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Transnational Corporations

Investment
and development



**United
Nations**



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The journal aims to advance academically rigorous research to inform policy dialogue among and across the business, civil society and policymaking communities. Its central research question – feeding into policymaking at subnational, national and international levels – is how cross-border investment, international production, multinational enterprises and other international investment actors affect sustainable development. The journal invites contributions that provide state-of-the-art knowledge and understanding of the activities conducted by and the impact of multinational enterprises and other international investors, considering economic, legal, or social aspects, among others.

The journal welcomes submissions from a variety of disciplines, including international business, innovation, development studies, international law, economics, political science, international finance, political economy and economic geography. Interdisciplinary work is especially welcomed.

The journal embraces both quantitative and qualitative research methods, and multiple levels of analyses at macro, industry, firm or individual/group level.

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¹ Previously: *The CTC Reporter*. In the past, the Programme on Transnational Corporations was carried out by the United Nations Centre on Transnational Corporations (1975–1992) and by the Transnational Corporations and Management Division of the United Nations Department of Economic and Social Development (1992–1993).



Editorial statement

Investment Forum and the Investment, Enterprise and Development Commission.

The research published in *Transnational Corporations* feeds directly into UNCTAD programmes related to investment for development, including its flagship product, the annual *World Investment Report*, and its technical assistance work (investment policies reviews, investment promotion and facilitation and investment treaty negotiations) in more than 160 countries and regional organizations. The journal thus provides a unique venue for authors' academic work to contribute to, and have an impact on, national and international policymaking.

For further information on the journal, including ethics statement and review policy, visit <https://unctad.org/Topic/Investment/Transnational-Corporations-Journal>.



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Bridging the productivity gap: A comparative analysis of foreign-owned and domestic firms in Viet Nam^{*}

Van Thi Cam Ha,^a Trang Mai Le,^b Thao Viet Tran^b
and Huyen Thi Thanh Vu^b

Abstract

This study investigates the productivity gap between foreign-owned and domestic firms in Viet Nam. Using quantile regression estimation for the period of 2011–2020, the study first examines the impact of firms' specifics and of provincial governance quality on firms' total factor productivity at different points of the productivity distribution. The results show that labour productivity, market share and return on assets appear to significantly affect firm productivity regardless of firm groups or quantiles. To understand the productivity gap between foreign and domestic firms, the study uses the quantile decomposition approach to differentiate the factors that contribute to the gap at different quantiles. Our findings reveal that across quantiles most of the productivity gap is explained by firms' specifics, especially labour productivity. To address the productivity gap between foreign-owned and domestic firms in Viet Nam, policymakers should focus on enhancing domestic firms' access to technology, firms' experience and human capital development, as firm-specific factors appear to be major contributors to the productivity differential. In addition, improving provincial governance quality and creating an enabling environment for both foreign-owned and domestic firms can further stimulate productivity growth and foster healthy competition in the manufacturing sector.

Keywords : domestic firms, foreign direct investment, quantile decomposition, total factor productivity gap, Viet Nam

JEL classification codes : F63, L25, L60, O53

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1. Introduction

Foreign direct investment (FDI) has played a pivotal and transformative role in shaping the economic landscape of Viet Nam throughout the past few decades. Viet Nam is known for its remarkable economic growth of an average of more than 5 per cent annually for the 2010–2022 period¹ and has experienced an unprecedented surge in FDI inflows,² particularly within such critical sectors as manufacturing, services and infrastructure. Viet Nam's young and competitive labour force, favourable investment policies and strategic geographical location have acted as a magnet, drawing multinational corporations to the country, according to the World Bank and the Ministry of Planning and Investment of Viet Nam (2017). As one of the fastest-growing economies in South-east Asia over the past few decades, Viet Nam has been an attractive destination for foreign investors from more than 90 countries, seeking to capitalize on its robust growth potential.³ Though FDI has been instrumental in the development of Viet Nam's economy, questions remain regarding its efficacy in generating productivity spillovers to domestic firms. Literature on the issue suggests that these spillovers are rather modest (Anwar and Nguyen, 2010; Ha et al., 2021; Ha et al., 2023) and performance gaps persist between foreign-owned and domestic firms. Despite the significant presence of FDI in the Vietnamese economy, the expected transfer of knowledge and expertise to local firms has not been as extensive as anticipated. Furthermore, it is essential to acknowledge that notable productivity disparities also persist between foreign-owned and domestic firms. Although FDI has undoubtedly contributed to the nation's economic growth and development, these persistent gaps emphasize the need for policymakers to consider how to maximize the positive effect of FDI on local firms

and address the existing disparities, thus ensuring a more inclusive and sustainable economic growth trajectory for Viet Nam.

Understanding the productivity gap between foreign-owned and domestic firms holds profound implications for Viet Nam's industrial development, economic growth and overall competitiveness in the global market. Understanding the factors that contribute to this gap is vital in formulating effective policies that promote sustainable economic development and foster a favourable environment for foreign-owned and domestic firms to thrive. The gap has far-reaching implications for industrial development, economic growth and global competitiveness. For several reasons, then, a thorough understanding of the factors contributing to this gap is crucial for policymakers to be able to design effective strategies that promote sustainable economic development and create an enabling environment in which both foreign-owned and domestic firms can prosper.

FDI often brings in advanced technology, managerial expertise and global supply chain links that contribute to the modernization and upgrading of industries. Yet, where the productivity gap between foreign-owned and domestic firms widens significantly, the domestic sector may need to catch up with the technological advancements brought by foreign investors. This could result in a lopsided industrial structure, where sectors dominated by FDI experience rapid growth and domestic industries play catch-up, hindering balanced economic development. Studies have shown that foreign-owned firms in Viet Nam tend to outperform domestic firms in terms of productivity levels. For instance, Nguyen (2019), Nguyen (2015) and the World Bank and the Ministry of Planning and Investment of Viet Nam (2017) found that foreign-owned firms in the country were more productive,

¹ More information can be found in the International Monetary Fund's country profile, available at www.imf.org/en/Countries/VNM (accessed 15 March 2024).

² See World Bank, Foreign direct investment, net inflows, available at <https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?locations=VN> (accessed 15 March 2024).

³ For more information, see World Bank, World Development Indicators, available at <https://databank.worldbank.org/source/world-development-indicators> (accessed 15 March 2024).



paying higher wages and achieving higher export intensity than domestic firms.

Moreover, the productivity gap between foreign-owned and domestic firms can significantly affect overall economic growth. A highly productive and competitive business environment attracts more investment, fosters innovation and encourages knowledge spillovers, which can contribute to higher rates of economic growth. Conversely, domestic firms that struggle to attain the productivity levels of foreign-owned firms may be hindered in their ability to expand, invest in new technologies and become globally competitive. Empirical research has indicated a positive correlation between FDI and economic growth in Viet Nam; however, the extent to which domestic firms benefit from FDI varies depending on factors that influence their productivity levels (Alfaro et al., 2010; Tiwari and Mutascu, 2011). In addition, in an increasingly globalized world, competitive domestic firms are crucial for Viet Nam to thrive in international markets. If domestic firms cannot compete with foreign-owned ones in productivity and efficiency, they may face challenges in exporting products and penetrating global supply chains. This could limit their market share and potential for growth, leading to a higher trade deficit and reduced economic resilience in the country.

This study undertakes a pioneering examination of the productivity gap between foreign-owned and domestic firms in the context of Viet Nam using a panel data set covering the 2011–2020 period. Its primary objective is to deliver a comprehensive analysis that not only highlights the extent of this disparity but also delves into the underlying determinants and potential mechanisms responsible for such differences. The study sheds some light on the productivity gap between foreign-owned and domestic firms in Viet Nam. First, this research is among the first studies to explore the productivity gap between foreign-owned and domestic firms in Viet Nam. FDI has significantly reshaped the country's economic landscape (World Bank and Ministry of Planning and Investment of Viet Nam,

2016), yet there has been a conspicuous lack of comprehensive analyses addressing the extent of the productivity gap and the intricacies involved in its dynamics. This study fills that void, offering a clear examination of factors that contribute to the gap. Second, our study takes an innovative approach by investigating the factors influencing total factor productivity (TFP) at different quantiles. This allows us to gauge the magnitude of the gap and provides insights into how this gap varies across different points of the productivity distribution. This approach is instrumental in capturing aspects that might be overlooked in conventional analysis, providing a more nuanced understanding of productivity dynamics. Furthermore, our study employs a decomposition approach, enabling us to comprehensively assess the driving forces behind the productivity gap at distinct points within the distribution. This method dissects components that contribute to the gap, shedding light on whether differences are rooted primarily in firms' specific factors or in external factors such as the local business environment.

The study is structured as follows. The next section summarizes key theories explaining the productivity gap between foreign-owned and local firms and some empirical evidence on this matter. Section 3 describes the methodology and data used in this research. Section 4 discusses the findings and section 5 concludes.

2. Literature review

The initial internalization-theory model developed by Rugman (1981) to explain why FDI occurs was economics-based and therefore efficiency-driven. Following Buckley (1985), it showed that FDI takes place when its benefits exceed its costs, leading to the decision to invest overseas (Rugman and Verbeke, 2008). Rugman's internalization theory explains why firms pursue direct investment, by balancing the benefits of internalization against alternative market entry modes such as licensing or exporting. Firms invest abroad to fully



exploit ownership-specific advantages such as proprietary technology or managerial expertise, which are better protected through direct ownership. In addition, firms seek to leverage location-specific advantages such as access to resources or favourable regulations, maximizing profitability by establishing a physical presence in foreign markets. Internalization reduces the transaction costs associated with coordinating external transactions, as firms centralize decision-making and minimize reliance on complex contractual arrangements.

Similarly, the eclectic paradigm proposed by Dunning (2000) comprises three main factors: ownership (O), location (L) and internalization (I). Ownership refers to the firm-specific advantages (such as proprietary technology, brand recognition or managerial expertise) that enable a company to compete effectively in the global marketplace. Firms with valuable ownership advantages are more likely to engage in FDI to leverage these assets in foreign markets. Location factors pertain to the advantages offered by specific regions or countries, including access to resources, skilled labour, infrastructure or favourable regulatory environments. Firms are motivated to invest in locations where they can maximize their competitive position and profitability. Internalization involves the decision-making process by which firms choose between alternative modes of market entry, such as exporting, licensing or FDI. Internalization occurs when the benefits of controlling foreign operations (such as protecting proprietary knowledge or minimizing transaction costs) outweigh the advantages of using external market mechanisms. These theories primarily seek to explain the motivations behind FDI and the strategic decisions made by multinational corporations. Yet, the productivity of foreign-owned firms compared with that of domestic firms depends on various factors, such as operational efficiency, market competitiveness, management quality, the regulatory environment, access to resources and technological capabilities. FDI does not

inherently guarantee higher productivity, as domestic firms can also be highly productive and competitive in their respective markets.

It is well documented in the literature that multinational enterprises and firms engaged in the global market are often more productive than domestic and domestic-focused firms (Sanfilippo, 2015; Tomiura, 2007). Multinational firms are often more likely to be part of the international supply chain, where they are highly connected worldwide and therefore can have more opportunities to improve their productivity. One of the ways is learning by exporting, which means that firms become more productive to be able to vie with a broader range of competitors when they get involved in the international market, resulting in higher productivity (Clerides et al., 1998; De Loecker, 2007 and 2013; Martins and Yang, 2009; Newman et al., 2016). This hypothesis posits that firms experience productivity gains only after they commence exporting. Essentially, engaging in international markets exposes firms to heightened global competition, motivating them to enhance their productivity. However, it is worth noting that only a limited number of studies have rigorously tested the learning-by-exporting hypothesis (Wagner, 2006b), and the evidence supporting this theory remains somewhat contentious. In summary, exporters and firms involved in FDI tend to exhibit higher levels of productivity than domestic firms. However, it's important to emphasize that while more productive firms often choose to enter international markets, the act of participating in the international arena does not necessarily lead to automatic productivity improvements (Wagner, 2007).

The second stream explains the productivity difference between international and domestic firms through the self-selection effect. This perspective posits that firms with superior management practices, advanced technology, a skilled workforce and higher productivity levels are more likely to enter international markets autonomously. This self-selection process, based on the firm's inherent attributes and capabilities,



effectively results in international firms being more productive than their domestic counterparts. This notion finds empirical support in various studies. For instance, (Bernard et al., 1995) examined the United States manufacturing sector and found that exporting firms tended to be larger and more productive than non-exporters. Their research indicated that firms with higher productivity were more inclined to engage in international trade activities. Greenaway and Kneller (2007) provide a comprehensive analysis of how firm heterogeneity, specifically factors such as management quality, technological capabilities and a skilled labour force, influences a firm's decision to engage in exporting and FDI, in the case of the United Kingdom. Wagner (2007) analysed German manufacturing firms and found that firms with higher productivity levels were more likely to become exporters. This self-selection mechanism is underpinned by the idea that firms possessing the capabilities and resources necessary for internationalization are the ones that ultimately venture into global markets, reinforcing the notion that international firms tend to have higher productivity levels because of their self-selected nature.

To our knowledge, limited attention has been paid to the productivity gap between foreign and domestic firms in the literature over the decades. A few studies have examined the productivity difference to a certain extent and found that multinational firms often appear to have higher productivity. Sanfilippo (2015) investigated productivity disparities among foreign affiliates of emerging market multinationals from Brazil, China, India, the Russian Federation and South Africa, comparing them with counterparts from developed countries and domestic multinational enterprises (MNEs). Utilizing a comprehensive data set covering foreign affiliates in Europe, the findings indicated that MNEs from emerging markets generally exhibit lower productivity levels, with an

average productivity gap of approximately 30 percentage points when contrasted with well-established competitors. This disparity is not uniform and varies across sectors, technology intensity and geographical destinations. In addition, within-firm diversity is pivotal, as it is less productive entities that predominantly drive the productivity gap. At the same time, top-tier firms approach performance levels similar to those of their established counterparts, especially in the services sector. Another study (Ferrante and Freo, 2012) investigated the productivity gap between internationalized and domestic firms using the quantile decomposition method on Italian firms from 2001 to 2003. It found that, accounting for compositional effects, the productivity premium remains but its magnitude diminishes significantly. Compositional effects were revealed as pivotal determinants of the productivity premium for internationalized firms. Once these effects are controlled for, the productivity premium decreases substantially, typically falling to levels around or below 5 per cent. This holds regardless of the estimation methods. Of particular significance, the disparity in the gross productivity premium between groups remains consistent across the entire distribution, whereas the spread for the net productivity premium becomes narrower and less uniform. Specifically, the net premium is found to be positive for less productive firms, whereas it becomes negligible for the most productive firms.

Wojciechowski (2017) investigates the correlation between labour productivity in Poland, the influx of FDI in Poland and the productivity gap between Poland and the 15 countries of the European Union before 2004.⁴ The research revealed that although investment decisions regarding country selection are primarily influenced by the size of the target market, geographical distance remains a negative factor affecting the volume of FDI. Furthermore, the relative disparity in business backwardness or labour

⁴ The so-called EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.



productivity relative to the 15 European Union countries had an unfavourable impact on productivity enhancement. Shen et al. (2021) explored how inward FDI affects the performance of domestic firms in China. The model indicates that the influence of FDI spillover effects hinges on the productivity gap between domestic firms and foreign counterparts. Specifically, for low-productivity domestic firms, the positive impact of FDI spillover decreases as the productivity gap widens whereas the opposite holds true for high-productivity firms. In essence, when the productivity gap widens, the entry of foreign firms enhances the efficiency of high-productivity firms but diminishes the efficiency of low-productivity ones. Empirical evidence supporting this theoretical model is provided using data from the annual survey of Chinese industrial enterprises. Tomiura (2007) investigated a firm-level data set for more than 118,300 firms in the Japanese manufacturing sector and found that foreign-owned firms exhibit significantly higher productivity levels than do foreign outsourcers and exporters; the latter, in turn, exhibit higher productivity than domestic firms. This hierarchical productivity pattern aligns with theoretical expectations and has remained robust even when accounting for factors such as industry, firm size and factor intensity. Consequently, this research furnishes empirical validation for the applicability of the heterogeneous firm model in the context of international trade.

In Viet Nam, to our best knowledge, there is not yet any study looking at the productivity gap between foreign investment and local firms. Our study aims to fill in the gap by examining the determinants of a firm's TFP at different quantiles. A large body of literature on the relationship between foreign-owned and domestic firms in Viet Nam focuses on the effect of FDI on domestic firm performance, where FDI is found to have an effect on local firm productivity (Anwar and Nguyen, 2010; Ha et al., 2021 and 2023), export spillovers (Anwar and Nguyen, 2011; Ha et al., 2020), firm survival (Kokko and Thang, 2014), wage differentials (Nguyen,

2015) or wage spillovers (Pomfret, 2010). Yet, the productivity gap between the two has not yet been investigated. The main objective of this study is to fill the gap in the literature on Viet Nam by considering the productivity gap between FDI and domestic manufacturing firms at different points of the productivity distribution across sectors and what accounts for the gap.

3. Methodology

3.1 TFP estimation

Following the Cobb-Douglas production function (Douglas, 1928), the total output of firm i in industry j at time t (Y_{ijt}) is a function of its capital (K_{ijt}), labour (L_{ijt}) and TFP (A_{ijt}), detailed as follows:

$$Y_{ijt} = K_{ijt}^{\alpha} (A_{ijt} L_{ijt})^{(1-\alpha)} \quad (1)$$

where $0 < \alpha < 1$

Taking the logarithm of equation (1) yields

$$\ln Y_{ijt} = \alpha \ln K_{ijt} + (1 - \alpha) \ln L_{ijt} + \ln A_{ijt} \quad (2)$$

which can be written as

$$y_{ijt} = \beta_k k_{ijt} + \beta_l l_{ijt} + \varepsilon_{ijt} + e_{ijt} \quad (3)$$

where y_{ijt} is total output, k_{ijt} is capital stock, l_{ijt} is the labour of enterprise i in sector j at time t , in log form. Since A_{ijt} is assumed as constant in equation (1), which refers to the unobserved part of the production function, we consider $\ln A_{ijt}$ as $(\varepsilon_{ijt} + e_{ijt})$, which is divided into two parts: the unobserved productivity (ε_{ijt}) which refers to the mean of log total factor productivity (Newman et al., 2015) and a random error term (e_{ijt}).

Estimation of equation (3) gives us the estimated result for total factor productivity as follows:

$$\hat{\varepsilon}_{ijt} = y_{ijt} - \hat{\beta}_k k_{ijt} - \hat{\beta}_l l_{ijt} - e_{ijt} \quad (4)$$

Estimating production functions is a complex task fraught with challenges, particularly



because of issues such as endogeneity and multicollinearity. In the pursuit of unbiased estimation using ordinary least squares (OLS) methodology, the error terms need to have a zero mean and remain uncorrelated with explanatory variables such as labour and capital. However, the presence of observed variables, such as labour and capital, often correlates with unobserved inputs or productivity shocks, such as managerial prowess or the quality of land and materials. This correlation introduces biases in the estimation of production functions. Furthermore, the interdependence between labour and capital inputs exacerbates the issue of multicollinearity. Typically, firms with greater capital requirements also require larger labour forces, resulting in a correlation between these inputs and potentially biased estimators. The OLS estimation framework presupposes that input selections are made independent of a firm's efficiency level. However, this assumption is often unrealistic, as firms frequently base their input decisions on unobservable productivity shocks. This discrepancy between actual practice and the OLS assumption results in a biased estimation of coefficients in the production function. For example, firms with higher productivity levels may opt to employ more labour, leading to an upward bias in the coefficient estimation for labour if productivity differentials are not controlled for. Conversely, the relationship between firms' labour decisions and their productivity levels could manifest as a downward bias in OLS estimates of the labour coefficient. This dynamic is indicative of the tendency for more productive firms to become increasingly capital-intensive, further complicating coefficient estimation. In addition, the issue of simultaneity introduces biases in the estimation of capital coefficients, with the direction of bias contingent upon various factors.

To mitigate these challenges, researchers have developed methodologies to control for unobservable variables in production function estimation. Early approaches (Olley and Pakes, 1992; Levinsohn and Petrin, 2003) focused on addressing endogeneity through

the inclusion of investment or intermediate inputs. However, these methods do not fully resolve the issue of multicollinearity. An alternative proposed by Wooldridge (2009) involves a one-step estimator utilizing the generalized method of moments (GMM) approach, offering a promising avenue for improving the accuracy of production function estimation amid the complexities of our data. This addresses the issue of estimating production functions for firms when there are unobservable factors that can affect the production process, which holds several advantages. One of the main advantages of Wooldridge's approach is its ability to control for unobservable or omitted variables that can affect a firm's production. In empirical economic analysis, it is common for certain important factors influencing production to be unobservable or difficult to measure. Wooldridge's method allows researchers to account for these unobservable factors using proxy variables, in which we use materials (energy consumption) as the proxy. The use of proxy variables helps reduce bias in the estimated production function. By including proxy variables that are correlated with the unobservable factors, the model can capture some of the unobservable variations in production, leading to more accurate estimation of parameters. Although it might be better if we had the information for the use of immediate inputs, these data are not available in our survey. Therefore, we choose to go with energy consumption as the proxy.

3.2 Factors that impact TFP

Building upon the earlier research by Anwar and Nguyen (2010), Fujimori and Sato (2015) and Newman et al. (2015), our model aims to investigate the influence of internal and external factors on productivity as in the model below:

$$\begin{aligned}
 TFP_{ijt} = & \alpha_0 + \alpha_1 \text{markertshare}_{ijt} + \\
 & \alpha_2 \text{size}_{ijt} + \alpha_3 \text{age}_{ijt} + \alpha_3 \text{export}_{ijt} + \\
 & \alpha_4 \text{labour productivity}_{ijt} + \alpha_5 \text{ROA}_{ijt} + \\
 & \alpha_6 \text{HHI}_{jt} + \alpha_7 \text{PCI}_{ijt} + \alpha_8 \text{entry cost}_{ijt} + \\
 & \alpha_8 \text{land access}_{ijt} + \alpha_9 \text{policy bias}_{ijt} + \\
 & u_{ijt}
 \end{aligned} \tag{5}$$



Where TFP_{ijt} is the TFP of enterprise i in sector j at time t computed by utilizing the GMM estimation approach (Wooldridge, 2009) to estimate the Cobb-Douglas production function.

Our model captures two categories for the explanatory variables: firms' characteristics and provincial business environment. $Markertshare_{ijt}$ is measured as the proportion of the firm's revenue in the sector's total revenue, and $size_{ijt}$ is the size of firm i in sector j , which is computed by taking a logarithm of the total employees of the firm. As most Vietnamese firms are small and medium-sized, perhaps characterized by non-decreasing returns to scale, we expect that size positively affects firm productivity. Age_{ijt} might be linked with firm TFP based on the accumulation of learning and experience over time. $Export$ is the annual total export volume in logarithm form. As exports are argued to have a positive impact on productivity (Arnold and Hussinger, 2005; Newman et al., 2016; Wagner, 2006a and 2006b), the more export-intense a firm is, the more productive that firm could be. $Labor\ productivity_{ijt}$ is the average value added per worker at firm i . Higher labour productivity is expected to lead to higher TFP overall. Similarly, return on assets (ROA) measures a firm's financial performance and is expected to give a positive sign to firm TFP. HHI_{jt} denotes the Herfindahl-Hirschman index of industry j , which measures the concentration of that market. The index may exert either a positive or a negative influence on firm productivity. All these variables are at the industry level. Following Newman et al. (2015), HHI is calculated as follows:

$$HHI_{jt} = \sum \left(\frac{x_{ijt}}{X_{jt}} \right)^2 \quad (6)$$

where x_{ijt} is the output of firm i in industry j at time t ; X_{jt} is the total output of industry j .

The remaining variables in equation (5) are control variables at the provincial level. PCI_{pt} – the Provincial Competitiveness Index – measures the overall business environment in each province.

The index comprises 10 component indicators, encompassing key areas of economic governance pertaining to business development in relevant provinces and cities. A locality is considered to have a good business environment when it possesses characteristics such as low market entry costs, easy land access and stable land use, a transparent business environment and publicly available business information. $Entry\ cost_{pt}$ and $land\ access_{pt}$ are some detailed components of the quality of the business environment that might affect the productivity difference between foreign-owned and domestic firms, given that foreign-owned firms might have some advantages over domestic firms in the entry cost of land access in some provinces owing to the policy of attracting FDI to these provinces. $Policy\ bias_{p,t}$, in contrast, measures the bias that a local government may favour State-owned firms over private firms including FDI.

3.3 Productivity gap decomposition

To assess the productivity differential, we first consider the observable differences in TFP distributions between foreign-owned firms (group 1) and domestic firms (group 0). We aim to isolate the effects of differences in the distribution of covariates on TFP between these two groups. The Blinder-Oaxaca decomposition approach (Blinder, 1973; Oaxaca, 1973) is widely used to examine factors that contribute to differentials, especially in wage inequality analysis (Doan et al., 2023; Jann, 2008; Neumark, 2004) or productivity differential analysis (Adzawla et al., 2020; Islam et al., 2019; Min and Bansal, 2023; Shita et al., 2020). These differences are characterized as functions of differences in characteristics and differences in coefficients associated with those characteristics. Although this original method allows researchers to analyse the differences around the outcome variable's mean, decomposition at different points of the distribution requires further development. Firpo (2018) and DiNardo et



al. (1996) propose a feasible methodology for decomposing differences in distributional statistics beyond the mean, which is the recentered influence function, called RIF decomposition (the Oaxaca-Rif method) (Rios-Avila, 2020). This approach is claimed to be simple to implement. Following Rios-Avila (2020), we suppose that there is a joint distribution function that captures the interconnections among TFP and the exogenous characteristics X , and the categorical variable T ($T = 1$ for foreign-owned firms and 0 for domestic firms) that identifies the group that firms are in. The productivity gap between foreign-owned and domestic firms can be calculated as follows:

$$\Delta TFP = TFP_1 - TFP_0 \quad (7)$$

For each firm, the factors that affect its TFP are defined in equation 5. To have a better understanding of how the difference in the characteristics and the difference in coefficients contribute to the overall productivity gap at different points in the TFP distribution, we need to identify the counterfactual productivity distribution TFP_c , which is the productivity distribution that group 1 would have if it had characteristics similar to those of group 0. The difference in the productivity distributions between the two groups can be estimated at a particular point on the distribution such as at the 25th, median and 75th percentiles. The difference ΔTFP then can be decomposed as follows:

$$\Delta TFP = TFP_1 - TFP_c + TFP_c - TFP_0 \quad (8)$$

The observed differences between the TFP distributions over the foreign-owned and domestic firms are decomposed into a component explained by the differences in the composition of covariates, a component explained by different returns to covariates (coefficients) and a residual component. In this way, it becomes possible to compute the impact of each of the components on the overall outcome distribution. The differences between distributions are evaluated moving from the lower to the

upper tail of the conditional distribution of the TFP, moving through quantiles that vary from 0 to 1. The component created by covariates can be interpreted as the effect induced by the heterogeneity in characteristics; the component created by coefficients can be interpreted as the net internationalization productivity premium; and the last component measures the residual difference. When interpreting results, a caveat should be kept in mind. Because of the method's construction, it provides an accounting decomposition conditional on a given model and may detect only the influence of modeled covariates.

The Oaxaca-Rif decomposition process involves two stages. In the first stage, a counterfactual firm productivity distribution is constructed for the domestic firms, assuming that they had the same characteristics as the foreign-owned firms. The difference between the actual productivity distribution and the counterfactual one reflects the difference in firm characteristics. In addition, the difference between the actual distribution of productivity in the domestic firms and the counterfactual distribution represents productivity differences caused by differences in firm characteristics. The second stage further dissects the composition and structure effects into contributions from individual explanatory variables. This allows for assessment of the impact of specific factors on the productivity gap between the two groups of firms. Equation (8) can be explained into components as follows:

$$\Delta TFP = \bar{X}_1(\hat{\beta}_1 - \hat{\beta}_c) + (\bar{X}_1 - \bar{X}_c)\hat{\beta}_c + (\bar{X}_c - \bar{X}_0)\hat{\beta}_0 + \bar{X}_c(\hat{\beta}_c - \hat{\beta}_0) \quad (9)$$

We followed Rios-Avila (2020) to apply Oaxaca-Rif estimation to our sample. The 25th, 50th and 75th percentiles were selected for the decomposition process. This approach enabled us to explore the various factors and dynamics that differentiate productivity in these two groups of firms at different quantiles, allowing for a comprehensive understanding of the variations and distinctions between them.



4. Data

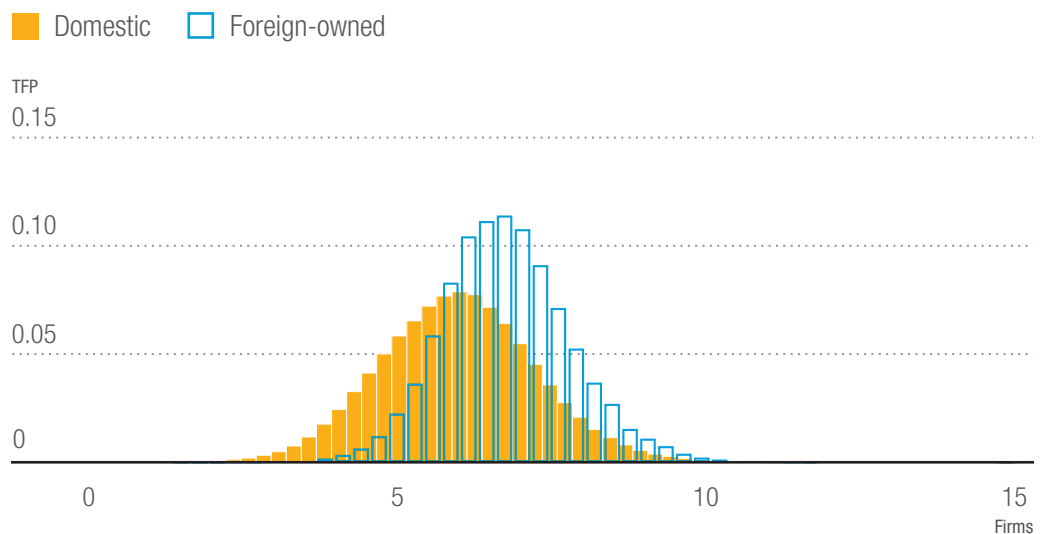
We employ a panel data set of domestic enterprises derived from the Viet Nam Enterprise Survey (VES), which has been conducted annually by the Vietnamese General Statistical Office since 2001. The survey serves multiple purposes, including (i) gathering fundamental information for management, policymaking, socioeconomic development plans, and national and local business development plans, as well as for investors and businesses; (ii) synthesizing indicators in the national statistical indicator system and the annual official reports of provincial statistics branches; (iii) evaluating the application of technology in processing and manufacturing enterprises; and (iv) updating the enterprise database. The survey encompasses all active firms with more than 50 employees, including State-owned enterprises, collective sector enterprises, private domestic firms and foreign-invested domestic firms operating across various sectors and regions. Specifically, it includes all State-owned enterprises, all enterprises with FDI capital and all non-State enterprises with at least 20 employees (or at least 100 employees for Hanoi and Ho Chi Minh City,

and at least 50 employees for Hai Phong, Da Nang City, Dong Nai and Binh Duong). The VES survey captures four main aspects of firm activities: (i) general information about firms and their branches; (ii) labour and labour income; (iii) business activities; and (iv) other factors such as technology improvement and intermediate inputs, which vary depending on the survey year.

To compute firm TFP for the study period from 2011 to 2020, we estimate the production function for each sector at the firm level. The Vietnamese manufacturing industry is divided into 24 two-digit sectors, coded from 10 to 33 in the VSIC 2012 classification. Our production function estimation uses the value added approach, with capital calculated as the deflated value of assets and labour measured by the total number of employees at the end of the year. Energy consumption is used as the instrumental variable in the GMM estimation approach suggested by Wooldridge (2009). Figure 1 shows a clear difference in TFP in foreign-owned and domestic firms, with foreign-owned firms appearing to have higher TFP.

The histograms presented in figure 1 reveal insightful patterns regarding TFP in foreign-owned and domestic firms. Notably,

Figure 1
TFP in foreign-owned and domestic firms in the 2011–2021 period



Source: Authors' calculation from the Viet Nam Enterprise Survey.

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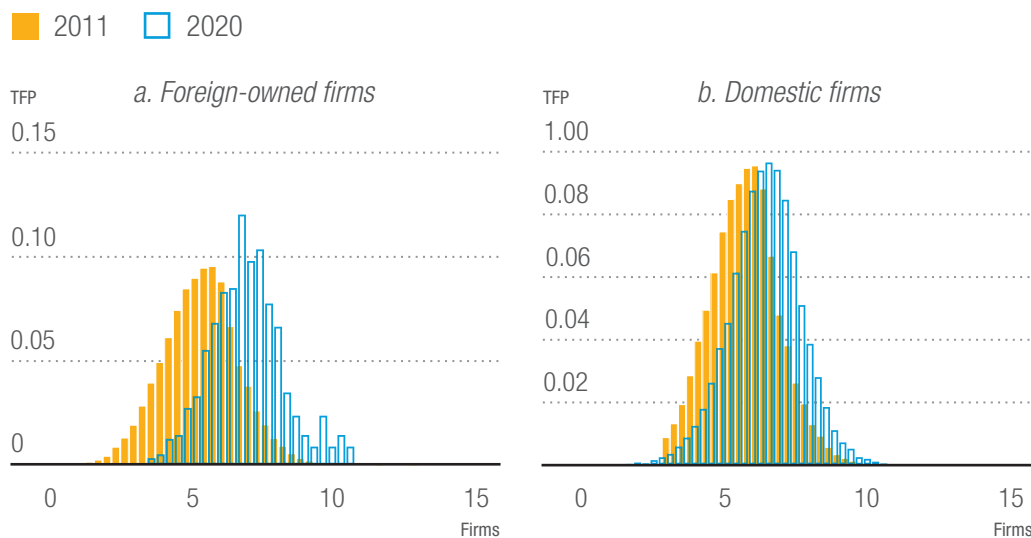
it becomes apparent that the distribution of TFP in the foreign-owned sample is consistently centered at a higher level than that observed within the domestic sample. This central tendency suggests that foreign-owned firms exhibit systematically higher TFP performance than their domestic counterparts. Furthermore, the temporal dimension of the data provides valuable insights into the dynamic nature of TFP in these two distinct categories of firms. Over time, the distribution of TFP in the foreign-owned sample exhibits a discernible rightward shift, indicating a consistent increase in TFP levels. In contrast, the domestic sample also experiences an increase but to a relatively lesser extent, resulting in a smaller rightward shift. Figure 2a shows the change of TFP in the foreign-owned sample in the 2011–2020 period, and figure 2b presents that change in the domestic sample.

These graphs reveal that not only is TFP higher in foreign-owned firms, but it also shows a more pronounced upward trajectory from 2011 to 2020. This suggests that foreign-owned firms have not only maintained a consistently superior TFP level but have also exhibited a more rapid rate of improvement over the specified period.

The control variables in equation (5) are largely available in or derivable from the VES data set. For instance, wages (average labour income) can be obtained by dividing the total cost of labour by the total number of employees, and export intensity is computed as the share of exports by volume in total firm revenue. We provide in table 1 some descriptive statistics on the variables used. A correlation matrix is also reported in the appendix table.

The total number of observations in the final data set is 409,782. There are some missing values in some variables, which are replaced by either the previous value or the future value of that variable, which a panel data set allows us to do. For TFP, it is 6.067, indicating an average level of efficiency in converting inputs into outputs. The relatively low standard deviation of 1.285 suggests that TFP values tend to cluster around this mean. Regarding market share, we find that it is a highly skewed variable, with a mean close to zero (0.000) but a standard deviation of 0.006, implying that while most observations have minimal market share, there are outliers with substantial market presence, as indicated by the maximum value of 2.345. Age averages 8.179 years, ranging from 0 to 97. This wide dispersion indicates

Figure 2
TFP change in foreign-owned and domestic firms in 2011 and 2020



Source: Authors' calculation from the Viet Nam Enterprise Survey.

 **Table 1**
Descriptive statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
TFP	409 782	6.067	1.285	0.012	15.012
Market share	409 782	0	0.006	0	2.345
Age	409 782	8.179	6.786	0	97
Size	409 782	3.124	1.622	0	11.335
Labour productivity	409 782	4.457	1.009	0	14.730
ROA	409 782	0.024	9.885	-92.462	6255.447
Export proportion	409 782	0.007	0.029	0	1
PCI	407 979	62.120	3.910	45.117	75.086
Entry cost	407 979	7.956	0.782	5.861	9.598
Land access	407 979	6.255	0.796	4.123	8.839
Policy bias	409 782	5.224	1.026	3.115	8.810
HI	409 782	0.017	0.126	0.001	5.525

Source: Authors' calculation from the Viet Nam Enterprise Survey.

that the data set includes entities of various ages, possibly representing different stages of development or longevity in the market. Size, measured as the log form of total labour, has a mean of 3.124, whereas labour productivity exhibits a moderate mean of 4.457 and a standard deviation of 1.009, suggesting a certain degree of consistency in productivity across entities, albeit with some variability.

