partly) incapacitated (3-2-2).

As a measure of resources allocated to education, the study uses total expenditures on primary, secondary and tertiary education from the OECD (2014a). This measure covers funding from public (central, regional and local government), private (households and other private entities), and international sources and includes all current and capital expenditures of or for public and private institutions, excluding for instance financial aid to students, scholarships and other grants to students and households, student loans, and subsidised expenditures for student living expenditures.

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<sup>11</sup> For France data on job rotation and job training is not available. Total expenditures on ALMPs in France hence exclude this programme. Yet, expenditures on this programme are generally relatively low and can in several countries even be neglected. For Italy data on public employment services and administration is not available until 1998. Nevertheless, expenditures on this programme are zero throughout the first two years during which data is available, suggesting that the sum of total expenditures is adequate for the years prior to 1998.

<sup>12</sup> Knotz (2016) has gathered data on conditions and sanctions for the unemployed in OECD countries over the period 1980-2012, but his data are not publicly available yet.

The time interval for which the measures of social investment policies from the SOCX database are available is 1980 to 2013, though countries vary in their coverage. In most cases, data on ALMPs is available from 1985 only. Time series data about expenditures on ECEC policies and primary, secondary and tertiary education are in most cases characterised by a break in the time series, following the introduction of the ISCED 1997 classification. Although the SOCX database contains nearly no missing data for ECEC policies, data prior to 1998 does either not include expenditures on pre-primary education – the lion’s share of total expenditures on ECEC – or does not correct for differences in the compulsory age of entry into primary school. Using expenditures on pre-primary education from the OECD (2014a) Education and Training Database, expenditures on additional programmes included under ECEC policies in the SOCX database, and population statistics total expenditures on ECEC policies were estimated for the years prior to 1997.<sup>13</sup> Since the Education and Training database contains no detailed expenditure data by education level for the years 1992, 1993 1996 and 1997 for most countries, the time series for ECEC policies and primary, secondary and tertiary education contain some missing values.

It should be noted that the use of expenditure data goes hand in hand with conceptual and methodological issues. It has been argued that expenditure-based measures might not capture important aspects of efforts on welfare programmes by states (Esping-Andersen 1990; Korpi and Palme 1998; Green-Pedersen 2004; Clasen and Siegel 2007; Kühner 2007; Van Oorschot 2013; De Deken 2014). Welfare effort implies decisions related to entitlement criteria, the type of benefit, as well as the overall budget for a specific programme; spending figures only capture the latter (Korpi and Palme 1998), whilst institutional characteristics of welfare programmes are neglected (De Deken 2014). Further, variation in the amount of

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<sup>13</sup> For Austria, Denmark (both prior to 1997) and Germany (prior to 2000), expenditures on ECEC exist of one category only, that has – however – not been corrected for the fact that children in these countries enter primary school at the age of 7. Using population statistics, total expenditures on ECEC were multiplied by the number of children aged 0-5 as a share of all children aged 0-6. For Belgium, the Czech Republic, France, Ireland, Italy, the Netherlands, Poland, Portugal, the United Kingdom (prior to 1998), and Hungary (prior to 1999) expenditures on pre-primary education were not included in expenditures on ECEC at all. Total expenditures on ECEC were estimated through adding total expenditures on pre-primary education from the OECD Education and Training Database (2014a), corrected for the compulsory age of entry into primary education, to the expenditures already included under ECEC in the SOCX Database. Expenditures on pre-primary education in Belgium, the Czech Republic, France, Italy, Poland, and Portugal were corrected by multiplying total expenditures on pre-primary education by the number of children aged 0-5 as a share of all children aged 0-6. Expenditures in Ireland and the Netherlands did not have to be corrected, because the compulsory age of entry into primary school is 6 years in these countries (Adema *et al.* 2011, 124). In the United Kingdom the compulsory age of entry into primary school is 5 years. Here, expenditures on pre-primary education are calculated as the sum of total expenditures on pre-primary education and expenditures on primary education multiplied by the number of children aged 5 as a share of all children aged 5-11. There is no break in the time series for Finland, the Slovak Republic and Sweden. For the Slovak Republic this follows from the fact that expenditure data for these policies is available since 1999 only.

expenditures across countries or changes in the amount of expenditures within countries may reflect specific policy preferences, but may also be the result of different or changing demographic compositions and economic trends (Jensen 2011; De Deken 2014). Lastly, gross expenditure measures do not take account of differences in tax systems that affect the level of social expenditure and benefits received (Adema *et al* 2011; De Deken 2014).<sup>14</sup> Net social expenditure measures are included in the SOCX database, but only available biannually for a significantly smaller number of countries and substantially short time periods. Replacement rates might constitute a better measure in this respect. They are, however, only available for unemployment, sick pay, public pensions, and social assistance benefits (Van Vliet and Caminada 2012; Scruggs *et al.* 2014; Wang and Van Vliet 2016; OECD 2017a) and can thus not be used for social investment policies.

Notwithstanding these limitations of expenditure measures, it should be acknowledged that an important advantage of using (disaggregated) expenditure measures constitutes the fact that it provides a bird-eye overview that enables one to identify the diverse spending priorities of different welfare states (Castles 2008). Besides, unlike most of the programmes for which replacement rates are available, there is little variation in the institutional, non-financial characteristics of social investment policies like elderly care, childcare, and education. First, the benefits received through these policies by those eligible for them are usually independent of past earning and payments. Second, education programmes are likely to experience small cross-sectional variation in terms of entitlement as well due to universal access to primary and lower secondary schools. For such welfare programmes with little variation in benefit type and entitlement criteria, social expenditures might constitute an adequate measure after all (Jensen 2011).

Acknowledging the fact that social expenditures are related to the number of people in need of and eligible for benefits and services, expenditures on the policy programmes are adjusted by the number of targeted or potential beneficiaries, largely following Vandenbroucke and Vleminckx (2011; cf. Kangas and Palme 2007; Van Vliet and Wang 2015; Kuitto 2016). In the absence of the exact number of recipients, the study uses proxy

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<sup>14</sup> Except for Australia, Canada, Japan, Korea, Mexico, Turkey and the United States, net public social spending in OECD countries is significantly below the levels suggested by gross expenditure data. This is because most countries have significant taxes on social benefits. Accounting for both the tax system and the role of private social benefits reveals that net social spending levels are similar in countries often thought to have very different gross public social expenditure levels. Moving from gross public to net total social expenditure not only leads to greater similarity in spending levels across countries, but it also changes the ranking of countries in terms of their total social expenditures (Adema *et al.* 2011, 24-34).

variables.<sup>15</sup> Dividing total social expenditures on a particular social investment policy programme by the number of beneficiaries yields the amount of money allocated per individual. To account for differences in income across countries, this measure is next related to GDP per capita.

Expenditures on ECEC are divided by the number of children aged 0-5. Since the OECD no longer updates its population statistics the study relies on data available from the UN Department of Economic and Social Affairs (2017). UN DESA provides annual population numbers by five-year age groups as well as detailed, interpolated annual populations by single age, which allows for the computation of different age groups. Based on the average duration of maternity and parental leave across OECD countries (Gornick *et al.* 1997; Waldfogel 2001; Gornick and Meyers 2003; Ray *et al.* 2010), expenditures on family policies are divided by the number of children aged 0-1. Following Nickell (1997) expenditures on ALMPs are divided by the number of unemployed, available from the OECD's (2016a) annual Labour Force Survey data. Expenditures on primary, secondary and tertiary education are divided by the number of people aged 6-24. Since determining the number of disabled and incapacitated receiving rehabilitation and care services is deemed impossible, expenditures on care for the elderly and frail are expressed as expenditures per capita as a share of GDP per capita.

### **4.3 Control variables**

The analysis controls for a number of other factors that affect employment and labour market participation. Neoclassical economic thinking suggests several 'labour market rigidities', like employment protection, unions density, minimum wages, and taxation that impact on labour markets outcomes, for instance by raising the costs of labour above the level realised in a perfectly competitive market (e.g. Nickell 1997; Siebert 1997; Blanchard and Wolfers 2000; Nickel *et al.* 2005). Nevertheless, some of these labour market institutions have been considered to have positive effects on employment levels within institutionalist comparative political economy (e.g. Estevez-Abe *et al.* 2001; Huber and Stephens 2001; Iversen 2005).<sup>16</sup>

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<sup>15</sup> The OECD's Social Benefit Recipients Database (SOCR) presents internationally comparable information on the number of people receiving cash benefits. SOCR includes data for the main income replacement programmes such as unemployment, social assistance, disability and old-age. Since it focuses exclusively on cash benefits and covers the years 2007-2014 only for most OECD and EU countries, this study uses proxies instead.

<sup>16</sup> During the last few decades, institutions have also figured centrally as objects of study or possible explanatory factors that shape the behaviour of agents in other fields of study, such as sociology or organizational theory (e.g. DiMaggio and Powell 1991) and comparative politics (e.g. March and Olsen 1984; Thelen 1999; Pierson 2000).

Notably within literature on the ‘Varieties of Capitalism’, political and economic institutions are seen as factors that impact on, or account for, comparative advantages (e.g. Hall and Soskice 2001), economic performance (e.g. Bradley and Stephens 2007), wages (e.g. Soskice 1990; Iversen 1999), and the redistribution of income and welfare (e.g. Bradley *et al.* 2003; Iversen and Soskice 2006; Huo *et al.* 2008; Iversen and Soskice 2015). Rather than seeing institutions as (market) disturbing factors, this literature generally regards institutions as market correcting factors or factors that enhance the prospects or welfare of specific (groups of) entities.

This study includes six variables to account for labour market institutions: employment protection legislation, trade union density, the coordination of wage setting, the tax wedge, and the net replacement rates of unemployment benefits and social assistance and minimum income benefits. The lay-off costs associated with employment protection legislation (EPL) have been considered as a kind of government-imposed tax. The effect of such a tax on employment is ambiguous and strongly depends on the type of equilibrium model relied upon (Ljungqvist 2002). In general, EPL reduces cyclical adjustments in the labour market and slows down the reallocation of labour. When firing employees is expensive, firms are cautious about opening vacancies and hiring new workers during good economic times, because hiring essentially constitutes an irreversible decision as lay-offs are more difficult and costly during bad economic times (Bentolila and Bertola 1990; Bertola 1990). Since it is impossible to *a priori* rule whether the implications for either hiring or firing dominate, the overall effect of EPL is ambiguous. Yet, such reluctance to hire and fire has also been taken to create an insider-outsider divide on the labour market that affects who is employed rather than the level of employment (Esping-Andersen and Regini 2000; Lindbeck and Snower 2001). The study uses a summary indicator of EPL, based on a weighted average of employment protection on regular contracts and temporary contracts using version 1 of the OECD’s (2016d; 2016e) employment protection indicators.<sup>17</sup>

Trade union density and bargaining centralisation are often considered to have a negative effect on employment. According to the right-to-manage model of wage bargaining (Nickell and Andrews 1983), the stronger the bargaining power of unions, the higher the

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<sup>17</sup> The OECD employment protection indicators are compiled from 21 subcomponents that quantify the costs and procedures involved in dismissing individuals (or groups of workers) or hiring workers on fixed-term or temporary-work-agency contracts (OECD 2013, 74-75). Version 1 does not include a mark-up associated with collective dismissals for employment protection on regular contracts. It should be noted that this mark-up applies to a subset of the countries included in the OECD employment protection data only (OECD 2013). The OECD no longer compiles an overall summary index of the strictness of EPL, but it was obtained as a weighted average of EPL for regular contracts and temporary contracts with weights 7/12 and 5/12 (OECD 2013, 74-75).



mark-up they will impose on the reservation wage, creating a wedge between labour supply and demand that leads to lower employment levels than in a perfectly competitive labour market. According to efficient contracts models of wage bargaining (McDonald and Solow 1981; Ashenfelter and Brown 1986; MaCurdy and Pencavel 1986) trade unions and employers' organisations bargain over both wages and employment, leading to both higher employment and wages than in a perfectly competitive labour market and attained through the right-to-manage model. Efficient bargaining is, however, only possible at decentralised bargaining levels. At the central level, the right-to-manage model is likely to apply. To control for the effects of trade union's power, the study uses data on trade union density – the percentage of employees that are trade union members – from the OECD (2016f). To capture the predominant level at which bargaining takes places, the study relies on data from the ICTWSS database (Visser 2016).<sup>18</sup>

The tax wedge, defined by the OECD as the ratio between the amount of taxes paid by an average single worker and the corresponding total labour cost for the employer, captures the extent to which tax on labour income discourages employment. The OECD provides data on the tax wedge for a large number of family situations in its Taxation database since 2000 only. The study therefore uses an alternative measure to capture the tax wedge: the amount of taxes paid by the average production worker as a share of his gross wage. Data on the average production worker's tax wedge is available for two family situations from Van Vliet and Caminada (2012): a single person without children that earns 100% of the average production wage and a two parent household with two children in which one of the parents earns 100% of the average production wage.

Unemployment benefits protect against the loss of wage income by providing an income transfer to smooth consumption in case job loss occurs. According to static and dynamic models of job search, higher benefit levels and longer entitlement duration are associated within increases in one's reservation wage that reduce job search intensity and improve the fallback option of workers, leading to selectivity in the acceptance of job offers – which diminishes over the spell of insured unemployment as the end of benefit entitlement

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<sup>18</sup> This variable distinguishes between five levels whereby higher levels involve more central arrangements: (1) bargaining predominantly takes place at the local or company level, (2) intermediate or alternating between sector and company bargaining, (3) bargaining predominantly takes place at the sector or industry level, (4) intermediate or alternating between central and industry bargaining, and (5) bargaining predominantly takes place at central or cross-industry level with binding norms for lower level agreements (Visser 2015, 15). Note that it is different from the variable that captures the coordination of wage-setting, based on Hicks and Kenworthy (1998) and Kenworthy (2001, which is more an indicator of “the degree, rather than type, of coordination” (Visser 2015, 14).

nears – and higher wage claim at the bargaining table (Mortenson 1977; Moffit and Nicholson 1982; Van den Berg 1990). Nevertheless, unemployment benefits can also be deployed as a tool to preserve or invest in asset-specific skills that may increase labour productivity (Acemoglu and Shimer 2000) or the prospects of finding a job (Estevez-Abe, Iversen and Soskice 2001). This trade-off between consumption smoothing and investment, on the one hand, and disincentives, at the other hand, is at the heart of the design of unemployment benefits (Lipmann and McCall 1979; Shavell and Weiss 1979; Chetty 2008).

Numerous studies have investigated the relation between the generosity of unemployment benefits and labour market outcomes. Layard *et al.* (1991) found that countries with higher replacement rates and longer benefit duration tend to experience higher unemployment rates. More recent studies (Scarpetta 1996; Nickell 1997; Bassanini 2006) find comparable results. The number of studies using microeconomic data to investigate how unemployment benefits affect the exit rate from unemployment is plentiful (see for an overview for instance: Tatsiramos and Van Ours 2014). Meta-analyses that review early literature find that replacement rates have significant effects on the flow out of unemployment American and British studies, while most continental European studies find insignificant or weak effects (Aktinson and Micklewright 1991; Pedersen and Westergård-Nielsen 1993). Lots of studies have found spikes in job-finding rates just prior to benefit exhaustion (e.g. Moffit 1985; Katz and Meyer 1990; Meyer 1990; Vodopivec 1995; Carling *et al.* 1996; Røed and Zhang 2003; Lalive *et al.* 2006; Van Ours and Vodopivec 2006; Krueger and Mueller 2010; Caliendo *et al.* 2013) or positive relationships between benefit generosity and unemployment duration (Card and Levine 2000; Carling *et al.* 2001; Røed and Zhang 2003; 2004; Lalive *et al.* 2006; Card *et al.* 2007a; Lalive 2008; Uusitalo and Verho 2010; Schmieder *et al.* 2012a; Caliendo *et al.* 2013), suggesting that benefit generosity mainly affects the duration of unemployment rather than employment and unemployment levels in general. These findings need to be interpreted with caution, however. Apart from optimising behaviour of unemployed workers, who rationally assume that employers will accept delays in the starting date of a new job and therefore exploit unemployment benefits for subsidised leisure until they expire (Boone and Van Ours 2012), such spikes in job-finding rates can also be attributed to measurement error as cancellations from the unemployment register are mistakenly considered as job-finding (Aktinson and Micklewright 1991; Card *et al.* 2007b). Obviously, such cancellations from the unemployment register do affect the labour market participation rate.

Notwithstanding the disincentives for job search caused by unemployment benefits, literature on the ‘scar effects’ of unemployment spells on individual life courses suggests that high replacement rates reduce the scar effects of unemployment by allowing for recovery, resulting in better, longer and more employment over the longer run (DiPetre 2002; Gangl 2004). Gangl (2004) indeed demonstrates a positive effect of unemployment benefits on the quality and stability of future careers following unemployment spells. As regards the potential duration of benefit entitlement, studies using microeconomic data have obtained mixed results. Van Ours van Vodopivec (2008) found that a reduction in the potential benefit duration had no detectable effects on wages, the probability of securing a permanent rather than temporary job, or the duration of the post-unemployment job. Likewise, Lalive (2007) found that large benefit extensions indeed increase unemployment duration, but do not have an effect on the quality of the post-unemployment job as measured through earnings. Schmieder *et al.* (2012b), however, found that extensions of benefit entitlement slightly decline the incidence of new unemployment, whereas Tatsiramos (2009) concludes that despite increased unemployment duration unemployment benefits positively affect subsequent employment stability, resulting from improved job matching. Caliendo *et al.* (2013), nonetheless, find that men who find a job close to and just after benefit exhaustion experience less stable employment patterns and receive lower re-employment wages than those that found a job earlier.

Apart from a search effect, unemployment benefits have an entitlement effect as well. Entitlement to unemployment benefits is usually conditional on active job search. Insofar unemployment benefits increase the value of unemployment over the value of inactivity, they might induce more people to participate on the labour market (Boeri and Van Ours 2013). Since there are multiple possible effects related to unemployment benefits, the overall effect is ambiguous *a priori*.

In relation to unemployment benefits, social assistance and minimum income benefits are relevant as well. The exhaustion of eligibility for unemployment benefits generally results in the beginning of eligibility for social assistance or minimum income benefits (Hölsch and Kraus 2006). Such benefits are usually not conditional on employment or labour market participation (Gough *et al.* 1997). Relatively generous social assistance and minimum income benefits might therefore function as a substitute for unemployment benefits that lead to lower labour market participation rates. If these benefits are generous enough, they might even satisfy the reservation wages of some individuals, thereby negatively affecting employment

levels (Lemieux and Milligan 2008) irrespective of the availability and type of unemployment benefits.

To control for the effects of unemployment benefits and social assistance and minimum income benefits, the study uses net replacement rates from Van Vliet and Caminada (2012) and Wang and Van Vliet (2016). Both measures are the average of net replacement rates for the two family types described above.

A demographic variable is included as well. Since the age composition of the population plays a role in the number of people that are required to provide care and education, irrespective of whether this is through the labour market or informal channels, the study includes the percentage of the dependent population, i.e. those aged fifteen and younger and sixty-five and over, using UN DESA (2017) data. In addition, the study controls for the state of the economy, expressed as the level of real GDP per capita. Real GDP is measured in 2010 US Dollar. Data is retrieved from the OECD (2017b) National Accounts database.

Finally, this study also controls for the possible impact of globalisation. According to the Heckscher-Ohlin model of international trade states specialise in the production of commodities that rely on the factors of production for which they enjoy a comparative advantage. Through trade and foreign direct investment (FDI) states should therefore take advantage of the abundance of labour in other – usually developing – countries, thereby fuelling specialisation in labour-intensive industries in these countries. At the same time, trade and FDI may cause a crowding-out of domestic production, especially in formerly protected or upcoming industries (Lee and Vivarelli 2006), thereby for instance expanding employment in capital-intensive and knowledge-intensive industries in developed countries. Globalisation might in particular unleash competition that leads to job losses and falling wages among low-skilled workers in both industrialised and developing countries (Lee 1996; Spence 2011). The overall impact of trade and FDI on domestic employment is hence uncertain. This study controls for globalisation using two measures: trade openness and capital openness. The former is measured as the sum of imports and exports as a percentage of GDP using OECD (2017b) national accounts data. The latter is measured as the sum of inward and outward flows of FDI as a percentage of GDP using OECD (2017c) data.<sup>19</sup>

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<sup>19</sup> Due to the existence of the Belgo-Luxembourg Economic Union, data on FDI flows is not available for the individual states for the years 1985-2001. Instead, flows corresponding to the entire union are related to national GDP levels. As a result the individual country percentages are overestimated for these years.

#### **4.4 Case selection and data availability**

Since the European Union has been actively promoting the social investment approach for the modernisation of the welfare state since the mid-2000s (Ferrera 2016), the analysis focuses on EU member states specifically. According to Kvist (2015), the EU has even been the main agenda-setter and ‘discursive entrepreneur’ that linked social objective and programmes to the investment perspective. The countries included in the analysis are the EU-15 (except for Greece and Luxembourg) and the four Viségrad countries: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, the Slovak Republic, Spain, Sweden and the United Kingdom.<sup>20</sup>

The time interval for which data for all dependent, independent and control variables is available is 1990-2009. Countries do vary in their coverage however, yielding an unbalanced time-series cross-section of data. Since the OECD (2014a) Education and Training Database contains no detailed expenditure data by education level for the years 1992, 1993, 1996 and 1997 for most countries, the time series for ECEC policies and primary, secondary and tertiary education contain some missing values. Complete time series of expenditures on these policies are hence only available since 1997 or 1998.

