

## HOW TO INCREASE KNOWLEDGE SPILLOVERS FROM FOREIGN DIRECT INVESTMENT IN NEW EU MEMBER STATES<sup>1</sup>

**Abstract.** *The paper provides recommendations to help strengthen knowledge spillovers from foreign direct investment (FDI) in new EU member states from Central and Eastern Europe (CEE). It is based on relevant theoretical considerations and a comprehensive review of policies used to increase FDI spillovers. We propose a greater policy focus on technological aspects that would boost not only the potential for knowledge spillovers, but also domestic firms' absorption capability. One way forward is to improve the coordination of FDI policy with research and development (R&D), innovation and regional policies. In this case, CEE countries could use FDI to realign their national innovation systems with the knowledge that is created and diffused globally.*

**Keywords:** *knowledge spillovers from FDI, policies to strengthen spillovers, new EU member states*

### Introduction

The accelerated liberalisation of foreign direct investment (FDI) seen in the last 25 years has led to new host countries, including new European Union (EU) member states from Central and Eastern European countries (CEECs), entering the 'FDI market'. The CEECs' main attractions for FDI include unit labour costs, human capital, market size and proximity, as well as the quality of their institutions (Bevan and Estrin, 2004; Bevan et al., 2004; Gauselmann et al., 2011). Intra-industry linkages such as specialisation and agglomeration economies are also relevant to the decisions made by foreign investors to locate in CEECs (Gauselmann and Marek, 2012). Further, stronger competition between countries in the region has resulted

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in aggressive policies to attract FDI. Policy measures that are widely used include investment incentives, image-building, direct acquisition of FDI, and providing general services to investors. Investment incentives lie at the core of FDI policy in both theory and policy discussions. The use of incentives to attract FDI has considerably expanded in frequency and value. The widespread and growing incidence of both fiscal and financial incentives is well documented (Organisation for Economic Cooperation and Development – OECD, 2003; Cass, 2007; James, 2013; Tuomi, 2012; Van Parys, 2012; Ginevičius and Šimelyte, 2011). Incentives can be used to entice new FDI to a host country or encourage foreign subsidiaries in a country to start activities and functions that are regarded as desirable. Most incentives do not discriminate between domestic and foreign investors, although they sometimes implicitly target one or the other (United Nations Conference on Trade and Development – UNCTAD, 2003). As a rule, investment incentives are non-selective in the EU, i.e. directed at domestic and foreign investors alike.

At a general level, government intervention is traditionally justified when markets are either characterised by certain distortions or are incomplete. There are three arguments in support of government intervention: the presence of knowledge spillovers and dynamic scale economies; coordination failures; and informational externalities (Pack and Saggi, 2006; Rodrik, 2006). The rationale for policy intervention with respect to FDI is frequently associated with the potentially positive effect of FDI on the productivity of domestic firms via knowledge spillovers and linkage effects (Charlton, 2003; UNCTAD, 2003). However, there is no consistent evidence of positive knowledge spillovers from FDI in CEECs (for an overview, see Jindra, 2005; Rojec and Knell, 2017; Rugraff, 2008; Sinani and Meyer, 2009; Damijan et al., 2013). This is often explained by domestic firms lacking in absorptive capacity. Yet several studies also show that foreign firms are heterogeneous with regard to knowledge-enhancing activities and technological linkages (Castellani and Zanfei, 2006; Marin, 2006; Marin and Bell, 2004; Ha and Giroud, 2015; Baltagi et al., 2015; Perri and Andersson, 2014). Therefore, not every foreign firm provides the same knowledge opportunities or spillover potential for domestic firms.

Eric Rugraff (2008) claims this lack of knowledge spillovers can largely be attributed to the CEECs' adoption of a particular FDI policy model that allows multinational companies (MNCs) to obtain certain benefits offered without also giving sufficient incentive to interact with the local environment. As a result, while trade and FDI have led to CEECs' successful integration into the European production network, there has only been a limited effect in terms of stimulating local technological development. In contrast, other, mainly Asian, emerging economies have applied a more interventionist approach to industrial upgrading that combines foreign MNCs' activities

