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Outward FDI, restructuring, performance upgrading and resilience: Firm-level evidence from Portugal

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Outward FDI, restructuring, performance upgrading and resilience: Firm-level evidence from Portugal [1]

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Abstract

This paper assesses the causal relationship between outward foreign direct investment (FDI) and various sides of firm performance, using micro data from Portuguese manufacturing firms during 2006-2012 and 2017-2020. Our analysis shows that the learning effects for Portuguese parent firms depend on the underlying outward FDI strategy. In particular, those learning effects seem to be mostly visible when firms engage in vertical outward FDI. Further, vertical or horizontal outward FDI appear to enhance the integration of Portuguese firms into the global economy through increased export intensity. Overall, the findings supports the argument that outward FDI can indeed be at root of upgrading performance and firm's restructuring in a small, open and peripheral economy such as Portugal. Nonetheless, the capability to be resilient and deal with sudden and external shocks - such as COVID-19 pandemic - is not supported by the available preliminary data.

JEL Classification: Productivity. Scale. Outward FDI. Portugal. Firm-level data. Difference-in-difference. COVID-19 pandemic

Keywords: D24, F23

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1. Introduction

Outward Foreign Direct Investments (FDI) from Portuguese firms is a quite recent phenomenon. It took off mainly in the 1990s with the Portuguese authorities electing the internationalisation of firms as a political goal. Portugal is not a unique case, as, by that time, outward internationalisation is becoming an increasingly important target of public intervention in most OECD countries (UNCTAD, 2001). Therefore, Portugal joints the group of latecomers of outward FDI, replicating the pattern of evolution of the most developed countries. More recently, several public incentives and legal instruments relevant to outward internationalization had been enacted and implemented. The impact of such home country support measures toward internationalization is visible in the slightly upward time trend in Portuguese outward FDI. At the end of 2019, Portuguese outward FDI stock was equivalent to 23.4% of GDP (OECD, 2021), indicating that outward FDI has became an important way of internationalization for Portuguese firms. Nonetheless, the Portuguese outward FDI performance is below the World, OECD or, even, EU28 average.

The existing studies on Portuguese outward FDI have mostly focussed on the analysis of the drivers of outward FDI. They mostly investigate whether the growth of outward FDI results from a new strength of Portuguese firms and the need to exploit firm's competitive advantage, or it mainly represents a loss of comparative attractiveness of the domestic location and hence the need to develop firm's competitive advantage by accessing advanced knowledge and capabilities. To understand firms' internationalization strategies and home country-specific context is a topical issue that foster stimulating research around the world. See, for instance, Bruhn et al. (2016) for the case of developing countries.

Apart from the determinants of outward FDI, to examine whether outward FDI is a catalyst for upgrading firm's performance is an important issue, as frequently trade policies heavily rely on the extent of learning/upgrading effects of outward FDI. Micro-level evidence for supporting such policies is therefore topical and deserves further attention. If there are no rewards at micro-level, and hence no macroeconomic consequences, then policies designed to foster internationalization, in particular outward FDI, may be wasting resources.

Moreover, without understanding the complexities of the link (or the lack of link) between outward FDI strategies and parent-firm performance and resources allocation, it is hard to designed policy incentives and measures to capture the opportunities and challenges of abrupt changes on the competitive environment or negative external shocks, such as those related to COVID-19 pandemic. Although the long-term impact of the pandemic on FDI is still uncertain (UNCTAD, 2021), export-oriented investments aiming at exploiting production resources and low-cost labour will remain important (UNCTAD, 2021). In a regional perspective, those investments could be helpful in diversifying supply bases and building redundancy and resilience. Therefore, Portuguese MNEs already present in relevant

regional markets could capture the benefits of this opportunity and upgrade their performance

Our analysis differs from the existing literature in several issues. First, rather than focusing on a narrow outcome of upgrading performance, a wider range of outcomes, which can potentially be driven by outward FDI decisions, are addressed and interrelated to understand what kind of restructuring process outward FDI could be fostering. Second, we examine firms in a small, open and developed economy, but within the context of the European Union (EU) it is a peripheral economy that traditionally was being a net receipt of FDI. The more recent propensity of Portuguese firms for outward FDI offers a rich and yet unexplored context to add understanding on the consequences of the globalization of firm activities. In particular, it allows us to seek further knowledge on key factors that yield heterogeneity in selection and learning effects. Third, the implications of outward FDI are examined for different qualitative FDI types: horizontal outward FDI and vertical outward FDI. Unlike previous studies examining qualitative differences between vertical and horizontal outward FDI, which rely mainly on host country differences (see, for instance, Debaere et al. (2010), Navaretti et al (2010), and Hijzen et al. (2011)), in this study the such distinction is based on each pair of parent-firm and overseas affiliates at two-digit industry level. Horizontal outward FDI is recorded if parent-firm has overseas affiliates that operate in the same two-digit industry; otherwise it is recorded as vertical outward FDI. Fourth, the sudden COVID-19 pandemic, which has had a huge impact on the global economy, complicating the trade environment and causing an economic downturn, is taken as a quasi-natural experiment to evaluate the resilience of MNCs, comparatively to pure domestic firms, to negative external shocks.

