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Vicious and virtuous cycles of female labour force participation in post-socialist Eastern Europe

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Abstract

Female labour force participation (hereinafter FLFP) trends across Eastern Europe, which were very high during communism, started to diverge substantially following its collapse. Women did not appear to benefit from the changing labour market conditions in those transition countries that pursued industrial upgrading as their strategy of economic development. On the other hand, in some small transition economies, most notably the Baltic countries, women benefited substantially from increased employment opportunities in the knowledge-intensive public and private sector services. This article seeks to explain the observed variation in FLFP rates across the region by synthesising insights from macroeconomic and comparative political economy literature. It identifies four key relationships between industrial upgrading, educational expansion and the expansion of knowledge-intensive services and examines how these factors interacted and translated into specific FLFP outcomes. The article suggests that industrial upgrading, driven by foreign direct investment, created a vicious cycle for FLFP. First of all, the upgrading led to a defeminisation of manufacturing because female labour-intensive sectors were not upgraded. Furthermore, the upgrading absorbed the budgetary resources that could have been used for educational reform and general skills formation. This lack of educational reform impeded the development of knowledge-intensive services, which would have been more conducive to the generation of female employment. The virtuous cycle of FLFP, on the other hand, occurred in those Eastern European countries that turned to reforming their educational sector towards general skills and expansion of tertiary education, with the aim of transforming themselves into knowledge economies. Such a transformation required an active social investment oriented state and an expansion of knowledge-intensive public and private sector employment. This development path created a positive causal loop for FLFP. I test these propositions quantitatively on a sample of 13 Eastern European countries.

Keywords: female labour force participation, industrial upgrading, knowledge intensive economy, social investment, capitalist diversity, Eastern Europe

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1. Introduction

Eastern European countries had the highest female labour force participation (hereinafter FLFP) rates in the world during socialism and the region was characterised by professed equal treatment of women and full gender equality (Lobodzinska, 1995). Since the onset of post-socialist transition in 1989, FLFP trends across these countries have diverged. Some of the countries in the region experienced a temporary reversal of trends due to the negative shock of transition, following which FLFP rates recovered to their pre-transition levels. For others, low FLFP became a more permanent feature of their economies. For example, Estonia and Latvia both had very high FLFP rate in 2010. The rate stood at 71.2% in both countries in 2010. In contrast, FLFP stood at 56.5% in Hungary and 50.5% in FYR Macedonia in the same year (see Graphs A-1 and A-2 in the Appendix).[1]

Literature on Eastern Europe has not yet addressed this cross-country variation in FLFP trends. While economic studies have focused on smaller groups of geographically proximate countries, political economists who have compared the different countries and sub-regions within Eastern Europe have not

[1] While the Baltic countries and the former Yugoslav Republic Slovenia saw growing economic re-activation of women during the 2000s, CEE countries were characterised by the persistently low FLFP at similar (or even higher) levels of economic development. Furthermore, while the FLFP trend in Bulgaria recovered during the 2000s, in similar fashion as in the Baltic countries and Slovenia, FLFP continued to fall in Romania. Female labour market outcomes also did not substantially improve in the former Yugoslav republics of Croatia and Macedonia as the transition progressed, while some progress was made in Serbia.

yet included FLFP into their analyses (Feldmann, 2006; Nölke & Vliegenthart, 2009; Bohle & Greskovits, 2012).

Conventional wisdom has it that *work-and-life balance* and the policies that support it should determine FLFP outcomes. The economic argument is that market forces have affected women's reservation wages[2] in Eastern Europe through mechanisms such as the rising cost of childcare and higher husband wages and that this process has resulted in lower FLFP rates (e.g. Chase, 1998). Nevertheless, the growing cost of childcare does not explain the observed cross-country variation in FLFP outcomes across Eastern Europe, since childcare costs and wages grew across the region.

In addition, looking at the relationship between FLFP and spending on childcare in Eastern Europe, Mills et al. (2014) argue that "the level of childcare usage, enrolment and public investment is actually very low", even though some of these countries have very high FLFP rates (p.42). Moreover, while Estonia has one of the highest FLFP rates in the EU, EC recommendations regarding Estonia's implementation of *Europe 2020* emphasise access to childcare as a particular problem (European Commission 2014; Official Journal, 2014). In addition, Estonia stands out as the Eastern European country with the highest number of births per woman and the highest FLFP at the end of the observed period.[3] Finally, there are no substantial differences in cultural attitudes towards female work among these countries that could account for the observed variation (Schnepf, 2006).

In addition, a growing body of empirical evidence from across the world has begun to question the nature of the relationship between women's work and their childbearing responsibilities. Billari & Kohler (2004) point towards a

[2] The lowest wage rate below which they would not be willing to work.
[3] The variation in number of births per woman across the countries is not as high as the variation in FLFP.

changing relationship between fertility and female work in Europe, as fertility at lower numbers of births-per-woman stops being an impediment to female economic activation. McCall & Orloff (2005) remind us that earlier feminist efforts to link social policy to female employment levels are being increasingly challenged by the growing emphasis on competitive demands in the new economy as the drivers of female employment (p.160). Humphries & Sarasúa (2012) argue that women have always historically worked when they have had the opportunity to do so, i.e. when jobs have been available. Fernández (2013) argues that cultural beliefs about women's work and FLPF are in fact co-determined by wages and job opportunities. In other words, there is a growing emphasis on understanding how economic restructuring and the changes in labour demand that are associated with it shape FLFP.

Nevertheless, there remain a number of unknowns. *Macroeconomic literature* does not specify the precise mechanisms through which economic restructuring and the policies associated with it interact and translate into specific FLFP outcomes. For example, it is well recognised that public sector employment plays an important role in boosting women's labour force participation (Psacharopoulos & Tzannatos, 1992; Gornick & Jacobs, 1998; Anghel, Rica & Dolado, 2011). At the same time, public sector employment as a determinant of FLFP is not conceptually integrated with economic studies that examine the positive impact of the expanding service economy on FLFP (Goldin, 1995; Gaddis & Klasen, 2014). Integration of these two accounts is important because the service economy has often expanded in parallel with public sector retrenchment.

Moreover, macroeconomic literature is not clear about the impact of manufacturing on FLFP. Some studies point to the positive role that manufacturing has played in women's employment in the developing world, despite the low skill, low wage foundation of such work (Gaddis & Pieters, 2012). Other em-

pirical evidence indicates that industrial upgrading in manufacturing has led to women's exit from the sector (Tejani & Milberg, 2016). Finally, while employment in the more complex industries as well as in the public sector requires a workforce with higher educational attainment, the interaction between educational attainment and structural change, and its combined impact on FLFP, has not been examined.

The comparative political economy (hereinafter CPE) literature on skill formation, expansion of the service economy and social investment[4], on the other hand, has thrown more light on the linkages between industrial upgrading, educational attainment and expansion of services, thus allowing me to develop hypotheses about the relationships between these variables and FLFP in Eastern Europe.

CPE literature has shown that countries produce the types of skills that complement their production systems and that these skill regimes reproduce gender biases. Estevez-Abe (2005) argues that specific skills regimes which are characteristic of countries that specialise in manufacturing have an adverse impact on women's employment opportunities. On the other hand, general skills regimes, characteristic of countries that have a comparative advantage in high-tech and services, promote female employment.[5] This is because turnover is costlier for employers who invest in firm-specific training, so interruptions from work are not as desirable in a specific skills regime as in a general skills regime. Since women's interruptions from work are more predictable than men's, due to childbearing and family reasons, employers rationally dis-

[4] Policies designed to strengthen people's skills and capacities and support them to participate fully in employment and social life. Key policy areas include education, childcare, training, job-search assistance and rehabilitation.

[5] Specific skills are acquired through on-the-job training (firm-specific) or through apprenticeship and vocational schools (industry-specific). They are valuable to the employer / industry which carried out the training but not to other employers / sectors. General skills, gained through formal education from high schools and colleges, are recognised by all employers and carry a value that is independent of the type of firm or industry.

criminate against women in hiring, training, and promotion. In response to this discrimination, women do not have the incentive to invest in specific skills so they specialise in family work. In contrast, women's incentives to work are higher in countries which specialise in services and which thrive on general skills, because labour market opportunities are more flexible rather than tied to entry and exit from a single firm or industry.

Demand for female labour is also closely tied to the demands of the 'new' economy and the types of state policies associated with them. Thelen (2014) argues that a country's focus on social investment oriented policies (e.g. provision of education and training for all kinds of people at all stages in life),[6] which is associated with Scandinavia and even the Netherlands, leads to both greater economic efficiency and reduction of gender inequality in the labour market. Furthermore, following the information and communication technology (hereinafter ICT) revolution and productivity gains in the service economy that stemmed from it, a new consensus is starting to emerge around the notion that women are benefiting from economic liberalisation and increased opportunities for employment in the expanding knowledge economy, because of the growing premium on communication and social skills (Wren, Fodor & Theodoropoulou, 2013; Nelson & Stephens 2013).

I use these insights from the CPE literature on skills and the rise of the new economy in advanced capitalist economies to hypothesise the drivers of cross-country variation in FLFP in Eastern Europe. According to Bohle & Greskovits (2012), Eastern European countries embarked on different trajectories of capitalist development – while some pursued industrial upgrading, others focused on the services sector oriented economic liberalisation. I also

[6] The focus of social investment policies is on the reduction of labour market vulnerability of individuals. This is achieved through investment in people's human capital from early childhood rather than through passive social insurance later in life.

hypothesise something that has not yet been discussed in the Eastern European literature – that the services-oriented economic liberalisation trajectory, which was especially pronounced in the Baltic countries, has been knowledge-intensive and has gone hand-in-hand with the implementation of social investment policies, expansion of general skills and tertiary educational attainment, as well as higher public sector employment.

In this context, I propose two stylised trajectories for FLFP in Eastern Europe – *a vicious cycle* – based on the pursuit of industrial upgrading and heavily supported by the government-led industrial policy, and *a virtuous cycle* – based on government-led social investment into education and development of knowledge-intensive services.

The vicious cycle of FLFP unravels in the context of industrial upgrading driven by foreign direct investment (hereinafter FDI). First of all, the upgrading lead to a defeminisation of manufacturing because female labour-intensive sectors are not upgraded. Furthermore, the upgrading absorbs the budgetary resources that could have been used for educational reform and general skill formation. This lack of educational reform impedes the development of knowledge-intensive services, which would have been more conducive to the generation of female employment.

The virtuous cycle of FLFP, on the other hand, occurs in Eastern European countries that turn to reforming their educational sector towards general skills and expansion of tertiary education, with the aim of transforming themselves into knowledge economies. Such a transformation requires an active social investment state and growth of knowledge-intensive public and private sector employment, which provides greater employment opportunities for women.

The structure of the article is the following. The next section presents my the-

oretical framework on the drivers of FLFP in Eastern Europe, depicts the relationships between the variables and traces the hypothesised causal mechanisms. Section 3 presents the results of the econometric analyses which test the relationships depicted in section 2, while section 4 concludes.

2. Theoretical framework

2.1 Relationships between the variables

This section brings together the proposed relationships between FLFP (ΔL), industrial upgrading (ΔK), educational expansion (ΔE) and knowledge-intensive services (ΔS). The theorised relationships are summarised into equations and then illustrated in the 4-quadrant diagram, which is presented in Figure 1 in section 2.2 below.

The hypothesised relationships between the four variables can be expressed in the following four equations:

(1) $\Delta L = f_1(\Delta K, X)$

(2) $\Delta L = f_2(\Delta S, Y)$

(3) $\Delta E = g(\Delta K, Z)$

(4) $\Delta S = h(\Delta E, W)$

X, Y, Z and W are the exogenous variables affecting these relationships. They are discussed in Table A-1 in the Appendix.