with various elements of industrial policy (also see Ramesh, 2013). This often occurred in the context of Asian emerging markets developing their own original approaches to innovation policies (Khorsheed, 2017). Arguably, these initiatives proved successful when pursuing comparative-advantage-following rather than comparative-advantage-defying strategies (Lin, 2012). The recent economic crisis posed another major challenge for the policies used in many CEECs when the region was hit much harder by the crisis than other parts of the emerging world, and is also recovering more slowly (Becker et al., 2010). Today, policymakers face a rapidly changing global landscape of production and innovation with growing FDI flows being directed to Asian emerging economies (UNCTAD, 2013), which are also increasingly attractive as a location for foreign research and development (R&D) by western MNCs (Ministry of Economy of the United Arab Emirates in cooperation with the Columbia Centre on Sustainable Investment, 2015). CEECs seek to create novel Research and Innovation Strategies for Smart Specialisation (RIS3) to strengthen their endogenous technological capabilities (Tiits et al., 2015). However, FDI and global value chains are not important components of their design, which is at odds with the CEECs' strong dependence on both FDI and global value chain participation (Radosevic and Ciampi Stancova, 2018). These issues constitute major challenges for FDI policies in the CEE region.

Our paper analyses policies of relevance to fostering knowledge spillovers from inward FDI in CEECs. FDI spillover policies might be particularly important for CEECs' positioning in the global shift of production and innovation and, thus, for speeding up their cohesion process. The main research question we consider in our study is whether there is space for more efficient policies and, if yes, in which direction these policies should develop. Methodologically, the study is based on relevant theoretical considerations and a comprehensive comparative review of policies used by policymakers to strengthen FDI spillovers. The reviewed policy areas include investment incentives, regulation or other instruments covering FDI, trade and technological links, R&D and innovation capability, horizontal policies, high-tech industries, employee training, and science and industry parks. In the remainder of the paper, we review and discuss policy areas that are relevant to knowledge spillovers from FDI that have thus far been applied in CEECs and certain other countries. The final section draws policy-related conclusions.

### **FDI policies in CEECs relevant to knowledge spillovers**

Rugraff (2008) differentiates the Irish and Taiwan-Korea-China (TKC) models of FDI policy. Both models try to promote an export-led strategy by opening a country up to FDI. Whereas the Irish variant aims for the massive

attraction of FDI chiefly through an FDI-friendly policy environment and minimum state intervention directed at sectoral policies (with preference given to high-tech sectors) as well as upgrading human capital, the TKC model is more constrained and promotes national economic priorities, particularly the emergence of competitive indigenous firms. CEECs like the Czech Republic, Hungary, Poland and Slovakia have adopted the Irish model. They have been successful in attracting mainly export-oriented FDI, but have largely failed to create spillover effects. Basically, knowledge transfer and spillover effects have been inhibited by the technology gap between foreign and domestic firms, i.e. by the lack of domestic firms' absorption capacity, as well as the power of MNCs' integrated global production networks. Yet, according to Rugraff (2008), the lack of spillovers is also mainly due to CEECs' adoption of the Irish model that has allowed MNCs to take advantage of certain benefits without also giving sufficient incentive to interact with the local environment.

In the remainder of this section, we review various FDI policies adopted in CEECs that are specifically relevant to knowledge transfer and spillover effects. Where appropriate, we also draw from examples in other economies such as Ireland, Singapore or Portugal. We argue that a stronger focus on the policies discussed below would improve not only the potential for knowledge spillovers from FDI, but also the absorption capability of domestic firms.

### *Linkage promotion*

Knowledge spillover effects from FDI to a host economy via vertical linkages require an adequate firm structure in up- and down-stream sectors. Given an adequate industry structure, investment promotion agencies (IPAs) can foster linkages between foreign subsidiaries and local firms. In the past, governments frequently attempted to 'force' foreign-owned companies to link up with local companies through local-content requirements, foreign equity ceilings, joint ventures and sometimes even by directly requesting the transfer of technology from abroad. The use of domestic-content requirements as part of import-substitution policies proved to be largely inefficient (Moran, 1998). With protected local markets and lower economies of scale, no transfer of cutting-edge technology or managerial best practice is needed and there is also a lower likelihood of spillovers occurring from foreign to domestic firms. Policymakers are also ever more aware that it is not only to what extent a foreign firm uses local sources that matters, but which type of inputs it sources.