Data for variables that represent the provincial business environment come from the Provincial Competitiveness Index (PCI) survey. It is a comprehensive measure of economic governance, business environment and administrative reform efforts of provincial and city governments in Viet Nam. It was developed by the Viet Nam Chamber of Commerce and Industry with support from the United States Agency for International Development. The PCI represents the collaborative work of both local and international experts associated with the Chamber. Built on the most extensive and meticulous annual survey of businesses in Viet Nam, the PCI survey serves as a collective voice of the private business community

regarding the business environment across provinces and cities in Viet Nam. The index does not solely aim for scientific research or to commend or criticize provinces with high or low scores. Instead, it seeks to understand and explain why some regions outperform others in private sector development, job creation and economic growth. It functions as a vital instrument for assessing economic competencies and policy effectiveness at the provincial and municipal levels, thereby contributing to the advancement of private sector-led economic development in Viet Nam.⁵ By design, the value of the index spans from 0 to 100, with a higher value indicating a better business environment. In our data set, the PCI has a mean value of 62.12 and a relatively low standard deviation of 3.910. The data range from a minimum of 45.117 to a maximum of 75.086, indicating a narrow distribution, with PCI values clustered closely around the mean. Other components range from 0 to 10 by design and are centred around 8 for entry cost, 6.2 for land access and 5.2 for policy bias (a measure of firms' perception of the privileges given to State-owned firms).

⁵ For more details, see the Provincial Competitiveness Index, available at <https://pcvietnam.vn/en> (accessed 15 March 2024).



5. Results and discussions

5.1 Quantile regression

In the first step, quantile regression is employed on panel data sets for several compelling reasons. First, it provides an overall view of the variables that affect firm TFP and how the effects vary across distributions of the TFP. This approach is particularly advantageous when dealing with heterogeneity in the data, as it allows examination of the distributional effects of covariates on the quantiles of interest (Canay, 2011). In the context of panel data, where observations are collected over time for multiple entities, quantile regression offers

valuable insights into how the determinants affect various segments of the distribution, making it especially relevant for capturing diverse economic phenomena. In this section, we apply quantile regression for panel data analysis to discern the heterogeneous effects of key factors on economic performance in both domestic and foreign-owned firms. We control for firm and year fixed effects (embedded in the *qregpd* command) and for provincial context by including the provincial business environment. The empirical findings are presented in tables 2 and 3, providing a comprehensive depiction of the varying effects across different quantiles of firms' TFP.

The results of the quantile regression analysis conducted on the domestic sample reveal

 **Table 2**
Quantile regression on the domestic sample

Variable	Q25	Q50	Q75
Market share	-0.053 (0.127)	0.210*** (0.048)	1.008*** (0.072)
Age	0.019*** (0.003)	-0.0023* -0.002	0.012* (0.006)
Size	0.209*** (0.006)	0.160*** (0.008)	0.082** (0.035)
Labour productivity	0.696*** (0.037)	0.664*** (0.017)	0.436*** (0.066)
ROA	0.003 (0.005)	0.016*** (0.003)	-0.007*** (0.002)
Export	-0.014*** (0.005)	0.032*** (0.005)	-0.014 (0.011)
PCI	0.021*** (0.003)	0.018*** (0.002)	0.048*** (0.010)
Entry cost	-0.089*** (0.027)	-0.025*** (0.006)	-0.010 (0.047)
Land access	0.004 (0.020)	0.081*** (0.021)	0.003 (0.011)
Policy bias	-0.066*** (0.021)	-0.095*** (0.010)	-0.057*** (0.010)
HHI	-0.313 (0.242)	1.312*** (0.464)	0.322 (0.21)
Observations	289 872	289 872	289 872
Number of groups	97 924	97 924	97 924

Source: Authors' calculation from Viet Nam Enterprise Survey.

Note: Quantile regression on panel data using *qregpd* package in Stata. Year and firm fixed effects are included. Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.



Table 3
Quantile regression on the foreign-owned sample

Variable	Q25	Q50	Q75
Market share	0.1860*** (0.0121)	0.1880*** (0.0259)	0.3120*** (0.0024)
Age	0.0089*** (0.0001)	0.0094*** (0.0003)	0.0153*** (0.002)
Size	0.1520*** (0.0023)	0.1340*** (0.0064)	-0.0341 (0.0270)
Labour productivity	0.7390*** (0.0103)	0.7150*** (0.0066)	0.3880*** (0.0725)
ROA	0.0003*** (0.0002)	0.0002*** (0.0001)	0.0002*** (0.0002)
Export	0.0214*** (0.0013)	0.0104*** (0.0256)	0.0448*** (0.0064)
PCI	0.0121*** (0.0033)	0.0129** (0.0054)	-0.0051 (0.0051)
Entry cost	0.0533*** (0.0124)	0.0210** (0.0088)	-0.1130*** (0.0169)
Land access	-0.0665*** (0.0137)	-0.0089 (0.011)	0.0494*** (0.0136)
Policy bias	0.0360*** (0.004)	0.0308* (0.018)	0.0841*** (0.0092)
HHI	-0.7240*** (0.0674)	0.0430 (0.0541)	1.1330*** (0.2400)
Year	0.0047 (0.0045)	0.0010 (0.0067)	0.0089 (0.0083)
Observations	42 258	42 258	42 258
Number of groups	9 507	9 507	9 507

Source: Authors' calculation from Viet Nam Enterprise Survey.

Note: Quantile regression on panel data using qregpd package in Stata. Year and firm fixed effects are included. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.01$.

several key findings about the effect of firm characteristics and provincial context on firm TFP. This sample includes both State-owned firms (1.18 per cent of the total sample) and private firms (86.39 per cent of the sample) over the 2011–2020 period. The effect on domestic firms of factors representing firms' specifics is not identical across quantiles. For instance, market share, firm size, firm age and firm market concentration index are found to have a significant impact on domestic firms in the lowest and the highest quantiles. Only labour productivity was

found to have a consistently positive effect on firm TFP across all quantiles. Export activity boosts firm TFP in the 25th and the 75th percentiles but harms TFP of firms in the 50th percentile. Similarly, variables that represent the provincial business environment do not have a consistent effect on domestic firms across all quantiles, as the overall PCI is found not to boost firm TFP in the middle but at the lower and higher quantiles. Interestingly, policy bias, which measures the level at which a province might give more privilege to State-owned firms,⁶

⁶ Details about policy bias can be found at The Provincial Competitive Index, PCI Methodology, available at <https://pcivietnam.vn/en/about/pci-methodology.html> (accessed 15 March 2024).



is found to harm domestic firms, including State-owned ones, across all quantiles.

When we look at the results for the foreign-owned firms (12.44 per cent of the total sample), almost all variables that represent firm characteristics are found to have a consistent effect on foreign-owned firms' TFP across all quantiles. Table 3 reports the results.

Within the foreign-owned firms, it is noteworthy that all firm-specific factors except HHI exhibit a similar effect on firm TFP across all quantiles. This finding suggests a degree of uniformity in the influence of these variables on TFP across different quantiles within the foreign-owned firm sample, implying that their effects maintain a consistent pattern throughout the TFP distribution. Furthermore, when examining other factors in the foreign-owned sample, such as the provincial context, we find that overall, a better business environment improves the TFP of foreign-owned firms. Policy bias, however, is found to harm FDI in the medium and high quantiles, which is explainable because higher policy bias in a province indicates more favour given to State-owned related enterprises, which might discourage both private and foreign-owned firms.

5.2 Quantile decomposition

As we have shown, in domestic and foreign-owned firms there is a difference in TFP, as well as in the relationships between TFP and other factors. To examine what factors contribute to the difference, in the next step we apply Oaxaca-Rif decomposition to different quantiles to elucidate the productivity disparity between foreign-owned and domestic firms. This approach provides a comprehensive understanding of the productivity gap at different segments of the productivity spectrum. By dissecting the gap at these specific quantiles, we can discern how the factors contributing to the divergence may vary across distinct productivity levels. The results for the first 25th percentile, presented in table 4, show

how TFP in domestic firms (group 1) differs from that of foreign-owned firms (group 0) and what contributes to the difference.

Using the Oaxaca-Rif estimation method, our study uncovers fascinating insights. First, at the 25th percentile, it becomes apparent that foreign-owned firms exhibit higher productivity, surpassing domestic firms by 0.944 points, and this gap gets larger at higher quantiles. This intriguing disparity underscores the effect of FDI on firm productivity, even within the lower quantile of the distribution. It underscores the significance of understanding how FDI status can influence a firm's performance, even for those at the lower end of the productivity spectrum. The second key point is that a substantial portion of this productivity differential is attributable to observable factors. Approximately 80.5 per cent of the total difference, which amounts to roughly 0.76 points, can be attributed to firms' characteristics and provincial characteristics. This underscores the importance of considering not only individual firm traits but also regional context when evaluating productivity disparities between foreign-owned and domestic firms. In this context, labour productivity, age and export activities are the most significant contributors to the difference. Furthermore, our analysis confirms the existence of unobservable or residual factors that contribute to the productivity gap. Approximately 19.5 per cent of the total difference, equivalent to 0.184 points, remains unexplained by the observable variables. These unobservable factors may encompass aspects such as managerial decisions, organizational culture or other idiosyncratic elements that require further investigation. Understanding these residual factors is crucial to a comprehensive grasp of the intricate dynamics at play in foreign-owned and domestic firm productivity.

Regarding the productivity difference at the mean, the result reported in table 5 shows a larger gap between foreign-owned and domestic firms than at the 50th percentile. In the 50th percentile distribution, the TFP of foreign-owned firms is 1.402 points higher





Table 4
Productivity difference at the 25th percentile

Variable	Overall	Explained	Unexplained
Market share		0.0021** (0.0009)	-0.0047*** (0.0004)
Age		-0.0014***] (0.0003)	-0.0647*** (0.0091)
Size		-0.1810*** (0.0082)	0.5940*** (0.0148)
Labour productivity		-0.4050*** (0.0049)	0.6260*** (0.0283)
ROA		0.0001 (0.0001)	-0.0001 (0.0002)
Export		-0.1560*** (0.0077)	-0.0295*** (0.0019)
PCI		-0.0094*** (0.0009)	1.7410*** (0.1240)
Entry cost		-0.0021*** (0.0008)	0.2710*** (0.0740)
Land access		-0.00644*** (0.0015)	-0.3620*** (0.0585)
Policy bias		-0.0008 (0.0017)	-0.4280*** (0.0449)
HHI		-0.0005 (0.0002)	0.0004 (0.0015)
Domestic (group 1)	5.1720*** (0.0037)		
Foreign-owned (group 0)	6.1160*** (0.0061)		
Difference	-0.9440*** (0.0072)		
Explained	-0.7600*** (0.0096)		
Unexplained	-0.1840*** (0.0109)		

Source: Authors' calculations.

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

than that of domestic firms. The productivity gap, particularly at the mean, is significantly influenced by firms' characteristics, with a strong emphasis on factors such as firm size and labour productivity. This observation highlights the substantial role of the learning-by-doing effect, often proxied by firm age, in explaining the productivity differential between foreign-owned and domestic firms. It underscores that the longer a firm has been in operation, the more proficient it becomes,

thus increasing its productivity. Furthermore, human capital emerges as another major contributor to the productivity gap. The skills, knowledge and expertise of the workforce within a firm play a crucial role in determining its productivity, emphasizing the importance of investment in human capital development for both foreign-owned and domestic firms. These findings underscore the multifaceted nature of the productivity gap and provide essential insights into the



Table 5
Productivity difference at mean

Variable	Overall	Explained	Unexplained
Market share		0.0278*** (0.0043)	0.0016 (0.0014)
Age		0.0066*** (0.0017)	-0.1580 (0.0459)
Size		-0.7040*** (0.0437)	-0.0862 (0.0689)
Labour productivity		-0.6410*** (0.0185)	2.8680*** (0.1340)
ROA		0.0002 (0.0002)	-0.0001 (0.0001)
Export		-0.2110*** (0.0394)	-0.1140*** (0.0086)
PCI		0.0051*** (0.0015)	-3.6570*** (0.5930)
Entry cost		-0.0005 (0.0005)	0.1290 (0.3500)
Land access		0.0066 (0.0059)	0.5450* (0.2880)
Policy bias		0.0004 (0.0007)	-0.6950*** (0.2190)
HHI		0.0001 (0.0008)	0.0003 (0.0077)
Domestic (group 1)	2.7040*** (0.0136)		
Foreign-owned (group 0)	4.1060*** (0.0273)		
Difference	-1.4020*** (0.0305)		
Explained	-1.5100*** (0.0457)		
Unexplained	0.1080** (0.0544)		
Constant			1.2750* (0.7540)

Source: Authors' calculations.

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.

key drivers that underpin disparities between these two categories of firms at the 50th percentile of the productivity distribution.

At the 75th percentile, reported in table 6, we observe a productivity gap of 1.349 points, which, while smaller than that of the 50th percentile, remains significantly larger than that of the 25th percentile.

As with other points along the distribution, this productivity gap is primarily attributed to firm-specific characteristics. A portion of this difference is elucidated by observable factors related to institutional quality. This finding underscores the persistence of a productivity disparity, even among firms at higher quantiles, suggesting that the effect

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of firm characteristics remains consistent throughout the distribution. Moreover, the influence of institutional quality, though not the sole determinant, is a contributing factor that can be identified and quantified. This emphasizes the multifaceted nature of the

productivity gap, in which both intrinsic firm attributes and the broader institutional environment play pivotal roles in influencing the performance differential between firms, particularly at the 75th percentile.



Table 6
Productivity at the 75th percentile

Variable	Overall	Explained	Unexplained
Market share		0.0285*** (0.0043)	-0.0085*** (0.0016)
Age		0.00457*** (0.0013)	-0.1420*** (0.0426)
Size		-0.7330*** (0.0402)	-0.2040*** (0.0675)
Labour productivity		-0.7230*** (0.0191)	1.9120*** (0.1290)
ROA		0.0003 (0.0003)	-0.0001 (0.0001)
Export		-0.2090*** (0.0377)	-0.0916*** (0.00815)
PCI		-0.0168*** (0.0043)	-2.6880*** (0.5740)
Entry cost		-0.0070* (0.0039)	-0.0489 (0.3430)
Land access		0.0066 (0.0072)	0.8980*** (0.2720)
Policy bias		-0.00745 (0.0083)	-0.8330*** (0.2090)
HHI		-0.0002 (0.0008)	-0.0005 (0.0072)
Domestic (group 1)	2.9520*** (0.0128)		
Foreign-owned (group 0)	4.3010*** (0.0263)		
Difference	-1.3490*** (0.0292)		
Explained	-1.6570*** (0.0442)		
Unexplained	0.3080*** (0.0522)		
Constant			1.5140** (0.7190)

Source: Authors' calculations.

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.



6. Conclusion and policy recommendations

Our analysis has shed light on several key aspects of the productivity gap between foreign-owned and domestic firms across different quantiles. First and foremost, we have unequivocally established the existence of a productivity gap, indicating that foreign-owned and domestic firms exhibit differential levels of productivity at various points along the distribution. Second, we have observed that the most substantial productivity gap is situated at the 50th percentile, signifying the centrality of this point in the distribution. This midpoint serves as a critical juncture where the disparities between foreign-owned and domestic firms are most pronounced. Third, our investigation has revealed that firms' observable characteristics, such as size, labour productivity and experience, play a pivotal role in promoting TFP as well as in explaining the majority of the productivity gap between these types of firms.

According to the International Labour Organization, Viet Nam's labour productivity is considerably lower than that of most of the countries in the region (Viet Nam stands at \$10.22 per hour, compared with \$13.53 for China or \$15.06 for Thailand).⁷ This shows large room for improvement. As labour productivity is the most significant contributor to firm TFP as well as to the TFP gap, firms' strategies to prioritize investment in employee training and development, embracing technology adoption, could help improve labour productivity and narrow the TFP gap. Implementing flexible work arrangements and promoting employee well-being could further enhance productivity by accommodating diverse needs and fostering a supportive work environment. On the governmental front, providing training programmes and investing in higher education to promote skills development both play crucial roles

in enhancing labour productivity and TFP and hence, in reducing the TFP gap.

In addition to prioritizing strategies to enhance labour productivity, policymakers must recognize the critical role of knowledge transfer initiatives in narrowing the productivity gap. Fostering linkages between domestic and foreign-owned firms is key to facilitating productivity spillovers (Barrios, 2002; Gorg and Strobl, 2001); however, the connection between Vietnamese and foreign-owned firms is rather loose as foreign-owned firms often cooperate more with their home-country firms, with which they have well-established relationships. According to the Ministry of Investment and Planning, in 2017, only 10 per cent of domestic enterprises acted as suppliers for foreign-owned firms in Viet Nam, and foreign-owned firms purchased only 26.6 per cent of their inputs by value from Vietnamese firms, with a majority of their purchases being made from other foreign-owned firms based in Viet Nam.⁸ The loose linkage between foreign-owned and domestic firms prevents productivity spillovers from occurring. The Government, therefore, should provide policy that encourages partnerships, joint ventures or mentorship programmes between foreign-owned and domestic firms that can effectively promote technology diffusion, improved management practices and skill enhancement. Such collaborative efforts create avenues for knowledge transfer, allowing domestic firms to leverage the expertise and resources of their foreign-owned counterparts. A collaborative effort could be made for foreign-owned and domestic firms through vertical linkages where Vietnamese firms act more closely as inputs suppliers or customers for foreign-owned firms from the upstream and downstream sectors of the value chain. Supplier-buyer relationships or subcontracting arrangements enable domestic firms to access advanced technologies and processes utilized by foreign-owned firms.

⁷ More details are available at the International Labour Organization, Statistics on Labour Productivity, available at <https://ilostat.ilo.org/topics/labour-productivity> (accessed 15 March 2024).

⁸ More details can be found at Viet Nam, Ministry of Finance, 2018, Boosting linkages between FDI and domestic enterprises, 1 August, available at https://mof.gov.vn/webcenter/portal/btcvn/pages_r/tin-bo-tai-chinh?dDocName=UCMTMP128622.



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This exposure facilitates the adoption of best practices and innovative techniques, ultimately enhancing productivity. Horizontal relationships, including joint research and development projects or strategic alliances, that promote collaborative learning and skill development across firms operating within the same industry or sector could also help. However, it is rather challenging for Vietnamese firms to collaborate with their competitors in the same industry since domestic firms are often small and nascent. To promote such collaborations, policymakers can provide incentives for foreign-owned firms to collaborate with domestic firms, for instance, offering tax breaks or incentives for foreign-owned firms that engage in partnerships or joint ventures with domestic firms. These could include tax credits for research and development conducted jointly or reduced corporate tax rates for profits generated through collaborative projects. These human capital development and knowledge transfer initiatives contribute to the overall resilience and sustainability of the domestic economy by fostering a culture of innovation and continuous improvement. As such, policymakers must prioritize these initiatives as integral components of their broader economic strategy (Fujimori and Sato, 2015; Marcin, 2008).

Furthermore, the findings underscore the influence of institutional quality on the productivity gap; therefore, improving the institutional quality at the provincial level might also help reduce the productivity gap between foreign-owned and domestic firms. Local institutional quality has been improved over the years; however, issues such as corruption and bureaucracy remain as barriers to enhancing firm productivity (Ha et al., 2023). Policymakers should prioritize efforts to enhance the business environment by reducing bureaucratic hurdles, improving contract enforcement and ensuring regulatory transparency. Creating competitive local business environments through investment-friendly policies and infrastructure development will help build a more transparent, dynamic and inclusive business

environment that supports the growth and competitiveness of domestic firms while reducing the productivity gap with foreign-owned firms. By providing a more favourable and predictable regulatory framework, Viet Nam can attract higher-quality FDI, and this, in turn, can positively affect domestic firms by creating a more conducive ecosystem for knowledge spillovers and collaboration.

Acknowledging the significant productivity disparities evident at the 50th and 75th percentiles, policymakers must prioritize the enhancement of support mechanisms for domestic firms, especially those situated at the median and high tiers. Policies that enhance labour productivity or foster linkages between foreign-owned and local firms, such as technology transfer platforms to connect domestic firms with foreign partners and mentorship programmes in which successful firms share their knowledge and best practices with smaller enterprises, should focus on firms in the median and high quantiles. Narrowing the productivity gap at the median and high levels promotes inclusivity by creating opportunities for a broader spectrum of firms to thrive. This fosters a more equitable distribution of wealth and resources, ultimately strengthening social cohesion and stability.



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Appendix table
Correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. TFP	1												
2. Market share	0.171	1											
3. Age	0.190	0.082	1										
4. Size	0.394	0.181	0.313	1									
5. Labour productivity	0.631	0.144	0.159	0.238	1								
6. ROA	0.019	0.003	0.003	0.003	0.028	1							
7. Export	0.313	0.168	0.155	0.630	0.234	0.001	1						
8. PCI	0.168	0.028	0.089	-0.007	0.194	0.002	0.026	1					
9. Entry cost	-0.044	-0.016	-0.005	-0.030	-0.045	-0.002	-0.018	-0.225	1				
10. Land access	0.023	0.014	-0.034	0.042	-0.003	0.000	0.066	0.224	0.041	1			
11. Policy bias	0.051	0.020	0.019	0.083	0.032	0.000	0.089	0.343	-0.397	0.349	1		
12. HHI	0.006	0.088	-0.006	-0.01	0.005	0.000	-0.007	0.012	-0.004	0.000	-0.007	1	
13. FDI share	0.209	0.122	0.000	0.442	0.243	0.006	0.535	0.051	-0.046	0.079	0.078	0.015	1

Source: Authors' calculations.

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.



Consolidated foreign wealth of nations: Nationality-based measures of international exposure^{*}

André Sanchez Pacheco^a

Abstract

This study presents novel estimates of foreign holdings using a consolidated-by-nationality approach for a sample of 14 developed countries over multiple years. This approach provides an alternative for policymakers and researchers to analyse international exposure that complements the existing approach based on residence-based data. Two main advantages of the nationality-based approach are that it looks through corporate structures of multinational enterprises and considers local positions. The resulting novel data show that aggregate international financial integration is larger than residence-based data indicate for the sample. These data are used to analyse (i) profit-shifting activities and (ii) spillovers from United States monetary policy shocks. This study presents evidence suggesting that nationals of relatively high-tax countries may shift assets to low-tax countries in ways not fully captured in residence-based statistics. It also shows that a tightening in United States monetary policy is associated with a decline in foreign asset holdings by non-financial multinational enterprises using the consolidated-by-nationality approach. These findings underscore the relevance of using the consolidated-by-nationality approach to evaluate policy-relevant questions.

Keywords : consolidated-by-nationality statistics, financial globalization, international financial integration, policy spillovers, residence-based statistics, tax differentials

JEL classification codes : F21, F23, F36, F41, F42

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1. Introduction

How can policymakers assess the exposure that a country's households and firms have to international risk factors? The conventional approach uses data on countries' foreign holdings. These data are collected using the residence of economic agents as the key criterion. For any given country, its external assets (or liabilities) represent claims (or liabilities) its residents have with respect to non-residents. It follows that only cross-border positions are recorded in residence-based statistics. Furthermore, this approach does not consider ties between entities within the same corporate group. Thus, using this approach, the local positions held by the affiliate of a multinational enterprise (MNE) operating abroad may not be considered part of the foreign holdings of its home and host countries.

These two features of the residence-based approach pose a challenge, given the growing importance of MNEs. These corporate groups have affiliates operating in multiple host countries. The local assets held by these affiliates in these countries represent investments made by an MNE away from its home country. Yet they may be recorded in foreign balance sheets of host and home countries only if cross-border transactions are involved. If these investments are funded by raising resources with local agents, no exposure is recorded for either home or host country.

For an example, consider a United States automaker MNE that has a local entity in a foreign country. This local entity decides to build factories and fund those investments by getting loans from banks of that foreign country. These factories represent investments made by a United States company in a foreign country. Yet these investments will not be recorded in the United States residence-based foreign balance sheet or in the foreign country's foreign balance sheet because they are local transactions happening in a foreign country. Now suppose

that this United States automaker decides to reduce its offshore operations and end its production in this foreign country. This decision will affect employment and income in that country. Focusing only on residence-based data could lead policymakers to overlook this international exposure. In this example, such international exposure is not accounted for as the residence-based approach considers only cross-border positions, and the loan taken by the affiliate is a local transaction between two entities resident in the foreign country – yet they have ultimate counterparts of different nationalities.

This example illustrates how decisions made by MNEs can affect employment and production in foreign countries that host MNEs' affiliates. Blomstrom and Kokko (1998) provide evidence of these spillovers from MNEs' activities. Avdjiev et al. (2020) have shown how monetary policy changes in the home country of multinational banks affect conditions in foreign countries that host bank affiliates. These studies point to the need to develop measures that can capture these international linkages more comprehensively. In this sense, Lane (2021) notes the importance of establishing a consolidated accounting framework to complement the residence-based one. Borio (2013) also points to the importance of creating a database using the consolidated-by-nationality approach to provide a more precise description of the decision-making units.

The alternative used in this study is a consolidated-by-nationality approach to computing foreign assets and liabilities. Under this approach, assets and liabilities held by affiliates operating abroad are consolidated with those of the parent group. This approach considers both local and cross-border positions, sorting them according to the nationality of the ultimate owners of such investments.¹ Accounting for all positions and consolidating positions held by affiliates produces a more nuanced view of countries' international exposure.

¹ Once the ultimate owner of a given entity is identified, the holdings of that entity are attributed to the country of the ultimate owner. Section 3 presents the methodology in detail.



Consolidated foreign wealth of nations: Nationality-based measures of international exposure

The recent literature on nationality-based foreign holdings has revealed important stylized facts. Coppola et al. (2021) show that China's net foreign assets position is substantially smaller when viewed from a nationality-based perspective. Their approach focuses on categorizing cross-border portfolio investment on a nationality basis. In contrast, this study focuses on consolidating local and cross-border positions of affiliates to their parent company and sorting international exposure on the basis of the nationality of the parent companies. Bénétrix and Sanchez Pacheco (2023) show that the United States economy is more financially integrated with the rest of the world than would appear using conventional residence-based data. They also provide a review of the literature on the multiple usages of nationality-based data in assessing exposure to financial risks and control. Despite recent progress, no current data set contains information on the entire foreign balance sheet of countries from a consolidated-by-nationality approach.

This study presents estimates of foreign assets and liabilities from a consolidated-by-nationality perspective for a group of 14 developed countries. The estimates are made using multiple data sources, including the United States Bureau of Economic Analysis (BEA), the International Monetary Fund (IMF), the Bank for International Settlements (BIS) and Orbis Europe. Section 3 describes the methodology used in constructing the data set.

The main data contribution of this study is about how to construct estimates of consolidated-by-nationality foreign holdings for non-bank MNEs using these sources. To the best of the author's knowledge, this is the first study to produce consolidated-by-nationality estimates for the non-bank sector. A second data contribution comes from combining these new estimates with existing data from the BIS and IMF to produce yearly estimates for the foreign balance sheet of 14 developed countries for the period between 2012 and 2019. It is the

first data set of nationality-based estimates of foreign holdings for any group of countries.

These novel data on foreign holdings are compared with the residence-based data in Lane and Milesi-Ferretti's external wealth of nations database.² A key variable in this analysis is the index of international financial integration (IFI), which measures the relative size of a country's foreign balance sheet. IFI is equal to the sum of a country's foreign assets and liabilities divided by its gross domestic product (GDP).

One relevant stylized fact that emerges from the analysis is that in the aggregate these 14 countries present a larger foreign balance sheet from a nationality-based perspective than from a residence-based one.

This result indicates that these economies are more financially integrated internationally than previously thought. The difference is associated with the fact that the consolidated-by-nationality approach considers both local and cross-border positions, whereas the residence-based approach considers only the latter.

Most – but not all – countries present a larger consolidated-by-nationality foreign balance sheet than a residence-based one. Countries with a sizeable presence of foreign companies that engage in international financial intermediation tend to have larger residence-based foreign balance sheets. These companies' cross-border holdings inflate their host country's residence-based foreign balance sheet. In contrast, using the consolidated-by-nationality approach, these holdings are instead consolidated to their parent country. Most notably in our data set, Ireland stands out as having a substantially larger balance sheet using the residence-based approach, in line with Sanchez Pacheco (2022). Lane (2019) argues that the presence of these financial intermediaries makes opaque the positions held by Irish nationals in the residence-based data. In this sense, the nationality-based approach provides a clearer view of the international exposure these agents have.

² Available at www.brookings.edu/research/the-external-wealth-of-nations-database (accessed 2 January 2024).



These novel data are used to study two macroeconomic issues. The first is profit shifting from high-tax countries to low-tax countries. Wier and Zucman (2022) estimate that about 37 per cent of profits earned by MNEs are shifted to tax havens. Dischinger and Riedel (2011) have shown that multinational firms tend to shift their intangible assets to affiliates located in low-tax countries. This study uses consolidated-by-nationality estimates of foreign holdings and residence-based data to focus on the relationship of the two approaches with differences in corporate income tax rates. A key variable in this analysis is the difference between the consolidated-by-nationality and residence-based measures of foreign holdings, which is a proxy of the foreign holdings not captured by the residence-based approach.

This study finds that in a sample of low-tax countries the difference between these two measures of foreign holdings is negatively correlated with corporate income tax differentials. In contrast, the coefficient estimate is positive when estimated in a sample of high-tax countries. These results provide indirect evidence that nationals from high-tax countries may shift assets and profits to low-tax countries in ways that are not entirely captured by the residence-based approach. This finding is in line with Bénétrix and Sanchez Pacheco (2023) and points to the relevance of consolidated-by-nationality data to analysis of profit-shifting activities and factors influencing the locational choices made by MNEs for international investments.

The second macroeconomic issue is spillovers of United States monetary policy shocks to MNEs. Bergant et al. (2023) show that a tightening in United States financial conditions is associated with a decline in global cross-border mergers and acquisitions. This study analyses the relationship between United States monetary policy shocks and foreign asset holdings by non-financial MNEs. It shows that tightening policy is correlated with a decrease in foreign asset holdings by non-financial MNEs under the consolidated-

by-nationality approach. This result is robust with respect to alternative estimation methods for these policy shocks. This result suggests that a tightening in United States monetary policy generates short-term spillovers that are associated with MNEs reducing their foreign asset holdings.

More broadly, these two sets of results indicate that consolidated-by-nationality estimates of foreign holdings can be useful in tackling important questions in international macroeconomics. As noted by Lane (2021), the consolidated-by-nationality approach should complement the residence-based approach, given that each offers advantages depending on the question at hand.

2. Nationality- and residence-based statistics

In two main data dimensions the consolidated-by-nationality approach differs from the residence-based approach. The first dimension relates to the set of positions that are considered when estimating foreign assets and liabilities. In residence-based statistics, external holdings are recorded when there is an exposure of a resident economic agent relative to a non-resident economic agent. As a consequence, the residence-based approach focuses exclusively on cross-border positions. Local positions that represent exposures between resident agents of different nationalities within the same country are not captured by this approach. In contrast, the consolidated-by-nationality approach takes into consideration both local and cross-border positions.

The second difference relates to how entities within the same corporate group are treated under each approach. In residence-based statistics, an affiliate of a foreign MNE operating in a given host country is seen as a resident of that country. There is no direct linkage between such an entity and the corporate group to which it belongs. Cross-border assets and liabilities held by the affiliate are recorded as external holdings of the host country even if the company is



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controlled by foreign agents. Meanwhile, the consolidated-by-nationality approach consolidates the assets and liabilities held by the affiliate to the parent company.

An example can illustrate how these differences affect the measurement of foreign assets and liabilities. Consider an affiliate of a foreign MNE from country A that operates in host country B. Through this affiliate, the MNE wants to buy a factory in country B worth \$5 million. That investment is financed entirely by taking a loan from a local bank in country B.

Under the consolidated-by-nationality approach, this factory is an asset that the foreign MNE owns in country B. Therefore, it would be recorded as a foreign asset of country A and a foreign liability of country B. Meanwhile, the loan undertaken by the affiliate to finance this investment represents a liability that the MNE from country A has relative to a bank from country B. This loan would be recorded as a foreign liability of country A and a foreign liability of country B. In this example, both foreign assets and foreign liabilities of countries A and B rise by \$5 million because of this investment.

Under the residence-based approach, no exposure would be recorded. The affiliate operating in country B is not seen as a foreign entity. There is no cross-border transaction as the investment made by the foreign MNE is funded locally. Crucially, this international exposure that a foreign MNE from country A takes in country B would not be recorded in residence-based statistics. Similarly, the exposure that the local bank B has relative to a foreign MNE would also not be recorded.

These two data differences are associated with a set of issues raised in the international finance literature. The first one relates to the identification of the ultimate exposure to financial risks. Under the residence-based approach, the foreign affiliate of country A's MNE is treated as a separate entity. Its local exposure is not captured in external residence-based statistics. As a result, relying exclusively on residence-based

data poses a challenge for policymakers in country A in identifying the exposure of its MNEs. In contrast, country A's consolidated-by-nationality foreign balance sheet would capture local and cross-border positions held by this and other affiliates relative to foreign agents. This feature makes it easier for policymakers to evaluate the ultimate exposure that their agents have. In this context, Borio (2013) points to the need for constructing consolidated statistics to assess the exposure that global firms have to different risk factors, countries and sectors.

A second issue relates to the triple coincidence literature, as noted in Avdjiev, McCauley and Shin (2016) and Avdjiev, Everett et al. (2018). In the standard international finance models, the decision-making unit coincides with the GDP area and the currency area. In reality, though, MNEs make decisions in their home countries that affect production in foreign countries where their affiliates operate. These affiliates may be spread across different currency areas. Treating each entity separately according to its residence fails to capture this complex decision-making and production structure. In contrast, the consolidated-by-nationality approach provides a more nuanced view of these global corporate structures.

When considering the ultimate exposure to financial risks, the consolidated-by-nationality approach offers an advantage relative to the residence-based approach. It also provides a more detailed view of the global footprint of MNEs. This is particularly useful given their greater relevance over the past decades. However, this approach also has some relative disadvantages. Unlike for the residence-based approach, there is no unified manual on how national authorities should collect consolidated-by-nationality data. In this sense, Lane (2021) notes that the consolidated-by-nationality approach should complement rather than replace the residence-based framework. Deciding which approach to use depends on the question at hand.



Another important relative disadvantage of the consolidated-by-nationality approach is that there is no data set containing estimates of foreign holdings from a nationality perspective for multiple countries, as in Lane and Milesi-Ferretti (2001, 2007 and 2018). This study seeks to fill this gap by producing the first data set of estimates of consolidated-by-nationality foreign holdings for a group of countries over multiple years. Where Coppola et al. (2021) focus on portfolio investment, this study presents estimates for the entire foreign balance sheet of countries.

3. Data

Consolidated-by-nationality estimates of foreign holdings for a group of 14 countries are constructed using data from the United States BEA,³ the IMF, the BIS and Orbis Europe.⁴ Foreign assets and liabilities are divided into similar functional categories as in BIS (2015) and Sanchez Pacheco (2022). More specifically, foreign assets and liabilities are divided into four categories: holdings related to the activities of national companies operating abroad, holdings related to activities of foreign companies operating in the country, portfolio investment and official assets. Furthermore, holdings are divided according to the MNEs' activities into three sectors: banks, financial non-banks and non-financial companies. The main data contribution of this study is to produce consolidated-by-nationality estimates of foreign holdings for non-bank entities using Orbis Europe and United States BEA data. Data on the banking sector comes from the BIS and data on the rest of the foreign balance sheet from the IMF.

Recent research has focused on using firm-level data to construct aggregate measures. Kalemli-Ozcan et al. (2024) describe how Orbis can be used to construct nationally representative firm-level data. While that

approach provides information on a more granular level, it is possible that samples extracted from Orbis are not nationally representative. Countries in Europe require firms to report financial and ownership information to national business registers. This legal requirement potentially reduces the scope for a substantial mismatch between the reported firm-level data and aggregate statistics. Indeed, Kalemli-Ozcan et al. (2024) show that Orbis data covered, on average, 78 per cent of the gross output of the manufacturing sector. In this study, Orbis data are used to construct the consolidated-by-nationality foreign assets and liabilities of non-bank companies in a set of 14 European countries.

The data set covers the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. For most, data are available from 2012 to 2019; for some, the first observation starts later because of data limitations. Data for Ireland are taken from Sanchez Pacheco (2022), and data for the United States are taken from Bénétrix and Sanchez Pacheco (2023).⁵

Section 4 compares these novel nationality-based data with conventional residence-based data. As noted earlier, residence-based estimates of foreign assets and liabilities come from Lane and Milesi-Ferretti's external wealth of nations data set.⁶ It is important to note that the consolidated-by-nationality data presented in this study are estimates from multiple data sources. Currently, no such official data are compiled by statistical offices or international institutions.

3.1 Bank-related holdings

Consolidated-by-nationality estimates of foreign holdings related to the banking sector are constructed using data from the BIS. The methodology follows that

³ Available at <https://www.bea.gov/data/economic-accounts/international> (accessed 21 March 2022).

⁴ Available at <https://orbiseurope.bvdinfo.com> (accessed 26 May 2022).

⁵ The data set is publicly available and can be accessed at www.aspacheco.com/research (accessed 15 March 2024).

⁶ Available at www.brookings.edu/research/the-external-wealth-of-nations-database (accessed 22 September 2022).



employed in BIS (2015), Bénétrix and Sanchez Pacheco (2023) and Sanchez Pacheco (2022). Bank-related holdings are associated with the activities of both national banks and foreign banks.