Equation (1) depicts FLFP as a function of industrial upgrading K. The relationship between industrial upgrading and FLFP is based on insights from

Tejani & Milberg (2016) and the history of occupational segregation within manufacturing in Eastern Europe during socialism (Lobodzinska, 1995). Following this literature, I hypothesise that FLFP and industrial upgrading are inversely related. The more industrial upgrading takes place, the fewer women participate in the labour market, ceteris paribus. This is because industrial upgrading has been shown to have a negative impact on female employment in manufacturing in Southeast Asia and in Latin America (Ghosh, 2001; Tejani & Milberg, 2016). While female employment was high during socialism in light labour-intensive industrial sectors, I hypothesise that those Eastern European countries that followed the industrial upgrading trajectory have dismantled a significant share of light female-labour oriented manufacturing, which has led to the defeminisation of manufacturing labour. A second mechanism through which female manufacturing employees could have lost out from industrial upgrading is that women held many auxiliary non-production jobs in manufacturing companies and these positions could have been cut or outsourced in the process of privatisation and company restructuring (Lobodzinska, 1995).

While both of these mechanisms could have simultaneously affected the relationship in the same direction, there are strong indications that occupational segregation has been the main driver of defeminisation of manufacturing in Eastern Europe. This is because gender-based segregation by sectors of employment has been pervasive across the world historically (Bettio & Verashchagina, 2009, p.7) and because industrial sectors where female employment is pervasive are textile, footwear and leather (ILO, 2014). Communist countries in Eastern Europe, although known for their high engagement of women in industrial employment, have not been immune to this gender segregation in the sectoral distribution of labour (Lobodzinska, 1995, p. 23).

It is also plausible to hypothesise a positive relationship between FLFP and industrial upgrading, based on the 'nimble fingers' hypothesis (Elson & Pearson, 1981) and the vast amount of empirical work that has stemmed from it, particularly from Asia. Nevertheless, as Ghosh (2001) points out, proliferation of female employment in manufacturing across the developing world during the period 1980-1995 was dependent on relative inferiority of remuneration and working conditions for women. As soon as wages and conditions started to improve and the manufacturing became more complex, capital and skill intensive, women across Asia stopped benefiting from employment in these sectors.

Therefore, given the initial levels of manufacturing complexity, skill intensity and income levels in Eastern Europe, which were higher than in East and Southeast Asia even during the early stages of transition, I posit that the type of industries that expanded via industrial upgrading in Eastern Europe were not the female labour-intensive ones and that women lost out from these processes in the region. In other words, over a larger range of industrial upgrading scenarios, the relationship between industrial upgrading and FLFP can be thought of as inverse U-shaped – women benefit from industrial upgrading in the beginning, until complexity and wages reach a level where defeminisation begins.

Equation (2) depicts FLFP as a function of knowledge-intensive services, where the relationship between the two variables is positive. [7] The hypothesised direction of this relationship is based on numerous evidence on how the knowledge economy and the expan sion of high productivity service employment has boosted female employment across the western world (Rubery, 2009; Walby, 2011; Nelson & Stephens 2013; Thelen, 2014). The knowledge-

[7] For a discussion of the exogenous variables *Y* that are affecting this relationship, see Table A-1 in the Appendix.

intensive services include both private and public sector jobs, because public investment in people's skills and capacities has been shown to stimulate the development of the knowledge economy (Wren, Fodor & Theodoropoulou, 2013; Thelen, 2014). Low skill services are not included in this equation because the focus of the most recent CPE literature has been on the emergence of the knowledge economy which, due to the ICT revolution and tertiary educational expansion, has generated the majority of new service employment (Wren, Fodor & Theodoropoulou, 2013).

Equation (3) depicts educational expansion, defined as a shift away from industry or firm specific towards general skills, as a function of industrial upgrading and other exogenous variables Z (see Table A-1 in the Appendix). I hypothesise that the relationship between industrial upgrading and educational expansion is inverse so that the demand for specific skills in those Eastern European countries that have pursued industrial upgrading is higher than the demand for general skills and vice versa. This hypothesis is based on insights from the CPE literature on skill formation. In this literature, Central and Eastern Europe[8] (hereinafter CEE) is perceived as having a comparative advantage in the production of complex goods because of their skilled but cheap manufacturing labour (Nölke & Vliegenthart, 2009). Furthermore, because multinational companies (hereinafter MNCs) have been the main source of innovation in CEE where domestic innovative activity is low, empirical evidence from the region indicates that these severely fiscally constrained governments[9] have not prioritised investment in general-skills oriented tertiary education nor in research and development (Nölke & Vliegenthart, 2009).

[8] Hungary, the Czech Republic, Poland and Slovakia

[9] These governments are fiscally constrained because of the substantial expenditure on subsidies in order to attract FDI and significant social and political pressure to compensate losers of transition, coupled with strict fiscal discipline imposed on them by the EU.

While I propose a negative linear impact of industrial upgrading on educational expansion, a U-shaped relationship between the two variables can also be conceived. As countries use their resources to attract FDI, educational expansion is not a top policy concern. But as the complexity of the country's production processes grow and it moves towards higher VA manufacturing, these industries may start demanding a greater number of specialised higher education graduates. This may lead to the expansion of higher education even in a fiscally constrained country, as private providers enter the market in response to these new labour market demands. Nevertheless, such expansion of specialised higher education is conceptually different from the state-led expansion of general skills oriented higher education.

On the other side of the spectrum, I hypothesise that government-driven expansion of general skills and tertiary education was an alternative development strategy to industrial upgrading and would have taken place in those countries that did not benefit from industrial upgrading. This argument is based on insights from Bohle & Greskovits (2012), who argue that the Baltic states pursued general skill educational expansion as an alternative to industrial upgrading.

Equation (4) shows that knowledge-intensive services,[10] which include highly skilled service jobs in the public and the private sector, are a function of educational reform and other exogenous variables *W* (see Table A-1 in the Appendix). The proposed relationship is based on the following logic: educational expansion leads to more public and private sector knowledge-intensive service employment. In the public sector, we can expect that employment in

[10] The following economic activity sectors are defined as knowledge intensive services: i) high-tech knowledge-intensive services (e.g. programming, telecommunications, scientific research and development and consultancy), ii) knowledge-intensive market services excluding financial intermediation and high-tech services (such as transport, legal and accounting services, advertising and market research), iii) knowledge-intensive financial services and iv) other knowledge-intensive services (such as publishing, public administration, education and health) (NACE Rev.2 codes - 2-digit level between brackets). The complete list can be found in Appendix A.3.1.

educational institutions as well as a stronger social investment state is the result of a greater amount of public resources devoted to educational expansion. While a traditional welfare state relies on passive cash payments, the social investment state, though it is less expensive in terms of total expenditure, relies on more public employment to provide services that support educational expansion. We know from literature that public sector employment disproportionately benefits women (Anghel, Rica & Dolado, 2011; Ansell & Gingrich, 2013). Recent empirical evidence relating to private sector employment shows that public investment in educational expansion, social investment and R&D leads to the expansion of both public and private sector knowledge-intensive service jobs, while absence of investment produces only new low skill low wage service jobs (Nelson & Stephens, 2011; Nelson & Stephens, 2013; Thelen, 2014).

Mellander & Florida (2012) draw our attention to the possibility of reverse causality between these two variables by arguing that the existence of firms that require 'knowledge workers' could be driving skill formation in a country (p.4). Nevertheless, in the case of post-socialist Eastern Europe, Bohle & Greskovits (2012) emphasise initial government efforts to attract foreign investors – investment in educational expansion in the case of the Baltic states and industrial subsidies to upgrade its industry in the case of CEE. Furthermore, Mellander & Florida (2012) conclude that this is a classic case of interaction between the demand for skills and their supply which can never be fully resolved theoretically or empirically. Therefore, they argue, the dynamics between educational supply and the knowledge economy should not be analysed as a chicken and egg question. It is a lot more important to understand how these two phenomena interact to produce public and private sector knowledge-intensive service jobs and how that translates into economic growth (p.4-5).

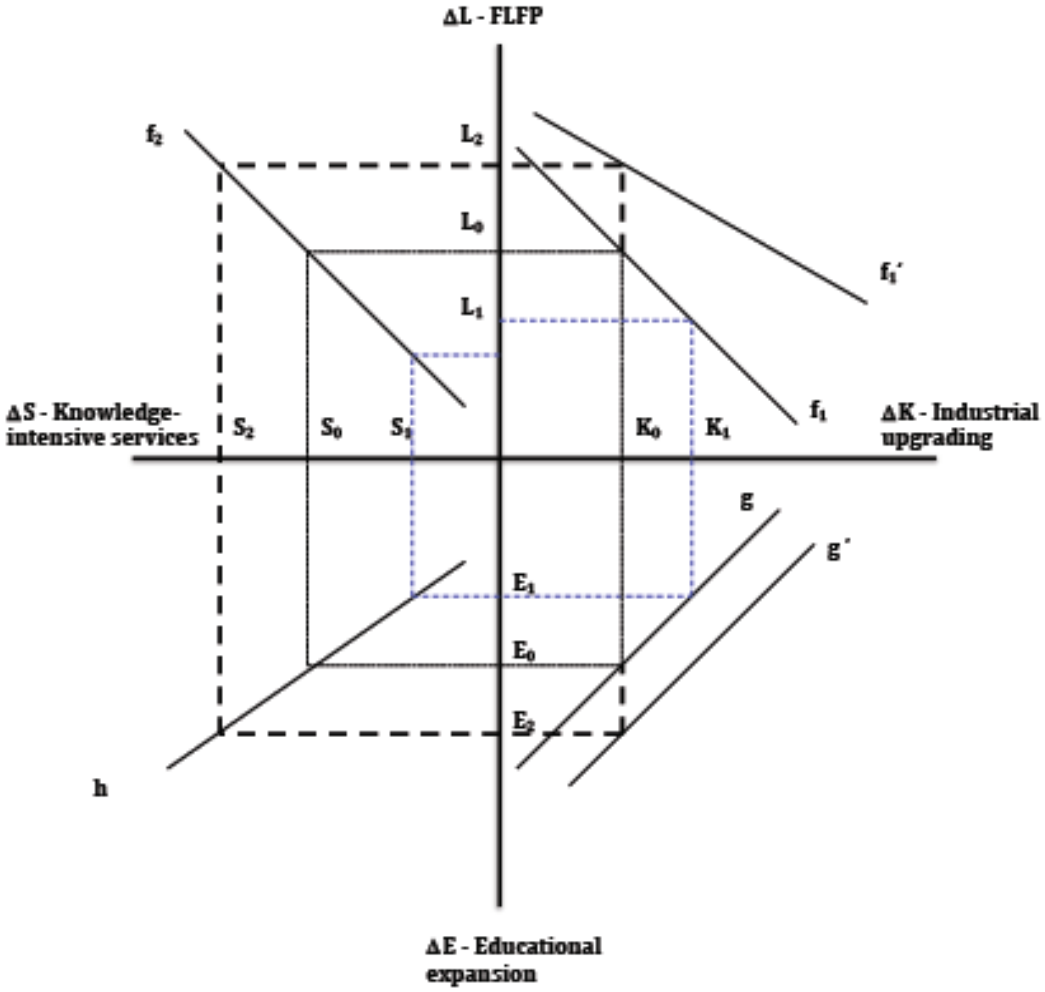
Given these insights, the model proposes a sequential relationship, where educational expansion leads to the expansion of knowledge-intensive services, which in turn positively affects FLFP (as specified in Equation 2). Nevertheless, I empirically test these relationships by treating educational expansion as an intervening variable that determines the extent to which knowledge-intensive services contribute to FLFP. This is because I acknowledge the complex causality between these two variables, which is difficult to reduce to linear one-way relationships.

2.2 The causal mechanisms

The diagram presented in Figure 1 below depicts the discussed relationships between FLFP (ΔL), industrial upgrading (ΔK), educational expansion (ΔE) and knowledge-intensive services (ΔS). This is a stylised model so the direction of the depicted relationships is more important than their magnitude.

The negative causal mechanism that the model depicts is as follows: Initially, while a country's competitive advantage lies in light, labour-intensive manufacturing such as textiles, women benefit from manufacturing employment. Starting in the NE quadrant of Figure 1, a movement down the f_1 curve takes place and industrial upgrading increases from K_0 to K_1. This affects FLFP negatively so it decreases from L_0 to L_1. This event, ceteris paribus, produces an upward movement along the g curve, depicted in the SE quadrant, so that E_0 shifts to E_1. The way this shift should be interpreted is that educational reform towards general skills loses support and there is disproportionately more demand for vocational education and specific skills. This shift from E_0 to E_1 leads to an upward movement along the h curve so that knowledge-intensive services are reduced from S_0 to S_1.

