Competing with whom? For what? And how? The great fragmentation of the firm, FDI attraction profiles, and the structure of international tax competition in the European Union

Arjan Reurink[1,*] & Javier Garcia-Bernardo[2,*]

Max Planck Institute for the Study of Societies | Paulstrasse 3, 50676 Cologne, Germany[1] & CORPNET, University of Amsterdam, Nieuwe Achtergracht 166, 1018, WV, Amsterdam, The Netherlands[2]

reurink@mpifg.de[1]

javier.garcia.bernardo@gmail.com[2]

* The order of the authors was randomized. Both authors contributed equally to this work.

Abstract

International tax competition is generally framed as states competing for foreign direct investment (FDI), and analyses of the phenomenon draw heavily on FDI statistics. In and of themselves, however, FDI statistics are merely a quantification of the value of investment projects and tell us little about the heterogeneity of these projects and the distinct patterns of competitive dynamics between countries they generate. In this article, we create a more sophisticated understanding of international tax competition by pointing out its variegated nature. To do so, we introduce the notion of the "great fragmentation of the firm" to distinguish between five categories of FDI: manufacturing affiliates, shared service centers, R&D facilities, intermediate holding companies and top holding companies. Using a novel combination of firm-level and country-level data, we identify for each of these different categories of FDI which European Union member states are most successful in attracting it, what macro-institutional and tax arrangements they use to do so, and what benefits they receive from it in terms of tax revenues and employment creation. In this way we were able to identify five distinct FDI attraction profiles and show that, rather than being a game of all against all, tax competition in the European Union increasingly takes place amongst subsets of countries that compete for similar categories of FDI.

1. Introduction

An important feature of the kind of economic globalization that we have witnessed over the last decades is the dramatic expansion of global foreign direct investment (FDI). Annual flows of global FDI have expanded considerably, from $205 billion in 1990 to $1.4 trillion in 2017 (Figure 1A). The worldwide stock of FDI has expanded accordingly. Whereas in 1990 it stood at $2.2 trillion, in 2017 this figure has risen to $31.5 trillion (Figure 1B). Countries, wanting to share in the gains to be had from the growing pie of global FDI, compete with one another to attract cross-border investments made by transnational corporations (TNCs). Motivated by the anticipated benefits from incoming FDI, which include both concrete short-term benefits, such as increased tax revenues, growing employment, and GDP growth, as well as more intangible, long-term ones, such as knowledge spillover effects, productivity gains, and a reduction of current account deficits, national governments and economic policy-makers have become increasingly preoccupied with improving their country's investment climate and preserving the competitiveness of their national economies (Philipp Genschel and Seelkopf 2015; Strikwerda 2010). Although governments and national policy-makers have a wide range of policy instruments at their disposal to increase the attractiveness of their countries' investment climates, they have increasingly come to rely on tax incentives. The global proliferation of tax incentives has led scholars, intergovernmental organizations, and civil society groups to warn against the negative consequences of a looming global tax race to the bottom (OECD 2013; Eurodad 2017; Philipp Genschel, Kemmerling, and Seils 2011).

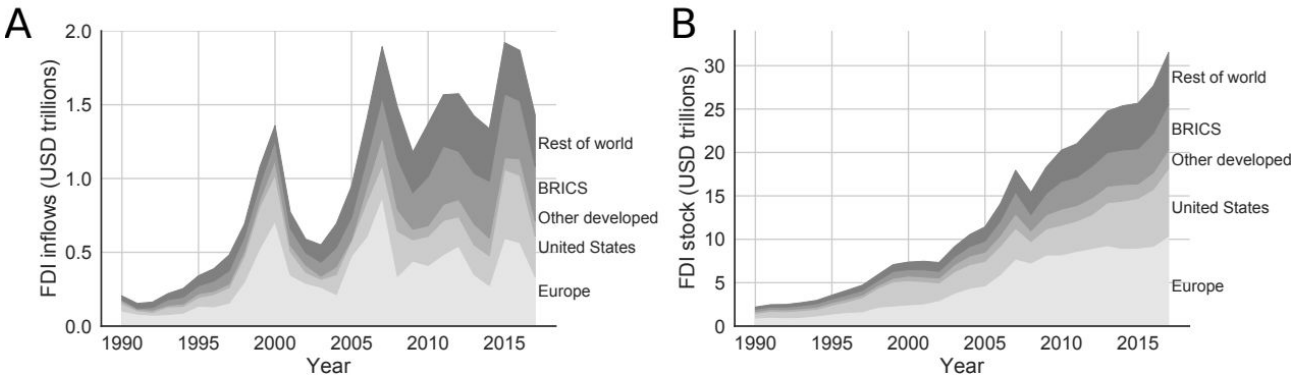

Figure 1. **The increasing importance of Foreign Direct Investment.** (A) FDI inflows by region (B) FDI stock by region. All FDI data was collected from the UNCTAD World Investment Report (2018)

Over the last decades a rich body of literature has emerged on the phenomenon of international tax competition. This literature has significantly pushed forward our understanding of the institutional arrangements and mechanisms that shape international tax competition (Blonigen 2005; Redoano 2014; Philipp Genschel, Kemmerling, and Seils 2011; Rixen 2011; Arel-Bundock 2017) as well as the implications of international tax competition for national tax policy autonomy (Swank and Steinmo 2002; Palan 2002). Surprisingly, however, this literature has not developed a sophisticated understanding of the actual structure and dynamics of international tax competition itself. That is to say, no convincing answers have been provided to the questions: who competes with whom? For what? And how?

Conventional understandings of tax competition conceive of the phenomenon as a monolithic force that pulls countries into a race of all against all, or, alternatively as one that pits small countries against big ones (Keen and Konrad 2013; Devereux, Griffith, and Klemm 2002; P. Genschel and Schwarz 2011). In line with such understandings, attempts to uncover the structure and dynamics of international tax competition typically study inward FDI statistics (Gropp and Kostial 2000; Bellak and Leibrecht 2009; de Mooij and Ederveen 2003, 2008). We argue that such an approach is problematic for two reasons. First, FDI statistics represent financing flows, not necessarily investment in new productive assets. More than 50% of the

value of FDI flows represents a transfer of ownership of existing assets (M&As). This figure can be as high as 70-90% for countries such as the Netherlands, Switzerland and Luxembourg (see Figure S1 in the online Supplementary). Distinguishing between greenfield FDI, where new operations are established, and brownfield FDI, where existing assets and operations are leased, licensed or acquired, is key to understanding the dynamics of tax competition.

The second problem with using FDI statistics to study the structure and dynamics of international tax competition is that FDI statistics are merely a quantification of the *value* of TNCs' investment projects in different countries. They tell us very little about the *character* of the actual investment projects. This is an important shortcoming because the actual investment projects that are financed by these financial flows are extremely heterogeneous — they may vary from investments in new production plants or regional headquarters to the financing of group holding companies —, and both the benefits that countries can expect to reap from them and the macro-institutional features required to attract such investments vary considerably from one type of investment project to another.

In this paper we challenge conventional monolithic understandings of international tax competition by showing that, in reality, tax competition is a much more variegated phenomenon. Increasingly, as firms unbundle their operations and disperse them across national borders, governments create targeted tax incentives, typically designed around the macro-institutional endowments of national (and regional) economies, to attract specific categories of global FDI. Although in some cases these categories pertain to specific industries (e.g. the automobile industry in Eastern Europe, IT firms in Ireland), increasingly they concern specific corporate functions that are practiced across industries (e.g. manufacturing activities, business services, R&D, and the holding and control of corporate assets). This has important implications for the way in which tax competition between countries plays out and the patterns

of competitive dynamics it generates. When Cyprus, in 2013, introduced one of the most generous tax incentives for R&D activities that currently exist in the European Union (Evers, Miller, and Spengel 2015), it was not to compete for manufacturing activities with Poland, but to compete for TNCs' R&D activities with countries such as Malta, Hungary and the Netherlands. Rather than being a game of all against all, tax competition thus increasingly takes place amongst subsets of countries that compete for the same categories of FDI.

We provide empirical evidence for our claim by combining firm-level and country-level data to expose the patterns of competitive dynamics in the race for FDI in the European Union (EU). Specifically, we (I) identify the different categories of FDI that EU member states attract, (II) discern possible benefits they receive from doing so, and (III) pinpoint the tax incentives and macro-institutional features associated with hosting these different categories of FDI. To do so, we conduct a country level analysis in which we examine which subsets of countries compete for the following categories of FDI: manufacturing affiliates, shared service centers, R&D facilities, intermediary holding companies and top holding companies. We conclude by profiling countries according to the specific combinations of categories of FDI that they attract. This prompted us to identify five, what we call, FDI-attraction profiles: *manufacturing centers, back-offices centers, innovation centers, coordination centers* and *profit centers.*

The paper proceeds as follows. The following two sections develop the theoretical and analytical framework that underpins the empirical analysis presented in the second part of the paper. Section two introduces the notion of the "great fragmentation of the firm" to capture the fundamental restructuring over the last couple of decades of the organizational and legal design of the large internationally operating firm. Section three then provides a schematic depiction of the anatomy and geographical dispersion of the contemporary firm. Specifically, it distinguishes between five different types of group subsidiaries, which correspond to five

different categories of FDI. The paper then turns to the empirical analysis. Section four details the analytical approach and discusses the data used for the analysis. Subsequently, section five presents the results of the analysis. Finally, section six concludes by suggesting some of the implications of these results for policy-making and further research.

2. The great fragmentation of the firm

The impressive expansion of global FDI in recent decades has been a symptom of a fundamental reorganization during that period of the architecture of TNCs. This reorganization, we propose, is best understood in terms of a fragmentation and geographical dispersion of TNCs' operational activities and legal-financial structure, a phenomenon we will refer to as the *great fragmentation of the firm*.

Conceptually, the great fragmentation of the firm can be thought of as transpiring on two levels of corporate organization. At the *operational level*, the notion of the great fragmentation of the firm captures the unbundling and geographical dispersion of TNCs' operational activities. This level of the great fragmentation has been well-documented in the International Business and Management literature as well as the Political Economy literature on Global Value Chains and Global Production Networks. Pioneered by Gary Gereffi, Michael Porter, Neil Coe and others, this body of literature discusses how, driven by growing demands to maximize shareholder value, and facilitated by advances in information and communication technology (ICT) and gradual reductions in trade and investment barriers, from the 1980s onwards large firms increasingly began to unbundle, outsource and relocate part of their operational activities offshore. Over time, these processes have resulted in the emergence of global value chains through which large TNCs, so-called "lead firms", organize and coordinate their productive operations across geographies (Gereffi, Humphrey, and Sturgeon 2005; Coe, Dicken, and Hess

2008). Most salient in this regard, both politically and in terms of scholarly interest, has been the relocation of TNCs' manufacturing activities to low labor-cost countries (Blinder 2006).

However, the offshoring of operational activities has not been confined to manufacturing activities. Since the second half of the 1990s, TNCs have increasingly been unbundling, outsourcing and offshoring business support services as well (McIvor 2010). The offshoring of business support services has involved not only back office and support operations, such as human resource management, legal services, and accounting (Wilson 1995), but also front-office operations such as customer support (Breathnach 2000) and even research and development activities (Dachs, Stehrer, and Zahradnik 2014). As of recently, the unbundling and geographical dispersion of TNCs operational activities has also come to affect those functions that traditionally were combined in the TNC's global corporate headquarter (Desai 2009). For example, TNCs' global treasury and financing function might be separated from other headquarter functions to be performed by a separate legal entity operating from a jurisdiction that provides the optimal institutional environment for the performance of that specific function. Similarly, strategic management might be offshored to jurisdictions that provide large pools of managerial talent and that are conveniently located in the proximity of major markets.

