Employment and Productivity Effects of Tax Haven FDI

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Novermber 19, 2019

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Abstract

Using longitudinal data on more than 300,000 Ukrainian firms over period of 1999-2013 representing more than 10,000 acquisitions by foreign investors, this study estimates the extent to which tax haven ownership affects employment and firm productivity in the post-acquisition period. Controlling for a rich set of fixed effects and employing propensity score matching, I find that firms acquired by foreign investors experience boost in employment of 8-30%, labor productivity of 10-16% and total factor productivity of 9-11% relative to firms that stay domestic. The gap is much lower for firms acquired by investors from tax haven countries: focusing on the most conservative specification that controls for firm specific fixed effects and growth trajectories, my results suggest that employment of tax haven acquired firms does not change in the post-acquisition period, while productivity improvement ranges from 4 to 5 percent. My findings suggest that the implications of tax havens go beyond the loss of tax revenue and might also include stunted growth of the domestic companies receiving FDI from tax havens.

1. Introduction

Foreign direct investment (FDI) remains an integral component of the development strategy of many countries seeking to stimulate job creation and economic growth. Support for these policies come from the extensive body of evidence that FDI leads to better performance of acquired firms.[1] However, assessing the contribution of FDI to firm performance is complicated by the fact that in some cases ultimate beneficiary of FDI is domestic rather foreign. Known as round-trip FDI, this type of FDI is recorded as FDI from a foreign country while ownership is actually domestic. Round-trip FDI has begun to attract attention of policy makers and international organizations (OECD, 2008; National Bank of Ukraine, 2019), yet little is known whether this type of FDI has any effects on firm performance.

The challenge of estimating the effect of round-trip FDI is that it is difficult to observe, requiring reliable information on the ultimate beneficial ownership of every company receiving FDI. Although the 4th edition of the OECD Benchmark Definition of Foreign Direct Investment (BMD4) recommends countries to compile statistics on the inward FDI stock by ultimate investing country, firms have incentives not to disclose real ultimate ownership because of the underlying motives for round-tripping such as tax avoidance and evasion, concealing the true ownership of the firm, and access to advanced financial and legal services.[2] To overcome this challenge, I utilize evidence from previous research suggesting that a significant part of FDI flows from tax havens to emerging economies are round-trip FDI (Ledyaeva et al, 2015).[3] In this study, I use tax haven FDI as a proxy for round-trip FDI.

The current paper examines the effect of round-trip FDI on firm performance in Ukraine, a country with a large share of tax haven FDI and unusually rich and long panel firm-level data, including source country of FDI. In contrast to previous work that mainly focused on a single industry, my data offers comprehensive coverage of the economy and includes information on firms from 56 2-digit NACEs industries.[4] This universal data spans from 1999 to 2013 and allows

[1] See Djankov and Hoekman, 2000; Conyon at al., 2002; Girma and Gorg, 2007; Arnold and Javorcik 2009, among others.

[2] Evidence from Ukraine that passed legislation on ultimate beneficial ownership in 2015 shows that only 23% of all firms report ultimate beneficial ownership, and there are significant discrepancies if one compares beneficial ownership across different databases (Anticorruption Action Center, 2019)

[3] According to National Bank of Ukraine, round-trip FDI to Ukraine is largely channeled through tax havens such as Cyprus (accounts for half of total round-trip FDI in 2010-2018), Netherlands, and Switzerland (NBU, 2019).

[4] For example, Guadalupe, Kuzmina, and Thomas (2012) use a panel of manufacturing firms; Girma and Gorg (2007) focus on electronics and food; and Piscitello and Rabbiosi (2005) investigate manufacturing.

me to observe more than 10,000 acquisitions by foreign investors, much higher than in previous studies. Detailed information on country of origin rather than groups of countries of origin as in most previous studies (Kamal, 2015, Chen, 2011) makes it possible to identify around 3,000 acquisitions from tax haven countries. The universal data includes more than 400,000 non-acquired firms that can be used to draw a control group that is very similar to the group of acquired firms.

My identification strategy focuses on the initially domestically owned firms, some of which are acquired by investors from tax havens, some by investors from non-tax haven countries and some of them stay domestic. I examine relative employment and productivity by ownership type (tax haven foreign, non-tax haven foreign, domestic) within industry-year cells to control for industry-specific shocks. My analysis also takes into account possible selection bias associated with firm-specific time-invariant observable and unobservable characteristics as well as firm-specific growth trajectories that may affect the probability of acquisition and whether the new owners are from tax havens or other foreign countries. I further extend my identification with propensity score matching approach that has several advantages. In contrast to controlling for firm-specific time-invariant characteristics and growth trajectories estimated on the entire period in the sample (both pre- and post-acquisition), propensity score matching allows the selection of control group based on pre-acquisition period only. Unlike most previous studies that used a single year of data, I use employment and productivity histories to construct control groups of non-acquired firms. The matching approach allows for non-linearity in pre-acquisition performance and offers a more flexible estimation of round-trip FDI effects on firm performance.

A priory, the relationship between round-trip FDI and firm performance is ambiguous. The theoretical literature on traditional FDI shows that only the most productive foreign firms engage in FDI given fixed cost to enter foreign markets (Melitz, 2003; Helpman, Melitz, and Yeaple, 2004). Therefore, the improvement in the performance of acquired firms depends on the transfer of proprietary assets from foreign acquirer, including superior technologies and advanced organizational practices (Navaretti, Venables, and Barry 2006). The FDI effect is thus based not merely on the capital flow but also on "a package of resources" that foreign investor brings along (Aykut et al. 2017). Although round-trip FDI as included in official statistics represents additional

capital flow to the firm, it might not come with the additional benefits pertinent to traditional FDI, because the ultimate owners are domestic. In this case, one should not find any effect of tax haven FDI on employment and firm productivity in the post-acquisition period.

On the other hand, the effect of round-trip FDI on firm performance likely depend on the underlying motivations to engage in round-trip FDI in the first place. Although the literature on the motivations of capital flight from emerging economies to tax havens are relatively well understood (low or no taxes, secrecy rules and advanced financial services), reinvestment back to the home economy has received little attention. Some exceptions include studies on China where the tax preferences for foreign investors have been identified as main reasons for round-tripping (Boisot and Meyer, 2008, Sutherland and Ning, 2011). In the context of other countries with a high share of round trip FDI like Russia, where there are hardly any privileges for foreign investors, institutional shortcomings of the home country are essential motivation to round-trip (Ledyaeva, 2015). Such shortcomings include "corruption, regulatory uncertainty, underdeveloped property rights protection" and increase transaction costs of firms operating in the emerging economy (Meyer, 2001). Therefore, round-trip investors face lower transaction cost compared to domestic investors, in which case there may be a positive effect on firm performance.

This paper contributes to the broader literature on FDI and firm performance (Djankov and Hoekman, 2000; Conyon at al., 2002; Girma and Gorg, 2007; Arnold and Javorcik 2009, among others). Most of the previous studies treated all FDI homogeneously, not differentiating between the origins of the acquirer. Some exceptions include Chen (2011), Kamal (2008) and Earle, Telegdy, and Antal (2018), where the motivation to examine heterogeneous effects is that investors from countries closer to the technological frontier are more likely to have higher effect on the performance of the acquired firms[5]. The concept of technological frontier also applies to the motivation to divide FDI into round-trip and other FDI: if round-trip FDI originates in the same country as the acquisition target, one might not expect to see a differential in technology transfer compared to purely domestic companies.