Figure 1. Model of female labour force participation, industrial upgrading and service transition



The mechanism whereby there is a reduction in knowledge-intensive services is as follows: At any given level of educational attainment, there is a certain level of knowledge-intensive services. If a country wants to stimulate knowledge-intensive services, it has to invest more in educational expansion. However, as industrial upgrading takes place, there is both more demand for specific skills and fewer resources for educational expansion, so the development of the knowledge economy stalls while manufacturing jobs become relatively more attractive. This negative loop results in an even lower new equilibrium for *L*. Women do not react to these employment losses politically because collective action is very hard to organise for the unemployed, so women become even further socially marginalised.

The positive causal mechanism operates as follows: Stagnation of industrial complexity (or absence of industrial upgrading) puts pressure on the country's economic growth model, so it starts with educational expansion to boost its economy. This is depicted as an outward shift of g to g' in the SE quadrant, which occurs due to the exogenous impact of new government spending on education. This shift results in E_0 increasing to E_2. This, in turn, increases the level of S_0 to S_2 as knowledge-intensive services expand which raises L_0 to L_2 as FLFP expands. Such expansion of FLFP results in the outwards shift of f_1 to f_1' because the relationship between FLFP and industrial upgrading is redefined once a larger share of those employed work in the service economy, since now at any level of industrial upgrading FLFP will be higher. f_1' is also less elastic because the link between women's position in the labour market and industrial upgrading is weakened, as the service economy expands and there are more employment opportunities outside manufacturing. Finally, since manufacturing has not been upgraded, low-skilled women continue to benefit from employment in light industry.

These two stylised causal mechanisms show how a self-reinforcing vicious or virtuous cycle of gender equality in labour market opportunities can develop in a country depending on whether its development trajectory is oriented towards industrial upgrading or knowledge-intensive services. They are posited as mutually exclusive, following the axiomatic logic of CPE literature on capitalist diversity in Eastern Europe (Feldmann, 2006; Nölke & Vliegenthart, 2009; Bohle & Greskovits, 2012). I am assuming that a country that is following the path of industrial upgrading cannot concurrently pursue the development of the knowledge economy and vice versa. Institutional complementarities that support the development of one trajectory develop, which are further reinforced by the Eastern European post-socialist context of tight budget-

ary restraint and dependence on foreign capital, reduce the agency of domestic actors and make them strongly path dependent.

While I argue that the implementation of concurrent trajectories of re-industrialisation and knowledge economy development were not possible in the specific context of Eastern European transition, there may be a possibility for convergence between the two development trajectories in the longer run. The story of capitalist development in Eastern Europe would, in that case, become a story about the best way of sequencing re-industrialisation vs knowledge economy oriented economic reforms and the socio-economic outcomes, such as levels of FLFP, that are associated with them, rather than the question of choosing one path vs the other.

3. Testing the theoretical framework

The empirical robustness of the model is tested on a sample of 13 Eastern European countries during the period 1997-2008. I use several econometric specifications in order to test the following relationships them stem from the model:

i) industrial upgrading and FLFP, represented in the NE quadrant of Figure 1;
ii) industrial upgrading and educational expansion, represented in the SE quadrant of Figure 1;
iii) knowledge-intensive services and FLFP, represented in the NW quadrant of Figure 1;
iv) knowledge-intensive services and educational expansion, represented in the SW quadrant of Figure 1.

The relationship between knowledge-intensive services and educational expansion is analysed as an extension of the analysis on the relationship between knowledge-intensive services and FLFP, because my framework posits that educational expansion is the intervening variable that affects the extent to which knowledge-intensive services contribute to FLFP.

3.1 Data, variables and method

In order to test the four sets of relationships presented in Figure 1, I use Eurostat's data on FLFP and employment by sectors of economic activity disaggregated by gender, which is based on household level Labour Force Surveys (hereinafter LFS) from the respective countries. Summary statistics on the variables used in this analysis are shown in Table A-3 in the Appendix.

For most countries in my sample an uninterrupted time series of employment by sector of economic activity is available for the maximum period from 1997 to 2008. The break in Eurostat's NACE classification of economic activities[11] came in 2008, the year when the Great Recession began. Nevertheless, this is not an issue for the empirical analysis because the complex effect of the crisis on the labour markets will not confounded with the 'transitional' causal mechanisms posited in the theoretical framework.[12] Additionally, LFS data is more reliable after 2000 because, by then, Eastern European countries in my sample had fully synchronised their datasets with EU standards.

Based on this Eurostat definition of sectors that are classified as knowledge-intensive services (see Table A-2 in the Appendix), I create an aggregate estimate of employment in knowledge-intensive services, which include all pub-

[11] The acronym is derived from the French *Nomenclature statistique des activités économiques dans la Communauté européenne*.

[12] The drawback of using sectoral employment data before 2007 is that the reclassification of NACE activities came only during 2007-8. Therefore, I am not able to separate knowledge-intensive sectors from the rest of the service economy as precisely as it would have been desirable.

lic services (public administration, education, health and social services) as well as high productivity private services, such as financial intermediation, real estate and transportation services. In addition, because knowledge-intensive services are expected to have a higher value added (hereinafter VA) than other services, I include the share of services in VA (percentage of GDP) obtained from the World Bank's World Development Indicators database as an alternative measure of the size of the knowledge-intensive service economy. Furthermore, following Eurostat's definition and insights from CPE literature, I account for both public and private sector components of knowledge-intensive services and analyse them both together and separately.

Because of the variation in employment-to-population ratios across the countries in my sample, I include a measure of the share of employees in a specific sector as a share of the total working age population, in addition to their share in total employment. This is because two countries can have identical shares of employees in manufacturing out of all employees, but when the overall employment-to-population ratio is much lower in one country, that indicator hides the fact that a significantly lower portion of working age people work in manufacturing in that country. I calculate these 'share of the working age population' indicators for the different sectors by dividing the number of employees in a sector with the total working age population (or the number of female employees in a sector with the total number of working age women). The additional benefit of including this alternative specification of the variables is that it accounts for the full variation in gender gaps in labour force participation, which are not always fully compatible with the variation in FLFP.

As a measure of industrial upgrading, I choose the Economic Complexity Index (hereinafter ECI) constructed by Hausmann et al. (2011). The basis for ECI is the quantity and complexity of exported goods and the frequency of ex-

ports. Services and non-export goods are not included in the index.[13] Furthermore, this index was developed because of the inadequacy of existing measures to capture the different components of industrial upgrading and it has already been used in its current format in econometric models which estimate structural change and economic growth (Hausmann et al., 2011).

When it comes to educational expansion, there is no agreement in the literature on how to measure the bias towards general or specific skills in an economy. A vast array of indicators have been used to determine a country's skill regime while the human capital literature has focused on the quantification of educational attainment (see Martinaitis, 2010 for overview). Because specific skills are associated with vocational training while general skills are associated with tertiary education, using measures such as the share of the total population as well as the share of women with tertiary educational attainment can also act as approximations of general skills education. Furthermore, Nelson & Stephens (2011) measure social investment in education by levels of tertiary educational attainment and educational expenditures. This is also why I use the term 'educational expansion' although I am also referring to the movement towards general skills education. I also analyse the share of spending on education as a percentage of GDP because I assume that Eastern European countries which inherited specific skill regimes from communism had to invest more in their education in order to re-direct their educational systems towards general skill regimes. All the data on educational trends are obtained from Eurostat.

The econometric analyses of the relationships posited in the model are conducted on a time-series cross-section (hereinafter TSCS) dataset. I run the or-

[13] While ECI is highly correlated with the United Nations Conference on Trade and Development (UNCTAD) data on the skill content of exports, it aggregates the low vs medium vs high skill components of such data into one non-monetary measure, which combines the total value of exports with their content.

dinary least squares (hereinafter OLS) estimates with panel-corrected standard errors (hereinafter PCSE), following Beck & Katz (1995). The PCSE OLS is the most robust OLS estimator for panel data and it measures the relationship between the variables by taking into consideration both cross-country and over time variation. I also include the OLS estimates with fixed effects (hereinafter FE), which assess the variation within individual countries only, by controlling for time invariant country specific effects. I am interested in both cross-country and within country trends because my argument posits diverging trajectories across the countries in my sample. Additionally, my sample of 13 countries over the time span of 10 or less years is rather small, so variation within individual countries may not be sufficient to produce meaningful within country estimates.

While explaining diverse empirical outcomes across only 13 Eastern European countries makes it difficult to draw strong conclusions from econometric analyses alone, exploring a limited range of cases is particularly relevant for the CPE scholarly community, because its members are interested in being able to compare country cases rather than analyse average cross-country effects (Shalev 2007, p.264). In fact, Shalev (2007) argues that by keeping the cases visible the researcher is directly catering to the needs of CPE researchers.

3.2 Industrial upgrading and defeminisation of manufacturing employment

H1: *Industrial upgrading leads to defeminisation of manufacturing.*

H2: *Industrial upgrading has a negative impact on FLFP.*

According to my theoretical framework, industrial upgrading affects FLFP both directly and indirectly. Directly, it leads to the defeminisation of manufacturing which, ceteris paribus, reduces the share of women in industrial labour. In practice, the net loss of female jobs in manufacturing will depend on whether defeminisation is taking place at a faster pace than the creation of new jobs in manufacturing, particularly during the initial stages. Nevertheless, I expect that the more complex the manufacturing, the more technology intensive it becomes and the less new jobs are created in the sector, so the negative effect of defeminisation on female labour prevails in the longer run.

The proposed indirect effect that industrial upgrading has on FLFP in my model is based on the following line of reasoning that was presented in section 2: industrial policies such as company subsidies which were pursued by countries aiming to attract industrial FDI, global tax competition (Appel, 2011) and political pressures to compensate losers from these processes (Vanhuysse, 2006), created fiscal constraints which had to be contained due to pressures for macroeconomic stability from the EU (Appel, 2011; Bohle & Greskovits, 2012). Such circumstances did not allow for educational expansion towards general skills, which would have increased occupational mobility of labour towards the knowledge economy, or expansion of public employment, which would have favoured women.

In order to test H1, I estimate two specifications for each of the following econometric models:

$$DFEMSHARE_{it} = \beta_0 + \beta_1 ECI_{it} + \beta_2 X'_{it} + \mu_{it} \quad (1)$$

$$DFEMSHARE_{it} = \beta_0 + \beta_1 ECI_{it} + \beta_2 ECI^2_{it} + \beta_3 X'_{it} + \mu_{it} \quad (2)$$

where $DFEMSHARE_{it}$ is a measure of feminisation of manufacturing employment in country i in year t.[14] ECI_{it} is a measure of industrial upgrading in country i in year t, while ECI^2_{it} represents its squared form. I include the squared form of the main independent variable to check for the possibility of an inverse U-shaped relationship between the level of economic complexity and women's employment in manufacturing. X_{it} is the vector of control variables, the error term is represented by μ_{it} and the betas are the parameters to be estimated. When using the FE estimator, a δ_t term, which represents time-specific fixed effects, is also added to the equations.

Following econometric standards, I include GDP per capita as a control variable. GDP per capita has a correlation coefficient of 0.75 at 1% significance with the level of economic complexity. This relatively high level of correlation between the two variables may result in multicollinearity, where GDP per capita takes away some of the predictive power of my independent variable. Therefore, I show the results of my estimates with and without this control. Some of the other possible variables that would affect the proposed relationship, such as occupational segregation, are not available for these countries in a time series format so I do not include them. Nevertheless, by including FE in my econometric specifications, I control for all country-specific characteristics that do not vary over time. The caveat of my FE estimates, however, is that the small sample size may not allow for enough variation within the countries to produce significant estimates.