Nowadays, policymakers increasingly strive to promote 'natural' linkages which depend on the existence of a competent local supplier base

whose production capacity is sufficiently large. The success of linkage programmes greatly depends on the willingness of foreign-owned companies to cooperate. Financial and organisational support offered by a host country to foreign-owned companies can reduce the risks related to the engagement and upgrading of local suppliers (OECD, 2005). Therefore, requirements regarding the specific behaviour of foreign-owned companies have primarily been replaced by more flexible systems that offer foreign investors incentives if they fulfil certain requirements. Such positive non-coercive incentives have led to the successful promotion of linkages in countries like Ireland, Singapore and Malaysia. According to UNCTAD (2010: 22–24), the core elements needed for developing a programme that fosters business linkages are ensuring a critical mass of purchasing companies, creating a pool of qualified domestic enterprises, building an effective selection mechanism, and putting supporting mechanisms in place. Linkage promotion can therefore entail activities such as: (i) informing foreign-owned companies about the possibility of engaging local suppliers; (ii) matching foreign-owned companies with local ones; (iii) upgrading capacity by promoting small and medium-sized enterprises (SMEs) development; (iv) training employees in potential local suppliers; and (v) giving assistance in financing the upfront production of inputs.

One example is the linkage-promotion programmes used by the Irish Development Agency (IDA) and Enterprise Ireland (Barry et al., 2003; IDA, 2015). Within these programmes, representatives of Enterprise Ireland visit foreign-owned firms to ascertain their needs for inputs and then attempt to find Irish suppliers for these inputs. Enterprise Ireland soon found that local suppliers face several problems in meeting the requests of foreign-owned firms. As a consequence, the programme has been increasingly upgraded in the direction of building capacity among domestic suppliers. Enterprise Ireland closely cooperates in this process with selected potential domestic suppliers and actively works to assist them within the existing set of industrial policy instruments. It helps prospective suppliers establish contacts with foreign-owned companies (UNCTAD, 2001). In its FDI strategy for 2015–2019, the IDA (2015) and Enterprise Ireland further affirm the above approach by showcasing the cadre of cutting-edge Irish companies, promoting foreign subsidiaries' interaction with Irish companies in research collaboration, business development and skills, introducing Irish companies to foreign investors at an early stage, encouraging them to take part in FDI-site visits, developing joint enterprise strategies for Irish firms and foreign subsidiaries, supporting the drive to increase Irish firms' sales to foreign subsidiaries, managing shared networking events with SMEs etc. (IDA, 2015).

The approach taken in Singapore combines a targeted strategy of attracting FDI with a linkage-promotion programme. The objective of Singapore's

Local Industry Upgrading Programme (LIUP) is to strengthen procurement links between foreign subsidiaries and local companies by building on pre-existing capabilities of Singapore suppliers. The LIUP's collaborative approach focuses on developing a broader range of new capabilities of local enterprises to meet stringent manufacturing and certification requirements (SPRING Singapore, 2017). Neil M. Coe and Martin Perry (2004) claimed the LIUP has a limited impact on supplier upgrading in the electronics sector but that horizontal partnerships may have more beneficial effects. The LIUP is complemented by the Partnership for Capability Transformation (PACT) that is intended to identify collaboration projects between large firms and SMEs in the areas of knowledge transfer to SMEs, upgrading the capability of new or existing suppliers of large firms and the development of innovative solutions (SPRING Singapore, 2017).

The main insights from the Irish experience are that linking local suppliers with foreign-owned companies and mediating these links require accompanying measures to build the capacity of existing and potential domestic suppliers; efforts to develop local suppliers should be selective and directed at only those local companies with the best growth potential; close cooperation with foreign subsidiaries and their parent companies is crucial, as is cooperation among the various domestic agencies involved in assisting local suppliers (Barry et al., 2003). Yet, linkage-promotion programmes such as those in Ireland and Singapore are quite expensive (around USD 50 million in Singapore; Singapore Budget, 2010). In addition, the respective agencies in charge (the Singapore Economic Development Board and the Irish Development Agency and Enterprise Ireland) hold strong positions in their governments. Finally, both countries might have a different human capital endowment and domestic supplier base compared to CEECs.

The promotion of links between MNCs and local firms has also become integrated into investment-promotion agencies' overall efforts in selected CEECs. For example, in 1999 the supplier development programme of CzechInvest was launched (UNCTAD, 2006). As part of this EU-funded programme, a database of over 900 potential Czech subcontractors was placed on the Internet. CzechInvest also mediates contacts between foreign investors and Czech suppliers, and selected subcontractors are provided with active counselling aimed at boosting production quality. Since 2001, Czechinvest mediated supplier contracts worth USD 250 million. Since 2010, Czechinvest was administering the Czechlink project where Czech companies are offered as potential partners for the creation of joint ventures with foreign firms. These programmes have helped establish linkages between local suppliers and foreign subsidiary manufacturers in the Czech Republic, building a relationship with existing inward investors, especially major MNCs (Czechinvest, 2017a).