At the *legal-financial level* of corporate organization, the great fragmentation of the firm involves processes of legal restructuring and financial innovation that enable firms to more efficiently capture the value created by their globalized operational activities. This dimension of the great fragmentation is currently being explored in the emerging literature on Global Wealth Chains (Seabrooke and Wigan 2017; Bryan, Rafferty, and Wigan 2017). Based on our reading of this literature, we distinguish three important features of the rethinking of the legal-financial organization of the corporate group. A first feature has been the interposition of (intermediate) holding companies in group ownership structures. These are companies that engage in

narrowly defined activities such as the holding of equity or debt stakes in group subsidiaries or the holding of rights to the (sub)licensing of intellectual property. The use of holding companies has increased significantly since the early 2000s. For example, assets held by intermediate holding companies in the Netherlands have increased from under 1.8 EUR trillion in 2006 to 3.8 EUR trillions in 2015[1]. For Germany, assets held by intermediate holdings increased by 1400% from 1989 to 2001 (Weichenrieder, Mintz, and Others 2008).

A second feature of the rethinking of the legal-financial organization of the firm has been the rearrangements of important value-creating assets, especially intellectual property such as copyrights, patents, and trademarks, across group subsidiaries. Through intra-group transactions and cost-contribution agreements[2], either intellectual property assets themselves, or (parts of) the rights to the income streams generated by those assets are transferred to group holding companies established especially for the purpose of holding those assets. These holding companies are typically located in jurisdictions that levy no tax on royalty income generated by intangible assets.[3]

A third feature of the redesign of the legal-financial organization of the corporation concerns innovative approaches to intra-group financing arrangements. Such arrangement may, for example, involve the use of hybrid financing instruments that combine properties of equity and debt and provide firms with possibilities to arbitrage mismatches between different national tax regimes (Bryan, Rafferty, and Wigan 2017; Seminogovas 2015). Another example of such arrangements is what is often called “earnings stripping”. In the case of earnings stripping,

[1] Data on Special Financial Institutions from De Nederlandsche Bank.

[2] Cost-contribution agreements are contracts in which two entities agree to contribute financially toward the development or production of an asset or the execution of a service. In exchange for their financial contribution, parties to the contract receive a proportionate share of the economic benefits arising from the asset or service.

[3] Apart from tax arbitrage, another advantage that the reallocation of assets into holding companies may provide to TNCs is that it isolates those assets from liability claims emanating from other group subsidiaries.

subsidiaries located in high-tax jurisdictions are financed by subsidiaries located in low-tax jurisdictions. The interest on the debt paid by the subsidiary in the high-tax jurisdiction reduces the taxable profits reported in that jurisdiction, while the interest income registered in the low-tax jurisdiction is taxed at a very low rate — or is not taxed at all.

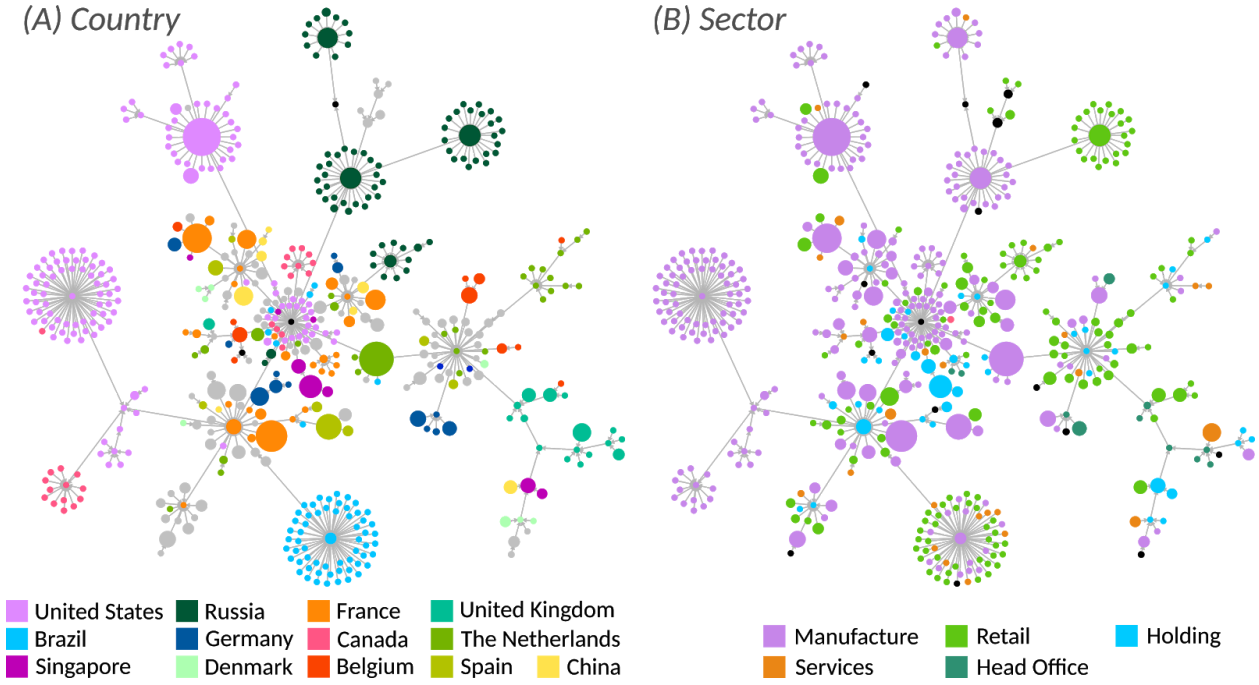

Figure 2. **Corporate structure of a large food company.** Nodes represent different subsidiaries, connected by ownership relationships. Colors indicate (A) country of incorporation, and (B) type of entity. Node size indicates turnover reported by the entity.

3. The Anatomy and Geographical Dispersion of Corporate Groups

Over the last couple of decades, the operational and legal-financial fragmentation of the TNC has resulted in a transformation of the large firm from a functionally diverse, but legally and jurisdictionally contained enterprise to a multi-subsidiary corporate group, in which different group functions are fulfilled by specific subsidiaries that all exist as separate legal entities in different jurisdictions. A typical TNC, or corporate group[4], nowadays has dozens, if not hundreds of subsidiaries each of which fulfills a specific role in the broader scheme of the

[4] Throughout this article we use the terms “transnational corporation” (TNC), “multinational” and “corporate group” interchangeably.

corporate group[5] (Figure 2). Although the specific functions of individual subsidiaries are idiosyncratic and the constellation of subsidiaries and functions are unique for each corporate group, for analytical purposes we distinguish between five broad types of subsidiaries. These are *manufacturing affiliates; shared service centers; R&D facilities, top holding companies;* and *intermediate holding companies*. Below, we discuss for each of these types of subsidiaries the kinds of activities they engage in, their specific function in the broader scheme of the corporate group, the macro-institutional arrangements and tax incentives that can be expected to attract these types of activities, and the benefits that countries can expect to receive from the hosting of such subsidiaries.

3.1. Manufacturing affiliates

A first type of subsidiary is the manufacturing affiliate. Manufacturing affiliates function as the production units of the firm and are some of the most labor-intensive of TNCs' operations. Beginning in the 1960s, and increasingly so with the gradual abandonment of international trade and capital barriers in the 1980s and 1990s, TNCs began to outsource and relocate parts of their manufacturing operations to foreign locales.

Initially, such relocations primarily involved the most routine and labor-intensive of TNCs' manufacturing operations and were driven above all by a search for labor cost advantages (Lewin and Peeters 2006; Johansson and Olhager 2018). Over time, however, both the type of manufacturing activities being considered for relocation and the factors going into TNCs' manufacturing location decision have changed (Ellram 2013). Although it is still more common to offshore simple manufacturing tasks (Jensen and Pedersen 2012; Bramucci et al. 2017), and higher labor costs therefore still affect manufacturing FDI into a country negatively (Bellak,

[5] The function that a given subsidiary fulfills in the broader scheme of the corporate group may even be so specific that it pertains only to a particular transaction and a limited period of time. If such subsidiaries are not dissolved after their specific purpose has dissipated, this may, over time, result in their becoming obsolete; an artefact of the past.

Leibrecht, and Riedl 2008), increasingly TNCs are considering more complex tasks for relocation as well. Where offshoring decisions relate to more complex tasks, TNCs increasingly move beyond cost savings to consider such things as worker skills, infrastructure, and government trade and investment policies (Ellram, Tate, and Petersen 2013).

In addition to the benefit of low labor costs and other institutional factors, manufacturing affiliates often make use of special regimes available in the new host country. Such "special economic zones" typically offer a combination of tax and tariff incentives and may even exclude firms operating in those zones from labor-, environmental- and ownership regulations that apply to firms operating elsewhere in the country (Farole, Akinci, and Gokhan 2011). Examples of such regimes are the Mexican maquiladoras regimes, free trade zones, and industrial parks.

Manufacturing activities are typically the most labor-intensive subsidiaries of a corporate group. So when a TNC relocates parts of its manufacturing operations abroad, this is generally believed to have significant and beneficial employment-creating effects in the manufacturing sector of the new host country (McMillan 2010). Moreover, previous research suggests that jobs that are created by the offshoring of manufacturing operations from developed to developing and transition economies tend to be of higher quality than those in the host country's domestic manufacturing sector (Harrison and Rodríguez-Clare 2010). However, the potential benefits for host countries go beyond the creation of high-quality jobs in TNCs' foreign affiliates. The offshoring of manufacturing operations by a lead firm in a particular global supply chain may also give a significant boost to the non-exporting segment of the manufacturing sector in the new host country as local suppliers flog around the lead firms production operations (Berger 2005), potentially giving rise to the emergence of manufacturing, or industrial, clusters (Fan and Scott 2003).

3.2. Shared services centers

A second cluster of group subsidiaries consist of intra-group service providers, or shared service centers. Shared service centers are subsidiaries that provide centralized support services to other group entities. This may involve both low value-adding back-office operations, such as information technology, human resource management and accounting, as well as higher value-adding services, such as procurement, marketing, sales and distribution. Some firms have opted for an outsourcing strategy, in which specific services (mostly the lower value-adding back-office operations) are provided by a third party service provider. A trend in recent years, however, has been for TNCs to centralize and "in-source" some or all business support activities and have them performed by a captive entity (Lewin and Peeters 2006; Bondarouk 2014)[6]. This entity, known as a "shared service center" (SSC), then provides the services to other group entities. Such an SSC may serve the entire corporate group or selected group entities operating in a s3pecific geographical region or line of business.[7]

Two considerations may lie behind the establishment of shared service centers. The first is cost reductions. SSCs allow corporate groups to benefit from economies of scale and avoid duplication of services across subsidiaries. Moreover, when located in jurisdictions that provide inexpensive labor, the establishment of SSCs can result in substantial savings on labor costs (Lewin and Peeters 2006). An increasingly important driver for the growing use of SSCs, however, is a desire to source new organizational capabilities (Lewin and Peeters 2006). TNCs increasingly discover that offshoring technical, professional and administrative activities allows them to tap into new pools of highly qualified staff (Lewin and Volberda 2011; Strikwerda 2010)

[6] See also: https://www2.deloitte.com/content/dam/Deloitte/dk/Documents/finance/SSC-Handbook-%20Hit-the-Road.pdf

[7] SSCs can be organized in myriad ways. In terms of ownership, SSCs might be organized as a standalone group subsidiary owned directly by the top holding, as a joint venture owned by different group subsidiaries, or they may be a subdivision of a global or regional headquarter (Farndale et al., 2009; Strikwerda 2010).