The empirical analysis proceeds in several steps. Firstly, domestically-owned manufacturing firms were identified and examined whether they hold subsidiaries abroad, the indicator of outward foreign investments being made. Secondly, the assessment of the effects of outward FDI on the evolution of firm performance across Portuguese multinational enterprises (MNEs) and pure domestic firms is carried out.

Disentangling correlation and causality in the context of FDI poses numerous challenges. The chief challenge in identifying outward FDI effects is selection. If Portuguese MNEs are not representative of the universe of Portuguese firms, subsequent heterogeneity in the evolution of firm performance might not be attributable to outward FDI as it well documented by, for instance, Arnold and Javorcik (2009) and Hijzen et al. (2013) in the case of ownership changes. To mitigate this threat to identification, we examine the effects of outward FDI using the propensity score matching technique combined with difference-in-difference estimators. The matching technique creates the missing counterfactual of a MNEs had it remained purely domestic. For that, Portuguese MNEs were paired up with a pure domestic firm with very similar observable characteristics, which have power to explain outward FDI decisions at firm level. Therefore our empirical strategy has an explicit focus on

the direction of causality and allows us to control for time-invariant observables and unobservable differences between Portuguese MNEs (treated firms) and pure domestic firms (the control group). Our difference-in-difference inferences on the matched sample comprise 319 outward FDI cases. For each case, the type of outward FDI (horizontal versus vertical) is assessed.

Our analysis, based on manufacturing firm-level data from Amadeus/Orbis, covering the period 2006-2012, shows that the learning effects for parent firms in Portuguese manufacturing depend on the underlying outward FDI strategy. Having overseas subsidiaries seem to have no effect neither on productivity (either total factor productivity or labour productivity) nor on export intensity. The positive changes taking place in the parent firms are in terms of investment, capital-labour ratio, and total assets per employee. These findings suggest that outward FDI leads to some restructuring in parent firms, mainly in terms of the transfer of know-how and technology, which do not always engender upgrading productivity. Looking at outward FDI-types, parent firms with vertical outward FDI seem to engage in a more profound restructuring process (either in terms of employment, skill composition and investment) that lead to upgrading performance which become visible in increasing productivity and export intensity. Nonetheless, from a firm point of view, there is no empirical evidence supporting the argument that investments abroad could be helpful in diversifying production or distribution bases in order to build resilience to sudden and negative external shocks.

The remainder of the paper is as follows. Next section presents and discusses the relevant literature review and theoretical framework. Section 4 describes the main data set used in the empirical analysis, presents the empirical strategy and results related to key factors that drive selection into outward FDI. Section 5 outlines the empirical strategy for examining and discussing learning effects from outward FDI, the long-standing effects, and the capacity to deal with strong exogenous market changes, such as the COVID-19 pandemic. The last section concludes the paper by highlighting the main findings, policy implications, and avenues for future research.

2. Brief literature review and theoretical framework

Similar to knowledge spillovers, as a form of technology transfer from inward FDI (see, for instance, Djulius (2017), the effects on productivity, as a result of gaining experience and obtaining new knowledge from outward FDI, may be positive. Firm's investments abroad provide increased competitive pressure and new business opportunities. They might obtain superior technology or knowledge or they may achieve total cost reduction by using low-priced production factors. These learning/upgrading effects may raise firm's productivity. Previous papers on effects at home of outward of FDI are not fully unanimous, as they do not necessarily succeed in detecting a positive causal effect on firms' productivity (Hayakawa et al., 2012). Nonetheless, some empirical evidence suggests that there are positive learning effects that provide performance upgrading at home. Navaretti and Castellani (2004) and Imbriani et al. (2011) for Italian manufacturing firms, Wei et al. (2010) for Chinese firms, Ito (2015) and Hayakawa et al. (2016) for Japanese firms Hijzen et al. (2011) for French firms, among others, claim positive impact of outward FDI on parent firms productivity. However, other works analysing the learning effect in investing abroad fail in detecting a positive and significant causal effect (see, for instance, Hijzen et al. (2007), Damijan et al. (2014)) for manufacturing firms).