One priority of the Hungarian Investment Promotion Agency (HIPA) is to strengthen the supplier role of the Hungarian SME sector for foreign subsidiaries. To this end, in 2017 HIPA further developed its Certified Supplier Database prepared for automotive, electronics and mechanical suppliers that encompasses 300 direct and indirect Hungarian SME supplier profiles and over 20 users from integrators. In the first half of 2017, on 1,406 occasions the Supplier Department of the HIPA promoted the services of potential Hungarian partners at the request of large companies and, together with the purchasing departments of four multinational companies, helped train approximately 100 production managers from 27 Hungarian SMEs (HIPA, 2017).

In the case of eastern parts of Germany, the overarching IPA is Germany Trade and Invest (GTAI) within the Federal Ministry of Technology and Economy. The basic idea is that foreign investors contact GTAI and are then referred to respective regional agencies (*Wirtschaftsförderungsgesellschaften*) which deliver further services. In practice, there is considerable competition between the regional agencies to acquire new investment projects. All regional agencies provide investors with services geared to establishing business links with other eastern German firms (Jindra, 2010).

To conclude, the effects of coercive requests and regulation to increase foreign subsidiaries' linkages with local firms might only have a limited positive impact on knowledge transfer and spillovers. However, there are strong arguments in favour of policies for stimulating links which aim to match foreign subsidiaries up with local firms and to upgrade local firms' (suppliers', customers') capabilities.

### *R&D capabilities and technological linkages*

MNCs still conduct their main R&D activities in their developed home countries but are increasingly locating R&D abroad by involving emerging economies, including CEECs (Gassmann and Han, 2004; UNCTAD, 2005). Statistics based on fDi Markets data from the Financial Times Ltd. show that during the 2003–2014 period the Rest of Europe<sup>2</sup> attracted through 755 FDI R&D centres USD 17.9 billion in capital expenditure. The Rest of Europe's share in the world total of newly opened FDI R&D centres rose from 5.4 per cent in 2003 to 9.1 per cent in 2014, while the corresponding shares for the capital expenditure on these centres are 3.9 per cent in 2003 and 5.6 per cent in 2014 (Ministry of Economy of the United Arab Emirates in cooperation with the Columbia Centre on Sustainable Investment, 2015). In spite of this increase, CEECs do not seem to be an above-average

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<sup>2</sup> The fDi Markets database divides Europe into Western Europe and the Rest of Europe. The Rest of Europe, thus, broadly corresponds to CEECs.

attractive location for R&D centres; namely, the 6.5 per cent share of the Rest of Europe in the total capital expenditures of FDI R&D centres created between 2003 and 2014 is exactly the same as the Rest of Europe's 6.5 per cent share in total inward FDI stock in 2013 (UNCTAD, 2014). Still, foreign-controlled enterprises' expenditure on R&D represents an important share of total business enterprise R&D expenditure in several CEECs, i.e. 77.9 per cent in Slovakia, 67.1 per cent in the Czech Republic, 62.6 per cent in Hungary, 44.8 per cent in Poland, 29.1 per cent in Slovenia and 22.5 per cent in Bulgaria (Eurostat, 2017).

According to Ari Kokko and Victoria Kravtsova (2008), the innovative capability of MNC subsidiaries depends on three sets of determinants: (i) the role of the subsidiary in the MNC's international production network; (ii) other subsidiary characteristics like size, age, and industry of origin; and (iii) host-country and host-industry characteristics, including the development level of the host industry and the competitive pressure exerted by local firms. Adequate local R&D-related capacities are a necessary precondition for attracting R&D-intensive FDI. The main reasons for an MNC to locate research in a particular location are the proximity to local universities and research parks, tapping informal networks, and proximity to centres of innovation, while the chief reasons to locate development in a certain location are the local market requirements, local support for global customers, the proximity of customers and lead users, and cooperation with local partners (OECD, 2011: 48). Any policy for attracting R&D-intensive FDI can only be successful if that country possesses relevant R&D-related capacities (Bellak and Leibrecht, 2016; Guimon, 2013). This points to the importance of the performance and governance of national innovation systems for R&D-related FDI and knowledge spillovers from FDI. The fact is that CEECs are not forerunners as far as innovation performance is concerned. In 2016, the Summary Innovation Index (SII) of the EU-28 as a whole was 0.503, but just 0.326 for the CEECs on average. None of the CEECs achieved the EU-28 level of the SII. Most CEECs were in the group 'Moderate Innovators' and only Slovenia (as the last entrant) was in the group 'Strong Innovators'. No CEECs were found in the group 'Innovation Leaders' (European Commission, 2017: 90). During their EU accession process, CEECs made substantial progress towards a more informed, evidence-based and well-structured science and technology (S&T) policy. However, most have very much retained the old governance features of their S&T policies where the science- or technology-push models dominate. The challenge is to establish a complex, interactive multi-actor governance system that enhances innovation and furthers knowledge production. Only innovation systems in CEECs that are rapidly improving will be able to compete for the location and expansion of foreign R&D and innovation activities.