#### **4.5 Method**

To examine the relationship between social investment policies and employment and labour market participation, pooled time-series cross-section regression analyses are conducted. According to Hicks (1994, 172; see also: Beck and Katz 1995) regressions analyses estimated from pooled data using ordinary least squares regression produce errors that are temporally autoregressive, cross-sectionally heteroskedastic, and cross-sectionally correlated; conceal unit and period effects; and reflect some causal heterogeneity across space, time, or both.

To address the simultaneous spatial correlation of the errors and panel heteroscedasticity, the study uses panel-corrected standard-errors as suggested by Beck and Katz (1995; 2011). To deal with autocorrelation of the errors, an AR(1) component is included in the model. This analysis technique, known as the estimation of Prais-Winsten regressions, was preferred to the incorporation of a lagged dependent variable as predictor, because the lagged dependent variable may obscure the relationship between the independent variables of substantive interest and the dependent variable by suppressing the power of other

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<sup>20</sup> Greece is not included since there is no data for minimum income replacement rates, because it does not have a nation-wide safety net (Nelson 2013). Luxembourg is not included because data about expenditures on education and EPL are available since 2008 only.

independent variables (Achen, 2000; Beck and Katz, 2004; 2011; Plümper *et al.* 2005; Keele and Kelly 2006).

The models include year and country dummies as suggested by Beck and Katz (1996) to address omitted variables bias or to address the cross-sectional issue of heterogeneity of the intercepts (Beck and Katz 2011). According to Beck (2001) such fixed effects do not use up large numbers of degrees of freedom with a reasonably large timespan, and are therefore, in principle, the appropriate way to estimate unit effects in time-series cross-sectional analyses. It should be noted that, as Plümper *et al.* (2005) have shown, the inclusion of such period and unit dummies does not only eliminate omitted variables bias, but also absorbs cross-sectional variance through unit dummies and time-series variance through period dummies. Specifically, these dummies eliminate any variation in the dependent variable which is due to time-invariant factors such as difference in constitutional structures, greatly reduce the coefficients of factors that vary mainly between countries, eliminate any differences in the dependent variable due to differences at  $t_1$  in the time series, and completely absorb differences in the level of the independent variables across the countries. Nevertheless, the focus of the estimated models is on variation *within* countries. The aim is to test whether increases in employment and labour market participation are associated with increases in expenditures on social investment policy programmes within countries, rather than analysing associations across countries. For that reason the use of such country and year dummies can be deemed appropriate to account for the fact that variation in employment and labour market participation may be related to unobserved country and year specific effects.

The models use a one year lag for all the independent and control variables, because it is assumed that policy changes need some time to take effect and reveal themselves. Moreover, the use of lags can be seen as solution for endogeneity and reversed causality. Nevertheless, the effect of expenditures on education on employment is unlikely to have such an immediate effect – even when using a one year lag. Since different individuals require different timespans to complete their education and reap the returns of this investment, the effect of investment in education is likely to play out over time. To model this, the study does not use yearly expenditures per student aged 6-24 as a share of GDP per capita, but follows Nelson and Stephens (2012) and rather uses cumulative average expenditures weighted by the number of students aged 6-24 and contrasted to GDP per capita. Cumulative average expenditures are calculated by dividing the sum of expenditures over period  $t$  by the number of years that constitute period  $t$ .

The regression models are based on the following equation:

$$Y_{it} = \alpha + \beta_k X_{k,it-1} + v_i + \lambda_t + \varepsilon \quad (3)$$

Here,  $Y$  is the dependent variable (i.e. the employment or labour market participation rate for the male, female or total population of a particular age group) in country  $i$  at time  $t$ . The intercept is captured by  $\alpha$ , whilst  $\beta_k$  refers to the coefficient for the independent variables  $X_k$  in country  $i$  at time  $t-1$ . To account for unobserved country ( $i$ ) and time ( $t$ ) effects, country- and year-specific effects are modelled through  $v$  and  $\lambda$  respectively. To correct for autocorrelation, the error term  $\varepsilon$  is allowed to follow an AR(1) process, which specifies that there is first order autocorrelation within the panels.

## 5. Results

### 5.1 Descriptive statistics

Following the availability of data for all the variables, the analysis focuses on the period 1990-2009. Data on the overall, male and female employment to population ratio and labour market participation rate are presented in Table 1. Notwithstanding slight changes during the period under consideration, employment to population ratios are particularly high in the Czech Republic and the Nordic countries. In these states approximately 80% or more of the people of prime working age were employed over the period 1990-2009. In contrast, less than or approximately 70% of the people of prime working age were employed in Ireland and Southern European states like Italy and Spain. Over time, the variation in overall employment ratios has decreased: states with traditionally high employment to population ratios experienced decreases or minor increases, states with traditionally low employment to population ratios experienced increases exclusively, and most of the remaining states experienced increases as well, leading to convergence of overall employment to population ratios in the seventeen states under study (cf. Van Rie and Marx 2012).

The increases experienced by individual states outweigh the decreases, resulting in a higher average employment level in 2009 than 1990. With 14.2 percentage points the increase was strongest in the Netherlands, which even had the highest overall employment to population ratio in 2009 with 85.4% of the people of prime working age being employed. This is rather peculiar given that back in 1990 the Netherlands had the lowest employment to population ratio (71.2%) after Ireland, Italy and Spain. Despite strong increases of 12.5 and 9.6 percentage points respectively over the period 1990-2009, Ireland and Spain still group among states with below-average employment to population rates like Italy and Hungary. Hungary and the Slovak Republic are the only states that had close to average employment to population ratios in 1990 but experienced decreases over the period 1990-2009.

When accounting for gender and zooming in on the male and female employment to population ratios, the data reveal that in 1990 male employment to population ratios were particularly high in predominantly social-democratic, corporatist states such as Austria, Finland, France, Italy, the Netherlands and Sweden, but also the Czech Republic and Portugal. In these states 89 to 94% of the male population of prime working age was employed. A notable exception to this group is Germany, which has oftentimes been regarded the prototype corporatist state (e.g. Arts and Gelissen 2002). Male employment rates were



**Table 1 Employment to population ratio and labour market participation rate (%), 1990-2009**

	Overall employment to population ratio				Male employment to population ratio				Female employment to population ratio				Overall labour market participation rate				Male labour market participation rate				Female labour market participation rate							
	1990	2000	2009	Change 1990-2009	1990	2000	2009	Change 1990-2009	1990	2000	2009	Change 1990-2009	1990	2000	2009	Change 1990-2009	1990	2000	2009	Change 1990-2009	1990	2000	2009	Change 1990-2009	1990	2000	2009	Change 1990-2009
Austria	79.8	82.5	82.9	3.1	90.4	91.4	87.4	-3.0	68.9	73.6	78.4	9.4	82.5	85.2	87.0	4.5	93.1	94.0	91.9	-1.2	71.6	76.3	82.1	10.4				
Belgium	71.7	77.4	79.8	8.0	88.5	87.3	85.7	-2.8	54.5	67.2	73.8	19.2	76.7	82.4	85.6	8.9	92.2	91.8	91.8	-0.4	60.8	72.7	79.2	18.4				
Czech Republic	86.3	81.6	82.5	-3.8	92.9	89.3	90.5	-2.4	79.7	73.7	74.1	-5.6	89.4	88.4	87.7	-1.7	95.3	94.9	95.1	-0.2	83.4	81.8	79.9	-3.5				
Denmark	84.0	84.2	84.7	0.7	87.4	88.5	86.9	-0.6	80.3	79.8	82.5	2.2	91.2	87.9	89.4	-1.9	94.5	91.7	92.2	-2.4	87.8	84.0	86.5	-1.3				
Finland	87.9	80.9	82.4	-5.5	90.6	84.1	84.4	-6.2	85.1	77.6	80.4	-4.7	89.7	87.9	88.2	-1.5	92.9	90.7	90.8	-2.2	86.4	85.0	85.7	-0.7				
France	77.3	78.4	82.1	4.8	90.1	87.3	87.7	-2.3	64.6	69.6	76.7	12.1	83.8	86.4	88.6	4.8	95.6	94.3	94.3	-1.2	72.2	78.6	83.1	10.9				
Germany	73.6	79.3	80.8	7.2	86.9	87.2	86.1	-0.8	59.6	71.2	75.4	15.8	77.1	85.3	87.2	10.0	90.2	93.4	93.2	3.0	63.4	76.9	81.0	17.6				
Hungary	75.7	73.0	72.9	-2.7	81.3	79.2	79.1	-2.2	70.2	66.9	66.9	-3.3	82.9	77.3	80.3	-2.7	89.9	84.4	87.1	-2.8	76.2	70.5	73.6	-2.6				
Ireland	60.0	75.5	72.5	12.5	80.9	88.4	78.0	-2.9	39.3	62.6	67.0	27.7	68.5	78.7	81.3	12.8	91.8	92.3	90.8	-1.1	45.4	65.1	71.8	26.3				
Italy	68.2	68.0	71.8	3.7	89.6	84.9	84.7	-4.9	47.1	50.9	59.1	12.1	73.9	74.3	77.2	3.3	94.1	90.6	90.0	-4.1	53.9	57.9	64.6	10.6				
Netherlands	71.2	81.0	85.4	14.2	89.2	91.4	91.4	2.2	52.4	70.3	79.3	26.9	76.3	83.1	87.9	11.6	93.4	93.2	94.0	0.6	58.5	72.7	81.8	23.4				
Poland	74.8	70.9	77.6	2.8	81.8	77.6	83.7	1.9	67.7	64.3	71.6	3.8	84.9	82.4	83.4	-1.6	91.5	88.3	89.4	-2.1	78.4	76.5	77.5	-0.9				
Portugal	77.4	81.8	79.7	2.2	92.0	90.0	84.7	-7.3	64.3	73.9	74.9	10.6	80.4	84.8	87.8	7.4	94.0	92.5	92.5	-1.5	68.0	77.3	83.3	15.2				
Slovak Republic	78.4	74.7	77.8	-0.6	85.1	79.6	84.2	-0.9	71.7	69.8	71.2	-0.5	88.0	88.4	87.2	-0.8	94.9	93.9	93.6	-1.4	81.1	82.9	80.8	-0.4				
Spain	61.4	68.4	71.0	9.6	85.7	85.6	77.3	-8.4	37.1	51.0	64.4	27.3	70.7	78.0	84.8	14.2	94.4	93.0	92.2	-2.2	46.9	62.8	77.2	30.3				
Sweden	91.6	83.8	84.4	-7.2	93.5	85.9	86.9	-6.6	89.6	81.7	81.9	-7.7	92.8	88.1	90.0	-2.8	94.7	90.5	92.8	-1.9	90.9	85.6	87.1	-3.8				
United Kingdom	79.1	80.2	79.8	0.7	89.5	87.4	85.4	-4.1	68.6	73.1	74.3	5.7	83.9	83.9	84.9	1.0	94.8	91.8	91.5	-3.3	73.0	76.2	78.5	5.5				
Mean	76.4	77.7	79.3	2.9	88.0	86.2	84.9	-3.0	64.7	69.3	73.6	8.9	81.9	83.7	85.8	3.9	93.4	91.9	91.9	-1.4	70.5	75.5	79.6	9.2				
Standard deviation	8.5	5.2	4.7	-3.8	3.9	4.1	3.9	0.0	15.1	8.5	6.4	-8.6	7.2	4.3	3.5	-3.7	1.7	2.5	2.0	0.2	13.9	7.9	5.7	-8.2				
Coefficient of variation	0.1	0.1	0.1	-0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1	-0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	-0.1				

Notes: For some countries data are around 1990: Austria and Slovak Republic 1990 refer to 1994, Czech Republic 1990 refers to 1993, and Hungary and Poland 1990 refer to 1992

Source: OECD Labour Force Statistics and own calculations

lowest among the other three countries from the Visegrád group, Ireland and Spain. Here, 80 to 85% of the male population of prime working age was employed in 1990.

Over time, male employment to population ratios have fallen in nearly all states. The largest decreases, comprising five percentage points or more, occurred in Finland, Italy, Portugal, Sweden – states that traditionally experienced high male employment to population ratios – and Spain, which already had a relatively low male employment to population ratio. This suggests that the weakest decreases are not necessarily reserved for those states that had the lowest employment to population ratios, nor that the strongest decreases occurred in states with the highest employment to population ratios. In percentage points Hungary and Ireland, for example, experienced decreases comparable to those in the Czech Republic and France.

The only two states where male employment to population ratios increased are the Netherlands and Poland. While this makes the Netherlands the state with the highest male employment to population ratio in 2009 with 91.4% of the men aged 24-54 being employed, the Polish employment to population ratio of 83.7% is still below average.

There was a lot of variation in female employment to population ratios across states in 1990. To illustrate, 89.6% of the women aged 24-54 were employed in Sweden – which is even higher than the male employment to population ratio in eleven of the seventeen states in 1990, whereas only 37.1% of the women aged 25-54 were employed in Spain. More generally, female employment to population ratios are highest in the Nordic countries with approximately 80 to 90% of the female population aged 25-54 being employed. Female employment to population ratios used to be far below-average in states such as Belgium, Ireland, Italy, the Netherlands and Spain, where only 35 to 55% of the female population was employed in 1990. Over time, these states – as well as France and Germany – experienced the strongest increases in the female employment to population ratio, comprising 12 to 28 percentage points. As of 2009, Hungary, Ireland, Italy and Spain constitute the group of states with the lowest female employment to population ratio. In these states less than approximately two thirds of the female population aged 25-54 is employed.

The only states where both male and female employment to population ratios increased over the period 1990-2009 are Poland and the Netherlands. While Poland underperforms in comparison to average employment levels across the seventeen states, the Dutch case is rather striking. Starting out as a below-average performer, the Netherlands stands out as the state with

possibly the best employment performance over the last two to three decades. This ‘Dutch miracle’ (Visser and Hemercijk 1997) or ‘Dutch jobs miracle’ (Pontusson 2005 – see, however: Van Oorschot 2002; Van Oorschot and Abrahamson 2003) is to a large extent the result of the rise of part-time employment (Plantenga 1996; Visser 2002), related to the adoption of what could be called a ‘dual earner-dual carer’ or ‘universal carer model’ (Pascall and Lewis 2004). In only five states both the male and female employment to population ratio decreased over the period 1990-2009. Three of these states, the Czech Republic, Finland, and Sweden, however still group among the states with the highest employment to population ratios. The other two states, Hungary and the Slovak Republic, started out with near to average employment to population ratios in 1990. As a result of the decreases they experienced they now constitute a distinct group of states with below-average employment to population ratios together with Poland. In terms of employment, the Czech Republic hence constitutes a positive exception to other states from the Visegrád group.

Concerning labour market participation rates, which differ from employment to population ratios by also including the unemployed in the numerator, a seemingly similar picture evolves: the states with the highest (lowest) overall labour market participation rates are also the states with the highest (lowest) overall employment to population ratio. In the Czech Republic and the Nordic countries roughly 90% of the population of prime working age participates on the labour market, whereas in Hungary, Ireland, Italy and Spain roughly 70% to 80% participates.

As with overall employment to population ratios the variation in overall labour market participation rates has decreased over the period 1990-2009, thus encompassing convergence. Although the seventeen states display both decreases and increases, the increases again outweigh the decreases, resulting in a higher average level of labour market participation in 2009 than in 1990. The strongest increases, comprising ten percent points or more, occurred in Germany, Ireland, the Netherlands, and Spain.<sup>21</sup> Despite these changes the Nordic countries still group among the states with the highest labour market participation rates, also including France in 2009. In spite of the increases it experienced, Ireland still ranks among the group of states with the lowest overall labour market participation rates, which also includes Hungary, Italy and Poland.

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<sup>21</sup> Unlike the increases in Ireland and the Netherlands, the increases in Germany and Spain went hand in hand with a substantial increase of the unemployment rate.

Over the period 1990-2009, the overall labour market participation rate is 5.5 to 6.5 percentage points higher than the overall employment to population ratio, suggesting that on average approximately 6% of the population of prime working age supplied labour but was unemployed. Based on the changes in the overall employment to population ratio and labour market participation rate over the period 1990-2009, unemployment seems to have increased in all states except for Denmark, France, Hungary, Italy, the Netherlands, Poland, and the Slovak Republic, whereby the combined decreases in unemployment and increases in employment for Denmark and the Netherlands stand out in particular. In addition to the Dutch (jobs) miracle, the Danish case has also been referred to as the ‘Danish employment miracle’ (Larsen 2002 – see, however: Schwarz 2001; Madsen 2002; Van Oorschot and Abrahamson 2003).

When accounting for gender and focusing on the male and female labour market participation rates, it turns out that the variation in the male labour market participation is relatively small. In 1990 Germany, Hungary, Ireland and Poland were the only states where less than 92% of the male population of prime working age was active on the labour market. Over the period 1990-2009 all states except for the Netherlands and Germany experienced decreases of 0.2 to 4.1 percentage points. With decreases of 3.3 and 4.1 percentage points respectively, the largest decreases occurred in the United Kingdom and Italy. As a result, in 2009 less than 92% of the male population of prime working age participated on the labour market in nine states, including Austria, Belgium, Finland, Hungary, Ireland, Italy, Poland and the United Kingdom. From these states, Finland, Hungary, Italy and Poland constitute the group of states with the lowest male labour market participation rates.

As with female employment to population ratios, there was a lot of variation in female labour market participation rates in 1990. To illustrate, 90.9% of the women aged 24-54 participated on the labour market in Sweden, whereas only 45.4% – i.e. half – of the women aged 25-54 were employed in Ireland. Female labour market participation rates are highest in the Nordic countries with approximately 85 to 90% of the female population aged 25-54 being active on the labour market over the period 1990-2009. Several states that belonged to the group of states with below-average female labour market participation rates in 1990 experienced strong increases. Due to increases of 15 to 25 percentage points, Belgium, Germany, the Netherlands and Portugal for instance find themselves amongst the group of states with above-average female labour market participation rates in 2009. Substantial increases also occurred in Austria, France,

Italy and – particularly – Ireland and Spain. Despite increases of 26 and 30 percentage points, Ireland (71.8%) and Spain (77.2%) still group among the states with below-average female labour market participation rates. The state with by far the lowest female labour market participation rate in 2009 is Italy with 64.6% of the female population of prime working age participating on the labour market, followed by Ireland and Hungary (73.6%).

From a more abstract point of view it seems that both employment to population ratios and labour market participation rates increased over the period 1990-2009, except in Nordic countries and most countries from the Visegrád group. It is worth noting that the overall increases mainly follow from increases in female employment and labour market participation, which outweigh the decreases in male employment and labour market participation observed in practically all countries.

Table 2 displays developments in the expenditures on different social investment policies, expressed as expenditures per potential beneficiary as a share of GDP per capita to allow for a more meaningful comparison. The data for early childhood education and care (ECEC) and family policies indicate that the Nordic countries are most generous in terms of the relative amount of money allocated per recipient for these policies. Not surprisingly, the Nordic welfare states have also been labelled as ‘gendered’ (Siim 1993), ‘women-friendly’ (Borchorst 1994), and ‘dual breadwinner societies’ (Ellingsæter 1998). Given that the Nordic countries are also the ones with the highest female employment to population ratios and labour market participation rates, this seems to suggest that policies aimed at ‘reconciling work and family’ are at least to some extent effective (cf. Adema and Whiteford 2007).