In addition to productivity, there are empirical works analysing the impacts of FDI on production, exports, investment, employment, and skilled labour composition (see, for instance, Castellani et al. (2008), Navaretti and Castellani (2004) and Navaretti et al. (2006) for Italian firms, Navaretti and Castellani (2004) and Hijzen et al. (2011) for French firms, and Hijzen et al. (2007) for Japanese firms). Most of the works report considerable heterogeneity of the effects of outward FDI on production, exports, investment, employment, and skilled labour composition with regards to host countries, industries and types of investments. If outward FDI improves firm's productivity and simultaneously there is heterogeneity on other measures of firm operations, this would suggest that firms undergo a deep restructuring process. Therefore, in order to derive meaningful conclusions regarding the effects of outward FDI more detailed analyses are required. This study explores a causal link between outward FDI and different aspects of firm operation in order to assess whether outward FDI causes the parent firm to undergo restructuring processes and to upgrade performance.

3. Data and econometric approach

3.1 Data

The empirical analysis in this paper draws mainly on data from Amadeus covering the 2006-2012 period. This data set is collected yearly from official business registers, annual reports and other complementary sources. The firm-level records include information on number of employees, industry code, geographical location, detailed balance sheets, and profit and loss account. This extent of information allows us to compute total factor productivity, labour productivity and other aspects of firm operations. More importantly, the data shows full list of shareholders and subsidiaries, which allow us to identify pure domestic firms and Portuguese MNEs.

On of the key variables of interest is firm productivity. Total factor productivity (TFP) has been obtained as the residual from industry-specific estimation of a logarithmic Cobb-Douglas production function, in which firm's add value is regressed on labour inputs measured as the number of employees, on the book value of tangible fixed assets that account for capital, and intermediate inputs comprising materials, energy and other goods and services used in production. Using information available in Eurostat, all variables have been deflated using industry-specific price indices for added value, a price index for investment goods for capital stocks and a general producer price index for intermediate inputs. The production function has been estimated using the semi-parametric estimator suggested by Levinsohn and Petrin (2003). We are able to obtain TFP for about 148,000 firm observations, providing a large choice of control units for the matching procedure.

A firm engaging in outward FDI is designed as a Portuguese MNE. It occurs if the global ultimate owners are not foreign investors and it holds at least one subsidiary overseas over 2006-2012. Using that criterion, we have data on 326 Portuguese MNEs. Table 1 reports descriptive statistics on the full sample used in the estimation. Column (1) reports statistics on the universe of firms that was possible to get TFP estimates. The other two columns distinguish between firms owned by Portuguese investors and with no overseas subsidiary and firms owned by Portuguese investors and with at least one overseas subsidiary.

Table 1: Descriptive statistics: full sample

	All firms	Pure domestic	Portuguese MNEs
	(1)	(2)	(3)
Log sales	5.869 (1.600)	5.823 (1.548)	7.432 (2.307)
Size (log employment)	2.204 (1.188)	2.171 (1.152)	3.385 (1.684)
Log labour productivity	-1.533 (0.788)	-1.545 (0.780)	-1.160 (0.889)
Total factor productivity	1.430 (3.270)	1.347 (3.016)	3.841 (6.337)
Age	15.824 (13.281)	15.508 (12.960)	27.119 (17.313)
Log average labour earnings	2.392 (0.470)	2.384 (0.465)	2.641 (0.501)
Log capital-labour ratio	-2.645 (1.704)	-2.667 (1.700)	-1.810 (1.487)
Log total assets-labour ratio	3.713 (1.081)	3.697 (1.077)	4.303 (1.052)
Log investment	2.995 (2.242)	2.928 (2.190)	5.054 (2.764)
Export intensity	0.129 (0.266)	0.125 (0.262)	0.250 (0.326)
N (obs.)	148,361	143,199	2042
N (firms)	26,727	25,864	326

Notes: The table reports means and standard deviations (in parentheses) for firms over the period 2006-2012. A firm is a Portuguese MNEs if the global ultimate owners are not foreign investors and it holds at least one subsidiary outside Portugal. Column (1) refers to all firms, column (2) refers to firms that the global ultimate owners are not foreign investors and it does not hold subsidiaries outside Portugal, column (3) refers to Portuguese firms with outward foreign direct investment. Monetary variables are in 2010 prices and in thousand of euros. The sectoral and temporal distribution of pure domestic firms and Portuguese MNEs are quite similar.
Source: Authors' calculations

Overall, the descriptive statistics reveal that Portuguese MNEs tend to be larger, older, more productive, pay higher average wages, and are more integrated into the global economy through higher export intensity than pure domestic firms. Further, Portuguese MNEs seem to invest significantly more in fixed assets than domestic ones. Or, alternatively, one can interpret this finding as indicating that Portuguese firms with better capital intensity are more prone to invest abroad. Given the similar sectoral distribution of firms among pure domestic firms and Portuguese MNEs, with the five most represented sectors being NACE25 - manufacture of fabricated metal products, NACE10 - manufacture of food products, NACE23 - manufacture of other non-metallic mineral products, NACE16 - manufacture of wood and of products of wood and cork, and NACE14 - manufacturing of wearing apparel, the explanation on these differences can hardly be routed on the sectoral composition. In fact, these differences seem to reflect initial heterogeneity in firm-specific characteristics among pure domestic and Portuguese MNES as well as change induced by outward FDI. Therefore, the estimation strategy has to control for selection bias and to be able to disentangle self-selection effects from learning effects.