For any country I , foreign assets related to national banks are equal to the claims held by them relative to all counterparts except those with the same nationality. Foreign assets of country i related to foreign banks operating in it are the local liabilities of such banks relative to country i nationals.

Foreign liabilities of country i related to its national banks are estimated as the local liabilities of these banks operating abroad plus their cross-border liabilities, excluding those to related offices. Foreign liabilities related to foreign banks are equal to the total claims of foreign banks on nationals of country i .

3.2 Non-financial MNEs

3.2.1 Foreign MNEs

The holdings associated with foreign MNEs operating in European countries are computed using Orbis Europe. For a given country i , financial, employment and ownership data were downloaded for all entities operating in it that have foreign nationals as their ultimate owners. Similarly, data on company status indicating whether they are active or have been liquidated were used. Companies are sorted according to their four-digit NACE code into two groups: financial non-banks and non-financial MNEs.⁷ Companies identified as banks were excluded from the sample, as the assets and liabilities related to that sector are computed using BIS data.

The financial data used in this study are companies' total asset holdings and shareholders' equity. These data may contain reporting gaps. Whenever there is a reporting gap, this study follows the procedure used in Sanchez Pacheco (2022). If a company is active, a reporting gap in

period T would be filled with data from period $T - z$ where $z > 0$ is the smallest possible. If a company's status is not listed as active, then a reporting gap in period T would be filled with data from $T - z$ only if there is at least one future period $T + k$, $k > 0$ in which financial information is available. If no financial information is available for subsequent periods, it is assumed that the company became inactive in period T . Therefore, its total assets and shareholders' equity will be set to zero for all $t \geq T$. This decision rule generates inputted data whenever there is a reporting gap in the sample.

Nationality-based foreign liabilities of country i related to foreign non-financial MNEs operating in it are estimated as the sum of these companies' total assets. Meanwhile, nationality-based foreign assets related to these companies are computed as the sum of their total assets minus their shareholders' funds. Given the data limitations, such calculations imply that the estimates of foreign holdings presented in this study represent an upper bound. More specifically, these calculations imply that all asset holdings of foreign MNEs operating in country i have country i nationals as counterparts. They also imply that the financing these companies receive, other than shareholders' funds, comes from country i nationals. As these assumptions may not always hold for all companies, the estimates related to the activities of foreign MNEs represent upper bounds.

3.2.2 National MNEs operating abroad

Consolidated-by-nationality foreign assets and liabilities related to national MNEs operating abroad are computed using data from Orbis Europe and the United States BEA. These data sources contain information on multinational activities in Europe and the United States. It is possible that many MNEs from a given country operate outside of these two areas, so this coverage limitation would pose a challenge

⁷ The NACE codes used to identify financial non-banks are all of those included in group K "Financial and Insurance" activities, excluding the codes 6411 and 6419.



when computing assets and liabilities related to these companies. Therefore, the first step taken is to construct a proxy of how well the two data sources cover the activities of MNEs, using the IMF Coordinated Direct Investment Survey.

For country i and year y , the first measure computed is the share of outbound FDI to countries in Europe and the United States relative to the total outbound FDI from country i . Tax haven countries outside of the European Union were excluded from this analysis.⁸ Then the average of these shares in the sample countries is computed for the period between 2009 and 2020. A share equal to one would indicate that these two areas receive all the FDI from country i . A share equal to zero would indicate that all FDI from country i is received by countries outside of Europe and the United States. The highest average share value in our sample is for Ireland, at 95 per cent. The lowest share is for the United Kingdom, at 78 per cent. Even at this lower bound, the two areas represent the destinations of the bulk of the direct investment made from the United Kingdom. Although the regional coverage could pose a challenge, it does not appear to do so for the countries included in the data set, given the high average coverage share across countries.

Foreign holdings related to affiliates of country i companies operating in Europe are constructed using Orbis Europe. The first step is to download financial and sectoral data on all companies that have country i as the country of their ultimate owner. Companies located in country i are excluded, as the focus is on companies located elsewhere in the region. Then the same procedure described in the preceding subsection is used to fill any reporting gaps. It is possible that the ultimate owners of

some of these companies are not from country i but rather have redomiciled there for tax-related purposes. In such cases, Orbis Europe will inaccurately indicate that these affiliates have country i as the country of their ultimate owner. To correct this, the Bloomberg Tax Inversion Tracker from Mider (2017) is used to identify companies that have redomiciled. If an ultimate owner is identified as having redomiciled from country j to country i , the countries of its affiliates are changed from j to i in the data set.

Country i 's consolidated-by-nationality foreign assets related to its companies operating in Europe are computed as the sum of its total asset holdings. Its foreign liabilities related to these entities are calculated as the sum of the difference between total asset holdings and shareholders' funds.

Consolidated-by-nationality foreign assets related to country i 's non-financial MNEs are equal to the sum of country i 's foreign assets related to these companies operating in the United States and in Europe. Similarly, country i 's foreign liabilities related to its non-financial MNEs are equal to the sum of its foreign liabilities related to these companies operating in these two locations.

3.3 Financial non-bank holdings

3.3.1 Foreign financial non-banks

Consolidated-by-nationality foreign assets and liabilities related to foreign financial nonbanks operating in European countries are computed using Orbis Europe. For country i , the focus is on the group of companies whose NACE code is associated with financial non-banking activities, as described in subsection 3.2.1. The same procedure described there is used to fill any reporting gaps.

⁸ For country i , the share is computed as the sum of outbound FDI position to all countries in the Orbis Europe database plus the United States divided by the total outbound FDI position of that country, excluding FDI in tax havens that are not members of the European Union. The countries included in Orbis Europe are Albania, Andorra, Austria, Belarus, Belgium, Bosnia and Herzegovina, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Greenland, Hungary, Iceland, Italy, Kosovo, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Montenegro, the Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, the Russian Federation, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine and the United Kingdom. The non-European Union tax havens are Bermuda, Cayman Islands and Jersey.



Before computing aggregate holdings, an additional step is taken to address the potential presence of special purpose entities (SPEs) in the sample. These financial non-bank companies often engage in cross-country financing, as documented by Galstyan et al. (2021). Their presence inflates the residence-based foreign balance sheet of host country i but they have virtually no economic ties to country i nationals or firms. As a result, when estimating the consolidated-by-nationality foreign holdings related to foreign financial non-banks, these companies must be identified and removed. The procedure adopted in this study follows that in Sanchez Pacheco (2022): a financial non-bank is removed from the sample if it has never reported a number of employees or it has last reported having zero employees.

Once potential SPEs are removed, country i 's consolidated foreign assets related to foreign financial non-banks operating in it are calculated as the sum of the difference between their total asset holdings and their shareholders' funds. Analogously, country i 's foreign liabilities are given by the sum of these companies' total asset holdings.

3.3.2 National financial non-banks operating abroad

Foreign holdings related to country i 's financial non-banks operating abroad are constructed using data from Orbis Europe and the United States BEA. The procedure adopted is akin to that used in section 3.2. We separately estimate the foreign holdings that result from the activities of these companies in Europe and those that result from activities in the United States.

For country i 's companies operating in Europe, its foreign holdings related to its financial non-banks are computed using the procedure described in subsection 3.2.2. Accordingly, ultimate owners that are identified as having redomiciled to country i are excluded from the sample.

Country i 's consolidated foreign assets related to its financial non-banks operating in Europe are equal to the sum of country i 's total asset holdings. Its foreign liabilities related to these companies are equal to the sum of the difference between their total asset holdings and shareholders' funds.

3.4 Portfolio investment

Data from the IMF Coordinated Portfolio Investment Survey are used when estimating foreign assets and liabilities. Notwithstanding the important contribution by Coppola et al. (2021), relatively little is known about the nationality of the ultimate owners of global portfolio investments. As a result, residence-based estimates of portfolio holdings are used when constructing the consolidated-by-nationality balance sheet of countries. For a given country, its foreign portfolio assets are equal to the total investment assets from the IMF survey, and its foreign liabilities are equal to the total investment liabilities from the survey.

3.5 Official assets

Official assets are equal to the official reserve assets from the IMF International Reserves and Foreign Currency Liquidity database.⁹ For the United States, official assets are equal to the United States reserve assets in its international investment position as released by the United States BEA.¹⁰

4. Stylized facts

This section describes key stylized facts that emerge from the novel data on consolidated-by-nationality foreign holdings. It compares the novel data with the residence-based data. Subsection 4.1 focuses on the aggregate dynamics of IFI under both approaches. Subsection 4.2 focuses on the country-specific dynamics and differences relative to the residence-based data for each country in the sample.

⁹ Available at <https://data.imf.org/?sk=2DFB3380-3603-4D2C-90BE-A04D8BBCE237> (accessed 21 July 2022).

¹⁰ Available at <https://www.bea.gov/data/intl-trade-investment/international-investment-position> (accessed 5 March 2022).



4.1 Aggregate dynamics

To assess broad dynamics, aggregate indices of IFI are constructed using both the consolidated-by-nationality approach and the residence-based approach. For any given year, the aggregate index is calculated as the sum of foreign assets and liabilities of selected countries divided by the sum of their GDP. The countries included in computing the aggregate index are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States. Denmark is removed from the sample because its nationality-based data starts in 2016. This index is computed for the period between 2013 and 2019 using both approaches.

Figure 1 shows the evolution of this aggregate IFI under the nationality-based and residence-based approaches for the period between 2013 and 2019.

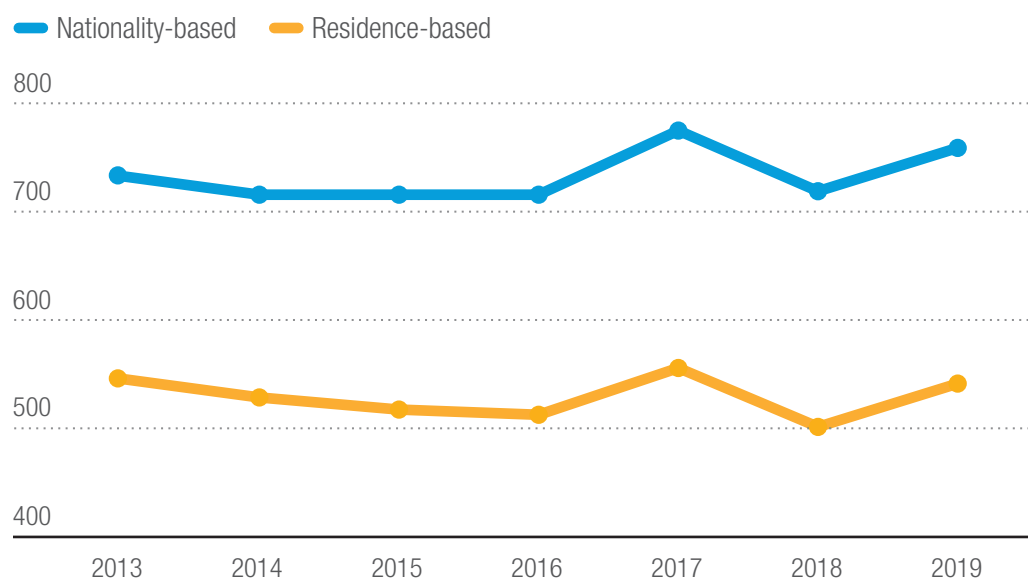
It reveals that the aggregate IFI under the consolidated-by-nationality approach is larger than under the residence-based approach for all years in this period.

This stylized fact indicates that these developed economies are more financially integrated with foreign agents than resident-based measures suggest. This results because the consolidated-by-nationality approach takes into account both cross-border and local positions, whereas the residence-based approach focuses exclusively on the former. As such, an important part of the international exposure of countries is not captured by the residence-based approach.

Figure 2 shows the difference between the nationality-based and the residence-based aggregate IFI over time. It reveals that not only is nationality-based IFI larger than residence-based IFI but also that the difference between the two increased between 2013 and 2019.



Figure 1
Aggregate international financial integration, 2013–2019
(Percentage of GDP)



Source: Author's calculation based on Lane and Milesi-Ferretti's external wealth of nations database.

Note: This figure shows the aggregate international financial integration under the consolidated-by-nationality and residence-based approach. For a given year, the aggregate index is calculated as the sum of foreign assets and liabilities of selected countries divided by their GDP. The countries included are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Kingdom of the Netherlands, Sweden, Switzerland, the United Kingdom and the United States.

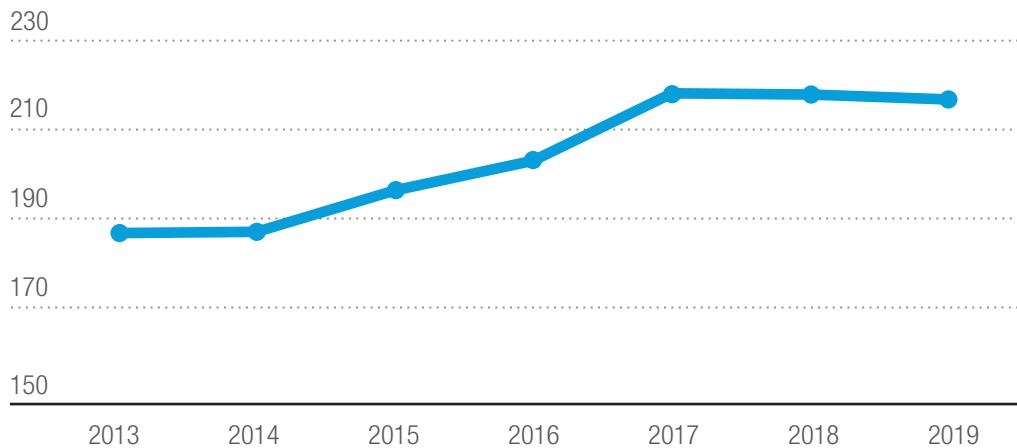




Figure 2

Difference between the aggregate nationality- and residence-based IFI, 2013–2019

(Percentage of GDP)



Source: Author's calculation, based on Lane and Milesi-Ferretti's external wealth of nations database.

Note: This figure shows the difference between the aggregate IFI under the consolidated-by-nationality approach relative to the residence-based approach. The countries included to construct the aggregated are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Kingdom of the Netherlands, Sweden, Switzerland, the United Kingdom and the United States.

There is an important increase in the difference between 2014 and 2017, and then it remained largely unchanged until 2019.

Taken together, the stylized facts shown in figures 1 and 2 are consistent with the complex ownership structure of MNEs detailed in UNCTAD (2016).

These figures illustrate how looking through such ownership structures when sorting foreign assets and liabilities produces different results in terms of IFI and its trend relative to residence-based data.

As noted in UNCTAD (2016), accounting for such differences between the residence and the nationality of ultimate owners is an important element for policymakers when evaluating the application of rules on foreign ownership of investments.

4.2 Country-level analysis

Figure 3 shows IFI under both the nationality-based and residence-based approaches by country for 2019. It reveals that most countries have greater consolidated-by-nationality

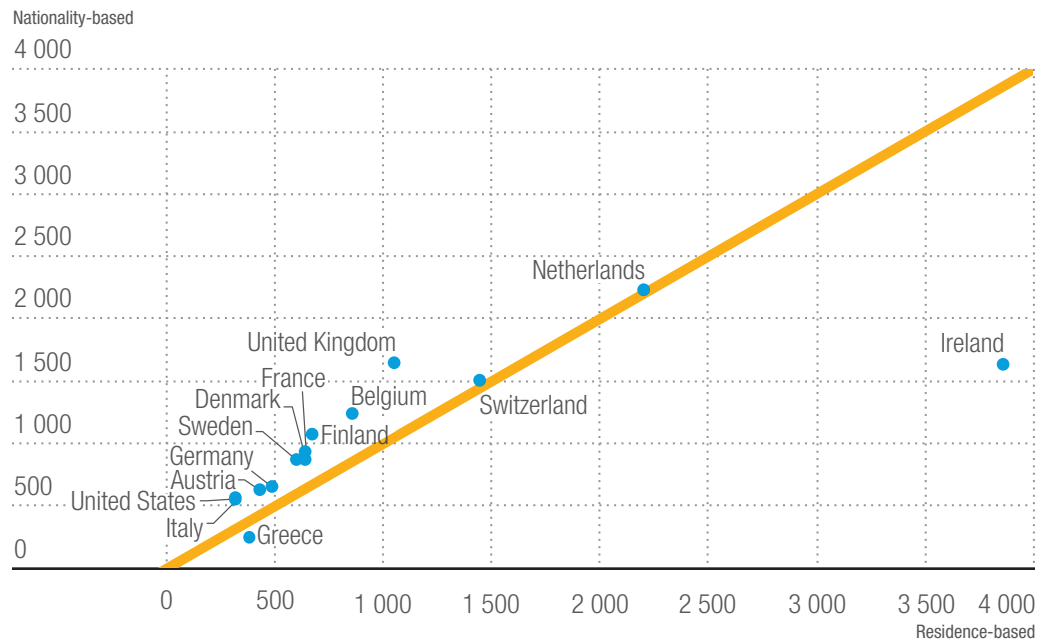
IFI than the IFI that appears on the residence-based balance sheet. This result is expected, as the consolidated-by-nationality approach considers both cross-border and local positions, whereas the residence-based approach considers only cross-border positions.

The two exceptions are Greece and Ireland. In addition, in 2019, in the Netherlands and Switzerland, the nationality-based foreign balance sheets were approximately the same size as the residence-based balance sheets. In general, a country will have a relatively smaller consolidated-by-nationality foreign balance sheet if it is host to a proportionally relevant number of foreign-owned entities whose activities involve holding cross-border assets and liabilities. These holdings inflate the size of the host country's residence-based foreign balance sheet. Yet, under the nationality-based approach they are identified as being foreign-owned and therefore do not appear in the host country's consolidated-by-nationality foreign balance sheet.





Figure 3
Consolidated-by-nationality and residence-based IFI, 2019
(Percentage of GDP)



Source: Author's calculation, based on Lane and Milesi-Ferretti's external wealth of nations database.

Note: This figure shows the consolidated-by-nationality and residence-based IFI for all countries in the data set for 2019. Data are computed as the sum of foreign assets and liabilities divided by GDP. Countries above the line presented a larger consolidated-by-nationality foreign balance sheet in 2019 than residence-based foreign balance sheet.

Ireland stands out as having a substantially smaller nationality-based foreign balance sheet relative to its residence-based one. Galstyan (2019) and Sanchez Pacheco (2022) discuss how the extensive presence of SPEs in Ireland inflates its residence-based balance sheet. These companies have virtually no economic ties to Irish agents and are often involved in international financial intermediation. Their relatively large cross-border holdings enter Ireland's residence-based foreign balance sheet and make opaque the positions held by Irish nationals, as noted by Lane (2018). In contrast, these holdings do not enter Ireland's consolidated-by-nationality foreign holdings.

Figure 4 shows the evolution of the consolidated-by-nationality and residence-based IFI for all countries over the sample period. The two measures are positively correlated across countries,

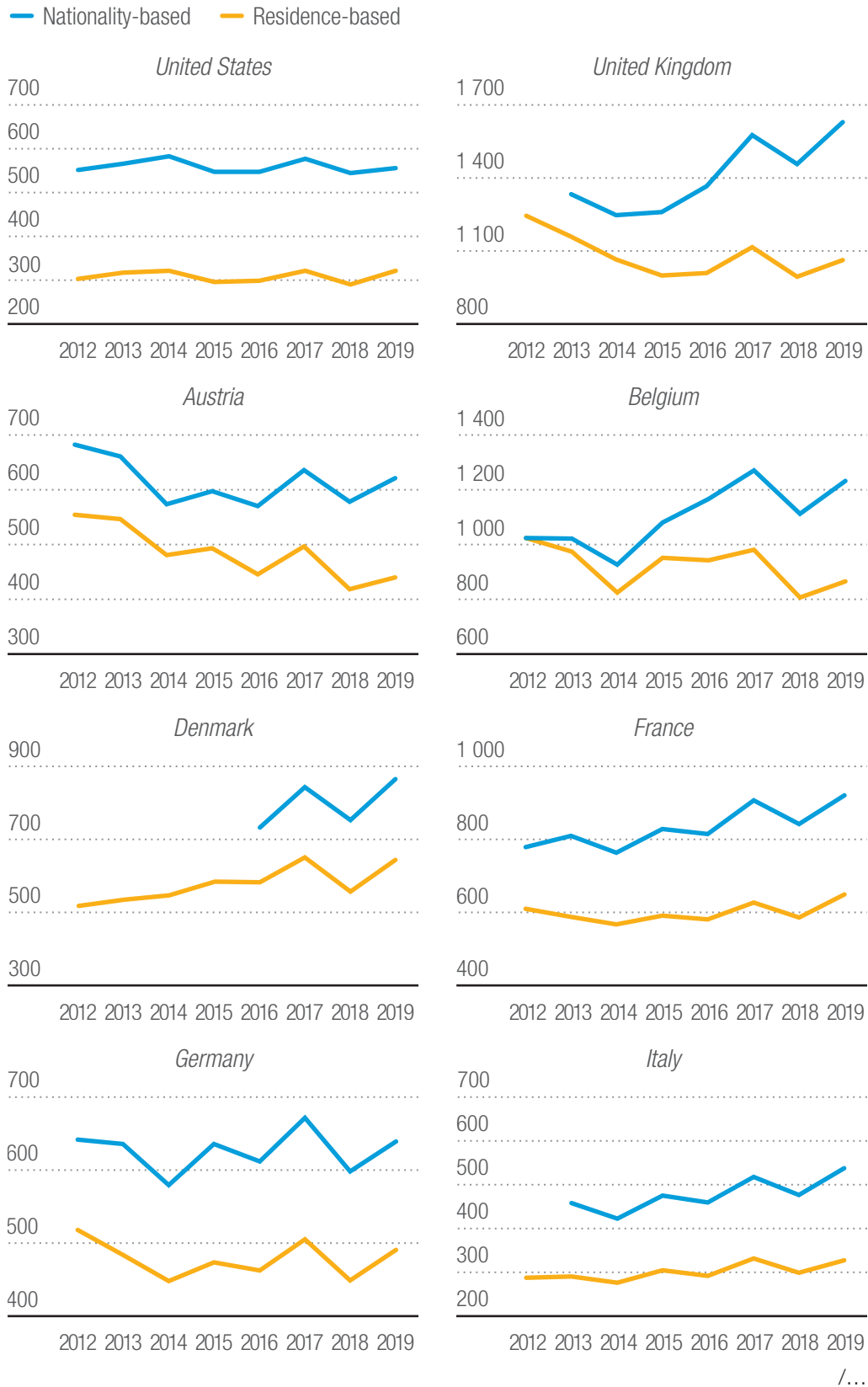
but the difference between them is not constant over time. Bénétrix and Sanchez Pacheco (2023) show that the time-varying difference between consolidated-by-nationality and residence-based IFI for the United States is positively correlated with tax differentials between the United States and the rest of the world. In sections 5 and 6, these data on multiple countries are used in a panel setting to study the macroeconomic issues of profit shifting and of spillovers of United States monetary policy shocks.

Figure 5 shows the evolution of consolidated-by-nationality foreign assets and liabilities by country over time. In general, consolidated-by-nationality foreign assets and liabilities move in tandem; however, the difference between foreign assets and liabilities in Belgium, Greece and Italy moved in important ways during the sample period.





Figure 4
Nationality-based and residence-based IFI, 2012–2019
(Percentage of GDP)



**Consolidated foreign wealth of nations:
Nationality-based measures of international exposure**

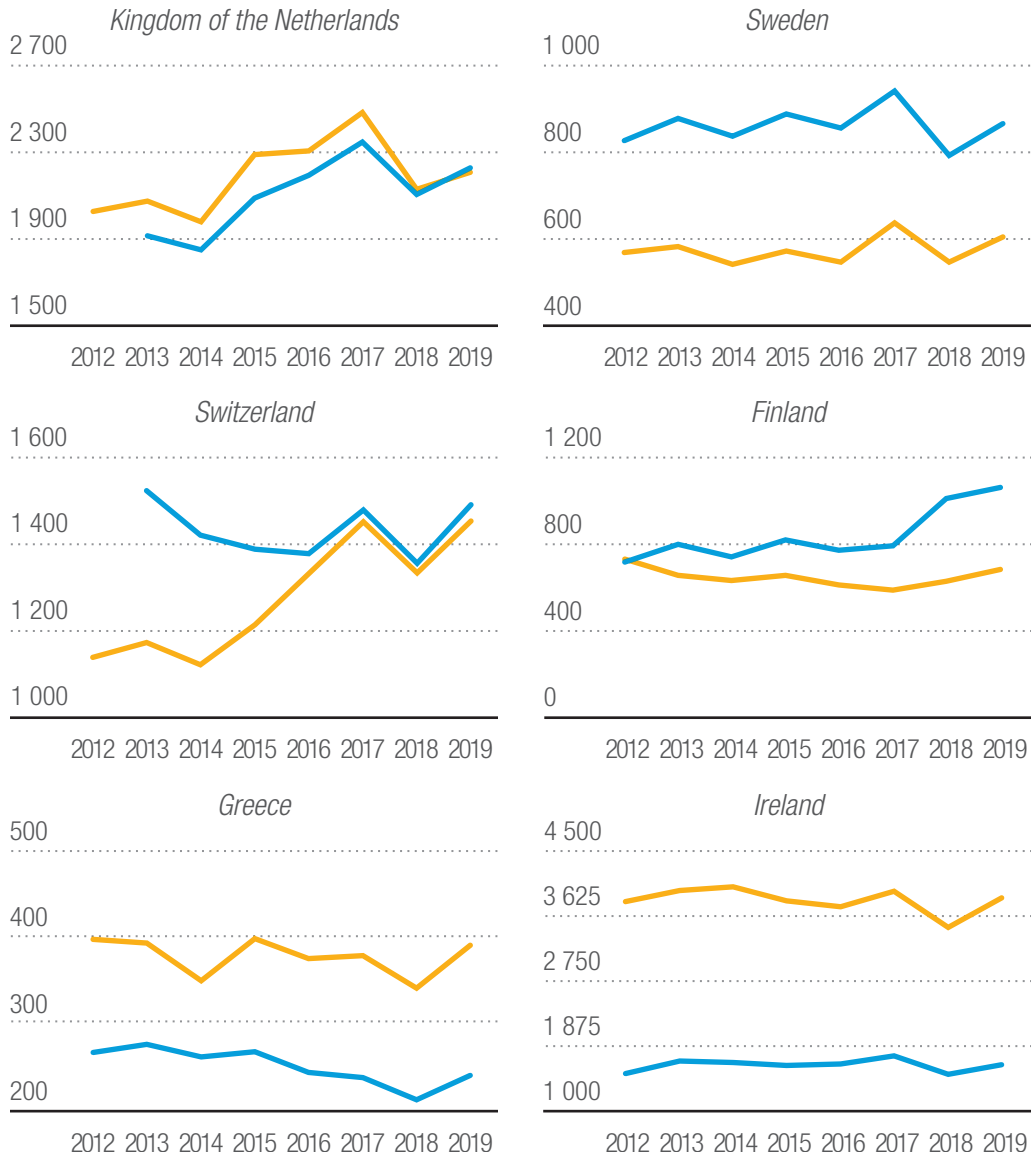


Figure 4

Nationality-based and residence-based IFI, 2012–2019

(Percentage of GDP) (Concluded)

— Nationality-based — Residence-based



Source: Author's calculation, based on Lane and Milesi-Ferretti's external wealth of nations database.

Note: This figure shows IFI under both the consolidated-by-nationality and the residence-based approach. It is computed as the sum of a country's foreign assets and liabilities divided by GDP.



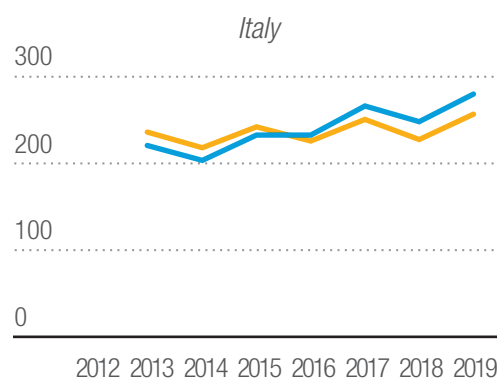
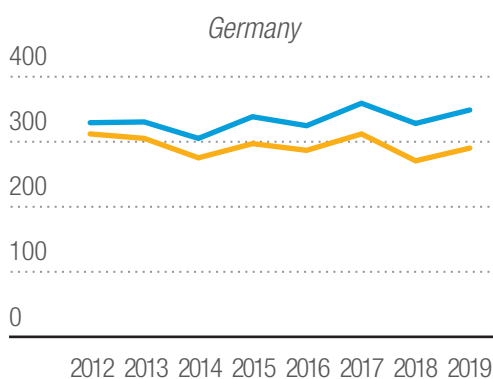
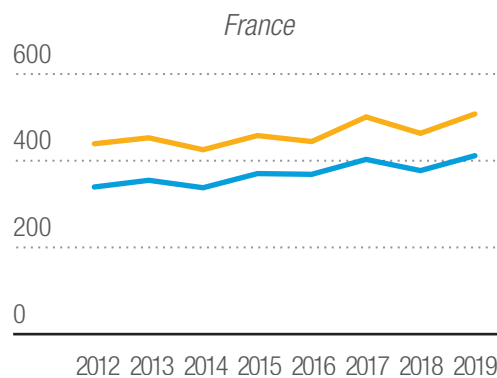
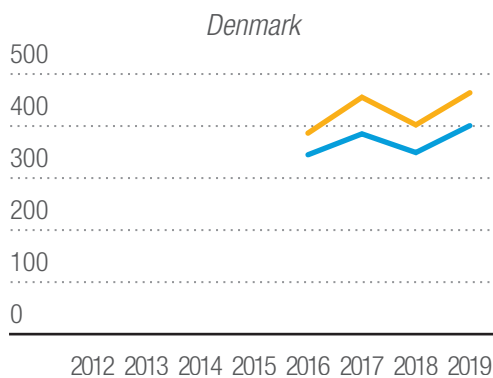
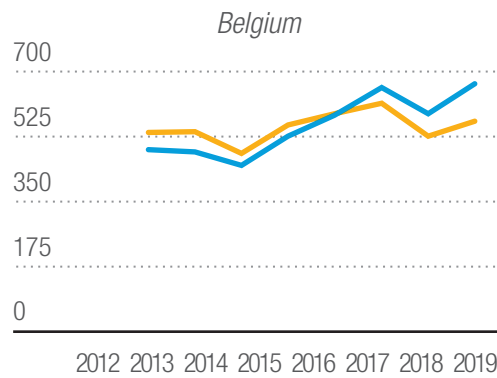
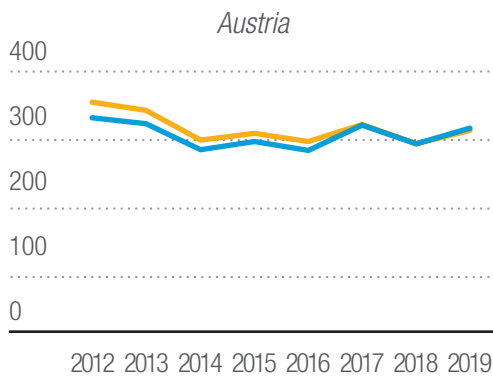
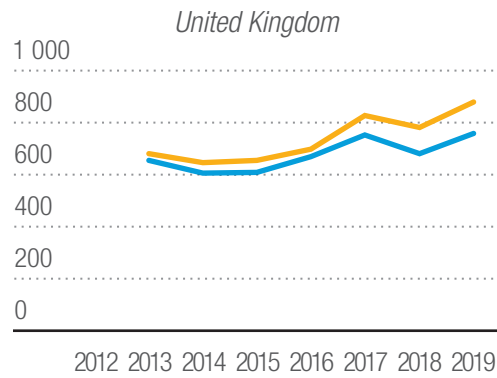
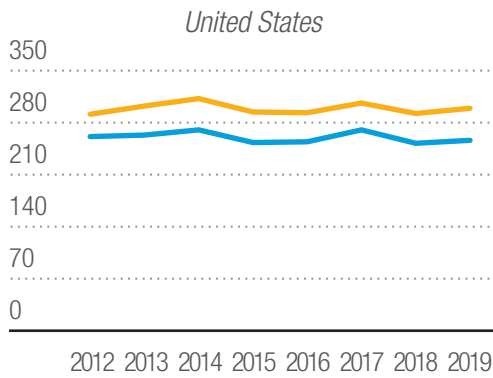


Figure 5

Consolidated-by-nationality foreign assets and liabilities

(Percentage of GDP)

— Nationality-based — Residence-based



/...



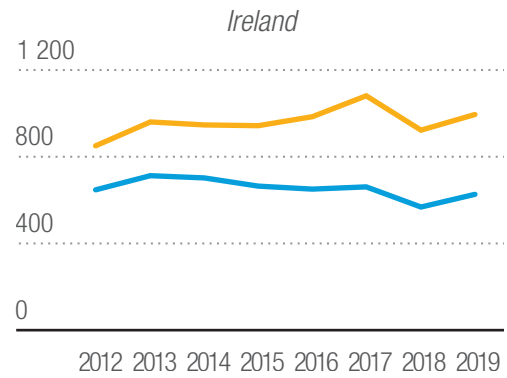
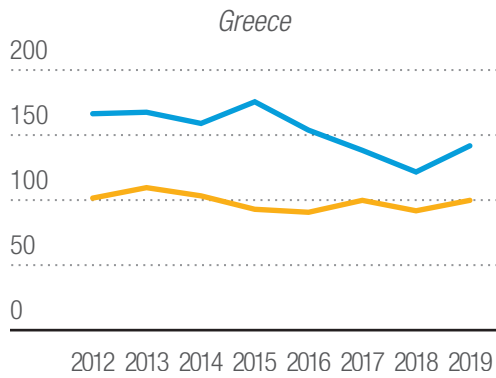
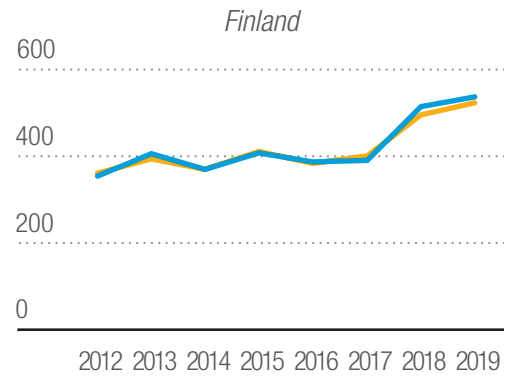
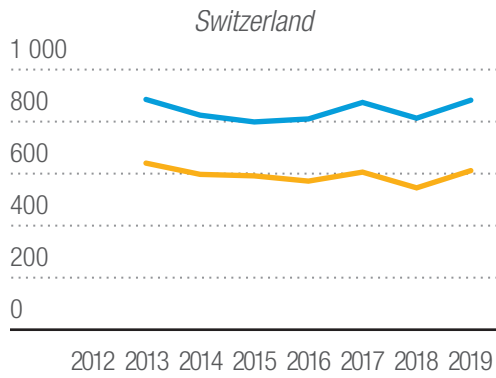
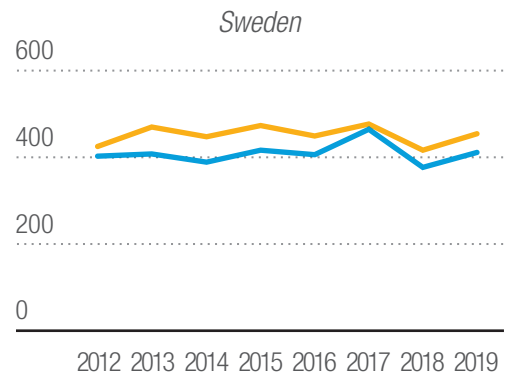
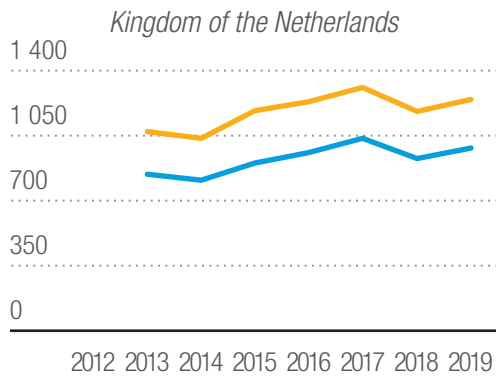


Figure 5

Consolidated-by-nationality foreign assets and liabilities

(Percentage of GDP) (Concluded)

— Nationality-based — Residence-based



Source: Author's calculation.



5. Tax differentials and foreign holdings

MNEs have an incentive to shift assets and profits to affiliates located in low-tax countries. Dischinger and Riedel (2011) document that the lower an affiliate's corporate tax rate is relative to other subsidiaries within the same group, the higher the level of intangible assets held by the affiliate. Wier and Zucman (2022) estimate that 37 per cent of profits earned by such companies were booked in tax havens in 2019. That compares to only 2 per cent in the 1970s, according to their estimates.

Using data for the United States, Bénétrix and Sanchez Pacheco (2023) provide indirect evidence that asset-and-profit-shifting activities by United States MNEs may extend beyond what residence-based statistics can capture as local positions are also considered in the consolidated approach.