[8]. Regardless of which of these considerations prevails, the successful implementation of SSCs relies heavily on the availability of good transportation- and ICT infrastructure and the availability of an English speaking workforce (Doh, Bunyaratavej, and Hahn 2009). Taxes, on the other hand, appear to play only a secondary role in TNCs' decision where to locate their SSCs. A survey conducted by management consulting firm Deloitte amongst 311 large firms that had established over 1,000 SSCs found that 70% of companies do not take taxation into consideration when choosing the location of their SSCs. We expect that this might be partly explained by the fact that SSCs are often run as cost-, rather than profits centers and thus make little or no taxable profits. For example, in a review of human resource management SSCs located in the Netherlands, Farndale et al. (Farndale, Paauwe, and Hoeksema 2009) found that the majority of the SSCs in their sample (13 out of 15) were run as cost centers. Still, 17% of companies setting up SSCs do so with the objective to reduce their global tax burden — for instance through transfer pricing strategies.[9]

The benefits countries receive from hosting SSCs come primarily in the form of job creation. This may be effectuated in two ways. The first, and most obvious, of these is direct job creation by the SSC. SSCs can be large employers in the service sector of a country's economy. The previously mentioned Deloitte survey[10] found that 43% of the SSCs in their sample employed more than 100 people, with 15% employing more than 500 people. SSCs may also contribute to job creation in a more indirect way. The establishment of SSCs in a particular country may provide a boost to the domestic services sector in that particular country, thereby contributing

[8] See also https://www.pwc.de/de/finanzdienstleistungen/assets/pwc_studie_financial_shared_service_centers.pdf

[9] For example, Starbucks' centralized procurement SSC, located in the Netherlands, played an important role in the tax planning strategy the company had adopted in order to minimize the tax burden on its European operations (Kleinbard 2013).

[10] https://www2.deloitte.com/content/dam/Deloitte/dk/Documents/finance/Deloitte-SSSurvey-Interactive.pdf

to job creation in that sector, or attract large multinational business service firms to a country. Moreover, since SSCs "sell" their services to group entities located in other countries, host countries see their services exports increase and their current account balance strengthened.

3.3. R&D facilities

A third cluster of group subsidiaries consists of TNCs' research and development (R&D) facilities. These are subsidiaries that are responsible for TNCs' product innovations. Although up until the 1990s these activities used to be performed in the context and proximity of TNCs' global headquarters (Patel and Pavitt 1991), increasingly TNCs are relocating them across jurisdictions (Dachs, Stehrer, and Zahradnik 2014; Hall 2011).

Existing literature identifies three main motives underlying the internationalization of TNCs' R&D activities (Fors and Zejan 2012; Moncada-Paternò-Castello, Vivarelli, and Voigt 2011; Carlsson 2006). The first is for TNCs to adapt the design and development of their goods and services to the specific needs of local markets (Fors and Zejan 2012). This is typically done for markets that are especially important for a firm's sales figures. Another motive for the relocation of R&D facilities is to bring them in closer proximity to TNC's previously offshored manufacturing operations. Finally, a third, and increasingly prominent, motive underlying the relocation of R&D activities away from TNCs' home country is a desire to establish presence in highly innovative regions and cities (Florida 1997). TNCs relocating their R&D activities to such regions do so to get access to local talent and knowledge. Important considerations taken into account by TNCs seeking to tap into local innovative capacities are the availability of highly qualified personnel and a high density of universities and other types of research institutions (Dachs, Stehrer, and Zahradnik 2014; Dachs 2014; Cantwell and Piscitello 2002). The cost of R&D personnel appears to be of only minor importance in the R&D location decision (Dachs, Stehrer, and Zahradnik 2014). Instead, TNCs value countries, and regions within countries, that

provide for attractive living conditions that make it easy to attract additional knowledge workers from abroad (Malecki 1987).

Although there appears to be consensus in the literature that macro-institutional factors dominate TNCs' R&D offshoring decisions, tax incentives are said to play a role as well (Cantwell and Mudambi 2000; Guimón 2011; Hines 1994). This is especially the case when a TNC's R&D offshoring decision has already boiled down to a shortlist of potential countries that are similar in their macro-institutional features. Tax incentives for R&D activities may involve tax credits for R&D expenditures or so-called patent- or innovation boxes, whereby income emanating from qualifying IP is taxed at a reduced rate (Guimón 2011; Evers, Miller, and Spengel 2015). Especially the latter type of incentive has become widely used in Europe over the last decade. As of June 2017, 14 European jurisdictions had introduced some form of innovation box.[11] Moreover, to attract foreign high-skilled workers, and thus increase their attractiveness as a location for TNCs' R&D activities, some jurisdictions have implemented temporary tax reduction for personal income taxes for foreign knowledge workers.

When it comes to the potential benefits that host countries might reap from the relocation of R&D activities, discussions in the literature tend to focus on the promise of knowledge spillovers and productivity gains (Hejazi and Safarian 1999; Todo 2006; Saggi 2002; Dachs 2014; Kim and Park 2017; Ben Hassine, Boudier, and Mathieu 2017). However, research on the policy strategies that governments adopt to attract FDI in R&D suggests that national investment promotion agencies consider the quantity and quality of jobs created as some of the most important factors in their evaluation of potential R&D investment projects (Guimón 2009,

[11] These are Belgium, Cyprus, France, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Malta, the Netherlands, Portugal, Spain, the Nidwalden canton in Switzerland, and the UK (Chen et al. 2017).

2011). Arguably, this is not all that surprising, since employment effects can most readily be translated into political successes by governments and policy-makers.

3.4. Top holding companies

The third cluster of group subsidiaries we identify are top holding companies. Top holding companies are companies that appear at the apex of a corporate group's ownership structure and therefore are often referred as the group's "global ultimate owner" (GUO).[12] These entities play a key role in the legal-financial organization of the group. The location of the top holding company generally determines the legal home of a corporate group and thereby not only the company law under which it operates, but in many cases also its tax residency[13]. Since a large fraction of profits are typically transferred to the top holding company, the tax residency of that company plays a key role in the consolidated tax rate of the group (Dischinger, Knoll, and Riedel 2014). For publicly listed TNCs, the top holding company is also the legal entity that administers the group's relationship with its external shareholders. This is because the top holding company is the entity that is listed and whose shares are traded on a stock exchange (which may or may not be in the same jurisdiction as the one in which the top holding is domiciled). Dividends to shareholders are thus paid out by the top holding company, which means that the tax regime of the jurisdiction in which the top holding is domiciled determines how dividend payments to shareholders are taxed.

Not all top holdings, however, are the same. The traditional top holding company would be domiciled in the jurisdiction from which the group originated and would not only fulfill a key role in the legal-financial organization of the corporate group, but also act as the group's global

[12] The GUO is itself owned by its shareholders. The owners can be either individuals or corporations. In the case of corporations, none of them owns more than 50% of the company directly or indirectly.

[13] Not all tax systems determine an entity's tax residency by its place of incorporation. Some jurisdictions determine tax residency by the place of management, or a combination of both place of incorporation and place of management.

headquarters and thus perform most or all of the corporate functions responsible for the orchestration of the group's global value chains: strategic management, shared services, and compliance and reporting (M. G. Baaij et al. 2015). In today's fragmented TNC, these functions are no longer necessarily all bundled in the group's top holding company, neither are they necessarily located in the group's home jurisdiction. Increasingly, TNCs are unbundling their corporate headquarters and relocating distinct headquarter functions to jurisdictions that provide the optimal conditions for the performance of those specific functions (Desai 2009; M. G. Baaij et al. 2015). Examples of traditional headquarter functions that TNCs increasingly detach from their top holding and relocate across borders are the staff function (resulting in the establishment of SSCs), the group financing and treasury function (resulting in group financing companies — see next section), and the strategic management function (resulting in divisional and regional headquarters — see next section). Regardless of whether the top holding is organized as a global headquarter or merely serves as the entity that determines the group's legal seat, a fraction of the consolidated profits of the group will be taxed under the tax regime of the jurisdiction in which the top holding is located.

Given the large impact of the tax regime that applies to a top holding on the overall tax burden of a corporate group, TNCs have large incentives to transfer their top holding to a jurisdiction with low corporate income tax rates and/or more favourable legislation (M. G. Baaij et al. 2015; Laamanen, Simula, and Torstila 2012; Voget 2011). In the period 1997-2007, 6% of all multinationals relocated their headquarters to another jurisdiction by means of corporate inversions or mergers with a foreign firm (Voget 2011). Over 50 percent of US multinationals that relocated their headquarters to another jurisdiction by means of corporate inversions in the period 1990-2016, did so to countries with no corporate income tax — mainly Cayman Islands, Bermuda and British Virgin Islands (Slangen, Baaij, and Valboni 2017). Transferring the

top holding to another jurisdiction may have other non-tax related benefits as well. For instance, it has been suggested that top holding relocations may enable TNCs to improve communication and knowledge exchange with investors (Birkinshaw et al. 2006; M. G. Baaij et al. 2015), and give them access to new pools of managerial talent (M. G. Baaij et al. 2015).

Although the tax benefits of relocating the corporate seat seem considerable, cross-border transfer of top holdings may involve risks as well. If the relocation is to a jurisdiction that has a less protective regulatory framework, minorities shareholders, creditors and employees may see their protection diminish and oppose the transfer. Moreover, firms, especially publicly listed ones, may suffer from reputational damage due to discontent about the relocation in the home country (Slangen, Baaij, and Valboni 2017). Partly because of these risks, top holdings remain the least mobile part of established TNCs (M. Baaij et al. 2005). Younger TNCs, however, face these risks to a much lesser extent and today's start-ups, which are tomorrow's TNCs, often consider the (re-)location of their top holding company as an integral part of their early growth and internationalization strategy. This is reflected in the average age of TNCs across countries. While the average TNC in Luxembourg incorporated 10.5 years ago, the average TNC in its neighboring countries incorporated 17.4 (Belgium), 15.0 (the Netherlands), 22.2 (France) and 34.4 (Germany) years ago[14].

The benefits that countries receive from hosting top holding companies thus very much depend on the scope of the activities performed by the top holding. When a top holding company only serves as legal seat, but carries out little or no real activities, then benefits for the host country come almost exclusively in the form of increased revenues from corporate taxes and incorporation fees[15]. If, on the other hand, a top holding companies carries out some or all of

[14] Orbis data on all Global Ultimate Owners incorporated before 2018 with at least one foreign subsidiary, collected on August 31st, 2018.

[15] Apart from the incorporation fees and tax revenues generated by top holding companies, the host country may also benefit from an indirect form of employment creation. The legal and financial reporting obligations that come

the traditional corporate headquarter functions, substantial employment benefits for the host country can be expected. Global headquarter functions are associated with high-quality jobs, and can potentially give rise to agglomeration effects and result in significant knowledge spillovers (Davis and Henderson 2008).

3.5. Intermediate holding companies

Our last group of subsidiary consists of intermediate holdings. These are holding companies that may appear anywhere under the top holding in a corporate group's ownership structure. Intermediate holding companies appear in different forms and may be used for a number of purposes. One such a purpose is the tax-efficient channeling of the value that is created by subsidiaries to the parent company. To achieve this, debt- or equity investments made by the parent company are not made directly into a foreign subsidiary, but indirectly through an intermediate holding company, or "conduit" entity. Returns made on those investments are then channeled back to the parent company through the conduit entity in the form of interest- or dividend payments. Intermediate holdings may also be used for the channeling of royalty payments. Such "royalty conduits" may receive royalty payments because they are the legal owner of an intellectual property asset itself or because they own the economic rights to the royalty income generated by the asset due to a licensing agreement with the group entity that legally owns the asset (Maine and Nguyen 2017). In some cases the above described dividend-, interest-, and royalty conduit functions may be combined in a single intermediate holding company.

The archetypical intermediate holding company is one that has few employees and plays only a minor role in managing and directing group activities. This may be different, however, in the case of intermediate holding companies that combine pure holding activities (i.e. the holding of

with the maintenance of top holding companies may provide work for the offshore services sector (i.e. trust firms, tax advice, legal advice, etc.) in the host country.

assets, be they financial, tangible, or intangible assets) with strategic, coordinating or capital management functions. The best example of such multifunctional intermediate holding companies are regional headquarters. Regional headquarters are typically designed to both hold the equity capital of operational subsidiaries active in the relevant region and to engage in strategic decision-making and coordinating functions regarding the TNC's activities in that region. It is also not uncommon for a regional headquarters to accommodate a shared service center offering business support services to operating subsidiaries in that specific region. Another example is the group financing company, sometimes also referred to as the group's treasury. These are entities that are responsible for the management of intra-group financial transactions, such as intra-group lending, group liquidity management, hedging, and other financial operations that had traditionally been part of of the finance function of the corporate headquarter.