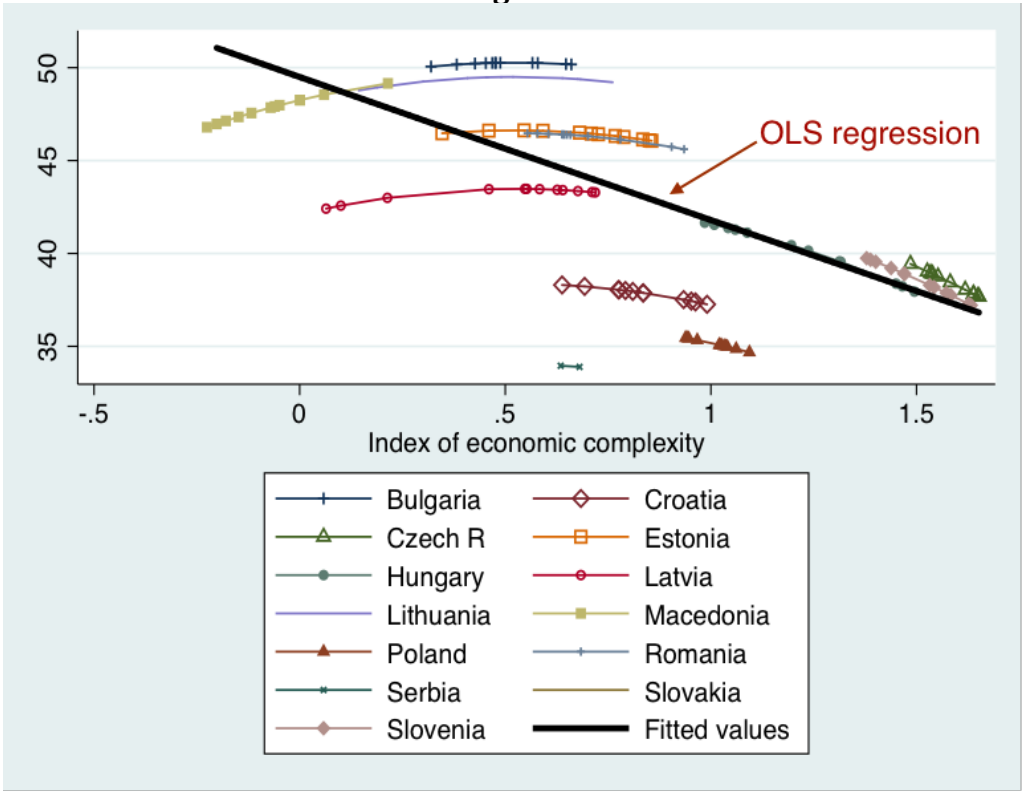
The PCSE OLS estimates indicate a linear negative effect of industrial upgrading on the share of women in manufacturing, which is preserved even when the quadratic specification of the independent variable is included, as well as when GDP per capita is included (see Table A-4 in the Appendix). R^2 is also

[14] D is the letter used for manufacturing in Eurostat's NACE classification.

substantial which indicates that this model has substantial explanatory power even without the inclusion of the additional variables. This result confirms H1 by indicating that both across the countries and over time, increases in economic complexity have led to the defeminisation of manufacturing.

On the other hand, the explanatory power of the FE model is significantly increased when I include the quadratic term of the independent variable, and even further when GDP per capita is included. The FE estimates therefore indicate an inverse U-shaped relationship between the level of economic complexity and the share of women in manufacturing within countries. This inverse U shape also supports the findings from PCSE OLS that industrial upgrading in the longer run leads to defeminisation of manufacturing. Therefore, the FE estimator also confirms H1.

Graph 1. Predicted values of female share in manufacturing: FE using LSDV with fitted values from the OLS regression



The results of the econometric estimates from Table A-4 that can be found in the Appendix are visualised in Graph 1 I run the FE estimates from model 6[15] using the least squares dummy variable estimator (hereinafter LSDV) in order to produce the graph. This is an alternative method to run the FE regression, which produces identical results as the OLS. It allows the generation of specific coefficients for each country, which can then be compared visually. While the within country estimates suggest slight inverse U-shaped trajectories, cross-country estimates indicate a linear downward sloping trajectory of female share in manufacturing over the growth in economic complexity, which is especially pronounced in CEE and in Slovenia. This empirical analysis offers robust evidence that industrial upgrading negatively impacts the share of women in manufacturing, leading to the sector's defeminisation. Therefore, I confirm H1.

Nevertheless, the main purpose of my theoretical framework is to analyse the extent to which these structural shifts within manufacturing affect overall FLFP rates. I therefore estimate the following econometric models in order to test H2:

$$FLFP_{it} = \beta_{0i} + \beta_1 ECI_{it} + \beta_2 X'_{it} + \mu_{it} \quad (3)$$

$$FLFP_{it} = \beta_{0i} + \beta_1 ECI_{it} + \beta_2 ECI^2_{it} + \beta_3 X'_{it} + \mu_{it} \quad (4)$$

where $FLFP_{it}$, is a measure of FLFP in country i in year t, while the other terms are as specified in the previous two equations.

Apart from GDP per capita as the control variable, I also include the share of knowledge-intensive service employment in the total working age population as a determinant of FLFP rates. This is because it is a large sector, which ac-

[15] Because coefficients in model 2 are not significant.

cording to my theoretical model exercises a significant influence on FLFP rates.

Table 1 shows the results of the linear estimates for the entire sample of countries. While the first PCSE model, which does not include the control variables, suggests a positive relationship between the level of economic complexity and FLFP, the inclusion of the control variables results in the tracing of a negative relationship between FLFP and the level of economic complexity in the PCSE OLS models.

Table 1. Economic complexity and FLFP (15-64): econometric estimates, all countries 1997-2008

	(1)	(2)	(3)	(4)	(5)	(6)
	PCSE	**FE**	**PCSE**	**FE**	**PCSE**	**FE**
Economic complex	3.306	3.156	-1.935	0.231	-3.894	0.613
	(6.77)***	(2.57)**	(5.41)***	(0.13)	(4.52)***	(0.35)
KIS pop			0.743	0.340	0.628	0.601
			(9.57)***	(2.19)**	(8.05)***	(2.31)**
GDP pc					0.559	-0.519
					(4.70)***	(1.25)
_cons	57.439	57.567	46.540	53.455	48.022	49.990
	(113.40)***	(54.44)***	(26.02)***	(19.39)***	(26.93)***	(12.81)***
R^2	0.08	0.05	0.35	0.07	0.38	0.09
N	146	146	120	120	120	120

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

The estimates with FEs, on the other hand, lose all significance when control variables are included. This is a disappointing result, but the caveat of my FE estimates is the short time series, which may not allow for enough variation in both economic complexity and the control variables within the countries that could lead to significant estimates. However, the estimations indicate a significant positive effect of knowledge-intensive service employment on FLFP, both across and within the countries, which is in line with my theoretical model. In fact, because of the concurrent effects of knowledge-intensive service employment and economic complexity on FLFP, knowledge-intensive

service employment as a control variable may be absorbing a portion of the effect of economic complexity on FLFP within the countries. This is possible due to the indirect effect of industrial upgrading on FLFP, where industrial upgrading has a negative impact on educational expansion and consequently on knowledge-intensive services. The positive coefficient for the effect of knowledge-intensive service employment on FLFP indicates that the slower expansion of knowledge-intensive services, which I argue is caused by industrial upgrading, may be impeding the growth of FLFP.

Finally, estimates of the model with the quadratic specification of the level of economic complexity are not included, because none of the coefficients are significant. This indicates that there is no quadratic relationship between economic complexity and FLFP across or within the countries in my sample.

In summary, cross-country evidence on the negative impact of industrial upgrading on FLFP generates substantial evidence in favour of H2. Nevertheless, due to the weaker within country evidence that stems from this analysis, in the subsequent sections I examine the relationships between industrial upgrading and educational expansion, as well as between educational expansion and the effect of knowledge-intensive services on FLFP. This is in order to determine whether industrial upgrading could also be exercising its indirect effect on FLFP through that causal mechanism. Showing the presence of that additional causal mechanism would strengthen the conclusion from this section that industrial upgrading impedes the growth of overall FLFP, and not only female employment in manufacturing.

3.3 Industrial upgrading and educational expansion

H3: *Industrial upgrading inhibits educational expansion.*

In order to test H3 econometrically, I estimate two specifications for each of the following models:

$$EDU_{it} = \beta_0 + \beta_1 ECI_{it} + \beta_2 X'_{it} + \mu_{it} \quad (5)$$

$$EDU_{it} = \beta_0 + \beta_1 ECI_{it} + \beta_2 ECI^2_{it} + \beta_3 X'_{it} + \mu_{it} \quad (6)$$

where EDU_{it} is a measure of educational expansion in country i in year t, while the other variables are the same as specified in the previous section. I specify educational expansion as the share of population with tertiary educational attainment, and alternatively, as expenditure on education as a share of GDP.

I also use the alternative specification of the dependent variable – expenditures on education as a share of GDP – assuming that countries that pursue educational expansion have to invest in their educational systems. Nevertheless, Castelló-Climent & Hidalgo-Cabrillana (2010) warn of the difficulty of drawing conclusions from data on educational expenditures, because such numbers suffer from substantial interpretational problems. For example, it is difficult to measure private investment in education. Countries also vary according to their demographics, so countries that educate more usually spend less on a per capita basis. Therefore, I do not include a measure of spending per student in my analysis and I take the results from the analysis of educational expenditures as a share of GDP with a grain of salt.

When it comes to economic complexity, I include the squared form of ECI because I want to check for the possibility of a U-shaped relationship between economic complexity and educational expansion. This is in line with the expectations of the macroeconomic human capital literature (Castelló-Climent & Hidalgo-Cabrillana, 2010), which argues that expansion of tertiary education may be a 'natural' effect of economic development. In other words, I posit

that countries may reach a level of economic development via industrial upgrading at which: i) they can afford more investment in education than was the case in the earlier stages of re-industrialisation which was characterised by budgetary restraint; and/or ii) the growing demand for tertiary education as the economy becomes more complex would create a private supply of education. In fact, a recent PhD thesis by Tarlea (2015) indicates the presence of the latter mechanism in CEE. She shows that over the last few years, demand for tertiary education in CEE has risen because of growing MNC skill needs. This has led to the proliferation of private higher education in the region, although the rates of tertiary educational attainment still remain at significantly lower levels than in the Baltic.

Reflecting on these trends is an important step in our understanding of future trajectories of the knowledge economy in Eastern Europe. This is particularly the case since Ansell & Gingrich (2013) show that in the advanced capitalist economies partly private education systems lead to the generation of different types of knowledge-intensive service jobs (e.g. in finance and real estate) than the government-led educational expansion (e.g. public sector services such as health and education). While the data constraints in the empirical analysis conducted here do not allow us to distinguish between the different types of higher education financing structures, I will return to this matter in the section 3.5 where I assess how educational expansion affects the relative contribution of public vs private sector knowledge-intensive service employment to overall FLFP.

I include GDP per capita as the standard control variable that I include in all specifications, along with the same caveats from the previous section. Due to possible multicollinearity between ECI and GDP per capita, this control variable may be reducing the effect of ECI on educational expansion. Therefore, I show the results with and without GDP per capita. The other variables that

might affect this relationship and are fiscal constraints, institutional and political constraints to reform and the extent of dependence on foreign capital. All of them will be covered in the FE estimations, because this estimation technique controls for time invariant country level effects.[16] Finally, because I propose a negative effect of industrial upgrading on educational expansion, reverse causality is not a concern, as it is difficult to theoretically posit why more tertiary educational expansion would lead to less industrial upgrading.