This section examines whether consolidated-by-nationality foreign assets are associated with corporate income tax differentials, using a panel of 14 developed countries. The analysis examines the relationship between foreign holdings and corporate income tax differentials. This analysis is done using both residence-based data and the novel consolidated-by-nationality data. Then the focus turns to the difference between the two measures of foreign holdings to assess whether these time-varying differences are also associated with tax differentials. This difference is a proxy for the foreign exposure of countries that is not captured by the residence-based approach. The regressions also include control variables that have been documented, such as GDP per capita and trade openness, as in Lane and Milesi-Ferretti (2001).

Data on GDP per capita come from the World Bank. Trade openness data also

come from the World Bank, measured as a country's trade in goods and services divided by GDP. The difference in the corporate income tax rate for country i is computed as its statutory corporate income tax rate minus the median statutory tax rate from the set of countries included in the tax database of the Organisation for Economic Co-operation and Development (OECD).¹¹

These empirical relationships are examined through panel regressions, as shown in equation 1. The dependent variables $Y_{i,t}$ used are foreign assets, liabilities and IFI under both the consolidated-by-nationality and the residence-based approach. Furthermore, this regression is estimated using the difference between the two measures as dependent variables as well. The panel data set includes observations on 14 developed countries over the period between 2012 and 2019.

$$Y_{i,t} = \alpha_i + \beta_1 * GDPpc_{i,t} + \beta_2 * Open_{i,t} + \beta_3 * TaxDiff_{i,t} + \epsilon_{i,t} \quad (1)$$

The coefficient α_i captures country i 's fixed effect. $GDPpc_{i,t}$ is the GDP per capita of country i at time t , $Open_{i,t}$ is country i 's trade in goods and services as a percentage of GDP at time t . $TaxDiff_{i,t}$ is the difference between country i 's statutory corporate income tax rate at time t minus the median corporate tax rate from the OECD tax database for the same year.

Table 1 shows the regression results using data for all countries in the sample. The coefficient estimate associated with income per capita is positive and statistically significant at the 5 percent level for nationality-based foreign assets, liabilities and IFI. This result is in line with Lane and Milesi-Ferretti (2001), which shows a positive correlation between income per capita and foreign assets in a cross-section analysis using residence-based data.

Importantly, this table shows that the difference between the nationality- and residence-based measures is also positively

¹¹ The median corporate income tax rate is strongly correlated to the average corporate income tax rate in the OECD database (0.96 correlation coefficient).





Table 1
Regression results using full sample of countries

	Assets			Liabilities			International financial integration		
	Nationality	Residence	Difference	Nationality	Residence	Difference	Nationality	Residence	Difference
GDP (percentage)	2.52** (1.19)	-0.95 (1.05)	3.94*** (1.07)	2.59** (1.12)	-1.34 (0.98)	4.10*** (1.00)	5.11** (2.19)	-2.29 (2.01)	8.04*** (1.94)
Open	-1.31 (1.03)	0.06 (0.94)	-1.50 (0.93)	0.50 (0.97)	0.45 (0.88)	0.06 (0.87)	-0.82 (1.90)	0.51 (1.81)	-1.44 (1.69)
Tax diff	0.09 (2.05)	1.27 (1.89)	-0.75 (1.85)	0.09 (1.94)	0.83 (1.77)	-0.32 (1.73)	0.18 (3.78)	2.10 (3.62)	-1.06 (3.35)
R²	0.19	0.23	0.31	0.44	0.30	0.12	0.00	0.00	0.03
Observations	105	112	105	105	112	105	105	112	105

Source: Author's estimations.

Note: This table shows regression results of foreign assets, liabilities and international financial integration under two approaches: consolidated by nationality and residence based. Dependent variables are expressed as a percentage of GDP. Independent variables are GDP per capita, trade as a percentage of GDP and the difference between the statutory corporate income tax rate and the median for a large set of countries. All regressions include country fixed effects. Statistics in brackets are estimated standard errors. The number of observations varies because of missing data for some country-year pairs in the consolidated foreign wealth of nations data set. * p < 0.10, ** p < 0.05, *** p < 0.01.

correlated with income per capita. The coefficient estimates in the regressions that use the difference between the two approaches are positive and statistically significant for foreign assets, liabilities and IFI. This result indicates that the time-varying difference between foreign holdings using these two alternative approaches is related to macroeconomic factors rather than orthogonal to them.

The coefficient estimates associated with corporate income tax differentials are not statistically significant across specifications. At first glance, this result seems to be at odds with Bénétrix and Sanchez Pacheco (2023), who show a positive correlation between the difference in United States nationality- and residence-based IFI and United States corporate income tax differentials.

One possibility for this result is that the sample used in table 1 includes both high- and low-tax countries. Consider a high-tax country A and a low-tax country B. Nationals of country A want to benefit from lower taxes in country B; thus, they shift holdings

to that country. If country A nationals shift assets and profits to low-tax country B, there would be a positive relationship between country A's tax rate and its foreign holdings. Yet, there would be a negative relationship between country B's tax rate and its foreign holdings. Therefore, including high-tax country A and low-tax country B in the same sample could result in coefficient estimates that are not statistically significant.

To overcome this challenge, the countries are divided into two groups: a relatively high-tax group and a relatively low-tax group. A country *i* will be in the relatively high-tax group if its statutory corporate income tax rate is greater than the median tax rate from the OECD database for most years in the sample. Conversely, it will be in the relatively low-tax group if its statutory corporate income tax rate is less than the median tax rate for most years in the sample.

This criterion puts Austria, Belgium, Denmark, France, Greece, Italy, the Netherlands, Sweden and the United States into the relatively high-tax group. Finland, Germany, Ireland, Switzerland



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and the United Kingdom are in the relatively low-tax group. Regression 1 is then estimated by focusing on the difference between nationality- and residence-based measures of foreign holdings for the country subsamples.

If MNEs shift profits in response to differences in taxation, the coefficient β_3 should be positive for high-tax countries and negative for low-tax countries. Consider an economy with a high-tax country A and low-tax country B with respective corporate income tax differentials $TaxDiff_A$ and $TaxDiff_B$. As country A has a relative higher tax rate, $TaxDiff_A > 0$ and $TaxDiff_B < 0$.

Consider then a tax cut in country B. The reduction increases $TaxDiff_A$ for country A while $TaxDiff_B$ for country B becomes more negative. If this tax cut encourages companies in country A to shift profits and holdings to country B, the increase in $TaxDiff_A$ should be multiplied by a positive coefficient β_3 to increase

the dependent variable that measures foreign holdings for country A (Y_A). In a sample of relatively high-tax countries, a positive β_3 would be consistent with profit shifting away from these countries.

The tax cut in country B makes $TaxDiff_B < 0$ more negative. Crucially, the decision by companies in country A to shift holdings to country B following the tax cut implies an increase in foreign holdings in both countries A (Y_A) and B (Y_B). This can be achieved only if $\beta_3 < 0$ when estimated in a sample of low-tax countries. Therefore, profit shifting would be consistent with $\beta_3 > 0$ when estimated in a sample of high-tax countries and $\beta_3 < 0$ when estimated in a sample of low-tax countries.

Table 2 shows the regression results for the difference between the nationality- and residence-based foreign assets, liabilities and IFI estimated using these subsamples. The coefficient estimates associated with $TaxDiff$ are negative and statistically



Table 2
Regression results of the difference between nationality- and residence-based measures

	Difference in assets			Difference in liabilities			Difference in international financial integration		
	Full sample	High-tax	Low-tax	Full sample	High-tax	Low-tax	Full sample	High-tax	Low-tax
GDP (percentage)	3.94*** (1.07)	5.93*** (1.31)	5.00** (1.82)	4.10*** (1.00)	4.14*** (0.84)	6.89*** (1.78)	8.04*** (1.94)	10.07*** (1.93)	11.89*** (3.43)
Open	-1.50 (0.93)	-0.75 (1.23)	-1.82 (1.41)	0.06 (0.87)	-0.42 (0.78)	-0.37 (1.38)	-1.44 (1.69)	-1.18 (1.80)	-2.18 (2.66)
Tax diff	-0.75 (1.85)	1.06 (1.45)	-24.04*** (9.60)	-0.32 (1.73)	1.77* (0.92)	-35.13*** (9.36)	-1.06 (3.35)	2.83 (2.13)	-59.17*** (18.10)
R²	0.31	0.10	0.06	0.12	0.50	0.19	0.03	0.41	0.04
Observations	105	66	39	105	66	39	105	66	39

Source: Author's estimations.

Note: This table shows regression results of the difference in foreign assets, liabilities and international financial integration between the consolidated-by-nationality approach and the residence-based approach. Statistics in brackets are estimated standard errors. Regressions are estimated using (i) the full sample of countries, (ii) a sample of relatively high-tax countries and (iii) a sample of relatively low-tax countries. Relatively high-tax countries are Austria, Belgium, Denmark, France, Greece, Italy, the Kingdom of the Netherlands, Sweden and the United States. Relatively low-tax countries are Finland, Germany, Ireland, Switzerland and the United Kingdom. The independent variables are GDP per capita, trade as a percentage of GDP and the difference between a country's statutory corporate income tax rate and the median for a large sample of countries. All regressions include country fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.



significant in the regressions focused on relatively low-tax countries. Meanwhile, the coefficient estimates are positive – albeit not statistically significant – in the regressions focused on relatively high-tax countries.

Taken together, these results are consistent with the notion that nationals of relatively high-tax countries shift holdings to relatively low-tax countries in a way that is not completely captured by conventional residence-based data. A policy implication of this finding is that there could be more asset- and profit-shifting activities than policymakers would observe if they focused only on residence-based data. Similarly, tax differentials may generate an even more significant incentive for agents to shift assets than analysis relying on residence-based data would suggest.

6. United States monetary policy spillovers and non-financial MNEs

The dominant role that the United States dollar plays in international finance indicates that monetary policy in the country can generate spillover effects for economic agents in other countries. Miranda-Agrippino and Rey (2020) demonstrate how monetary policy shocks in the United States generate co-movements in international financial variables. They also show that a tightening in United States monetary policy generates a decline in global capital flows to both banks and non-banks.

Focusing on the banking sector, Avdjiev, Koch et al. (2018) show that an easing in United States monetary policy boosts cross-border bank lending. Similar results were found by Bruno and Shin (2015) in an analysis of spillovers to cross-border capital flows in the banking sector. In this sense, an easing in United States monetary policy would be associated with an increase in foreign asset holdings by global banks.

Recent research has also focused on United States monetary policy spillovers to non-bank MNEs. Arbatli-Saxegaard et al.

(2022) examine channels through which United States monetary policy shocks affect companies' investments in foreign countries. They find that such shocks have a larger effect on firms that have a higher share of debt denominated in foreign currency and on firms that are more leveraged. Bergant et al. (2023) document spillover effects from United States financial conditions on cross-border merger and acquisition activities.

This section investigates whether United States monetary policy shocks are associated with changes in consolidated-by-nationality foreign assets by non-financial MNEs. The novel data on such assets for the sample group of developed countries are used in a panel regression setting.

The analysis proceeds by estimating the following panel regression of the change in foreign assets held by these companies to a series of United States monetary policy shocks identified by Bu et al. (2021), as well as some control variables. These variables include the real exchange rate, the home country's monetary policy rate and an index of United States financial conditions. In the robustness checks, different series of United States monetary policy shocks based on alternative estimation methodologies are used.

$$\Delta FA_{i,t}^{MNES} = \alpha_i + \beta * USMP_t + \gamma * USFCI_t + \delta \Delta REER_{i,t} + \theta * HomeMP_{i,t} + \epsilon_{i,t} \quad (2)$$

The dependent variable $\Delta FA_{i,t}^{MNES}$ is computed as the first difference in consolidated-by-nationality foreign asset holdings by country i 's non-financial MNEs as a percentage of GDP between year t and $t - 1$. $USMP_t$ captures changes in United States monetary policy. In the baseline specification, it is equal to the sum of the unified United States monetary policy shocks estimated by Bu et al. (2021) in year t . An alternative specification is presented in which $USMP_t$ is equal to the average United States effective federal funds rate for any given year t . $USFCI_t$ is the average United States National Financial Conditions Index, computed by the Federal



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Reserve Bank of Chicago.¹² $\Delta REER_{i,t}$ is the percentage change in the real exchange rate of country i between years t and $t - 1$. $HomeMP_{i,t}$ represents the average monetary policy rate in country i at year t , and α_i captures country fixed effects.¹³

Table 3 shows the regression results for the baseline specification shown in column 3 as well as alternative specifications. The coefficient estimates associated with $USMP_t$, defined as the unified monetary policy shocks, are negative and statistically



Table 3
Regression results of the first difference in foreign assets related to national non-financial MNEs

(Percentage of GDP)

	1	2	3	4	5	6	7
U.S. monetary policy shock	-0.579**	-0.510**	-0.923***				
Standard error	(0.070)	(0.251)	(0.256)				
U.S. FCI			-0.420***	-0.162	-0.249**	-0.231**	
Standard error			(0.111)	(0.107)	(0.108)	(0.107)	
U.S. federal funds						-0.128*	-0.142**
Standard error						(0.070)	(0.071)
Real exchange rate		-0.011*	-0.015*		-0.018***	-0.015**	-0.012**
Standard error		(0.006)	(0.006)		(0.006)	(0.006)	(0.006)
Home monetary policy		0.052	0.019		-0.080	0.066	0.134
Standard error		(0.122)	(0.113)		(0.118)	(0.141)	(0.141)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R²	0.07	0.10	0.23	0.03	0.10	0.15	0.09
Observations	91	91	91	91	91	91	91

Source: Author's estimations.

Note: This table shows regression results of first difference in foreign assets related to national non-financial MNEs as a percentage of GDP. The independent variables are (i) the unified measure of United States monetary policy shocks by Bu et al. (2021); (ii) the United States National Financial Conditions Index from the Federal Reserve Bank of Chicago (available at <https://www.chicagofed.org/research/data/nfci/current-data>, accessed 14 February 2023); (iii) the United States Effective Federal Funds Rate (available at <https://fred.stlouisfed.org/series/FEDFUNDS>, accessed 14 February 2023); (iv) the real exchange rate for the home country from the International Monetary Fund (available at <https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b>, accessed 15 February 2023); and (v) the monetary policy rate from the home country. For Euro Area countries, the monetary policy rate is the European Central Bank's deposit rate (available at https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html, accessed 15 February 2023). For Switzerland, the rate is the Swiss overnight average rate (available at https://www.snb.ch/en/the-snb/mandates-goals/statistics/statistics-pub/current_interest_exchange_rates#t00, accessed 16 February 2023). For Sweden, it is the Swedish effective repo rate (available at <https://www.riksbank.se/en-gb/statistics/interest-rates-and-exchange-rates/policy-rate-deposit-and-lending-rate>, accessed 15 February 2023). For the United Kingdom, the monetary policy rate is the Bank of England's official bank rate (available at <https://www.bankofengland.co.uk/boeapps/database/Bank-Rate.asp>, accessed 15 February 2023). For Denmark, the policy rate is the Danish repo rate (available at <https://www.nationalbanken.dk/en/what-we-do/stable-prices-monetary-policy-and-the-danish-economy/official-interest-rates>, accessed 15 February 2023). All regressions include country fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

¹² Available at www.chicagofed.org/research/data/nfci/current-data (accessed 14 February 2023).

¹³ For Euro Area countries, the policy rate is the European Central Bank's deposit rate. For Denmark, it is the Danish repo rate. For Sweden, it is the Swedish effective repo rate. For Switzerland, it is the Swiss overnight average rate. For the United Kingdom, the policy rate is the Bank of England's official bank rate.



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significant at the 5 per cent level across specifications. Similarly, the coefficient estimates associated with the United States effective federal funds rate is also negative. These results suggest that a tightening shock in United States monetary policy is associated with a decrease in foreign asset holdings by non-financial MNEs. This finding stands even when United States financial conditions are incorporated in the regression analysis.

Furthermore, these regression results suggest that the home country's monetary policy is not correlated with changes in foreign asset holdings by non-financial MNEs. They also indicate that there is a negative correlation between changes in the real exchange rate of the home country and the change in foreign assets.

Taken together, these results can be interpreted as indicating that United States monetary policy appears to be a relevant factor in the decision-making of non-financial MNEs. Tighter or easier United States monetary policy is associated with a decrease or increase in the consolidated-by-nationality foreign assets of these companies.

This finding complements the well-documented spillovers of United States monetary policy on global financial firms. Using firm-level data, this study provides evidence that United States monetary policy shocks also produce spillovers for non-financial MNEs.

The empirical strategy adopted in this subsection does not allow for the disentanglement of the underlying channels through which a tightening policy shock is associated with a reduction of foreign holdings by non-financial MNEs. Such a tightening is often associated with rising costs of funding. It is possible that non-financial MNEs react to such tightening by reducing investment and/or shedding assets abroad.

It is also possible that a part of this reduction in foreign assets is driven by valuation effects. A tightening in United

States monetary policy is associated with lower asset prices, which could potentially explain the decline in foreign assets. Further research is needed to better understand the channels through which United States monetary policy shocks affect investment decisions by non-financial MNEs.

It is possible that the negative and statistically significant coefficients associated with United States monetary policy shocks may be related to the estimation method adopted to compute these shocks.

Therefore, a robustness check is done using different measures of United States monetary policy shocks when estimating equation 2. One such measure is the United States monetary policy news shocks from Nakamura and Steinsson (2018). The other measures are the target and path policy shocks from Gurkaynak et al. (2005). These updated series are taken from Acosta (2023). For each year, the monetary policy shocks used in the regression are equal to the sum of the respective shocks that took place during that year.

Table 4 shows the regression results for equation 2 using these different measures of policy shocks. The results show that these alternative measures of United States monetary policy shocks are also negatively correlated with changes in foreign asset holdings by non-financial MNEs. They indicate that the association between these shocks and changes in foreign assets is not related to the specific identification strategy used by Bu et al. (2021). Rather, such negative correlation also emerges once different estimation methodologies are adopted.

In sum, this analysis finds evidence that a tightening shock in United States monetary policy is associated with a decrease in foreign asset holdings by non-financial MNEs. Such negative correlation is robust with respect to different identification strategies used to determine United States monetary policy shocks.





Table 4

Regression results of the first difference in foreign assets related to MNEs using alternative measures of policy shocks

	1	2	3
BRW - Unified policy shock	-0.923***		
Standard error	(0.256)		
NS - Policy News shock		-1.277**	
Standard error		(0.561)	
GSS - Target shock			-0.910*
Standard error			(0.458)
GSS - Path shock			-0.579**
Standard error			(0.265)
U.S. Financial Conditions Index	-0.420***	-0.427***	-0.458***
Standard error	(0.111)	(0.131)	(0.139)
Real exchange rate	-0.011*	-0.015**	-0.016**
Standard error	(0.006)	(0.006)	(0.006)
Home monetary policy	0.019	-0.001	0.033
Standard error	(0.113)	(0.120)	(0.130)
Country fixed effects	Yes	Yes	Yes
R²	0.23	0.16	0.17
Observations	91	91	91

Source: Author's estimations.

Note: This table shows regression results of first difference in foreign assets related to national non-financial MNEs as a percentage of GDP. Three measures of United States monetary policy shocks are used. The baseline specification uses the unified monetary policy shocks from Bu et al. (2021). Another specification uses the policy news shock from Nakamura and Steinsson (2018). The third specification uses the target and path United States monetary policy shocks from Gürkaynak et al. (2005). The independent variables are (i) a measure of United States monetary policy shock, (ii) the United States National Financial Conditions Index from the Federal Reserve Bank of Chicago, (iii) the United States Effective Federal Funds Rate, (iv) the real exchange rate for the home country from the International Monetary Fund and (v) the monetary policy rate from the home country. For Euro Area countries, the monetary policy rate is the European Central Bank's deposit rate. For Switzerland, the rate is the Swiss overnight average rate. For Sweden, it is the Swedish effective repo rate. For the United Kingdom, the monetary policy rate is the Bank of England's official bank rate. For Denmark, the policy rate is the Danish repo rate. The statistics in brackets are the estimated standard errors. All regressions include country fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

7. Conclusions and policy implications

Consolidated-by-nationality data on foreign holdings can be particularly helpful for policymakers to identify the ultimate exposure that its national economic agents have to several risk factors. This approach also provides a more detailed view of the decision-making units, as affiliates operating abroad are consolidated with their ultimate parent. This study presents novel estimates of consolidated-by-

nationality foreign holdings for non-bank entities. These novel data are combined with existing data sources to produce the first data set containing nationality-based estimates of foreign holdings for a group of developed economies over time. This data set should complement the residence-based data from the seminal external wealth of nations project by Lane and Milesi-Ferretti (2001, 2007 and 2018).

These novel data reveal that these developed economies are on aggregate more financially integrated internationally



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than is shown in the residence-based data. This difference comes from the fact that all positions are taken into account when constructing consolidated-by-nationality data. In contrast, in residence-based statistics only cross-border positions are considered. The country-level data reveal that most – but not all – countries present a larger foreign balance sheet in the consolidated-by-nationality perspective than in the residence-based approach. Countries with a significant presence of SPEs – most notably Ireland – can have a smaller consolidated-by-nationality balance sheet. This result arises because the cross-border holdings related to these foreign entities do not enter the host country's nationality-based balance sheet but do appear in the residence-based one. These stylized facts underscore the importance of taking into account and looking through the complex ownership structures of MNEs when sorting foreign assets and liabilities, as noted in UNCTAD (2016). The data set is used in this study to analyse two international macroeconomic issues: profit shifting and spillovers from United States monetary policy shocks on non-financial MNEs.

For a sample of low-tax countries, the empirical analysis shows a negative correlation between corporate income tax differentials and the difference between their consolidated-by-nationality foreign assets minus their residence-based foreign assets. Meanwhile, a positive coefficient estimate emerges in the same panel regression on a sample of high-tax countries. These two results are consistent with the notion that agents in high-tax countries have an incentive to shift assets and profits to low-tax countries. A policy implication that emerges from such findings is that profit-shifting activities might extend beyond what is captured by residence-based statistics, consistent with the findings of Bénétrix and Sanchez Pacheco (2023) based on United States data.

The second application of these novel data is on the analysis of spillovers of United States monetary policy shocks on foreign asset holdings by non-financial MNEs.

The study finds a negative correlation between tightening shocks and changes in consolidated-by-nationality foreign assets of these companies. A policy implication is that United States monetary policy shocks might generate spillovers that are associated with international investment decisions by non-financial MNEs. This study provides an alternative way for policymakers to analyse the international exposure of countries based on a consolidated-by-nationality approach. Relative to the residence-based data, the main advantages of this approach are that (i) it considers both local and cross-border positions, and (ii) it attributes assets and liabilities to their ultimate counterparts. In doing so, it looks through the corporate structure of MNEs and provides a more nuanced view of international exposures. Therefore, the approach and data presented in this study can help guide policymakers in better assessing the exposure of a particular economy relative to different countries and/or sectors. The study offers two examples of policy-relevant usage of these new data. The first one focuses on the interaction between differences in corporate taxation and profit- or asset-shifting activity. The second one focuses on the international spillovers of United States monetary policy shocks through MNEs.

This study has some important limitations. First, the lack of available and representative data on nationality-based portfolio holdings poses a key challenge in determining the overall size of the consolidated-by-nationality foreign balance sheets. Second, the novel data set is used in the empirical analysis to study the correlation between nationality-based measures of foreign holdings and relevant policy variables such as tax differentials and monetary policy shocks. However, these data are not detailed enough to allow for a study of causal relationships between these variables. Therefore, collecting more granular nationality-based data of foreign holdings remains a relevant challenge for future research and for statistical offices.



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Do minority shareholder protection laws benefit investors? Evidence from a natural experiment on cross-listed firms^{*}

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Abstract

Good corporate governance practices are not universal. Unlike practices in institutional settings in developed countries, which have attracted most scholarly attention, corporate governance practices in emerging economies lean towards addressing principal-principal conflicts that stem from concentrated ownership. The study employs a difference-in-differences panel data design with matched samples of Chinese firms cross-listed in mainland China and Hong Kong (China) and of those listed only in Hong Kong (China) based on propensity score matching. It thus adopts a natural experimental setting – the promulgation of China’s Revised Securities Law in March 2020 – to pinpoint whether and how legal revisions of investor protection laws can really benefit investors. The findings show that independent directors in cross-listed firms turn over significantly more than those in firms listed only in Hong Kong (China). Also, it suggests that firms mainly replace departed directors with new directors from similar demographics. Furthermore, the study observes no evidence of significant changes in board independence in the short run. The findings suggest that policymakers should mind unintended consequences beyond the intended outcomes of the legal reforms on corporate governance, particularly the potential disproportionate impacts on smaller firms.

Keywords : China, corporate governance, cross-listed firms, emerging economy, independent director, legal reforms, principal-principal conflicts

JEL classification codes : G34, G38, K22, K40, P26, P52

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1. Introduction

One core theme of the corporate governance literature is the mechanisms that protect shareholder interests. Adopting the classic agency theory (Eisenhardt, 1989; Fama and Jensen, 1983; Jensen and Meckling, 1976), a plethora of corporate governance studies address the principal–agency conflicts between shareholders and managers. These are highly relevant in the Anglo-American context, where the main purpose of public corporations is to maximize shareholder returns (Krause et al., 2019). In emerging economies characterized by much lower levels of market efficiency and ownership dispersion than in economies where agency theory was first developed (Firth et al., 2016), the most pronounced corporate governance issues are the principal–principal conflicts between controlling shareholders and minority shareholders (Shleifer and Vishny, 1997; Young et al., 2008).

In such institutional settings, the Anglo-American governance approach based on the classic agency theory, which aims to enhance management–shareholder alignment, can be less effective (Chen et al., 2011; Young et al., 2008; van Essen et al., 2012). Research on corporate governance in emerging economies unveils the context-specific nature of good corporate governance practices (Black et al., 2012; Chen et al., 2011) and identifies advancement in formal legislative measures that improve market transparency and legal enforcement as a more pertinent instrument to address prevalent principal–principal conflicts (Millar et al., 2005; Mueller, 2006).

In response to this call, legislators in China carried out a major revision to the Securities Law, with a specific focus on enhancing protection of minority shareholders. The revised law, promulgated in 2020, marks a significant step-up towards better corporate governance, which casts some doubt on the validity of existing governance practices. In particular, the revised law stresses the accountability of the controlling

shareholder of a listed firm and attributes strengthened rights of shareholder representation to independent directors.

Leveraging the natural experimental setting where the legal revision represents an exogenous shock, this study aims to uncover whether legislative efforts towards greater investor protection materialize as intended and how such efforts roll out by influencing the level and quality of board independence. At the intersection of research on regulatory intervention and board independence, the analyses of this study reveal significantly higher turnover of independent directors in cross-listed firms than in control group firms listed only in Hong Kong (China). The contrast may be attributed to both greater accountability of the actual controllers and enhanced de facto responsibility of the independent directors. In terms of board independence, this study finds no evidence of significant changes among the cross-listed firms. The post-revision observation window is limited, yet this finding might indicate firms' reluctance to go an extra mile beyond the minimum requirement of board independence in the revised law in the short term, as the revision is yet to place emphasis on this metric.

Despite the one-country setting, results based on the Chinese sample imply substantial transferability. First, the legal system in China traces its origin to German civil law while borrowing substantially from common law systems, in particular those of the United States and the United Kingdom. This is a common feature among East Asian countries (La Porta et al., 1998). The legal origin of that system matters because the establishment and enforcement of formal institutions are heavily influenced by a country's legal system. In this respect, countries with civil law origin account for about 80 per cent of the 88 countries investigated by Djankov et al. (2008). Second, the two-tier board structure in China, in which the board chair enjoys official empowerment by law, deviates from that in the United States. Indeed, Krause et al. (2019) find that the effects



of the board chair on firm performance in China and Germany is comparable to the effects of the chief executive officer in the United States and the United Kingdom. That is, although the findings might have limited implications for common-law advanced economies such as the United States, they can be generalized to civil-law advanced economies such as Germany, in addition to other emerging economies.

This study makes several contributions. First, it advances agency theory by exploring external governance approaches that address the type II agency problem in the form of principal–principal conflicts between majority and minority shareholders which, despite its pervasiveness in emerging economies (Young et al., 2008), has failed to garner as much scholarly attention as has the type I agency problem between managers and owners. Second, it enriches the corporate governance literature by adopting an international business perspective to question the validity of Anglo-American-developed good practices of corporate governance in a non-Western emerging market context and to shed light on indigenous legislative endeavours that address context-specific governance issues (Black et al., 2012). Specifically, this study sheds light on corporate governance in emerging markets from a legal perspective. The findings bring significant evidence to the literature on the interplay between investor protection and corporate governance from a legal perspective pioneered by La Porta et al. (2000). Third, through an institutions-based lens (Peng et al., 2009), the study informs the debates on whether and how country-level institutions could substitute or complement firm-level governance (e.g. Melis and Rombi, 2021). Using a unique natural experimental setting, this study enables identification of empirical evidence on how country-level institutions affect firm-level corporate governance practices. The empirical findings contribute to bridge the distinctive arguments advanced by the finance literature and the strategy literature (Zattoni et al., 2020). That is, strengthening investor protection could both induce

shareholder-friendly firm-level corporate governance practices and induce symbolic adoption of certain practices, especially in the form of greater independent director accountability (Roberts et al., 2005). Besides the theoretical contributions, this study is also informative for policymaking in emerging markets that are characterized by institutional voids and rapid institutional transitions (Peng et al., 2009) in terms of the causality and effectiveness of major legal revisions.

The remainder of this paper is organized as follows. Section 2 reviews the related literature. Section 3 introduces the research setting and develops two hypotheses. Section 4 describes the data and details the empirical methodology. Section 5 discusses the empirical results. Section 6 offers concluding remarks and draws policy implications.

2. Literature review and institutional background

There is a vast and flourishing literature on corporate governance. In particular, this study is most closely related to two streams. First is the literature on addressing principal–principal conflicts as the major concern in emerging economies. Young et al. (2008) summarize the cause, prevalence and consequences of principal–principal conflicts across emerging economies. They show concentrated ownership is a root cause of such conflicts: over 50 per cent equity ownership is typical in emerging economies, whereas in advanced economies 5 per cent ownership qualifies as a blockholder. Furthermore, listed firms in emerging economies look similar in form but not in substance compared with those in developed economies. That is, the tripod of modern governance mechanisms – shareholders, board of directors, professional managers – is adopted but rarely functions as in advanced economies. Moreover, monitoring costs of a different nature arise, because concentrated ownership is a substitute for poor external governance mechanisms. In addition,



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despite the identified effectiveness of board independence in resolving principal–principal conflicts, there is a lack of enthusiasm and demand for independent directors in emerging markets. Listed firms in such markets rarely appoint any independent directors beyond the minimum threshold in regulatory mandates (Firth et al., 2016). This weak demand for independent directors should not come as a surprise, considering the pervasiveness of agency problems among controlling and minority shareholders (Veltrop et al., 2015) and the assumed duties of independent directors to mitigate such problems. A limited supply of competent independent directors accompanies such lackluster demand. A considerable portion of independent directorships may be decorative board seats – friendly observers rather than diligent monitors (Huyghebaert and Wang, 2012).

The prevalence of principal–principal conflicts in emerging markets and the consequent ineffectiveness of traditional corporate governance mechanisms have inspired scholars to explore alternative governance options. Using a pooled sample of 917 listed firms from 2003 to 2006 in China, Xu et al. (2011) find that regional tax enforcement efforts reduce agency costs between blockholders and minority shareholders, and thus improve a firm’s market performance. Using a natural experiment setting of China’s split-share structure reform, Sun et al. (2017) validate the importance of regulatory intervention in enhancing investor protection and information disclosure.

To further illustrate the prominence of principal–principal conflicts in emerging economies, three noteworthy aspects distinguish emerging economies from their more advanced peers in terms of investor protection: small numbers of controlling shareholders, weak institutions and underdeveloped labour markets for independent directors.

First, formal institutions that protect investors’ property rights tend to be weak, incomplete or missing in emerging economies (Hou and Moore, 2010; Lin and

Chuang, 2011; Young et al., 2008; Zhang et al., 2014). Specifically, a takeover market is absent or inactive, the threat of bankruptcy for defaulting firms is minimal and the financial market is too nascent to regulate supply and demand efficiently (Huyghebaert and Wang, 2012). Furthermore, in these economies law enforcement typically varies substantially from one region to another despite having in place a uniform legal framework (Jiang et al., 2010).

Concentrated ownership structures are adopted by typical publicly listed firms in an emerging economy (Firth et al., 2016). This structure allows the largest shareholder to exercise substantial control by manipulating board composition and managerial incentives (Zhang et al., 2014). The board thus acts as the representative of the controlling shareholders (Firth et al., 2016; Sun et al., 2017) rather than as an effective fiduciary of the firm (Jensen and Meckling, 1976). In such firms, controlling shareholders can easily exploit the wealth of minority shareholders by means of related-party transactions or asset transfers. Berkman et al. (2009) and Zhang et al. (2014) document the collusion between managers and controlling shareholders on such “tunneling”. Using a Chinese sample, the authors find that blockholders with excessive control rights are less likely to advocate performance-based incentives that direct managerial actions towards maximizing shareholder value. In this vein, Huyghebaert and Wang (2012) find that as the share of directors affiliated with the dominant owner of a firm increases, so does the firm’s amount of related-party transactions.

Prevalent state ownership exacerbates the expropriation of minority shareholders in emerging economies (La Porta et al., 1999). A typical manifestation of principal–principal conflicts emerges when States are controlling owners of a firm. In such circumstances States tend to use firms as tools to pursue political and social objectives that divert resources from the goal of maximizing economic value for minority shareholders (He and Rui, 2016). For example, Shan (2013) has identified a positive correlation between



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State ownership and the occurrence of type I tunnelling, which entails outward transfers of firm resources for the benefit of the controlling shareholders (Shleifer and Vishny, 1997).

In sum, minority shareholders are especially at a disadvantage in emerging economies, where ownership concentration, ineffective institutions and pervasive State ownership coexist. That is, traditional “bundles” of corporate governance mechanisms that align ownership with control (Lin and Chuang, 2011) are ineffective in shielding minority investors from managerial opportunism. Worse, these bundles tend to aggravate principal–principal conflicts, which eventually leads to more value extraction by blockholders (Young et al., 2008). Using a sample of 525 listed firms in Taiwan Province of China, Lin and Chuang (2011) find that internal corporate governance mechanisms, such as increasing family ownership and institutional ownership and introducing CEO duality (i.e. making the CEO also the chairman of the board), do not reduce the risk of underpricing in initial public offerings, which harms primarily minority shareholders. In contrast, they find evidence that employing independent outside directors mitigates the extent of such underpricing (Lin and Chuang, 2011). Similarly, Shan (2013) finds that the frequency of board meetings reduces the extent of type I tunneling and that board independence mitigates the expropriation of minority shareholdings.

The second noteworthy aspect is the literature on legal approaches to corporate governance that was pioneered through a series of works by La Porta and coauthors, who demonstrate that the effectiveness of shareholder protection regulations is contingent on a wide range of formal and informal institutional factors. They show how legal origins and rules determine the size of capital markets (La Porta et al., 1997), the effectiveness of investor protection (La Porta et al., 1998), the concentration of ownership (La Porta et al., 1999) and the valuation of firms (La Porta et al., 2002). Furthermore, studies on the impact of the Sarbanes-Oxley Act of 2002 in the United States, passed in

response to a number of major corporate and accounting scandals, show that legal reform can have both intended and unintended consequences. For instance, Arping and Sautner (2013) find that Section 404 of the Act resulted in more accurate and less dispersed earnings forecasts by analysts, which are proxies for improved accounting transparency. However, Linck et al. (2009) demonstrate the costs associated with the mandates on directors' workload and firms' board independence – doubled premiums on director and officer insurance along with significant increases in directors' pay and overall costs. In this vein two streams of literature emerge: the finance literature often suggests that strengthening national institutions (e.g. investor protection) tend to induce shareholder-friendly firm-level corporate governance practices, while the strategy literature tends to argue that most new corporate governance practices outside the United States and the United Kingdom are adopted symbolically to increase a firm's or country's legitimacy (Zattoni et al., 2020). The latter argument indicates that the strengthened institutions might either be symbolic or bring additional monitoring costs without additional benefits (Hermalin and Weisbach, 2012). However, the void of one type of institution might be filled or substituted by others, in a complex interplay between both formal and informal institutions. The finance literature argues for substitution effects between national institutions and corporate governance mechanisms, while the strategy literature promotes complementary effects.

The institutional background related to the appointment and departure of directors is relevant. In mainland China, each elected director must receive shareholder approval through e.g. annual general meetings. Independent directors cannot be dismissed except for unusual circumstances. If their resignations lead to board independence lower than one third, such resignations shall come into effect when their replacements are found. In Hong Kong (China), the Rules and Guidance of the Hong Kong Stock Exchange state that “all directors appointed to fill a



casual vacancy should be subject to election by shareholders at the first general meeting after appointment”.¹ In sum, although the shareholders are entitled to approve or reject the election of a director, the appointment of a director can occur and become effective any time before a shareholder meeting. This procedural practice means that director appointment and departure can take place any time throughout the year.