A number of institutional features can make a jurisdiction an especially attractive location for the establishment of intermediate holding companies and/or regional headquarters. One is the availability of the institutional infrastructure necessary to support intermediate holdings companies: a stable and efficient state apparatus, sufficiently advanced ICT infrastructure, and the availability of knowledgeable tax advisors, trust firms, and other types of business services (Wójcik 2013; Eicke 2009). For group treasuries, having access to deep and developed capital markets may represent an important consideration as well (Eicke 2009). Perhaps even more important for TNCs' decision where to locate their intermediate holding companies, however, are the specificities of a jurisdiction's tax regime. One such specificity is the absence of withholding taxes on outgoing and incoming dividend-, interest- and royalty payments, or the availability of reduced rates on such payments. Typically, therefore, intermediate holding companies are located in jurisdictions that provide TNCs with access to an extensive network of

bilateral tax treaties, enabling them to significantly reduce the tax costs of funneling payments through a specific jurisdiction (Weyzig 2013). Other aspects of a country's tax regime that TNCs may consider in the location decision for their intermediate holding companies are the administrative burden created by tax compliance and the existence and enforcement of anti-avoidance provisions. Finally, the availability of investment treaties with countries in which an envisioned holding company's subsidiaries are located may further increase the attractiveness of a jurisdiction as a location for an intermediate holding company.

From a country perspective, the benefits that come with the hosting of intermediate holding companies depend very much on the extent to which these companies are pure conduit entities or engage in a broader scope of activities. For intermediate holding companies that act as pure conduit entities, the benefits should primarily be looked for in additional tax revenues and indirect employment effects. Effective tax rates on the dividends, interests, and royalties that flow through these entities may be minimal, but because of the sheer size of these flows, they may generate substantial tax revenues for the host country nevertheless. In the case of the Netherlands, for instance, financial flows through intermediate conduits of €4 trillion (five times the size of the country's GDP) contribute an estimated 3 to 3.4 €billion in taxes, salaries and services hired (Kerste et al. 2013; van den Berg et al. 2008). Conduit entities themselves employ few employees, but the establishment and maintenance of intermediate holding companies requires the services of local corporate service providers (i.e. notaries, trust firms, tax advisors, lawyers, etc.) and thus has employment-creating effect in those sectors. This is different, however, when the intermediate holding company also serves as a regional headquarter. In this case, the intermediate holding company might employ substantial amounts of employees and contribute significantly to a country's services exports.

The representation of the anatomy of the contemporary firm sketched in the previous paragraphs is, of course, a highly stylized one. Explicitly distinguishing between FDI in these five different types of operations does, however, provide a degree of analytical traction that has been missing in previous analyses of international tax competition. In the ensuing analysis we exploit this analytical traction to develop a more sophisticated understanding of tax competition between EU member states. Specifically, we answer three simple questions: Which EU countries attract which types of FDI? What institutional and tax arrangements do they use to do so? And what are the benefits they receive from doing so in terms of tax revenues and employment creation?

4. Analytical approach, data and visualization

4.1 Analytical approach

To answer these questions we conducted a two-step analysis. In a first step we determined for each of the five categories of FDI identified in section three which EU member states[16] are most successful in attracting those activities. Because the available data on FDI does not distinguish between the different types of investment projects that are financed by the FDI flows, we constructed a set of indicators that gauge the intensity of the economic phenomena and activities associated with each type of FDI. Throughout the remainder of the article we denote these indicators as *activity indicators*.

In a second step we looked at a range of *macro-institutional*- and *tax- and policy indicators* to understand which macro-institutional features and tax policies are associated with those countries that are most successful in attracting the different categories of FDI. For example, we assume low labor costs and low corporate income tax rates to be associated with countries that

[16] The unit of analysis is all countries covered by the Interest and Royalty Directive (2003/49/EC) and the Parent-Subsidiary Directive (2003/123/EC): All countries from the European Union and Switzerland.

are successful at attracting manufacture affiliates, while we assume the availability of low withholding taxes to be associated with countries successful at attracting intermediate holding companies. In the following sections we motivate our choice of the indicators that we use for each category of FDI and explain how we have operationalized them. Throughout the ensuing text, we label our indicators using square brackets (e.g. [Governance]).

The motivations for our indicators and the exact operationalization of each indicator can be found in Table S1 and section S5 in the Appendix.

4.2 Data

To construct our indicators we use a combination of macro (country-level) and micro (firm-level) statistics. Macro statistics were collected from Eurostat, the World Input-Output Database, World Bank Open Data, the International Bureau of Fiscal Documentation, and UNCTADstat. Since we obtain the majority of our indicators from Eurostat, we generally lack data on Switzerland. Micro statistics were collected from the Orbis database. Orbis collects information on over 250 million public and private firms worldwide from official country registrars and other country collection agencies, and it is a frequently used source of data (Vitali, Glattfelder, and Battiston 2011; Johannesen, Tørsløv, and Wier 2016; Fichtner, Heemskerk, and Garcia-Bernardo 2017; Garcia-Bernardo et al. 2017) that offer good coverage for EU's firms (Garcia-Bernardo and Takes 2017). All indicators were calculated as the mean value for the period 2007-2017, or a subset of the period when data was not available for all years. For a complete description of all the indicators, including sources, time data availability and descriptive statistics see tables S1—S6 in the appendix as well as the Supplementary Methods section provided online. In order to ensure replicability and cumulative knowledge-building, all our indicators and *Python* code are available at xxxx [blanked] under public license Creative Commons Attribution-ShareAlike 4.0.

4.3 Visualization of the results

4.3.1 Normalization

Our visualization strategy assigns a color to a numerical value, where blue corresponds to low values and red corresponds to high values. Using the same matching between colors and numerical values in all variables would be infeasible since the range of our variables varies by several order of magnitude. While the average tax rate of multinationals is 0.18 (± 0.07), the average time to complete and submit taxes is 192.2 (± 99) days. In order to visualize the results effectively, we need to normalize all variables so that they lie in the same range. A common normalization strategy (StandardScaler) is to subtract the mean and divide by the standard deviation, which standardize all variables to have mean equal to zero and standard deviation equal to one. However, this strategy is not robust to outliers — such as Malta, having a FDI stock 16 times the size of their GDP. Instead, we use another normalization strategy (RobustScaler) where we subtract the median and divide by the interquartile range — the range between the 1st quartile (25th percentile) and the 3rd quartile (75th percentile) (Figure 4A). Figure 4B visualizes the data on FDI flows in 2017 (Figure S2 in the Appendix) using both RobustScaler and StandardScaler. When using RobustScaler we are able to see in red both outliers (Malta and Cyprus), and countries attracting high FDI stocks (Belgium or Netherlands), while for the StandardScaler strategy only outliers are visible.

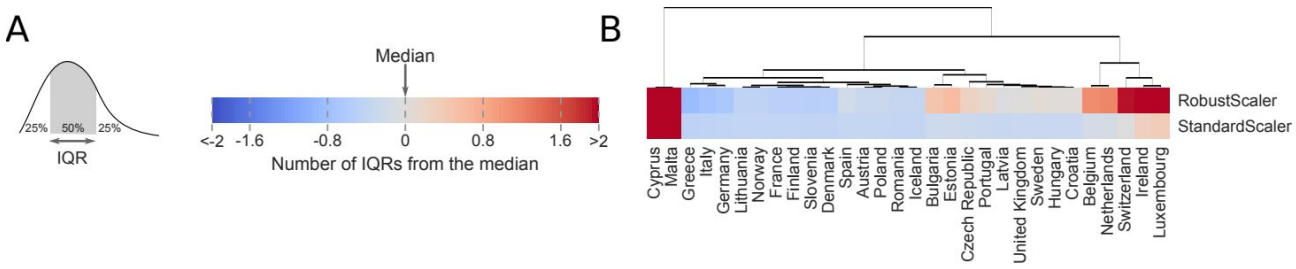

Figure 3. **Visualization of our results.** (A) Example of the interquartile range (IQR) and the color scheme used through the analysis. (B) Example of the FDI stock by country using two normalization strategies. Note that the outliers (Malta and Cyprus) reduce the range of countries visible with the StandardScaler strategy.

4.3.2 Clustering

We use the activity indicators to identify countries that compete for a specific category of FDI. We make use of a clustering algorithm to guide our interpretation of the results. The clustering algorithm calculates the distance between two countries based on the differences between all activity indicators. For instance, in Figure 3B there are two variables (RobustScaler and StandardScaler). Two countries have a small distance if they have similar values for both variables. The algorithm then constructs a tree, where countries appear in adjacent branches if the distance between them is small — e.g. Cyprus and Malta, or Luxembourg, Ireland, Switzerland, Netherlands and Belgium.

To arrange countries into groups, many different clustering algorithms can be used. Each of these techniques uses its own distance formulas, and thus yields different results. In order to avoid cherry-picking a clustering technique that produces “meaningful” results, we apply the default algorithm and use the results only as a starting point, on the basis of which we then cluster the countries manually. The initial clustering is provided in Figure S3. A detailed explanation of the clustering algorithm and its possible variations is provided in the Supplementary Methods.

4.3.3 Country summaries

We summarized how successful countries are at attracting each category of FDI by using the sum of all activity indicators, separating low and high value-adding activities (see section S4 in the Appendix). In order to compare the European countries among themselves, the success of each country was then normalized using the method from section 4.3.1.

5. Results

5.1 Manufacturing affiliates

We first identified those countries that attract disproportionate amounts of TNCs' manufacturing affiliates. We found a prominent cluster of countries composed of Romania, Hungary, Poland, Slovakia, Czech Republic, Estonia, Malta and Bulgaria (Figure 4A). All these countries engage primarily in low value-adding manufacturing activities in which they show high levels of wage-adjusted productivity. Moreover, this cluster of countries receives greenfield investment flows in the manufacturing sector of 2.0% (±0.8%) of their GDP, which contrast with the 0.4% (±0.3%) received by all other countries[17] There is, however, a broad distinction within this cluster between those countries in which a large fraction of the labor force is employed in foreign owned companies in the manufacturing sector and those for which this fraction is much smaller (Figure 4B). In Malta, Romania, Estonia, Hungary, Slovakia, and Czech Republic the number is 6.9% (±1.8), whereas for Poland and Bulgaria it is 3.7% (±0.5%). For the latter group of countries, however, a number of factors might partly explain these relatively low numbers. For Poland, the country's large population size has a significant downward effect on the percentage of the labor force employed by foreign firms. The raw number of jobs created in that country, however, is 680,000, considerably higher than the numbers for countries of similar size, such as Spain and Italy (386,000 and 429,000 respectively). For Bulgaria, the size of greenfield investment suggests that a future increase in the number of jobs in foreign-owned manufacturing operations can be expected.

We next moved to the macro-institutional and tax arrangements associated with the countries previously identified (Figure 4C). As anticipated, since we assume cost reductions to be the

[17] Three countries (Lithuania, Latvia and Croatia) receive relatively large greenfield FDI flows (0.9% ±0.4%). However, given their small size and the fact that only a small fraction of their labor force is employed in foreign owned companies in the manufacturing sector, we do not consider them as countries that attract disproportionate numbers of manufacturate affiliates.

primary motivation for the offshoring of manufacturing operations, all countries previously identified score low on all macro-institutional indicators when compared with the EU average. As the figure shows, labor costs are especially low in Romania and Bulgaria. These countries' exceptionally low labor costs may be an important factor in explaining why since 2007, the year they joined the European Union, these countries have been the largest recipients of greenfield FDI in manufacturing activities. Regarding the tax indicators (which, in Figure 4C are separated from the macro-institutional indicators by a thin white line), we see that all the identified countries have corporate income tax rates that are significantly lower than those for most other European countries, with the notable exceptions of Ireland and Cyprus. They also all stand out both in terms of the number of tax incentives they provide to investments in manufacturing activities and in terms of the low levels of withholding taxes that they levy on outbound dividend payments. We also observe that all countries that attracting manufacturing affiliates, except Slovakia and the Czech Republic, had signed large numbers of investment treaties, but not tax treaties, with Western Europe before they entered the European Union. This suggests that withholding tax considerations are secondary to the securing of property rights in TNCs' decision where to locate their offshored manufacturing activities.