Over time, relative expenditures per recipient on ECEC and family policies have increased, albeit to different extents, in nearly all states. The Czech Republic, the Slovak Republic and Sweden are the only states where expenditures per recipient as a share of GDP per capita on ECEC decreased, whereas Austria, Finland and the Netherlands are the only states where expenditures per recipient as a share of GDP per capita on family policies decreased. This makes the Slovak Republic the least generous state with respect to expenditures on ECEC policies and groups the Czech Republic among the group of states with substantially below-average expenditures that further comprises predominantly Central and Southern European states such as the Czech Republic, Poland, Portugal, the Slovak Republic, Spain, but also Austria and

**Table 2 Public and (mandatory) private expenditures on social investment policies per recipient as a share of GDP per capita (%), 1990-2009**

	Expenditures on early childhood education and care per child aged 0-5 as a share of GDP per capita				Expenditures on family policies per child aged 0-1 as a share of GDP per capita				Expenditures on active labour market policies per unemployed as a share of GDP per capita				Expenditures on care for the elderly and frail per capita as a share of GDP per capita				Cumulative average expenditures on primary, secondary and tertiary educational institutions per student aged 6-24 as a share of GDP per capita			
	1990	2000	2009	Change	1990	2000	2009	Change	1990	2000	2009	Change	1990	2000	2009	Change	1990	2000	2009	Change
				1990-2009				1990-2009				1990-2009				1990-2009				
Austria	2.7	4.2	6.8	4.1	23.0	24.6	14.9	-8.1	21.5	30.4	30.5	9.0	0.1	0.5	0.9	0.8	17.0	16.5	15.9	-1.1
Belgium	5.2	7.2	9.4	4.2	9.7	13.1	17.1	7.4	37.8	28.0	21.2	-16.6	0.0	0.4	0.5	0.5	17.0	14.3	16.1	-1.0
Czech Republic	6.7	5.7	6.2	-0.5	16.9	35.7	47.5	30.6	6.7	4.1	8.1	1.4	0.0	0.5	0.2	0.2	14.6	11.4	12.9	-1.6
Denmark	16.4	17.9	18.3	1.9	38.3	38.1	47.2	8.9	15.6	74.8	48.5	32.9	2.7	2.6	3.2	0.4	20.0	17.9	17.7	-2.3
Finland	14.4	13.4	15.6	1.2	42.7	30.7	31.5	-11.2	51.9	17.6	21.0	-30.9	0.9	1.1	1.4	0.5	19.2	15.9	16.8	-2.4
France	13.5	16.0	15.7	2.2	12.0	15.2	14.6	2.5	17.8	26.0	24.6	6.8	0.5	0.2	0.4	-0.1	17.6	17.5	17.3	-0.3
Germany	3.0	5.8	8.6	5.6	12.2	13.5	18.5	6.3	41.9	33.2	24.8	-17.1	0.3	0.6	0.7	0.4	20.8	20.5	19.5	-1.3
Hungary	—	10.3	10.9	0.6	—	25.3	40.0	14.7	13.6	14.9	11.2	-2.3	—	0.4	0.6	0.2	19.1	11.2	12.3	-6.8
Ireland	4.1	2.6	4.9	0.8	3.9	7.7	15.9	12.0	21.3	37.2	13.6	-7.7	0.2	0.2	0.4	0.2	10.4	6.9	10.9	0.5
Italy	7.3	8.7	9.6	2.4	4.8	6.5	10.2	5.4	4.6	12.5	14.3	9.7	0.1	0.1	0.2	0.1	13.0	13.6	16.3	3.3
Netherlands	4.4	4.4	12.6	8.2	18.6	15.5	0.0	-18.6	34.8	86.0	56.6	21.8	0.5	0.8	1.2	0.7	18.1	14.2	13.9	-4.2
Poland	—	5.2	7.8	2.5	9.8	14.9	17.7	7.9	4.2	3.5	16.7	12.5	0.2	0.1	0.2	0.0	—	14.0	14.3	0.3
Portugal	1.1	4.5	6.5	5.4	3.4	6.0	16.2	12.7	20.1	30.4	15.2	-4.9	0.0	0.0	0.0	0.0	8.5	10.7	14.9	6.4
Slovak Republic	7.8	3.4	4.1	-3.7	24.3	32.3	26.1	1.8	7.8	3.4	4.1	-3.7	0.4	0.4	0.5	0.2	—	11.9	11.2	-0.7
Spain	4.3	7.7	8.5	4.2	3.6	9.5	18.7	15.1	11.9	12.7	9.3	-2.6	0.2	0.3	0.8	0.7	11.2	11.1	13.0	1.8
Sweden	25.1	15.4	21.7	-3.4	37.5	45.3	45.6	8.1	156.0	55.6	20.9	-135.2	1.8	3.3	3.9	2.0	16.4	15.6	16.0	-0.4
United Kingdom	3.5	8.9	10.8	7.3	3.3	6.5	15.1	11.8	15.1	8.2	10.2	-4.8	0.0	0.5	0.8	0.8	12.7	10.8	12.3	-0.3
Mean	8.0	8.3	10.5	2.5	16.5	20.0	23.3	6.8	28.4	28.1	20.6	-7.7	0.5	0.7	0.9	0.4	15.7	13.8	14.8	-0.9
Standard deviation	6.6	4.7	4.9	-1.7	13.3	12.5	14.1	0.8	35.6	24.2	13.9	-21.7	0.8	0.9	1.0	0.3	3.8	3.4	2.4	-1.3
Coefficient of variation	0.8	0.6	0.5	-0.4	0.8	0.6	0.6	-0.2	1.3	0.9	0.7	-0.6	1.5	1.2	1.1	-0.4	0.2	0.2	0.2	-0.1

*Notes:* For most countries there is a break in the time-series around 1997; For some countries data are around 1990 or 2000: Czech Republic 1990 refers to 1994; Hungary 2000 refers to 1999; Poland 2000 refers to 1997;

For some countries data are around 1990 or 2000: Hungary 2000 refers to 1999; Slovak Republic 1990 refers to 1995

For some countries data are around 1990: Austria and Slovak Republic 1990 refer to 1994; Czech Republic 1990 refers to 1993; Hungary and Poland 1990 refer to 1992;

For some countries data are around 1990 or 2000: Czech Republic 1990 refers to 1993; Hungary 2000 refers to 1999; Slovak Republic 1990 refers to 1995;

For most countries there is a break in the time-series around 1997; For some countries data are around 1990 or 2000: Czech Republic 1990 refers to 1994; Germany 1990 refers to 1995; Hungary 1990 refers to 1991; Poland 2000 refers to 1997; Slovak Republic 2000 refers to 1999; Data for Hungary ends in 2006

*Source:* OECD Social Expenditure Database and own calculations

OECD Social Expenditure Database and own calculations

OECD Social Expenditure Database and own calculations

OECD Social Expenditure Database and own calculations

OECD Education and Training Database and own calculations

Germany. Despite the decrease in relative expenditures Sweden is still the most generous state with respect to ECEC.

The decrease in expenditures per recipient on family policies in the Netherlands is particularly noteworthy. Whilst the Netherlands used to be a rather average spender on family policies until 2007, expenditures on maternity and parental leave and home-help and accommodation services following childbirth have fallen to null or practically null, making it the least generous state with respect to family policies. Nevertheless, expenditures per recipient relative to GDP on ECEC substantially increased simultaneously in the Netherlands, suggesting that expenditures on family policies might have been reallocated to another policy aimed at reconciling work and family. Due to this increase, the Netherlands ranks along the group of states with substantially above-average expenditures on ECEC per recipient as a share of GDP, which also includes Denmark, Finland, France and Sweden.

With respect to family policies, the Nordic countries and the Visegrád group except for Poland are the most generous as of 2009, spending more than 25% – and in the case of the Czech Republic, Denmark, Hungary and Sweden even 40% or more – of GDP per capita on family policies per child aged 0-1. The high ranking for the Czech Republic and Hungary are the result of 31 and 15 percentage point increases – the highest of all states together with Spain, which also realised a 15 percentage point increase in relative expenditures on family policies. Except for the Netherlands, all the remaining countries spent between 10 and 19% of GDP per capita on family policies per child aged 0-1 in 2009.

In 1990 states hugely differed in their expenditures on active labour market policies (ALMPs) per unemployed as a share of GDP. Whilst in the Czech Republic, Italy, Poland and the Slovak Republic expenditures on ALMPs per unemployed amounted to 4 to 8% of GDP per capita only, expenditures amounted to an astonishing 156% of GDP per capita in Sweden. Other countries with generous expenditures per unemployed relative to GDP per capita were predominantly social-democratic states such as Belgium, Finland, Germany and the Netherlands, which spent roughly 35 to 50% of GDP per capita on ALMPs per unemployed in 1990.

Over time, expenditures on ALMPs per unemployed as a share of GDP per capita have changed in all countries. The largest changes, those comprising 15 percentage points or more, occurred among the five most generous spenders of 1990 and Denmark. In Belgium, Finland, Germany and Sweden relative expenditures per unemployed decreased, whilst they increased in Denmark and the Netherlands. This makes Denmark and the Netherlands the states that by far spend most on ALMPs per unemployed as a share of GDP. Note that

Denmark and the Netherlands are the only countries that experienced decreases in unemployment and increases in employment over the period 1990-2009. Not surprisingly, the job miracles observed in these states have often been linked to the Danish and Dutch adoption of the ‘flexicurity’ model and its emphasis on activation (Auer 2002; Van Oorschot 2004; Viebrock and Clasen 2009). Apart from Denmark and the Netherlands, Austria, the Czech Republic, France, Italy and Poland are the only states where expenditures on ALMPs per unemployed as a share of GDP per capita increased over the period 1990-2009.

As of 2009 it seems possible to distinguish four groups of states with regard to the relative amount of expenditures on ALMPs per unemployed. The first group comprises Denmark and the Netherlands, followed by a group of slightly above-average spenders consisting of Austria, Belgium, Finland, France, Germany and the United Kingdom. The third group comprises Ireland, Italy, Poland and Portugal. With expenditures per unemployed amounting to approximately 15% of GDP per capita, these states are below-average spenders. This leaves the Czech Republic, Hungary, the Slovak Republic and Spain, which spend roughly between 4 and 11% of GDP per capita on ALMPs per unemployed.

Expenditures on care for the elderly and frail per capita as a share of GDP per capita increased in all states over the period 1990-2009. As with ECEC, the Nordic countries are by far the most generous states in terms of the expenditures on care for the elderly and frail per capita as a share of GDP per capita. According to Daly and Lewis (2000, 289) the Nordic countries “form a distinct group in this regard, tending to collectivize caring for both the elderly and children ... [they] are really the only countries to form something resembling a cluster in regard to care”. The only country to attain a rather similar level of spending – a welfare state that has been grouped among the Nordic welfare states by some (e.g. Esping-Andersen 1990) – is the Netherlands, which by 2009 spent 1.2% of GDP per capita on care for the elderly and frail per capita. In comparison: in 2009 Denmark, Finland and Sweden spent 3.2, 1.4 and 3.9% of GDP per capita respectively. Despite modest increases (except for France) over the period 1990-2009, Belgium, the Czech Republic, France, Hungary, Ireland, Italy, Poland, Portugal and the Slovak Republic still constitute the group of countries with the lowest expenditures on care for the elderly and frail per capita as a share of GDP per capita in 2009, spending less than 0.7% of GDP per capita.

Cumulative average expenditures on primary, secondary and tertiary educational institutions per student indicated relatively little variation in 1990. With the exception of some Central European, Southern European and Anglo-Saxon states, expenditures on educational institutions per student aged 6-24 were roughly between 17 and 20% of GDP per



capita. The most generous states, which spent 20% of GDP per capita or more on educational institutions per recipient, were Denmark and the Netherlands. Expenditures on educational institutions are the only expenditure figures that mainly indicate decreases over the period 1990-2009: in twelve out of the seventeen states expenditures per student aged 6-24 relative to GDP per capita decreased. With 6.8 and 4.2 percentage points respectively, the strongest decreases occurred in Hungary and the Netherlands. It is interesting to note that predominantly Southern European states display increases in expenditures per student, although the increase in Spain is rather modest. This makes the Czech Republic, Hungary, Ireland, the Slovak Republic, Spain and the United Kingdom the least generous states with respect to expenditures on primary, secondary and tertiary educational institutions in 2009. These states spent less than 13% of GDP per capita per student aged 6-24, whereas the most generous states – Denmark, Finland, France and Germany – spent at least 17% of GDP per capita in 2009.

Decreases in the standard deviation of expenditures on ECEC, ALMPs and primary, secondary and tertiary educational institutions indicate that there has been convergence of relative expenditures per recipient on these social investment policies across the seventeen states. In contrast, the dispersion of relative expenditures on family policies and care for the elderly and frail has slightly increased. Nevertheless, the coefficient of variation reveals that the dispersion, or variability, of expenditures on all the social investment policies has declined relative to the mean. In relative terms, there has hence been convergence of expenditures on social investment policies per potential beneficiary as a share of GDP per capita across the seventeen EU member states under consideration.

## **5.2 Regression analyses**

The descriptive statistics presented and discussed above indicate that for both the dependent and main independent variables there is variation with regard to their level as well as change over time. This variation is further examined using regression analyses on the seventeen EU member states over the period 1990-2009. The results are presented in Table 3. With respect to the five social investment policies used in the study, model 3.1 shows that expenditures on ECEC and AMLPs per recipient as a share of GDP per capita are positively and significantly related to employment. A one percentage point increase in expenditures on these policies results in 0.24 and 0.06 percentage point increases in employment respectively. Expenditures on care for the elderly and frail, and primary, secondary and tertiary educational institutions are negatively associated with employment. On percentage point increase in expenditures on

**Table 3 Prais-Winsten regressions with panel-corrected standard errors of employment, labour market participation and expenditures on social investment policies, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	3.1	3.2	3.3	3.4	3.5	3.6
Early childhood education and care <sub>t-1</sub>	0.24 *** (0.08)	0.14 * (0.08)	0.31 *** (0.11)	0.19 *** (0.06)	0.05 (0.03)	0.31 *** (0.10)
Family policies <sub>t-1</sub>	-0.01 (0.02)	-0.03 (0.02)	0.01 (0.03)	0.01 (0.01)	0.00 (0.01)	0.02 (0.02)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.04 *** (0.01)	0.07 *** (0.01)	0.01 (0.01)	-0.01 (0.01)	0.03 ** (0.01)
Care for the elderly and frail <sub>t-1</sub>	-1.19 * (0.71)	-0.35 (0.70)	-1.98 ** (0.95)	-1.29 ** (0.52)	-0.61 * (0.37)	-1.87 ** (0.88)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.50 *** (0.15)	-0.80 *** (0.16)	-0.24 (0.19)	0.22 *** (0.08)	0.00 (0.06)	0.41 *** (0.14)
Employment protection legislation <sub>t-1</sub>	-1.95 *** (0.60)	-0.95 * (0.52)	-2.39 *** (0.74)	-0.90 ** (0.39)	0.12 (0.23)	-1.72 *** (0.65)
Trade union density <sub>t-1</sub>	0.32 *** (0.05)	0.12 ** (0.05)	0.49 *** (0.07)	0.19 *** (0.03)	0.03 (0.02)	0.35 *** (0.06)
Bargaining level <sub>t-1</sub>	0.12 (0.13)	0.18 (0.12)	0.01 (0.17)	0.03 (0.10)	0.15 ** (0.06)	-0.09 (0.16)
Tax wedge <sub>t-1</sub>	-0.13 *** (0.05)	-0.08 * (0.05)	-0.15 ** (0.06)	-0.05 (0.03)	-0.04 ** (0.02)	-0.07 (0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.04 * (0.02)	0.04 ** (0.02)	0.03 (0.03)	-0.05 *** (0.02)	-0.04 *** (0.01)	-0.06 ** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.01 (0.02)	-0.02 (0.02)	0.07 ** (0.03)	0.03 ** (0.02)	-0.00 (0.01)	0.07 *** (0.03)
Dependent population <sub>t-1</sub>	-0.90 *** (0.20)	-0.74 *** (0.21)	-0.91 *** (0.27)	-0.15 (0.12)	0.06 (0.07)	-0.32 (0.21)
Real GDP per capita <sub>t-1</sub>	0.28 *** (0.09)	0.05 (0.10)	0.52 *** (0.11)	0.34 *** (0.05)	0.04 (0.03)	0.60 *** (0.09)
Trade openness <sub>t-1</sub>	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.00)	-0.01 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	100.40 *** (8.94)	123.66 *** (9.20)	71.57 *** (11.74)	73.07 *** (5.43)	93.37 *** (3.14)	52.41 *** (9.62)
Number of observations	244	244	244	244	244	244
Rho	0.55	0.61	0.65	0.62	0.47	0.67
Adjusted R-squared	0.989	0.992	0.978	0.995	0.998	0.984

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

these policies lead to 1.19 and 0.50 percentage point decreases in employment respectively. No statistically significant effect is found for expenditures on family policies per child aged 0-1 as a share of GDP per capita. These results suggest that only two out of the five social investment policies are capable of raising employment levels.

The negative coefficients for care for the elderly and frail and educational institutions are surprising, because they are in the opposite direction of what was expected and, moreover, seem to be rather strong in comparison to the coefficients obtained for the other

social investment policies. Regarding the former it may be the case that relatively high expenditures are the result of relatively low employment to population ratios, instead of relatively high expenditures causing low employment to population ratios. Unlike the other social investment policies, expenditures on care for the elderly and frail are not weighted by the potential number of recipients, but the entire population, because it was deemed impossible to estimate, or find an adequate proxy for, the number of (partly) incapacitated per country. Relatively high expenditures per capita as a share of GDP per capita on this policy field could therefore be the result of two factors: states might prioritise expenditures on this policy relative to other policies, or there might be a relatively large group of beneficiaries not accounted for by the weighting method. The latter factor might account for the reversed causal relationship suggested above. Such a relationship is nevertheless only likely to hold if expenditures for the frail constitute a major share of total expenditures on care for the elderly and frail, because expenditures on residential care and home-help services for the elderly are simply unlikely to accrue to the population aged 25-54.

A closer inspection of the data reveals that over the period 1990-2009 expenditures on residential care, home-help services, and rehabilitation services for the sick and (partly) incapacitated accounted for approximately half (49.3%) of the total expenditures on care for the elderly and frail. In a time of ageing populations, the number of sick and (partly) incapacitated can be expected to be smaller than the number of people of old age. This can therefore be considered a substantial share and might thus explain the negative association. In the light of this potential explanation it is, however, striking that the effect is particularly strong – and moreover only statistically significant – for the female population as indicated by models 3.2 and 3.3.

As regards the negative coefficient for expenditures on primary, secondary, and tertiary educational institutions a similar explanation might seem tentative. A relatively large share of students may not have finished education by the age of 25, explaining why expenditures on education – tertiary education in particular, which on average accounts for 26.3% of the total expenditures on primary, secondary and tertiary educational institutions – are negatively related to the employment to population ratio. Instead of higher expenditures causing relatively low employment, it may be that higher expenditures follow because of relatively high educational attainment (and thus relatively low employment) amongst those aged 25-54. This can, however, not explain why this variable displays a positive and statistically significant coefficient in model 3.4, which uses the labour market participation rate as the dependent variable. In combination with the negative effect obtained in model 3.1,

this would then suggest that expenditures on educational institutions mainly affect the number of unemployed as a share of the entire labour force or, more generally, the supply of labour. More problematically, the suggested explanation is also not capable of explaining why higher expenditures *per student* as a share of GDP – instead of higher overall expenditures – are negatively associated with employment.<sup>22</sup>

Subsequently, separate models were estimated for the employment to population ratio of the male and female population aged 25-54 respectively. The results obtained for these models indicate that the positive correlation of ECEC and employment is stronger for women: a one percentage point increase in expenditures on ECEC as a share of GDP per capita is associated with a 0.14 percentage point increase in male employment, whereas it results in a 0.31 percentage point increase in female employment. This corroborates with the expectation specified in the theoretical section, namely that women are generally the ones taking care of children and therefore particularly likely to be affected by expenditures on ECEC. Models 3.2 and 3.3 further indicate that the positive effect of ALMPs is stronger for women, which also corroborates with the specified expectation. Interestingly, the unexpected, negative relation between expenditures on primary, secondary and tertiary educational institutions and employment is only statistically significant for the male population.

The negative association between care for the elderly and frail and employment is only statistically significant for the female population. A one percentage point increase in expenditures on this policy per capita as a share of GDP per capita is associated with a decrease in female employment of as much as 1.98 percentage points. This finding questions the validity of the explanation suggested above. If high expenditures on care for the elderly and frail per capita as a share of GDP per capita are associated with relatively low employment to population ratios due to the presence of a relatively large group of sick or (partly) incapacitated people, there seems to be no reason to expect this group to be larger amongst the female population. It therefore seems that there are other mechanisms at stake. Contrary to findings from previous research (Stone and Short 1990; Wolf and Soldo 1994; Ettner 1995; 1996; Johnson and Lo Sasso 2006), the findings might suggest that in the presence of a relatively large group of elderly and frail women do quit employment to

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<sup>22</sup> An additional robustness check (not presented here) which uses one-year lagged cumulative average expenditures on primary and secondary educational institutions per student aged 6-19 indicates that the obtained effects are maintained when focusing on primary and secondary educational institutions only. The statistically significant positive coefficients are, however, stronger in magnitude, whereas the statistically significant negative coefficients are weaker in magnitude. The findings presented in Table 3 do hence not seem to be disproportionately affected by focusing on primary, secondary *and* tertiary educational institutions. Still, it seems that the negative associations indeed follow from educational attainment at higher age.

provide care for these people. Since there might be two mechanisms operating at the same time, it is not clear whether this negative effect is partly offset by increases in the demand for and employment of women providing such care through market arrangements.

In terms of magnitude and direction the coefficients obtained for models 3.4-3.6, which use the labour market participation rate as the dependent variable, are much alike models 3.1-3.3. There are, however, some interesting dissimilarities. The most striking difference concerns ALMPs. While expenditures on ALMPs per unemployed as a share of GDP per capita have a consistently positive, statistically significant effect on the employment to population ratio, they have no statistically significant effect on the overall and male labour market participation rate. In combination with models 3.1-3.3, this suggests that ALMPs are successful in getting people (back) into employment, but are only partially successful at maintaining labour market participation, for they cannot avoid a substantial share of the unemployed becoming inactive.