3. Research setting and hypotheses development

Aware of the principal–principal conflicts facing firms in emerging economies, legislators in China revised the Securities Law with a focus on protecting minority shareholders. Particularly relevant to this study, the revised law enhances the accountability of the actual controller (the individual or entity that has the de facto control rights) of a firm and attributes enhanced rights of shareholder representation to independent directors. Under the revised law, individual investors can file class lawsuits against firms that exploit shareholder rights in the forms of theft, fraud, accounting manipulation and related-party transactions, and independent directors are held accountable. With the revision, independent directors are exposed to greater legal, financial and reputational risks, which is expected to encourage them to act more responsibly in supervising firm operations and strategies. Despite their face value, it is unclear to what extent and under what circumstances the intended benefits of the revised law can materialize. Drawing on insights from studies on the impact of the Sarbanes-Oxley Act, which was passed by the United States Congress in response to a series of high-profile corporate scandals, it appears that legal reform can have both intended outcomes and unintended consequences (Arping and Sautner, 2013; Linck et al., 2009).

An important consideration on the validity of the natural experimental setting is whether the shock can be considered exogenous to the firms rather than endogenous.

This study argues that companies have exerted minimal influence on the legislation processes. The revised law was passed by the legislative body on 28 December 2019 and went into effect on 1 March 2020.² Although the debates surrounding the revision had been ongoing since 2014, the room for policy lobbying in China is generally small (Calomiris et al., 2010). Furthermore, the uncertainty about the finality and implementation of the revision is settled only when it gets officially stamped. Hence the anticipation effect on director turnovers would be minimal for this study. Most important, given the temporal gap between the passage and the enactment of law, directors could simply resign shortly before the enactment of the law if they were concerned about its impact. Most directors would not resign before the passage of a law to escape its potential impact while the law was still under discussion because of the uncertainty about whether and when the law would be passed as well as the content of the new legislation. On these grounds, this study argues that the revision can be taken as an exogenous shock to listed firms in mainland China.

As such, the legal revision provides a unique opportunity to investigate research questions in a natural experiment setting. To exploit this setting to the full extent, this study focuses on the causal effects that the revisions of the law have on firm and director behaviour. Specifically, it employs the difference-in-differences (DiD) methodology, taking as treatment firms those that are cross-listed in mainland China and in Hong Kong (China), and as control firms those that are listed in Hong Kong (China) but not in mainland China. The cross-listed firms are a natural choice in such a setting as they are affected by securities laws in both markets,

¹ Hong Kong Exchanges and Clearing, n.d., Appendix 14 Code on corporate governance practices, paragraph A.4.2 (accessed 10 October 2022).

² Liu X, Lin Q and Sun M, 2020, Xinjiu Zhengquanfa Quanwen Duibi: Xinzeng Liangzhang, Zhe 150 Tiao You Shanghai 新旧证券法全文对比：新增两章，这150条有删改 [Comparing new and old Securities Law], *Pengpai News*, 1 March, www.thepaper.cn/newsDetail_forward_5378169.



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making it possible to control by design any effect attributable to regulations in Hong Kong (China), where the control firms are listed. Notably, such treatment and control groups are available thanks to the fact that the mainland Securities Law applies only to firms listed in mainland China, explicitly excluding firms listed in Hong Kong (China).

The articles of interest for this study in the revised law pertain to the greater accountability of the controlling shareholders and the enhanced rights of independent directors. A brief summary of the legal articles follows.³

Articles 24 and 85: The burden of proof in cases of misconduct resides in the “critical minorities”, including controlling shareholders and actual controllers, the board of directors and other members of the top management team. The inclusion of controlling shareholders and actual controllers marks a critical shift from the previous version of the law, which put the burden of proof on law enforcement.

Article 94 and 78: The critical minorities can be legally pursued when they practice misconduct resulting in investor losses. The statute of limitations expands well over that specified in the Corporation Law, and there is no limitation on shareholding percentage. Combined with Article 78, which specifies the obligation of critical minorities to disclose information, they are thus accountable if any undisclosed information leads to losses for investors. Combined with Article 95, this has a resemblance to class action lawsuits pertaining to stock investments in the United States.

Article 90: Independent directors are explicitly identified as having the right to collect proxy votes from shareholders, allowing them to submit proposals and vote on behalf of shareholders.

These articles are intended to improve corporate governance by explicitly

holding accountable critical minorities, including controlling shareholders and actual controllers, the board of directors and other members of the top management team. Accordingly, two hypotheses were formulated about the effects of the revised law.

Hypothesis 1: Corporate governance of firms improves, as evidenced by greater board independence.

The revised law’s emphasis on holding critical minorities accountable, in particular putting the burden of proof in cases of misconduct on the controlling shareholders, incentivizes strengthened corporate governance practices. The finance literature suggests that strengthening national institutions (e.g. investor protection) tends to induce shareholder-friendly firm-level corporate governance practices; hence this study expects greater board independence under the revised law and a more shareholder-friendly board (Zattoni et al., 2020). However, this effect might not be strong, at least in the short run, as firms are already obligated to have at least one third of the board composed of independent directors. Given the substitution effects between country-level institutions and firm-level governance (Melis and Rombi, 2021), firms might have fewer incentives to pursue voluntary improvements in board independence when such institutions are strengthened. Furthermore, board independence might be hindered by tokenism or form over substance (Young et al., 2008). That is, firms might have hired independent board members who do not have any actual involvement with the firms’ affairs, thereby hampering the effectiveness of independent boards. This study expects such practices to be mitigated under the revised law, which explicitly attributes more rights to the independent directors, leading to the next hypothesis.

³ These are the author’s summaries from the Chinese legal text, focusing on the meanings rather than word-for-word translation. For the full text (in Chinese), see China Securities Investor Protection Fund, 2020, Zhonghua Renmin Gongheguo Zhengquanfa (2019 Nian Xiuding) 中华人民共和国证券法 (2019年修订) [Securities Law of the People’s Republic of China (2019 Revision)], 24 March, www.sipf.com.cn/fifg/2020/03/12865.shtml.



Hypothesis 2: The composition of independent boards in firms shifts towards more involved members, marked by greater turnover in independent board directors.

Those independent board memberships, previously sinecures, should become much less attractive because of the greater responsibility these members bear under the revised law. In particular, a considerable portion of the independent directorships may be decorative board seats – for friendly observers rather than diligent monitors (Huyghebaert and Wang, 2012). Changing environments and external pressures contribute to greater director turnover as they alter the needs of both firms and directors (Cotugno et al., 2020; Banerjee et al., 2020). Moreover, changes in board size and composition matter to investors (Vallelado and García-Olalla, 2021) and relate to firm risks (Feng and Xiao, 2021). These factors combined motivate this study to investigate turnover in independent directors. In particular, one would expect to see greater turnover as a result of nudging effects on the independent board members. Furthermore, one would expect a large part of this greater turnover to be attributed to resignations from such sinecures.

4. Data and methodology

Firm-level fundamentals data come from Thomson Reuters' Worldscope, a director list and turnover report from the Hong Kong Stock Exchange's HKEXnews and director information from firms' annual reports. The study also utilizes data from the China Stock Market and Accounting Research Database (CSMAR). The main sample contains 86 cross-listed firms with annual data from 2017 to 2020 –

that is, three years before and one year after the revised Securities Law went into effect. This study focuses its discussions on a matched sample comprising 172 unique firms (643 observations) and uses a sample of all firms listed in Hong Kong (China) comprising 2,302 unique firms (7,755 observations) as a baseline test.⁴

To obtain the baseline sample of these firms, this study applies the following four procedures. First, to ensure basic comparability only non-small firms with total assets in any year above HK\$100 million are retained as cross-listed firms tend to be large; this restriction removes 2,174 observations.⁵ Second, to ensure both comparability and data quality only firms with a minimum board size of three are retained; this restriction removes 96 observations. Third, to ensure data quality only entries with board independence greater than zero are retained as the Hong Kong Stock Exchange requires a minimum of three independent directors and a board independence threshold of one third of directors being independent; this results in removal of 152 observations.⁶ The final step removed an additional 27 observations because of missing data and irregularities in extreme data: 12 missing values in industry, 11 missing values in return on assets, 1 missing value in financial leverage, 2 from extreme values of total assets and 1 from extreme value of return on assets.

To arrive at the matched sample, this study matches each firm cross-listed on the stock exchanges of both mainland China and Hong Kong (China) in 2017 to a similar firm listed on the Hong Kong Stock Exchange. It then includes all observations available for the matched firms from later periods. Matching variables include firm size

⁴ Included firms may change as this study does not require that all non-cross-listed firms have a sustained presence during the period.

⁵ The Hong Kong Institute of Certified Public Accountants defines "small private company" to be one that does not have total assets of HK\$100 million or more (see www.hkicpa.org.hk/en/Standards-setting/Standards/Our-views/Standards-Interpretations-Guides-and-PN-Members-Handbook/Reference-Materials/references-materials/smefirfre2020, accessed 15 December 2023).

⁶ Actual board independence may fall below one third as even if a firm fulfils the criteria laid out by Hong Kong Stock Exchanges and Clearing (see <https://en-rules.hkex.com.hk/entiresection/238>, accessed 13 January 2024), it may voluntarily report the actual number of independent non-executive directors, with some leeway corresponding to the principle of comply-or-explain.



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measured as total assets in billions of Hong Kong dollars, industry (25 major industry groups from Worldscope) and board size. The first two variables capture important firm characteristics and are commonly used in firm-level matching in the literature. This study employs only board size as the internal governance characteristic – because board independence is an outcome variable of interest – to further ensure institutional comparability within the sample, as firms tend to list on foreign host markets most appropriate for them (Moore et al., 2012). Moreover, although board size might correlate with firm size, it reflects monitoring costs (Boone et al., 2007).

The set of control variables include return on assets, financial leverage (total liabilities over total shareholders' equity), strategic change, and industry and year fixed effects. In particular, the variable strategic change includes resource allocation in six domains in response to organizational decline, according to Crossland et al. (2014) and Wowak et al. (2016). This study includes this measure because director turnover might be closely related to organizational change. More specifically, this variable is constructed by summing the log of absolute changes from the previous year among the following six variables: *Advertising* is the ratio of advertising (proxied by selling, administrative, and general expenses) over sales (net sales or revenue). *R&D* is the ratio of research and development expenses over sales. *Overhead Efficiency* is the ratio of overhead costs to sales. This study uses as overhead costs – ongoing expenditures of running a business that cannot be conveniently traced to any particular cost unit – the sum of selling, general and account expenses; R&D expenses; and interest expenses. *Capital Intensity* is the ratio of net fixed assets to the total number of employees. *Plant and Equipment Newness* is the ratio of net fixed assets to gross fixed assets, where the difference comes from accumulated depreciation and impairment provisions. *Financial Leverage* is the ratio of total liabilities to total shareholder equity.

Furthermore, this study controls for industry and year fixed effects.

To examine the nudging effects of the law regarding sinecures, this study considers both the number and the percentage of independent directors who resigned upon the enactment of the law. This study treats a turnover of an independent director as a resignation in a given year if the following two conditions are satisfied: (a) the director has left the firm, and (b) the director has served in the position for fewer than the maximum six years in the mainland for cross-listed firms or fewer than the maximum nine years in Hong Kong (China) for control firms. The study uses this crude measure because (i) the exact reasons for a director's turnover are rarely disclosed, and (ii) a director's departure may be recorded later than the resignation date if a replacement has not yet been found, as discussed earlier. This study assumes that a director might leave a firm for reasons unrelated to the firm. For instance, a director might take on other commitments or become sick. However, this study relies on the fact that such idiosyncratic departures remain arbitrary across firm and time. Therefore, if a sudden overall significant surge in premature turnovers is identified, this study regards it as resulting from exogenous shocks.

4.1 Summary statistics

Table 1 reports the summary statistics of the main variables across the samples. As discussed earlier, the cross-listed firms are quite different from typical firms listed in the Hong Kong Stock Exchange in that they are much larger in size by total assets, have a larger board and are much older with higher leverage. Finding peers through matching is difficult, as tradeoffs must be made on what to match. The matched peers are farther apart in size (unreported balance test significance below 1 per cent) but closer in board size and board independence (unreported balance test significance at 5 per cent).

Table 2 reports the correlations among the variables employed in the matched sample.



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 **Table 1**
Summary descriptive statistics, 2017–2020

	Observations	Mean	Median	Standard deviation	Minimum	Maximum
All listed firms, Hong Kong (China)						
Total assets (HK\$ billion)	7 755	116.78	2.494	1 140.266	0.100	30 109.436
Board size	7 755	8.103	8	2.436	3	39
Board independence	7 755	0.432	0.429	0.091	0.143	0.923
Return on assets	7 755	-0.026	0.020	0.324	-10.370	7.258
Financial leverage	7 755	2.673	0.761	81.156	-257.749	7 016.468
Strategic change	7 755	-10.688	-10.664	5.365	-32.032	15.678
Cross-listed firms						
Total assets (HK\$ billion)	344	184.162	62.02	366.864	0.158	2 733.190
Board size	344	9.36	9	2.046	4	15
Board independence	344	0.400	0.375	0.078	0.25	0.800
Return on assets	344	0.031	0.031	0.092	-1.300	0.397
Financial leverage	344	1.477	1.369	2.509	-30.44	21.839
Strategic change	344	-13.634	-13.724	6.258	-32.032	11.551
Matched firms by total assets, board size, board independence and industry						
Total assets (HK\$ billion)	299	387.308	19.682	2 446.578	0.298	24 878.288
Board size	299	10.328	9	4.370	6	39
Board independence	299	0.390	0.375	0.072	0.222	0.714
Return on assets	299	0.007	0.031	0.501	-8.097	2.336
Financial leverage	299	1.539	1.208	4.716	-56.445	29.348
Strategic change	299	-12.423	-12.618	5.444	-27.711	2.349

Source: Author's calculations.

 **Table 2**
Correlation matrix of variables

	Total assets (HK\$ billion)	Board size	Board independence	Return on assets	Financial leverage	Strategic change
All firms listed in Hong Kong (China)						
Total assets (HK\$ billion)	1					
Board size	0.19	1				
Board independence	-0.02	-0.55	1			
Return on assets	0.01	0.09	-0.08	1		
Financial leverage	0.01	0.01	-0.01	0.00	1	
Strategic change	0.00	-0.12	0.16	-0.18	0.03	1
Matched sample of cross-listed firms and control firms						
Total assets (HK\$ billion)	1					
Board size	0.10	1				
Board independence	0.02	-0.33	1			
Return on assets	0.00	0.03	-0.02	1		
Financial leverage	0.25	-0.02	0.08	0.00	1	
Strategic change	0.02	0.09	0.02	-0.08	-0.01	1

Source: Author's estimation.

4.2 Difference in differences analysis

To draw causal inferences from the effects of the revised law, this study resorts to the DiD technique. Empirical results using DiD on cross-listed firms against all firms listed in Hong Kong (China) as baseline results are reported first. Then this study focuses on introducing the matching method to match cross-listed firms one to one against their peer listed firms on the Hong Kong Stock Exchange. The rationale to focus on results after matching is that cross-listed firms are generally much larger both in size and market capitalization than an average listed firm, and the comparison should be made with more similar firms. To exploit the natural experimental setting, regression analyses were conducted on the following specifications:

$$\begin{aligned} Outcome_{i,t} = & \delta * 1_{cross-listed} * 1_{after\ 2019} \\ & + \gamma_1 * 1_{cross-listed} + \gamma_2 * 1_{after\ 2019} \\ & + X\beta + \alpha_i + \lambda_t + \epsilon_{i,t}, \end{aligned}$$

where δ is the coefficient of interest, that is, the causal effect of the revised law on the treated firms. $Outcome_{i,t}$ is the outcome variable of interest defined in the working hypotheses. $1_{cross-listed}$ is a dummy variable that indicates whether a firm is cross-listed or not. $1_{after\ 2019}$ is a dummy variable that indicates whether the current year t is after 2019 or not. X is the set of control variables; α_i is the industry fixed effect, λ_t is the year fixed effect and $\epsilon_{i,t}$ is the residual error term. As a panel data set is employed, this study uses double-clustered standard errors, at the firm level and the time dimension, following Petersen (2009).

4.3 Propensity score matching

To arrive at the final sample with treatment and control firms that are as comparable as possible, this study resorts to propensity

score matching, conducted for 2017. Ryan et al. (2018) find that DiD analysis with matching outperforms the standard DiD or interrupted time-series analysis models.

The matching procedure can be broken down into three steps. First, a logistic regression is conducted on the dummy variable of interest – that is, whether a firm is cross-listed or not – using a set of four covariates: total assets, industry, board size and board independence.⁷ This regression sample includes firms with the dummy being both ones or zeros. Second, the coefficients from the first step are deployed to predict, using a logistic function, the likelihoods – the propensity scores – that the firms in the sample will end up having a cross-listing dummy of value 1. Third, using these propensity scores, the nearest neighbours of the firms with a dummy of 0 to those firms with a dummy of 1 are found. That is, the nearest neighbours are the counterpart non-cross-listed firms that have the closest propensity score to that of each cross-listed firm. Employing a one-to-one matching scheme, the study ends up with a final sample of matched pairs with each treatment firm corresponding to a non-treatment or control firm.

In sum, the unique natural experimental setting makes it possible to investigate the causal effects of legal revisions on firm and director behaviour. Such a unique setting is difficult to come across, as one can only await the occurrence of appropriate events. Furthermore, the setting threads through both emerging and advanced markets, which enables myriad intriguing observations and comparisons. The detailed variables included empower this study's inquiry in that various aspects of interest can be studied and at the same time controls for effects established from the extant literature can be included. However, such a setting, like most other natural experiments on cross-listed firms, has the downside of a double-edged sword.

⁷ For hypothesis 1 to include board independence may not be reasonable, as a good matching would make the matched samples similar in this aspect. This study hence uses two guards of robustness: (i) the baseline result without matching serves as a benchmark, and (ii) in unreported results using matching without board independence, the findings are similar on board independence.



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There is an apparent bias towards larger-sized firms and the matched sample is of limited size. In addition, cross-listed firms might contain distinct attributes that limit the generalization of the findings.

5. Results and discussion

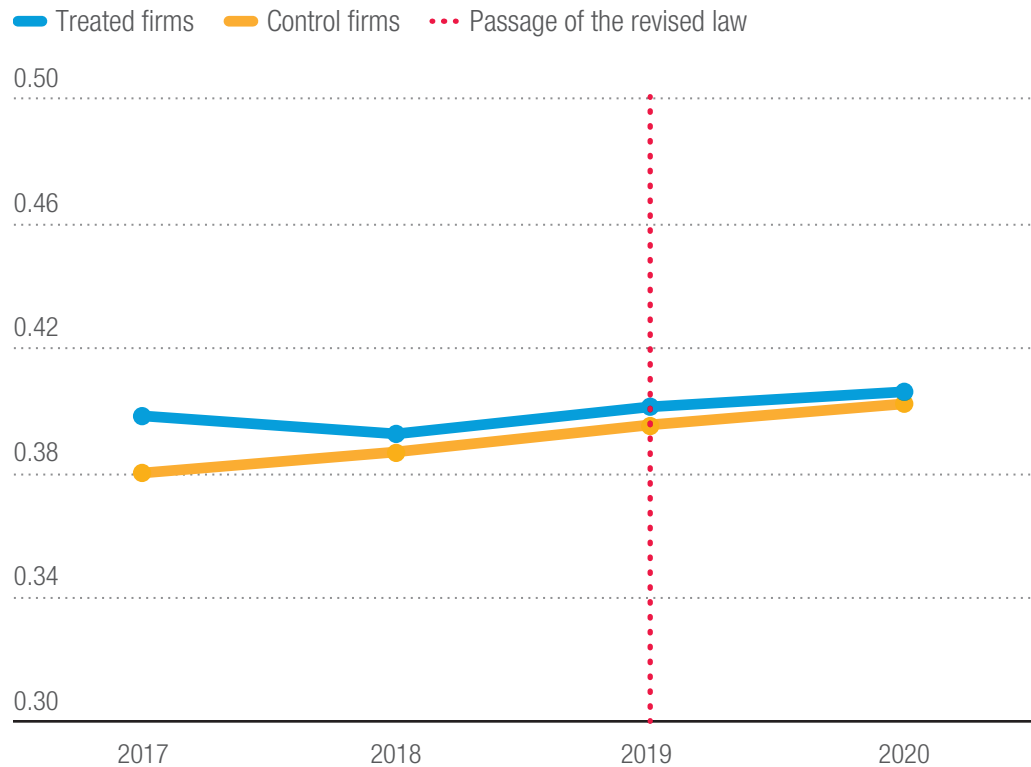
To put the results in context, this study first examines the trends between treatment and control firms by depicting the dependent variables of interest across time and provides market-wide statistics to facilitate economic interpretation of the results. Figures 1 and 2 illustrate the board independence and independent director turnover of the matched sample, respectively. Figure 3 depicts the independent director turnover as a percentage of the total number of independent directors.

From visual inspection, the parallel trend assumption for DiD analysis, which is arguably the most difficult to fulfil, might be violated for independent director turnover. Nonetheless, this study argues

that the trends before the law was revised work in favour of, rather than against, the questions investigated. For director turnover, the treatment group of cross-listed firms underwent a consistent declining trajectory whereas the control group of firms listed in Hong Kong (China) followed a path of modest increase. A counterfactual, without exogenous shocks, would find director turnovers of the treatment group to be lower in 2020 than in the previous year and that of the control group to be slightly higher. Empirically the data show instead a drastic reversal, leading to



Figure 1
Time-series plot of board independence of matched sample firms
(Percentage)



Source: Author's calculations.

Note: This figure plots the annual average of the board independence of cross-listed firms (treatment group) and firms listed in Hong Kong (China) (control group).

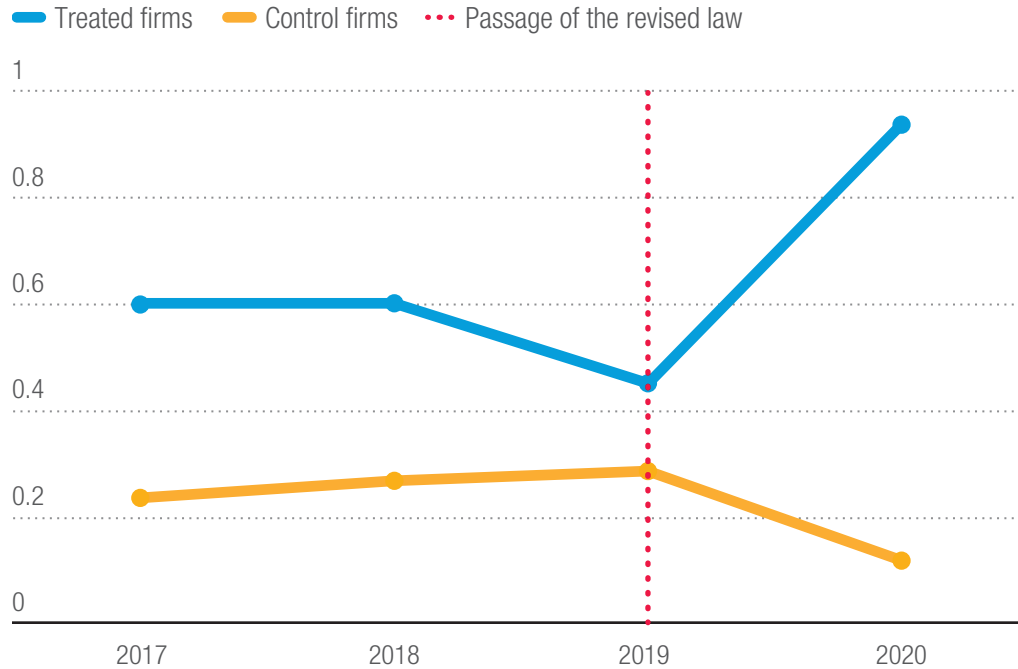




Figure 2

Time-series plot of independent director turnover of matched sample firms

(Average, persons per firm)



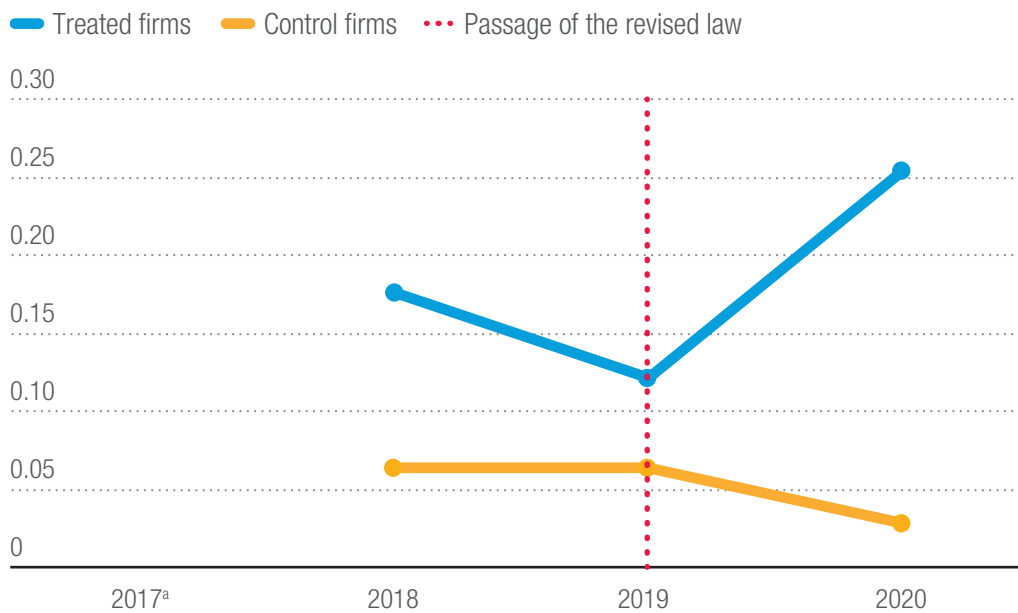
Source: Author's calculations.



Figure 3

Time series plot of percentage of independent director turnover of matched sample firms

(Percentage)



Source: Author's calculations.

^a Percentage not available for 2017 because the data set does not cover 2016.



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significant uptake unseen in the preceding three years for the treatment group, which this study argues may be attributable to the effect of the revision of the law.⁸

Now turning to the results from regression analyses, this study first reports baseline results of cross-listed firms against all firms on the Hong Kong Stock Exchange, because these results are more stable whereas the matched sample has the disadvantage of being subject to changes dependent upon the matching variables chosen. However,

with the considerable benefits of robustness under matching (Ryan et al., 2018) and comparability across treatment and control firms, the study now focuses on results from analysing the matched sample.

Tables 3 and 4 report the baseline DiD empirical results on board independence and independent director turnover, respectively. The following discussions focus on results from the panel regression with both industry and year fixed effects as they represent the more stringent set



Table 3
Difference-in-differences baseline results: board independence

	Board independence		
	OLS		Panel linear
	(1)	(2)	(3)
Cross-lister: year 2020	-0.0068*** (0.0014)	-0.0079*** (0.0008)	-0.002 (0.0081)
Cross-lister dummy	-0.0302*** (0.0062)	0.0014 (0.0057)	
Year 2020 dummy	0.0140*** (0.0003)	0.0080*** (0.0005)	
Total assets (HK\$ billion)		0.0000** (0.0000)	0.0000** (0.0000)
Return on assets		-0.0040 (0.0026)	0.0003 (0.0017)
Board size		-0.0209*** (0.0017)	-0.0243*** (0.0015)
Financial leverage		-0.0000*** (0.0000)	0.0000 (0.0000)
Strategic change		0.0012*** (0.0004)	0.0000 (0.0002)
Constant	0.4320*** (0.0088)	0.6062*** (0.0134)	
Observations	7 755	7 755	7 755
R²	0.0284	0.3333	0.2154
Adjusted R²	0.0262	0.3313	-0.1176

Source: Author's estimations.

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. The regression results compare cross-listed firms against all firms listed in Hong Kong (China) using the difference-in-differences technique. Analysis includes industry and year fixed effects; standard errors are clustered by industry and year.

⁸ Empirically, the violation may result in a bias of the estimate.



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Table 4

Difference-in-differences baseline results: independent director turnover

	Total turnover			Percentage of turnovers		
	OLS		Panel linear	OLS		Panel linear
	(1)	(2)	(3)	(4)	(5)	(6)
Cross-lister: year 2020	0.4113*** (0.0261)	0.4231*** (0.0353)	0.3489** (0.1774)	0.1132*** (0.0109)	0.1171*** (0.0130)	0.0936* (0.0498)
Cross-lister dummy	0.2767*** (0.0349)	0.3098*** (0.0307)		0.0671*** (0.0112)	0.0832*** (0.0113)	
Year 2020 dummy	-0.0910*** (0.0132)	-0.0967*** (0.0185)		-0.0270*** (0.0043)	-0.0307*** (0.0057)	
Total assets (HK\$ billion)		0.0000** (0.0000)	0.0000 -0.0001		0.0000* (0.0000)	0.0000 (0.0000)
Return on assets		-0.1971*** -0.0632	-0.0803** -0.0381		-0.0600*** -0.0189	-0.0253** -0.0119
Board size		0.0061 (0.0092)	-0.0567*** (0.0150)		-0.0026 (0.0020)	-0.0126*** (0.0040)
Financial leverage		0.0000 (0.0000)	-0.0001*** (0.0000)		-0.0000* (0.0000)	-0.0000*** (0.0000)
Strategic change		0.0136*** (0.0041)	0.0011 (0.0032)		0.0039*** (0.0011)	0.0001 (0.0010)
Constant	0.3861*** (0.0274)	0.4651*** (0.0938)		0.1059*** (0.0063)	0.1636*** (0.0244)	
Observations	7 276	7 276	7 276	7 276	7 276	7 276
R²	0.0203	0.0446	0.0093	0.0152	0.0402	0.0069
Adjusted R²	0.0179	0.0416	-0.4269	0.0128	0.0372	-0.4303

Source: Author's estimations.

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. The regression results compare cross-listed firms against all firms listed in Hong Kong (China) using the difference-in-differences technique. Analysis includes industry and year fixed effects; standard errors are clustered by industry and year. The panel linear column reports within estimators equivalent to firm and year fixed effects.

of controls and the results are generally robust across specifications. First, the coefficient of interest measuring effects on board independence is close to zero, suggesting that board independence does not change substantively because of the revision of the law, at least in the short term. Second, the coefficient estimates for total independent director turnovers and percentage of such turnovers per firm are economically and statistically significant.

Tables 5 and 6 report the matched sample DiD empirical results on board independence and independent director

turnover, respectively. The two observations from the baseline results on board independence and independent director turnover hold also in the matched sample. In particular, the 0.48 coefficient estimate on total turnovers suggests that the revision of the law resulted in about a 50 per cent increase in the likelihood of having an independent director turn over. The 0.12 coefficient estimate on percentage of turnovers combined with the average number of independent directors being three helps validate this finding, further ensuring the stationarity of the dependent variable.



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Taking the baseline and matched sample results together, this study does not find strong evidence supporting hypothesis 1; specifically the revised law does not seem to significantly affect board independence. In contrast, this study finds strong empirical evidence in support of hypothesis 2, specifically that the revised law triggered significant turnovers among independent directors. To further investigate whether indeed such turnovers of independent directors are conducive to companies' corporate governance,

which is central to hypothesis 2's claim on more involved board members, the study first discusses the conditions and subsequently examines other empirical data.

The turnover triggered by the increased legal mandate among directors could be beneficial to firms under certain conditions. Hauser (2018) offers causal evidence that focused directors contribute to higher profitability and market-to-book valuations in the focal firms. Firms with directors whose outside appointments are far from headquarters benefit most from directors



Table 5
Difference-in-differences results with matched firms: board independence

	Board independence		
	OLS		Panel linear
	(1)	(2)	(3)
Cross-lister: year 2020	-0.0117** (0.0046)	-0.0123** (0.0048)	0.0064 (0.0099)
Cross-lister dummy	0.0090 (0.0063)	0.0054 (0.0051)	
Year 2020 dummy	0.0176*** (0.0035)	0.0150*** (0.0030)	
Total assets (HK\$ billion)		0.0000 (0.0000)	0.0000 (0.0000)
Return on assets		-0.0029 (0.0104)	-0.0026 (0.0025)
Board size		-0.0070*** (0.0019)	-0.0179*** (0.0043)
Financial leverage		0.0007 (0.0011)	-0.0001 (0.0004)
Strategic change		0.0007 (0.0006)	0.0008 (0.0007)
Constant	0.3855*** (0.0079)	0.4602*** (0.0227)	
Observations	642	642	642
R²	0.1288	0.2204	0.2258
Adjusted R²	0.0920	0.1808	-0.1178

Source: Author's estimations.

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. The regression results compare cross-listed firms against *matched* firms listed in Hong Kong (China) using the difference-in-differences technique. Analysis includes industry and year fixed effects; standard errors are clustered by industry and year. The panel linear column reports within estimators equivalent to firm and year fixed effects.





Table 6

Difference-in-differences results with matched firms: independent director turnover

	Total turnover			Percentage of turnovers		
	OLS		Panel linear	OLS		Panel linear
	(1)	(2)	(3)	(4)	(5)	(6)
Cross-lister: year 2020	0.4681*** (0.1518)	0.4841*** (0.1651)	0.4841*** (0.1589)	0.1246** (0.0534)	0.1228** (0.0579)	0.1228*** (0.0476)
Cross-lister dummy	0.8830 (0.5827)	0.8967 (0.6739)		0.2918 (0.2047)	0.3109 (0.2484)	
Year 2020 dummy	-0.0913 (0.0820)	-0.0684 (0.0954)		0.1650*** (0.0442)	0.1771*** (0.0339)	0.1771*** (0.0584)
Total assets (HK\$ billion)		0.0000 (0.0003)	0.0000 (0.0002)		0.0000 (0.0001)	0.0000 (0.0001)
Return on assets		0.0546 (0.0929)	0.0546** (0.0270)		-0.0035 (0.0127)	-0.0035 (0.0105)
Board size		-2.4351** (1.0569)	-2.4351*** (0.9099)		-0.4248 (0.3202)	-0.4248 (0.2736)
Financial leverage		-0.0273 (0.0226)	-0.0273 (0.0209)		-0.0027 (0.0030)	-0.0027 (0.0026)
Strategic change		-0.0003 (0.0176)	-0.0003 (0.0115)		0.0029 (0.0048)	0.0029 (0.0040)
Constant	0.0309 (0.0608)	0.8122*** (0.3011)		-0.1784*** (0.0518)	-0.0210 (0.0822)	
Observations	643	643	643	471	471	471
R²	0.2643	0.2808	0.0359	0.3161	0.3214	0.0522
Adjusted R²	-0.0114	0.0006	-0.3397	-0.0859	-0.0961	-0.5309

Source: Author's estimations.

Note: * p < 0.10, ** p < 0.05, *** p < 0.01. The regression results compare cross-listed firms against *matched* firms listed in Hong Kong (China) using the difference-in-differences technique. Analysis includes industry- and year-fixed effects; standard errors are clustered by industry and year. The panel linear columns report within estimators equivalent to firm and year fixed effects.

having fewer directorships. Following this vein, Moursli (2019) finds that increased busyness of independent directors lead to decreases in firm value. Extra demand imposed by regulations is met with shortages in the supply of directors in the labour market, hence incumbent independent directors must join multiple boards, thereby increasing their business opportunities at the cost of reduced commitments to any single firm. Furthermore, were a firm to take the opportunity to appoint directors more befitting the new environment,

such increased board turnover might be beneficial to the firm, for instance, if the board education level rises (Cotugno et al., 2020) or more female directors come on board (Boutchkova et al., 2020).

However, such sudden escalated turnover might also open doors to detrimental changes in the firms. Ingratiation of corporate leaders with independent directors and the tendency to appoint deferential individuals as independent directors combine to mitigate the effectiveness of an independent board (Westphal and Zajac, 2013).



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The departure boom that this study uncovers might result in further justification for swiftly appointing replacements who are deferential, thence leading to corrosion of independent board monitoring in the long run (Fracassi and Tate, 2012). From the perspective of resource dependence theory, management is given an opportunity to co-opt by appointing their own representatives to the board in the face of difficulties in finding appropriate candidates. Li et al. (2021) document that independent directors who are appointed due to favouritism reciprocate by pampering the insiders through expropriation and tunnelling. Feng and Xiao (2021) find that higher director turnover rates lead to higher risk, but if new directors differ from their predecessors in terms of demographics and experience, such risks are reduced. In a similar vein, Vallelado and García-Olalla (2021) find that investors react negatively to board changes in banks across the European Union.

As Zattoni et al. (2020) observe, the finance literature often suggests that strengthening investor protection tends to induce shareholder-friendly firm-level corporate governance practices, while the strategy literature tends to argue that most new corporate governance practices outside the United States and the United Kingdom are adopted symbolically to make firms or countries more legitimate. The latter argument indicates that the strengthened institutions might either be symbolic or bring additional monitoring costs without additional benefits (Hermalin and Weisbach, 2012). The findings on unchanged board independence in the face of increased minority shareholder protection thus would seem to favour the argument advanced by the strategy literature. However, combined with greater director turnover – should it meet the conditions to benefit firms – the thesis of the finance literature on strengthened shareholder-friendly corporate governance at the firm level may or may not be supported. Hence here this study provides supplementary analyses to examine whether there is any indication

of changes in the quality of independent directors' involvement in decision-making.