I also contribute to the growing literature on the costs associated with tax havens for receiving and sending countries. These primarily include studies on the implications of tax havens for inequality (Zucman, 2013; Alstadsæter, Johannesen, and Zucman, 2018), loss of corporate tax revenues (Crivelli, de Mooij, and Keen, 2015; Cobham and Janský, 2018) as well as oversized

[5] Some other examples include Conyon et al. (2002), Harris and Robinson (2003) and Girma and Gorg (2007).

financial sector as a barrier for economic growth of tax havens (Arcand et al, 2015; Christensen et al., 2016). Limited number of studies examined the effects of tax haven FDI on acquired firms: most of them focused on profitability and sales as measures of firm performance and used short panels of data with small numbers of acquisitions[6]. My study fills the gap in the literature by providing empirical evidence on the implications of tax haven FDI for firm productivity and employment using a long panel of data and a much larger number of acquisitions.

Subsequent sections of this paper proceed as follows. Sections 2 and 3 describe the data and methods, respectively. Section 4 discusses the results, and Section 5 concludes.

2. Data

The main data source for the firm-level data is the national statistical office (*Derzhkomstat* in Ukrainian), which supplies annual enterprise performance statement, balance sheet statement, financial results statement, and the quarterly foreign direct investment statement for firms in all sectors for 1999-2013. Employment and output data come from the enterprise performance statement. Employment is defined as the average number of listed employees in the year, while output is net sales after indirect taxes. For firm-year observations missing output data in the enterprise performance statement, I use net sales after indirect taxes from the financial results statement. Key performance variables include employment (log employment), labor productivity (log of output to employment ratio) and total factor productivity (TFP) measured as the residual from the following unrestricted Cobb-Douglas production function:

$$Y_{ijt} = f_j(K_{ijt}, L_{ijt}) + \theta_{jt} + u_{ijt}, \quad (1)$$

where i indexes firms, j represents 56 2-digit NACE industries and t indexes years from 1999 to 2013. Y, K and L represent log of output, capital and employment, respectively. θ_{jt} are industry-year fixed effects and f_j are industry-specific production functions.

The data on foreign ownership come from the quarterly 10-zez form "On foreign direct investment in Ukraine" ("form" hereafter). According to the form manual, the firms of all ownership forms and types of economic activity that received any foreign investment in the reporting period or before have to complete the form quarterly. The firm is considered a firm with

[6] Some exceptions include Bilyk (2008) examining the link between tax haven FDI and firm profitability of around 200 joint stock companies in Ukraine, Dewit et al (2017) studying the effect of establishing subsidiary in tax haven on firm productivity and Bentivolgi and Mirenda (2017) who use tax haven FDI as a falsification test in their analysis of the effect of FDI on firm sales and profitability in Italy.

foreign direct investment if it meets any of the following criteria: 1) has at least 10 percent of foreign investments in the statutory fund; 2) has a foreign investor with at least 10 percent of the voting stock in the enterprise; 2) has liabilities on loans and credits received from foreign direct investors; 3) carried out the transfer of at least 10 percent of the ownership to non-resident by either directly transferring it or trading it for shares, bonds or other securities (10 percent of criterion); 4) received foreign investment as a result of the conclusion of concession contracts and contracts on joint investment activities. If the firm received investment from multiple investors from the same country, the total value of the investment reported in the form.

Quarterly FDI data includes the information about the stock and flows of FDI by country of investment origin and currency of the transaction. I classify a firm-year as foreign if it has positive FDI stock at the end of the last quarter of the year. For firms that do not appear in the fourth quarter in particular year, I treat them as foreign if they have positive FDI stock in the last available quarter. One benefit of the data from 10-zez form is that it includes information on the country of origin. I combine this data with the official lists of tax haven jurisdictions to construct tax haven ownership dummy.

Definition of tax havens

International institutions have several definitions of tax havens given the controversial nature of this phenomenon. OECD refers to them as "tax haven", International Monetary Fund (IMF) calls them "offshore financial center" while KPMG is calling them "states without or with low taxation". The definition of OECD includes the following characteristics of tax havens: no or low taxes, lack of effective exchange of information, lack of transparency, and no requirement of substantial activity. [7] The IMF definition of the offshore financial center by includes the following characteristics: "(i) the primary orientation of business toward nonresidents; (ii) the favorable regulatory environment (low supervisory requirements and minimal information disclosure) and; (iii) the low-or zero-taxation schemes."[8] The IMF methodology identifies OFC based on the share of net financial services exports to GDP ratio. Bank of International Settlements refers to them as "offshore centers" and defines them as "…countries with banking sectors dealing primarily with

[7] Organization for Economic Development and Cooperation, Harmful Tax Competition: An Emerging Global Issue, 1998, p. 23.
[8] Zoromé, A. IMF Working Paper "Concept of Offshore Financial Centers: In Search of an Operational Definition", April 2007. p. 4 and 7.

non-residents and/or in foreign currency on a scale out of proportion to the size of the host economy."[9]

In Ukrainian legislation, there are official lists that define tax haven (offshore) status of the countries (territories) with whom Ukrainian firms have business. The first list of offshore zones was approved in 2000 when it included 44 countries and territories. The list has changed several times and the most recent one approved in 2011 includes 36 countries and the territories.[10] The purpose of the list is to regulate transfer pricing in Ukraine and the full list of offshore zones by year of the decree is presented in Table A1.

For the purpose of this study, I classify investment as *tax haven FDI* if it comes from the country (territory) that has ever been part of the offshore list. I code firm-years as *tax haven FDI* if a firm is foreign and offshore in year t and *not tax haven FDI* if a firm has investors from countries other than offshore.

Figure 1 on the evolution of the foreign ownership in the sample illustrates that the share of foreign firms has been increasing from zero in 1999 to more than 5 percent in 2013. The increase has resulted from the rise in both non-tax haven and tax haven foreign investors, with the latter rising steadily after 2007 and reaching almost 2 percent in 2013. The extent of tax haven FDI in the sample is substantially larger if we look at the share of employment accounted by firms with tax haven investors, reflecting the relatively larger size of the firms acquired by tax haven investors. For example, firms with tax haven investors accounted for 9% of sample employment in 2013.

It is important to note that the effect of foreign ownership will be identified from the firms that switched from domestic to tax haven or/and non tax haven ownership between 1999 and 2013. Table 1 shows that the sample includes 10,926 firms that have been acquired by foreign investors and although we observe the largest number of firms switching to non tax-haven foreign ownership (8,097 firms between 1999 and 2013), the sample includes more than 3,000 firms that were acquired by tax haven investors during the sample period.

There are 673 firms that have been acquired by both tax haven and non-tax haven investors. For the main results, I include those firms in the sample, but robustness analysis also includes results using the sample without those firms as well as sample allowing each firm to have only one

[9] Bank for International Settlements Monetary and Economic Department, 2012, Guidelines to the international locational banking statistics p.28, http://www.bis.org/statistics/locbankstatsguide.pdf

[10] Cabinet of Ministers Decree N106-p approved on March 11, 2000: http://zakon3.rada.gov.ua/laws/show/106-2000-%D1%80

type of foreign investor[11]. For all firms in the sample, the average length of the panel is 8 years and for the acquired firms, the time series before and after acquisition is on average 3 years and 4 years, respectively.