3.2 Estimation strategy

In order to create the missing counterfactual of a Portuguese MNE had it remained pure domestic (i. e., concentrating all operations in Portugal), we firstly explore the patterns of selection into overseas operations. Evidence from several previous studies (e. g., Antras and Yeaple, 2013; Grossman et al. 2006) suggest that parent's scale, whether measure through either employment or sales, and productivity are key drivers of the self-selection of firms into outward FDI. Further, our data reveal substantial performance premiums in terms of productivity and scale of operations associated with firms with overseas subsidiary.

As a first step to disentangle correlation and causality in the context of outward FDI, we model empirically the probability a firm becoming a multinational enterprise, which is the basis to predict the propensity scores of being a Portuguese MNE. We do so by estimating a logit model of the binary outcome of a firm becoming multinational with observable firm-specific characteristics (sales and productivity) that would be expected to drive an outward FDI decision. To account for potential differences on firm-specific characteristics across industries, those explanatory variables are demeaned to the industry. We also include industry, region and time-specific effects to account for the role of idiosyncratic shocks at those three dimensions. Table 2 reports the results from estimation of the probability of becoming a Portuguese MNE, or the propensity score, which forms the basis of our matching procedure.

Table 2: Logit results. Predicting outward FDI. Propensity score estimates

Log sales	0.602*** (0.044)
Log labour productivity	-0.416*** (0.175)
Log average labour earnings	0.293* (0.176)
Industry effects	Yes
Region effects	Yes
Time effects	Yes
N (obs.)	144,530
N (firms)	26,044
Chi^2 (p-value)	415.17 (0.000)
Pseudo R^2	0.1068

Notes: Standard errors in parentheses clustered at the firm-level. *, **, and *** mean that coefficients are statistically significant at 10%, 5%, and 1% level, respectively.
Source: Authors' calculations

Overall, the results indicate that Portuguese MNEs differ systematically from pure domestic firms. The estimated model suggests that Portuguese MNEs tend to be larger firms. They also indicate that, conditional on size and labour productivity, firms with higher average labour earnings, which can be seen as a proxy to skill composition, are more likely to hold overseas subsidiary. Conversely, the estimates suggest that better performers in terms of labour productivity are more prone to be pure domestic firms. However, this result should be read with caution, as it is conditional on size and labour earnings. In fact, the negative sign of the point estimate on labour productivity may be explained by the fact that the logit model includes simultaneously three different, but positively correlated, observable firm-specific characteristics. The inclusion is justified on the grounds that they all reflect relevant heterogeneity between pure domestic and Portuguese MNEs. As the goal was to estimate the propensity score, and not looking at explanatory power of each variable, we have included them simultaneously.

Based on the propensity score, we match treated firms by year and industry, using one-to-one nearest neighbour matching without replacement. We impose an additional requirement that excludes observations outside the common support. The lowest propensity score of a treatment observation and the highest propensity score of a control observation

binds the common support. The final matched sample comprises 319 Portuguese MNEs and 1714 pure domestic firms.

To assess how well the matching procedure performs in our case, several tests of the balancing hypothesis were carried out. Table A1 in the Apendix reports results from tests of matching quality. All individual t-tests and the two-group Hotelling t-square test never reject the mean equality of observable firm-specific characteristics between pure domestic and Portuguese MNEs in the matched sample. Moreover, the very small magnitude of the Pseudo R2 of the logit on the matched sample and the Chi-square test for joint significance of regressors give us confidence that our approach is capable of grouping together relatively homogenous firms.

Another way to assess the overall quality of the matching procedure is looking at descriptive statistics for the sample of matched firms and comparing it with those for the full sample. Table 3 reports summary statistics for the sample of firms (treated and control) that were similar among a number of key observable firm-specific characteristics.