Evidence from the early stages of the transition process shows that the majority of multinational subsidiaries based in CEECs used the parent MNC's already existing technology rather than establishing host-country-specific technology or own R&D (Manea and Pearce, 2006). There were only weak linkages between foreign investors and nationally-based R&D institutions (von Tunzelmann, 2004). Newer evidence provided by Jutta Günther, Johannes Stephan and Björn Jindra (2009) shows the majority of foreign subsidiaries in CEECs are technologically active in a broader sense, yet their R&D and innovation activities seem to be largely detached from the host country's innovation systems. Foreign subsidiaries that conduct R&D and implement home-base-augmenting technological strategies enjoy greater autonomy and seem more likely to engage in technological cooperation with domestic actors. However, the creation of links between foreign subsidiaries and domestic firms still appears to be inhibited by the inadequate capacities of domestic firms and public R&D institutions (Dyker, 2006; Varblane et al., 2007). As a result, the principal learning processes are mainly confined to the MNC's home country, thereby restricting the long-term accumulation of knowledge and causing potential misalignment between the foreign and domestic technological accumulation (von Tunzelmann, 2004).

Attractive R&D-intensive FDI that becomes embedded with the national innovation system could be a legitimate reason for a government to promote inward FDI since that promotes technological accumulation and knowledge spillovers. In fact, FDI in R&D appears high on the political agenda of most EU member states, although the R&D part is usually included in more general FDI policies (European Union, 2008). Grants associated with R&D investments – by either domestic or non-domestic firms – have in particular seen a rising trend in both developed and developing countries (European Commission, 2006; UNCTAD, 2005; Bellak and Leibrecht, 2016; Guimon, 2013; Owczarczuk, 2013). While only a limited number of countries have specific policy instruments in place to stimulate spillovers from FDI into R&D, there is growing awareness to upgrade policy measures in order to take advantage of inward FDI in R&D and innovation. To boost MNCs' R&D activities in CEECs and strengthen knowledge spillovers from MNCs onto local companies, Rajneesh Narula (2009) suggests several policy considerations. First, host countries should reduce their emphasis on cost advantages and more strongly stress particular specialised location-specific assets, which implies developing and fostering certain industries and technological trajectories so that the location advantages they offer are less 'generic' and more distinctive, highly immobile and conducive to 'locking' mobile investments into these assets. Second, attempts should be made to create clusters around MNCs, requiring host countries to focus on attracting those kinds of FDI projects that give the greatest opportunity for embeddedness

and domestic–foreign firm linkages. Third, MNCs should be helped to establish links with local firms as the main driver of knowledge spillovers from FDI. In order to maximise technological externalities from FDI, it seems paramount to stimulate technological activities in existing foreign subsidiaries as well as technological cooperation between domestic firms and subsidiaries in CEECs (*ibid.*). The latter appears to be especially urgent in an environment where the locus of technological innovation increasingly resides at the interfaces between firms, universities, research laboratories, suppliers and customers (Powell et al., 1996).

Yet, policymakers encounter ever stronger competitive bidding for FDI between ‘high order’ and ‘intermediate’ regions both within and between countries (Cantwell and Iammarino, 2003). This may imply that only a few, and in practice the most developed, regions within CEECs with established agglomeration advantages and technological specialisations will be successful in this bidding process. Therefore, FDI policy must tackle region- and sector-specific misalignments in domestic and foreign technology accumulation, with a focus on particular regions within countries. An efficient way for building up the R&D capabilities of foreign subsidiaries and their technological links with local firms is to coordinate all available policy measures in order to upgrade the R&D, innovatory and entrepreneurial capacities of host economies. This includes broader measures to develop research capacity in the public and private sectors and instruments that target human resource capabilities as well as start-up firms and SMEs (Guimon, 2013; Bellak and Leibrecht, 2016). In this context, there is room for more specific FDI policy measures that emphasise the development of specialised location-specific assets.