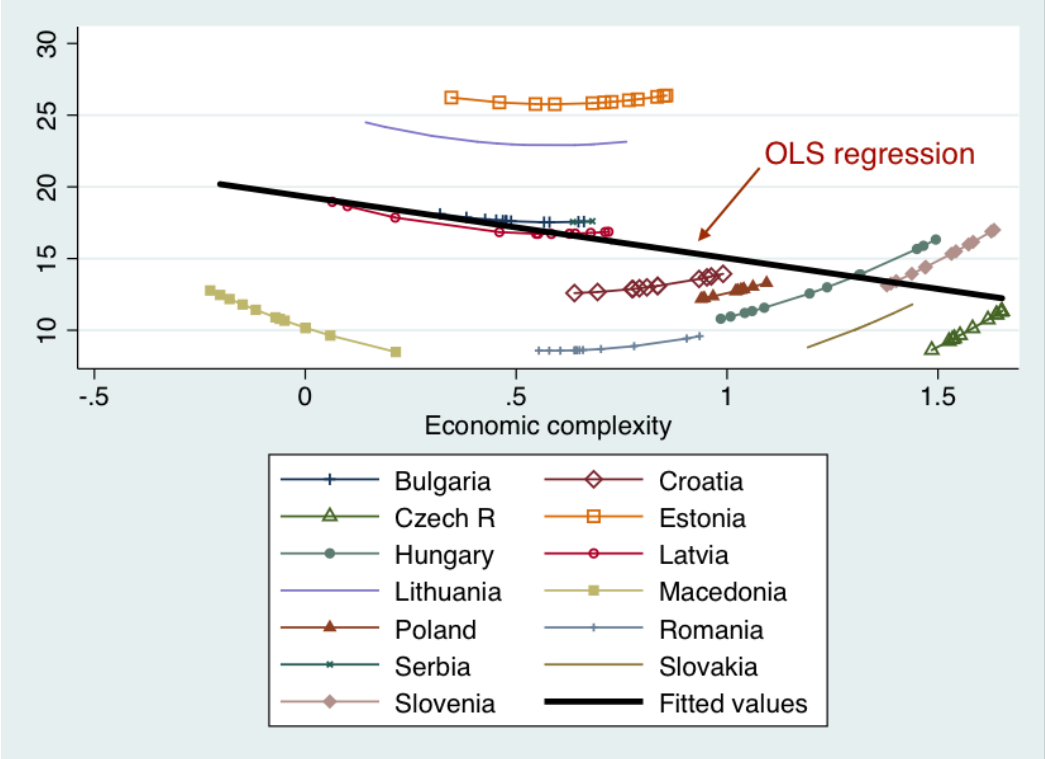
Results of the econometric estimates of the impact of industrial upgrading on the share of population with tertiary education are shown in Table A-5 in the Appendix. The linear specification of the independent variable indicates a negative impact of economic complexity on tertiary educational attainment, significant at 1%, both for with and without FEs. The quadratic specification of ECI preserves the linear and negative PCSE OLS results, while the FE estimates show a U-shaped impact of economic complexity on tertiary education within the countries in my sample.

The differences between estimates with and without FEs using the LSDV estimation technique are shown in Graph 2. While the graph shows a clear downward sloping relationship between economic complexity and tertiary educational attainment across the countries in my sample, the within country U-shaped relationship is the result of growth of tertiary education in the countries with the highest levels of economic complexity. This is, however, taking place from significantly lower levels of educational attainment than in the Baltic countries and Bulgaria.[17]

[16] Fiscal constraints are not necessarily time invariant, but they have been persistent in many Eastern European countries throughout the 2000s. Therefore, for the purpose of this analysis, I consider them time invariant.

[17] While Graph 2 appears to show that the level of tertiary education has not grown in the Baltic countries during transition, it in fact indicates predicted values of the variable over economic complexity. There has been substantial growth of tertiary education in the Baltic countries over the period of observation.

Graph 2. Predicted values of population with tertiary education: FE using LSDV with fitted values from the OLS regression



Graph 2 further indicates that the within country U-shaped relationship between industrial upgrading and growth of tertiary education is driven by Slovenia and CEE. While Slovenia has been a persistent outlier,[18] the case of CEE could be explained by findings from Tarlea (2015), who shows that MNCs have shaped the demand for higher education and its supply through private institutions in CEE during the later stages of transition. The fact that these countries did not see a substantial increase in female entry in their labour markets indicates that, following Ansell & Gingrich (2013), privately supplied education may not have as positive an impact on FLFP as public. While more research should be conducted in order for us to fully understand the mechanisms at play here, I find this empirical evidence compelling enough to support H3, with the caveat that industrial upgrading may impede

[18] Because of its higher level of economic development than the rest of the countries in the sample, as well as its low dependence on foreign capital and lower fiscal constraints than the rest of Eastern Europe.

government-led educational expansion rather than both public and private educational expansion (as discussed in section 2.1).

Results from the estimates on the effect of industrial upgrading on educational expenditures as a share of GDP are shown in Table A-6 in the Appendix. The PCSE OLS evidence also supports my hypothesis about the negative impact of industrial upgrading on educational expenditures. Furthermore, the inclusion of the quadratic term in the FE estimates indicates a U-shaped relationship between the two variables. This U-shaped relationship is expected because the measure of educational expansion that I use does not distinguish between private and public provision of higher education, or between specialised and general skills oriented higher education. Therefore, imprecise measurement of educational expansion and movement towards general skills is an important limitation of this econometric analysis.

3.4 Knowledge-intensive services and feminisation of service employment

H4: *Growth of knowledge-intensive services leads to higher FLFP rates.*

H5: *The higher the share of knowledge-intensive service employment in the economy, the higher the share of women in knowledge-intensive services.*

H6: *Growth of public sector employment leads to higher FLFP.*

In section 3.2, where I included knowledge-intensive services as a control variable in the econometric analysis of the impact of industrial upgrading on FLFP, I show that the share of the total working age population employed in knowledge-intensive services positively affects FLFP in Eastern Europe, both

across and within the countries over time (see Table 1 in section 3.2). This finding already strongly confirms H4.

Apart from this positive effect of knowledge-intensive service employment on FLFP, I am interested in understanding whether women have disproportionately benefited from greater expansion of knowledge-intensive services, i.e. whether knowledge-intensive services have absorbed women and men at the same rate, or absorption of women has been faster when knowledge-intensive services has expanded more rapidly. This is an important test for my argument that women have disproportionately benefited from knowledge-intensive services because they also disproportionately benefited from the expansion of tertiary education. This question is therefore put forward in H5.

Finally, H6 reflects that portion of my argument which states that the public sector component of knowledge-intensive service employment has grown along with the expansion of tertiary education and that women have disproportionately benefited from that expansion, both as providers of public education as well as its beneficiaries.

In order to test H5, I specify the following equation:

$$KIS\_FEMSHARE_{it} = \beta_0 + \beta_1 KIS_{it} + \beta_2 X'_{it} + \mu_{it} \quad (7)$$

where $KIS\_FEMSHARE_{it}$ is a measure of the extent of feminisation of knowledge-intensive services while KIS_{it} is a measure of presence of knowledge-intensive services in country i at time t. Because the share employment in knowledge-intensive services is highly correlated with the share of women in knowledge-intensive services (the coefficient is above 0.90), I use alternative measures of knowledge-intensive services, such as the share of services in VA and the relative share of services to industry. This second measure is particularly important when I use GDP per capita as a control var-

iable, since it makes my key independent and control variable less correlated. I do not include a quadratic specification of the independent variable because there is no theoretical reason to expect a quadratic relationship (the data also does not point to it). X'_{it} is the vector of control variables, such as GDP per capita, μ_{it} is an error term and the betas are the parameters to be estimated.

Table 2, which shows the results of the econometric estimates, indicates that the share of services in VA, as a proxy for the expansion of knowledge-intensive services, has had a significantly positive effect on the feminisation of knowledge-intensive services, both across and within the analysed countries.[19]

Table 2. Share of services in VA and the share of women in knowledge-intensive services: econometric estimates, all countries 1997-2008

	(1) PCSE	(2) FE	(3) PCSE	(4) FE
Services, VA	0.946 (11.43)***	0.399 (5.86)***	0.810 (9.56)***	0.262 (5.17)***
GDP pc			1.039 (9.44)***	0.267 (9.43)***
_cons	-14.723 (3.00)***	19.178 (4.53)***	-11.617 (2.42)**	21.168 (7.00)***
R^2	0.45	0.27	0.57	0.63
N	105	105	105	105

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Given the compelling strength of both cross-country and within country empirical evidence, I conclude that women have disproportionately benefited from the creation of new knowledge-intensive service employment in Eastern Europe, so that feminisation of knowledge-intensive services was higher in

[19] The significantly positive coefficients are fully preserved at 1% significance when I use alternative measures of the independent variable: the value of services vis-à-vis industry, the share of knowledge intensive services in the total working age population, and the share of knowledge-intensive services in total employment.

those countries where the expansion of the sector was more substantial. Therefore, I confirm H5.

Before I move on to examining the impact of education on the relationship between FLFP and knowledge-intensive services, I disaggregate knowledge-intensive service employment into its public and private sector components and analyse their respective contributions to FLFP in the region. This analysis has important implications for my theoretical framework, which suggests that countries with high FLFP have invested public resources into educational expansion, which has resulted in more jobs in the public and knowledge-intensive sectors of the private economy. This argument is summarised in H6. It is a particularly important line of enquiry for this article because pro-market reforms, which were implemented in Eastern Europe during post-socialist transition, were aimed at the retrenchment of the state and reduction of public sector employment, processes which should have harmed women. In fact, resistance to public sector reform has been a highly politicised and salient issue in a number of transition countries (Kornai, Haggard & Kaufman, 2001). Identifying public sector employment as an important driver of high FLFP in the Baltic region challenges the argument put forward by Bohle & Greskovits (2012) that the region has experienced the most neo-liberal reforms in Eastern Europe and a strong degree of social exclusion as a result of it.

In order to test H6, I specify the following econometric model:

$$FLFP_{it} = \alpha_i + \beta PUB_{it} + \delta X'_{it} + \mu_{it} \quad (8)$$

where PUB is a measure of public sector employment in country i in year t, while the control variables include a measure of employment in the private sector, as well as economic complexity and GDP per capita.

Table 3 shows the results of the econometric estimates of the relationship be-

tween public sector employment as a share of the total working age population and FLFP. This econometric analysis is conducted with the caveat that 'deeper' causal mechanisms are driving the observed effect of public sector employment on FLFP, but I am still interested in finding out whether overall levels of public sector employment can predict FLFP rates.

Table 3. Public sector employment and FLFP (15-64): econometric estimates, all countries 1997-2008

	(1)	(2)	(3)	(4)	(5)	(6)
	PCSE	**FE**	**PCSE**	**FE**	**PCSE**	**FE**
PUB pop	1.064	0.441	0.953	0.470	0.877	0.661
	(11.34)***	(1.37)	(7.72)***	(1.35)	(6.11)***	(1.73)*
PRIV_KIS pop	0.276	0.278	0.475	0.240	0.304	0.540
	(2.40)**	(1.06)	(2.23)**	(0.84)	(1.54)	(1.42)
Economic complex			-1.607	0.219	-3.563	0.596
			(2.82)***	(0.13)	(3.51)***	(0.34)
GDP pc					0.576	-0.504
					(5.64)***	(1.19)
_cons	44.109	52.670	45.552	52.502	46.884	49.591
	(26.72)***	(15.36)***	(26.51)***	(14.65)***	(25.34)***	(11.45)***
R^2	0.35	0.07	0.35	0.08	0.38	0.09
N	123	123	120	120	120	120

* p<0.1; ** p<0.05; *** p<0.01

The positive effect of public sector employment on FLFP is significant both with and without FEs, while the effect of private sector employment is not. The positive and significant coefficients are preserved when a quadratic specification of economic complexity is included. Econometric analyses that include the share of public sector in total employment and the share of women in public sector employment as alternative specifications of the independent variable do not yield as strong predictions as the above analysis. This points to the importance of using the share of the working age population employed in a specific sector in order to understand a sector's contribution to overall labour force participation (because it is calculated as a share of economically active individuals in the working age population). In summary, this analysis

points to a stronger contribution of public than private sector knowledge-intensive service employment to FLFP in Eastern Europe. Therefore, it allows me to confirm H6.

3.5 Knowledge-intensive services and educational expansion

H7: *Educational expansion amplifies the positive effect of knowledge-intensive services on FLFP.*

If the positive effect of knowledge-intensive services growth on FLFP is amplified by educational expansion, women are able to benefit more from knowledge-intensive service employment in countries with higher overall educational attainment. Education is a more important factor for women than for men, I argue, because empirical evidence from Eastern Europe has shown that women have higher qualifications than men in the same category of jobs both in the public and in the private sector, possibly due to the higher barriers to labour market entry that they face (Avlijaš et al, 2013). Therefore, I include the interaction term between educational expansion and knowledge-intensive service employment into my analysis and estimate the marginal effects of knowledge-intensive service employment on FLFP at different levels of educational attainment.