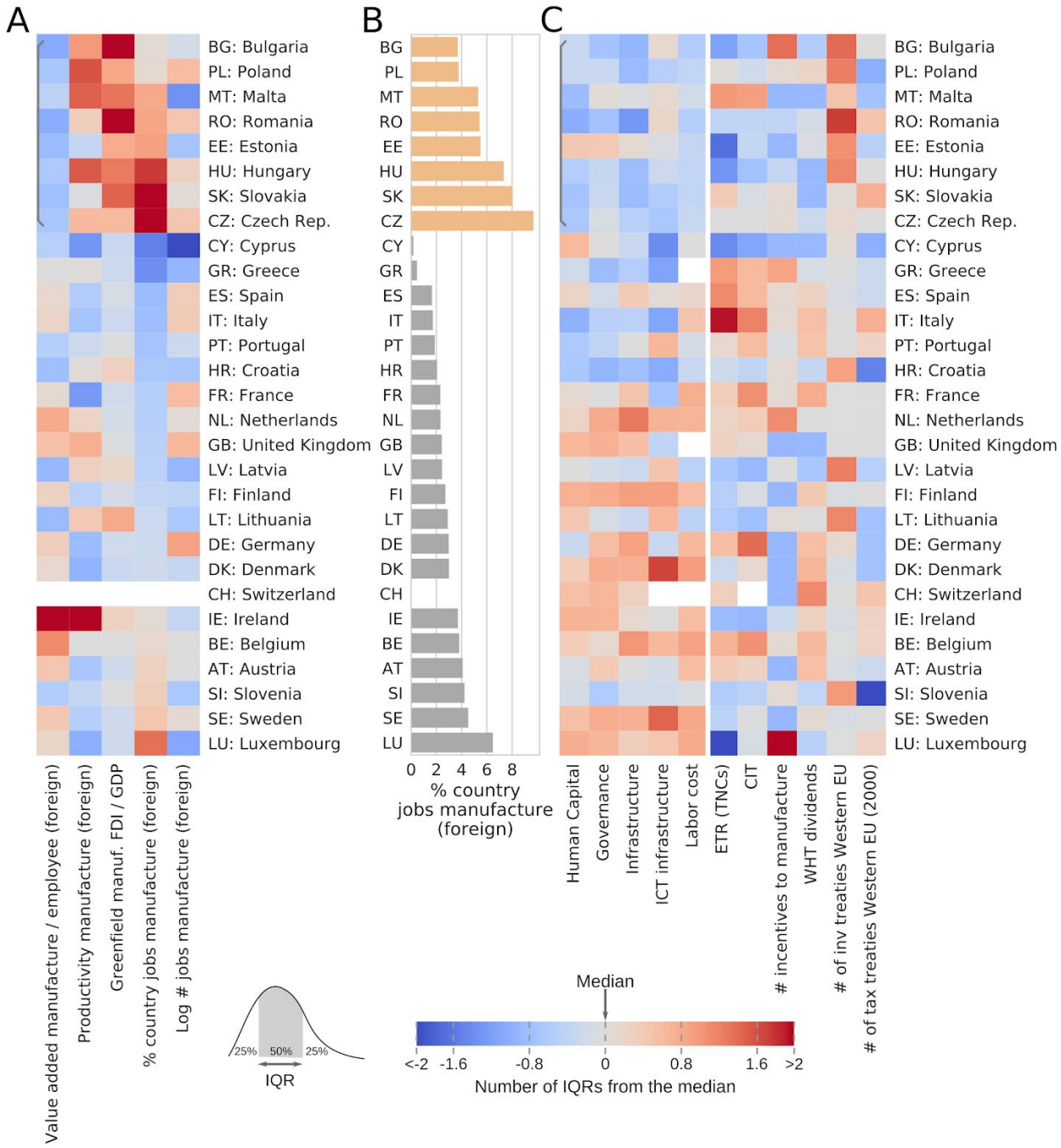

Figure 4. **Manufacturing affiliates.** (A) Activity indicators, (B) benefits, and (C) macro-institutional features and tax incentives associated with attracting manufacturing affiliates. The identified clusters of countries is marked with a gray bracket (A,C) and different shades of orange (B). See Table A1 for a complete explanation of the indicators.

5.2 Shared service centers

We next identified countries that are competing for TNCs' SSCs. Here we identified three clusters of countries that successfully do so (Figure 5A). All countries in those three clusters

(with the notable exceptions of Poland and Bulgaria, which we will discuss below), see a relatively large fraction of their labor force employed in foreign owned SSCs. The first cluster, consisting of the Netherlands, Ireland, United Kingdom and Luxembourg attracts high value-adding SSC activities, has high wage-adjusted productivity and receives large amounts of greenfield investments in SSC activities. The second cluster, composed of Finland, Austria, Belgium and Sweden also attracts high value-adding SSC activities but shows lower wage-adjusted productivity and also somewhat lower levels of greenfield investment in SSCs. We interpret this difference as the second cluster being somewhat less attractive as a location for TNCs' high value-adding SSC operations and therefore attracting fewer such operations. The third cluster, composed of Poland, Bulgaria, Romania, Hungary, Czech Republic, Portugal and Estonia, is characterized by low value-adding activities but high levels of adjusted productivity. In this third cluster, foreign owned SSCs employ 1.3% (±0.5%) of the labor force, compared to 4.1% (±4.7%) and 1.7% (±0.3) for the first and second clusters respectively (Figure 5B). However, Bulgaria receives the second highest flows of greenfield FDI and we thus expect employment numbers to increase in the following years. In the case of Poland, the large size of their labor force causes a downward bias in the share of the labor force employed in foreign owned SSCs. In fact, the raw number of workers in foreign owned SSCs in Poland (372,000) is two to four times higher than the number for Romania (183,000), Portugal (107,000), Czech Republic (102,000) and Hungary (78,000).

Looking at the macro-institutional and tax policies associated with the countries in those three clusters (Figure 5B, we make the following observations. High value-adding SSC activities (first and second clusters) take place in countries that combine high levels of development with an expensive, but highly productive labor force, while the contrary is true for low value-adding activities (third cluster). Similar to the manufacturing case, tax considerations appear to be

secondary to macro-institutional determinants in TNCs' decision where to locate their SSC activities. Again, we assume this to be a result of the fact that most SSCs are run as cost centers and therefore do not make substantial amounts of taxable profits.

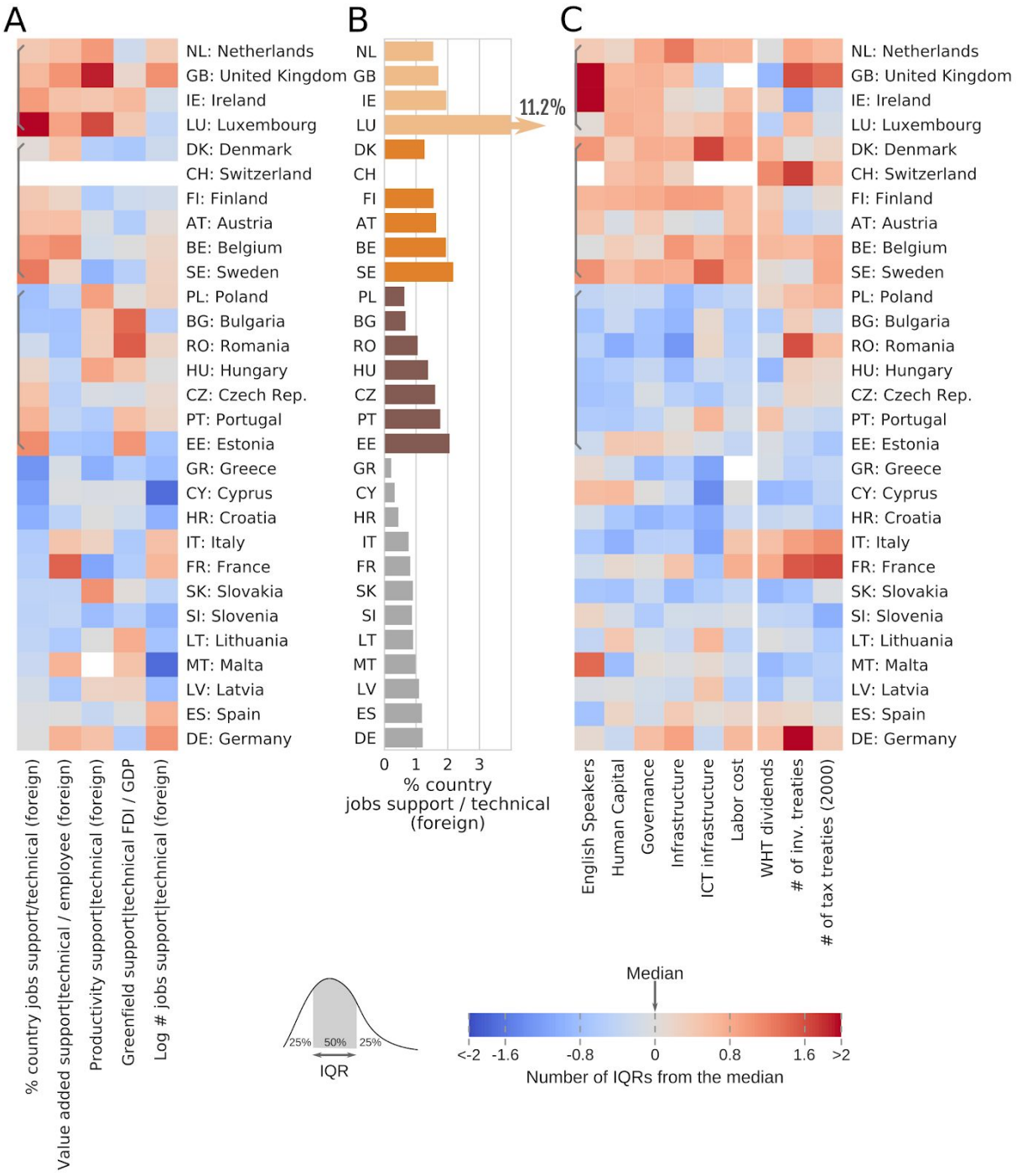

Figure 5. **Shared service centers.** (A) Activity indicators, (B) benefits, and (C) macro-institutional features and tax incentives associated with attracting shared service centers. The two identified clusters of countries are marked with gray brackets (A,C) and different shades of orange (B). See Table A1 for a complete explanation of the indicators.