### *High-tech industries*

Various countries including CEECs tend to promote investment in high-tech industries by offering tax incentives, normally as part of national development strategies and without distinguishing between foreign and domestic investors. For example, Hungary has provided industry-specific incentives (tax reductions of up to 80 per cent of the investment value) for development projects above a certain investment threshold and creating a certain number of new jobs. Projects which are specifically promoted include investments in high-tech sectors and establishing R&D centres (HIPA, 2016a). Thus, in line with the objective to transform the Hungarian economy from a “manufacturing hub” to an “advanced manufacturing and innovation centre”, new forms of cash-incentive measures were introduced in 2017. Based on individual government decisions, these cash subsidies aim to enhance corporate R&D activities and technology-intensive investments

(HIPA, 2016b). The development strategy of the Czech Republic promotes development of the manufacturing industry, technology centres and business-support service centres. This includes incentives for high-tech manufacturing sectors with the full or partial exemption of tax payments on profits, subsidised job creation and training, incentives for business services and technological centres, investment in equipment, and employment subsidies (Czechinvest, 2017b). In Slovakia, investment incentives depend on the region and project type. The incentives policy distinguishes among: (i) industry; (ii) technology centres; (iii) shared services centres; and (iv) tourism. Incentives include grants, tax relief and acquiring property at below-market prices. The incentives range from 25 to 35 per cent of qualifying costs, depending on the region. Investors involved in R&D are entitled to an R&D super deduction of at least 25 per cent of actual costs that qualify (KPMG, 2016; Slovak Investment and Development Agency – SARIO, 2017). In the future, Slovakia intends to focus more on promoting production and services with higher-added value and investment in R&D, including presentations of the Slovak R&D environment (SARIO, 2017). However, the rationale for concentrating investment incentives in high-tech *industries* may be disputed on the grounds that each industry has low- and high-tech *activities* (von Tunzelmann and Acha, 2005; Varblane et al., 2007). Therefore, promoting a particular set of ‘high-tech’ industries could end up attracting the location of the low-tech (often low-cost) activities of high-tech industries or inhibit the adoption and diffusion of high-tech activities in other sectors of major importance to the economy. In fact, Jože P. Damijan and Matija Rojec (2007) claim that, when it comes to FDI in CEECs’ high-tech industries, foreign investors are often engaged in lower-end segments and transfer less than up-to-date technologies. Therefore, the investment-incentives scheme should be open in nature and target high-tech *activities* rather than high-tech *industries*.

In the eastern parts of Germany, the investment grant scheme puts a lot of attention on the employment effect of a new investment (see Jindra, 2010). This might create a distortion by reducing incentives for capital-intensive production. The scheme gives incentives to all firms for investing in embodied technology (machinery and equipment) as well as process innovation. However, there is a restriction on the incentives related to training, applied R&D, and product innovation only to SMEs. This obviously limits the possibility of incentives for large multinational subsidiaries to invest in such activities and does not foster their evolution towards competence-creating business functions, which would increase the spillover potential.

Several countries apply a specific contractual regime for large technology- and R&D-intensive projects. The Czech Republic gives bigger incentives to larger, i.e. “strategic investment projects” in the manufacturing

industry and technology centres. To enable the existing incentive system to give preferential treatment to projects that are technologically advanced, are closely connected with R&D or require the greater involvement of highly qualified personnel, the Czech Republic is currently amending its existing incentives scheme (KPMG, 2017). In Slovakia, the lower threshold to qualify for incentives is EUR 0.5 million for technology centres and EUR 0.4 million for investment in shared services centres, while the minimum for investments in industrial production depends on the unemployment rate in the district targeted by the investment. Yet, apart from size and high-tech sectors, the granting of a particular contractual regime to an investment project can also be associated with technology transfer, R&D activity, the training of employees etc. (SARIO, 2017). The advantage of a contractual regime is that it enables 'individually tailored packages' of incentives and stricter control of contract implementation by the investor. A complementary approach entails incentives for locating particular business functions. For example, in Hungary a VIP cash subsidy may be granted based on an individual government decision. The granting of VIP treatment relates to the investment amount and number of new jobs created, although other criteria such as establishing regional headquarters and investing in information technology, logistics, financial services and technological R&D are also considered. The conditions of the VIP subsidy are determined in negotiations between the investor and the Hungarian authorities (HIPA, 2016a).