In contrast to model 3.2, which indicates no statistically significant relationship between care for the elderly and frail and male employment, model 3.5 indicates that there is a statistically significant, negative association between care for the elderly and frail and male labour market participation. This may hint at the use of sickness and incapacity policies as a cover for, or alternative to, unemployment (e.g. Blöndal and Pearson 1995; Beatty and Fothergill 2002; Bell and Smith 2004; Baumberg 2014). As noted above, expenditures on primary, secondary and tertiary educational institutions are positively related to the overall labour market participation rate. It thus seems that education is capable of raising labour market participation. Nonetheless, models 3.5 and 3.6 indicate that this relation only holds for the female population. Further investigation seems necessary in order to establish why higher expenditures per student on educational institutions are negatively related to overall and male employment to population ratios, whereas they are positively related to overall and female labour market participation rates.

In order to better understand the magnitude of the effects found for the different social investment policies, the effect of a one standard deviation change on the dependent variables is displayed in Table 4. In comparison to the other social investment policies (as well as most of the control variables) a one standard deviation change in expenditures per recipient on ECEC, ALMPs and primary, secondary and tertiary educational institutions has a relatively large effect on the overall employment to population ratio. The relatively strong effect found for these variables corresponds with previous findings (e.g. Nelson and Stephens 2012). Still, the effect of education is in the opposite direct of what was expected. When accounting for

gender, the effects of ECEC, ALMPs and care for the elderly and frail are particularly large for women, as was expected. A one standard deviation change in these variables is, on average, associated with an increase in female employment of approximately 1.7 percentage points. Nevertheless, the effect of care for the elderly and frail is in the opposite direction. For the male population the strong effect of expenditures on educational institutions stands out: a one standard deviation change in expenditures on educational institutions per student is associated with a decrease in male employment of 2.64 percentage points. Note that this effect is also in the opposite direction from what was expected.

**Table 4 Effect of one standard deviation change in social investment variables on the employment to population ratio and labour market participation rate**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
Mean	76.9	85.8	68.0	83.3	92.3	74.3
Standard deviation	6.9	4.2	11.8	5.7	2.1	11.1
	4.1	4.2	4.3	4.4	4.5	4.6
ECEC	1.30	0.74	1.68	1.01		1.68
Family policies						
ALMPs	1.25	0.82	1.59			0.61
Care elderly and frail	1.09		1.81	1.18	0.56	1.70
Educational institutions	1.66	2.64		0.73		1.35

With respect to the overall labour market participation rate, the effect is relatively large for expenditures per recipient on ECEC and care for the elderly and frail. When controlling for gender it turns out that the effects of all social investment policies on the labour market participation rate are again particularly large for women. However, it should be noted that the standard deviations of the female employment to population ratio and labour market participation rate are also substantially larger than those of the male population. Since male employment and labour market participation are less dispersed, there is less variation to explain. One could, on average, therefore expect smaller effect sizes than for female employment and labour market participation to begin with.

Although essentially the same holds with regard to findings for the male and overall population, it should in addition be stressed that the displayed effect sizes are averages; they might be influenced by relatively strong effects confined to only a few countries from the time-series cross-section of data. Note from the discussion of the descriptive statistics that a few states in particular experienced strong increases in female employment and labour market

participation, while data for the male population presented a much more uniform picture. One should hence be cautious in comparing effect sizes across models.

The control variables incorporated in models 3.1-3.6 present a relatively consistent pattern. For the variables related to labour market institutions mixed – and at times somewhat controversial – results have been obtained. EPL is negatively related to both the employment to population ratio and labour market participation rate. This suggests that the increased lay-off costs associated with stronger EPL either affect the surplus of firms to such an extent that they are less able to finance vacancy costs and hire new workers (e.g. Saint-Paul 1995) or affect the surplus of workers to such an extent – i.e. lower their returns to work – that they substitute work for leisure and become inactive (e.g. Hopenhayn and Rogerson 1993; Ljungqvist 2002). Trade union density is positively associated with employment and labour market participation. This contradicts theoretical expectations: the right-to-manage model assumes lower employment levels with stronger union power, whereas the efficient contracts model does assume higher employment levels, but at decentralized levels only. Although some have accused trade unions of predominantly representing the interests of male blue-collar workers (Lawrence 1994; Ledwith and Colgan 2002), the magnitude of the relationship between trade union density and female employment and labour market participation suggests otherwise. As expected, the tax wedge is negatively associated with both employment and labour market participation in nearly all models.

It is further interesting to note that the net replacement rate of unemployment benefits is positively related to employment, whereas it negatively correlates with labour market participation. This suggests, on the one hand, that generous unemployment benefits may indeed reduce the scar effects of unemployment and lead to higher employment over the longer run (DiPetre 2002; Gangl 2004) and, on the other hand, that unemployment benefits do not raise the value of unemployment over inactivity but rather induce unemployed people to become inactive. Since the 1970s states have become stricter with regard to job-search requirements and possible sanctions for the unemployed (Knotz 2016). Such nonfinancial characteristics of unemployment benefits are not captured by the replacement rate but do negatively affect the value of unemployment over inactivity and might hence explain why such a negative participation effect is observed over the period 1900-2009. Contrary to what was expected, the net replacement rate of minimum income and social assistance benefits is positively related to female employment and labour market participation. This is surprising since entitlement for these benefits is usually not conditional on labour market activity (Gough *et al.* 1997).

Negative coefficients are obtained for the demographic variable, the dependent population, in relation to the employment to population ratios, whereas no statistically significant coefficients are found in relation to the labour market participation rates. Considering that the dependent population needs to be cared for, this suggests that care is mainly provided through non-market arrangements by people that for that reason decide to leave the labour market. As one would expect, the negative association is stronger for the female population. Economic growth, or upward movement of the business cycle, is associated with increases in both overall and female employment and labour market participation. Lastly, the regression analyses yield no significant effects for the variables capturing globalisation.<sup>23</sup>

### 5.3 Robustness checks

Next, a number of additional analyses are performed to test the robustness of the presented results. In total, five types of robustness checks are conducted. First, the analysis is performed over a shorter timeframe, 1997-2009, to account for the break in the time-series of variables related to education for some states as a result of the implementation of the ISCED 1997 classification. The results are presented in Table 5.

Using the shorter time-series to estimate the employment to population ratios only slightly affects the coefficients obtained for the two variables known to contain a break in the time-series. While the models still indicate positive coefficients for the relation between ECEC and both employment and labour market participation, the coefficient is no longer

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<sup>23</sup> To test whether the models suffer from multicollinearity additional models (not reported here) have been estimated whereby one of the social investment policies is left out at a time. Leaving out expenditures on ECEC only affects the confidence interval of the coefficients obtained for the association between employment and care for the elderly and frail, resulting in lower significance levels or even insignificant coefficients. This may not be very surprising, given that expenditures on ECEC and care for the elderly and frail are strongly correlated ( $r = 0.76$ ;  $p < 0.01$ ), which – moreover – suggests that there are distinct regimes with respect to care in general (cf. Anttonen and Sipilä 1996; Daly and Lewis 2000; Bettio and Plantenga 2004). Statistically significant positive associations between expenditures on ALMPs and overall labour market participation are found when leaving out one of the variables related to care. Likewise, leaving out expenditures on ALMPs strongly affects the magnitude of the coefficients obtained for the variables related to care – particularly expenditures on care for the elderly and frail, which also obtains higher significance levels. These finding may be somewhat surprising given that expenditures on ECEC ( $r = 0.40$ ;  $p < 0.01$ ) and expenditures on care for the elderly and frail ( $r = 0.51$ ;  $p < 0.01$ ) are only moderately correlated to expenditures on ALMPs. Last, it is worthwhile noting that statistically significant, negative associations are found between expenditures on family policies and both overall and male employment when leaving out expenditures on educational institutions. Overall, these minor differences suggest that the results obtained in the different models are not biased as a result of multicollinearity. The same strategy was applied to the net replacement rates of unemployment benefits and net replacement rates of minimum income and social assistance benefits as well as trade openness and capital openness, resulting in similar conclusions.



**Table 5 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies, 1997-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	5.1	5.2	5.3	5.4	5.5	5.6
Early childhood education and care <sub>t-1</sub>	0.32 *** (0.12)	0.41 *** (0.13)	0.16 (0.14)	0.08 * (0.04)	0.08 (0.05)	0.10 (0.07)
Family policies <sub>t-1</sub>	0.01 (0.02)	0.01 (0.02)	0.00 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.02)
Active labour market policies <sub>t-1</sub>	0.05 *** (0.02)	0.04 ** (0.02)	0.06 *** (0.01)	-0.00 (0.01)	-0.01 (0.01)	0.00 (0.01)
Care for the elderly and frail <sub>t-1</sub>	-2.65 ** (1.08)	-3.81 *** (1.20)	-1.39 (1.01)	-0.21 (0.45)	-0.98 ** (0.49)	0.57 (0.66)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.82 *** (0.19)	-1.07 *** (0.21)	-0.56 *** (0.20)	0.10 (0.09)	-0.01 (0.09)	0.20 * (0.12)
Employment protection legislation <sub>t-1</sub>	0.26 (0.71)	1.01 (0.70)	-0.54 (0.88)	-1.03 ** (0.44)	0.21 (0.38)	-2.36 *** (0.66)
Trade union density <sub>t-1</sub>	0.16 ** (0.07)	-0.05 (0.06)	0.33 *** (0.09)	0.22 *** (0.03)	0.03 (0.03)	0.42 *** (0.06)
Bargaining level <sub>t-1</sub>	0.31 *** (0.12)	0.55 *** (0.16)	0.00 (0.13)	0.05 (0.09)	0.19 *** (0.07)	-0.10 (0.14)
Tax wedge <sub>t-1</sub>	-0.01 (0.06)	-0.06 (0.06)	0.01 (0.08)	0.07 ** (0.03)	-0.03 (0.03)	0.15 *** (0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.04 (0.03)	0.07 ** (0.04)	-0.00 (0.03)	-0.11 *** (0.02)	-0.06 *** (0.02)	-0.15 *** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.03 (0.02)	-0.01 (0.02)	0.08 *** (0.03)	0.05 *** (0.01)	0.01 (0.01)	0.08 *** (0.02)
Dependent population <sub>t-1</sub>	-0.59 *** (0.22)	-1.05 *** (0.22)	-0.14 (0.29)	0.17 (0.11)	-0.11 (0.10)	0.47 *** (0.18)
Real GDP per capita <sub>t-1</sub>	0.07 (0.11)	-0.19 (0.12)	0.30 ** (0.12)	0.30 *** (0.05)	0.00 (0.04)	0.58 *** (0.08)
Trade openness <sub>t-1</sub>	0.01 (0.01)	0.02 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.01)	-0.02 * (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.00)	0.00 (0.00)	-0.01 ** (0.00)	-0.01 * (0.00)	-0.00 (0.00)	-0.01 ** (0.00)
Constant	103.37 *** (13.90)	144.80 *** (12.63)	65.41 *** (16.92)	66.00 *** (6.90)	98.32 *** (5.67)	33.21 ** (10.44)
Number of observations	192	192	192	192	192	192
Rho	0.44	0.48	0.55	0.39	0.35	0.38
Adjusted R-squared	0.984	0.983	0.981	0.994	0.996	0.981

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

statistically significant for to the female population. The negative association between cumulative average expenditures on primary, secondary and tertiary educational institutions and employment again prevails, but is stronger and statistically significant in all three models. The positive association between these expenditures and labour market participation is now also statistically significant for the overall population.

In addition, the effect of ALMPs on female labour market participation is no longer statistically significant. Further, care for the elderly and frail is no longer significantly related

to female employment as well as overall and female labour market participation. Instead, a statistically significant negative coefficient is found in relation to male employment. It hence seems that higher expenditures on care for the elderly and frail negatively affect male employment and labour market participation whilst no statistically significant effect is found for the female population. This may suggest that any negative effects for the female population are offset by increases in the number of women employed to provide such care.

The most substantial further differences concern EPL and the tax wedge, which are no longer significantly related to employment. In addition the negative coefficient of the dependent population on female employment is no longer statistically significant, whereas a statistically significant, positive association is found between the dependent population and female labour market participation. This suggests that as the share of the dependent population increases, the female supply of labour increases – presumably in order to provide care for this population through market arrangements. Lastly, capital openness is found to be negatively related to both female employment and labour market participation, whereas trade openness is also negatively related to female labour market participation. This suggests that feminine jobs, which often involve atypical forms of employment and generally relate to low-skilled jobs (De Grip *et al.* 1997), might be vulnerable to globalisation.

Second, the regression analyses are repeated using slightly different operationalisations of the independent variables. To examine the role of (mandatory) private expenditures, the original models are first estimated using only public expenditures on the social investment policies. This yields the results presented in Table 6. Since expenditures by funding source and education level are available from the OECD Education and Training database (2014b) since 1997 only, these models apply to the period 1997-2009. They can therefore not directly be contrasted to the models presented in Table 4, but can be contrasted to the models presented in Table 5 instead.

Most of the results presented in Table 6 are practically identical to those presented in Table 5. The variables that seem to be substantially affected by using only public expenditures to capture expenditures on the different social investment policies are variables related to care. ECEC is no longer significantly related to labour market participation, whereas care for the elderly and frail and the dependent population are no longer significantly related to employment. Instead, care for the elderly and frail is now positively and significantly related to the female labour market participation rate, which further reinforces the expectation that despite possibly negative effects of expenditures on this policy field on

**Table 6 Prais-Winsten regressions of employment, labour market participation and public expenditures on social investment policies, 1997-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	6.1	6.2	6.3	6.4	6.5	6.6
<i>Early childhood education and care</i> <sub>t-1</sub>	0.27 ** (0.12)	0.37 *** (0.14)	0.19 (0.12)	0.07 (0.05)	0.07 (0.04)	0.07 (0.08)
<i>Family policies</i> <sub>t-1</sub>	-0.03 * (0.02)	-0.02 (0.02)	-0.03 * (0.02)	0.00 (0.01)	0.02 (0.01)	-0.02 (0.02)
<i>Active labour market policies</i> <sub>t-1</sub>	0.05 *** (0.01)	0.04 *** (0.02)	0.06 *** (0.01)	0.00 (0.01)	-0.01 (0.01)	0.02 (0.01)
<i>Care for the elderly and frail</i> <sub>t-1</sub>	-1.18 (1.08)	-2.28 (1.39)	-0.34 (0.97)	0.30 (0.52)	-0.76 ** (0.42)	1.50 * (0.86)
<i>Primary, secondary, and tertiary educational institutions</i> <sub>t-1</sub>	-0.52 ** (0.21)	-0.92 *** (0.26)	-0.14 (0.21)	0.23 ** (0.10)	0.01 (0.08)	0.46 *** (0.15)
Employment protection legislation <sub>t-1</sub>	0.31 (0.64)	0.98 (0.75)	-0.26 (0.71)	-0.96 ** (0.38)	0.13 (0.34)	-2.23 *** (0.60)
Trade union density <sub>t-1</sub>	0.19 *** (0.06)	-0.01 (0.07)	0.35 *** (0.08)	0.19 (0.04)	0.01 (0.02)	0.39 *** (0.07)
Bargaining level <sub>t-1</sub>	0.26 * (0.13)	0.46 ** (0.21)	0.02 (0.12)	0.04 (0.09)	0.23 *** (0.07)	-0.12 (0.18)
Tax wedge <sub>t-1</sub>	-0.10 * (0.06)	-0.11 (0.07)	-0.09 (0.06)	0.01 (0.02)	-0.04 * (0.02)	0.06 (0.04)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.04 (0.03)	0.08 ** (0.03)	0.01 (0.03)	-0.10 *** (0.02)	-0.06 *** (0.02)	-0.15 *** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	-0.00 (0.02)	-0.04 (0.03)	0.04 (0.03)	0.04 *** (0.01)	0.01 (0.01)	0.07 *** (0.02)
Dependent population <sub>t-1</sub>	0.01 (0.21)	-0.33 (0.23)	0.38 (0.27)	0.31 *** (0.11)	-0.03 (0.08)	0.65 *** (0.19)
Real GDP per capita <sub>t-1</sub>	0.18 (0.12)	-0.06 (0.16)	0.40 *** (0.11)	0.31 *** (0.04)	0.01 (0.03)	0.59 *** (0.08)
Trade openness <sub>t-1</sub>	0.01 (0.01)	0.03 (0.02)	0.00 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.02 (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	73.77 *** (11.94)	114.31 *** (13.57)	33.53 ** (13.75)	58.49 *** (5.33)	95.02 *** (4.03)	21.30 ** (9.23)
Number of observations	218	218	218	218	218	218
Rho	0.56	0.56	0.64	0.45	0.39	0.42
Adjusted R-squared	0.987	0.985	0.942	0.995	0.996	0.982

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies concern public expenditures only and are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the Netherlands is the only country for which data are available since 1995  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

employment and labour market participation, such expenditures fuel the supply of women willing to provide such care through market arrangements.

The statistically significant coefficients obtained for expenditures on primary, secondary and tertiary educational institutions further substantiate the observation that these expenditures seem to have a negative effect on male employment, but raise the female supply of labour. Besides, a statistically significant, negative association between expenditures on

family policies and female employment is found. This finding can be interpreted in multiple ways. On the one hand, it may be that generous expenditures on family policies are also associated with longer periods of maternity and parental leave, thereby lowering attachment to the labour market and resulting in exit for some. On the other hand, it could be that leave arrangements make female employees less attractive for employers than their male counterparts (Shalev 2008; Mandel and Shalev 2009).

Yet, the effect may also follow from neglecting mandatory private expenditures on family policies. Whilst public expenditures are in fact an unconditional transfer that might lower the incentive to return to work, mandatory private expenditure on family policies by employers could be seen as essentially conditional, for they are only paid in case one returns to work. In two out of the seventeen countries family policies were to a large extent financed by employers over the period 1997-2009.<sup>24</sup> Although it is questionable whether the overall effect of a variable can be altered by changes in its values for two out of seventeen states only, this might potentially explain the negative effect for expenditures on family policies when neglecting mandatory private expenditures. Lastly, the coefficients capturing globalisation no longer display statistically significant effects, thereby questioning the validity of the relationship found in the previous models.

Next, the analyses are conducted using public expenditures on education instead of educational institutions. This also includes other expenditures related to education such as financial aid to students, scholarships and other grants to students and households, student loans, and subsidised expenditures for student living expenditures.<sup>25</sup> Using public expenditures on education yields results (see Supplementary Table S1) that are nearly identical to those presented in Table 6. Apart from affecting the confidence intervals of some control variables, rendering them just statistically significant or insignificant, most of the predictors for the employment to population ratio are unaffected. The negative association between expenditure on primary, secondary and tertiary education is now only statistically significant for the male population. Yet, the effect is weaker, suggesting that – on top of

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<sup>24</sup> In Germany mandatory private expenditures on family policies accounted for approximately 25% of the total expenditures on family policies, whereas in the Slovak Republic mandatory private expenditures constituted nearly 10% of total expenditures over the period 1997-2009.

<sup>25</sup> Since data on these expenditures are also only available since 1997, these models apply to the period 1997-2009 as well. Ideally, the original models presented in Table 3 would be estimated again using total expenditures on primary, secondary and tertiary education. Due to substantial numbers of missing data for private expenditures and expenditures from international agencies and other foreign sources, this would however reduce the number of cases from 244 to 159 (instead of 218) cases and entirely exclude the Netherlands, Poland and Portugal. This was considered undesirable. Therefore the previous models presented in Table 6, which also used only public expenditures, were again estimated. This yields the same number of cases and hence allows for direct comparison.

public expenditures on educational institutions – financial aid to students, scholarships and other grants to students and households, student loans, and subsidised expenditures for student living expenditures from public sources better facilitate investment in human capital than public expenditures on educational institutions exclusively. Still, the effect is in the opposite direction of what was expected.<sup>26</sup> In addition to the statistically significant association between family policies and female employment, family policies are now also negatively related to overall and male employment. This seems to suggest that family policies in general reduce employment, probably because they induce people to quit employment.

The coefficients of the predictors of labour market participation are also hardly affected by using public expenditures on education instead of educational institutions only. The correlation with overall labour market participation is no longer statistically significant, whereas it is significant for the male population. Nevertheless, this still aligns with the conclusion that expenditures on primary, secondary and tertiary education(al institutions) have a negative effect on male employment, but raise the female supply of labour. Apart from raising employment, the models indicate that more generous expenditures on ECEC are also associated with more supply of labour. The positive relation between care for the elderly and frail and female labour market participation is no longer statistically significant, whereas a statistically significant, positive association between family policies and male labour market participation is found. In combination with the correlations obtained in relation to the employment to population ratios, this suggests that family policies lead some women to exit the labour market, whereas in the case of men they result in increases of unemployment rather than exit.

In order to further examine the coefficients obtained for expenditures on primary, secondary and tertiary educational institutions, the original models are next estimated using separate variables for the three levels of education (see Supplementary Table S2). The models seem to confirm the expectation that the negative coefficients obtained in Table 3 mainly follow from continued educational attainment after the age of 24.<sup>27</sup> Statistically significant

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<sup>26</sup> An additional robustness check (not presented here) in which one-year lagged expenditures on primary, secondary and tertiary educational institutions per student aged 6-24 (following the same rationale as the other social investment policies) are used instead of one-year lagged cumulative average expenditures per student aged 6-24 indicates that the negative effect is not the result of using these cumulative averages. The models yield rather similar, negative coefficients for the effect of expenditures on primary, secondary and tertiary educational institutions on the employment to population ratio.