5.3 R&D facilities

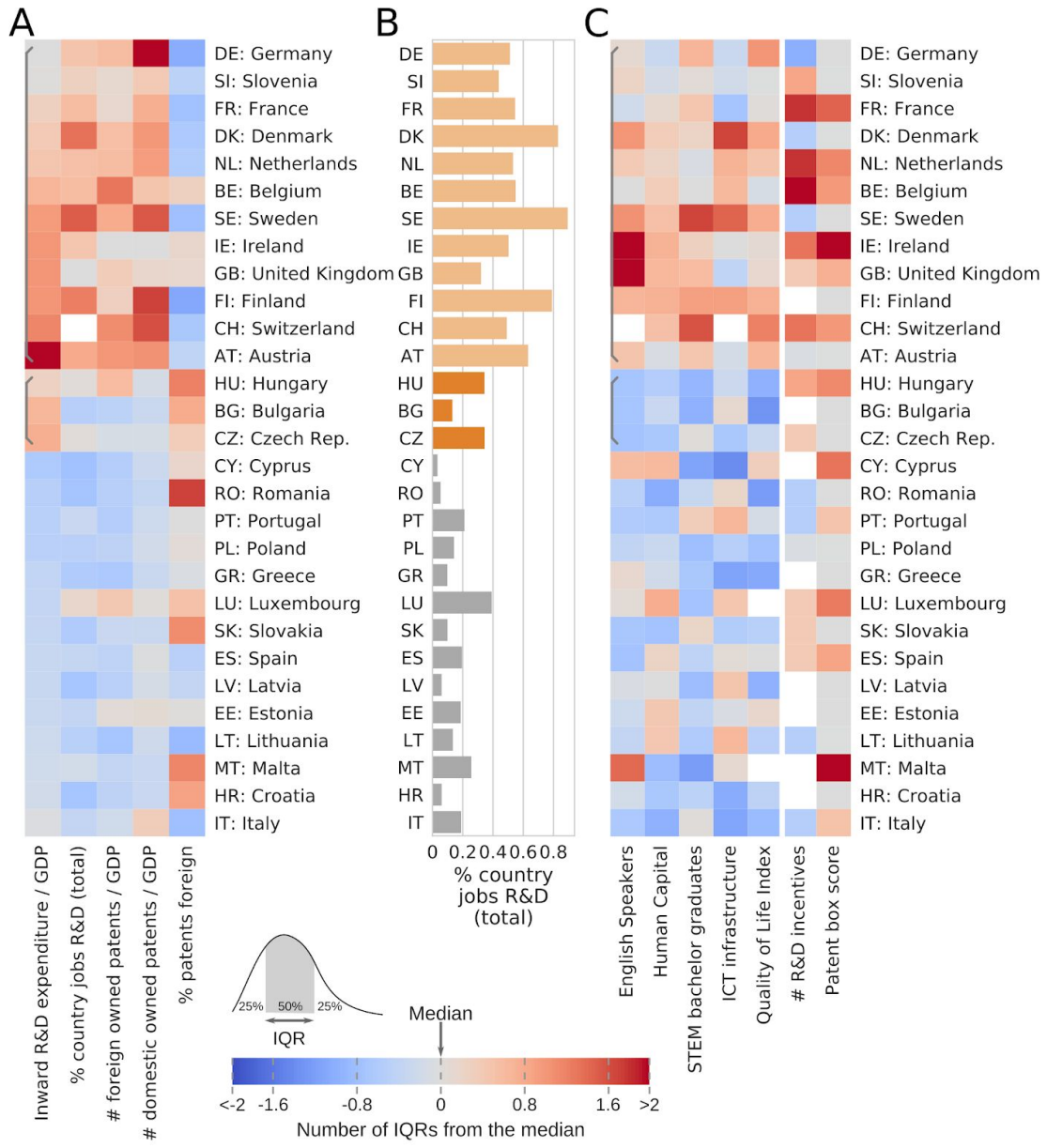

Figure 6. **R&D facilities.** (A) Activity indicators, (B) benefits, and (C) macro-institutional features and tax incentives associated with attracting R&D facilities.The two identified clusters of countries are marked with gray brackets (A,C) and different shades of orange. See Table A1 for a complete explanation of the indicators.

Thirdly, we identified countries that successfully attract R&D facilities of TNCs. We found two clusters of such countries (Figure 6A). The first consists of an heterogeneous group of highly developed countries. All countries in this cluster have a large R&D sector, evidenced by the

large share of their labor force employed in corporate R&D facilities and the large numbers of patent applications by both domestic and foreign firms. Moreover, these countries all display high levels of R&D expenditure financed from abroad, which indicates that a significant part of R&D operations in those countries is conducted by foreign owned firms. This is further confirmed by the fact that, corrected for the size of their economies, these countries show high numbers of patent applications by foreign owned companies. Three countries within this cluster (Belgium, Ireland and the United Kingdom) distinguish themselves from the others in that foreign owned firms account for 42-45% of all patent applications in those countries — compared with 16-31% in the rest of the cluster. The second cluster consists of Hungary, Bulgaria and the Czech Republic. Compared to the first cluster, R&D takes a much less prominent role in these countries' economies, as evidenced by the much lower fraction of their labor forces employed in R&D operations as well as the low number of patent applications by domestic firms (Figure 6B). They do, however, receive high values of foreign R&D expenditure, suggesting that foreign firms see them as suitable locations for their offshored R&D activities nevertheless.

To get a deeper understanding of the differences between the two clusters, we then looked at the macro-institutional and tax features of these countries. For the first cluster of highly developed countries, fluency in English, ICT infrastructure, graduates in science and technology and quality of life highly correlate with foreign owned R&D activities (Figure 6C). This was expected, since TNCs operate R&D facilities in those countries where the skills are located. The top three countries by foreign R&D investment (Austria, Switzerland and Finland) rank 4th, 2nd, 3rd for quality of life and 6th,3rd and 2nd for graduates in science and technology. For the second cluster of countries, low labor costs appear to dominate over other indicators. Most likely, the fact that these countries see comparably large amounts of their total R&D expenditures come

from foreign owned companies and see a large percentage of their domestic patent applications come from foreign owned companies is due to the prominent presence of foreign owned manufacturing activities in those countries. As explained in section 3.3, one motivation for TNCs to relocate some of their R&D activities is to have them in the proximity of their already offshored manufacturing operations. Finally we found that R&D incentives (with the notable exception of the patent box) are correlated with R&D activity. However, we also found a number of countries (i.e. Sweden, Austria or Denmark) that offer only a small number of R&D incentives but nevertheless attract high levels of foreign R&D investments. This indicates that tax considerations play only a secondary role to the availability of talent in those countries.

5.4 Top holdings

We identified two clusters of countries that appear successful in attracting TNCs' top holding companies (Figure 7A). The first cluster is composed of the three smallest EU member states: Cyprus, Luxembourg and Malta. The second is composed of Ireland, Switzerland, the Netherlands and the United Kingdom[18]. Both clusters attract disproportionate amounts of top holding companies, but countries in the first cluster attract the highest numbers relative to the sizes of their GDPs. Countries in the first cluster also seem to enjoy more significant benefits from hosting top holdings, at least in as far as tax revenues are concerned. They raise tax revenues of 5.4% (±0.3%) of their GDP from corporations, compared with 2.5% (±0.5%) in other European countries (Figure 7B). The main difference between the two clusters, however, concerns the profit rate of foreign firms (Figure 7A). The profit rate in the first cluster is 484,000 (±257,000) €/employee[19], significantly higher than the profit rates in the second cluster (70,000

[18] Arguably, with a strong presence of the Big Four, a high number of GUOs and high profit rates, Denmark would also be a candidate for this group. However, we decided to excluded it for two reasons. First, the comparatively low value of equity assets held by companies in that country suggests that Denmark primarily harbors top holdings of rather small and inconsequential TNCs. Second, the low profit rates when compared with domestic companies suggests that the relatively high number of GUOs in Denmark has little to do with TNCs' tax planning strategies.

[19] Assuming an employee cost of $100,00 across countries.

±29,000 €/employee) and all other countries (73,000 ±30,000€/employee). Moreover, the difference in profit rates between multinational and domestic companies for the first and second cluster respectively are 376,000 (±337,000) and 26,000 (±27,000) versus -55,000 (±44,000) €/employee for all other countries.

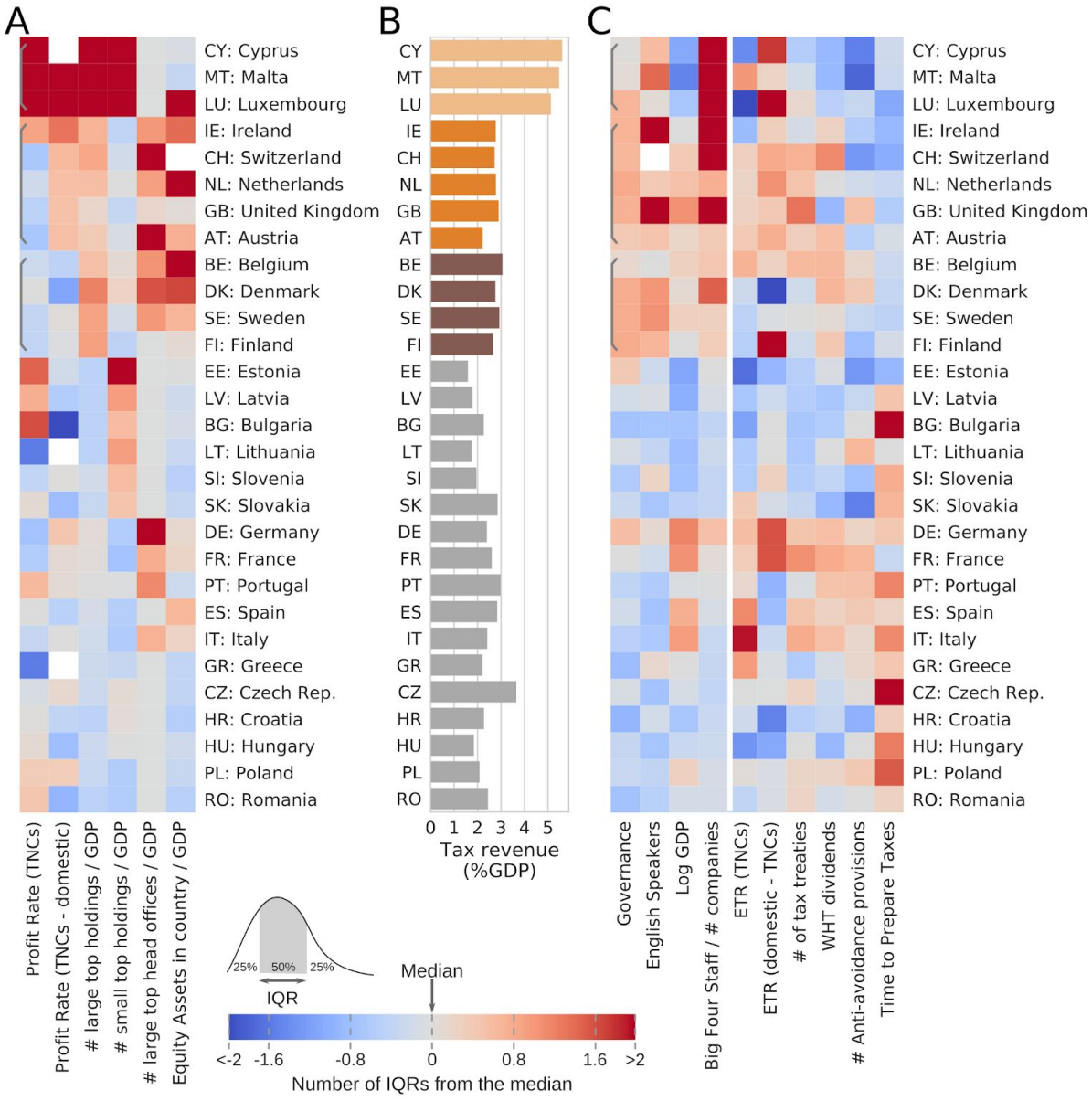

Figure 7. **Top holdings.** (A) Activity indicators, (B) benefits, and (C) macro-institutional features and tax incentives associated with attracting top holdings. The three identified clusters of countries are marked with gray brackets (A,C) and different shades of orange. See Table A1 for a complete explanation of the indicators.