In sum, incentives for investing in high-tech *industries* do not seem to be the correct way forward. Experience seems to favour promoting investment in high-tech *activities* regardless of the industry, by horizontal measures that foster such activities and relate to R&D, training, entrepreneurship, the provision of infrastructural facilities etc., and by measures specifically targeting high-tech projects by promoting particular business functions.

### *Incentives for employee training*

Human capital formation is crucial for foreign subsidiaries' capability to perform R&D and innovation and other higher value business functions, and is equally important as a precondition for domestic firms to benefit from FDI spillovers. Most CEECs are characterised by fairly high rates of human resources in science and technology occupations close to the EU-28 average level and far above certain emerging economies in Asia such as China (OECD, 2013). The intensity of R&D personnel in CEECs is also considerably higher than in China (*ibid.*). Evidence shows the strong complementarity of human capital and inward FDI in how they relate to the long-term growth prospects of regions within CEECs (see Völlmecke et al., 2015).

Policies might therefore seem appropriate for promoting high-skilled and

knowledge-intensive jobs in foreign subsidiaries. This may be facilitated by co-financing the salaries of employees being trained in-house with respect to the introduction of new technologies and/or production programmes. Subsidies should then be strictly tied to the training period and to new technologies/production programmes. We can note some country's incentives given for training employees upon the introduction of new technologies. For example, Enterprise Ireland offers within its "R&D and innovation supports for companies" incentives for the creation and/or expansion of the R&D capacity of enterprises. Apart from co-financing equipment, advisers and supporting services, it subsidises the costs of in-house researchers. Enterprise Ireland also provides R&D funding via the Technical Feasibility Study grants, the In-house Research, Development and Innovation Fund, the Innovative High Potential Start Up Fund, and Collaborate on Research and Development Projects with Colleges and/or Companies (Enterprise Ireland, 2017).

The Czech Republic supports employee training and retraining as part of an incentives package granted to eligible investment projects in the manufacturing industry, technology centres and business-support services centres. Cash grants for retraining and training new employees may be up to 50 per cent of training costs (Czechinvest, 2017b). In Slovakia, the sums involved in investment incentives granted depend on the number of jobs created, and range from EUR 5,000 to EUR 30,000 per new job according to the (defined by unemployment level) zone in which an investment is located and the type of project (industry, technology centres, shared services centres, tourism). The biggest incentives are granted in technology centres (SARIO, 2017). Grants for training are offered by the Central Office of Labour, Social Affairs and Family that cover labour costs, mentoring and personal equipment. The grant is provided to employers that create part-time jobs for at least nine months (VGD, 2017).

It thus appears that CEECs systematically promote investments that create better jobs. The main policy instruments entail co-financing the costs of researchers, subsidies for requalification and training/education, or by including training costs in tax relief. CEECs also co-finance the training of employees and management. These incentives often combine with incentives for investment in technologically more advanced industries like tax relief for investment in R&D, subsidies for the acquisition of specific equipment etc. Given that, along with the subsidisation of R&D, the subsidising of training costs is considered one of the best-performing types of state aid (see, for instance, Meiklejohn, 1999; Blöndal et al., 2002), incentives for employee training also seem an appropriate policy tool to foster knowledge spillovers from FDI. Yet, it seems appropriate to target knowledge-intensive activities or occupations, which is a broader category than jobs in R&D or

S&T. It also includes knowledge-intensive jobs in foreign subsidiaries' business functions, such as finance, management, logistics, marketing, distribution and ICT.

### *Industrial, technological and science parks*

The stronger inter-country convergence of tax and financial incentives for foreign investors has led to new types of incentives being introduced. One of the most promising types is schemes to establish industrial, technological and science parks. They differ from traditional industrial zones by the very concept of their organisation. Industrial parks, as a rule, include spatial planning with the necessary road and other infrastructure (Kelleher and Thompstone, 2000).