<sup>27</sup> In 2015, approximately 80% of the population aged 15-24 was still attaining education in the seventeen EU member states studied, approximately 30% of which worked at least one hour per week. In other words, roughly 55% of the overall, male and female population aged 15-24 was unemployed or not active on the labour market as a result of attaining education (OECD 2016g).

negative relations between expenditures on tertiary educational institutions and both employment and labour market participation are found for the overall and female population. Expenditures on primary educational institutions are positively associated with overall and female labour market participation, again suggesting that education is capable of raising the supply of labour. With respect to employment, a negative coefficient for these expenditures is found for the male population, whereas a positive coefficient is found for the female population. The former is still surprising as it is in the opposite direction from what was expected. It seems that this negative coefficient accounts for the overall negative relation between expenditures on educational institutions and male employment observed in Table 3.

Next, the negative association of care for the elderly and frail with both employment and labour market participation is further examined using slightly different operationalisations of the variable. When weighing the expenditures by the population aged 65 and older instead of the total population – which is still not a very accurate, but probably more accurate measure of the group of recipients of these services – only the magnitude of the coefficient itself is affected. All the other variables and their significance levels remain unaffected (see Supplementary Table 3).

Subsequently care for the elderly and frail is distinguished into care for the elderly, operationalised as expenditures on home-help and accommodation services weighted by the population aged 65 years and older, and care for the frail, operationalised as expenditures on home-help and accommodation services and rehabilitation programmes for the sick and (partly) incapacitated weighted by the total population (see Supplementary Table 4). The findings reveal that expenditures on care for the elderly are negatively associated with male employment and labour market participation, whereas they are positively associated with female labour market participation. This corresponds with the explanation suggested earlier, namely that despite negative effects on employment these expenditures fuel the supply of women willing to provide such care through market arrangements, thereby offsetting the negative effect for the female population. The findings with respect to care for the frail indicate that the negative association between these expenditures and employment and labour market participation only holds for the overall and female population. This is peculiar, for there seems to be no reason to expect the group of people to which sick and incapacity-related services accrue to be larger amongst women than men. If the negative association indeed follows from the presence of a relatively large group of frail people, it may be that – unlike men – women do quit employment to care for these people as was described above.

Estimating the same models when excluding expenditures on rehabilitation programmes for the sick and (partly) incapacitated yields results highly similar to the results obtained when including these expenditures (see Supplementary Table 5). The negative coefficients are somewhat stronger in magnitude when expenditures on these rehabilitative programmes are excluded, which suggests that they are to some extent capable of raising the supply of labour and that the negative associations are not biased by them.

Finally, the negative effects of the dependent population on employment are also further examined by distinguishing the dependent population into a ‘young’ dependent population, i.e. those younger than 15, and an ‘old’ dependent population, i.e. those older than 64 (see Supplementary Table 6). Most of the other predictors in the models are not substantially affected. The results reveal that the young dependent population has a negative effect on both employment and labour market participation, especially for the female population. This corroborates with theoretical accounts suggesting that particularly women quit employment to take care of their children at home. In addition, the coefficients obtained in relation to the old dependent population present a negative relation to male employment and positive relation to overall and female labour market participation. This finding is likely to be attributable to the fact that the need for care-givers for the elderly leads to an increase in the demand for and supply of women willing to provide such care through market arrangements. It is worth noting that none of the coefficients for care for the elderly and frail are statistically significant when distinguishing between the young and old dependent population.

The study focused on the population of prime working age to control for the possibly disturbing effects of extended periods of schooling and early retirement on the employment to population ratio and labour market participation rate. Nevertheless, it could be argued that expenditures on social investment policies affect, and mostly also accrue to, the entire population of working age. Third, the original models are therefore replicated using the population of working age, i.e. those aged 15-64, instead of the population of prime working age for the computation of the dependent variables. The results are presented in Table 7.

Even though the magnitude and significance levels of some of the predictors are slightly affected, the observations raised in relation to the models presented in Table 3 still hold. Three differences deserve being mentioned. Firstly, expenditures on ECEC are now also positively related to male labour market participation. Yet, the effect is still stronger for the female population. Secondly, family policies are now significantly and positively related

**Table 7 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies for the population of working age, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	<i>Overall (15-64)</i>	<i>Male (15-64)</i>	<i>Female (15-64)</i>	<i>Overall (15-64)</i>	<i>Male (15-64)</i>	<i>Female (15-64)</i>
	7.1	7.2	7.3	7.4	7.5	7.6
Early childhood education and care <sub>t-1</sub>	0.22 ** (0.09)	0.17 ** (0.08)	0.26 ** (0.10)	0.17 *** (0.06)	0.09 ** (0.04)	0.24 *** (0.09)
Family policies <sub>t-1</sub>	0.00 (0.02)	-0.02 (0.02)	0.01 (0.02)	0.02 (0.01)	0.02 * (0.01)	0.02 (0.02)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.06 *** (0.01)	0.07 *** (0.01)	0.02 ** (0.01)	0.01 (0.01)	0.03 ** (0.01)
Care for the elderly and frail <sub>t-1</sub>	-1.43 * (0.74)	-0.67 (0.72)	-2.06 ** (0.89)	-1.50 *** (0.56)	-1.03 ** (0.41)	-1.87 ** (0.82)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.65 *** (0.15)	-0.87 *** (0.17)	-0.43 *** (0.15)	-0.07 (0.09)	-0.22 *** (0.07)	0.05 (0.12)
Employment protection legislation <sub>t-1</sub>	-2.47 *** (0.62)	-2.09 *** (0.60)	-2.63 *** (0.68)	-1.37 *** (0.41)	-0.92 *** (0.28)	-1.74 *** (0.57)
Trade union density <sub>t-1</sub>	0.30 *** (0.05)	0.19 *** (0.05)	0.40 *** (0.06)	0.19 *** (0.04)	0.11 *** (0.02)	0.27 *** (0.05)
Bargaining level <sub>t-1</sub>	0.08 (0.13)	0.22 (0.14)	-0.06 (0.15)	0.01 (0.10)	0.16 * (0.09)	-0.13 (0.14)
Tax wedge <sub>t-1</sub>	-0.09 * (0.05)	-0.07 (0.05)	-0.11 ** (0.05)	-0.03 (0.03)	-0.02 (0.02)	-0.06 (0.04)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.06 *** (0.02)	0.09 *** (0.02)	0.04 (0.03)	-0.03 * (0.02)	-0.01 (0.01)	-0.04 * (0.02)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.01 (0.02)	-0.03 (0.02)	0.05 * (0.03)	0.03 ** (0.02)	0.01 (0.01)	0.06 *** (0.02)
Dependent population <sub>t-1</sub>	-0.64 *** (0.20)	-0.74 *** (0.21)	-0.49 (0.23)	0.03 (0.14)	0.06 (0.09)	0.03 (0.21)
Real GDP per capita <sub>t-1</sub>	0.37 *** (0.09)	0.19 * (0.10)	0.54 *** (0.09)	0.41 *** (0.06)	0.24 *** (0.04)	0.57 *** (0.08)
Trade openness <sub>t-1</sub>	0.00 (0.02)	0.01 (0.02)	-0.00 (0.02)	-0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	79.68 *** (8.88)	103.98 *** (9.40)	54.03 *** (9.97)	57.32 *** (5.90)	74.79 *** (4.13)	39.66 *** (8.69)
Number of observations	244	244	244	244	244	244
Rho	0.56	0.55	0.61	0.63	0.53	0.68
Adjusted R-squared	0.985	0.986	0.976	0.993	0.997	0.984

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

to the male labour market participation rate. Thirdly, the negative coefficient obtained for expenditures on primary, secondary and tertiary educational institutions is now also statistically significant for the female employment, whereas the positive coefficients for overall and female labour market participation are no longer statistically significant and a statistically significant negative association is found with male labour market participation. Over the whole, Table 7 hence presents a more negative effect for expenditures on



educational institutions. This is not very surprising and most likely results from the fact that a substantial share of the population aged 15-24 still attains education.

Fourth, the original models are replicated without the inclusion of country fixed effects. The inclusion of both country and year dummies might lead to overly conservative estimates for the independent variables included in the models. Moreover, country fixed effects may absorb cross-sectional variance by reducing the coefficients of variables that vary mainly between countries and eliminating variation due to time-invariant factors specifically (Plümper *et al.* 2005). Leaving out country fixed effects has implications for the interpretation of the results as this leads to the estimation of variation *between* states rather than variation *within* states.

As Table 8 indicates, leaving out these fixed effects affects some of the results obtained in the initially estimated models. The implications are relatively strong for some of the social investment variables. Expenditures on ECEC and male employment are no longer significantly related, whilst the correlations for both the overall and female population with employment and labour market participant remain. Besides, statistically significant, positive relations are found between expenditures on family policies and employment and labour market participation in all models except model 8.5. This suggests that states with more generous leave arrangements enjoy higher employment to population ratios and labour market participation rates. The association is stronger for the female population. This corroborates with theoretical accounts that suggest that in the presence of leave arrangements people – particularly women – are more likely to utilise this period and return to work once it ends rather than quitting employment (e.g. Blau and Ehrenberg 1997). This probably stems from the fact that leave arrangements raise job continuity for those that are relatively weakly attached to the labour market and would leave it otherwise (Baum and Ruhm 2015).

Again, no statistically significant coefficients are obtained for care for the elderly and frail in any of the models. Further, cumulative average expenditures on primary, secondary and tertiary education are positive and significantly related to both overall and female employment and labour market participation. Since the magnitude of the coefficients for employment is practically similar to that for labour market participation, this suggest that over the longer run higher expenditures on educational institutions are associated with higher employment levels – especially for the female population – which corroborates with the theoretically hypothesised effect.

**Table 8 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies without country dummies, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	8.1	8.2	8.3	8.4	8.5	8.6
Early childhood education and care <sub>t-1</sub>	0.11 ** (0.05)	-0.07 (0.05)	0.29 *** (0.07)	0.13 *** (0.05)	-0.04 (0.04)	0.32 *** (0.08)
Family policies <sub>t-1</sub>	0.06 *** (0.02)	0.05 * (0.03)	0.09 *** (0.03)	0.05 *** (0.02)	0.02 (0.01)	0.07 *** (0.03)
Active labour market policies <sub>t-1</sub>	0.08 *** (0.01)	0.04 *** (0.01)	0.12 *** (0.01)	0.03 *** (0.01)	-0.00 (0.01)	0.07 *** (0.01)
Care for the elderly and frail <sub>t-1</sub>	-0.44 (0.42)	-0.46 (0.38)	-0.39 (0.57)	0.44 (0.34)	0.22 (0.28)	0.63 (0.51)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	0.56 *** (0.12)	-0.04 (0.14)	1.08 *** (0.15)	0.55 *** (0.08)	-0.04 (0.06)	1.06 *** (0.13)
Employment protection legislation <sub>t-1</sub>	-1.66 *** (0.39)	0.87 *** (0.23)	-3.81 *** (0.62)	-1.23 *** (0.35)	0.27 (0.21)	-2.76 *** (0.60)
Trade union density <sub>t-1</sub>	0.05 *** (0.01)	-0.03 ** (0.01)	0.12 *** (0.02)	0.02 * (0.01)	-0.04 *** (0.01)	0.08 *** (0.02)
Bargaining level <sub>t-1</sub>	-0.53 *** (0.15)	-0.46 *** (0.17)	-0.66 *** (0.19)	-0.16 * (0.09)	0.06 (0.07)	-0.41 ** (0.16)
Tax wedge <sub>t-1</sub>	-0.17 *** (0.04)	-0.04 (0.05)	-0.28 *** (0.06)	-0.13 *** (0.04)	-0.05 (0.03)	-0.22 *** (0.06)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.04 * (0.02)	-0.00 (0.02)	0.07 * (0.04)	0.04 * (0.02)	0.01 (0.01)	0.07 * (0.04)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.04 (0.02)	0.05 *** (0.02)	0.04 (0.03)	0.02 (0.02)	0.02 (0.01)	0.03 (0.03)
Dependent population <sub>t-1</sub>	-0.37 *** (0.13)	-0.10 (0.14)	-0.51 *** (0.19)	-0.30 ** (0.14)	0.02 (0.08)	-0.57 ** (0.23)
Real GDP per capita <sub>t-1</sub>	0.15 *** (0.04)	0.32 *** (0.05)	0.00 (0.05)	-0.01 (0.03)	0.11 *** (0.03)	-0.13 ** (0.06)
Trade openness <sub>t-1</sub>	-0.02 *** (0.01)	-0.00 (0.01)	-0.03 *** (0.01)	-0.02 *** (0.01)	-0.00 (0.00)	-0.04 *** (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	75.96 *** (4.57)	83.48 *** (4.95)	63.66 *** (6.82)	82.88 *** (5.15)	90.97 *** (3.13)	73.47 *** (8.64)
Number of observations	244	244	244	244	244	244
Rho	0.76	0.67	0.80	0.84	0.84	0.84
Adjusted R-squared	0.976	0.985	0.942	0.990	0.998	0.963

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1;  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

Some of the changes in the control variables are worth discussing as well. As the efficient contracts model predicted states with higher bargaining levels are associated with lower employment levels. In addition, statistically significant, positive – instead of negative – coefficients are obtained for the net replacement rate of unemployment benefits in relation to overall and female labour market participation. This suggests that states with relatively more generous benefit schemes realise higher labour market participation. Since the effect is of similar magnitude as the positive effect on employment, this finding corresponds with studies

that attribute positive effects to unemployment benefits by reducing the scar effect of unemployment, leading to higher employment (DiPetre 2002; Gangl 2004). Finally, statistically significant, negative correlations are found between trade openness and both overall and female employment and labour market participation. As has been stated earlier above, this suggests that feminine jobs may particularly be affected by globalisation.

Fifth, the original models are replicated for different subsets of countries, successively leaving out one group of states based on their welfare state regime. Different welfare states, for instance, deal differently with the role of gender in social policy (Arts and Gelissen 2002). Likewise, ‘progressive liberalism’, found in welfare states such as Sweden, Denmark, Norway and Finland, is associated with greater gender equality in the labour market, whereas ‘traditional conservatism, found in countries such as Italy, Austria, Belgium, France and Germany, is associated with weaker employment performance (Hicks and Kenworthy 2003). To account for such differences related to national welfare state regimes, the seventeen countries are first clustered into different groups of welfare states following Esping-Andersen’s typology of welfare states as well as modified and alternative typologies (see for an overview: Arts and Gelissen 2002). Five welfare state regimes are distinguished: continental (Austria, Belgium, France, Germany and the Netherlands), Anglo-Saxon (Ireland and the United Kingdom), Nordic (Denmark, Finland and Sweden), Central European (the Czech Republic, Hungary, Poland and the Slovak Republic), and Mediterranean (Italy, Portugal and Spain).<sup>28</sup>

The results presented in Tables 9-13 suggest that the relationship between expenditures on different social investment policies per recipient as a share of GDP per capita and labour market outcomes differs across countries and welfare states types.<sup>29</sup> Excluding Central European welfare states only renders the positive association between ECEC and male employment insignificant, whilst a positive effect of ALMPs on overall labour market participation is found.

Excluding Mediterranean welfare states has more implications. It, amongst others, leads to a positive association between ECEC and male labour market participation. Further, the association between ALMPs and labour market participation is affected: the relation is no

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<sup>28</sup> In the literature, the continental welfare states have also been referred to as ‘Bismarckian’, ‘conservative’ and ‘corporatist’ welfare states. Likewise, the Anglo-Saxon welfare states have also been referred to as ‘liberal’ welfare states and the Central European as ‘postsocialist’ ones. Other names for the Mediterranean welfare states are ‘Latin’ and ‘Southern European’.

<sup>29</sup> Consult Supplementary Tables 7-11 for the specific results obtained for the control variables.

**Table 9 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding continental welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	9.1	9.2	9.3	9.4	9.5	9.6
Early childhood education and care <sub>t-1</sub>	0.22 *	0.27 ***	0.15	0.07	0.03	0.11
	(0.12)	(0.10)	(0.15)	(0.07)	(0.05)	(0.12)
Family policies <sub>t-1</sub>	-0.05	-0.09 ***	-0.02	0.00	-0.02	0.02
	(0.03)	(0.03)	(0.04)	(0.02)	(0.01)	(0.03)
Active labour market policies <sub>t-1</sub>	0.07 ***	0.05 ***	0.09 ***	0.01	-0.01	0.03
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)
Care for the elderly and frail <sub>t-1</sub>	-0.08	1.04	-1.34	-1.55 **	-0.61	-2.46 **
	(1.06)	(0.97)	(1.33)	(0.65)	(0.42)	(1.09)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.24	-0.91 ***	0.42 *	0.58 ***	-0.00	1.13 ***
	(0.19)	(0.18)	(0.24)	(0.12)	(0.08)	(0.20)
~~~~~						
Constant	116.36 ***	132.59 ***	96.83 ***	88.85 ***	100.08 ***	77.60 ***
	(8.69)	(9.11)	(10.66)	(5.43)	(3.42)	(9.43)
Number of observations	169	169	169	169	169	169
Rho	0.51	0.51	0.61	0.60	0.50	0.63
Adjusted R-squared	0.986	0.988	0.977	0.995	0.999	0.983

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes control variables as well as country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Austria, Belgium, France, Germany, and the Netherlands;  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table 10 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Anglo-Saxon welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	10.1	10.2	10.3	10.4	10.5	10.6
Early childhood education and care <sub>t-1</sub>	0.28 ***	0.01	0.53 ***	0.33 ***	0.10 **	0.62 ***
	(0.10)	(0.09)	(0.15)	(0.08)	(0.04)	(0.14)
Family policies <sub>t-1</sub>	-0.00	-0.04 *	0.03	0.02	0.01	0.04
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)	(0.03)
Active labour market policies <sub>t-1</sub>	0.05 ***	0.02 *	0.08 ***	0.01	-0.01 **	0.04 ***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Care for the elderly and frail <sub>t-1</sub>	-0.50	-1.71 *	0.57	-0.15	-0.76 *	0.63
	(0.89)	(0.88)	(1.23)	(0.68)	(0.43)	(1.15)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.32 **	-0.51 **	-0.16	0.26 ***	0.03	0.41 ***
	(0.16)	(0.16)	(0.20)	(0.09)	(0.06)	(0.15)
~~~~~						
Constant	87.67 ***	124.02 ***	52.53 ***	60.05 ***	91.28 ***	31.28 ***
	(10.56)	(10.44)	(14.46)	(6.49)	(3.66)	(11.98)
Number of observations	212	212	212	212	212	212
Rho	0.51	0.46	0.55	0.57	0.40	0.56
Adjusted R-squared	0.989	0.988	0.976	0.995	0.998	0.981

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes control variables as well as country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Ireland and the United Kingdom;  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table 11 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Nordic welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	11.1	11.2	11.3	11.4	11.5	11.6
Early childhood education and care <sub>t-1</sub>	0.25 *	0.55 ***	0.03	-0.12 **	0.04	-0.29 ***
	(0.13)	(0.16)	(0.14)	(0.05)	(0.04)	(0.09)
Family policies <sub>t-1</sub>	-0.01	0.00	-0.01	0.01	0.02 *	0.00
	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.02)
Active labour market policies <sub>t-1</sub>	0.09 ***	0.09 ***	0.08 ***	0.02 **	0.01	0.03 **
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Care for the elderly and frail <sub>t-1</sub>	-1.58	-3.59 ***	-0.01	0.78	-0.62	2.35 ***
	(1.20)	(1.39)	(1.18)	(0.55)	(0.45)	(0.79)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.56 ***	-0.79 ***	-0.39 *	0.18 **	0.03	0.28 **
	(0.20)	(0.21)	(0.23)	(0.08)	(0.06)	(0.12)
Constant	95.58 ***	128.96 ***	65.55 ***	67.59 ***	89.27 ***	44.80 ***
	(11.17)	(11.87)	(13.40)	(5.97)	(3.67)	(9.84)
Number of observations	196	196	196	196	196	196
Rho	0.56	0.47	0.65	0.45	0.41	0.39
Adjusted R-squared	0.988	0.987	0.981	0.995	0.998	0.980

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes control variables as well as country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Denmark, Finland, and Sweden;  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table 12 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Mediterranean welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	12.1	12.2	12.3	12.4	12.5	12.6
Early childhood education and care <sub>t-1</sub>	0.28 ***	0.20 **	0.35 ***	0.22 ***	0.10 ***	0.35 ***
	(0.07)	(0.08)	(0.09)	(0.05)	(0.03)	(0.09)
Family policies <sub>t-1</sub>	-0.00	-0.01	-0.01	0.00	0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Active labour market policies <sub>t-1</sub>	0.03 ***	0.03 ***	0.04 ***	-0.01	-0.01 *	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Care for the elderly and frail <sub>t-1</sub>	-1.27 **	-0.19	-2.35 ***	-1.35 ***	-0.88 **	-1.90 **
	(0.63)	(0.69)	(0.86)	(0.51)	(0.39)	(0.83)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.95 ***	-1.04 ***	-0.85 ***	-0.16	-0.06	-0.27
	(0.15)	(0.17)	(0.20)	(0.11)	(0.07)	(0.18)
Constant	105.12 ***	131.08 ***	74.89 ***	78.27 ***	98.54 ***	59.71 ***
	(7.91)	(9.22)	(11.08)	(5.47)	(3.29)	(9.65)
Number of observations	200	200	200	200	200	200
Rho	0.47	0.58	0.60	0.64	0.40	0.67
Adjusted R-squared	0.989	0.993	0.981	0.996	0.998	0.988

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes control variables as well as country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Italy, Portugal, and Spain;  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table 13 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Central European welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	13.1	13.2	13.3	13.4	13.5	13.6
Early childhood education and care <sub>t-1</sub>	0.18 ** (0.08)	0.03 (0.09)	0.33 *** (0.13)	0.24 *** (0.07)	0.04 (0.03)	0.42 *** (0.12)
Family policies <sub>t-1</sub>	0.03 (0.02)	0.01 (0.02)	0.06 (0.03)	0.02 (0.02)	0.00 (0.01)	0.03 (0.03)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.02 * (0.01)	0.09 *** (0.02)	0.03 *** (0.01)	-0.01 (0.01)	0.06 *** (0.02)
Care for the elderly and frail <sub>t-1</sub>	-1.99 *** (0.68)	-1.12 (0.76)	-2.66 *** (1.02)	-1.54 *** (0.55)	-0.72 * (0.38)	-2.33 ** (1.01)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.67 *** (0.15)	-1.04 *** (0.20)	-0.30 (0.20)	0.26 *** (0.10)	-0.04 (0.05)	0.52 *** (0.19)
Constant	117.60 *** (11.52)	138.67 *** (17.72)	88.80 *** (13.25)	79.16 *** (7.05)	95.68 *** (3.97)	62.57 ** (13.56)
Number of observations	199	199	199	199	199	199
Rho	0.57	0.68	0.57	0.52	0.42	0.56
Adjusted R-squared	0.991	0.994	0.973	0.994	0.998	0.979

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: the Czech Republic, Hungary, Poland, and the Slovak Republic  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

longer statistically significant for the female population, whereas the results display a statistically significant, negative relationship between ALMPs and the male labour market participation rate. The results obtained in relation to expenditures on primary, secondary and tertiary educational institutions are affected as well. These expenditures are now also significantly and negatively related to female employment, whilst no statistically significant effects are found in relation to labour market participation. So far, none of these differences have large implications for the main findings. Moreover, they do not lead to unexpected findings or new results that contradict theoretical expectations.