Table 3: Descriptive statistics: matched sample

	All firms	**Pure domestic**	**Portuguese MNEs**
	(1)	(2)	(3)
Log sales	7.474 (2.244)	7.490 (2.236)	7.458 (2.252)
Size (log employment)	3.323 (1.612)	3.272 (1.574)	3.373 (1.648)
Log labour productivity	-1.153 (0.894)	-1.146 (0.921)	-1.160 (0.866)
Total factor productivity	3.723 (5.895)	3.675 (5.418)	3.772 (6.337)
Age	23.113 (0.493)	19.541 (15.936)	26.697 (16.931)
Log average labour earnings	2.642 (0.493)	2.643 (0.484)	2.641 (0.501)
Log capital-labour ratio	-1.924 (1.558)	-2.021 (1.622)	-1.828 (1.484)
Log total assets-labour ratio	4.259 (1.095)	4.213 (1.135)	4.306 (1.052)
Log investment	4.846 (2.712)	4.637 (2.647)	5.051 (2.762)
Export intensity	0.243 (0.331)	0.234 (0.335)	0.252 (0.327)
N (obs.)	3984	1992	1992
N (firms)	2033	1714	319

Notes: The table reports means and standard deviations (in parentheses) for firms over the period 2006-2012. A firm is a Portuguese MNEs if the global ultimate owners are not foreign investors and it holds at least one subsidiary outside Portugal. Column (1) refers to all firms, column (2) refers to firms that the global ultimate owners are not foreign investors and it does not hold subsidiaries outside Portugal, column (3) refers to Portuguese firms with outward foreign direct investment. Monetary variables are in 2010 prices and in thousand of euros. The sectoral and temporal distribution of pure domestic firms and Portuguese MNEs are quite similar.
Source: Authors' calculations

In the matched sample, pure domestic and Portuguese MNEs are clearly more similar along the set of observable and measured firm-specific characteristics. The matching procedure removes almost initial heterogeneity across firms along a number of firm-specific characteristics. Notice, however, that some differences remain given that outward FDI would affect how these firm-specific characteristics evolve over time. Moreover, the sectoral distribution of the matched sample is similar to the full sample, indicating that there is no a sectoral bias affecting firm-specific characteristics and performance.

4. Empirical results and discussion

The empirical analysis is carried out in two steps. Firstly, the effects of Portuguese firms' outward investments on a variety of performance and restructuring indicators are assessed over the period 2006-2012. Then, those firms were follow-up until 2020 in order to evaluate long-lasting performance effects and the resilience to a negative external exogenous shock, as it is the case of the COVID-19 pandemic.

4.1 The effects of outward FDI on performance and restructuring

Here, we proceed by assessing and discussing the effects of outward FDI on parent-firm performance and restructuring. For each outcome of interest we report the difference-in-differences estimates using the matched sample and distinguishing outward FDI types. In particular, we identify horizontal outward FDI and vertical outward FDI based on each pair of parent-firm and overseas affiliates at two-digit industry level. Horizontal outward FDI is recorded if parent-firm has overseas affiliates that operate in the same two-digit industry, while vertical outward FDI is recorded if parent-firm has overseas affiliates that operate in a different two-digit industry. There are also complex outward FDI types. That is, a parent firm may be engaged in both horizontal and vertical outward FDI at the same time in the same or different locations. This type of parent-firm is residual in the case of Portuguese context and, hence, they are excluded from the analysis based on outward FDI types of strategy.

The distinction between horizontal and vertical outward FDI aims at disclosing firm's motivation to start operations abroad, which would drive its impact at home. Horizontal outward FDI is usually associated with market-seeking motivation, leading to significant scale effects, while vertical outward FDI tend to be driven by factor-seeking motivation, leading to some technology effects revealed in greater efficiency as well as larger exports (Hijzen et al. 2011).

The first outcomes of interest are productivity and export intensity. Our main interest is whether outward FDI is able to improve productivity and deep the integration of Portuguese firms in the global economy. The estimates reported in Table 4 reveal that outward FDI appears to be neutral to productivity gains (both total factor productivity and labour productivity) and firm's export intensity. Nonetheless, the estimated causal effects of outward FDI differ according types of FDI, providing a rough test of the appropriateness of splitting types, motivations of outward FDI.

Table 4: Effects of outward FDI on productivity and export intensity. Matched sample

	(1)	(2)	(3)
A. Dependent variable: **Total factor productivity**			
Outward FDI	0.110 (0.328)	-	-
Vertical Outward FDI	-	1.046** (0.511)	-
Horizontal Outward FDI	-	-	0.786 (1.281)
R^2	0.228	0.245	0.241
N (obs.)	3984	2829	2829
N (firms)	2033	1839	1839
B. Dependent variable: **Log labour productivity**			
Outward FDI	-0.017 (0.045)	-	-
Vertical Outward FDI	-	0.308*** (0.059)	-
Horizontal Outward FDI	-	-	0.217 (0.159)
R^2	0.184	0.194	0.177
N (obs.)	3984	2829	2829
N (firms)	2033	1839	1839
C. Dependent variable: **Export intensity**			
Outward FDI	0.017 (0.019)	-	-
Vertical Outward FDI	-	0.093*** (0.031)	-
Horizontal Outward FDI	-	-	0.230*** (0.072)
R^2	0.151	0.145	0.148
N (obs.)	2766	2000	2000
N (firms)	1553	1380	1380

Notes: All regressions include industry effects, time effects, and industry trends. Standard errors in parentheses clustered at firm level. . *, **, and *** mean that coefficients are statistically significant at 10%, 5%, and 1% level, respectively
Source: Authors' calculations

Vertical outward FDI seem to lead to a significant boost to firm productivity, suggesting that technology effects, in the form of greater efficiency, are at work. In the case of horizontal, market seeking, outward FDI the potential scale effects have no impact on upgrading productivity.