Figure 1. Share of Foreign Acquisitions by Year

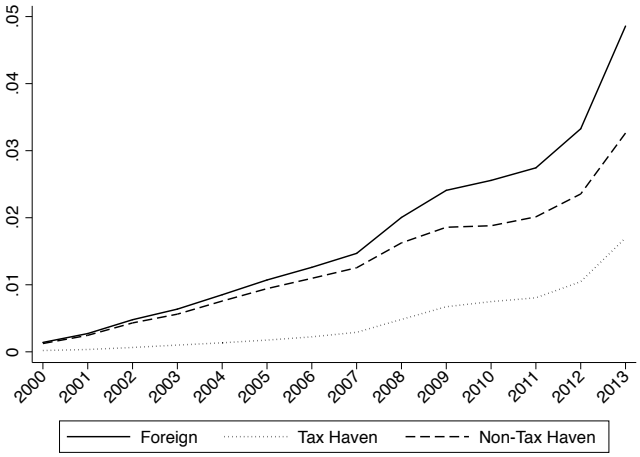


Figure 1 is based on the regression sample.

Table 1. Number of Foreign Acquisitions by Year

Acquisition year	Total FDI	Tax haven	Non-tax haven FDI
1999	181	24	161
2000	235	31	213
2001	405	59	365
2002	381	75	328
2003	544	92	492
2004	575	115	489
2005	575	128	491
2006	698	182	586
2007	1357	466	985
2008	1056	401	729
2009	624	262	413
2010	745	201	576
2011	1,048	445	677
2012	2,502	1,052	1,592
Total	10,926	3,533	8,097

Note that the sum of firms acquired by tax haven and non-tax haven foreign investors is not equal to total FDI, because the sample includes 1) firms that have both types of FDI and 2) firms that switch from one type to another type of FDI.

[11] Here I assume that firm had only non-tax haven investor for the firm-years when the firm had both types of investors.

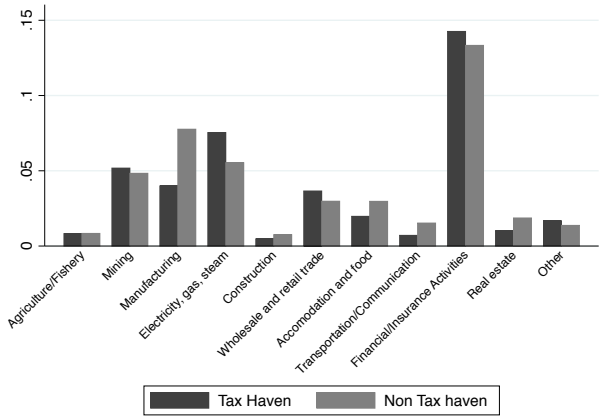
The summary statistics presented in Table 2 suggests that foreign firms differ systematically from always-domestic firms and the difference is more pronounced for firms acquired by investors from tax havens. The table illustrates that firms acquired by foreign investors tend to be larger (in terms of employment, sales, and capital) and better performing (measured by labor productivity). Among all foreign, the firms acquired by *tax haven investors* tend to be larger and more productive than the firms acquired by non-tax haven investors. Comparisons of simple averages say little about the direction of the causality: the differences may imply substantial foreign ownership premium, but also can signal about the cherry picking by foreign investors. To address the direction of causality, I utilize the longitudinal structure of the data and control for a rich set of industry, year and firm specific fixed effects and trends. Additionally, I combine propensity score matching with the difference-in-differences approach to account for the residual selection into tax haven and non-tax haven ownership. Comparison of standard deviations of all variables across the investor types shows that there is large variation of labor productivity among firms with tax haven investors. Closer look at the data illustrates that the small firms with large sales in the service sector drive this variation. Therefore, I also conduct a robustness check restricting the sample to firms with employment larger than 5 employees in any year.

Table 2. Summary Statistics

Variable	***Domestic***		***Foreign***		***Non-tax haven***		***Tax haven***	
	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
Employment	41	546	156	1,028	139	1,001	300	1,288
Sales	6,871	210,264	62,792	577,937	51,923	506,489	126,541	843,735
Total assets	3,107	162,377	17,925	223,957	15,290	221,993	38,195	267,375
Labor productivity	349	9,497	1,005	14,776	736	6,684	1,652	24,209

The sample includes 56 2-digit NACE industries with at least one firm acquired by a foreign investor. Figure 2 shows that the sectors with the largest share of employment accounted by tax havens are financial and insurance activities (14 percent), electricity, gas, steam (8 percent), mining (5 percent) and manufacturing (4 percent). Within these sectors, mining of metal ores (70 percent), insurance services (58 percent), mining of coal (50 percent) and manufacturing of coke and refined petroleum products (37 percent) are the industries with the overwhelming shares of employment accounted by the firms with tax haven investors (see Figure A1 for details).

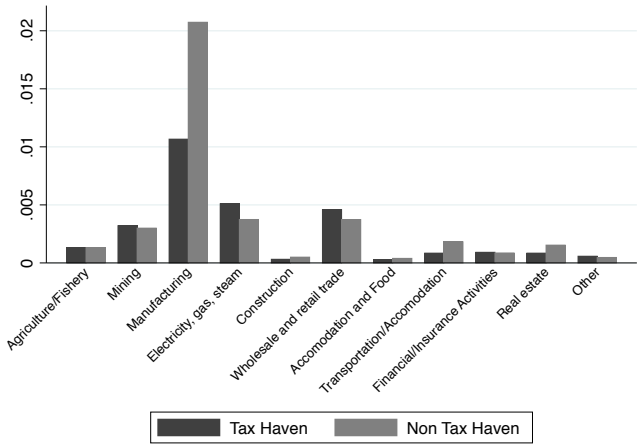
Figure 2. Share of Sector Employment Accounted by Firms with Tax Haven and Non-Tax Haven Investors



The shares are calculated as a ratio of sector employment accounted by tax haven (non-tax haven) firms to the total employment in the same sector.

However, if we look at the shares of tax haven firms relative to the total employment in the sample displayed in Figure 3, tax haven firms in manufacturing (2 percent), electivity, gas and steam (0.5 percent) and wholesale and retail trade (0.4 percent) account for the largest shares of total employment in the sample.

Figure 3. Share of Sample Employment Accounted by Firms with Tax Haven and Non-Tax Haven Investors, by Sector



The shares are calculated as a ratio of sector employment accounted by tax haven (non-tax haven) firms to the total employment in the sample.

3. Empirical strategy

The identification problem of estimating the effect of foreign acquisitions is that one cannot observe what would happen to the performance of foreign acquired firm had it stayed domestic. Comparing the unconditional means of foreign and domestic firms suggests large differences between domestic and foreign (tax haven and non-tax haven) firms. These differences may signal about the selection of firms by foreign investors based on observable (for example, firm size, age and industry) and time-invariant unobservable characteristics. Foreign investors are likely to acquire better performing firms and those with better growth prospects (also referred to as "cherry picking") and thus post-acquisition performance might be result of selection rather than the change in ownership per se. As a result, within-firm variation in ownership may be correlated with the observable and unobservable firm characteristics. To account for differences in observable characteristics of treated and control firms, I exploit the long nature of my panel data by controlling for several types of fixed effects including 2-digit industry, year and firm fixed effects and trends. In addition, I construct matched samples using propensity score matching and estimate my basic equation on the sample of firms similar to those acquired by tax haven and non tax haven investors.