The difference between the the countries in the first and second cluster becomes more pronounced when their scores on the macro-institutional and tax indicators are considered (Figure 7C). Most importantly, the effective tax rates (ETRs) for countries in the second cluster are significantly higher than those for countries in the first cluster. We find the median ETR for companies with revenues higher than one million dollars to be 3.9% in Luxembourg, 9.8% in Cyprus, 28.0% in Malta, and 20.6% (±6.0%) in all other European countries. In the Maltese case, however, the effective tax rate excludes an up to six-sevenths refund to the shareholders on the tax paid. Including this refund in the calculation would bring the ETR down to 4-8%. Moreover, the low ETRs that multinationals pay in these countries do not necessarily apply to domestic companies. We found that the tax paid by TNCs in countries that belong to the first cluster is up to 11 percentage points lower than the tax paid by their domestic counterparts. We interpret our finding that countries in the first cluster combine low effective tax rates with relatively high profit rates of multinationals, and above those of domestic companies, as an indication that TNCs locate their top holding in those countries primarily for reasons of tax planning[20]. Countries in the second cluster, with lower profit rates of multinationals, larger economies, a higher score on the governance indicator, and higher effective tax rates for multinationals, seem to be able to attract a larger fraction of top holdings that are not exclusively motivated by tax planning considerations, meaning, for example, actual global or regional headquarters. Another difference between the two clusters is the availability of an extensive network of tax treaties in the second one. We interpret the apparent unwillingness of countries to sign tax treaties with countries in the first cluster as another indication that TNCs locate their top holdings in Cyprus, Malta, Luxembourg, and Ireland mainly to reduce their tax

[20] We further speculate that in the case of Ireland, which has the lowest effective corporate tax rate of the countries in the second cluster (12.5%), an additional reason why the country displays a high profit rate for multinationals, especially when compared to domestic companies, is that that country hosts a number of very large and extremely profitable technology companies.

burden. For countries in the second cluster, on the other hand, we interpret their ability to sign treaties with large numbers of countries as an indication that the top holdings located in those countries are perceived as more legitimate by potential treaty partners. Finally, our results further suggest that countries may increase their attractiveness as a location for TNCs' top holding companies by offering low withholding taxes on dividends and providing for a lenient and efficient tax legislation (low number of anti-avoidance provisions and short time needed to prepare taxes).[21]

5.5 Intermediate holdings

Lastly, we identified three clusters of countries that successfully attract intermediate holding companies, or conduits (Figure 8A). The first cluster is composed of Hungary, Malta and Cyprus. Countries in this cluster are all specialized in one type of intermediate holding company. Cyprus operates as a pure dividend conduit, as evidenced by its high value of conduit investment[22]. Hungary and Malta attract disproportionally large payments for the use of intellectual property, reflecting their status as preferred jurisdictions for royalty conduits. The second cluster is composed of a prominent group of multi-purpose countries: Luxembourg, Netherlands, Switzerland, Ireland, Belgium and United Kingdom. All countries in this group exhibit high values for all types of holding activities. For the case of the United Kingdom, its large GDP — 3.4 times higher than the second largest country in the cluster — downplays the importance of the

[21] Worthy of special mentioning is Estonia. This country appears to have all the right conditions to be identified as a top holding jurisdiction — a small economy, lenient and efficient tax legislation, minimal taxation. It also harbors a large number of GUOs. However, the low scores of the country on all the other activity indicators suggest that the country may be attracting large amounts of top holdings of small and inconsequential TNCs (possibly related to personal finance and wealth management) but does not play a significant role as a preferred jurisdiction for top holdings of bigger TNCs. This also explains the almost negligible amount of tax revenues the country receives from foreign-owned firms.

[22] The conduit investment indicator measures how frequently a country appears in the middle of any type of equity structure, while the equity indicator measures only non-financial institutions. The equity assets held in Cyprus are low, which suggests that the country may be attracting large amounts of holdings of small and inconsequential TNCs (possibly related to personal finance and wealth management) but does not play a significant role as a preferred jurisdiction for intermediate holdings of bigger TNCs. is more frequently used by individuals or financial corporations than by non-financial corporations.

country as a conduit jurisdiction. The third cluster we identified consists of four countries that attract moderate amounts of holding companies: Finland, Sweden, Austria and Denmark. Countries in this group are frequently used as dividend conduits, and occasionally as royalty and interest conduits.

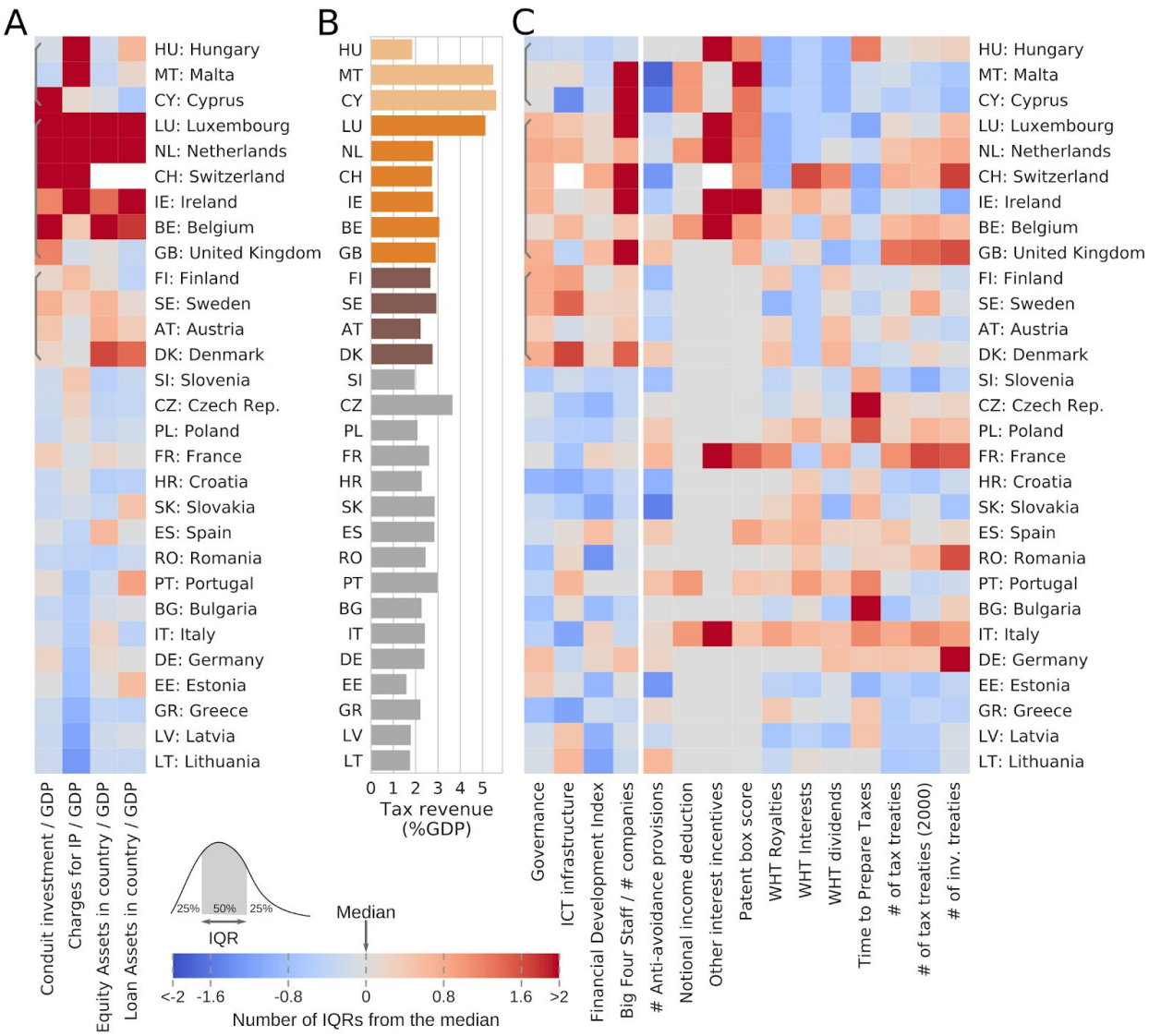

Figure 8. **Intermediate holdings.** (A) Activity indicators, (B) benefits, and (C) macro-institutional features and tax incentives associated with attracting intermediate holdings. The two identified clusters of countries are marked with gray brackets (A,C) and different shades of orange. See Table A1 for a complete explanation of the indicators.

We next analyzed the macro-institutional indicators correlated with the clusters (Figure 8C). We found that countries in the second and third clusters have good governance, a highly developed ICT and financial infrastructure, and a large presence of the Big Four. Contrary, countries in the first cluster exhibit comparatively lower levels of governance and infrastructure (at similar levels than Spain or France), which suggest that tax determinants may be the key to their success. Indeed, we found that all three countries have no withholding taxes, a low number of anti-avoidance provisions, and the most generous patent boxes in Europe. The patent box in Hungary (established in 2003) offers a tax rate of 5% on qualifying royalty income, the Maltese patent box (established in 2010) provides a full exemption for all qualifying royalty income, and the Cyprus patent box (established in 2013) offers an 80% exemption in gross profits (tax rate below 2.5%).

The second cluster of countries is also characterized by the presence of a generous patent box, and either the presence of the notional interest deduction or another tax incentive targeting group interest payments. The high correlation between the patent box score and the success to attract royalty holdings indicates that royalty holdings (but not R&D activities) are attracted to places with generous patent boxes, which is consistent with the literature on patent location (Evers, Miller, and Spengel 2015; Karkinsky and Riedel 2012). Moreover, the correlation between the presence of measures granting special tax treatment for interest income and the loans held by non-financial corporations in a country indicates that interest holdings may be attracted to places with generous interest incentives. Moreover, countries in this group have either no or low withholding taxes (Luxembourg and the Netherlands), or an extensive network of tax treaties (Switzerland, Belgium, United Kingdom). The only exception is Ireland, with moderate withholding taxes and a relatively shallow network of tax treaties. However, withholding taxes in Ireland can be avoided by using a holding company in a third EU country

that has an extensive network of tax treaties, since intra-group payments in the EU are exempt from withholding taxes. Countries in this second cluster also have a large network of investment treaties, ensuring investor rights and increasing the attractiveness of a country for dividend holdings. Finally, countries in the third cluster are characterized by the highest levels of governance, reduced regulation and incentives, evidenced by the lack of anti-avoidance provisions and interest incentives.

5.6 Towards a typology of "FDI attraction profiles"

To summarize and wrap up the results of our analysis we then profiled all countries according to the different types of FDI they attract. We identified six groups of countries (Figure 9), each of which we indicated with a unique color mark in the bar just above the country labels. One group of countries (indicated with the white color mark) consists of a heterogeneous set of big and small countries (Germany, France, Slovenia, Spain, Italy, Greece, Latvia, Croatia, and Lithuania) that all appear to be rather unsuccessful in attracting FDI of any category. Countries in each of the other five groups all successfully attract distinct combinations of two or more categories of FDI. We call these distinct combinations "*FDI attraction profiles"*. Below we briefly discuss each of these profiles in more detail.

The FDI attraction profile that is marked in grey, and which is associated with Hungary, the Czech Republic, Bulgaria, Romania, Slovakia, and Poland, revolves primarily around TNCs' offshoring of manufacturing activities. For this reason, we dubbed countries associated with this profile *manufacturing centers*. Apart from manufacturing activities, all countries in this group attract at least some degree of (primarily low value-adding) SSC activities. It is conceivable that this particular combination of manufacturing and low value-adding SSC FDI is the result of a sequential phenomenon in which TNCs first offshore their manufacturing operations to those countries and, after having had good experiences with the country's

investment climate, decide to also relocate some of their lower value-adding SSCs to the country. After all, in decisions regarding SSC (re)locations that are primarily motivated by cost reductions TNCs seem to consider location factors that are very similar to those that are considered in decisions regarding the (re)location of manufacturing activities. Such a pattern of "sequential FDI" has indeed been identified in the International Business literature as a mechanism that might explain TNCs' location decisions when offshoring activities (Oman 2000; Kogut 1983). Two of the countries associated with the manufacturing centers profile (the Czech Republic and Hungary) also attract a small amount of R&D activities. As we suggested earlier, this may be an artefact of TNCs' preference to have some of their R&D activities located in the proximity of their previously offshored manufacturing operations. Hungary is a special case in this group of countries because it has also been able to attract substantial amounts of intermediate holding companies due to its aggressive tax incentives (see section 5.5).