Science and technological parks are usually closely interlinked with universities or public research institutes within a respective region. In Europe, most of such parks are managed by private companies. Found in the neighbourhood of larger cities or outside big urban conglomerates, these parks are typically managed by public organisations like local authorities (for example, the industrial park in Kolin, Czech Republic) or state-owned enterprises for the development of industrial parks (for example, the IDA in Ireland). Such parks act as a location incentive for foreign investors because they enable them to rapidly start operating (they can buy or hire prefabricated premises immediately, or alternatively immediately begin to construct premises on the land they buy or hire) and, at the same time, offer appropriate working conditions and environments to employees.

For example, the Czech Republic has given incentives to develop technological centres and supporting business services. Technological centres intended for developing innovations in production, centres for developing software equipment, high-tech service centres, call centres for supporting customers, regional headquarters etc. and related high value-added services are eligible for incentives in the form of income-tax relief, cash grants for job creation and training, and for the acquisition of assets (Czechinvest, 2017b).

Thus, in principle, subsidising industrial/technological/science parks is a promising way of stimulating knowledge transfer without discriminating between foreign and domestic investors. However, in reality, many of these parks are either poorly aligned with the actual technological needs of the host region/country more generally, or achieve too little apart from benefiting from generous subsidies to locate themselves at pleasant greenfield sites. Therefore, it is a key task for host-country governments at different levels to ensure such institutions are properly aligned with the development priorities and FDI motives as well as the location-specific potential and specialised assets.



## Conclusion

Theoretical considerations and the practical experiences of host-countries' FDI policies clearly demonstrate that comparative advantages, general economic policies and an appropriate regulatory framework are more important than specific, targeted instruments and measures directed at FDI. However, to facilitate the transfer of knowledge to foreign subsidiaries, upgrading towards knowledge-intensive jobs and higher value-added activities, as well as knowledge spillovers to the domestic economy, policies related to the governance of S&T, R&D and innovation, education and training etc., are very important. It is only within a coordinated policy framework that specific FDI policies can be successful. The R&D and innovation policies of CEECs should support the local development of multinational subsidiaries towards competence-creating technological activities and simultaneously strengthen domestic firms' absorptive capacity. Policies should continue to foster R&D cooperation, joint product development, co-design and standard-setting in networks that link multinational subsidiaries up with other private and public actors in the respective innovation systems. With regard to specific FDI policies seeking to increase knowledge spillovers, the following aspects deserve special attention in the CEEC setting:

- a. *The policy of stimulating linkages between foreign subsidiaries and local firms* centres around matching foreign subsidiaries up with local firms, and upgrading local firms' (suppliers') capabilities. There is a need to coordinate the simple matching programmes and general policy schemes directed at investment, finance, training as well as R&D and innovation.
- b. *R&D capabilities and technological links*. An efficient way to increase the R&D capabilities of foreign affiliates and their technological connections is to build up research capacities in the public sector, and to use and coordinate all the available policy tools to upgrade the R&D, innovatory and entrepreneurship capacities of host economies. Within this context, policy could reduce the emphasis on cost advantages and instead more strongly stress the development of particular specialised location-specific assets. The policy must tackle region- and sector-specific misalignments in domestic and foreign technology accumulation, including a regionally differentiated approach within CEECs.
- c. *High-tech industries*. Incentives for investing in high-tech industries should avoid the traditional sectoral approach, i.e. they should favour investment promotion in high-tech activities regardless of the industry by using horizontal measures that promote such activities and relate to R&D, training, entrepreneurship, the provision of infrastructural facilities etc. There might be space for measures specifically aimed at 'high-tech' projects by promoting R&D or regional-headquarter-specific business functions.

- d. *Incentives for employee training.* Incentives for employee training seem to be the right type of policy intervention for reinforcing existing advantages. Ever stronger attention should be paid to an appropriate supply of science and engineering graduates and sufficient entry possibilities into the private sector in the post-crisis context. In addition, incentives should not only target R&D-related S&T occupations but knowledge-intensive activities more generally.
- e. *Industrial, technological and science parks.* The subsidising of industrial/technological/science parks could be a promising way of stimulating knowledge transfer without discriminating between foreign and domestic investors. Such site-specific development should be coordinated with the development and innovation strategies at different levels.

There is a considerable misalignment in CEECs between domestic and foreign technological accumulation. This is partly associated with the weak performance and governance of national innovation systems. Greater emphasis on technological and knowledge-intensive aspects in the investment schemes would not only increase the potential for technological spillovers from MNCs, but improve the absorption capability of domestic firms. One way forward is to coordinate FDI policy through R&D, innovation, and regional policy instruments.

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