I start with estimating the following empirical model that relates foreign ownership to the performance outcomes:

$$Performance_{it} = \beta_1 FO_{it-1} + D_{jt}\gamma_{jt} + w_t a_i + \varepsilon_{it}, \quad (2)$$

where *i* indexes firms, *j* indexes industries, and *t* indexes years from 2000 to 2013. D_{jt} is a vector of industry-year interaction dummies, γ_{jt} is the associated vector of coefficients, and ε_{it} is an idiosyncratic error. By estimating equation (2), I establish the effect of all foreign acquisitions on outcome variables where FO is the firm-year varying dummy indicating if a firm has a foreign investor in year $t-1$. The next specification breaks down the foreign dummy into tax haven and non tax haven dummies:

$$Performance_{it} = \alpha_1 TaxFDI_{it-1} + \alpha_2 NonTaxFDI_{it-1} + D_{jt}\gamma_{jt} + w_t a_i + \varepsilon_{it}, \quad (3)$$

where $TaxFDI$ is the firm-year varying dummy indicating if a firm has a foreign investor in year $t-1$ from one of the countries listed in Table A1 and $NonTaxFDI$ equals one if a firm has a foreign investor in year $t-1$ from a country other than the ones listed in Table A1. α_1 and α_2 are

coefficients of interest and estimate the effect of tax haven and non tax haven foreign acquisitions on firm performance.

Comparison group consists of the firm-years with no foreign participation. α_i is firm fixed effects and w_t is vector of time variables. First, I estimate (2) and (3) by ordinary least squares (*OLS*) on the full sample of firms (α_i=0 and w_t=0). *OLS* will provide the estimate of average performance differential and serve as a benchmark to compare with other methods and discern casual effects from selection. To account for self-selection bias that may arise from the fact that the choice of the acquisition target from the foreign investors is not random, I estimate (2) and (3) using fixed effect regressions (*FE*) on the full sample by controlling for firm fixed effects a_i ($w_t = 1$). Finally, *FE&FT* specification controls for firm specific random trends where $w_t = (1, \mathrm{t})$ such as $\boldsymbol{\alpha i} \equiv (\alpha_{1i}, \alpha_{2i})$ where α_{1i} is a fixed unobserved effect and α_{2i} is the random trend for firm *i*. The inclusion of firm specific time trends is referred by Wooldridge (2010) as a random growth model where we also control for firm specific time-invariant fixed effects. *FE&FT* model estimation is performed in two steps by detrending all variables for each firm separately and then estimating the model on the detrended data. In order to discriminate between *OLS*, *FE* and *FE&FT* model, I perform two specification tests. First, I perform F-test on the joint statistical significance of firm fixed effects and then conditional on including firm fixed effects, I test statistical significance of firm specific trends. Second, I conduct Hausman specification tests where I test the difference in the vector of coefficients between *OLS* and *FE* and then between *FE* and *FE&FT* models.

Propensity score matching

As an alternative to estimating basic equations on the full sample of firms, I apply propensity score matching (Rosenbaum and Rubin, 1983) to construct a matched sample that includes a set of control firms as similar as possible to those acquired by tax haven and non-tax haven investors. I limit my treated sample to the firms that have been acquired by either a tax haven or non-tax haven investor only once over the sample period. I also include only those acquired firms that have non-missing employment the year before the acquisition, two years before the acquisition and one year after the acquisition. I restrict the potential non-treated sample to always domestic firms that meet the same criteria of non-missing employment relative to the year when we include them as controls.

To obtain propensity scores, I estimate a multinomial logit model where the dependent

variable is the probability of the firm to stay domestic (=0), being acquired by a offshore investor (=1) and being acquired by other foreign investor (=2) and explanatory variables are observable firm characteristics in the pre-acquisition year such as firm's age and age squared, employment, labor productivity; employment, labor productivity and TFP growth back to $t-4$, year, region and 2-digit industry fixed effects as well as dummy indicating whether firms were ever state owned. For the employment, labor productivity and TFP growth, I also impute zeros in place of missing values and include dummies for such cases. I estimate separate multinomial logit for each performance variable (employment, labor productivity and total factor productivity) and then repeat the steps below for all three cases. The exact specifications for each multinomial logit and corresponding results are presented in Table A2.

Using propensity scores from multinomial logit, I impose common support assuring that no propensity score of a treated (non-treated) firm is higher than the highest non-treated (treated) firm propensity score, and no propensity score of a treated (non-treated) firm is lower than the lowest non-treated (treated) firm propensity score. Next, I exact match on industry and year and allow non-treated firms appear in the employment (labor productivity and TFP) regression as many times as they have treated firms to which they are matched. I allow multiple controls for each treated firm with the condition that the propensity score of each control firm lays within 5 percent bandwidth of the matched acquired firm. I weight each control inversely to the square difference between the control's propensity score and that of the matched acquired firm. In employment and productivity regressions each control is assigned a final weight which is their weight divided by the sum of all weights for all controls for a particular treated firm and treated firm is given a weight of one.

To diagnose how well the matching is performed, I follow Imbens and Wooldridge (2009) and compute normalized mean differences in matching variables between treated and control groups before and after matching. Tables A3 through A5 show that all normalized differences are less than 0.25 which is the threshold reported in Imbens and Wooldridge (2009). Matching also reduces number of treated firms from 10,269 to 8,584 (employment), 9,176 (labor productivity) and 8,387 (total factor productivity) as on average 1,800 firms are not matched to domestic ones based on the matching algorithm.

4. Results

Table 3 presents the set of results on employment. The results in Panel A imply an 0.840 foreign ownership employment premium in the *OLS* specification while controlling for firm fixed effects reduces the differential to 0.295. Further accounting for the firm heterogeneity in growth trajectories reduces the differential to 0.075 percent, but it remains significant at 0.01 level. The comparison of *OLS*, *FE* and *FE&FT* results imply positive selection of firms into foreign ownership based on firm-specific fixed effects and growth trajectories as controlling for firm specific fixed effects and trends reduces the magnitude of foreign ownership employment effect. Panel B further breaks down foreign ownership into tax haven FDI and non tax haven FDI. *OLS* results confirm the evidence from the summary statistics that firms acquired by tax haven investors tend to be larger than always domestic firms as well as firms acquired by non-tax haven investors. Controlling for specific fixed effects reduces estimated tax haven employment effect almost five times to 0.239 and non-tax haven effect reduces in half to 0.289. Further controlling for firm specific trends, the coefficients are essentially zero for tax haven FDI, but positive and significant for non-tax haven FDI (0.099).

Table 3. The Estimated Effect of Foreign Acquisitions on Employment

	Employment		
	OLS	***FE***	***FE&FT***
Panel A			
Foreign	0.840**	0.295**	0.075**
	(0.019)	(0.011)	(0.009)
R^2	0.200	0.157	0.046
Panel B			
Tax Haven Foreign	1.176**	0.239**	0.004
	(0.037)	(0.020)	(0.017)
Non-Tax Haven Foreign	0.697**	0.289**	0.099**
	(0.021)	(0.011)	(0.010)
R^2	0.201	0.157	0.046

Estimated coefficients (standard errors) for Eq.2 and Eq.3 in the text. *OLS* ordinary least squares, *FE* fixed effect. *FE&FT* firm fixed-effects and firm-specific trends. All equations control divestment period dummy. The number of firm-year observations is 2,475,279 and the number of firms is 315,783. Standard errors (corrected for firm clustering) are shown in parentheses. **=significant at 0.01.