Demographic variables such as age and gender may be proxies for cognitive orientation that in turn affect director behaviour such as decision-making (Cuypers et al., 2022). Table 7 reports the age and gender of independent director replacements before and after the revision of the law for cross-listed firms and their matched peers. Notably, there are significantly more turnovers in the cross-listed firms than in their matched counterparts. For cross-listed firms directly affected by the revision, newly appointed independent directors seem to be slightly younger than before the revision.

In cross-listed firms, pre-revision replacements tend to include more women. This pattern might benefit firms in the long run as gender-diversified boards reduce the attendance problem for male directors and increase the probability of CEO turnover in the face of poor firm performance, and male directors who work with female colleagues also benefit in the same direction outside the focal board (Boutchkova et al., 2020).

Post-revision replacements among cross-listed firms, however, show similar shares of female directors as among the departed directors; this is not the same replacement pattern as before the revision. Among matched firms, however, director replacement patterns remain similar. Combined with the greater turnover shown earlier, the evidence suggests that firms may have opted to fill directorships left empty by sudden increases in unplanned departures rather than aim to refresh the board. Nonetheless, although the demographics examined may indicate a tendency in decision-making (Cuypers et al., 2022), the limitations of demographic proxies are obvious, particularly in terms of how the processes resulting in decisions unfold (Priem et al., 1999).

Another question on the robustness of the results relates to firm size, given



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that previous studies have documented disproportionate macroeconomic effects on small firms (e.g. Beck et al., 2008; Demirgüç-Kunt et al., 2020) and differing growth impacts from similar strategies of small and medium firms such as outward investment (e.g. Santos-Paulino et al., 2023). Given that cross-listed firms tend to be large, the question arises as to whether firms of different size may receive differential effects from the revised law. Table 8 reports the average independent director turnovers of all mainland-listed firms in number and proportion, by firm size as categorized by assets. The data suggest that the effects of the revision on independent director turnovers mainly

manifested among the largest and the smallest firms, while the medium-sized firms in the two middle quartiles saw little impact. Notably, average turnover increased 3 percentage points (or 30 per cent) for the largest firms post-revision compared with the previous three-year average from 2017 to 2019, with a similar increase of 4 percentage points (or 38 per cent) for the smallest firms. However, large and small firms may experience the seemingly similar situation quite differently: large firms typically have more resources to handle the increased turnovers and may draw on their status or reputation to recruit replacements, whereas small firms are more constrained (Beck et al., 2005).



Table 7
Independent directors: incumbents and replacements of matched sample firms, pre- and post-revision

Time indicator	Replacement dummy	Age, average	Gender	Observations	Missing percentage
Cross-listed firms: demographic of independent director					
0	0	58.83	0.06	108	9
0	1	58.10	0.19	148	0
1	0	57.18	0.10	83	21
1	1	55.24	0.09	100	0
Matched firms listed in Hong Kong (China): demographic of independent director					
0	0	57.07	0.10	59	2
0	1	56.92	0.13	89	33
1	0	59.79	0.07	14	0
1	1	61.20	0.07	25	40

Source: Author's estimation.

Note: Gender is 1 for female and 0 for male. Time indicator is 1 for post-revision (in 2020) and 0 for pre-revision (before 2020). The replacement dummy is 1 for directors who are newly appointed to replace departed directors, who are indicated by 0. Missing percentages indicate missing observations for the two demographic variables.





Table 8
Independent directors: turnovers among mainland-listed firms by firm size, pre- and post-revision

Firm size category (Percentage quartile)	Mean turnover, 2020	Mean percentage turnover, 2020	Mean turnover, 2019	Mean percentage turnover, 2019	Mean turnover, 2017–2019	Mean percentage turnover, 2017–2019
Largest (over 75)	0.11	0.03	0.08	0.02	0.08	0.02
Medium (50–75)	0.07	0.02	0.11	0.04	0.10	0.03
Smaller (25–50)	0.11	0.04	0.10	0.03	0.11	0.04
Smallest (below 25)	0.15	0.05	0.08	0.03	0.11	0.04

Source: Author's calculations.

Note: Average turnover before six years of tenure.

6. Concluding remarks and policy implications

Adopting a DiD design with matched samples of Chinese firms cross-listed in mainland China and Hong Kong (China) and of those listed only in Hong Kong based on propensity score matching, the study makes use of a natural experimental setting – the promulgation of China's Revised Securities Law in March 2020 – to pinpoint whether and how legal revisions of investor protection laws can benefit investors. The research question is inspired by the widespread principal–principal conflicts between majority and minority shareholders in emerging markets that result from concentrated ownership manifested as the presence of a small number of high-powered controlling shareholders and weak formal institutions, which are further exacerbated by an underdeveloped labour market of competent independent directors. Considering the limited transferability of good corporate governance principles to non-Anglo-American contexts, this study adopts a legal perspective, in line with the theme studies by La Porta et al. (1997, 1998, 1999, 2000 and 2002), to shed light on the role of country-level legal institutions,

especially the improvement thereof, in shaping firm-level governance practices.

The empirical analyses derive the following findings. First, the study identifies that independent directors in cross-listed firms turn over significantly more often. The increased turnover alone could be both beneficial and detrimental to firms, depending on certain conditions. Second, the newly appointed directors seem to be filler replacements of their predecessors, i.e. they share similar demographics. Such one-for-one replacement may indicate that the turnover was not planned but that firms affected by the revision of the law need to fill directorships left empty due to sudden increases in unplanned departures. With the current observation window, the study finds no evidence of significant changes in board independence in the short run.

This study makes several theoretical contributions. First, it complements the mainstream corporate governance literature by offering insights into the principal–principal conflicts that are prevalent in emerging markets but have received limited scholarly attention so far (Young et al., 2008). Second, it highlights the usefulness of an inside-out contextualization approach in understanding familiar concepts in



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non-Western contexts (Barkema et al., 2015; Tsui, 2007). Instead of testing the transferability or spillover of corporate governance practices informed by agency theory that were developed in response to Anglo-American realities, this study casts light on the effects of legislative revision on the conduct of firm-level corporate governance, which is more specific to the institutional contexts in emerging economies (Millar et al., 2005; Mueller, 2006). Third, it enriches the institutions-based perspective by observing how different levels of institutions offset or complement each other.

Because of the particular focus on legal institutions, this study also has critical implications for policymaking in terms of minority shareholder protection in emerging civil law economies. First, proportionality is a critical principle that policymakers should apply at both the firm level and the director level. The legislation examined in this study aims to bring proportionality in minority shareholder protection, learning from common law systems, for a civil law system. The approach is a laudable one, yet success calls for adaptation to account for institutional differences such as independent directors' incentives. More importantly, while larger firms such as the cross-listed firms in the study may absorb the costs related to the necessary changes and tap into the best talent for director replacements, that may not be the case for smaller firms which may find it too costly to comply with the changes. Likewise, experienced directors may have more leeway in their careers, yet less experienced directors may not adapt well on their own to the enhanced mandates. These are two aspects on which policymakers may need to make appropriate adjustments or interventions.

Second, post-reform evaluation should entail a wider scope to include examination of both intended outcomes and unintended consequences, uncovering the hidden costs. Directions of such investigation can draw lessons from studies on the institutional system modeled; in this case abundant inspiration can be gained from the literature

examining the (unintended consequences of) the Sarbanes-Oxley Act in the United States.

Third, this study thus advocates an adaptive learning approach to legislative reform. As discussed earlier, even when legislators are all well intended, there may be unintended consequences that require deliberate examination, particularly after the fact, so as to (i) guide and shape the public's interpretation and perception of the reform, and (ii) introduce adequate policy measures to cater for potential adjustments.

Several limitations of this study may restrict generalization from the findings and thus require future research. First, to understand the causal effects the focus of this study is cross-listed firms, which tend to be large firms with more resources. Although smaller firms are also subject to the same forces from the legal reform, they may experience it rather differently given their more limited resources. One direction for future research may consider whether and how different types of firms respond to the legal reforms, e.g. by size, industry and profitability. Second, to examine the causal effects of the legal reform on director departure this study restricted its attention to the short run; future research may also consider longer-term effects but may need to deal with other confounders. One venue for future research to examine whether independent directors become more involved after the revision of the law may investigate directors' voting behaviour. Third, this study considers only a small set of demographic variables among directors owing to limited data availability in other aspects and the small sample of turnovers.



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Arguments for implementing formulary apportionment in the European Union^{*}

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Abstract

Using recently published country-by-country reporting data released by the United States Internal Revenue Service, we assess United States multinationals' activity in the single market, aiming to contribute with data-based evidence to the ongoing political debate about the potential changes in the European corporate tax system. Our findings show evidence of artificial profit shifting across member States under the current method to allocate profits of multinational enterprises, with the Netherlands, Luxembourg and Ireland appearing to be the countries showing a higher degree of complicity with these activities. Such actions challenge fair international taxation in the European Union, distorting European internal competition and hampering tax revenue collection. Although it may not be (yet) the time for a worldwide unitary taxation approach, the analysis highlights the urgency for the European Union to adopt a formulary apportionment approach, overhauling a century-old set of global tax rules based on the separate entity approach.

Keywords : country-by-country reporting, European Union, formulary apportionment, tax havens, United States multinationals enterprises

JEL classification codes : D22, F23, F60, H25, H26

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1. Introduction

This study adds to the growing research on the activity of multinational enterprises (MNEs) in the European single market (Garcia-Bernardo et al., 2021 and 2022). Starting from the empirical evidence that United States MNEs shift twice as much profit as European MNEs and that European Union higher-tax countries lose twice as much profit as the United States (Tørsløv et al., 2022), we perform a risk assessment analysis to address potential aggressive tax avoidance schemes employed by large United States MNEs in the European Union.

We take advantage of recently published country-by-country reporting (CbCR) data released by the United States Internal Revenue Service (IRS) to perform an empirical assessment of United States MNEs' activity within the European Union by building an overall picture of the level of risks related to base erosion and profit shifting posed by these MNEs in an aggregate manner. For that, we explore three tax risks indicators: ownership, profitability and effective tax rates (ETRs). Based on these data, we conclude that United States MNEs have been taking advantage of differences in the member States' tax systems and relying on European tax havens to carry out their activity in a tax-friendly environment, which may have a distorting effect on internal competition in the single market. Of the commonly identified tax havens in the European Union, the Netherlands and Luxembourg (and, to a lesser extent, Ireland) are the countries that attract large amounts of profits and foreign direct investment (FDI), while applying low ETRs and registering modest real economic activity (measured either by sales, employment or assets).

With this analysis, we aim to contribute to the policy debate regarding a reform of the European corporate tax system on the basis of MNEs' activity. The analysis helps to have a better perception of the profit-shifting activities that are currently occurring within the European single market. This highlights the urgency for the European Union to promote a comprehensive tax

policy reform that is capable of better dealing with artificial profit shifting.

The current international transfer pricing regime, based on the separate entity approach, is no longer adequate to reflect MNEs' worldwide presence and activity, as it fails to deliver an effective and transparent taxation system capable of aligning taxation and economic substance (IMF, 2019). The scale of MNEs' activity, the increasing degree of globalization and economic integration, the growing prevalence of hard-to-value intangible assets, the fragmentation of production and supply chains and the emergence of new ways of business guided by the trade of unique goods and services outpaces the local tax authorities' capability to effectively enforce the transfer pricing rules, failing to protect countries from MNEs' tax abuse and aggressive tax planning schemes.

This lack of resilience and suitability of the separate entity approach to deal with tax avoidance and profit-shifting activities has led to numerous reform initiatives in the last decade, such as the Base Erosion and Profit Shifting (BEPS) Action Plan of the G20 and the Organisation for Economic Co-operation and Development (OECD) as well as the most recent tax agenda for business taxation in the 21st century of the European Commission, the Business in Europe: Framework for Income Taxation (BEFIT) initiative (European Commission, 2023). Altogether, these initiatives highlight the inadequacy of the current international regulatory model based on transfer pricing standards to prevent profit shifting. But when assessed in detail, two distinctive courses of action can be identified.

The first one is pursued by the G20/OECD. It acknowledges that the separate entity approach is outdated in its current form and needs to be overhauled (or enhanced) within its context – what the BEPS 1.0 and 2.0 initiatives have been trying to do. Nonetheless, concerns have been arising that the initiatives resulting from the BEPS Project have not been sufficiently effective to fulfil its principles of establishing



coherence among international tax rules, realigning substance with taxation rights and improving transparency (Piantavigna, 2017; Picciotto and Bertossa, 2019).

The other course of action has been pursued by the European Commission over the last two decades and acknowledges that the separate entity approach is no longer adequate to reflect MNEs' worldwide activity, especially within the single market, by not granting each jurisdiction its fair share of tax. These shortcomings led the Commission to propose a new method for allocating MNEs' profits across the European Union member States – the unitary taxation approach with formulary apportionment,¹ under the BEFIT initiative.

This alternative corporate tax system has been gaining supporters, and, as the literature strongly suggests, it is the most robust approach better suited to tackle tax avoidance and artificial profit shifting via transfer pricing (Avi-Yonah and Tinhaga, 2017; IMF, 2019; Keen and Konrad, 2013; Rixen, 2011). Under formulary apportionment, intercompany prices do not need to be established, so this approach would result in a simpler, fairer and more rational international tax system than the current one, cutting off MNEs' tax incentives to artificially shift profits from higher- to lower-tax jurisdictions while enhancing transparency and easing compliance costs for taxpayers and tax authorities.

The continuous delay in effectively reforming corporate tax rules has left the European Union exposed to global tax abuse by MNEs. In fact, the European Union appears to be the region most affected by profit shifting, with higher-tax member States

losing about 20 per cent of their domestic profit (Tørslov et al., 2022). This amounts to \$216 billion, reaching 1.5 per cent of gross domestic product (GDP), which is twice as much the amount that the United States loses (0.8 per cent of GDP). Looking at the total amount of global profits shifted to tax havens (\$616 billion), Ireland appears as the number one destination, with \$106 billion in shifted profits. The Netherlands and Luxembourg come next, with \$57 billion and \$47 billion respectively.

The BEFIT initiative is being designed to be a reform consistent with the OECD two-pillar solutions (European Commission, 2023). Pillar 1 involves a partial reallocation of taxing rights to market jurisdictions (using formulary apportionment), while also aiming to simplify the current separate entity approach for certain activities. Its details are still being discussed at the international level. Pillar 2 has already been endorsed by European Union member States, which unanimously adopted a directive on ensuring a global minimum ETR of 15 per cent for MNEs.

While reducing some current distortions, the formulary apportionment approach could result in new tax-induced economic distortions (e.g. in corporate ownership or in the location of the apportionment factors), as it does not eliminate the risk of tax competition, considering that some of the factors used for apportionment are mobile.² This hazard of a potential increase in tax competition over the location of factors is, however, mitigated with the introduction of the minimum ETR under Pillar 2, particularly important to create a floor on international tax competition and hinder the “race to the bottom” (Liotti et al., 2022).

¹ Under unitary taxation with formulary apportionment, legally separated but economically integrated companies are treated and recognized as a single group for tax purposes. It is through a multifactor allocation formula – based on apportionment factors that should reflect the true economic contribution of each entity – that MNEs' global taxable income is assigned as tax base between the different jurisdictions.

We only give the reader insight into the two most discussed and applied approaches to guiding the international transfer pricing regime (the separate entity approach and the unitary taxation approach). For a more comprehensive analysis and more alternatives for the international tax architecture (e.g. minimum tax schemes, residual profit allocation, allocation of taxing rights to destination-based countries), please see IMF (2019).

² The formulary apportionment approach can lead to a potential increase in international tax competition because member States would no longer be able to use the tax base to attract investment, which would have to be performed through tax rates – thus increasing competitive pressure on the statutory tax rate (the remaining variable policy in a harmonized corporate tax system).



Finally, it is worth mentioning that the current United Nations negotiations to establish a tax convention capable of leading the reform of the international tax system can help to create momentum for the European Union to strengthen in its tax agenda the clear call for tax reform and to further increase public support for government action to curb tax avoidance.

The remainder of the study is as follows: In section 2 we describe the methodology and data source used to assess how United States MNEs are challenging a fair international taxation in the European Union under the current separate entity regime. In sections 3 to 5 we perform the assessment based on three tax risk indicators: ownership, profitability and ETRs. In section 6 we present the main conclusions.

2. Assessing United States MNEs' activity in the single market

The current international taxation system is becoming increasingly unsuitable for dealing with artificial profit shifting, given the high levels of globalization and hard-to-value intangible assets. Both the BEPS 1.0 and 2.0 initiatives have been steps in the right direction but may prove insufficient to address these issues. Hence, policymakers, academics, international institutions and tax experts have been advocating for a true tax reform, moving away from the separate entity approach to a formulary apportionment approach (Avi-Yonah and Tinhaga, 2017; IMF, 2019; Keen and Konrad, 2013; Rixen, 2011). Under this approach, MNEs would be taxed on their global consolidated profits, with taxing rights allocated between jurisdictions according to an agreed formula that would ensure that each country receives its fair share of tax revenue.

Although replacing the separate entity approach may seem a wide-ranging dismantling of the current transfer pricing regime, tax experts (e.g. Avi-Yonah and Tinhaga (2017) and Picciotto and Bertossa

(2019)) argue that formulary apportionment could be, indeed, compatible with the bilateral network of double taxation treaties, suggesting that the main obstacles to the introduction of formulary apportionment are not legal, but rather political.

Implementing a form of formulary apportionment in the European Union would represent a reform towards greater alignment of economic value creation and taxation, reducing opportunities for MNEs to avoid taxes. The European Union leveraging its market power through stricter unilateral source-country taxation measures could thus have far-reaching tax consequences.

Although the European single market is a very competitive and important market for MNEs all over the world, we focus our attention on the activities only of United States MNEs. In addition to data availability, this decision stems from several reasons.

First, the European Union and the United States have the largest bilateral trade and investment relationship (UNCTAD, 2022). They are each other's biggest trading partner in services and biggest source of FDI.

Second, large technology MNEs from the United States are among the main beneficiaries of tax rulings granted by European Union tax havens (UNCTAD, 2022; United States, Department of the Treasury, 2016).

Third, although MNEs from all countries shift profits, it is predominately United States MNEs that shift profits from higher-tax countries in the European Union (Clausing, 2020; Tørsløv et al., 2022). For United States MNEs, tax-motivated profit shifting remains an important concern after the Tax Cuts and Job Act (TCJA), with a number of United States MNEs generating large profits in the single market but paying little or no tax in the European Union, relying on aggressive tax planning schemes, national mismatches and legal loopholes (Clausing, 2020; Garcia-Bernardo et al., 2022).

The United States tax law applies some tightening measures against profit shifting



targeted at MNEs with activities in tax havens, namely through controlled foreign corporation rules, the global intangible low-taxed income measure and a tax applied to certain cross-border transactions between foreign related parties and their United States subsidiaries (under the Base Erosion and Anti-Abuse Tax). Yet, these measures do not prevent artificial profit shifting between overseas subsidiaries, from higher- to lower-tax countries, leading the European Union to lose twice as much profit (relative to GDP) as the United States, because United States MNEs shift twice as much profit (relative to the size of their earnings) as European Union MNEs (Tørsløv et al., 2022). These activities highly distort the European internal market, resulting in unfair competition between European Union member States.

To understand how the behaviour of United States MNEs may affect the single market's functioning, it is important to evaluate their corporate activities, disaggregated by member State, to infer the possible distortion of competition between them. The goal is to assess if United States MNEs have a more intense relationship with European Union tax havens without corresponding economic activity, which suggests an artificial presence. Definitions of tax havens differ,³ and some degree of judgement is involved in compiling any list of tax havens. Menkhoff and Miethe (2019) provide a summary of the classifications used in six publications; by combining the criteria provided by these sources, we assume as a potential tax haven any country that is labelled

accordingly in any of those lists. Of the current 27 member States, 7 satisfy this criterion: Austria, Belgium, Cyprus, Ireland, Luxembourg, Malta and the Netherlands.

A risk assessment analysis of potential aggressive tax avoidance schemes employed by large United States MNEs in the European Union can be performed based on aggregate CbCR data made available by the IRS on its Statistics of Income Tax Stats webpage.⁴ Latest available data refer to returns filed for tax year 2020, reporting data such as the number of filers, revenues, profit, income taxes, earnings, number of employees and tangible assets. The database used in our exercise refers to the period between 2018 and 2020 – allowing us to capture data for three years after the reform and to provide a clear picture of the dynamic of United States MNEs' activity after the TCJA – to stabilize the ratios calculated and conclusions inferred.

These data provide complete coverage of the global distribution of profits and other indicators of economic activity for United States MNEs, aggregated at the country level. They also present an advantage over micro data at the company level (e.g. Orbis), because it has a better coverage of companies in lower-tax jurisdictions (especially tax havens), which is relevant for our analysis (Santomartino et al., 2022). Tørsløv et al. (2022) estimate that Orbis shows an average of only about 17 per cent of global profits, highly underrepresenting tax havens. Moreover, it includes all variables of interest for the analysis (profits, assets,

³ According to Dharmapala and Hines Jr. (2009), tax havens tend to be small, affluent and well-governed countries. They are also characterized for having very low tax rates (usually with ETRs below 10 per cent) and other tax attributes designed to appeal to foreign investors.

⁴ Aggregate CbCR data seeks to enhance transparency for national tax authorities by providing them with information to conduct transfer pricing risk assessments. The information reported by MNEs concerns to *aggregate* data, with separate information on each constituent entity in a jurisdiction being combined with no adjustment for transactions between constituent entities in the same MNE, as opposed to *consolidated* data, that treats the constituent entities of an MNE in a particular jurisdiction as a single economic entity. Data are based on CbCR made available annually by the IRS, specifically from Form 8975 – Country-by-Country Report and Form 8975 Schedule A – Tax Jurisdiction and Constituent Entity Information, available at www.irs.gov/statistics/soi-tax-stats-country-by-country-report (accessed 12 June 2023). Forms 8975 are required to be filed by certain United States ultimate parent entities of United States MNE groups with annual revenue of \$850 million or more. No specific information about a particular MNE can be inferred from the published data.



employees and revenues), and it is currently the only systematic source on the taxes effectively paid by MNEs.

OECD (2017) lists a number of potential tax risk indicators that can be derived from the information contained in an MNE's individual CbCR. With due adaptations, that information can also be used to build an overall picture of the level of BEPS-related risks posed by United States MNEs in an aggregate manner, mainly by exploring the following three tax risk indicators: ownership, profitability and ETR.

3. Ownership: the footprint of United States MNEs in particular jurisdictions

Analysing the patterns of ownership of United States MNEs in the European Union is a starting point for understanding if the activities of these MNEs within the European Union may be distorting the internal single market. Profits arising in any United States subsidiary go back to the ultimate parent entity as a dividend, which may trigger withholding taxes that have different treatment across European Union member States, incentivizing United States MNEs to structure their European activities in a particular way. But profits can also be shifted between different parts of an MNE (and, consequently, between different jurisdictions) using other forms of income (e.g. interest and royalties). In this case, profit-shifting opportunities can arise without a specific ownership structure. A more general analysis of the location of United States MNEs is useful to identify clusters of countries in which subsidiaries of these MNEs tend to be located.

According to information filed by United States MNEs with an annual revenue in excess of \$850 million – those subject to the proposed scope of the formulary apportionment tax reform – in each of fiscal years 2018 to 2020, there were on average 55,463 constituent entities resident in Europe ultimately owned by a United

States parent entity with a total of 1,416 United States MNE groups operating in the same region. Figure 1 shows how United States MNEs are spread across the European Union. The Netherlands, Germany and France are the member States with the largest numbers of reporting groups (974, 958 and 823, respectively).

It is expected, of course, that larger economies appear more frequently, since greater economic activity takes place in those countries. Thus we were already expecting to see significant numbers of MNE groups and subsidiaries in Germany, France, Italy and Spain – the member States with the largest numbers of reporting groups after the Netherlands. But, relative to their size, some other countries do appear to be more prevalent than expected (figure 1).

The undoubted preference for the Netherlands – by far the largest host of European Union subsidiaries of United States companies (6,067 in the reporting period) – may be explained for non-tax reasons. Nevertheless, considering the relative size of its economy, the disproportional use of this country seems likely to be related to its relatively favourable tax treatment. On average, each United States MNE reporting group present in the Netherlands has more than six subsidiaries operating within Dutch borders (with an average of three subsidiaries per MNE in the remaining member States). Luxembourg also features relatively heavily as a location for United States companies, followed, to a lesser extent, by Ireland and Belgium. The identification of this cluster of countries points to a degree of tax planning in determining location decisions, as these are among the European Union tax havens identified previously.

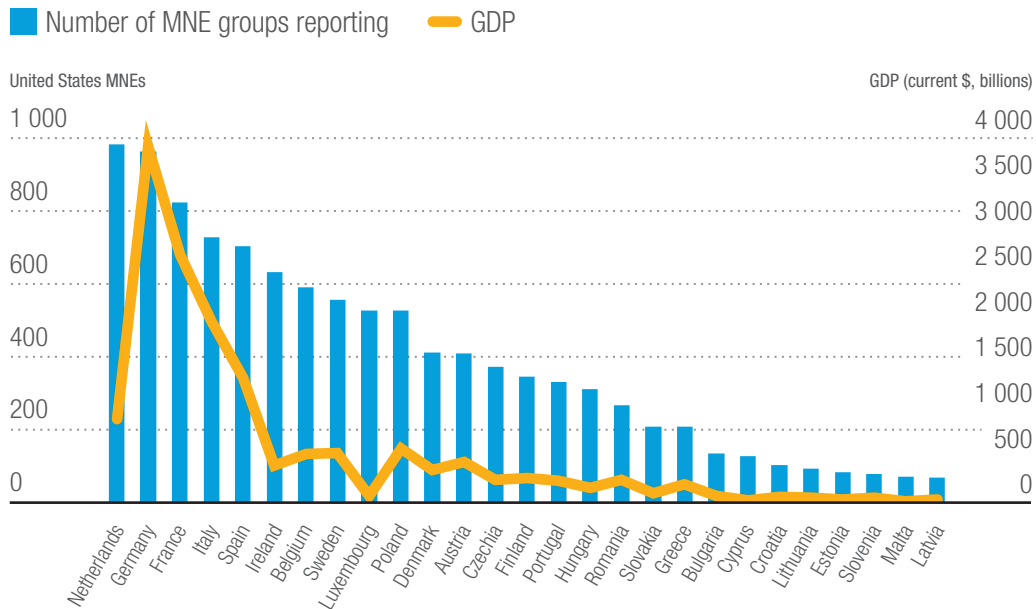
The decision to establish subsidiaries in these member States may be associated with the perceived idea that tax havens provide low tax rates (Dharmapala and Hines Jr., 2009; Keen and Konrad, 2013). If MNEs can shift profits to their subsidiaries in these (assumed to be) lower-tax





Figure 1

Number of reporting United States MNE groups in the European Union and country GDP, 2018–2020



Source: IRS Statistics of Income Division (www.irs.gov/statistics/soi-tax-stats-country-by-country-report), table 1A, Country-by-country report (Form 9875) for the number of MNE groups reporting; and UNCTAD Data Centre (https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en, accessed 17 March 2023) for GDP.

jurisdictions by underpricing sales to them and/or overpricing purchases from them, they can reduce their overall tax burden.

But tax competition and tax planning opportunities also take place through instruments other than the statutory tax rates, such as research and development (R&D) tax subsidies, patent box regimes and generous tax exemptions. Hence, in addition to the number of United States MNEs’ subsidiaries spread across the European Union, it is useful to assess the possible unequal predominance of specific sectors in specific jurisdictions. Table 1 shows the breakdown of the European Union subsidiaries of United States MNEs by member State and main business activity, allowing us to identify two important facts.

The first interesting fact is that United States MNEs concentrate their holdings mainly in the Netherlands and Luxembourg, which account for 38 per cent and 20 per cent of the total number of subsidiaries in the

European Union with “holding shares or other equity instruments” as their main business activity. This predominance could have been explained by the fact that these two member States serve as the residence of a larger absolute number of United States MNEs’ subsidiaries, as already stated. But, when looking at the relative weight that these subsidiaries represent in the total constituent entities resident in the corresponding jurisdictions, that possible justification collapses. The weight and importance that holding companies have in the Netherlands and Luxembourg are unrivalled, representing 56 per cent and 44 per cent (respectively) of all subsidiaries operating in these countries in other business activities. Malta also appears with a prominent position, with 31 per cent. This poses a higher risk of BEPS due to the high mobility of this activity: holding companies – legal entities with no or minimum substance and no real economic activities – are relatively easy to shift to



Table 1
Number of United States entities resident in the European Union by main business activity, 2018–2020

Tax jurisdiction	Number of entities	Main business activity								All other business activities
		Purchasing or procurement	Manufacturing or production	Sales, marketing or distribution	Administrative, management or support services	Provision of services to unrelated parties	Regulated financial services	Holding shares or other equity instruments	Dormant	
Austria	801	29	65	426	113	161	12	109	42	158
Belgium	1 472	85	209	699	304	296	26	114	85	336
Czechia	671	30	139	343	125	128	5	18	35	136
Denmark	917	25	91	449	115	181	20	154	47	208
Finland	575	18	69	334	86	116	18	28	29	129
France	3 717	138	799	1 706	517	605	66	524	204	874
Germany	5 029	232	981	1 868	922	850	111	863	365	1 352
Greece	314	9	23	164	47	79	9	7	31	49
Hungary	566	23	91	251	118	102	9	40	44	121
Ireland	2 385	87	185	529	303	447	159	365	321	768
Italy	1 969	84	396	1 014	279	374	58	143	108	458
Lithuania	141	6	10	54	40	25	7	5	14	34
Luxembourg	2 575	17	30	97	133	175	145	1 433	115	943
Malta	210	5	7	26	12	28	5	65	18	71
Netherlands	6 067	184	417	1 347	637	692	99	2 672	445	1 366
Poland	1 168	53	226	511	228	212	33	33	61	245
Portugal	629	13	54	347	88	132	12	33	36	78
Romania	428	25	75	189	104	96	6	8	26	97
Spain	2 014	50	274	903	293	406	72	221	148	410
Sweden	1 418	40	137	650	191	257	34	222	113	300

Source: IRS Statistics of Income Division (www.irs.gov/statistics/soi-tax-stats-country-by-country-report), table 1D, Country-by-country report (Form 9875).

Note: Data on Bulgaria, Croatia, Cyprus, Estonia, Latvia, Slovakia and Slovenia are missing because of the small number of forms on which they are based, in order to guarantee confidentiality. Tax jurisdiction detail exceeds the total number of entities because some of them may have more than one associated main activity business.

a different jurisdiction in order to benefit from a more favourable tax regime. Doing so entails simply relocating the corporate tax residence to a more business-friendly environment while continuing operations in the original location. For MNEs operating in higher-tax jurisdictions, establishing holding companies in tax-preferential jurisdictions has been a popular strategy to minimize the global tax burden, with legitimate tax advantages available in doing so. A concentration of holding companies can thus be evidence of certain tax planning structures. Holding companies established in the Netherlands and Luxembourg have access to extensive treaty networks and European Union Directives that exempt them from withholding taxes within the European Union while, simultaneously, benefiting from tax treatments that also exempt withholding taxes on outbound payments. These member States have been also particularly prone to granting access to reduced rates under tax rulings (Directorate-General for Competition, European Commission, 2016).

Other than through the manipulation of transfer prices, MNEs frequently shift profits across jurisdictions using channels such as financing structures (e.g. intragroup loans, internal debt shifting or cash-pooling schemes) and the location of valuable intangible assets (intellectual property (IP), such as trademarks or patents) (Dharmapala and Riedel, 2013; Mooij and Liu, 2018). Here lies the second interesting fact. OECD (2017), the handbook on CbCR, lists the reporting requirements that countries should follow and makes available a template on which the information by main business activity should be based. When comparing the template with the data made available under the United States CbCR, disaggregated information regarding the specific business activities of “research and development”, “holding or managing intellectual property” and “internal group finance” is missing and no justification is mentioned in the data files or in the

IRS’s disclaimer about data sources and limitations. We should not expect the reason to be confidentiality concerns, given the large number of reports filed and the fact that, of the 47 jurisdictions in the public OECD CbCR database with information by business activity,⁵ the United States is the only country that does not disclose this information in a disaggregated manner. Instead, it presents all the categories missing as “all other business activities”.

This aggregation of the statistics is a significant limitation, as it masks the effects of outliers and does not detail information that would be useful for the analysis of BEPS activities. Tax-deductible interest payments are one of the strategies that MNEs can apply to reduce tax liabilities in a particular jurisdiction. In the European Union, if a subsidiary in a higher-tax country pays interest to another group subsidiary in a lower-tax country, then the tax charge of the MNE will be lower, reflecting the difference in tax rates and tax systems in the two member States. Countries hosting a higher number of MNE subsidiaries engaged in “internal group finance” could, therefore, present a higher risk of BEPS.

MNEs can argue that their IP is owned by entities headquartered in tax havens, to which companies that sell their products in other (higher-tax) populous markets must pay royalties. Royalties accrue to the affiliate that holds the IP of the group in the tax haven (which probably offers a preferential regime for income derived from IP – the patent box regimes), enabling United States MNEs to exploit the mismatch resulting from inconsistencies in rules between member States. Determining the economic ownership of IP among the subsidiaries of an MNE can be challenging. IP ownership should be registered at the location where the asset was created, but the creation of IP assets is quite often funded by subsidiaries elsewhere in the group, through cost-sharing agreements. This makes it difficult to pinpoint which entity should maintain

⁵ The OECD releases aggregated and anonymized information on the global tax and economic activities of MNE groups headquartered in 47 jurisdictions (OECD Corporate Tax Statistics, table I – Aggregate totals by jurisdiction, accessed 12 June 2023). The latest year for which data are available is 2018.



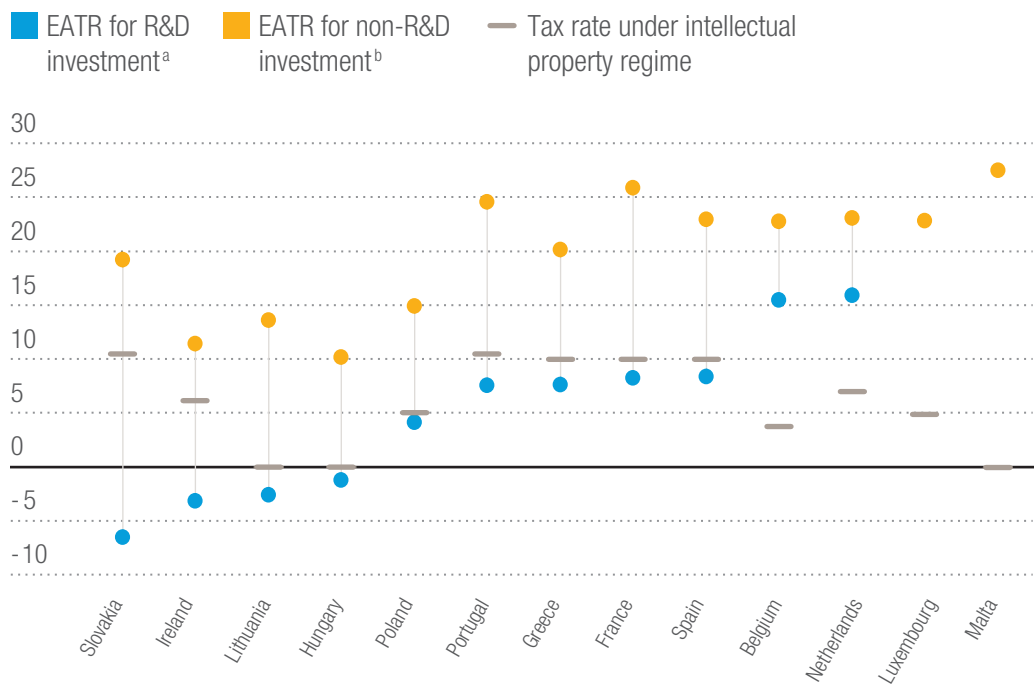
the legal ownership. Moreover, even if the question of initial ownership is solved, MNEs have a lot of leeway to change the ownership of an IP asset to lower-tax countries at a price that is not arm's length. This happens because, from an economic point of view, the transfer of all risks, rewards and rights deriving from IP ownership is not straightforward, as intangible assets are usually unique to the MNE and market prices for these transactions are not easy to establish. Hence, by shifting the ownership of intangible assets to subsidiaries in lower-tax jurisdictions or with favourable IP regimes, MNE groups can also lower their overall tax burden.

Currently 13 member States offer favourable IP regimes – already reviewed by the OECD and considered as non-harmful – that allow income from the exploitation of IP to be taxed at a lower rate than the statutory tax rate (figure 2). As some features of the preferential IP regimes can facilitate BEPS activities and, therefore, unfairly affect the tax base of other jurisdictions, the OECD applies a nexus approach, which requires a link between the income benefiting from the IP regime and the extent to which the MNE has undertaken the underlying R&D that generated the IP asset in the country of that IP regime. To assess the fulfilment of that requirement, more



Figure 2

Effective average tax rate for R&D investment in the European Union, 2021
(Percentage)



Source: OECD Corporate Tax Statistics, Effective tax rates for R&D (https://stats.oecd.org/Index.aspx?DataSetCode=CTS_CIT, accessed 22 April 2023) for EATRa for R&D and non-R&D investment and tax rates under IP regime; and Intellectual property regimes (https://qdd.oecd.org/subject.aspx?Subject=IP_regimes, accessed 21 April 2023) for the list of tax jurisdictions with an intellectual property regime.