Interestingly, horizontal outward FDI seem raise export intensity of parent-firm more intensively than in the case of vertical outward FDI. This finding suggests some contradiction with prior assumption that horizontal, market-seeking FDI would have no significant effect on parent-firm exports. However, the Portuguese case of outward FDI may comprise some country specificities such as the higher presence in previous Portuguese colonies. Possible differences on host countries of horizontal or vertical outward FDI, in particular if there were significant differences among EU partners or outside EU territories, would differently impact on productivity and export-intensity. Our distinction between horizontal and vertical outward FDI only account for differences in two-digit industry, regardless the host country. The different findings related to alternative outward FDI types suggest that the identification of host country and its impact on firm's upgrading performance should deserve further research.

Another possible explanation is that a sizable increase on average earnings per employee observed in the case of vertical outward FDI (see Table 5) suggests an improvement on skilled employees, which, in turn, may lead to upgrading the quality of

products and thus make them more suitable for export markets. Additionally, we have to recall that most of vertical outward FDI performed by Portuguese firms are on distribution networks, which could improve firm's proximity to customers and their needs in foreign markets. Apart from distribution channel, vertical outward FDI could ease the access to quality raw material, which would promote product quality and exports. Jointly those factors contribute to the surprising, unexpected impact of vertical outward FDI on parent-firm export intensity.

On the parent-firm size side, the empirical results suggest a difference on the growth effect. Both types of outward FDI boost firm size (measured by sales and employment) when examined the level effect. However, the growth effect of different types of outward FDI is statistically significant only in the case of vertical outward FDI. This indicates that firms performing vertical outward FDI record growth in terms of size but with a lower speed than other firms.

Table 5: Effects of outward FDI on firm size. Matched sample

	(1)	(2)	(3)
A. Dependent variable: **log sales**			
Outward FDI	0.009	-	-
	(0.131)		
Vertical Outward FDI	-	1.290***	-
		(0.153)	
Horizontal Outward FDI	-	-	1.065***
			(0.308)
R^2	0.141	0.189	0.143
N (obs.)	3984	2829	2829
N (firms)	2033	1839	1839
B. Dependent variable: **log employment**			
Outward FDI	0.129	-	-
	(0.096)		
Vertical Outward FDI	-	1.029***	-
		(0.117)	
Horizontal Outward FDI	-	-	0.995***
			(0.308)
R^2	0.108	0.152	0.099
N (obs.)	3984	2829	2829
N (firms)	2033	1839	1839
C. Dependent variable: **Annual employment growth**			
Outward FDI	-0.017**	-	-
	(0.008)		
Vertical Outward FDI	-	-0.028***	-
		(0.008)	
Horizontal Outward FDI	-	-	0.002
			(0.010)
R^2	0.017	0.023	0.020
N (obs.)	3244	2299	2299
N (firms)	1714	1527	1527
D. Dependent variable: **log total assets per employee**			
Outward FDI	0.095*	-	-
	(0.056)		
Vertical Outward FDI	-	0.442***	-
		(0.073)	
Horizontal Outward FDI	-	-	0.341*
			(0.178)
R^2	0.246	0.283	0.261
N (obs.)	3984	2829	2829
N (firms)	2033	1839	1839
E. Dependent variable: **log average earnings per employee**			
Outward FDI	-0.002	-	-
	(0.025)		
Vertical Outward FDI	-	0.213***	-
		(0.031)	
Horizontal Outward FDI	-	-	0.102*
			(0.055)
R^2	0.218	0.284	0.254
N (obs.)	3984	2829	2829
N (firms)	2033	1839	1839

Notes: All regressions include industry effects, time effects, and industry trends. Standard errors in parentheses clustered at firm level. . *, **, and *** mean that coefficients are statistically significant at 10%, 5%, and 1% level, respective
Source: Authors' calculations

The changes taking place in firms performing outward FDI, documented so far, do extend to other aspects of parent-firm operations. Table 6 reports matching results with respect to the effects of outward FDI on net total investment and capital-labour ratio. Overall, the results show that outward FDI (both horizontal and vertical) do appear to induce increases in total investment and on the capital-labour ratio. A similar picture emerges with

respect to total assets per employee (see Table 5), which shows that firm with outward FDI make available more assets per employee than on pure domestic firms.