The second outcome of interest is labor productivity. Panel A of the Table 4 implies positive and significant labor productivity effect of foreign acquisitions across all

specifications. Comparison of *OLS* estimate of 0.699 with *FE* estimate of 0.168 and *FE&FE* estimate of 0.101 indicates the selection of more productive firms into foreign ownership. Further break down of foreign ownership by the investor origin shows that there is more selection going on among firms acquired by investors from tax havens as *OLS* coefficients on tax haven (0.800) is more than six times larger than its *FE* coefficient (0.127) while *OLS* coefficient on non-tax haven (0.610) is less than four times larger than its *FE* coefficient (0.166). *FE&FT* specification further reduces the magnitude of both coefficients to 0.051 and 0.103 for tax haven and non-tax haven acquired firms, respectively. Overall labor productivity results are in line with employment results suggesting positive premium for both types of foreign ownership where the effect is larger for firms acquired by non-tax haven investors.

Table 4. The Estimated Effect of Foreign Acquisitions on Labor Productivity

	Labor Productivity		
	OLS	***FE***	***FE&FT***
Panel A			
Foreign	0.699**	0.168**	0.101**
	(0.016)	(0.014)	(0.014)
R^2	0.237	0.070	0.082
Panel B			
Tax Haven Foreign	0.800**	0.127**	0.051*
	(0.032)	(0.026)	(0.025)
Non-Tax Haven Foreign	0.610**	0.166**	0.103**
	(0.018)	(0.015)	(0.016)
R^2	0.237	0.070	0.082

Estimated coefficients (standard errors) for Eq.2 and Eq.3 in the text. *OLS* ordinary least squares, *FE* fixed effect. *FE&FT* firm fixed-effects and firm-specific trends. The number of firm-year observations is 2,475,279 and the number of firms is 315,783. Standard errors (corrected for firm clustering) are shown in parentheses. **=significant at 0.01.

The next set of results is based on the estimation of basic equations (2) and (3) with total factor productivity (TFP) as dependent variable. Table 5 reports positive TFP differential of 42 percent in the *OLS* specification for the firms acquired by any foreign investors. Similar to employment and labor productivity results, the coefficients of *FE* and *FE&FT* specifications suggest smaller productivity premium of about 10 percent, Firms acquired by non-tax haven investors are likely to experience larger productivity boost of 10 to 11 percent compared to

domestic firms while those acquired by tax haven investors tend to experience smaller significant effect of 8 percent in *FE* and not significant 4 percent in *FE&FT*.

Table 5. The Estimated Effect of Foreign Acquisitions on Total Factor Productivity

	Total Factor Productivity		
	OLS	***FE***	***FE&FT***
Panel A			
Foreign	0.422**	0.111**	0.092**
	(0.015)	(0.013)	(0.014)
R^2	0.598	0.394	0.290
Panel B			
Tax Haven Foreign	0.421**	0.075**	0.040
	(0.031)	(0.025)	(0.025)
Non-Tax Haven Foreign	0.384**	0.114**	0.098**
	(0.017)	(0.014)	(0.015)
R^2	0.598	0.394	0.290

Estimated coefficients (standard errors) for Eq.2 and Eq.3 in the text. *OLS* ordinary least squares, *FE* fixed effect. *FE&FT* firm fixed-effects and firm-specific trends. The number of firm-year observations is 2,475,279 and the number of firms is 315,783. Standard errors (corrected for firm clustering) are shown in parentheses. **=significant at 0.01.

Matching results

Table 6 extends the baseline results by restricting the analysis to the matched sample. I find that employment, labor and total factor productivity differentials are 30, 24 and 17 percent for the non-tax haven acquired targets and 18, 17 and 12 percent for tax haven acquired firms. This means that having accounted for the pre-acquisition difference between both types of targets and always domestic firms, non-tax haven acquired firms exhibit 40 and 30 percent higher employment and productivity compared to tax haven acquired firms.

To further investigate the dynamics of acquisition effects as well as test for the quality of the matching, I estimate a dynamic version of the baseline equation by allowing tax haven (non-tax haven) coefficient to vary by year before and after acquisition. The base category is the acquisition year. Although I estimate this model by including all 13 years pre-acquisition and 14 years post-acquisition, I report coefficients from 5 years before and 5 years after acquisition only, because the number of firms beyond this range is relatively low thus leading to imprecisely estimated coefficients.

Table 6. The Estimated Effect of Foreign Acquisitions using Matched Sample

	Employment	*LP*	*TFP*
Panel A			
Foreign	0.269**	0.225**	0.158**
	(0.015)	(0.014)	(0.013)
R^2	0.485	0.424	0.300
Panel B			
Tax Haven Foreign	0.176**	0.174**	0.120**
	(0.028)	(0.029)	(0.027)
Non-Tax Haven Foreign	0.298**	0.240**	0.169**
	(0.017)	(0.015)	(0.014)
R^2	0.486	0.424	0.300
# of tax haven firms	2,493	2,616	2,371
# of non-tax haven firms	6,091	6,560	6,016
# of domestic firms	187,111	191,972	169,733

All regression control for matched group fixed effects and industry-year fixed effects. Standard errors (corrected for firm clustering) are shown in parentheses. **=significant at 0.01.

Figure 4 displays the estimation results for employment sample and shows that all pre-acquisition coefficients for both types of targets are small and insignificant except for the coefficient in the pre-acquisition year for non-tax haven acquired targets which appears to be significant but small. Despite its significance, the estimation shows a large jump to 21 percent employment differential in the first year after acquisition. The differential widens in the subsequent years reaching 36 percent in the fifth year after acquisition. For the non-tax haven targets, initial jump in the first year is 15 percent that is smaller than for tax haven acquired firms. Although increasing in the second and third year after acquisition, we don't observe a monotonic increase in the next several years with effect becoming small and insignificant five years after acquisition.

Figures 5 and 6 summarize the dynamic effects for labor productivity and total factor productivity. Although the quality of matching is slightly worse than for employment sample, the results suggest similar dynamics of differentials for both productivity outcomes. Specifically, non tax haven acquired firms experience initial jump in labor and total factor productivity of 18 and 12 percent, respectively and the effect increases each subsequent year reaching 30 and 20 percent in five years after acquisition. Tax haven acquired firms experience initial labor productivity jump of 20 percent in the first year after acquisition but fail go beyond 19 percent in the subsequent years. Total factor productivity dynamics for tax haven acquired firms follows similar trend where initial

effect of 11 percent, although being very close to the one of non-tax haven acquired firms, is only slightly higher in the subsequent post-acquisition years.