Note: Only IP regimes reviewed by the OECD's Forum on Harmful Tax Practices were considered. The difference between the two EATRs provides an estimate of the preferential tax treatment for R&D investments in the member State, which measures by how much R&D tax incentives reduce the taxation of R&D investments that earn an economic profit.

^a Expenditure-based R&D tax incentives. It should be interpreted as an upper bound of the generosity and incentives provided by the tax system for the location of profitable R&D investments.

^b Comparable investment that does not benefit from expenditure-based R&D tax incentives.



than being able to identify the location of the entities with the “holding or managing IP” activities, it would be useful to know whether ownership of the IP is separated within the group and in a different jurisdiction than where the MNE’s activities gave rise to the IP (as “research and development”). If so, a greater number of IP registrations in certain countries can point to a possible use of this channel to engage in BEPS activities, because in order to access the preferential patent box regimes, the MNE should have substantial R&D activity effectively and actually carried out in the same jurisdiction. This is particularly important for Hungary, Lithuania, Ireland and Slovakia, which have the smallest – and negative – effective average tax rates (EATRs) for R&D investment.

As already stated, the disaggregated information needed to perform that assessment is not available, making it challenging to assess the true intention behind IP ownership transfers. However, from the OECD’s CbCR data we can calculate the average weight that “all other business activities” represent in the number of total entities per member States with the United States as a partner jurisdiction and with the information by main business activity disaggregated according to the OECD’s template. On average, other entities do not represent more than 9 per cent of the total companies. In the IRS CbCR data, the countries that deviate most positively from this ratio (used as a very loose proxy) are Luxembourg, Malta and Ireland, where other entities represent more than one third of all entities engaged in other business activities. These countries are, thus, the ones with an assumed higher relative percentage of entities engaging in intragroup activities, being better positioned to take advantage of the commonly used channels of profit shifting (finance structures and IP management). In these countries, MNEs can more easily relocate their activities and artificially rearrange intragroup payments to shift profits from higher- to lower-tax countries without actually relocating much of their real economic activity.

4. Profitability: the (dis)connection between profits and economic activity

Before the TCJA took effect in 2018, United States MNEs booked a disproportionate share of their worldwide foreign profits – profits booked outside of their headquarters country – in lower-tax locations (Clausing, 2020; Tørsløv et al., 2022). From figure 3, it is possible to assert that the situation has not changed since then. Considering individual tax jurisdictions, the top five countries in which large United States MNEs allocate profits – Switzerland (13 per cent), the United Kingdom (11 per cent), Singapore (10 per cent), Bermuda (9 per cent) and Cayman Islands (7 per cent) – are often identified in the literature as tax havens. Considering the European Union as a whole, the preference for allocating profits in the single market is clearly visible, as it captures almost one quarter of all foreign profits of United States MNEs. However, the individual contribution of each member State to the European Union’s global preponderance is quite disproportionate: almost three quarters of those profits were allocated solely in three countries – the Netherlands, Ireland and Germany. As Germany represents the largest European Union economy, the allocation to it of 7.9 per cent of United States MNEs’ European Union-wide profits is not surprising. The same, however, cannot be said for the Netherlands (35.7 per cent) and Ireland (30.7 per cent), the fifth and the tenth largest European Union economies, respectively. In fact, these countries alone rank fourth and sixth in United States MNEs’ preferred destinations for allocating foreign profits. Accumulated earnings are even more disproportionately reported, with the Netherlands and Luxembourg accounting for more than 75 per cent of the European Union total.

One of the first indicators that an MNE may be involved in BEPS-related activities is having earnings that are disproportionate and misaligned with their level of economic activity. At the aggregate level, this

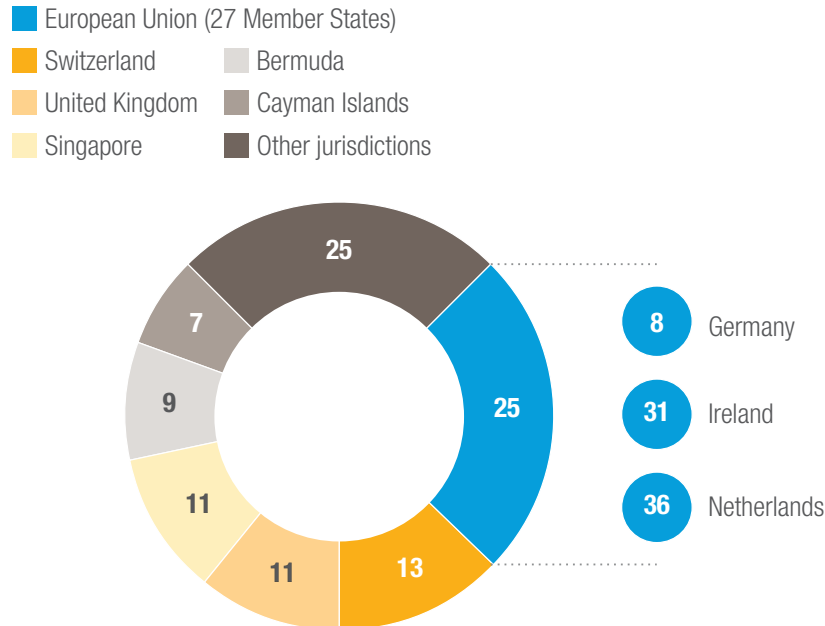




Figure 3

Foreign profit allocation of United States MNEs, 2018–2020

(Percentage)



Source: IRS Statistics of Income Division (www.irs.gov/statistics/soi-tax-stats-country-by-country-report), table 1A, Country-by-country report (Form 8975).

Note: Excludes foreign profits allocated to stateless entities and foreign-controlled domestic corporations. All computations are based on the subsample of profit-making jurisdictions of the data set, which excludes two reporting countries (Denmark and Malta). Numbers do not sum due to rounding.

requires assessing whether there are jurisdictions with significant profits but little substantial activity or jurisdictions with significant activities but low levels of profit. Both can indicate potential profit shifting and, thus, a tax risk. Table 2 show the allocation of United States MNEs’ profits across the European Union, employees and tangible assets in the 10 member States with higher profits.

The high concentration of foreign profits contrasts with the dispersion of employees and tangible assets. Despite evidence that MNEs shift the location of real economic activity in response to tax-rate differences among jurisdictions (Keen and Konrad, 2013), a substantial share of United States MNEs’ real activity remains in higher-tax countries, mostly large economies (Germany, Spain and France, mainly). This suggests that United States MNEs have

been able to reduce their tax liability by artificially shifting ownership and profits to lower-tax jurisdictions, where little real economic activity occurs – whether measured by employment, sales or investments in plant and equipment. They keep developing their profit-generating activities (e.g. manufacturing or production; sales, marketing or distribution; provision of services to unrelated parties; regulated financial services) in higher-tax countries while booking the corresponding profits in lower-tax countries. This is particularly visible in the case of the Netherlands, where there is evidence of limited real activity in comparison with the profits allocated therein. The share of tangible assets and employees located in tax havens – i.e. the *real* economic activity carried out there – is disproportionately low, compared to the profits reported there.



Table 2
Allocation of United States MNEs' profits, employment and tangible assets across the European Union, 2018–2020

Tax jurisdiction	Profit before tax (\$ thousands)	Share of European Union profits (%)		Number of employees	Share of European Union employees (%)		Tangible assets (\$ thousands)	Share of European Union tangible assets (%)		Rank
		Rank	Rank		Rank	Rank				
European Union, total	162 790 143			2 622 358			561 920 310			
Netherlands	58 049 229	36	1	172 004	7	6	70 541 902	13		4
Ireland	49 948 153	31	2	162 354	6	7	105 628 971	19		1
Germany	12 894 813	8	3	588 223	22	1	76 424 826	14		3
Belgium	7 336 670	5	4	107 792	4	8	45 516 060	8		6
Spain	5 322 033	3	5	198 443	8	5	23 067 176	4		8
France	4 857 193	3	6	374 373	14	2	50 606 661	9		5
Luxembourg	4 759 181	3	7	14 169	1	19	98 958 856	18		2
Italy	4 115 619	3	8	203 691	8	4	27 817 476	5		7
Sweden	3 497 474	2	9	62 268	2	12	8 693 218	2		10
Hungary	2 958 951	2	10	70 310	3	11	4 760 488	1		14

Source: IRS Statistics of Income Division (www.irs.gov/statistics/soi-tax-stats-country-by-country-report), table 1A, Country-by-country report (Form 9975).

Note: All computations are based on the subsample of profit-making jurisdictions of the data set, which excludes two reporting countries (Denmark and Malta).

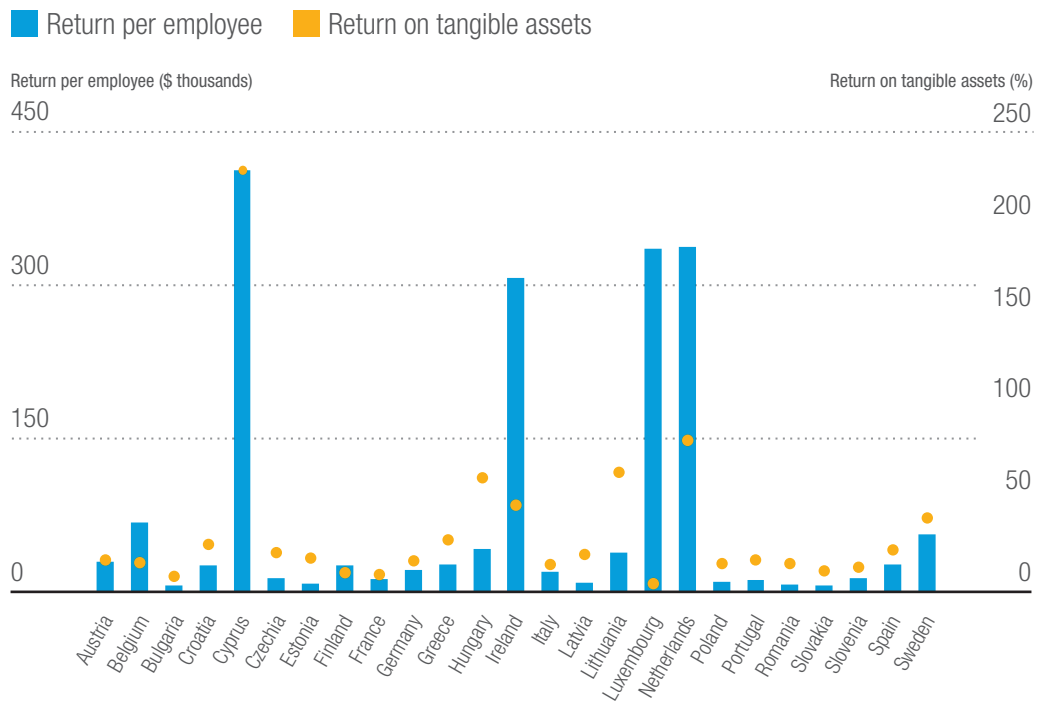
To further assess the role that European Union tax havens play in United States MNEs' global activities, we computed two common profitability measures, namely the average ratio of pre-tax profits to tangible assets ("return on tangible assets") and to the number of employees ("return per employee") in different countries for the period under analysis. The profitability measures are computed by dividing the aggregate profits reported by all European Union subsidiaries of United States MNEs by the aggregate amount of tangible assets and the number of employees, in each country. The results are presented in figure 4.

Subsidiaries located in tax havens are, on average, far more profitable than subsidiaries located elsewhere. In these countries, the average return to tangible assets is roughly 66 per cent, which is more than twice the return for subsidiaries located in

other jurisdictions. Differences in returns on tangible assets within the tax havens countries are almost imperceptible, except for two clear outliers: Cyprus (229 per cent) and the Netherlands (85 per cent). Returns per employee – which can provide a representation of productivity, though not a complete measure – show an even larger difference: tax havens are jointly, on average, 12 times more profitable than the other countries. The average profit per employee in tax havens is \$249,000. Within this group, the countries that stand out above average are, in decreasing order, Cyprus (\$412,000), the Netherlands (\$337,000), Luxembourg (\$336,000) and Ireland (\$308,000). In this case, a worker from Cyprus is assumed to be almost 20 times more productive than, for instance, a German worker – a clear sign of misalignment of profits with economic activity.



Figure 4
Profitability measures of United States MNEs in the European Union, 2018–2020



Source: IRS Statistics of Income Division (www.irs.gov/statistics/soi-tax-stats-country-by-country-report), table 1A, Country-by-country report (Form 9875).

Note: All computations are based on the subsample of profit-making jurisdictions of the data set, which excludes two reporting countries (Denmark and Malta).



Finally, when assessing United States MNEs' profits, an additional aggregate measure is worth evaluating, respecting related-party revenues (i.e. revenues derived from companies within the MNE group). If earnings are largely derived from related-party revenues (in absolute terms or as a proportion of total revenues), that poses an additional risk, as it can indicate that profit is being shifted from other entities of the MNE (probably located in higher-tax jurisdictions) through inadequate transfer prices – one of the main channels through which MNEs shift profits.⁶ Only in six countries do revenues generated from related parties account for more than 50 per cent of the total amount of revenues: Cyprus (78 per cent), Luxembourg (70 per cent), Lithuania (66 per cent), Belgium (65 per cent), the Netherlands (64 per cent) and Ireland (56 per cent). Excluding Lithuania, all the remaining countries have been identified as potential European Union tax havens. This suggests that subsidiaries located in tax havens are particularly important for the provision of goods or services to affiliated companies, generating more than 50 per cent of their revenues through related-party transactions. This finding, combined with the higher profitability shown in some tax havens, may indicate a strategic location of revenues, aiming to shift profits to lower-tax jurisdictions.

5. Effective tax rate: comparing the ability to minimize taxes

The analysis performed so far represents an attempt to infer the extent to which United States MNEs engage in tax planning activities when they operate and undertake

investment in the European Union. The question is whether United States MNEs actually succeed in shifting profits and pay relatively low rates of tax on their activities, providing them a competitive advantage relative to European companies.

The statutory tax rate is just one of the several legal components of corporate taxation that determine the tax liability of MNEs, as the tax burden also depends strongly on the definition of taxable profits. These may differ from profits before tax as a result of capital and equity allowances, tax deductible interest payments, special tax regimes (e.g. R&D incentives or patent box regimes), special agreements between tax authorities and individual MNEs (tax rulings), and tax losses carry-forward rules. Hence, to truly assess the tax burden of MNEs, we need to calculate their ETR. Very low ETRs may serve as an indirect measure of profit shifting or an indicator of a tax haven. With the information included in the IRS CbCR data set, we cannot calculate the ETR for specific subsidiaries or for the corporate group as a whole, but we can assess it at a country level for the aggregated United States MNEs within scope.

To assess the tax liability, we consider “profit and loss before income tax”, a direct measure of taxable profit. The average ETR per country is then proxied by the ETR of the United States MNEs' affiliates resident in that country, computed as foreign income taxes paid relative to pre-tax profit.⁷ Note that these figures represent taxes paid only in the European Union – they do not include any further taxes paid in the United States or in any other country by the MNE groups considered. As in the remainder of the analysis, ETRs are

⁶ Empirical evidence suggests that the most common mechanism MNEs use to shift profits (about 70 per cent of them) is through strategic distortion of transfer prices on intragroup trade (Heckemeyer and Overesch, 2013).

⁷ The “income tax paid” represents the actual amount of cash paid in taxes by the MNEs in a particular financial reporting year. However, it is not necessarily directly related to the profit before tax reported in that same financial reporting year, as it considers payments of tax with respect to profits earned in earlier periods, advanced payments made in the current year and withholding tax incurred on payments. As for the “income tax accrued”, it is more related to the amount of profit before tax reported in a specific period, but it does not represent the true tax burden borne by the MNEs. There are a number of valid reasons why the figures for these two variables may differ for a particular fiscal year. It might be an indicator of possible tax risk only if the level of tax paid in a jurisdiction is materially lower than the level of tax accrued and/or if this difference persists over time. Nonetheless, if we were to consider the income tax accrued, it would not alter the results.



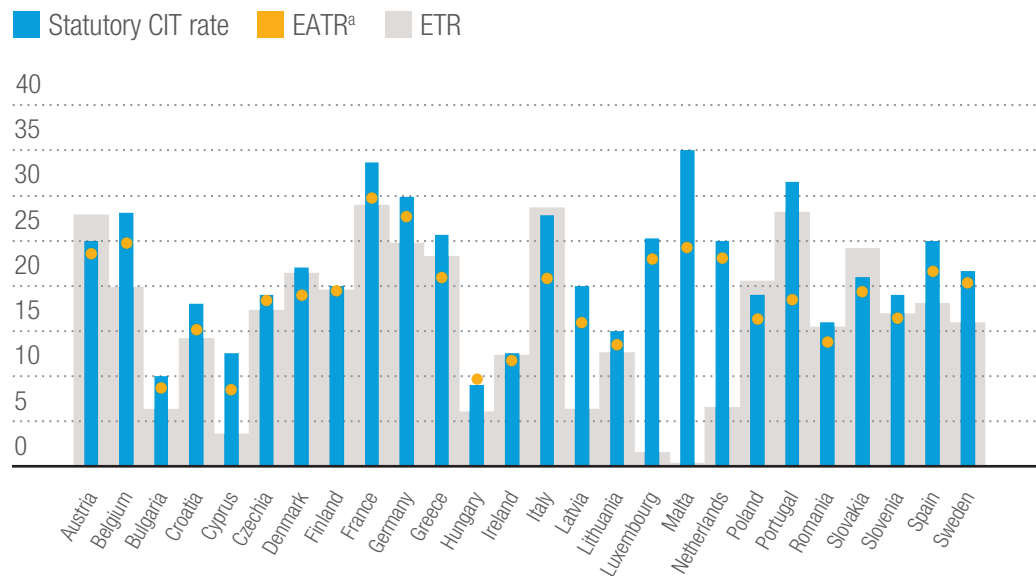
calculated on a country-by-country basis and averaged over the three available years (2018 to 2020). Also, as taxes are mostly paid only by profitable companies, only entities with positive profits and tax payments were considered when computing the ETR. Results are shown in figure 5.

This analysis – based on aggregate data concerning only large companies, obliged to participate in CbCR – seems to confirm that large companies have the ability to exploit their greater resources to reduce the tax burden and engage in more sophisticated tax planning strategies, enabling them to benefit from lower ETRs. This is especially true not only in the member States recording an exceptionally lower ETR, but also when a significant difference is observed between the headline tax rate and the ETR.

The differences in the taxation of corporate profits can partially explain some of the cross-country differences in profitability identified earlier, as some of the most profitable member States (measured in return per employee and return on tangible assets) are also the ones with low ETRs. Seven member States present an ETR below 10 per cent: Bulgaria, Cyprus, Hungary, Latvia, Luxembourg, Malta and the Netherlands. The first four already have low statutory CIT rates, which helps to explain the resulting lower ETRs. This leaves three prominent cases: Luxembourg (1.6 per cent), Malta (0.4 per cent) and the Netherlands (6.6 per cent). In addition to having low ETRs, these countries have some of the highest statutory CIT rates, well above the European Union average



Figure 5
Effective tax rates of United States MNEs in the European Union, 2018–2020
 (Percentage)



Source: IRS Statistics of Income Division (www.irs.gov/statistics/soi-tax-stats-country-by-country-report), table 1B, Country-by-country report (Form 9975) for ETR; OECD Tax Database, table II.1 (https://stats.oecd.org/Index.aspx?DataSetCode=CTS_CIT, accessed 17 March 2023) for statutory CIT rate; and OECD Corporate Tax Statistics, Effective tax rates (https://stats.oecd.org/Index.aspx?DataSetCode=CTS_CIT, accessed 17 March 2023) for EATR.

Note: All computations are based on the subsample of profit-making entities of the data set. Data on Estonia are missing (probably to ensure confidentiality given the small number of forms on which the information is based).

^a The EATR reflects the average tax contribution a firm makes on an investment project earning above-zero economic profits. It is constructed as a weighted average across finance- and asset-specific EATRs, under a country-specific interest and inflation rates scenario.



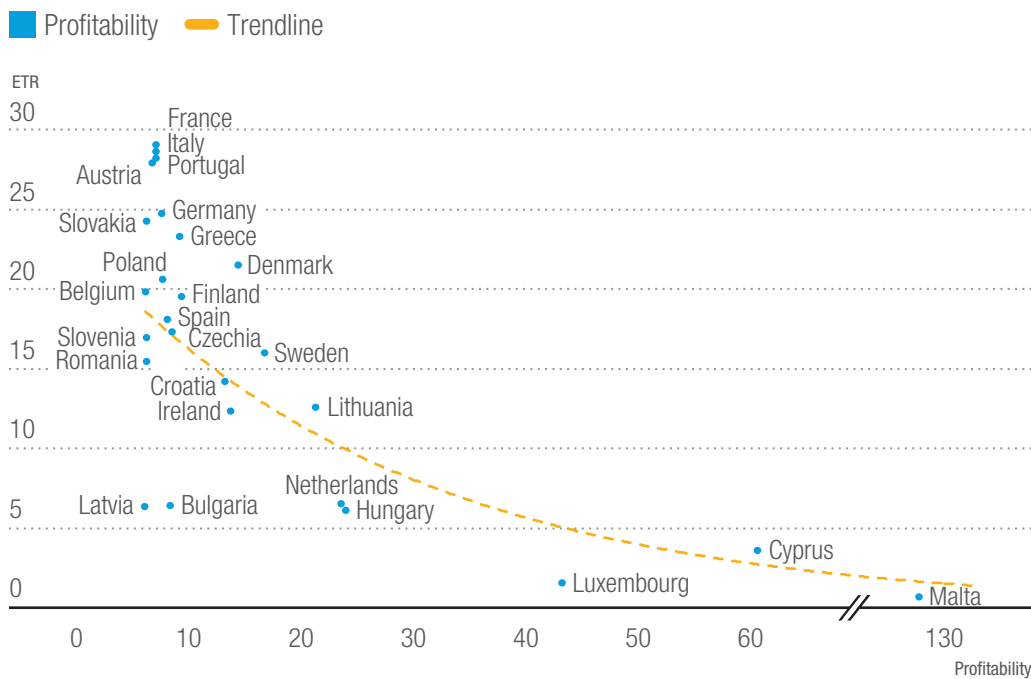
(21.8 per cent), hence having the highest percentage point differences between the two rates. They are also the top three countries where there is a greater difference with the country-specific EATR estimated by the OECD, which reflects the average tax contribution that all companies (not only those from the United States) make on an investment project that earns profits. As this also happens on average across the European Union, it highlights the fact that United States MNEs do have, on average, lower values of consolidated ETR in the European Union, demonstrating that they are able to reduce their European Union-wide taxable profit rather than simply shifting it between European Union countries.

In addition to the fact that jurisdictions with significant profits and or/ accumulated earnings usually have a low level of tax accrued, the literature typically finds a

negative correlation between tax rates and profitability, with companies in relatively lower-tax jurisdictions being more profitable than companies in higher-tax jurisdictions (Garcia-Bernardo et al., 2021; Keen and Konrad, 2013). Based on a profit-to-revenues ratio, figure 6 supports this growing view, especially in Cyprus, Hungary, Luxembourg, Malta and the Netherlands, which have profitability ratios above 20 per cent while applying ETRs below 10 per cent. As sales are measured on the basis of where they originate (instead of their final destination), sales from subsidiaries in lower-tax jurisdictions increases their profitability compared with that of other subsidiaries located in higher-tax countries. It is then not surprising that lower-tax jurisdictions have higher ratios of revenues (especially related-party revenues) than their level of employment or assets would suggest.



Figure 6
Profitability of United States MNEs in the European Union by ETR, 2018–2020
 (Percentage)



Source: IRS Statistics of Income Division (www.irs.gov/statistics/soi-tax-stats-country-by-country-report), table 1B, Country-by-country report (Form 9975).

Note: All computations are based on the subsample of profit-making entities of the data set. Data on Estonia are missing (probably to ensure confidentiality given the small number of forms on which the information is based).



Finally, evidence from United States MNEs suggests that lower tax rates indeed offer powerful incentives to inbound foreign investment and tax avoidance activities, sustaining the extensive literature on FDI tax sensitivity (Bolwijn et al., 2018; Keen and Konrad, 2013). Countries are eager to attract foreign capital and the economic benefits that accompany them, and, for that, some rely on low tax rates or other tax attributes designed to appeal to foreign investors. From 2018 to 2020, about 88 per cent of United States FDI stock in the European Union was located in merely three countries: the Netherlands (43 per cent), Luxembourg (33 per cent) and Ireland (12 per cent), incidentally countries with lower ETRs or aggressive IP tax regimes and large shares of United States MNEs' foreign profits booked.⁸ These high shares reflect the investment that is held in investment funds and holding companies in these countries. The level of FDI directed to these countries represents more than half of their economic weight, with Luxembourg being the most prominent case – net FDI inward from the United States represents more than 800 per cent of its GDP. This strongly indicates the use of aggressive tax practices to attract investments and income (acting as offshore investment hubs).

6. Conclusion and policy considerations

In performing the tax risk analysis, we ought to recognize that most of the inferences reached can be explained by non-related BEPS reasons. However, when taking in consideration all of the tax risk indicators addressed, it is hard not to attribute at least a part of United States MNE activity to tax avoidance practices.

United States CbCR data allow us to assess profit-shifting activities of United

States MNEs, providing a clear indication that their activity in the European Union is distorting the single market. United States MNEs have been exploiting the differences in the 27 member States' tax systems and relying on European tax havens to carry out their activity under a tax-friendly environment. Not only is income earned locally taxed at favourable rates, but tax havens also facilitate the avoidance of taxes that might otherwise have to be paid to other member States.

Of the seven European Union tax havens commonly identified in the literature, the Netherlands and Luxembourg (and Ireland, to a lesser extent) appear to be the ones with a higher level of United States MNEs' BEPS activity, highlighting the fact that better-governed countries – measured by political stability, government effectiveness, rule of law and the control of corruption – can be attractive offshoring locations (Dharmapala and Hines Jr., 2009). They are the countries that attract large amounts of FDI and profits from United States MNEs, while applying low ETRs and showing little real economic activity (measured by sales, employment or assets).

The analysis performed also shows evidence that United States MNEs have more subsidiaries in these tax-friendly countries than would be expected by the size of their economies. Subsidiaries in European Union tax havens are much more profitable than those in non-tax haven countries, which can be explained by the disproportionate large share of profits reported in tax havens and the small fraction of economic activity (tangible assets and employees). Of the global profits reported in the European Union, 36 per cent rests in the Netherlands and 31 per cent in Ireland. Offshore centres such as these have higher levels of tax avoidance activities either because of low taxes on

⁸ FDI stock data were retrieved from Eurostat, EU direct investment positions by country, ultimate and immediate counterpart and economic activity (BPM6), available at https://ec.europa.eu/eurostat/databrowser/view/BOP_FDI6_POS__custom_6040063/default/table (accessed 8 March 2023). Data on Austria, Cyprus, Malta and Sweden are not available because of confidentiality concerns and hence was not accounted for. It would be interesting, however, to know the percentage of FDI from United States MNEs in Malta, given the high incidence of holding companies in this country.



corporate profits or exemptions from taxation certain types of payments received by a company from its foreign subsidiaries.

Finally, these tax havens are also used as gateways through which United States MNEs channel profits out of the single market (Hakelberg, 2016). They have been identified in recent literature on profit shifting as a way for United States MNEs to shift their profits to non-European Union offshore centres, serving as conduit tax havens that facilitate profit shifting to non-European Union havens, such as the Bermudas (Tørsløv et al., 2022), by using the differences of tax systems within the single market and distorting intra-European Union competition.

The analysis suggests then that additional policy efforts must be put in place – especially in the European Union – to further reduce profit shifting by MNEs. Extending the practice of addressing tax havens outside the bloc to offshore financial centres inside the bloc would be a first step. The European Union must hold European countries up to the same level of scrutiny as non-European countries as regards harmful tax practices or favourable aggressive tax-planning practices.

This evidence concerning MNEs' profit-shifting activities supports the European Commission's most recent tax agenda for business taxation in the 21st century, the BEFIT initiative (European Commission, 2023). If carefully designed, this initiative can help to fulfil the three principles that the BEPS Project has been trying to achieve: establish coherence of corporate tax rules, realign substance with taxation rights and increase tax transparency.

Continued delay in implementing a formulary apportionment approach in the European Union will continue to allow aggressive tax planning behaviour. The European Union, a large financial and consumer market that accounts for an important fraction of United States MNEs' global sales, should be able to translate market size into political power and impose tax

avoidance measures without risking the United States presence in the single market.

Implementing a new corporate tax system implies reassessing the trade-off between tax autonomy and fiscal neutrality. The question is how much tax autonomy can be allowed without interfering with the European Union's goals of free trade and competition.



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Special economic zones and entrepreneurship: A new path forward for SEZs in Africa?^{*}

Susanne A. Frick^a and Imane Radouane^b

Abstract

In recent years, interest has been growing among policymakers in how to leverage special economic zone (SEZ) policies to support local entrepreneurship. With a few recent exceptions, the academic literature to date has been silent on the matter. This article aims to contribute to addressing this gap. First, it develops a conceptual framework linking SEZ policies and entrepreneurship development. Second, it explores the state of play of entrepreneurship promotion in SEZs in Africa using a survey of African SEZs and two case studies. We find significant appetite among African SEZs to promote local entrepreneurship; however, it is less clear how best to accomplish the task. Many of the policies, facilities and services offered are open to local entrepreneurs rather than being tailored specifically to their needs. The support required in some policy areas also seems to be more straightforward than in others. Adapting the SEZ offering to the needs of local entrepreneurs is one of the key challenges to increasing the effectiveness of the support.

Keywords : special economic zones, entrepreneurship, developing countries, local economic development, knowledge spillovers, sourcing linkages

JEL classification codes : L26, O31, O55, O25, R58

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1. Introduction

Special economic zones (SEZs) are an ever-popular policy tool for promoting investment, generating employment and stimulating innovation. Policymakers put their hopes in them to overcome key developmental challenges such as low levels of industrialization, unemployment and low value added. Current estimates suggest that there are about 240 SEZs in Africa alone, with the total number worldwide passing 5,000 (UNCTAD, 2019, 2021). Traditionally, SEZ policies have focused on the attraction of foreign large-scale industrial investors, but interest has been growing among policymakers in how to leverage SEZ policies to support local entrepreneurship and micro, small and medium-sized firms (MSMEs).

The roles of entrepreneurship and MSMEs in economic and social development has been extensively documented in the literature (Acs and Stoey, 2004; Schumpeter, 2011; Toma et al., 2014). Entrepreneurs help to improve economic efficiency by reallocating resources and hence contribute to economic growth (Acs and Storey, 2004). In most economies, MSMEs represent the vast majority of firms, in particular in the developing world. They contribute the lion's share of formal and informal employment and typically grow faster than large, established companies (Van Praag and Versloot, 2007).¹ The entry of new firms has also been shown to promote productivity and value added (Van Praag and Versloot, 2007). Yet, entrepreneurship and MSME development also require a supportive ecosystem to flourish. A significant financing gap, bureaucratic hurdles, a lack of support infrastructure and cultural aspects, among other factors, can all hamper the creation and growth of new firms (Djankov et al., 2002; Facundo and Schmuckler (2017); Klapper et al., 2006).

Given the proliferation of SEZs, the question arises to what extent SEZ policies are suited and can be leveraged to alleviate these constraints and support an effective local entrepreneurial ecosystem. The topic is of great relevance for a couple of reasons, the first one being that while SEZs have proven to be an effective policy tool in some countries, many SEZ regimes have struggled to fulfil their promise. Occupancy rates, employment generation and linkages to the local economy have frequently remained limited, leading to a low developmental impact on the host economies.² In addition, the ever-increasing number of SEZs around the world, competing for a limited amount of foreign direct investment (FDI), will put further competitive pressure on existing SEZs. In this context, targeting local entrepreneurs rather than or in addition to foreign investors could be an opportunity to improve the performance and developmental outcomes of SEZs.

Second, SEZ policies will have to adapt to a changing international regulatory landscape in which providing incentives to large established firms – the core of many SEZ policies, will become increasingly difficult. The Organisation for Economic Co-operation and Development and the Group of 20 (OECD/G20) Global Anti-Base Erosion Rules (GloBE) foresees a minimum tax of 15 per cent on large multinational companies. Promoting local entrepreneurship could therefore be an important strategic consideration to increase options for policymakers in an increasingly complex environment.

The academic literature is relatively silent on the link between SEZs and entrepreneurship. To the best of our knowledge, there are no studies that develop the possible conceptual links in a comprehensive manner. On the empirical side, despite the large body of studies that examine the economic impact of SEZs on host economies, very few have explicitly addressed the topic. The notable

¹ For the role of MSMEs in employment generation, see for example OECD, n/d, Small and medium-sized enterprises and trade: Making it easier for SMEs to trade in the global economy (accessed 11 April 2024).

² See, for example, Frick and Rodriguez-Pose (2022); Frick et al. (2019); UNCTAD (2021).



exceptions are Sun et al. (2024); Tian and Xu (2022); and Li et al. (2024) who, in recent years, investigated the effect of SEZs on entrepreneurship in China, mainly focusing on indirect channels resulting from increased agglomeration of firms in and around SEZs.

Against this backdrop, this study sets out to do two things. First, we aim to develop a conceptual framework linking SEZ policies to entrepreneurship development both within and around SEZs. And second, we map current practices, opportunities and challenges of entrepreneurship promotion in SEZs in Africa. For this purpose, we rely on a survey of SEZs in 28 African countries, as well as two in-depth case studies of SEZs' experience with entrepreneurship promotion.

Our contribution to the literature is threefold. First, by developing a conceptual framework that identifies the possible links between SEZ policies and entrepreneurship in a more comprehensive manner than done thus far, we hope to facilitate future research on the relationship as well as to support policymakers in approaching the topic in a structured manner when considering options for entrepreneurship promotion. Second, rather than looking at SEZ policies as a black box, we explore the various elements of such policies and their potential to support entrepreneurship. Although SEZ policies frequently share similar core features, they are diverse with regard to the specific incentives, initiatives and facilities they offer. It has also been shown that spillovers from SEZs and FDI in general are by no means automatic and often require supporting policies if they are to materialize (Frick and Rodriguez-Pose, 2022). Thus, SEZs' ability to promote entrepreneurship is likely to vary significantly depending on the specific set-up. Finally, we extend the geographical coverage of the literature beyond China. This is important given the likely context-specific nature of the effectiveness and challenges of initiatives to promote entrepreneurship promotion through SEZs. The Chinese economic and institutional landscape differs significantly from that of many other countries where SEZ policies are being implemented.

We therefore believe that an exploration of the topic beyond China is desirable.

The African context is particularly interesting as many recently established zones have struggled to attract foreign investment and hence are considering alternative strategies (Rodriguez-Pose et al., 2022).

The study is structured as follows: section 2 reviews the literature and develops the conceptual framework. Section 3 details our methodology, and section 4 maps the current initiatives in African SEZs related to entrepreneurship support and discusses the findings. The final section concludes and draws policy implications.

2. SEZs and entrepreneurship

2.1 Empirical literature

How and to what extent do SEZs support entrepreneurship? A large and growing body of literature examines the economic impact of SEZs on host economies, including employment generation, investment attraction, spillovers and productivity (e.g. Ambroziak and Hartwell, 2018; Ciżkowicz et al., 2017; Frick and Rodriguez-Pose, 2019; Frick and Rodriguez-Pose, 2023; Hartwell, 2018; Meng and Zeng, 2019; Narula and Zhan, 2019; Rodriguez-Pose et al., 2022; and Wang, 2013). Yet, less than a handful of recent studies explicitly address the links between SEZ policies and entrepreneurship. Sun et al. (2024) investigate the effect of green industrial zones on entrepreneurship in China. They conclude that SEZs, in particular green industrial parks, can have a positive effect on entrepreneurship by reducing financial constraints, creating customer and supplier linkages, and by promoting the dissemination of knowledge. Li et al. (2024), also in the context of China, find that the establishment of pilot free trade zones has increased urban entrepreneurship, as measured by the number of new enterprises. This result holds primarily for the services sector.



They furthermore suggest that SEZs promote entrepreneurship by promoting financial sector development, knowledge spillovers, demand for new products and pooled labour markets. Finally, Tian and Xu (2022), again for the case of China, investigate whether high-tech zones, a specific type of SEZ, have been able to drive innovation and entrepreneurship. They find a positive effect on both outcomes. In terms of mechanisms, their results confirm that better access to finance and the attraction and cultivation of talent play an important role. They also identify a lower administrative burden within an SEZ as a driver for local entrepreneurship.