The second FDI attraction profile, which is associated with Portugal and Estonia, combines low value adding SSC activities with a limited amount of high value adding SSC activities. We refer to countries associated with this profile as *back office centers*. The reason these countries are successful in attracting SSCs may lie in their unique macro-institutional features. Both countries combine low labor costs with an efficient workforce and above average ICT infrastructure. Their success in attracting top holding companies, on the other hand, has probably more to do with the specificities of their corporate tax regimes. Estonia only taxes corporate income once it is distributed to shareholders, which is an attractive regime for small individually-owned companies, while Portugal harbors within its borders the Madeira international business center, where no withholding taxes are levied and which offers a statutory tax rate of only 5%.

The third FDI attraction profile, which we label *innovation centers*, is associated with Sweden, Denmark, Finland and Austria (marked in yellow). The main strength of these countries is their

ability to attract TNCs' R&D affiliates. We attribute these countries' success in doing so primarily to their macro-institutional features. All countries offer large numbers of STEM graduates, good ICT infrastructure, and a stable political climate. Interestingly, none of these countries seems to rely on exceptionally generous patent boxes or other kinds of tax incentives to be successful in attracting TNCs' R&D facilities. Apart from the FDI in R&D, most of these countries also attract a considerable number of intermediate- and top holdings. The attraction of holdings is correlated with good access to financial markets, and the presence of a stable government providing with efficient regulation.

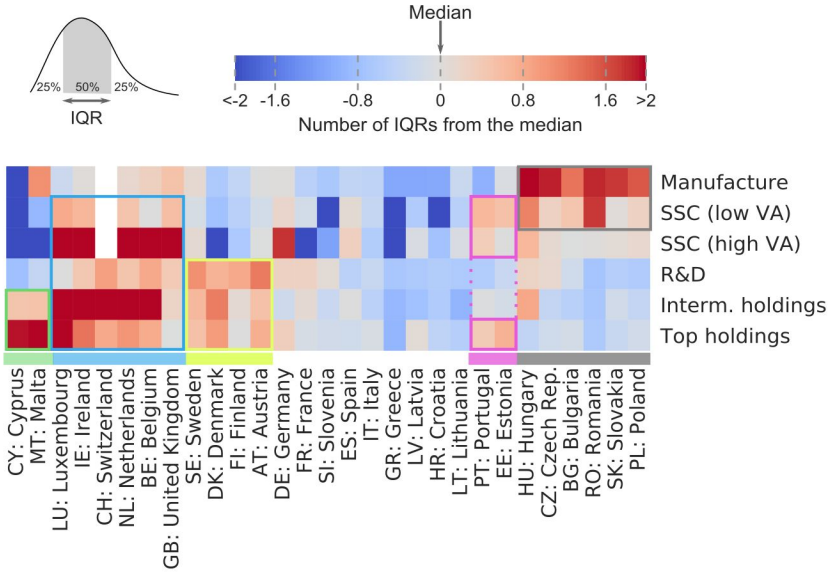

Figure 9. **Summary of the results.** Countries' ability to attract different category of FDI. Red cells correspond to highly successful, blue cells correspond to highly unsuccessful. Colored boxes indicate the five FDI-attraction profiles identified: Profit (green), Coordination (blue), Innovation (yellow), Back-office (magenta) and Manufacturing (gray).

The fourth FDI attraction profile that we identified is without doubt the most encompassing one. This profile (indicated in blue) combines all categories of FDI except for manufacturing activities. However, what is unique about the countries associated with this profile is their

ability to attract high value-adding SSCs and intermediate holding companies. Because of the central role of these two functions in the coordination of global supply- and wealth chains, we dubbed this the *coordination centers* profile. This unique combination of activities is partly explained by these countries' macro-institutional endowments. All countries in this group provide for a highly skilled workforce, good infrastructure, and a stable political climate. However, tax incentives appear to play a significant role as well. Most of these countries provide for low withholding taxes and tax incentives specifically created to attract holding companies, such as patent boxes and special treatment of group interest income. We believe that the explanation for the emergence of this particular FDI attraction profile should be looked for in the proactive role of the offshore services sector in shaping tax- and financial regulatory policies in these countries (Dörry 2016). Although this hardly confirms our expectation, all countries associated with the coordination profile display an exceptionally high presence of the Big Four accounting firms (see Figure 8C).

We labelled the fifth and final FDI attraction profile the *profit centers* profile. The two countries associated with this profile (Cyprus and Malta) primarily attract top holding companies, but also, to a somewhat lesser extent, intermediate holding companies. The extraordinary high profit rates of multinationals that we found for those two countries indicate that the top holdings they attract are mainly of the sort that is used for profit shifting purposes, rather than those that engage in substantial global headquarter activities. We thus conclude that these countries owe their status as a preferred location for top holdings almost exclusively to the specificities of their tax regimes. Taking into account Malta's special tax refund scheme, both countries have effective tax rates that are amongst the lowest in the EU. The centrality of such low effective tax rates makes that the profit center profile can only be a feasible FDI attraction profile for countries with very small domestic economies. This is because in such countries, the

additional tax revenues generated by taxing the activities of intermediate holding companies more than offset the reduction in tax revenues from domestic companies.

6. Conclusion

In this paper we have created a more sophisticated understanding of the variegated nature of international tax competition for FDI. To do so we first traced the great fragmentation of the firm to distinguish between five different categories of FDI: Manufacturing affiliates, shared service centers, R&D facilities, intermediate holding companies (conduits) and top holding companies (sinks). By using a combination of micro and macro statistics, we were able to show for each category of FDI which European countries are most successful in attracting it and what benefits they obtain from doing so. We also looked at a range of macro-institutional and tax indicators to show which policy measures countries have implemented to attract these specific categories of FDI. Finally, we summarized our findings by profiling countries according to the different types of FDI they attract. In this way, we were able to identify five distinct groups of countries, each of which attracts a distinct combination of categories of FDI. We called these distinct combinations "FDI attraction profiles" and labelled the five FDI attraction profiles that we found to exist in the European Union *manufacturing centers*, *back-office centers*, *innovation centers*, *coordination centers*, and *profit centers*.

Three important lessons can be learned from our results. The first of these pertains to our understanding of the broader phenomenon of tax competition. Contrary to the prevailing assumption that tax competition for FDI is a monolithic force that pits small countries against big ones, our results suggest that, in reality, specific countries compete for specific types of FDI and use specific types of tax policies to do so. Tax competition thus takes place amongst subsets of countries that compete for similar categories of FDI. This insight has important implications for policy initiatives at the EU level that aim to curb aggressive tax competition. Tax

policy-making in the EU is a highly politicized affair. Direct taxation is one of the few policy fields in which individual member states have successfully defended their sovereignty. As a result, any attempt to question the legitimacy of a specific tax incentive or instrument tends to run against opposition from those member states that rely on that incentive or instrument to attract internationally mobile FDI. Given the variegated nature of tax competition, we should not expect smaller member states to invariably be united in their attempts to block attempts orchestrated at the EU level to question the legitimacy of a specific tax incentives or instrument. Rather, we should expect member states to alternately side with and oppose *ad hoc* coalitions of countries, big or small, that initiate attacks on specific tax measures and instruments. Advocacy groups, international organizations, and even the European Commission would be wise to take the existence of such flexible coalition into account when formulating policy proposals aimed at curbing the harmful aspects of international tax competition.

A second lesson that can be drawn from our results has to do with potential unintended consequences of policy initiatives aimed at curbing the harmful effects of international tax competition. The goal of the Base Erosion and Profit Shifting (BEPS) project, a major anti-tax avoidance initiative currently carried out under the auspices of the OECD (OECD 2015), is to move TNCs to align economic substance (i.e. sales, assets and employees) with value creation (i.e. profits). However, if one takes serious the fragmented nature of today's TNC, one soon realizes that TNCs can easily create the minimally required economic substance in those countries where they chose to book their profits, for example, by adding shared service center activities to their (intermediate) holding companies. This might, in fact, reinforce, rather than bring a halt to international tax competition. Indeed, the overlap that we found in our analysis between countries attracting shared service centers and intermediate holding companies suggests that this is already being done.

A third lesson that can be drawn from our results goes beyond the phenomenon of tax competition and speaks to debates about national varieties of capitalism (VoC). The existence of distinct FDI attraction profiles and their embeddedness in countries' institutions of economic governance, we argue, challenges conventional ways of thinking about national varieties of capitalism in two ways. First it challenges the (implicit) assumption that the institutional complementarities that underpin national varieties of capitalism are an inherently national phenomenon. At least some of the institutional complementarities that underpin FDI attraction models have a strong inter-/transnational component. Consider, for example, the reliance of *innovation*- and *coordination centers* on regionally integrated labor markets in order to attract sufficient amounts of high-skilled workers from other countries in the region. Second, it confronts conventional approaches to VoC with a phenomenon that has thus far not been sufficiently theorized. That is the phenomenon that FDI attraction profiles, and the national varieties they are embedded in, are themselves complementary to each other.[23]

The analysis presented in this paper has a number of limitations and thus opens up several avenues for future research. We see three of them as especially fruitful. The first of these would be to extend the analysis presented in this paper to other parts of the world. In this regard, the Asia-Pacific region seems to be an especially suitable candidate. A process of regional economic integration in some ways resembling that in the European Union has been underway in that region since the mid-1980s under the auspices of the Association of Southeast Asian Nations (ASEAN) and the Asia-Pacific Economic Cooperation (APEC). For firms operating in that region, this has opened up the possibility to organize their corporate structures and processes on a regional, rather than national basis. Indeed, jurisdictions like Singapore and Hong Kong are known to be domiciles for large numbers of holding companies and regional

[23] For exceptions to this see (Lane 2008; Nölke and Vliegenthart 2009)

headquarters, making it at least conceivable that they fulfill a role in that region that is not unlike the one played by the coordination centers we found in the EU. Whether the region also harbors some or all of the other FDI attraction profiles we identified in this article is an open question.

Another limitation of our analysis that could be addressed in future research is that we have focused primarily on non-financial firms. Yet, financial firms (banking conglomerates, investment funds, insurance firms) have gone through a similar process of fragmentation. The emergence of multi-purpose financial service firms and the unbundling of front- and back-office operations in those firms have since the 1990s resulted in a geographical dispersion of the financial firm that is very similar to the one experienced by non-financial firms. A typical investment fund nowadays is domiciled in Luxembourg or the Cayman Islands, the fund manager sits in London, while the back office paperwork is done in Dublin. International competition for each of these activities is as fierce for financial TNCs as it is for non-financial ones (Fernandez 2016).

Finally, future studies could build on the analytical framework laid out in this article to contribute to debates about national varieties of capitalism (Soskice and Hall 2001) and growth models (Baccaro and Pontusson 2016; Hope and Soskice 2016) in the field of comparative political economy. In this regard, the development of more sophisticated indicators to measure, for example, fixed capital formation and the development of wages in countries with different FDI attraction profiles, would give better insights into the benefits that countries attain from the FDI they receive and allow for the identification of the winners and losers within that countries of the specific FDI attraction model pursued by a country's economic policy elite. Moreover, (comparative) case studies of national FDI attraction models could address some of the limitations of the current macro approach. For example, our analysis is not able to explain

why, despite similarities in their macro-institutional features and tax incentives, Slovenia is not able to attract high levels of FDI, while Hungary, Estonia, Poland, Romania, Czech Republic and Slovakia are. Such research could also look at the specific historical and political conjuncture in which these models emerged and unveil the institutional specificities and historical contingencies that helped to shape individual and collective preferences of actors or that otherwise might have had an impact on the evolution of national FDI attraction models.

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