Figure 4. Estimated Employment Effect by Years before/since Acquisition

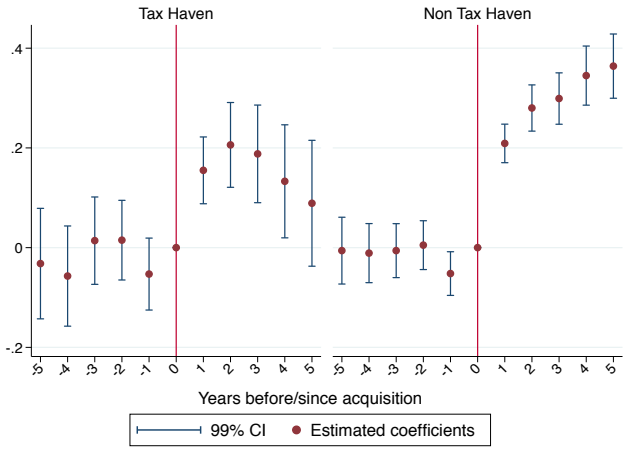


Figure 5. Estimated Labor Productivity Effect by Years before/since Acquisition

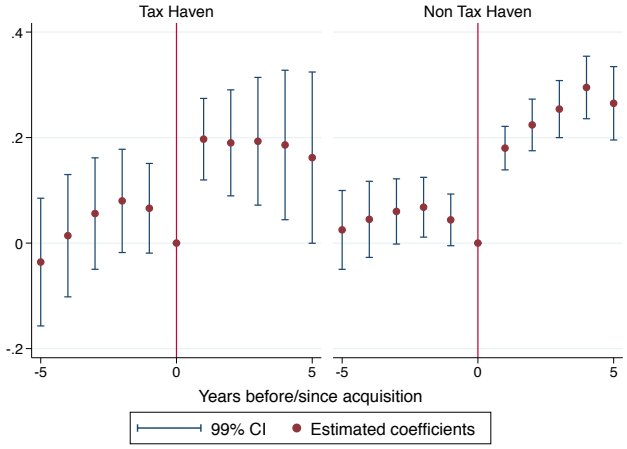
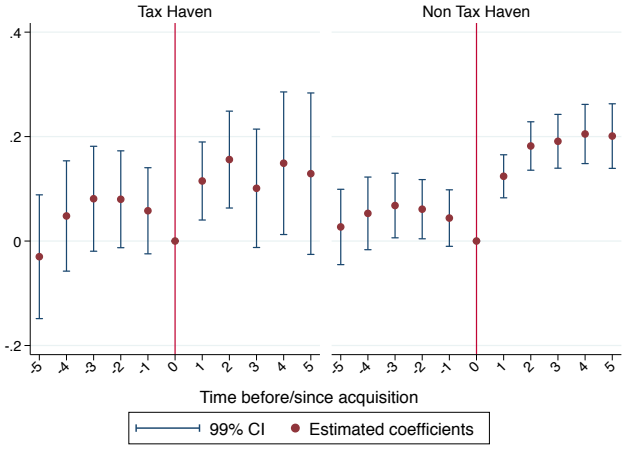


Figure 6. Estimated Total Factor Productivity Effect by Years before/since Acquisition



Robustness analysis

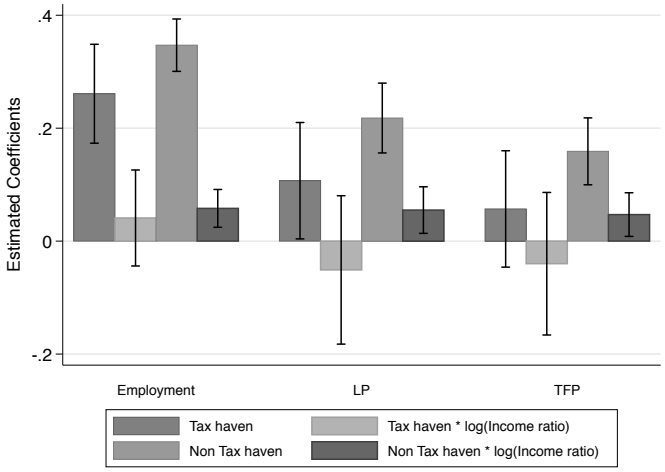
One alternative explanation of the larger effect of non-tax haven FDI might be that non-tax haven investors tend to come from more advanced economies compared to tax haven investors. As a result, they might be likely to bring more advanced technologies and increase productivity more than investors from tax havens merely because of superior technological capabilities. Although not the main focus, some studies including Harris and Robinson (2003), Chen (2011) and Earle and Telegdy (2018) distinguish between the FDI source countries and find that firms acquired by investors from countries with higher GDP per capita, OECD countries and industrialized countries experience larger wage, productivity, employment and sales effects in the post-acquisition period. To address this concern, I estimate triple difference model where I include interactions between tax haven FDI (non-tax haven FDI) dummy and the proportionate difference between GDP per capita of the investor country (tax haven or non-tax haven) and GDP per capita of the US in the acquisition year. If a firm has more than one tax haven (non-tax haven) investor's country in the acquisition year, I use GDP per capita of the wealthiest country. For example, if an investor from Cyprus has acquired a Ukrainian firm in 2010, I take a log of ratio of Cypriot to the US GDP per capita in 2010 and interact it with the tax haven FDI dummy. The estimating equation is the following:

$$Y_{it} = \alpha_1 Tax_{it-1} + \alpha_2 NTax_{it-1} + \alpha_3 Tax_{it-1} * \log\left(\frac{GDPCtax_{i.acq}}{GDPCU_{i,acq}}\right) + \alpha_4 NTax_{it-1} * \log\left(\frac{GDPCntaxi_{i,acq}}{GDPCU_{i,acq}}\right) + D_{jt}\gamma_{jt} + w_t a_i + \varepsilon_{it}, \quad (4)$$

where $GDPCtax$ and $GDPCntax$ is GDP per capita of the wealthiest tax haven investor's and non tax haven investor's country, respectively, measured in the acquisition year; $GDPU$ is GDP per capita of the US in the acquisition year. Note that coefficients α_1 and α_2 measure effects of tax haven and non-tax haven FDI where the log ratio of incomes is 0 which is not possible in our sample.

The results presented in Figure 7 suggest that even controlling for the investor country income, non-tax haven acquired firms exhibit larger employment and productivity effects compared to non-tax haven firms. Specifically, estimation show employment premium of 35 and 26 percent for non-tax haven and tax haven acquired firms, respectively. Results on productivity

Figure 7. Estimated Effect of Foreign Acquisitions and Income of Investor Country



Estimated coefficients with 99% confidence intervals for Eq.4 in the text.

suggest larger differential between two types of firms where LP effect for non-tax haven acquired firms is as twice as large as for tax haven firms. In the TFP regression, only non-tax haven FDI has positive and significant effect of 16 percent. As expected, the interaction between non-tax haven dummy and income ratio is significant and positive in all three cases suggesting that FDI from non-tax haven countries with higher GDP per capita has additional positive effect on employment and productivity. Meanwhile, the interaction between tax haven dummy and income ratio is always not significant suggestion that it does not matter if one receives investment from tax haven country with high or low GDP per capita. The latter result is likely to be in line with the extensive evidence from numerous journalist investigations that it is non-residents who usually invest through tax havens, with round-tripping being a special case of this phenomena.