The exclusion of states belonging to the other welfare regimes has more serious implications, especially with regard to the variables related to care. This may not be very surprising, for relatively distinct regimes are known to exist amongst European welfare states when it comes to the role of the state, market and family in the provision and financing of care services for children and the elderly (Anttonen and Sipilä 1996; Daly and Lewis 2000; Bettio and Plantenga 2004; Flynn 2017). When excluding the continental and Nordic welfare states from the analysis, the relation between ECEC and employment is no longer statistically significant for the female population, whereas the relationship with female labour market

participation is also insignificant or even negative. This suggests that, higher expenditures on ECEC raise female employment and labour market participation only in the continental and Nordic welfare states, where female employment and labour market participation are also relatively high. Such an affect may seem surprising, because childcare is generally both affordable and available in the Nordic countries as well as Belgium and France. Yet, given the relatively low availability of childcare in Mediterranean welfare states and, for example, Ireland (Flynn 2017) it seems that higher expenditures per child are insufficient to address the inadequate availability of childcare in the other welfare state regimes, a factor that has been found to constrain female labour market participation (Chevalier and Viitanen 2002).

The results further suggest that expenditures on family policies and male employment are negatively associated in all welfare states except for the continental and Anglo-Saxon. In other words, it seems that a positive association between male employment and expenditures on family policies is only observed in the continental and Anglo-Saxon welfare states. Rather surprisingly, these welfare states are the least generous states with respect to expenditures on family policies after the Mediterranean welfare states. This may suggest that too generous expenditures on family policies are associated with disincentives.

It seems that expenditures on educational institutions are positively associated with female employment in the Nordic countries. This is not really surprising given the relatively high expenditures per student on educational institutions relative to GDP per capita and the high female employment to population ratio observed in these states. In contrast, it seems that these expenditures are negatively associated with female employment in the continental welfare states, which may be the result of relatively high female educational attainment after the age of 24 in these states.

When excluding the Nordic welfare states, the coefficients obtained for expenditures on care for the elderly and frail change substantially: a negative relationship with male employment is found as well as a positive relationship with female labour market participation. The changes in the effects found for this variable seems to suggest that in the Nordic welfare states several women leave the labour market entirely to provide care for the elderly and frail through non-market arrangements in addition to funded care, whilst in the other welfare states the provision of such care seems to fuel the supply of women willing to provide it. Such a negative correlation for the female population seems rather surprising, given that care in the Nordic states has traditionally been strongly collectivised (Daly and Lewis 2000) and based on the principle of universalism (Anttonen and Sipilä 1996; Bettio and Plantenga 2004). Moreover, these states are extremely generous in terms of expenditures

on care for the elderly and frail in comparison to states belonging to other welfare states regimes and display the highest female employment and labour market participation rates. Nonetheless, recent years have witnessed marketization of care for the elderly in particular, thereby affecting its universality (Moberg 2017).

When excluding the Anglo-Saxon welfare states, the coefficients obtained for expenditures on care for the elderly and frail are also substantially affected. Like in the Nordic states, several women seem to leave the labour market in Anglo-Saxon welfare states in order to provide care for the elderly and frail in addition to funded care. This might not seem very surprising, given the rather liberal character of these welfare states and the fact that relative to GDP per capita expenditures on care for the elderly and frail per capita are below-average in these states. Nevertheless, it has been argued that the ‘Beveridgean approach’ to caring found in these states is also characterized by a collectivisation of care for the elderly (Daly and Lewis 2000).

When excluding continental welfare states no statistically significant associations between care for the elderly and frail and employment are found. Besides, the negative association with male labour market participation is no longer statistically significant. Although continental welfare states do not delegate the responsibility for care to the family to the same extent as Mediterranean welfare states, this may not be very surprising given that “the primary responsibility for care of elderly people lies, at least formally, with the family [in the Netherlands, Germany, Belgium and France]” (Anttonen and Sipilä 1996, 97). As Bettio and Plantenga (2004) describe, informal care is relatively important in continental welfare states such as the Austria, Germany, Belgium and France. The costs involved in such care are partly compensated by leave arrangements, which leads them to describe the care model found in these states as ‘publicly facilitated private care’: “whereas there is a systematic reliance on the family for the provision of care work and services, based on the principle of subsidiarity, the family is actively encouraged to perform this role through receiving state support rather than direct interventions” (Bettio and Plantenga 2004, 101). In the last two decades, states such as France, Germany and the Netherlands have even adopted policies aimed at fostering the provision of care through the family (Pavolini and Ranci 2008). This might therefore explain why one could find negative correlations of care for the elderly and frail with employment and labour market participation in the continental welfare states.

It could, however, also be that eligibility criteria for incapacity-related benefits are less strict in these states, functioning as a cover for unemployment or simply enabling more



people to receive such benefits instead of participating on the labour market. Such a situation is for instance known to have been applicable to the Dutch disability and long-term sickness system, eventually resulting in substantial reforms in the 1990s and 2000s (Van Wirdum 1998; Van Berkel 2013). After the Nordic countries, the continental welfare states are indeed most generous in terms of their expenditures on care for the frail per capita as a share of GDP per capita over the period 1990-2009.<sup>30</sup> Yet, it does seem that the provision of such care does fuel the supply of female workers willing to provide such care in the continental states, because the magnitude of the negative associations with overall and female labour market participation is larger when excluding these states.

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<sup>30</sup> Over the period 1990-2009 expenditures on care for the frail per capita constitute 0.82% of GDP per capita in the Nordic welfare states, whereas they constitute respectively 0.29%, 0.16%, 0.07% and 0.06% in the continental, Eastern European, Anglo-Saxon and Mediterranean welfare states.

## 6. Conclusion and discussion

To date there are only a couple of studies that systematically analyse the outcomes of social investment policies. So far, most studies have examined the relationship between social investment policies and poverty. Acknowledging that the reduction of poverty constitutes an ultimate goal of the social investment approach, which is to be achieved through more employment and higher labour market participation, this study focuses on the relationship between social investment policies, employment and the supply of labour instead. Specifically it addresses the following research question:

*To what extent do social investment policies contribute to employment and labour market participation?*

To answer this research question the study empirically analyses whether the adoption of the social investment approach, expressed through increases in the expenditures on five social investment policies per potential beneficiary as a share of GDP per capita, is associated with increases in overall, male and female employment to population ratios and labour market participation rates in seventeen EU member states over the period 1990-2009. The results, obtained using pooled time-series cross-section regression analyses, suggest that higher expenditures on early childhood education and care as well as active labour market policies are associated with higher employment levels, in particular for the female population.

With respect to the other social investment policies less consistent results have been obtained; it is not really clear if – and, if so, how – the other social investment policies are related to employment and labour market participation. Expenditures on educational institutions constitute an exception, but additional analyses suggest that the observed associations follows from continued educational attainment. Besides, expenditures on educational institutions constitute a somewhat odd category in contrast to the other social investment policies, because – unlike the other policies – expenditures associated with this policy do not directly accrue to the targeted population. As Nelson and Stephens (2012, 208) stress “spending effort alone does not provide any information about how spending is allocated and then translated into learning outcomes in the classroom”.

A potential explanation for finding no or divergent effects for some of the social investment policies such as those related to care may relate to the fact that the implications of these policies on labour market outcomes seem to differ across welfare state regimes. Further

research is encouraged to provide more insight into such country-specific associations between social investment policies and employment, on the one hand, and labour market participation, on the other hand. The effects of family policies, care for the elderly and frail, and education deserve additional investigation in particular, because it is not entirely clear which mechanisms account for the obtained results. More generally, the applied analysis technique is unable of providing a clear picture as to whether employment is affected by changes in either the supply of or demand for labour. It should be noted that studies using aggregated macro-level data are, however, always vulnerable to the ecological fallacy problem and are also unable to fully elucidate mechanisms by which policies affect outcomes. Quantitative studies using micro-data and medium to small-n comparative and case study research are therefore encouraged, for such studies are more suited for the identification of causal mechanisms at the individual level.

Further, future studies should examine interaction effects, which have not been tested here due to limited resources in terms of time. Labour market institutions often interact with each other (e.g. Boeri and Van Ours 2013). For that reason, studies in the field of labour market economics have included interaction terms in their analyses for several years now (e.g. Elmeskov *et al.* 1998; Blanchard and Wolfers 2000; Belot and Van Ours 2004; Nickell *et al.* 2005; Bassanini and Duval 2006; Checchi and García-Peñalosa 2008; Boone and Van Ours 2009). Besides, the effect of some of the social investment policies may also depend on, or causally interact with the presence of other institutions or policies due to institutional or policy complementarities (Hemerijck *et al.* 2016). Active labour market policies can, for example, be expected to interact with passive labour market policies such as unemployment benefits, whereas expenditures on ALMPs may, for instance, only be effective if expenditures on ECEC policies allow parents entering the labour market to reconcile work with family.

Finally, this study only focused on changes in employment measured through the absolute number of people in paid employment irrespective of the number of hours actually worked. As a result, the study does not consider changes in employment caused by changes in terms of the total hours worked by all people in employment. Yet, several studies suggest that policies foreseeing in care may raise employment, but involve part-time employment and thus a reduction of hours worked. Likewise, the study does also not focus on the quality of jobs, which comprises the monetary evaluation of a job as well as nonmonetary aspects related to characteristics of a job such as the security it offers and the working conditions (e.g. Jencks *et al.* 1988). Job quality has received increasing attention in recent years (e.g. Leschke and Watt 2008; Leschke *et al.* 2008; 2012; Dahl *et al.* 2009; Peña-Casas 2009;

OECD 2014c), but not been the subject of systematic analysis (see for an exception: Nelson and Stephens 2012). In short, future studies could examine the effect of social investment policies with respect to employment measured in total number of hours worked as well as non-standard and atypical forms of employment such as temporary employment and (involuntary) part-time employment that are not accounted for in the present study.

This study contributes to the social investment literature in multiple ways. It goes beyond existing studies – both conceptual and empirical – in developing a comprehensive, encompassing framework of preparing, activating, and capacitating social investment policies that can be translated into measurable, disaggregated expenditures figures suited for comparative research. Moreover, the manner in which expenditures on different social investment policies are operationalised accounts for differences in demography and income across countries, thereby allowing more meaningful and accurate comparisons across time and cases. In addition, the study engages with predominantly feminist literature that stresses the role of women in the provision of care and welfare. In the context of policies aimed at reconciling work and family so central to the social investment approach and the simultaneous focus on the stereotypical male worker rather than the worker and care model within most of social investment literature, the analysis accounts for gender-related effects. Last, the study engages with literature on labour market economics to identify relevant control variables with regard to employment and labour market participation that, with the availability of relatively new data, leads to the inclusion of different factors that have not simultaneously been incorporated in previous studies

From a more pragmatic point of view, it should be noted that the feasibility of social investment might be limited, particularly in the post-crisis period (e.g. Diamond and Liddle 2012). Descriptive studies indicate that the social investment approach is reflected to various extents across different states (e.g. Hemerijck *et al.* 2013; Kuitto 2016). Although recent studies suggest that the crisis has not led to cuts in expenditures on programmes such as ECEC and ALMPs (Kvist 2013; Van Kersbergen *et al.* 2014), there are several factors that may limit *further* adoption of the approach. As described, the social investment approach largely constitutes a supply-side strategy for raising labour market participation and employment. Such a strategy may not be capable of serving as an adequate substitute for macroeconomic management in times – such as the current post-crisis period – characterised by decreased demand for labour, increasing uncertainty, contradictory pressures, and new challenges for and relationships among industrial relations as well as employment and social

policies (Keune and Crouch 2012). Although the analysis runs until 2009, it is probably too early to determine if social investment policies are effective under such conditions.

In addition, the social investment approach strongly relies on a life course perspective. The temporal mismatch between (expenditures on) social investment policies and their returns, which materialise throughout different phases of a life course, requires a high degree of ‘political patience’ (Ferrera 2016). Such patience might not be forthcoming for a number of reasons. Although social investment policies may be regarded an effective response to new social risks and the (new) challenges faced by welfare states, the fiscal and political leeway to respond to these challenges is increasingly limited as a result of budget constraints in an era of ‘permanent austerity’ (Pierson 2001; cf. Taylor-Gooby 2004; Ferrera 2008). In the wake of the Great Recession, welfare states have entered a new phase of austerity. Under such conditions, the reallocation of expenditures on passive transfers like pensions and unemployment benefits to expenditures on activating and capacitating policies such as education and ALPMs is likely to go hand in hand with substitution (see, however: Van Kersbergen *et al.* 2014) – especially because the post-crisis EU fiscal and budgetary rules stress fiscal consolidation and do not allow higher levels of public debt (e.g. Buti and Carnot 2012; Dawson 2015).

Some have hence questioned whether the newly instituted EU macroeconomic governance regime is supportive of the social investment approach (e.g. Streeck and Mertens 2011; 2013). Through strengthened budgetary discipline and specific policy initiatives, albeit largely based on the open method of coordination, the EU might have created a straightjacket with respect to labour market and social policy (De la Porte and Heins 2017). The alternatives, cutbacks in existing programmes or increased taxes to finance additional expenditures, are usually unpopular with voters or the general public.<sup>31</sup> Using survey data, Busemeyer and Garritzmann (2017) for instance find that social investment policies are generally very popular among the citizens of Denmark, Germany, France, Ireland, Italy, Spain, Sweden and the United Kingdom, but that support for these policies drops considerably when expenditures on them come into conflict with fiscal or budgetary trade-offs so relevant in the post-crisis era. The largest drop occurs when social investment policies

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<sup>31</sup> Using survey data Busemeyer *et al.* (2017) find that citizens of Denmark, Germany, France, Ireland, Italy, Spain, Sweden and the United Kingdom are very supportive of increasing investments in education, even when having to choose between increases in education and other areas of spending such as health care, poverty, pensions, family, environment, unemployment, defence and the labour market. Very surprisingly, their results suggest that in the current context of austerity citizens of some states are willing to finance increases in investments in primary and lower secondary education as well as vocational education and training with higher taxes.

would be financed through cutback in compensatory policies rather than higher taxes or higher public debt levels (cf. Busemeyer and Neimanns 2017).<sup>32</sup>

With increasing pressures for fiscal consolidation the capacity of governments to (re)allocate resources towards social investment thus decreases. This also sheds new light on the ‘trilemma of the service economy’ between budgetary restraint, earnings equality and job growth (Iversen and Wren 1998). According to the trilemma, governments can only pursue two of these goals at the same time as a result of the shift to the service economy. The post-crisis context of budgetary constraints, institutionalised in EU macroeconomic governance, poses serious challenges with regard to social investment if one remembers that it is aimed at both increasing employment and, ultimately, reducing poverty – something that is at odds with increased earnings inequality. With a focus on budgetary restraint, the trilemma argues that states can only pursue either job growth or earnings equality besides that.

More recently, it has, however, been asserted that the trilemma has been altered due to the ICT revolution that enhanced the capacity for trade and productivity increases in knowledge-intensive services. According to the revisited trilemma, the expansion of employment in knowledge-intensive sectors flourishes in states where institutional and policy configurations encourage the developments of higher-level skills among the labour force. This can be stimulated by either allowing the wages of highly skilled workers to deviate from the average wage level, thereby stimulating private investment in education, or by increasing public investments in education (Wren *et al.* 2013; cf. Nelson and Stephens 2012). While the latter option still involves additional expenditures, this route is substantially cheaper than the alternative suggested by the original trilemma: direct creation of employment in the public sector (Iversen and Wren 1998). Still, it is in this regard striking that the present study found no positive associations between expenditures on education or educational institutions and employment. More importantly, the ‘high-end wage inequality’ (Wren *et al.* 2013) suggested by the former option is the opposite of inequality at the lower end of the wage distribution and hence not in conflict with poverty reduction.

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<sup>32</sup> It should, however, be noted that Busemeyer and Garrizmann (2017) did not focus on an entire package of social investment policies, but education specifically. Moreover, Busemeyer *et al.* (2009) have shown that – apart from one’s socioeconomic position – age is very relevant for explaining individual preferences for redistributive policies. In an era of demographic ageing and associated age cleavages this could account for the fact that policies like unemployment insurance, health, pensions and social assistance are preferred over education by those aged 18 and over.