Table 6: Effects of outward FDI on net total investment and capital-labour ratio. Matched sample

	(1)	(2)	(3)
A. Dependent variable: **log net total investment**			
Outward FDI	0.356*	-	-
	(0.191)		
Vertical Outward FDI	-	1.141***	-
		(0.232)	
Horizontal Outward FDI	-	-	0.857**
			(0.377)
R^2	0.141	0.174	0.151
N (obs.)	1254	959	959
N (firms)	814	675	675
B. Dependent variable: **log capital-labour ratio**			
Outward FDI	0.200**	-	-
	(0.080)		
Vertical Outward FDI	-	0.668***	-
		(0.095)	
Horizontal Outward FDI	-	-	0.569***
			(0.161)
R^2	0.178	0.228	0.202
N (obs.)	3984	2829	2829
N (firms)	2033	1839	1839

Notes: All regressions include industry effects, time effects, and industry trends. Standard errors in parentheses clustered at firm level. . *, **, and *** mean that coefficients are statistically significant at 10%, 5%, and 1% level, respectively
Source: Authors' calculations

How can we reconcile those technology effects, in form of greater capital-intensity and investment, regardless the type of outward FDI, with no evidence of upgrading productivity in the case of horizontal outward FDI? One possible explanation is that parent-firm with horizontal outward FDI fail to introduce organizational and managerial changes that make the production process more efficient and using labour more effectively. That is, some financial effort in order to upgrading technology seems to be done but it was not accompanied by significant changes in the production process, which, in turn, made no visible such effort in terms of productivity. Another possible explanation is that parent-firm replicating the same activities in overseas locations – horizontal outward FDI – do not alter the skill composition of labour and do not be able to attract more experienced and motivated employees. This explanation is in line with the matching results in terms of average earnings per employees (see Table 5).

4.2 COVID-19 pandemic and firms' resilience

An important issue during the current pandemic has been the relationship between COVID-19, MNC's status, and firms' resilience. In particular, it would be particularly relevant to evaluate whether MNCs are more prone to absorb or transmit COVID-19 shocks than pure domestic firms and whether MNCs are more able to be successful in such adverse competitive environment. The complexities of the link (or the lack of link) between outward

FDI strategies and parent-firm performance and resources allocation - as discussed in the previous section -, could be helpful to understand how MNCs capture the opportunities and deal with changes in the competitive environment due to COVID-19.

Although the long-term impact of the pandemic on FDI and MNCs reconfigurations are still uncertain (UNCTAD, 2021), in a regional perspective, FDI investments could be helpful in diversifying supply bases and building redundancy and resilience. Therefore, Portuguese MNEs already present in relevant regional markets could capture the benefits of this opportunity and upgrade their performance.

Looking at firms' performance in the recent years - *before* and *after* COVID-19 pandemic - Table 7 reports the mean values for some performance indicators averaged over all firm-year observations for Portuguese MNCs and pure domestic firms. To account for inter-industry differences, the performance indicators at firm-level are demeaned to the industry mean. The last column presents the statistical difference (given by a *t*-test) of the means of these indicators for the two types of firms.

The mean values reported in the first panel provide some support to the view that outward FDI have scope to improve firm's performance, regardless the indicator used to assess firm's performance. These findings corroborate the long-standing positive effects of outward FDI on parent-firm, as Portuguese MNCs are those identified in 2012 and remained active until 2020. Similar finding was derived from the assessment of high performers, which are firms at the top 5% percentile on firms' growth distribution, suggesting that outward FDI is a relevant channel to upgrading performance.

Table 7: Mean values for Portuguese MNCs and Pure Domestic firms

Variables	**Portuguese MNCs** (1)	**Pure Domestic Firms** (2)	**Difference** (1)-(2)
	Before COVID-19 pandemic		
3-years growth (2017-2019)			
Turnover	-0.046	-0.100	0.055**
Employment	-0.012	-0.044	0.032**
Total Assets	-0.135	-0.061	-0.074*
High performers			
Turnover	0.036	0.015	0.021**
Employment	0.037	0.023	0.014*
	After COVID-19 pandemic		
1-year growth (2019-2020)			
Turnover	-0.088	-0.065	-0.023
Employment	-0.028	-0.022	-0.005
Total Assets	-0.037	-0.049	0.012
High performers			
Turnover	0.028	0.027	0.001
Employment	0.031	0.029	0.002

Notes: ***, ** and * indicate that the difference in means is statistically significant at the 1%, 5% and 10% level, respectively. High performers are firms at the top 5% percentile on firms' growth distribution at 4-digit NACE industry level.