My empirical strategy to test H7 is summarised in the following econometric model:

$$FLFP_{it} = \beta_0 + \beta_1 KIS_{it} + \beta_2 EDU_{it} + \beta_3 KIS*EDU_{it} + \beta_4 X'_{it} + \mu_{it} \quad (9)$$

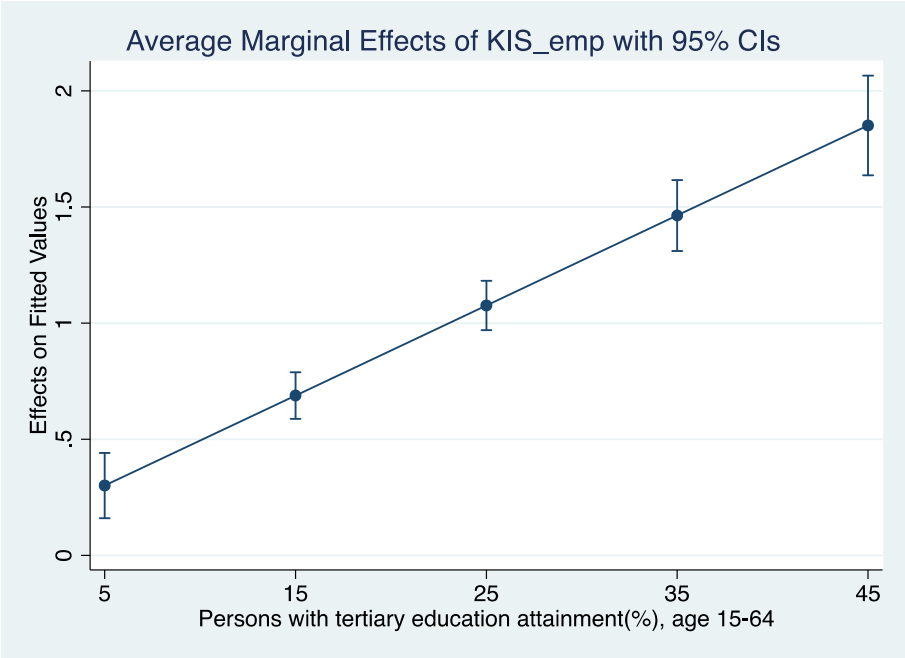
where all the terms have already been defined in the previous sections. I operationalise knowledge-intensive services as the share of knowledge-intensive service employment in the total working age population. I also show the results for public sector employment only, as an alternative specification of the

independent variable.[20] I include both measures of educational expansion that I used in the previous sections, tertiary educational attainment and expenditures on education as a share of GDP. I also include GDP per capita as a standard control variable with the same caveats that were mentioned in the previous sections.

All of the estimates, with and without the FEs, produce a positive interaction coefficient, which is significant at 1% in all specifications (see Tables A-7 to A-9 in the Appendix). I do not present the coefficients from the regressions in the article because when an interaction term is included, the coefficients of the original variables have very little meaning, i.e. they show the estimated slope when the independent variable takes on the value 0. Instead, I use marginal effect plots to show the estimated effect of knowledge-intensive services on FLFP at different levels of educational attainment and educational expenditures. The marginal effect plots are shown for the PCSE OLS estimates in the graphs below. Graph 3 shows the effect of 1 percentage point increase in knowledge-intensive service employment on FLFP at different levels of educational attainment. The effect of knowledge-intensive service employment on FLFP is around 0.7 percentage points when tertiary educational attainment is 15% of the population (this is the average level of tertiary educational attainment in my sample of countries, as shown in Table A-3 in the Appendix). While it is around 1.1pp when tertiary educational attainment is 25% and 1.5pp when educational attainment is 35%. Furthermore, these marginal effect estimates are robust because the confidence intervals (vertical lines) do not overlap and all the points are significant and different from zero.

[20] I do not show the results with all the alternative specifications of the independent variable because they produce very similar estimates. Instead, I focus on the results with the most important implications for this article.

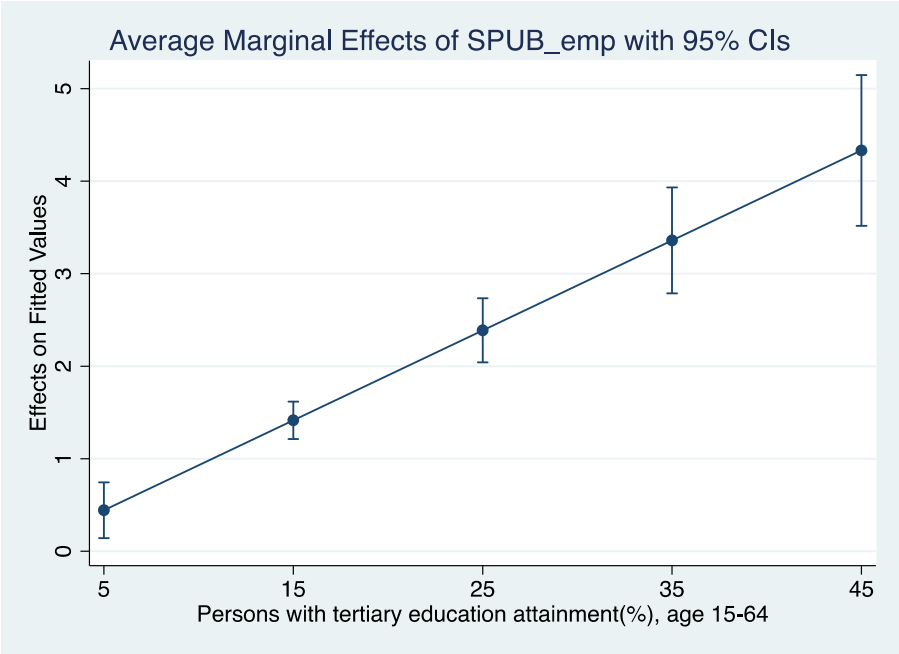
Graph 3. Impact of interaction between knowledge-intensive service employment and educational attainment on FLFP (15-64): estimated marginal effects 2000-2008



Note: 'KIS_emp' stands for knowledge-intensive service employment as a share of total working age population.

The marginal effect plot of public sector employment on FLFP in Graph 4 shows an even more pronounced impact of public sector employment on FLFP at higher levels of educational attainment. This finding indicates that when tertiary educational attainment is at 25% of the total population, a 1pp increase in public sector employment results in a 2pp increase in the overall FLFP. This means that at higher levels of tertiary educational attainment, public sector jobs generate new private sector employment for women. While a more nuanced analysis would be required to understand the exact number and type of private sector jobs for women that an additional public sector job creates, this finding points to a strong multiplier effect of public sector employment on FLFP at higher levels of educational attainment.

Graph 4. Impact of interaction between public sector employment and educational attainment on FLFP (15-64): estimated marginal effects 2000-2008



Note: 'SPUB_emp' stands for public sector employment as a share of total working age population.

Additionally, Graph A-4 in the Appendix shows the effect of knowledge-intensive service employment on FLFP for the different levels of educational expenditures. A statistically-significant higher effect of knowledge-intensive service employment on FLFP is traced at higher levels of educational expenditure as GDP per capita, and the effect doubles when educational expenditures increase from 4 to 6% of GDP. Finally, the effect of public sector employment on FLFP is also higher at higher levels of educational expenditures but this effect is also more pronounced than for total knowledge-intensive service employment (Graph A-5). Given the amplifying effect that educational expansion proxies used in this analysis have on the relationship between knowledge-intensive service employment and FLFP, I find this evidence compelling enough to confirm H7.

3.6 Summary of the empirical analysis

The presented empirical evidence supports the posited relationships between the variables for all seven hypotheses. I show robust evidence to support the claim that industrial upgrading leads to the defeminisation of manufacturing, both across and within the countries in my sample. Furthermore, within country FE estimates trace an inverse U-shaped relationship between economic complexity and the share of women in manufacturing. This dynamic leads me to question whether this relationship could have been driven by the temporary access of Eastern European countries to female intensive low skill low wage jobs in footloose industries such as textiles and clothing, which would have moved to locations with cheaper labour once industrial upgrading pushed the wages up to a certain level.

Furthermore, cross-country evidence on the negative impact of industrial upgrading on FLFP is a lot more compelling than within country evidence on this relationship from the FE estimates, which is insignificant. Nevertheless, knowledge-intensive service employment, which is a control variable in this analysis, has a robust positive effect on FLFP in all of my estimates. I therefore argue that this strongly positive effect of knowledge-intensive services on FLFP might capture some of the overall negative effect of industrial upgrading on FLFP, as industrial upgrading is also posited to negatively affect FLFP by reducing the expansion of knowledge-intensive services. This argument also illuminates the weaknesses in using econometric estimates to trace complex causal relationships between the variables of interest.

For this reason, I also examine the relationships between industrial upgrading and educational expansion, as well as between educational expansion and the effect of knowledge-intensive services on FLFP, to determine whether industrial upgrading could also be exercising its indirect effect on FLFP through

that causal mechanism. Empirical confirmation of these relationships strengthens my conclusion that industrial upgrading impedes the growth of FLFP in Eastern Europe.

The cross-country evidence on the negative impact of industrial upgrading on educational expansion is compelling, while the within country evidence based on the FE estimates shows a U-shaped relationship between the two variables. I argue that this is the case because at higher levels of manufacturing complexity, demand for specialised graduates grows and private providers start supplying higher education to fill this gap. Nevertheless, this type of expansion of tertiary education is not as beneficial for female employment as the state-led expansion of tertiary education, because it does not serve to expand general skills of the population.

Furthermore, given the compelling strength of both cross-country and within country empirical evidence, I conclude that women have disproportionately benefited from the creation of new knowledge-intensive service employment in Eastern Europe, so that feminisation of knowledge-intensive services is higher in those countries where the expansion of the sector has been more substantial. I also show that public sector employment has a stronger effect on overall FLFP rates than private sector knowledge-intensive service employment. In the final section, I also confirm that educational expansion has an amplifying effect on the positive effect of knowledge-intensive service employment on FLFP, which is particularly pronounced in the case of public sector employment.

4. Conclusions

This article begins by observing substantial variation in FLFP rates across post-socialist Eastern Europe. The observed divergence in FLFP trends during these countries' transitions to capitalism is puzzling given the high economic participation of women during socialism. Literature has not attempted to explain this phenomenon because the common tendency has been to attribute socio-economic trends, which cannot be explained by existing western theories, to 'the black box of transition'. The article therefore answers to the following question: Why were some Eastern European countries successful in reintegrating women into their labour markets during transition while others were not?

The article posits a causal mechanism (depicted in Figure 1, section 2.1) through which different trajectories of economic restructuring in post-socialist Eastern Europe have led to different FLFP outcomes. It spells out the relationship between industrial upgrading and expansion of knowledge-intensive services to FLFP and the role of a country's skill regime in mitigating this relationship. This theoretical framework allows us to trace how countries can end up in a vicious cycle of low FLFP through the following causal mechanism: FDI-led industrial upgrading defeminises manufacturing employment because female labour-intensive sectors are not upgraded. Furthermore, the upgrading absorbs the budgetary resources that could have been used for educational reform and general skills formation. This absence of educational reform in turn impedes the development of the knowledge economy and the service jobs associated with it, which are particularly absorbent of the female labour force and thus further reduces employment opportunities for women. Figure 1 also depicts how countries end up in a virtuous cycle of FLFP growth. Countries that do not succeed in pursuing re-industrialisation as their growth strategy turn to the reform of their skill regime by investing into ter-

tiary education and expansion of general skills. This boosts public and private sector knowledge-intensive service employment as well as the share of women in it, creating a positive feedback loop for female labour market opportunities.

While literature has investigated the role of specific sectoral changes on female employment within that particular sector, its tendency has been to examine one sector at a time. For example, topics of interest have been the impact of trade liberalisation on female employment in developing countries (e.g. Gaddis & Pieters, 2012; Ghosh, 2001), or the role of service expansion on female economic opportunities in advanced capitalist economies (e.g. Nelson & Stephens, 2013). These processes have been commonly treated as independent of one another and there have been no attempts that I am aware of to capture the dynamics of interaction between manufacturing and service employment. This dynamics of interaction between the different sectors of the economy is an especially salient topic for Eastern European countries which have been going through both the substantial restructuring of their economies as well as institutional reforms.

Therefore, instead of treating FLFP as an automatic outcome of competitive economic forces, this article accounts for the role of the state in reinforcing female inclusion into the labour force. In that light, it challenges the Bohle & Greskovits (2012) classification of the Baltic countries as 'disembedded neoliberal' regimes and shows that instead, these countries have had a strong state commitment to social investment which also boosted female employment opportunities. These insights are in line with Nelson & Stephens (2013) who argue that, contrary to conventional wisdom about liberalisation, substantial public sector investment is needed in order to support growth of high productivity service jobs in an economy.