These recent studies suggest that SEZs, in fact, have the potential to support entrepreneurship development, in particular through the promotion of knowledge spillovers, improved access to finance and pooled labour markets. However, important gaps remain in our conceptualization and understanding of the relationship between SEZs and entrepreneurship. First, these studies remain partial in their identification of possible mechanisms, focusing primarily on so-called indirect effects of SEZs such as the greater availability of venture capital funding and/or skilled labour arising through firm agglomeration in and around SEZs or increased household incomes. The exception is the study by Tian and Xu (2022), which also considers the more direct effect of a lowered administrative burden as a driver for increased entrepreneurship. While indirect effects, without doubt, can be important channels for entrepreneurship promotion, SEZ policies also have the potential to have a more direct effect on entrepreneurship within a zone. Some SEZs provide specific tax incentives for start-ups, develop facilities designed for smaller firms or launch incubator programmes.³ Gaining a greater understanding of the potential and limitations of these more direct approaches to entrepreneurship promotion is hence desirable. Second, it has also been shown that the indirect effects from SEZs and

FDI in general are by no means automatic and often require supporting policies to materialize (Aggarwal, 2019; Frick and Rodriguez-Pose, 2022). Thus, SEZs' ability to promote entrepreneurship indirectly through different types of spillovers, as suggested by the empirical literature, is likely to vary significantly depending on the specific set-up of the SEZ policy, including the policy initiatives aimed at facilitating their emergence, as well as the context in which the SEZ policy is being implemented. Finally and related to the previous point, the existing studies exclusively focus on the Chinese experience. Although the mechanisms presented can also be at play in other countries, their presence will in all likelihood depend on the wider country context and specificities of the SEZ policy. The Chinese economic and institutional landscape differs significantly from that of many other countries where SEZ policies are being implemented. Hence, in light of these gaps in our current understanding of the link between SEZs and entrepreneurship, a wider consideration of the topic in terms of mechanisms, policies and geographies is desirable.

2.2 Conceptual framework

For entrepreneurship to flourish, a well-functioning entrepreneurial ecosystem needs to be in place that nourishes the start-up and survival of new firms (Isenberg, 2010; Stam, 2015; Stam and van de Ven, 2021). From a conceptual perspective, it is conceivable that SEZs contribute to such an ecosystem (1) indirectly through spillovers to firms and entrepreneurs located outside of the SEZ and (2) more directly by supporting local entrepreneurs and MSMEs within the SEZ.

Traditionally, efforts to reap the benefits of SEZ policies for the local economy have focused on the first channel, the promotion of spillovers to firms outside the SEZ. The development and running of a SEZ and the presence of large, typically international,

³ For example, Bhubaneswar SEZ in India (see Odisha Startup Hub, accessed 28 January 2024) and Lodz SEZs in Poland (see Startup Sparks, accessed 11 April 2024).



firms within SEZs are thought to create new market opportunities for local firms as well as to lead to greater innovation and improved productivity (Farole, 2011; Frick and Rodriguez-Pose, 2022; World Bank, 2011). These so-called spillovers can occur through labour mobility between SEZ and local firms, the creation of sourcing linkages between SEZ firms and domestic producers and the imitation of technology and/or management practices of SEZ tenants by local firms. Although spillovers are not limited to new firms and MSMEs, they present an important avenue to consider when exploring options to promote local entrepreneurship. The empirical literature on the link between SEZs and entrepreneurship described in section 2.1 supports some of these ideas; i.e. it finds evidence for knowledge spillovers, demand for new products and the attraction of talent as drivers of entrepreneurship connected to SEZs (Li et al., 2024; Sun et al., 2024; Tian and Xu, 2022). It has also been shown that the occurrence of spillovers is not automatic and is highly context dependent. A concerted effort is often required to enable local firms to realize the potential opportunities arising through the presence of SEZ firms.⁴ Smaller, less established firms are likely to require more support in this respect than large companies. Hence, if SEZs are to promote entrepreneurship in surrounding areas, specific policies will have to be implemented to support local entrepreneurs' ability to benefit from spillovers.

The second channel through which SEZs could promote entrepreneurship and MSME development is by contributing to an entrepreneurial ecosystem that supports local entrepreneurs within the SEZs rather than indirectly through different types of linkages with SEZ firms. The literature lists a large range of factors that inhibit and/or contribute to an entrepreneurial ecosystem,

among them the availability of finance, the regulatory environment, proximity to and networks with other firms and the presence of market opportunities as well as a large talent pool.⁵ The co-location of entrepreneurs and the facilities, services and policies available within SEZs could address some of these factors and hence promote entrepreneurship. Tian and Xu's work on SEZs and entrepreneurship in China (2022), for example, provides evidence of a positive effect on local entrepreneurship from the lower administrative burden within SEZs.

To establish a framework that describes the possible links between SEZs and entrepreneurship, we leverage the UNCTAD Entrepreneurship Policy Framework (EPF). The EPF is useful for this purpose as it provides a structured framework of all relevant policy areas, which help to create an entrepreneurial environment that facilitates the emergence and growth of entrepreneurs and new enterprises (UNCTAD, 2012). The EPF outlines five priority areas that have a direct effect on a country's entrepreneurial activity.⁶ The key policy areas are (1) optimizing the regulatory environment, (2) enhancing entrepreneurship education and skills, (3) facilitating technology exchange and innovation, (4) improving access to finance and (5) promoting awareness and networking. These policy areas resemble closely other frameworks developed in the entrepreneurial ecosystems literature.⁷ Combining the EPF with the two channels for entrepreneurship promotion just identified makes it possible to establish a framework of the possible mechanisms and areas for policy intervention through which SEZs and SEZ policies more widely can have an effect on local entrepreneurship. Figure 1 shows the framework with some illustrative examples of initiatives in each area.

⁴ See, for example, Frick and Rodriguez-Pose (2022).

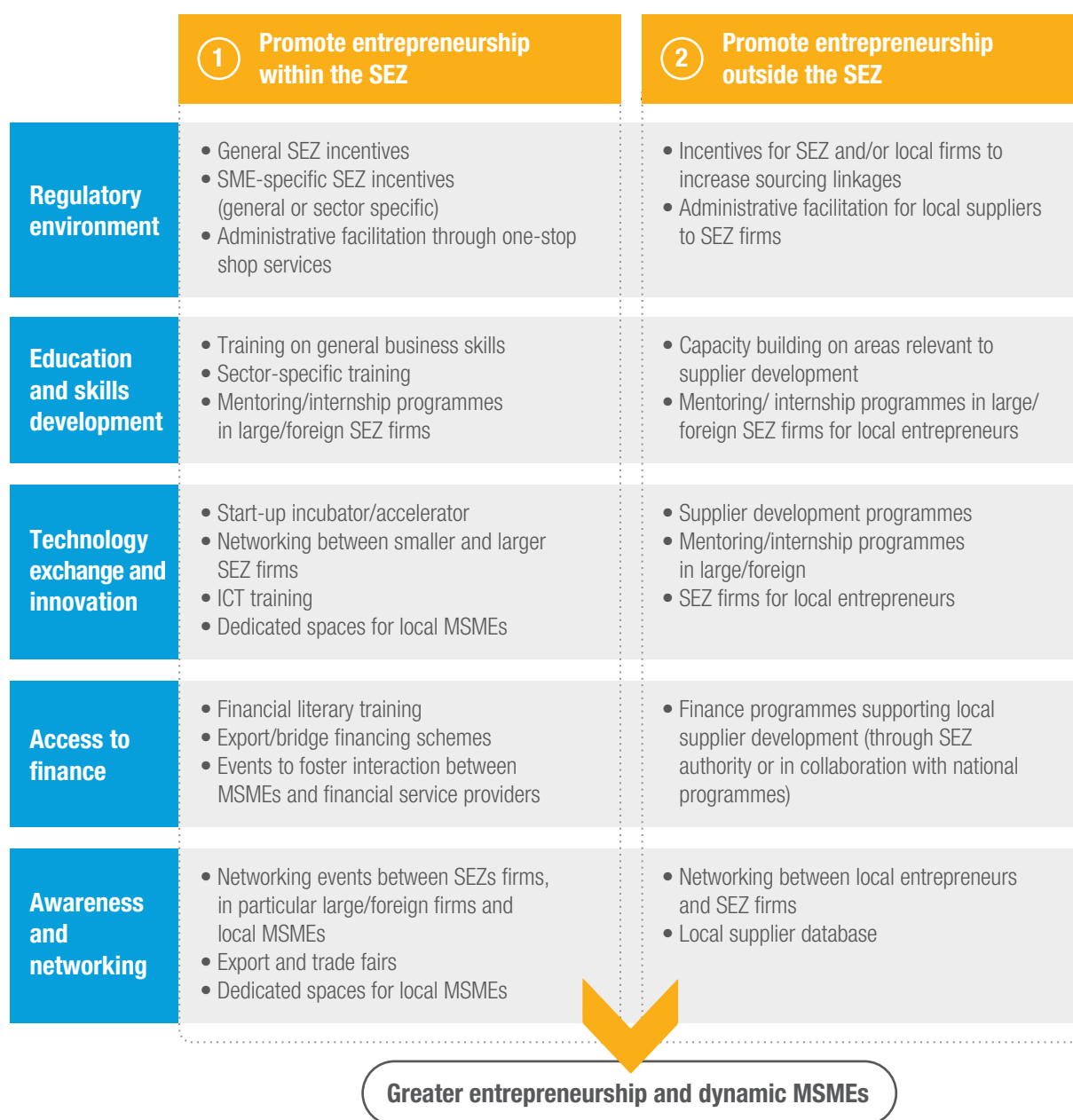
⁵ For overviews, see Feld (2012), Stam (2015) and Stam and van de Ven (2021) for overviews.

⁶ The sixth priority area, the development of a national entrepreneurship policy, has been excluded as this is considered as beyond the realm of SEZ policies.

⁷ See, for example, Feld (2012) or Stam (2015).



Figure 1
SEZs, local entrepreneurship and MSME growth



Source: UNCTAD (2023).

The first policy area, optimizing the regulatory environment, is the most straightforward channel, given that it is the inherent objective of SEZs to provide an ideal business environment for firms. Regulation is an important ingredient in any entrepreneurial ecosystem as it establishes the rules of the game and can have a direct effect on the incentives for and costs of

opening and growing businesses (Djankov et al., 2002; Klapper et al., 2006). SEZs can contribute to enhancing the regulatory environment for local entrepreneurs in a variety of ways. First, general fiscal incentives, offered in many SEZ programmes, can be as beneficial for local entrepreneurs as they are for foreign firms. Streamlined regulatory processes and a

dedicated one-stop shop, features of many SEZ policies, can also be particularly helpful for local entrepreneurs, which typically struggle more with the regulatory burden than do larger firms (Calcagno and Sobel, 2013; Chambers et al., 2022). Second, besides the general fiscal incentives, SEZ policies could also offer additional and/or more tailored fiscal incentives for local entrepreneurs located within the zones. These could be more generous than the general incentives offered to all firms or could target specific areas particularly important to entrepreneurs such as capital formation. Finally, the regulatory environment also needs to be considered for the promotion of entrepreneurship outside the zone, especially related to the development of sourcing linkages between local MSMEs and SEZ firms. Local firms can be disadvantaged from a cost perspective relative to foreign suppliers if foreign inputs are exempt from custom duties, hence SEZ incentives such as exemptions from value added tax on local inputs or corporate tax relief contingent on using local suppliers can help level the playing field.⁸

The second policy area, enhancing entrepreneurship education and skills, is a key area for entrepreneurship promotion as a diverse and skilled workforce is a core element of any entrepreneurial ecosystem (Stam and van de Ven, 2021; Qian et al., 2013). SEZs can have an influence in several ways. Capacity-building provided as part of the SEZ policy can benefit firms inside and outside the SEZs. Many supplier development programmes have traditionally included training on topics such as quality and sustainability standards for the local suppliers. Capacity-building could also be provided to local entrepreneurs located within the SEZs on topics such as financial literacy, export promotion and management practices. More indirectly, labour mobility between SEZs and local firms can facilitate

learning from management and production processes within the frequently larger or more productive SEZ firms.⁹ Local entrepreneurs around the Kigali SEZ, for example, set up their own businesses after working for and learning from foreign SEZ firms for multiple years (UNCTAD, 2023). Although this can happen without any further intervention through labour circulation, programmes for internships and mentoring that target owners and managers of local firms could help to increase the potential for this sort of learning to occur.

Technology, innovation and entrepreneurship are intrinsically linked with each other. On the one side, technology and innovation can be an important source of new business opportunities for entrepreneurs. On the other side, entrepreneurs create new technologies and innovation (Nambisan et al., 2019). The third policy area, technology exchange and innovation, can hence be considered at the core of entrepreneurship promotion. Traditionally, SEZs are thought to have an impact in this area through knowledge spillovers into the local economy. Labour mobility, sourcing linkages between SEZ firms and domestic producers, and the imitation of technology and/or management practices of SEZ tenants by local firms can all lead to technological progress and innovation among local firms (Farole, 2011; World Bank, 2011). SEZs increasingly also host dedicated start-up incubators or growth accelerators as well as provide specific training programmes supporting technological upgrading and innovation.¹⁰ Fostering horizontal linkages and networking between firms can further support peer learning among local MSMEs and larger or foreign firms within the zones.

The fourth policy area, access to finance, is one of the biggest influencing factors for entrepreneurship (e.g. Anton and Bostan, 2017) and an integral part of an

⁸ See, for example, Frick and Rodriguez-Pose (2022).

⁹ See, for example, Farole (2011) and World Bank (2011).

¹⁰ See, for example, the start-up Odisha programme (<https://startupodisha.gov.in/odisha-startup-hub>, accessed 28 January 2024) and Lodz SEZ in Poland (<https://startupspark.io/en/homepage-english>, accessed 11 April 2024).



entrepreneurial ecosystem. Although financing programmes have typically not been part of the standard SEZ offer, an increasing number of SEZs provide direct support in this area through capacity-building in financial literacy and investor readiness as well as matching grants schemes in the context of supplier development programmes. COEGA IDZ in South Africa, for example, provides a bridge financing scheme to local MSMEs around the zone that are involved in providing services and construction works for SEZ operations and firms. The fiscal incentives and reduced land prices offered within many zones might furthermore free up capital and hence allow entrepreneurs to invest more in the development of their business (Tian and Xu, 2022). Indirectly, SEZs might also ease finance constraints by increasing household incomes (Sun et al., 2024).

Beyond looking at the “hard inputs” for entrepreneurship, the literature on entrepreneurial ecosystems emphasizes the role of social networks of entrepreneurs, workers and supporting institutions to maximize information flows and the efficient distribution of knowledge, capital and labour (Greve and Salaff, 2003; Stam and van de Ven, 2021), as well as a supportive culture (Spigel, 2017). The fifth policy area, awareness and networking, hence plays an important role in promoting entrepreneurship. SEZs can promote networking and learning among entrepreneurs through the clustering of firms within the zones (Sun et al., 2024). The facilities provided may also be important to facilitate interaction between entrepreneurs (Audretsch et al., 2015). Specific initiatives such as export fairs and trade shows and the promotion of interactions between SEZ firms and local firms can further contribute to this endeavour. SEZs can also raise awareness of the importance of entrepreneurship, by highlighting

possible opportunities coming out of SEZ operations as well as by strengthening networks among entrepreneurs.

3. Methodology

While the interest of policymakers in leveraging SEZs for entrepreneurship promotion has blossomed in recent years and clear conceptual links exist, it remains unclear to what extent initiatives are being implemented to foster entrepreneurship in SEZs. Equipped with the conceptual framework developed in the previous section, we explore this issue by mapping whether African SEZs are currently actively promoting entrepreneurship and MSME development, the types of policies and initiatives implemented, and the perceived challenges to and effectiveness of the measures. The analysis is based on the responses to a survey conducted by UNCTAD and the Africa Economic Zones Organization (AEZO) among AEZO members, as well as on two case studies.

3.1 Survey

The survey questionnaire was structured around the conceptual framework developed in section 2.2 and included both closed and open-ended questions. Closed questions were employed for those that could easily be captured in categorical answers. Examples are whether any specific measures for entrepreneurship promotion were being implemented (yes/no) and what the target group of such support measures was (within the SEZ, around the SEZ or both). Open-ended questions allowed respondents to add more detail and nuance to describe, for example, specific measures, challenges and opportunities of the initiatives. The survey was available online in French and English. Invitations were sent by email to the universe of African SEZs associated with AEZO between March and April 2022.¹¹

¹¹ AEZO has 82 members in 42 African countries. Recent estimates suggest that about 230 SEZs have been established by law across Africa; however, a significant number of those are under construction or at an early stage of development (UNCTAD, 2019; Rodriguez-Pose et al., 2022). The membership of AEZO hence covers a significant portion of operational SEZs in Africa.



Fifty-three SEZs across 28 countries participated in the exercise.¹² Respondents were primarily senior officials within the zones, including managing directors, CEOs and general managers as well as heads of communications, corporate affairs and/or investment management services. Two SEZs were not yet operational and were, therefore, not included in the analysis. We conducted a thematic analysis of the answers to the open-ended questions, using both deductive and inductive coding frameworks. Deductive codes were developed on the basis of the literature review, and inductive codes reflected new concepts that emerged in the answers.

3.2 Case studies

To explore some of the points raised in the survey in more detail, two in-depth case studies of African SEZs engaged in the promotion of local MSMEs and entrepreneurship complement the survey results. To select these two cases, we relied on purposeful sampling based on the survey responses and further desktop analysis. Purposeful sampling makes it possible to select information-rich cases to ensure the most effective use of limited resources (Patton, 1990). For our purposes, we aimed to identify SEZs with significant experience in entrepreneurship promotion.

Athi River EPZ in Kenya showcases the different approaches, benefits and challenges of initiatives aiming to promote local entrepreneurship within the zone. Its EPZ SME development programme, initially named the Export Business Accelerator, was launched in 2013. The programme was set up with the objective to create synergies between the SEZ policy and local industries to speed up the growth of operational local SME exporters, primarily in three sectors: horticulture and

food processing, textiles and apparel, and leather and commercial crafts.

In contrast, the second case study, Bole Lemi Industrial Park (BLIP) in Ethiopia, shines light on strategies for fostering entrepreneurship around the SEZ through linkages with the local economy. Established in 2014, BLIP is the first SEZ established under Ethiopia's Industrial Parks programme. The programme has been highly successful in attracting foreign investment to the zones, primarily in the garments sector. One of the key challenges has been to increase sourcing linkages with local SMEs to deepen the impact on the local economy. In order to address this issue, the Government of Ethiopia, in collaboration with the World Bank Group, implemented the Competitiveness and Job Creation (CJC) Project. Subcomponent 3 of the project aimed to facilitate business-to-business (B2B) linkages between foreign firms located in BLIP and domestic SMEs to enhance value addition, develop local supply chains and hence promote local entrepreneurship.¹³

The case studies are based on document analysis and written and oral communications with the responsible authorities and other parties involved. Specific references and sources used for each of the case studies appear in appendix.

4. The state of play in African SEZs

4.1 Prevalence and overarching channels

Overall, a positive picture emerges from the survey. The results show significant appetite among African SEZs to promote local entrepreneurship as the majority offer some form of support for local entrepreneurs.

¹² Participating SEZs were located in Angola, Cameroon, Cabo Verde, the Central African Republic, Côte d'Ivoire, Djibouti, Egypt, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Kenya, Libya, Mali, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Sudan, the United Republic of Tanzania, Togo, Tunisia and Zambia.

¹³ Additional components of the project include strengthening the regulatory and institutional framework for the industrial park programme and providing support for investment promotion and industrial infrastructure in and around the zone.



Over 70 per cent of the respondents, 36 of the 51 participating SEZs, confirm having measures in place that they consider promote local entrepreneurship and MSME development (figure 2, left side). Considering the two overarching channels through which SEZs can promote local entrepreneurship, the main focus of support measures in African SEZs is on promoting MSME growth within the zones (figure 2, right side). Among the respondents with support measures in place, 56 per cent target local entrepreneurs within the SEZ and 31 per cent target MSMEs located both outside and within the SEZ. Fourteen per cent focus only on firms outside the SEZ.

The current support is hence focused on promoting entrepreneurship within zones; only a smaller percentage of SEZs has measures in place to promote spillovers. This is somewhat surprising given that traditionally the focus of policies aiming to deepen SEZs' impact on the local economy has been on spillovers to the surrounding

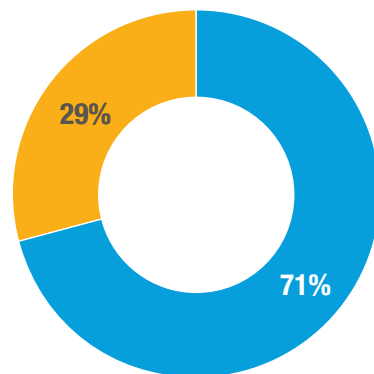
areas, in particular sourcing linkages. These have also been highlighted as an important channel to promote entrepreneurship by all empirical studies (Sun et al., 2022; Li et al., 2024; Tian and Xu, 2022). The mixed track record of initiatives that aim to develop backward linkages with local firms (Frick and Rodriguez-Pose, 2022) might have contributed to reduced interest in this topic. Other forms of facilitating spillovers to the local economy related to learning and to pooling local talent, which were suggested as important channels in the literature (Sun et al., 2024; Li et al., 2024; Tian and Xu, 2022), do not feature in the survey answers at all. This is likely to present a missed opportunity as initiatives such as promoting learning within SEZ firms through internship and mentoring programmes could be cost-effective ways to leverage SEZs' potential for promoting local entrepreneurship around zones.

Figure 2
SEZs and entrepreneurship promotion

Initiatives to promote entrepreneurship

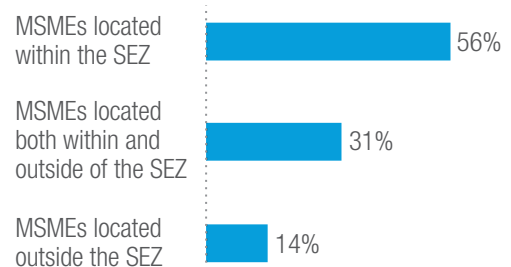
Percentage of SEZs (n = 51)

■ Yes ■ No



Target firms

Percentage of SEZs with support measures (n = 36)



Source: UNCTAD (2023).



4.2 Policy interventions

Turning to the five policy areas of our conceptual framework, there is a clear focus in the initiatives on education and skills development as well as awareness and networking (figure 3, left side). Seventy-one per cent of SEZs that reported having measures in place to promote local entrepreneurship target these policy areas respectively. Trade fairs and support programmes to promote exports and supplier development feature most prominently in the category of awareness and networking. Examples in the areas of skills development and education are training local MSMEs to enhance their ability to benefit from procurement from SEZ development and operations. Capacity-building on the importance of international certifications and skills development for the local workforce is another important area.

Almost half of the SEZs (45 per cent) reported that they promote entrepreneurship by providing an optimal regulatory

environment (figure 3, left side). When examining the initiatives and policies in this policy area more closely, however, many are not specific to MSMEs and local entrepreneurs but rather reflect the general incentives and administrative services provided within the zones. It remains unclear to what extent these initiatives and policies address the most pressing issues for local entrepreneurs more specifically.

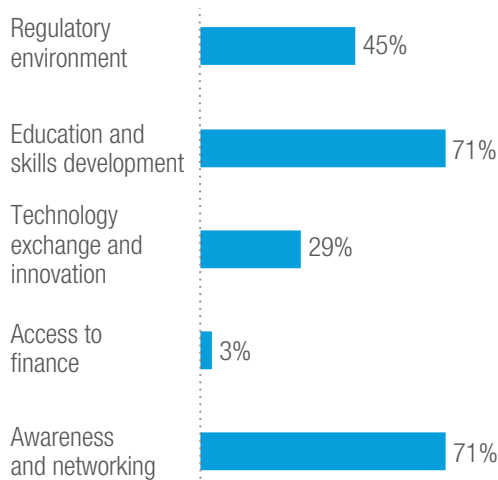
Almost a third of SEZs (29 per cent) confirm that they promote technology exchange and innovation through initiatives such as dedicated start-up incubators (figure 3, left side). Finally, specific measures to promote access to finance among local MSMEs is almost absent among the respondents of the survey (figure 3, left side). The only specific example mentioned in the survey forms part of our second case study, the linkage programme in Ethiopia's BLIP, which includes a match funding scheme for local MSMEs to upgrade their machinery in order to enable them to become suppliers for SEZ firms.



Figure 3
Current policy interventions

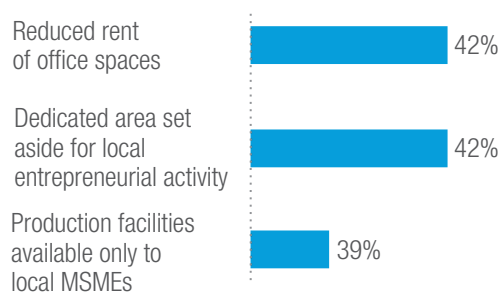
Initiatives in the five policy areas

Percentage of SEZs with support measures (n = 36)



Adapting SEZ facilities for local entrepreneurs

Percentage of SEZs with support measures (n = 36)



Source: UNCTAD (2023).



Our two case studies mostly confirm these survey findings. The EPZ SME development programme in Athi River EPZ aims to attract local SMEs to the zone by providing an attractive business environment, capacity-building and experience sharing, hence reflecting the policy areas most frequently mentioned in the survey. Participating SMEs can benefit from the general tax incentives offered to firms within the EPZ as well as the administrative facilitation of the one-stop shop. Tax incentives include a 10-year corporate tax holiday, 100 per cent investment deduction on new investments and perpetual exemption from payment of stamp duty on legal instruments and from value added tax and customs import duty on inputs. The one-stop shop provides advice related to labour regulations, registration with the tax authorities, and application to utility connections, among others. Although firms in the programme benefit from these incentives, they are not specific to the programme but open to all firms within the SEZ. This is in line with the common practice across African SEZs as shown in the survey: local entrepreneurs can benefit from incentives, but the incentives are not tailored to them.

Initially the EPZ also provided specific capacity-building to SMEs in various areas relevant to exporting, such as strategic business planning, quality standards and financial management, human resource management and export marketing. Adaptation of the training component was, however, considered necessary as previous courses offered to entrepreneurs by the SEZ itself were too generic. The number of SMEs participating was too low and their characteristics too diverse to tailor the courses more to their specific needs. Hence, SMEs are currently supported on a case-by-case basis by linking them with national and regional solution providers for specific challenges rather than providing the training in-house.

Turning to the second case study, the supplier development programme in BLIP Ethiopia aims to remove the binding

constraints currently hindering the development of linkages between local and SEZ firms, which include an important gap of information that limits access of large firms to local qualified MSMEs and vice versa, a scarcity of local skilled labour and both poor quality and lack of adherence to international standards in the domestic SMEs' products.

The programme addresses these issues through several interventions with a B2B fund at its core. It is the only initiative identified in the survey that specifically aims to remove financial barriers for local entrepreneurs. The B2B fund provides matching grants to local SMEs that aim to upgrade their production machinery. In addition, the programme provides technical assistance to SMEs on areas related to international quality standards, certifications and logistics. A B2B portal and supplier exhibitions both support networking and awareness among local and SEZ firms to close the information gap. Apart from the B2B fund, the chosen interventions thus reflect the focus of the policy areas as identified in the survey, i.e. networking and awareness raising as well as skills development and education.

Besides initiatives in the five key policy areas of our conceptual framework, the survey and the case studies also show that adapting the SEZ offering to the needs of MSMEs is an important part of the current measures in African SEZs (figure 3, right side). Forty-two per cent of survey respondents with support measures in place report having a dedicated area set aside for local entrepreneurs or production facilities available only to local MSMEs (39 per cent of respondents). This is important since land plots, production facilities and office spaces within SEZs are frequently designed with larger firms in mind, hence making it challenging for local MSMEs to benefit from the advantages offered by location in an SEZ. Forty-two per cent of respondents furthermore offer reduced rent of office spaces; however, this is likely to be a general incentive open for all firms within the SEZ rather than a targeted measure for local MSMEs.



Similar efforts can also be seen in the SME development programme in Athi River EPZ. To make the SEZ programme more accessible for local entrepreneurs, the infrastructure offering has been adapted by providing purpose-built infrastructure with smaller warehouses, which was seen as key for making the zone accessible for local entrepreneurs. Furthermore, SMEs are granted differential treatment in terms of export restrictions, which normally apply within the zone. Participating firms are allowed to sell 80 per cent of their production to the local market in the first year, decreasing to 40 per cent by the fourth year. This contrasts with the limit for other firms in the SEZ of only 20 per cent. This allows local SMEs, whose export volumes are not yet sufficiently high, to fulfil the requirements for enrolment in the SEZ programme while building up their export capacity. This policy highlights the need for SEZs to adapt not only their infrastructure but also their requirements to allow local entrepreneurs to participate in SEZ programmes.

Overall, the findings from the survey and case studies suggest that the support required in some policy areas is more straightforward than in others. Many SEZs already implement initiatives for skills development and networking, which is in line with the channels identified in the empirical literature. Other fields such as access to finance and innovation, even though deemed to be very important by the survey respondents and academics alike (Li et al., 2024; Sun et al., 2024; Tian and Xu, 2022), currently receive less attention in terms of concrete policies. This is particularly true for access to finance. The case study of BLIP highlights one of the few specific initiatives on this topic in African SEZs.

Many of the policies, facilities and services described in the survey and the case studies can be described as open to local entrepreneurs rather than being tailored specifically to their needs. Example include general tax incentives,

administrative facilitation and reduced rent offered to all firms in the SEZ. Without doubt these can also be beneficial for local firms; however, the measures are typically designed for larger foreign firms and thus might not address the most pressing challenges of local businesses. Furthermore, although the survey shows that many zones are making progress to adapt their infrastructure offering for smaller local firms, this is not yet universal; thus, in many SEZs access to zone benefits remains limited for local entrepreneurs. In that sense, the survey results are likely to overstate the current prevalence of policies and initiatives to promote local entrepreneurship on the ground.

4.3 Effectiveness of entrepreneurship support measures

In terms of the effectiveness of current support for local entrepreneurs, a third of survey respondents consider such efforts to be very successful, while just over half report them to be averagely successful. Only one in ten think they are not successful at all. Adding some colour to these numbers from our case studies, the Athi River EPZ SME programme is considered one of the most important drivers for the number of firms in the SEZ, with local ownership rising from 25 per cent in 2012 to 38 per cent in 2018. In the BLIP linkages programme, 36 local SMES from the packing materials, leather and accessories sectors have been supported throughout several rounds of the programme and are now working with firms located within industrial parks. Twenty-six of those are owned by women. These figures show the potential of SEZs to promote local entrepreneurship.

Survey responses to what is seen as the most effective way of promoting local entrepreneurship varied and likely reflect the need to carefully consider the local context when designing interventions. A few common themes could be identified. Respondents frequently cited capacity-building and training for local entrepreneurs



on topics such as quality standards, investor readiness and exporting as the most effective ways to promote entrepreneurship. Specific tax incentives and subsidies to support the start-up phase of new enterprises were also mentioned several times. The same can be said for the promotion of supply chain linkages with SEZ firms. Other topics that were mentioned include access to infrastructure, stability of foreign exchange, and consistency and sustainability of fiscal and economic policies. Interestingly, many of the interventions mentioned as most effective are currently not being implemented, according to the survey results and the case studies. Capacity-building is the focus of current activities, but targeted tax incentives and subsidies are not on the menu nor are supplier development programmes widespread. Taking also into account the need, identified in the previous section, to further adapt SEZ programmes to expand access for local firms, the reported survey results about the perceived effectiveness should hence be taken with a pinch of salt.

Finally, the factors reported in the survey and the case studies to facilitate or hamper the effectiveness of the measures are instructive for understanding potential changes that need to happen to improve the effectiveness of policies and initiatives that target the promotion of local MSMEs. One of the primary issues that was mentioned in the survey is the inadequacy of many zones for local entrepreneurs in relation to the size of land plots, production facilities and/or office spaces. Many zones are already implementing measures to remedy this issue, as highlighted in section 4.2, yet this remains an important challenge. One survey respondent explained that a project aiming to adapt the zone for local firms failed because of its financial non-viability. Adapting or building purpose-made infrastructure has significant costs, yet returns from local MSMEs are typically lower than from the large foreign investors, making this a challenging business case. This financing challenge was also highlighted for the

implementation of the SME development programme in Athi River EPZ, where the operator continues to struggle to raise sufficient funding to build smaller spaces.

Access to finance was also highlighted by survey respondents as an important factor in promoting the effectiveness of initiatives to support local entrepreneurship, yet the business development fund at BLIP was the only initiative identified in the survey that specifically addressed this issue. This highlights a large gap between theory and practice on the ground.

In addition, the survey respondents and the case studies highlighted the importance of dialogue and collaboration between relevant stakeholders within and outside the zones as well as a coherent overall policy framework as important ingredients to make the measures work. Building institutional support for programmes is important to secure funding as well as to leverage the strength of different partners in the entrepreneurial ecosystem. From a cost perspective, MSME programmes can be difficult to implement for SEZ developers and operators. This is particularly true for private operators and developers, though not exclusive to them. This difficulty was reflected in the survey responses as well as in the Athi River EPZ case study, where the implementation of a fully fledged incubator programme had to be stopped for a lack of funding. Similarly, the B2B fund in Ethiopia's BLIP could be implemented only because of a significant World Bank commitment of funds. Hence, support from the public sector and/or international organizations is required for such programmes to be feasible. Collaboration with existing programmes and partner organizations is also crucial to leverage the strength of each partner in the ecosystem. SEZs are well placed to address some of the EPF policy areas, but others are better addressed in collaboration with partners. Improving the regulatory environment, for instance, is a natural fit for SEZs to take on, whereas access to finance and capacity-building may be easier to address in collaboration with partners.



And last but not least, the case study of the linkages fund in BLIP highlighted some of the well-known challenges regarding entrepreneurship promotion through the development of local suppliers (Frick and Rodriguez-Pose, 2022). Although the project has made important steps to increase linkages with the local economy and hence stimulate local entrepreneurship, several challenges remain. The limited range of products available in the local market has restricted the scope and opportunities to attract more local suppliers to serve the international firms in the industrial parks. A mismatch of the business cases from both ends with regard to volume and price presents a further hurdle. In addition, a lack of confidence on the part of buyers makes it challenging to establish more sourcing linkages, despite the efforts of the programme. The cost of local products also raises challenges. For instance, there is a misalignment of incentives for local sourcing as value added tax and duties are incurred while imported inputs on foreign inputs are exempt. This and other reasons can make locally purchased goods 30 per cent more expensive than imported products.

5. Conclusion and policy implications

SEZs are an ever-popular policy tool for promoting investment, generating employment and stimulating innovation. Traditionally SEZ policies have focused on the attraction of foreign investment, yet interest in leveraging SEZ policies to support local firms and foster entrepreneurship has been growing. In this study, we developed a conceptual framework that links SEZ policies and local entrepreneurship and mapped the state of play of entrepreneurship promotion in African SEZs. The impact of SEZs on entrepreneurship is likely not automatic and will require a concerted effort by policymakers. Hence, we hope that the conceptual framework and a better understanding of current experiences and practices will help inform further research and policy in the area.

Our results show significant appetite among African SEZs to promote local entrepreneurship, with the majority of SEZs already offering some form of support for it. The current support focuses on promoting entrepreneurship within the zones rather than promoting spillovers to surrounding areas. Despite this general appetite and first steps in the right direction, questions remain about the best way to accomplish the task. Many of the policies, facilities and services offered can be described as open to local entrepreneurs rather than being tailored specifically to their needs. The support provided in some policy areas also seems more straightforward than in others, with many of the identified channels not being considered yet by policymakers. Initiatives in education and skills development as well as awareness and networking abound, whereas access to finance and technology exchange and innovation receive less attention. A lack of suitable infrastructure for local entrepreneurs and the associated costs are seen as the biggest challenges to the effectiveness of the measures.

From a policy perspective, this has important implications. First, when designing policies and initiatives for entrepreneurship promotion, policymakers should consider the whole option space identified in the conceptual framework. Initiatives to facilitate learning, such as mentorship and internship programmes, could be a cost-efficient option that is currently not considered. Second, policies and initiatives should ideally be more tailored to the specific needs of local entrepreneurs rather than reflecting only the general incentives provided. And third, adapting the SEZ infrastructure to the requirements of local firms is paramount. Given the cost challenges associated with this, collaborations with international and/or national partners will likely be required.



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Appendix. References and sources for the case studies

Athi River EPZ, Kenya

Documents

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Interviews or written communications

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- Interviewee 3, SEZ firm 1

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Interviews or written communications

- Interviewee 1, Bole Lemi IP
- Interviewee 2, IPDC



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¹ India, Ministry of New and Renewable Energy, 2021, India achieves 100 GW milestone of installed renewable energy capacity, 12 August, available at <https://pib.gov.in>.

² European Commission, 2021, What category do I fit into?, EU Immigration Portal, available at <https://ec.europa.eu/immigration> (accessed 13 December 2021).

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⁵ Bloomberg News, 2017, Tracking tax runaways, Bloomberg Special Reports: Corporate Tax Inversions, 1 March, available at www.bloomberg.com/graphics/tax-inversion-tracker.

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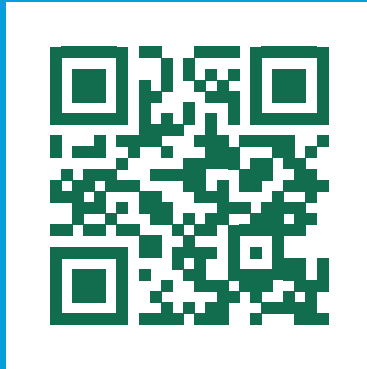
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