5. Conclusions

Using longitudinal data on more than 300,000 Ukrainian firms over period of 1999-2013 representing more than 10,000 acquisitions by foreign investors, this study estimates the extent to which tax haven ownership affects employment and firm productivity in the post-acquisition period. Controlling for a rich set of fixed effects and employing propensity score matching, I find that firms acquired by foreign investors experience boost in employment of 8-30%, labor productivity of 10-16% and total factor productivity of 9-11% relative to firms that stay domestic. The gap is much lower for firms acquired by investors from tax haven countries: focusing on the

most conservative specification that controls for firm specific fixed effects and growth trajectories, my results suggest that employment of tax haven acquired firms does not change in the post-acquisition period, while productivity improvement ranges from 4 to 5 percent. Meanwhile, firms acquired by non-tax haven investors, experience employment and productivity improvement of 10 percent.

Results using propensity score matching combined with difference-in-differences approach confirm the baseline results that tax haven acquired targets exhibit positive but lower employment and productivity improvement compared to non-tax haven acquired firms. Finally, this paper investigates whether the results are driven by the prevalence of high-income countries among non-tax haven investors. I find that even controlling for the income of investor country, firms acquired by tax haven investors experience lower performance boost. The results of this paper add to the timely discussion of the effects of tax havens on developing countries, by introducing new evidence on the overlooked aspect of this problem. This study suggests that the implications of tax havens go beyond the loss of tax revenue and might also include stunned growth of the domestic companies receiving FDI from tax havens.

References

Alstadsæter, Annette, Niels Johannesen, and Gabriel Zucman. "Who owns the wealth in tax havens? Macro evidence and implications for global inequality." *Journal of Public Economics*162 (2018): 89-100.

Arcand, Jean Louis, Enrico Berkes, and Ugo Panizza. "Too much finance?" *Journal of Economic Growth* 20, no. 2 (2015): 105-148.

Arnold, Jens Matthias, and Beata S. Javorcik. "Gifted kids or pushy parents? Foreign direct investment and plant productivity in Indonesia." *Journal of International Economics* 79, no. 1 (2009): 42-53.

Aykut, Dilek, Apurva Sanghi, and Gina Kosmidou. "What to do when foreign direct investment is not direct or foreign: FDI round tripping." (2017).

Bentivogli, Chiara, and Litterio Mirenda. "Foreign ownership and performance: evidence from Italian firms." *International Journal of the Economics of Business* 24, no. 3 (2017): 251-273.

Bilyk, Olga. "Foreign ownership and firm performance: A closer look at offshore-owned companies in Ukraine." *Kyiv School of Economics* (2009).

Blundell, Richard, and Monica Costa Dias. "Alternative approaches to evaluation in empirical microeconomics." *Journal of Human Resources* 44, no. 3 (2009): 565-640.

Boisot, Max, and Marshall W. Meyer. "Which way through the open door? Reflections on the internationalization of Chinese firms." *Management and Organization Review* 4, no. 3 (2008): 349-365.

Bulatov, Alexander. "Offshore orientation of Russian Federation FDI." *Transnational Corporations* 24, no. 2 (2017): 71-90.

Chen, Wenjie. "The effect of investor origin on firm performance: Domestic and foreign direct investment in the United States." *Journal of International Economics* 83, no. 2 (2011): 219-228.

Christensen, John, Nick Shaxson, and Duncan Wigan. "The finance curse: Britain and the world economy." *The British Journal of Politics and International Relations* 18, no. 1 (2016): 255-269.

Cobham, Alex, and Petr Janský. "Global distribution of revenue loss from corporate tax avoidance: re-estimation and country results." *Journal of International Development* 30, no. 2 (2018): 206-232.

Conyon, Martin J., Sourafel Girma, Steve Thompson, and Peter W. Wright. "The productivity and wage effects of foreign acquisition in the United Kingdom." *The Journal of Industrial Economics* 50, no. 1 (2002): 85-102.

Crivelli, Ernesto, Ruud A. De Mooij, and Mr Michael Keen. *Base erosion, profit shifting and developing countries*. No. 15-118. International Monetary Fund, 2015.

Dewit, Gerda, Chris Jones, and Dermot Leahy. "Does Tax Haven FDI Influence Firm Performance?." (2017).

Djankov, Simeon, and Bernard Hoekman. "Foreign investment and productivity growth in Czech enterprises." *The World Bank Economic Review*14, no. 1 (2000): 49-64.

Earle, John S., Álmos Telegdy, and Gábor Antal. "Foreign ownership and wages: Evidence from Hungary, 1986–2008." *ILR Review* 71, no. 2 (2018): 458-491.

Girma, Sourafel, and Holger Görg. "Evaluating the foreign ownership wage premium using a difference-in-differences matching approach." *Journal of International Economics* 72, no. 1 (2007): 97-112.

Girma, Sourafel, Holger Görg, and Mauro Pisu. "Exporting, linkages and productivity spillovers from foreign direct investment." *Canadian Journal of Economics/Revue canadienne d'économique* 41, no. 1 (2008): 320-340.

Guadalupe, Maria, Olga Kuzmina, and Catherine Thomas. "Innovation and foreign ownership." *American Economic Review* 102, no. 7 (2012): 3594-3627.

Helpman, Elhanan, Marc J. Melitz, and Stephen R. Yeaple. "Export versus FDI with heterogeneous firms." *American economic review* 94, no. 1 (2004): 300-316.

Hijzen, Alexander, Pedro S. Martins, Thorsten Schank, and Richard Upward. "Foreign-owned firms around the world: A comparative analysis of wages and employment at the micro-level." *European Economic Review* 60 (2013): 170-188.

Javorcik, Beata S. "Does FDI bring good jobs to host countries?" *The World Bank Research Observer* 30, no. 1 (2014): 74-94.

Javorcik, Beata S., and Mariana Spatareanu. "Does it matter where you come from? Vertical spillovers from foreign direct investment and the origin of investors." *Journal of Development Economics* 96, no. 1 (2011): 126-138.

Kamal, F. (2015). Origin of foreign direct investment and firm performance: Evidence from foreign acquisitions of Chinese domestic firms. *The World Economy*, *38*(2), 286-314.

Kirchner, Robert, Vitaliy Kravchuk, and Julian Ries. "Foreign Direct Investment in Ukraine: Past, Present, and Future." *Policy Paper Series PP/02/2015. German Advisory Group, Institute for Economic Research and Policy Consulting. Kyiv* (2015).

Lipsey, Robert E. "Home-and host-country effects of foreign direct investment." In *Challenges to globalization: Analyzing the economics*, pp. 333-382. University of Chicago Press, 2004.

Ledyaeva, Svetlana, Päivi Karhunen, Riitta Kosonen, and John Whalley. "Offshore foreign direct investment, capital round-tripping, and corruption: Empirical analysis of Russian regions." *Economic Geography* 91, no. 3 (2015): 305-341.

Melitz, Marc. "The impact of trade on aggregate industry productivity and intra-industry reallocations." *Econometrica* 71, no. 6 (2003): 1695-1725.

Meyer, Klaus E. "Institutions, transaction costs, and entry mode choice in Eastern Europe." *Journal of international business studies* 32, no. 2 (2001): 357-367.

National Bank of Ukraine. “Estimation of Round-Tripping Transactions in Ukraine, 2010-2018”. Kyiv, 2019.(https://bank.gov.ua/doccatalog/document?id=73913043)

Navaretti, Giorgio Barba, Anthony J. Venables, and Frank Barry. *Multinational firms in the world economy*. Princeton University Press, 2006.