The theoretical framework presented in this article also allows us to think about the interactions between the various components of economic restructuring and their impact on female economic opportunities in a dynamic and integrated fashion. It reflects systems thinking and accommodates a non-linear notion of causality, both of which are being increasingly advocated by political economy and sociological literature (see Hall, 2006; Rodrik, 2015; Swedberg, 2014). Furthermore, my exploration of the role of social investment in the continually evolving and institutionally unstable Eastern Europe contributes to the CPE literature that has only recently begun to take interest in social investment and the knowledge economy (Gingrich & Ansell, 2015; Thelen, 2014).

Finally, the explanation presented in this article opens up room for new theoretical, empirical and normative research on what it means to achieve higher FLFP and what the trade-offs involved in it are. There is room for both horizontal and vertical extensions of the theoretical framework. Its extensions to other emerging markets which depend on foreign sources of capital may produce novel insights. The explanation could be expanded to include other components of gender inequality in the labour market, including gender pay gaps, job quality and occupational segregation.

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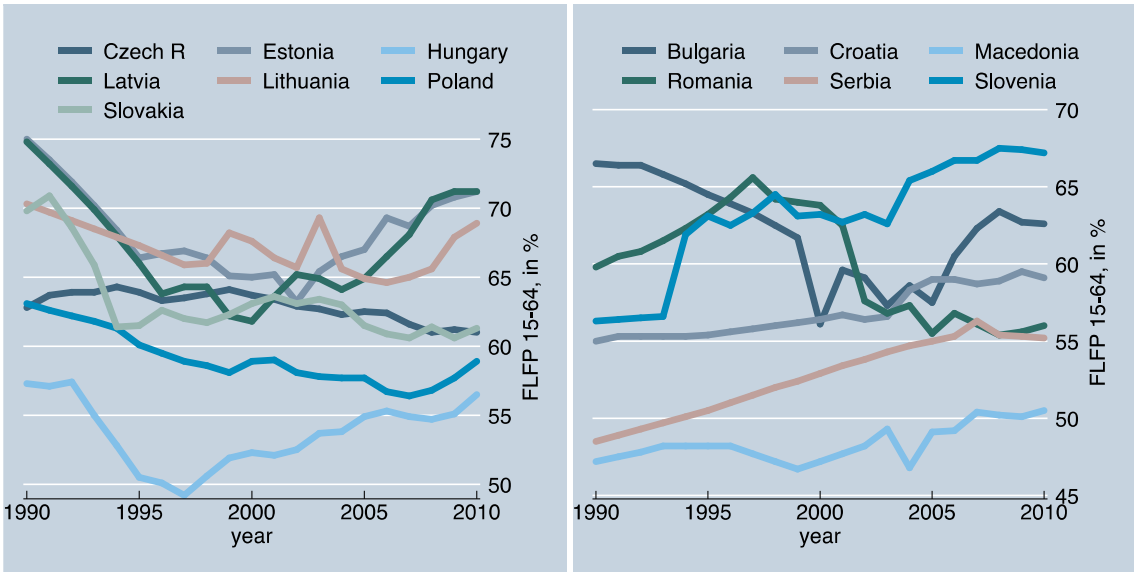
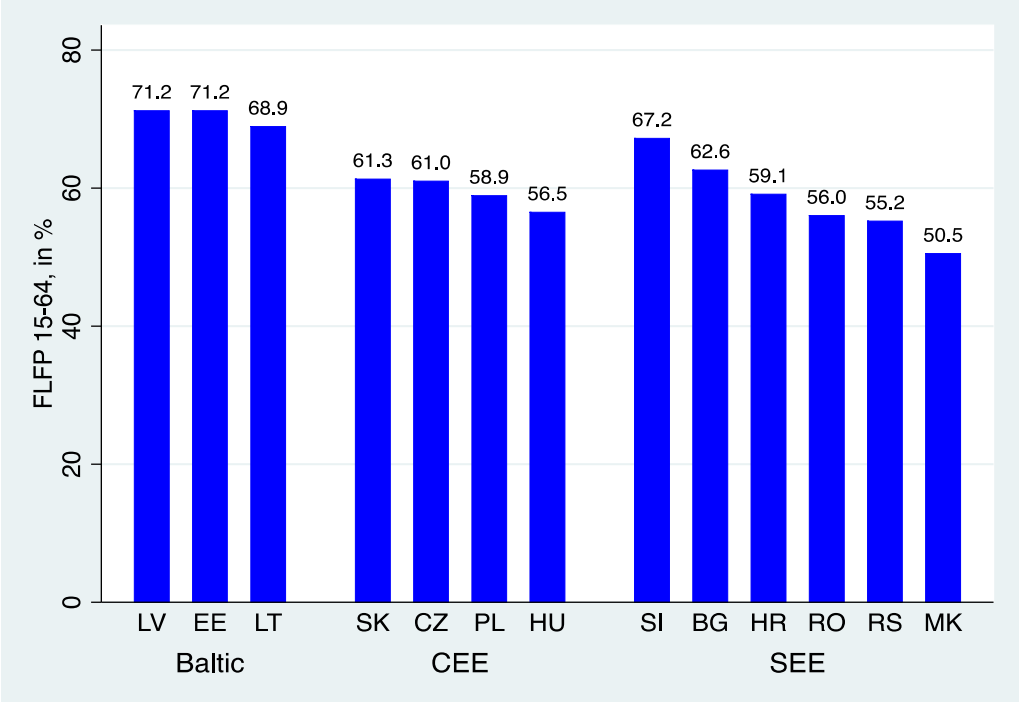
Appendix

Graph A-1. FLFP (15-64) in CEE and Baltic (left panel) and SEE (right panel), 1990-2010



Source: Eurostat.
Note: Trends for SEE are shown in a separate panel due to lack of analytical clarity when trends for all 13 countries are shown on a single graph. The range of values shown on the Y-axis is purposefully not the same on the two graphs. Equalisation of values on the Y-axis would have made it difficult to read the data off the graphs.

Graph A-2. FLFP (15-64) in all countries, 2010



Source: Eurostat.

Table A-1. Exogenous variables

Equation	Exogenous variables
(1) $\Delta L = f_1(\Delta K, X)$	X contains other exogenous variables that affect the slope and the Y-intercept of the relationship between industrial upgrading and FLFP, so that a change in these exogenous variables can shift the curve and/or change the slope of the hypothesised relationship. This theoretical association between FLFP and industrial upgrading is determined by the extent of occupational segregation between the genders in industrial labour. A decrease in occupational segregation in manufacturing, the equivalent of having more female employees in those industrial sectors that are dominated by men, would make this negative relationship between defeminisation of manufacturing and industrial upgrading more inelastic. L would thus be less sensitive to changes in K. Moreover, a country that has historically had relatively more women in manufacturing (regardless of the level of occupational segregation within manufacturing) would lose more female manufacturing labour as a result of industrial upgrading, ceteris paribus. This means that the Y-intercept would be smaller in those countries where fewer women work in manufacturing. Female reservation wages, which are a function of family policy (maternity and childcare benefits) and partner's earnings, can also theoretically determine to what extent women are willing to work in manufacturing. Higher reservation wages would result in fewer female workers in manufacturing, ceteris paribus. I am assuming that the relationship between female employment and their reservation wages is stronger for low-skill workers in manufacturing than for the highly-skilled workers in knowledge-intensive services. Prasad (2003), for example, suggests that highly-skilled workers are less tolerant of prolonged unemployment because they stand to lose more human capital investment by being unemployed. Following this line of argument, we may postulate that an increase of *K* would lead to a smaller negative effect on *L* in those countries where low skill women have higher reservation wages, i.e. the relationship between the two variables would be less elastic.
(2) $\Delta L = f_2(\Delta S, Y)$	*Y* contains the exogenous variables that affect the relationship between FLFP and knowledge-intensive services. The types of knowledge-intensive service jobs that are created determine the gender composition of knowledge-intensive service employment. According to Walby (2011), the more centred these jobs are on fixed capital and technology, the more masculine they are, while the more centred on human capital they are, the more gender balanced. In other words, the more these knowledge-intensive service jobs are focused on workers' skills and the less productive they are, the more elastic is the relationship between knowledge-intensive services and FLFP. She also finds that the less centred the jobs are on fixed capital and technology, the less they are well paid. Another distinction within knowledge-intensive services is whether these jobs are generated in the public (e.g. in education and health services) or private sector (e.g. in IT, real estate or finance). Based on the findings by Ansell & Gingrich (2013), a larger share of public sector knowledge-intensive service jobs would have a stronger impact on the overall FLFP. Following Walby (2011), I also expect these public sector knowledge-intensive service jobs to be characterised by lower remuneration.
(3) $\Delta E = g(\Delta K, Z)$	Exogenous variables, influencing the relationship between industrial upgrading and educational expansion, and represented by *Y* in equation (3) are the following: *Fiscal constraints*. The more fiscally constrained a country is, the less public investment in education takes place, ceteris paribus, so the Y-intercept of the relationship between *K* and *E* is lower. This could be linked to that country's level of GDP per capita, but it does not have to be, since different countries have different social and political pressures on public expendi-

	ture, irrespective of their income levels. Fiscal constraints have been particularly pertinent in Eastern Europe, due to the pressure of global tax competition to attract foreign capital as well as the constraint imposed by the process of EU integration. *Dependence on foreign capital for innovation.* The more dependent the country is on foreign capital for innovation, the more elastic is the inverse relationship between *K* and *E*. This is because the country that is dependent on MNCs for innovation will focus on preserving that source of innovation rather than invest in general skills-oriented education and R&D. Furthermore, the MNCs are also keen to keep the taxes low, which fiscally constrain the host country and does not allow it to invest in educational expansion. *Institutional and political factors* may also stall the ability of a country to reform and adapt its educational system to structural change. Such factors are the strength of teachers' unions and their resistance to reform (Padure, 2009) as well as the institutional flexibility of a country's educational and training system. The flexibility of a country's training system depends on whether skills are acquired through firms and on-the-job training or through the public sector. According to Anderson & Hassel (2008), firm-based skill regimes, like the skill regime in Germany, have been slower to respond to the needs of the rising service economy than school-based training regimes, as seen in the Netherlands.
(4) $\Delta S = h(\Delta E, W)$	I have identified three exogenous variables represented by *W* that can affect the relationship between educational expansion and knowledge-intensive services. One is the level of a country's economic openness and its exposure to foreign investment. Educational expansion can translate into private sector knowledge-intensive service jobs to the extent that there is an international (and domestic) market that requires these skills. The more a country is integrated with the global economy and global knowledge supply chains, and the more tradable are the services it produces, the more educational expansion can translate into knowledge-intensive service jobs. The second factor that shapes this relationship between *E* and *S* is investment in ICT, since it is a key tool through which knowledge can be managed inside organisations as well as in the market (Jalava & Pohjola, 2002) and a key reason for the growth of productivity in the service economy (Wren, Fodor & Theodoropoulou, 2013). The more a country invests in ICT, the more we can expect educational expansion towards general skills to translate into the expansion of knowledge-intensive service jobs. The third factor is the financing structure of a country's system of higher education, as observed by Ansell & Gingrich (2013). A mass publicly provided tertiary education, such in Scandinavia, can be expected to increase public service knowledge-intensive service jobs, while a partially private financing structure is expected to generate more jobs in the private knowledge-intensive service sectors, such as finance and real estate.