Nonetheless, negative and sudden external shocks - as it is the case o COVID-19 pandemic - seem to inhibit a comparatively positive effect of outward FDI on firm's performance. There seems not be statistical differences on short-term performance between

Portuguese MNCs and pure domestic firms, regardless the performance indicator, suggesting that the economic impacts of COVID-19 are complex and transversal to all firms. Similarly to Wong et al (2022) findings, being a MNC seems to not engender additional capabilities to deal with this kind of external shocks that has a direct negative impact but also affect the behavioural decisions of economic agents, which are able to yield long-term effects. While more detailed data are needed to better understand and assess the long-term-effects, more resilient strategies and continuous adjustments to new global market conditions could be crucial to upgrading performance. In this sense, long-term specific capabilities of MNCs could have scope to make the difference.

5. Conclusion

This study aims at shed additional light on the causal link between outward FDI and parent-firm performance upgrading, restructuring and resilience to negative external shocks, as it the case of COVID-19 pandemic. While existing evidence lends some support to a positive causal relationship, relatively is known about whether and how different relationship occurs in a small, open and peripheral economy such as Portugal. If Portuguese firms do not get rewards from their integration into the global economy through outward FDI, then policies designed to foster internationalization seem to fail and the assumption that outward FDI benefit parent-firm may not hold true.

We exploited comprehensive data on Portuguese firms spanning the period 2006 to 2012 to study the effect of outward FDI on parent-firm performance at micro-level. During this period several official home country incentives had been provided through law to promote the internationalization of domestic firms, resulting in an upward time trend in Portuguese outward FDI. We identify causality by controlling for the possible endogeneity of parent-firm outward FDI decision, using a difference-in-difference approach in combination with propensity score matching. Our analysis differs from the most existing literature by considering a range of outcomes that can potentially be shaped by outward FDI decisions and by separating the analysis into different types of outward FDI.

From a managerial and policy perspective, our results provide evidence that outward FDI leads to: (1) an expansion in the scale of operations at home; (2) and increase on total investment, capital intensity and assets per employee; (3) an increase on integration into the global economy; and (4) different impacts on parent-firm according the FDI strategy. In particular, the paper provides evidence that vertical outward FDI cause technology effects, in form of greater efficiency along with scale effects. The effects associated with horizontal outward FDI are more visible in terms of scale effects. Nonetheless, we interpret the evidence provided by this study as supporting the argument that outward FDI can indeed be at root of upgrading performance and firm's restructuring in a small, open and peripheral economy such as Portugal.

Our findings also suggest that the short-term negative impact of disruptions in production due to COVID-19 pandemic seems to affect all firms in similar way, as there is no significant differences on MNCs and pure domestic firms' performance after COVID-19 pandemic. Portuguese MNCs seem not be more protected against such sudden negative external shocks. Outward FDI investments aiming at exploiting production resources or at benefiting from technological effects appears to not engender additional resilience in the short-term. The long-term effects are still not well understood and, as a result, deserve further research

The newness of the empirical findings in a context of a small, open and peripheral economy inspires fruitful avenues of future research. One possibility would be to examine, from a theoretical and empirical point of view, the channels that could lead to positive or

negative effects of outward FDI on parent-firm´s performance and whether such channels diverge according to FDI strategies and host countries. Another interesting avenue of research would be to adopt a dynamic approach in order to look at the evolution of outward FDI strategies over time and its impact on parent-firm´s performance and restructuring. These topical issues are beyond the scope of this paper but undoubtedly deserve further research.

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Appendix: Balancing tests

The Panel A present the simple t-test of the equality of means between the treated group and the matched control group. The second test is based on the logit model applied to the selection equation on the matched and full sample. In both cases the Pseudo R2 and the Chi-square test provide information on the joint significance of regressors. The third test is a Hotelling T^2 test for the joint null of equal means of all the variables. It is applied to the treated and the matched control group.

Table A1: Balancing tests

Panel A: t-test before and after matching

		Mean					
Variable	Sample	Treated	Control	% bias	% reduct bias	t-test	p-value
Log Sales	Unmatched	1.528	-0.033	84.1		45.57	0.000
	Matched	1.528	1.547	-1.0	98.8	-0.28	0.777
Log productivity	Unmatched	0.309	-0.007	41.7		19.11	0.000
	Matched	0.309	0.327	-2.4	94.4	-0.68	0.495
Log average earnings per employee	Unmatched	0.210	-0.07	48.7		21.91	0.000
	Matched	0.210	0.214	-0.9	98.1	-0.30	0.767

Panel B: Pseudo R^2 and test of joint significance of regressors

Sample	Pseudo R^2	Chi2	p-value
Unmatched	0.102	2135.83	0.000
Matched	0.006	31.59	0.968

Panel C: Two-group Hotelling T-squared

Sample	T-squared	F-test	p-value
Matched	15.87	0.631	0.921

Source: Authors' calculations

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