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## Supplementary tables

**Table S1 Prais-Winsten regressions of employment, labour market participation and public expenditures on social investment policies whereby expenditures on educational institutions are replaced with expenditures on education, 1997-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S1.1	S1.2	S1.3	S1.4	S1.5	S1.6
Early childhood education and care <sub>t-1</sub>	0.21 *	0.27 *	0.17	0.10 **	0.08 *	0.13 *
	(0.12)	(0.15)	(0.12)	(0.04)	(0.04)	(0.07)
Family policies <sub>t-1</sub>	-0.05 ***	-0.05 ***	-0.04 **	0.01	0.02 *	0.00
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Active labour market policies <sub>t-1</sub>	0.06 ***	0.05 ***	0.06 ***	0.00	-0.01	0.01
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Care for the elderly and frail <sub>t-1</sub>	-0.82	-1.71	-0.12	0.05	-1.04 **	1.18
	(1.10)	(1.44)	(0.99)	(0.52)	(0.45)	(0.86)
Primary, secondary, and tertiary education <sub>t-1</sub>	-0.10	-0.21 *	-0.01	0.04	-0.06 *	0.14 *
	(0.09)	(0.12)	(0.08)	(0.04)	(0.03)	(0.07)
Employment protection legislation <sub>t-1</sub>	0.33	1.03	-0.30	-0.89 **	0.20	-2.13 ***
	(0.66)	(0.76)	(0.73)	(0.38)	(0.34)	(0.60)
Trade union density <sub>t-1</sub>	0.18 ***	-0.01	0.35 ***	0.19 ***	0.02	0.37 ***
	(0.07)	(0.08)	(0.08)	(0.04v)	(0.02)	(0.06)
Bargaining level <sub>t-1</sub>	0.28 *	0.52 **	0.04	0.02	0.22 ***	-0.16
	(0.15)	(0.23)	(0.12)	(0.09)	(0.07)	(0.17)
Tax wedge <sub>t-1</sub>	-0.08	-0.08	-0.09	0.00	-0.04 **	0.04
	(0.06)	(0.07)	(0.06)	(0.02)	(0.02)	(0.04)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.02	0.04	0.00	-0.09 ***	-0.06 ***	-0.13 ***
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	-0.01	-0.05 *	0.04	0.04 ***	0.02	0.07 ***
	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.02)
Dependent population <sub>t-1</sub>	0.06	-0.24	0.39	0.29 ***	-0.04	0.61 ***
	(0.20)	(0.22)	(0.26)	(0.10)	(0.08)	(0.18)
Real GDP per capita <sub>t-1</sub>	0.23 *	0.01	0.42 ***	0.29 ***	-0.01	0.56 ***
	(0.12)	(0.18)	(0.10)	(0.04)	(0.03)	(0.08)
Trade openness <sub>t-1</sub>	0.01	0.02	-0.00	-0.01	0.00	-0.01
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Capital openness <sub>t-1</sub>	0.00	0.01	-0.00	-0.00	-0.00	-0.01
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
Constant	63.59 ***	97.24 ***	30.07 ***	62.80 ***	96.72 ***	28.88 ***
	(10.33)	(12.25)	(11.37)	(4.70)	(3.75)	(8.23)
Number of observations	218	218	218	218	218	218
Rho	0.58	0.57	0.62	0.48	0.37	0.46
Adjusted R-squared	0.987	0.984	0.981	0.995	0.996	0.983

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies concern public expenditures only and are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the Netherlands is the only country for which data are available since 1995

\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S2 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies whereby cumulative average expenditures on *educational institutions* are separated into *primary educational institutions* (weighted by the population aged 6-12), *secondary educational institutions* (weighted by the population aged 13-18) and *tertiary educational institutions* (weighted by the population 19-24), 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6
Early childhood education and care <sub>t-1</sub>	0.22 *** (0.09)	0.23 *** (0.09)	0.21 * (0.11)	0.11 ** (0.06)	0.08 * (0.04)	0.15 (0.10)
Family policies <sub>t-1</sub>	-0.01 (0.02)	-0.04 ** (0.02)	0.02 (0.02)	0.01 (0.01)	-0.00 (0.01)	0.03 (0.02)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.03 *** (0.01)	0.07 *** (0.01)	0.01 (0.01)	-0.01 (0.01)	0.03 *** (0.01)
Care for the elderly and frail <sub>t-1</sub>	-0.72 (0.70)	-0.70 (0.68)	-0.78 (0.95)	-0.92 * (0.54)	-1.06 *** (0.38)	-0.85 (0.87)
Primary educational institutions <sub>t-1</sub>	-0.15 (0.19)	-0.72 *** (0.17)	0.40 * (0.24)	0.53 *** (0.08)	0.02 (0.06)	1.00 *** (0.16)
Secondary educational institutions <sub>t-1</sub>	-0.02 (0.08)	-0.11 (0.07)	0.07 (0.10)	0.04 (0.04)	-0.07 ** (0.04)	0.13 (0.08)
Tertiary educational institutions <sub>t-1</sub>	-0.29 *** (0.10)	-0.01 (0.10)	-0.58 *** (0.12)	-0.22 *** (0.06)	0.08 * (0.05)	-0.52 *** (0.09)
Employment protection legislation <sub>t-1</sub>	-1.26 ** (0.51)	-0.82 * (0.46)	-1.50 ** (0.65)	-0.41 (0.36)	0.21 (0.24)	-0.82 (0.56)
Trade union density <sub>t-1</sub>	0.23 *** (0.06)	0.02 (0.05)	0.42 *** (0.08)	0.22 *** (0.04)	0.06 ** (0.02)	0.36 *** (0.07)
Bargaining level <sub>t-1</sub>	0.12 (0.12)	0.23 (0.12)	-0.01 (0.16)	0.05 (0.09)	0.18 *** (0.06)	-0.10 (0.13)
Tax wedge <sub>t-1</sub>	-0.12 ** (0.05)	-0.06 (0.04)	-0.16 *** (0.06)	-0.07 ** (0.03)	-0.05 ** (0.02)	-0.10 * (0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.01 (0.02)	0.03 (0.02)	-0.02 (0.03)	-0.07 *** (0.02)	-0.04 *** (0.01)	-0.10 *** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.01 (0.02)	-0.02 (0.02)	0.05 (0.03)	0.02 (0.01)	0.00 (0.01)	0.04 * (0.02)
Dependent population <sub>t-1</sub>	-0.72 *** (0.20)	-0.90 *** (0.20)	-0.49 * (0.26)	0.08 (0.11)	-0.05 (0.09)	0.21 (0.20)
Real GDP per capita <sub>t-1</sub>	0.31 *** (0.09)	0.01 *** (0.10)	0.59 *** (0.11)	0.38 *** (0.06)	0.02 (0.03)	0.69 *** (0.09)
Trade openness <sub>t-1</sub>	0.01 (0.01)	0.01 (0.02)	0.01 (0.02)	0.01 (0.01)	0.00 (0.01)	0.01 (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.00)	-0.00 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	94.50 *** (9.37)	129.88 *** (10.12)	58.19 *** (11.65)	65.29 *** (5.47)	96.91 *** (3.81)	35.28 *** (9.45)
Number of observations	232	232	232	232	232	232
Rho	0.55	0.56	0.61	0.54	0.44	0.62
Adjusted R-squared	0.987	0.989	0.973	0.994	0.998	0.981

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S3 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies whereby expenditures on care for the elderly and frail are weighted by the population aged 65 and older instead of the total population, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S3.1	S3.2	S3.3	S3.4	S3.5	S3.6
Early childhood education and care <sub>t-1</sub>	0.24 *** (0.08)	0.14 * (0.08)	0.31 *** (0.11)	0.19 *** (0.06)	0.05 (0.03)	0.31 *** (0.10)
Family policies <sub>t-1</sub>	-0.01 (0.02)	-0.03 (0.02)	0.01 (0.03)	0.01 (0.01)	0.00 (0.01)	0.02 (0.02)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.04 *** (0.01)	0.07 *** (0.01)	0.01 (0.01)	-0.01 (0.01)	0.03 ** (0.01)
Care for the elderly and frail <sub>t-1</sub>	-0.22 * (0.11)	-0.09 (0.11)	-0.33 ** (0.15)	-0.20 *** (0.08)	-0.10 * (0.05)	-0.28 ** (0.13)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.48 *** (0.15)	-0.79 *** (0.16)	-0.21 (0.19)	0.24 *** (0.08)	0.01 (0.05)	0.43 *** (0.14)
Employment protection legislation <sub>t-1</sub>	-1.96 *** (0.60)	-0.97 * (0.52)	-2.36 *** (0.74)	-0.90 ** (0.39)	0.12 (0.23)	-1.70 *** (0.64)
Trade union density <sub>t-1</sub>	0.32 *** (0.05)	0.12 ** (0.05)	0.49 *** (0.07)	0.19 *** (0.03)	0.02 (0.02)	0.35 *** (0.06)
Bargaining level <sub>t-1</sub>	0.11 (0.13)	0.18 (0.12)	0.00 (0.17)	0.03 (0.10)	0.15 ** (0.06)	-0.09 (0.16)
Tax wedge <sub>t-1</sub>	-0.13 *** (0.05)	-0.08 * (0.05)	-0.15 ** (0.06)	-0.05 (0.03)	-0.04 ** (0.02)	-0.07 (0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.04 * (0.02)	0.04 ** (0.02)	0.03 (0.03)	-0.05 *** (0.02)	-0.04 *** (0.01)	-0.06 ** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.01 (0.02)	-0.02 (0.02)	0.07 ** (0.03)	0.03 ** (0.01)	0.00 (0.01)	0.07 *** (0.03)
Dependent population <sub>t-1</sub>	-0.92 *** (0.20)	-0.75 *** (0.21)	-0.93 *** (0.27)	-0.17 (0.11)	0.05 (0.07)	-0.34 (0.21)
Real GDP per capita <sub>t-1</sub>	0.28 *** (0.09)	0.05 (0.10)	0.53 *** (0.11)	0.34 *** (0.05)	0.04 (0.03)	0.60 *** (0.09)
Trade openness <sub>t-1</sub>	0.01 (0.01)	0.01 (0.02)	0.01 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.00)	-0.01 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	100.82 *** (8.95)	124.05 *** (9.21)	71.57 *** (11.75)	73.10 *** (5.39)	93.42 *** (3.12)	52.28 *** (9.62)
Number of observations	244	244	244	244	244	244
Rho	0.55	0.61	0.65	0.61	0.48	0.66
Adjusted R-squared	0.989	0.992	0.978	0.995	0.998	0.984

Notes: Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S4 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies whereby expenditures on care for the elderly and frail are separated into care for the elderly (weighted by the population aged 65 and older) and care for the frail (weighted by the total population), 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S4.1	S4.2	S4.3	S4.4	S4.5	S4.6
Early childhood education and care <sub>t-1</sub>	0.26 *** (0.08)	0.12 (0.08)	0.39 *** (0.10)	0.25 *** (0.05)	0.04 (0.03)	0.43 *** (0.09)
Family policies <sub>t-1</sub>	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)	0.00 (0.01)	0.01 (0.01)	-0.00 (0.02)
Active labour market policies <sub>t-1</sub>	0.05 *** (0.01)	0.04 *** (0.01)	0.07 *** (0.01)	0.01 (0.01)	-0.01 (0.01)	0.02 ** (0.01)
Care for the elderly <sub>t-1</sub>	-0.03 (0.13)	-0.32 ** (0.13)	0.27 (0.17)	0.10 (0.10)	-0.20 *** (0.08)	0.39 ** (0.16)
Care for the frail <sub>t-1</sub>	-2.95 *** (0.98)	1.33 (0.97)	-7.06 *** (1.29)	-4.23 *** (0.62)	0.04 (0.44)	-7.97 *** (1.10)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.48 *** (0.15)	-0.82 *** (0.17)	-0.18 (0.17)	0.24 *** (0.07)	-0.01 (0.05)	0.46 *** (0.12)
Employment protection legislation <sub>t-1</sub>	-2.18 *** (0.63)	-0.85 (0.53)	-3.14 *** (0.79)	-1.36 *** (0.39)	0.16 (0.23)	-2.63 *** (0.64)
Trade union density <sub>t-1</sub>	0.32 *** (0.05)	0.12 *** (0.05)	0.50 *** (0.06)	0.19 *** (0.03)	0.03 * (0.02)	0.35 *** (0.05)
Bargaining level <sub>t-1</sub>	0.16 (0.13)	0.14 (0.12)	0.12 (0.16)	0.10 (0.09)	0.14 ** (0.06)	0.04 (0.14)
Tax wedge <sub>t-1</sub>	-0.14 *** (0.05)	-0.08 * (0.05)	-0.17 ** (0.07)	-0.06 * (0.03)	-0.04 ** (0.02)	-0.08 (0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.03 (0.02)	0.06 *** (0.02)	-0.01 (0.03)	-0.07 *** (0.02)	-0.03 *** (0.01)	-0.10 *** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.01 (0.02)	-0.02 (0.02)	0.07 *** (0.03)	0.04 *** (0.01)	-0.00 (0.01)	0.08 *** (0.02)
Dependent population <sub>t-1</sub>	-0.88 *** (0.20)	-0.82 *** (0.20)	-0.79 *** (0.25)	-0.08 (0.11)	0.02 (0.07)	-0.15 (0.19)
Real GDP per capita <sub>t-1</sub>	0.28 *** (0.09)	0.03 (0.10)	0.57 *** (0.11)	0.37 *** (0.05)	0.03 (0.03)	0.68 *** (0.09)
Trade openness <sub>t-1</sub>	0.01 (0.01)	0.00 (0.02)	0.03 (0.02)	0.02 * (0.01)	0.00 (0.01)	0.03 * (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.00)	-0.00 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	100.24 *** (8.92)	126.43 *** (9.02)	68.05 *** (11.29)	71.04 *** (5.07)	94.56 *** (3.13)	47.07 *** (8.84)
Number of observations	244	244	244	244	244	244
Rho	0.51	0.61	0.57	0.51	0.47	0.56
Adjusted R-squared	0.988	0.992	0.976	0.994	0.998	0.985

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01



**Table S5 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies whereby expenditures on care for the elderly and frail exclude expenditures on rehabilitation programmes for the sick and (partly) incapacitated, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S5.1	S5.2	S5.3	S5.4	S5.5	S5.6
Early childhood education and care <sub>t-1</sub>	0.23 *** (0.08)	0.13 * (0.07)	0.30 *** (0.11)	0.19 *** (0.06)	0.05 (0.03)	0.33 *** (0.10)
Family policies <sub>t-1</sub>	-0.01 (0.02)	-0.03 (0.02)	0.01 (0.03)	0.02 (0.01)	0.00 (0.01)	0.02 (0.02)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.04 *** (0.01)	0.07 *** (0.01)	0.01 (0.01)	-0.01 (0.01)	0.02 * (0.01)
Care for the elderly and frail <sub>t-1</sub>	-1.08 (0.66)	-0.03 (0.63)	-2.05 ** (0.92)	-1.65 *** (0.46)	-0.71 ** (0.35)	-2.44 *** (0.82)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.49 *** (0.15)	-0.79 *** (0.16)	-0.23 (0.19)	0.22 *** (0.08)	0.01 (0.05)	0.41 *** (0.14)
Employment protection legislation <sub>t-1</sub>	-1.96 *** (0.61)	-0.91 * (0.53)	-2.45 *** (0.76)	-1.06 *** (0.39)	0.08 (0.22)	-1.98 *** (0.66)
Trade union density <sub>t-1</sub>	0.32 *** (0.05)	0.12 *** (0.05)	0.48 *** (0.07)	0.19 *** (0.03)	0.02 (0.02)	0.34 *** (0.06)
Bargaining level <sub>t-1</sub>	0.13 (0.13)	0.19 (0.12)	0.01 (0.17)	0.04 (0.10)	0.16 ** (0.06)	-0.09 (0.16)
Tax wedge <sub>t-1</sub>	-0.13 ** (0.05)	-0.08 * (0.05)	-0.15 ** (0.06)	-0.05 (0.03)	-0.04 ** (0.02)	-0.07 (0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.04 * (0.02)	0.04 ** (0.02)	0.03 (0.03)	-0.05 *** (0.02)	-0.04 *** (0.01)	-0.06 ** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.01 (0.02)	-0.02 (0.02)	0.07 ** (0.03)	0.03 ** (0.01)	0.00 (0.01)	0.07 *** (0.03)
Dependent population <sub>t-1</sub>	-0.91 *** (0.20)	-0.74 *** (0.21)	-0.92 *** (0.26)	-0.17 (0.11)	0.05 (0.07)	-0.34 * (0.21)
Real GDP per capita <sub>t-1</sub>	0.27 *** (0.09)	0.04 (0.10)	0.52 *** (0.11)	0.34 *** (0.05)	0.03 (0.03)	0.60 *** (0.09)
Trade openness <sub>t-1</sub>	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.00)	-0.01 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	100.60 *** (8.99)	123.30 *** (9.24)	72.21 *** (11.72)	74.32 *** (5.28)	93.79 *** (3.13)	54.16 *** (9.41)
Number of observations	244	244	244	244	244	244
Rho	0.55	0.61	0.65	0.59	0.47	0.64
Adjusted R-squared	0.989	0.992	0.979	0.995	0.998	0.983

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S6 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies whereby the dependent population is split into a ‘young’ and ‘old’ dependent population, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S6.1	S6.2	S6.3	S6.4	S6.5	S6.6
Early childhood education and care <sub>t-1</sub>	0.17 ** (0.07)	0.14 * (0.08)	0.20 ** (0.10)	0.10 ** (0.05)	0.04 (0.03)	0.15 (0.09)
Family policies <sub>t-1</sub>	0.01 (0.02)	-0.03 (0.02)	0.01 (0.02)	0.01 (0.01)	0.00 (0.01)	0.02 (0.02)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.04 *** (0.01)	0.07 *** (0.01)	0.01 * (0.01)	-0.01 (0.01)	0.03 ** (0.01)
Care for the elderly <sub>t-1</sub>	-0.09 (0.67)	-0.42 (0.73)	-0.18 (0.89)	-0.13 (0.54)	-0.50 (0.40)	-0.02 (0.87)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.52 *** (0.14)	-0.79 *** (0.17)	-0.28 * (0.17)	0.20 ** (0.08)	0.00 (0.06)	0.35 ** (0.15)
Employment protection legislation <sub>t-1</sub>	-1.29 ** (0.54)	-0.98 * (0.57)	-1.35 ** (0.63)	-0.15 (0.33)	0.19 (0.24)	-0.47 (0.56)
Trade union density <sub>t-1</sub>	0.33 *** (0.04)	0.12 ** (0.05)	0.49 *** (0.06)	0.19 *** (0.03)	0.03 (0.02)	0.34 *** (0.06)
Bargaining level <sub>t-1</sub>	0.08 (0.12)	0.18 (0.11)	-0.07 (0.15)	-0.02 (0.08)	0.15 ** (0.06)	-0.18 (0.14)
Tax wedge <sub>t-1</sub>	-0.16 *** (0.05)	-0.08 (0.05)	-0.21 *** (0.06)	-0.08 *** (0.03)	-0.04 ** (0.02)	-0.13 *** (0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.03 (0.02)	0.04 ** (0.02)	0.01 (0.03)	-0.06 *** (0.02)	-0.04 *** (0.01)	-0.08 *** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.03 * (0.02)	-0.02 (0.02)	0.10 *** (0.02)	0.05 *** (0.01)	0.00 (0.01)	0.11 *** (0.02)
Dependent population <15 <sub>t-1</sub>	-1.05 *** (0.22)	-0.73 *** (0.23)	-1.22 *** (0.30)	-0.34 *** (0.13)	0.04 (0.06)	-0.67 *** (0.26)
Dependent population >64 <sub>t-1</sub>	-0.12 (0.24)	-0.79 *** (0.22)	0.56 (0.37)	0.77 *** (0.18)	0.13 (0.11)	1.32 *** (0.32)
Real GDP per capita <sub>t-1</sub>	0.30 *** (0.09)	0.04 (0.10)	0.56 *** (0.11)	0.36 *** (0.06)	0.04 (0.03)	0.62 *** (0.09)
Trade openness <sub>t-1</sub>	0.01 (0.01)	0.01 (0.02)	0.01 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	0.00 (0.00)	-0.01 (0.01)	-0.01 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	90.30 *** (8.47)	124.24 *** (8.75)	54.21 *** (11.72)	62.06 *** (5.66)	92.39 *** (3.49)	33.76 *** (10.16)
Number of observations	244	244	244	244	244	244
Rho	0.56	0.61	0.67	0.68	0.48	0.74
Adjusted R-squared	0.990	0.992	0.981	0.997	0.998	0.988

Notes: Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; \* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S7 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding continental welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S7.1	S7.2	S7.3	S7.4	S7.5	S7.6
Early childhood education and care <sub>t-1</sub>	0.22 *	0.27 ***	0.15	0.07	0.03	0.11
	(0.12)	(0.10)	(0.15)	(0.07)	(0.05)	(0.12)
Family policies <sub>t-1</sub>	-0.05	-0.09 ***	-0.02	0.00	-0.02	0.02
	(0.03)	(0.03)	(0.04)	(0.02)	(0.01)	(0.03)
Active labour market policies <sub>t-1</sub>	0.07 ***	0.05 ***	0.09 ***	0.01	-0.01	0.03
	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)
Care for the elderly and frail <sub>t-1</sub>	-0.08	1.04	-1.34	-1.55 **	-0.61	-2.46 **
	(1.06)	(0.97)	(1.33)	(0.65)	(0.42)	(1.09)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.24	-0.91 ***	0.42 *	0.58 ***	-0.00	1.13 ***
	(0.19)	(0.18)	(0.24)	(0.12)	(0.08)	(0.20)
Employment protection legislation <sub>t-1</sub>	-2.81 ***	-2.17 ***	-2.99 ***	-1.00 **	-0.21	-1.75 **
	(0.73)	(0.66)	(0.91)	(0.47)	(0.28)	(0.80)
Trade union density <sub>t-1</sub>	0.30 ***	0.13 **	0.45 ***	0.16 ***	0.01	0.31 ***
	(0.05)	(0.05)	(0.07)	(0.03)	(0.02)	(0.06)
Bargaining level <sub>t-1</sub>	0.24	0.41 ***	0.06	0.01	0.17 **	-0.14
	(0.15)	(0.15)	(0.17)	(0.09)	(0.07)	(0.14)
Tax wedge <sub>t-1</sub>	-0.16 **	-0.19 ***	-0.13	-0.02	-0.05 **	0.00
	(0.06)	(0.06)	(0.08)	(0.04)	(0.02)	(0.06)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.05 *	0.05 **	0.04	-0.05 **	-0.04 ***	-0.05 *
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)	(0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	-0.00	-0.04	0.05	0.03 *	0.01	0.06 **
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)	(0.03)
Dependent population <sub>t-1</sub>	-1.17 ***	-0.79 ***	-1.49 ***	-0.45 ***	-0.01	-0.88 ***
	(0.23)	(0.24)	(0.28)	(0.14)	(0.08)	(0.24)
Real GDP per capita <sub>t-1</sub>	0.24 **	-0.09	0.54 ***	0.36 ***	0.00	0.67 ***
	(0.10)	(0.11)	(0.12)	(0.06)	(0.03)	(0.09)
Trade openness <sub>t-1</sub>	0.00	0.02	-0.01	-0.01	0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Capital openness <sub>t-1</sub>	0.01	0.02	0.00	-0.00	0.00	-0.00
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Constant	116.36 ***	132.59 ***	96.83 ***	88.85 ***	100.08 ***	77.60 ***
	(8.69)	(9.11)	(10.66)	(5.43)	(3.42)	(9.43)
Number of observations	169	169	169	169	169	169
Rho	0.51	0.51	0.61	0.60	0.50	0.63
Adjusted R-squared	0.986	0.988	0.977	0.995	0.999	0.983