Table A-2. Eurostat classification of knowledge-intensive services (NACE Rev.2 codes – 2-digit level between brackets)

High-tech knowledge-intensive services:

- Motion picture, video and television programme production, sound recording and music publishing activities (59);
- Programming and broadcasting activities (60);
- Telecommunications (61);
- Computer programming, consultancy and related activities (62);
- Information service activities (63);
- Scientific research and development (72)

Knowledge-intensive market services (excluding financial intermediation and high-tech services):

- Water transport (50);
- Air transport (51);
- Legal and accounting activities (69);
- Activities of head offices; management consultancy activities (70);
- Architectural and engineering activities; technical testing and analysis (71);
- Advertising and market research (73);
- Other professional, scientific and technical activities (74);
- Employment activities (78);
- Security and investigation activities (80)

Knowledge-intensive financial services:

- Financial service activities, except insurance and pension funding (64);
- Insurance, reinsurance and pension funding, except compulsory social security (65);
- Activities auxiliary to financial services and insurance activities (66)

Other knowledge-intensive services:

- Publishing activities (58);
- Veterinary activities (75);
- Public administration and defence; compulsory social security (84);
- Education (85);
- Human health activities (86);
- Residential care activities (87);
- Social work activities without accommodation (88);
- Creative, arts and entertainment activities (90);
- Libraries, archives, museums and other cultural activities (91);
- Gambling and betting activities (92);

Sports activities and amusement and recreation activities (93)

Source: http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Knowledge-intensive_services_(KIS)

Table A-3. Descriptive statistics, 1997-2008

	Obs.	Mean	SD	Min	1st Q	Median	3rd Q	Max
D femshare	123	42.17	5.16	33.09	38.28	40.92	47.32	53.01
E. complex	146	0.85	0.49	-0.23	0.55	0.79	1.31	1.65
E. complex²	146	0.96	0.84	0.00	0.30	0.62	1.72	2.73
KIS femshare	105	43.95	8.01	22.67	41.24	46.66	49.8	54.01
KIS emp	123	36.98	5.36	21.22	35.63	38.05	40.77	45.48
KIS pop	123	22.02	4.12	12.42	18.97	22.61	24.74	31.09
PUB femshare	119	65.17	5.24	47.77	62.86	65.98	67.86	75.12
PUB emp	123	23.18	3.17	13.37	21.79	23.72	25.43	28.26
PUB pop	12	13.77	2.31	8.71	11.95	14.21	15.45	18.14
Edtert total	100	15.29	5.58	7.50	11.20	14.05	18.05	35.30
Edtert female	100	17.07	7.40	6.80	10.95	15.50	21.65	39.80
Ed. exp.	121	4.74	0.87	2.65	4.02	4.79	5.43	7.22

Note: Label 'femshare' refers to share of women in that sector, label 'emp' refers to share of that sector in total employment and label 'pop' refers to the share of that sector in the total population.

Table A-4. Economic complexity and share of women in manufacturing: econometric estimates, all countries 1997-2008

	(1) PCSE	(2) FE	(3) PCSE	(4) FE	(5) PCSE	(6) FE	(7) PCSE	(8) FE
Economic complex	-7.668	-1.896	-6.924	1.734	-7.744	5.306	-7.527	6.975
	(6.54)***	(1.63)	(7.99)***	(1.28)	(4.10)***	(2.35)**	(3.91)***	(3.23)***
Economic complex²					0.042	-5.074	0.352	-4.038
					(0.07)	(3.65)***	(0.46)	(3.03)***
GDP pc			-0.182	-0.870			-0.191	-0.752
			(1.47)	(4.41)***			(1.45)	(3.88)***
_cons	49.473	44.127	49.721	45.235	49.499	42.841	49.952	44.062
	(44.41)***	(40.66)***	(40.22)***	(43.81)***	(38.41)***	(39.46)***	(31.38)***	(41.30)***
R²	0.47	0.02	0.48	0.18	0.47	0.13	0.48	0.24
N	120	120	120	120	120	120	120	120

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A-5. Economic complexity and population with tertiary education: econometric estimates, all countries 2000-2008

	(1) PCSE	(2) FE	(3) PCSE	(4) FE	(5) PCSE	(6) FE	(7) PCSE	(8) FE
Economic complex	-4.291	2.169	-10.812	-3.933	1.203	-9.659	-1.558	-13.384
	(4.37)***	(1.12)	(8.53)***	(2.21)**	(0.25)	(2.55)**	(0.42)	(4.36)***
Economic complex²					-2.980	8.263	-5.307	6.832
					(1.39)	(3.56)***	(3.27)***	(3.66)***
GDP pc			1.495	1.756			1.616	1.662
			(14.47)***	(6.99)***			(17.17)***	(7.03)***
_cons	19.320	13.245	17.353	9.473	17.383	15.414	13.744	11.469
	(16.16)***	(7.25)***	(13.28)***	(6.06)***	(8.14)***	(8.46)***	(8.14)***	(7.35)***
R²	0.12	0.01	0.35	0.37	0.13	0.14	0.39	0.46
N	100	100	100	100	100	100	100	100

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A-6. Economic complexity and educational expenditures: econometric estimates, all countries 1997-2008

	(1) PCSE	(2) FE	(3) PCSE	(4) FE	(5) PCSE	(6) FE	(7) PCSE	(8) FE
Economic complex	-0.146	-0.532	-1.001	0.111	-0.080	-1.905	-0.353	-1.407
	(0.69)	(1.77)*	(3.85)***	(0.32)	(0.08)	(3.09)***	(0.37)	(2.36)**
Economic complex²					-0.036	1.006	-0.371	1.154
					(0.08)	(2.54)**	(0.81)	(3.07)***
GDP pc			0.210	-0.167			0.219	-0.182
			(5.46)***	(3.37)***			(5.75)***	(3.80)***
_cons	4.876	5.231	4.594	5.487	4.853	5.445	4.342	5.756
	(22.87)***	(18.75)***	(22.19)***	(19.80)***	(10.13)***	(19.11)***	(9.51)***	(20.50)***
R²	0.01	0.03	0.18	0.12	0.01	0.08	0.19	0.19
N	121	121	121	121	121	121	121	121

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table A-7. Interactive effect of knowledge-intensive service employment and educational attainment on FLFP (15-64): econometric estimates, all countries 1997-2008

	(1)	(2)	(3)	(4)
	PCSE	FE	PCSE	FE
KIS pop	0.107	-1.124	-0.017	-0.837
	(1.24)	(3.04)***	(0.18)	(1.94)*
Edtert total	-0.740	-1.546	-0.733	-1.506
	(7.43)***	(4.18)***	(6.71)***	(4.07)***
KIS pop* Edtert total	0.039	0.073	0.040	0.072
	(10.32)***	(4.42)***	(10.65)***	(4.36)***
GDP pc			0.237	-0.539
			(4.01)***	(1.27)
_cons	56.230	83.811	57.174	80.108
	(26.09)***	(10.90)***	(26.96)***	(9.77)***
R^2	0.52	0.28	0.53	0.30
N	97	97	97	97

* p<0.1; ** p<0.05; *** p<0.01

Table A-8. Interactive effect of knowledge-intensive service employment and educational expenditures on FLFP (15-64): econometric estimates, all countries 1997-2008

	(1)	(2)	(3)	(4)
	PCSE	FE	PCSE	FE
KIS pop	-1.181	-1.631	-1.234	-1.446
	(3.62)***	(3.22)***	(3.98)***	(2.36)**
Ed. exp.	-9.361	-9.807	-9.532	-9.504
	(5.68)***	(4.11)***	(5.91)***	(3.86)***
KIS pop* Ed. exp.	0.422	0.435	0.430	0.418
	(5.84)***	(4.29)***	(6.12)***	(3.94)***
GDP pc			0.054	-0.209
			(0.94)	(0.54)
_cons	86.662	97.587	87.513	94.827
	(12.16)***	(8.21)***	(12.72)***	(7.31)***
R^2	0.37	0.28	0.37	0.28
N	107	107	107	107

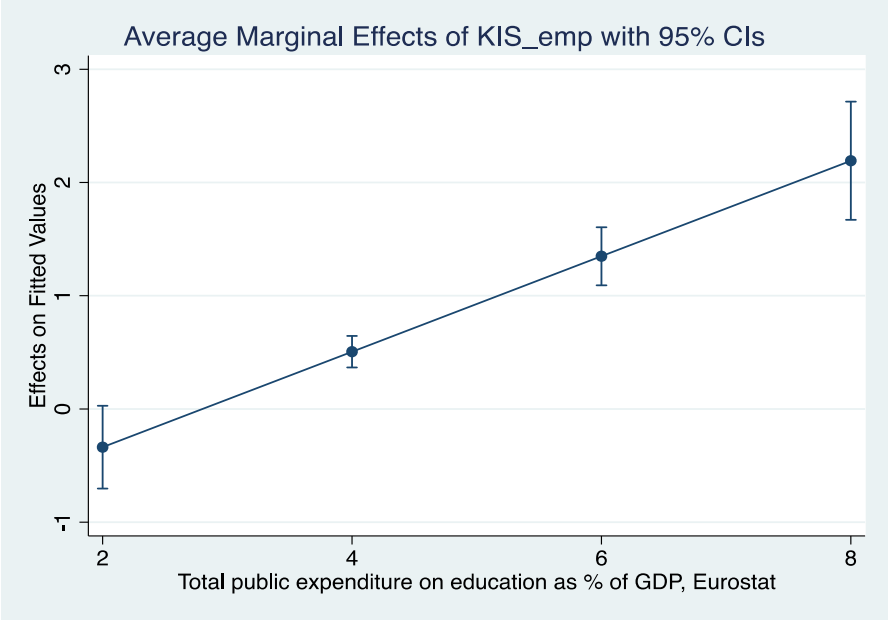
* p<0.1; ** p<0.05; *** p<0.01

Table A-9. Interactive effect of public sector employment and educational attainment on FLFP (15-64): econometric estimates, all countries 1997-2008

	(1)	(2)	(3)	(4)
	PCSE	FE	PCSE	FE
PUB pop	-0.043	-0.953	-0.390	-0.713
	(0.21)	(1.57)	(2.07)**	(1.06)
Edtert total	-1.315	-1.582	-1.409	-1.528
	(6.69)***	(3.59)***	(7.57)***	(3.43)***
PUB pop* Edtert total	0.097	0.106	0.106	0.104
	(7.50)***	(3.70)***	(9.04)***	(3.61)***
GDP pc			0.345	-0.266
			(10.92)***	(0.85)
_cons	60.328	75.068	62.739	72.784
	(19.85)***	(8.87)***	(22.71)***	(8.18)***
R^2	0.56	0.28	0.58	0.29
N	97	97	97	97

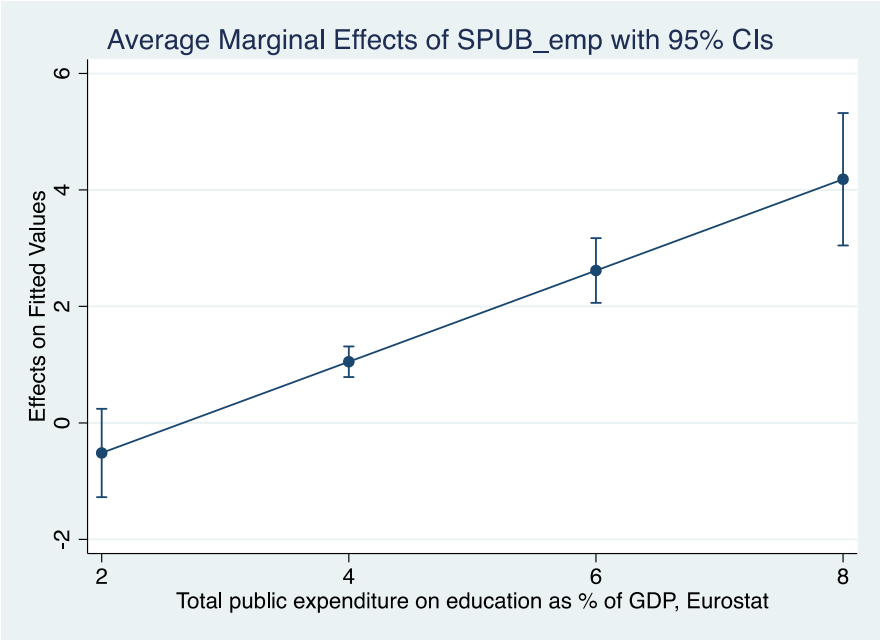
* p<0.1; ** p<0.05; *** p<0.01

Graph A-3. Impact of interaction between knowledge-intensive service employment and educational expenditures on FLFP (15-64): estimated marginal effects 1997-2008



Note: 'KIS_emp' stands for knowledge-intensive service employment as a share of total working age population.

Graph A-4. Impact of interaction between public sector employment and educational expenditures on FLFP (15-64): estimated marginal effects 1997-2008



Note: 'SPUB_emp' stands for public sector employment as a share of total working age population.

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