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Austria, Belgium, France, Germany, and the Netherlands  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S8 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Anglo-Saxon welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S8.1	S8.2	S8.3	S8.4	S8.5	S8.6
Early childhood education and care <sub>t-1</sub>	0.28 *** (0.10)	0.01 (0.09)	0.53 *** (0.15)	0.33 *** (0.08)	0.10 ** (0.04)	0.62 *** (0.14)
Family policies <sub>t-1</sub>	-0.00 (0.02)	-0.04 * (0.02)	0.03 (0.03)	0.02 (0.02)	0.01 (0.01)	0.04 (0.03)
Active labour market policies <sub>t-1</sub>	0.05 *** (0.01)	0.02 * (0.01)	0.08 *** (0.02)	0.01 (0.01)	-0.01 ** (0.01)	0.04 *** (0.01)
Care for the elderly and frail <sub>t-1</sub>	-0.50 (0.89)	-1.71 * (0.88)	0.57 (1.23)	-0.15 (0.68)	-0.76 * (0.43)	0.63 (1.15)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.32 ** (0.16)	-0.51 ** (0.16)	-0.16 (0.20)	0.26 *** (0.09)	0.03 (0.06)	0.41 *** (0.15)
Employment protection legislation <sub>t-1</sub>	-1.70 *** (0.59)	-0.78 (0.59)	-2.55 *** (0.69)	-0.81 ** (0.37)	0.40 * (0.23)	-2.02 *** (0.60)
Trade union density <sub>t-1</sub>	0.35 *** (0.05)	0.17 *** (0.05)	0.55 *** (0.06)	0.19 *** (0.03)	0.02 (0.02)	0.36 *** (0.06)
Bargaining level <sub>t-1</sub>	0.06 (0.14)	-0.20 (0.14)	0.27 (0.23)	0.13 (0.12)	0.01 (0.07)	0.22 (0.23)
Tax wedge <sub>t-1</sub>	-0.11 * (0.06)	-0.25 *** (0.06)	0.00 (0.08)	0.05 (0.04)	-0.07 *** (0.02)	0.14 ** (0.07)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.03 (0.02)	0.05 ** (0.02)	0.02 (0.03)	-0.06 *** (0.02)	-0.02 (0.01)	-0.08 ** (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.00 (0.03)	0.03 (0.02)	-0.02 (0.04)	-0.01 (0.02)	0.01 (0.01)	-0.04 (0.04)
Dependent population <sub>t-1</sub>	-0.69 *** (0.25)	-1.00 *** (0.24)	-0.39 (0.34)	0.23 (0.15)	0.01 (0.09)	0.43 (0.27)
Real GDP per capita <sub>t-1</sub>	0.45 *** (0.15)	0.13 (0.16)	0.74 *** (0.17)	0.45 *** (0.08)	0.11 *** (0.04)	0.73 *** (0.14)
Trade openness <sub>t-1</sub>	-0.02 (0.02)	0.03 (0.02)	-0.06 *** (0.02)	-0.03 *** (0.01)	0.01 (0.01)	-0.07 *** (0.02)
Capital openness <sub>t-1</sub>	0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.01)
Constant	87.67 *** (10.56)	124.02 *** (10.44)	52.53 *** (14.46)	60.05 *** (6.49)	91.28 *** (3.66)	31.28 *** (11.98)
Number of observations	212	212	212	212	212	212
Rho	0.51	0.46	0.55	0.57	0.40	0.56
Adjusted R-squared	0.989	0.988	0.976	0.995	0.998	0.981

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Ireland and the United Kingdom  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S9 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Nordic welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S9.1	S9.2	S9.3	S9.4	S9.5	S9.6
Early childhood education and care <sub>t-1</sub>	0.25 *	0.55 ***	0.03	-0.12 **	0.04	-0.29 ***
	(0.13)	(0.16)	(0.14)	(0.05)	(0.04)	(0.09)
Family policies <sub>t-1</sub>	-0.01	0.00	-0.01	0.01	0.02 *	0.00
	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.02)
Active labour market policies <sub>t-1</sub>	0.09 ***	0.09 ***	0.08 ***	0.02 **	0.01	0.03 **
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Care for the elderly and frail <sub>t-1</sub>	-1.58	-3.59 ***	-0.01	0.78	-0.62	2.35 ***
	(1.20)	(1.39)	(1.18)	(0.55)	(0.45)	(0.79)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.56 ***	-0.79 ***	-0.39 *	0.18 **	0.03	0.28 **
	(0.20)	(0.21)	(0.23)	(0.08)	(0.06)	(0.12)
Employment protection legislation <sub>t-1</sub>	-1.94 ***	-0.58	-3.13 ***	-1.77 ***	0.20	-3.80 ***
	(0.71)	(0.67)	(0.86)	(0.38)	(0.24)	(0.60)
Trade union density <sub>t-1</sub>	0.33 ***	0.16 ***	0.50 ***	0.17 ***	0.02	0.32 ***
	(0.05)	(0.05)	(0.07)	(0.03)	(0.02)	(0.04)
Bargaining level <sub>t-1</sub>	0.07	0.53 **	-0.30	-0.09	0.25 ***	-0.44 **
	(0.18)	(0.21)	(0.21)	(0.12)	(0.09)	(0.21)
Tax wedge <sub>t-1</sub>	-0.15 ***	-0.14 ***	-0.17 ***	-0.06 **	-0.04 **	-0.10 **
	(0.06)	(0.06)	(0.06)	(0.03)	(0.02)	(0.05)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.00	0.09 ***	-0.07 *	-0.13 ***	-0.04 ***	-0.22 ***
	(0.03)	(0.02)	(0.04)	(0.02)	(0.01)	(0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.05 **	-0.00	0.11 ***	0.07 ***	0.01 *	0.14 ***
	(0.02)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)
Dependent population <sub>t-1</sub>	-0.78 ***	-1.08 ***	-0.54 *	0.18	0.11	0.31
	(0.23)	(0.25)	(0.29)	(0.12)	(0.07)	(0.20)
Real GDP per capita <sub>t-1</sub>	0.24 **	-0.09	0.49 ***	0.34 ***	0.03	0.63 ***
	(0.10)	(0.11)	(0.12)	(0.05)	(0.03)	(0.09)
Trade openness <sub>t-1</sub>	0.02	0.02	0.02	0.01	0.01 **	0.02
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Capital openness <sub>t-1</sub>	-0.00	0.00	-0.01	-0.01 **	-0.00	-0.02 ***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
Constant	95.58 ***	128.96 ***	65.55 ***	67.59 ***	89.27 ***	44.80 ***
	(11.17)	(11.87)	(13.40)	(5.97)	(3.67)	(9.84)
Number of observations	196	196	196	196	196	196
Rho	0.56	0.47	0.65	0.45	0.41	0.39
Adjusted R-squared	0.988	0.987	0.981	0.995	0.998	0.980

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Denmark, Finland, and Sweden  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S10 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Mediterranean welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S10.1	S10.2	S10.3	S10.4	S10.5	S10.6
Early childhood education and care <sub>t-1</sub>	0.28 *** (0.07)	0.20 ** (0.08)	0.35 *** (0.09)	0.22 *** (0.05)	0.10 *** (0.03)	0.35 *** (0.09)
Family policies <sub>t-1</sub>	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.00 (0.01)	0.01 (0.01)	-0.01 (0.02)
Active labour market policies <sub>t-1</sub>	0.03 *** (0.01)	0.03 *** (0.01)	0.04 *** (0.01)	-0.01 (0.01)	-0.01 * (0.01)	-0.00 (0.01)
Care for the elderly and frail <sub>t-1</sub>	-1.27 ** (0.63)	-0.19 (0.69)	-2.35 *** (0.86)	-1.35 *** (0.51)	-0.88 ** (0.39)	-1.90 ** (0.83)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.95 *** (0.15)	-1.04 *** (0.17)	-0.85 *** (0.20)	-0.16 (0.11)	-0.06 (0.07)	-0.27 (0.18)
Employment protection legislation <sub>t-1</sub>	0.21 (0.55)	0.29 (0.58)	-0.08 (0.74)	0.43 (0.37)	0.51 ** (0.26)	0.39 (0.65)
Trade union density <sub>t-1</sub>	0.32 *** (0.04)	0.19 *** (0.05)	0.41 *** (0.05)	0.14 *** (0.03)	0.05 *** (0.02)	0.24 *** (0.04)
Bargaining level <sub>t-1</sub>	0.23 (0.14)	0.21 (0.13)	0.09 (0.18)	0.04 (0.10)	0.15 ** (0.07)	-0.09 (0.17)
Tax wedge <sub>t-1</sub>	-0.20 *** (0.04)	-0.06 (0.05)	-0.27 *** (0.05)	-0.10 *** (0.03)	-0.04 * (0.02)	-0.17 *** (0.04)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.02 (0.03)	-0.04 (0.03)	0.07 * (0.04)	-0.03 (0.02)	-0.09 *** (0.02)	0.01 (0.04)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	0.02 (0.02)	-0.05 ** (0.02)	0.10 *** (0.02)	0.05 *** (0.01)	-0.01 (0.01)	0.11 *** (0.02)
Dependent population <sub>t-1</sub>	-0.87 *** (0.17)	-0.85 *** (0.20)	-0.76 *** (0.24)	-0.14 (0.11)	-0.02 (0.06)	-0.23 (0.19)
Real GDP per capita <sub>t-1</sub>	0.18 ** (0.08)	0.05 (0.08)	0.36 *** (0.10)	0.24 *** (0.05)	0.03 (0.03)	0.42 *** (0.09)
Trade openness <sub>t-1</sub>	0.04 *** (0.01)	0.01 (0.02)	0.05 *** (0.02)	0.03 *** (0.01)	0.00 (0.01)	0.05 *** (0.02)
Capital openness <sub>t-1</sub>	-0.00 (0.01)	-0.00 (0.00)	-0.01 (0.01)	-0.01 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	105.12 *** (7.91)	131.08 *** (9.22)	74.89 *** (11.08)	78.27 *** (5.47)	98.54 *** (3.29)	59.71 *** (9.65)
Number of observations	200	200	200	200	200	200
Rho	0.47	0.58	0.60	0.64	0.40	0.67
Adjusted R-squared	0.989	0.993	0.981	0.996	0.998	0.988

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: Italy, Portugal, and Spain  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

**Table S11 Prais-Winsten regressions of employment, labour market participation and expenditures on social investment policies excluding Central European welfare states, 1990-2009**

	Employment to population ratio			Labour market participation rate		
	Overall (25-54)	Male (25-54)	Female (25-54)	Overall (25-54)	Male (25-54)	Female (25-54)
	S11.1	S11.2	S11.3	S11.4	S11.5	S11.6
Early childhood education and care <sub>t-1</sub>	0.18 ** (0.08)	0.03 (0.09)	0.33 *** (0.13)	0.24 *** (0.07)	0.04 (0.03)	0.42 *** (0.12)
Family policies <sub>t-1</sub>	0.03 (0.02)	0.01 (0.02)	0.06 (0.03)	0.02 (0.02)	0.00 (0.01)	0.03 (0.03)
Active labour market policies <sub>t-1</sub>	0.06 *** (0.01)	0.02 * (0.01)	0.09 *** (0.02)	0.03 *** (0.01)	-0.01 (0.01)	0.06 *** (0.02)
Care for the elderly and frail <sub>t-1</sub>	-1.99 *** (0.68)	-1.12 (0.76)	-2.66 *** (1.02)	-1.54 *** (0.55)	-0.72 * (0.38)	-2.33 ** (1.01)
Primary, secondary, and tertiary educational institutions <sub>t-1</sub>	-0.67 *** (0.15)	-1.04 *** (0.20)	-0.30 (0.20)	0.26 *** (0.10)	-0.04 (0.05)	0.52 *** (0.19)
Employment protection legislation <sub>t-1</sub>	-2.45 *** (0.63)	-1.40 * (0.72)	-3.15 *** (0.78)	-1.34 *** (0.42)	-0.22 (0.23)	-2.38 *** (0.72)
Trade union density <sub>t-1</sub>	0.20 *** (0.07)	-0.07 (0.07)	0.48 *** (0.11)	0.26 *** (0.05)	0.03 (0.03)	0.49 *** (0.10)
Bargaining level <sub>t-1</sub>	0.10 (0.13)	0.08 (0.16)	0.12 (0.20)	0.14 (0.12)	0.13 * (0.07)	0.11 (0.22)
Tax wedge <sub>t-1</sub>	0.02 (0.07)	0.08 (0.07)	-0.03 (0.10)	-0.04 (0.05)	-0.05 * (0.03)	-0.06 (0.09)
Net replacement rate unemployment benefits <sub>t-1</sub>	0.07 *** (0.02)	0.03 (0.02)	0.11 *** (0.03)	0.02 (0.02)	-0.02 ** (0.01)	0.06 * (0.03)
Net replacement rate minimum income and social assistance benefits <sub>t-1</sub>	-0.04 (0.03)	0.02 (0.04)	-0.09 * (0.05)	-0.09 *** (0.03)	-0.01 (0.01)	-0.15 *** (0.05)
Dependent population <sub>t-1</sub>	-1.22 *** (0.26)	-0.86 ** (0.39)	-1.43 *** (0.26)	-0.45 *** (0.14)	0.03 (0.08)	-0.88 *** (0.25)
Real GDP per capita <sub>t-1</sub>	0.25 ** (0.11)	0.05 (0.16)	0.48 *** (0.13)	0.30 *** (0.07)	0.03 (0.04)	0.54 *** (0.12)
Trade openness <sub>t-1</sub>	0.00 (0.02)	-0.03 (0.03)	0.04 * (0.02)	0.04 *** (0.01)	0.01 (0.01)	0.07 *** (0.02)
Capital openness <sub>t-1</sub>	-0.00 (0.00)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Constant	117.60 *** (11.52)	138.67 *** (17.72)	88.80 *** (13.25)	79.16 *** (7.05)	95.68 *** (3.97)	62.57 ** (13.56)
Number of observations	199	199	199	199	199	199
Rho	0.57	0.68	0.57	0.52	0.42	0.56
Adjusted R-squared	0.991	0.994	0.973	0.994	0.998	0.979

*Notes:* Panel-corrected standard errors in parentheses; each regression model includes country and year dummies (not presented here); expenditures on the different social investment policies are corrected for the number of targeted or potential beneficiaries and expressed as a percentage of GDP per capita; rho represents the coefficient of the autocorrelation of the error term, ranging from 0 to 1; the following welfare states are excluded: the Czech Republic, Hungary, Poland, and the Slovak Republic  
\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01

## Appendices

**Table A1 Descriptive statistics of main dependent and independent variables**

	Obs.	Mean	Std. Dev.	Min.	Max.
Total employment rate 25-54	325	77.28	6.06	58.43	91.60
Male employment rate 25-54	325	85.87	4.00	73.01	93.49
Female employment rate 25-54	325	68.67	10.14	37.08	89.63
Total labour market participation rate 25-54	325	83.52	4.98	68.50	92.81
Male labour market participation rate 25-54	325	92.09	2.22	82.95	95.56
Female labour market participation rate 25-54	325	74.95	9.37	45.44	90.86
ECEC per child aged 0-5 / GDP per capita	277	9.15	5.28	0.09	25.11
Family policies per child aged 0-1 / GDP per capita	326	19.98	13.10	0.00	56.32
ALMPs per unemployed / GDP per capita	325	24.43	19.99	2.50	156.04
Care for the elderly and frail per capita / GDP per capita	323	0.74	0.93	0.00	3.88
Educational institutions per student aged 6-24 / GDP per capita	253	14.17	3.28	6.86	21.43
Employment protection legislation	334	2.18	0.78	0.74	4.23
Trade union density	329	37.26	21.51	7.55	83.86
Bargaining level	336	2.85	1.21	1.00	5.00
Tax wedge	334	21.79	8.05	1.35	39.73
Net replacement rate of unemployment benefits	331	59.31	14.06	24.15	90.45
Net replacement rate of minimum income and social assistance	321	46.20	10.10	24.80	72.67
Dependent population	340	32.85	1.81	27.63	38.57
Real GDP per capita	339	24.61	10.46	0.91	53.02
Trade openness	339	81.83	34.59	33.98	175.14
Capital openness	327	7.83	14.42	-8.60	185.79

*Notes:* Expenditures on the different social investment policies include public and mandatory private expenditures; in case of education expenditures are from public, private and international sources



**Table A2 Casewise correlation matrix of main dependent and independent variables**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	1.00												
(2)	0.62 ***	1.00											
(3)	0.95 ***	0.35 ***	1.00										
(4)	0.87 ***	0.30 ***	0.92 ***	1.00									
(5)	0.31 ***	0.64 ***	0.12 *	0.36 ***	1.00								
(6)	0.85 ***	0.16 **	0.95 ***	0.97 ***	0.14 **	1.00							
(7)	0.45 ***	0.06	0.52 ***	0.48 ***	-0.07	0.52 ***	1.00						
(8)	0.53 ***	0.03	0.61 ***	0.59 ***	-0.06	0.64 ***	0.60 ***	1.00					
(9)	0.45 ***	0.44 ***	0.36 ***	0.23 ***	0.11	0.22 ***	0.40 ***	0.28 ***	1.00				
(10)	0.51 ***	0.11 *	0.56 ***	0.49 ***	-0.05	0.53 ***	0.76 ***	0.72 ***	0.51 ***	1.00			
(11)	0.35 ***	0.14 **	0.35 ***	0.40 ***	0.15 **	0.38 ***	0.49 ***	0.33 ***	0.34 ***	0.40 ***	1.00		
(12)	-0.06	0.19 ***	-0.15 *	-0.00	0.30 ***	-0.07	0.06	-0.12 *	0.04	-0.13 **	0.26 ***	1.00	
(13)	0.36 ***	0.05	0.41 ***	0.30 ***	-0.15 **	0.35 ***	0.57 ***	0.58 ***	0.40 ***	0.73 ***	0.33 ***	-0.20 ***	1.00
(14)	0.00	0.18 ***	-0.07	-0.10	0.14 **	-0.15 **	0.08	-0.11 *	0.38 ***	0.12 *	0.15 **	0.14 **	0.41 ***
(15)	0.15 **	-0.04	0.19 ***	0.16 **	-0.11 *	0.19 ***	0.42 ***	0.30 ***	0.44 ***	0.50 ***	0.73 ***	-0.05	0.51 ***
(16)	0.31 ***	0.33 ***	0.24 ***	0.31 ***	0.37 ***	0.24 ***	0.30 ***	0.19 ***	0.47 ***	0.33 ***	0.46 ***	0.58 ***	0.18 ***
(17)	0.14 **	0.20 ***	0.09	0.06	0.08	0.05	0.20 ***	0.28 ***	0.40 ***	0.30 ***	0.17 ***	0.07	0.42 ***
(18)	0.17 ***	0.11 *	0.16 *	0.06	0.00	0.07	0.53 ***	-0.03	0.33 ***	0.36 ***	0.33 ***	-0.03	0.43 ***
(19)	0.46 ***	0.44 ***	0.37 ***	0.26 ***	0.18 ***	0.23 ***	0.23 ***	0.01	0.36 ***	0.31 ***	0.21 ***	-0.15 **	0.21 ***
(20)	0.07	0.03	0.07	-0.01	-0.08	0.00	-0.26 ***	0.14 **	0.12 *	-0.02	-0.38 ***	-0.42 ***	0.05
(21)	0.07	0.09	0.05	0.01	-0.01	0.01	0.00	-0.04	0.13 **	0.03	-0.04	-0.08	0.16 **
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)					
(14)	1.00												
(15)	0.17 ***	1.00											
(16)	0.45 ***	0.22 ***	1.00										
(17)	0.14 **	0.35 ***	0.18 ***	1.00									
(18)	0.34 ***	0.34 ***	0.27 ***	0.10	1.00								
(19)	0.43 ***	0.10	0.22 ***	-0.01	0.25 ***	1.00							
(20)	0.21 ***	-0.13 **	-0.07	0.04	-0.33 ***	0.20 ***	1.00						
(21)	0.22 ***	0.15 **	0.07	-0.00	0.15 **	0.16 **	0.32 ***	1.00					

*Notes:* (1) Total employment rate 25-54 (2) Male employment rate 25-54 (3) Female employment rate 25-54 (4) Total labour market participation rate 25-54 (5) Male labour market participation rate 25-54 (6) Female labour market participation rate 25-54 (7) Total expenditures on ECEC per child aged 0-5 as a share of GDP per capita (8) Total expenditures on family policies per child aged 0-1 as a share of GDP per capita (9) Total expenditures on ALMPs per unemployed as a share of GDP per capita (10) Total expenditures on care for the elderly and frail per capita as a share of GDP per capita (11) Total expenditures on educational institutions per student aged 6-24 as a share of GDP per capita (12) Employment protection legislation (13) Trade union density (14) Bargaining level (15) Tax wedge (16) Net replacement rate of unemployment benefits (17) Net replacement rate of minimum income and social assistance benefits (18) Dependent population (19) Real GDP per capita (20) Trade openness (21) Capital openness

\* p < 0.1 \*\* p < 0.05 \*\*\* p < 0.01