OECD. "Benchmark Definition of Foreign Direct Investment." (2008).

Piscitello, Lucia, and L. A. R. I. S. S. A. RABBIOSI*. "The impact of inward FDI on local companies’ labour productivity: evidence from the Italian case." *International Journal of the Economics of Business* 12, no. 1 (2005): 35-51.

Sutherland, D., El-Gohari, A., Buckley, P. J., and Voss, H. 2010. The role of Caribbean tax havens and offshore financial centers in Chinese outward foreign direct investment

Sutherland, Dylan, and Lutao Ning. "Exploring ‘onward-journey’ODI strategies in China's private sector businesses." *Journal of Chinese Economic and Business Studies* 9, no. 1 (2011): 43-65.

Wooldridge, Jeffrey M. *Econometric analysis of cross section and panel data*. MIT press, 2010.

Zucman, Gabriel. "The missing wealth of nations: Are Europe and the US net debtors or net creditors?." *The Quarterly journal of economics* 128, no. 3 (2013): 1321-1364.

Appendix

Table A1. List of offshore zones

Country (territory)	2000	2001	2002	2003	2011	Country (territory)	2000	2001	2002	2003	2011
Alderney	x	x	x	x	x	Isle of Man	x	x	x	x	x
Andorra	x	x	x	x	x	Jersey Island	x	x	x	x	x
Anguilla	x	x	x	x	x	Labuan	x	x			
Antigua and Barbuda	x	x	x	x	x	Liberia	x	x	x	x	x
Antilles	x	x	x	x	x	Liechtenstein	x				
Aruba	x	x	x	x	x	Madeira	x	x			
Bahamas	x	x	x	x	x	Maldives			x	x	x
Bahrain	x	x	x	x	x	Malta	x	x			
Barbados	x	x	x	x	x	Marshall Islands	x	x	x	x	x
Belize	x	x	x	x	x	Mauritius	x	x			
Bermuda	x	x		x	x	Monaco	x	x	x	x	x
British Virgin Islands		x	x	x	x	Montenegro	x				
Campione	x	x				Montserrat			x	x	x
Cayman Islands	x	x		x	x	Nauru	x	x	x	x	x
Cook Islands	x	x	x	x	x	Niue	x	x	x	x	x
Costa Rica	x	x				Panama	x	x	x		
Cyprus	x	x	x			Puerto Rico				x	x
Damascus	x					Saint Lucia			x	x	x
Dominica			x	x	x	Samoa	x	x	x	x	x
Dominican Republic		x				Seychelles	x	x	x	x	x
Gibraltar	x	x	x	x	x	Singapore	x	x			
Grenada	x	x	x	x	x	St. Kitts and Nevis	x	x	x	x	x
Guernsey	x	x	x	x	x	St. Vincent and the Grenadines			x	x	x
Hong Kong	x	x				Turks and Caicos	x	x	x	x	x
Ireland	x					Vanuatu	x	x	x	x	x
						Virgin Islands	x	x	x	x	x

Figure A1. Industries with at least 10 percent of industry employment accounted by firms with tax haven investors

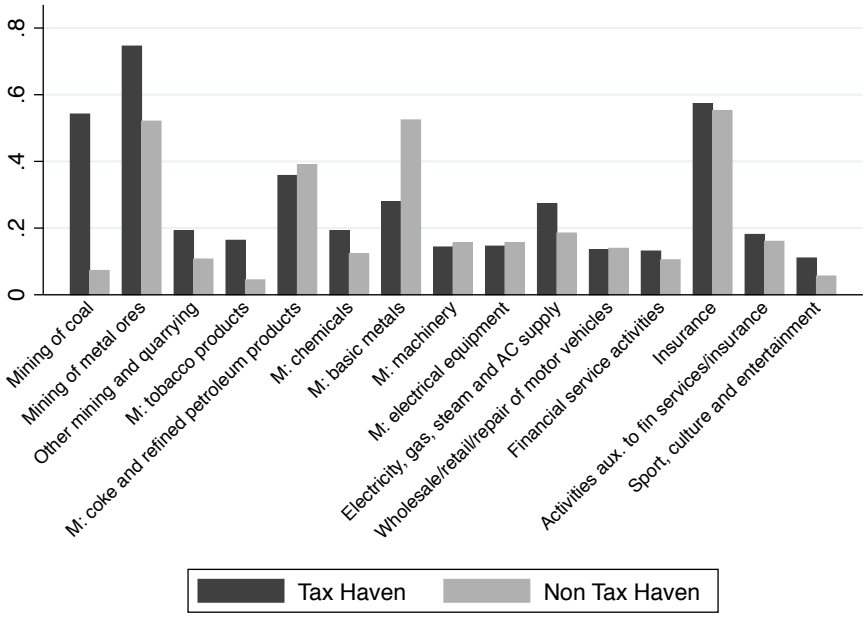


Figure A2. Share of Firms with Tax Haven and Non-Tax Haven Investors by Sector

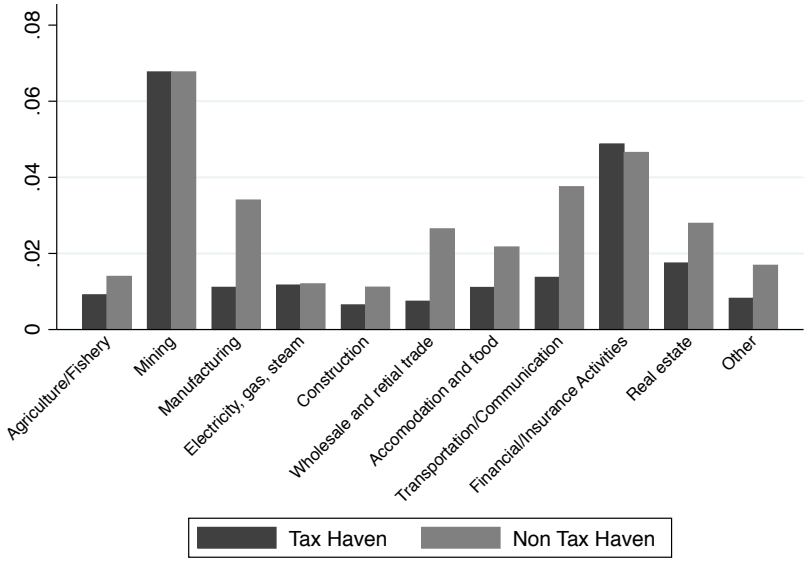


Table A2. Multinomial Logit Models of Foreign Acquisitions

	Employment		Labor Productivity		Total factor Productivity	
	Tax haven	Non tax haven	Tax haven	Non tax haven	Tax haven	Non tax haven
Log Emp t-1	0.471**	0.177**	0.283**	0.141**	0.548**	0.307**
	(0.016)	(0.011)	(0.017)	(0.012)	(0.015)	(0.010)
Log Emp t-1/t-2	0.251**	0.555**				
	(0.039)	(0.023)				
Log Emp t-2/t-3	0.147**	0.428**				
	(0.044)	(0.028)				
Log Emp t-3/t-4	0.267**	0.451**				
	(0.047)	(0.032)				
Log TFP t-1	0.151**	0.140**	-1.441**	-0.744**	0.169**	0.118**
	(0.020)	(0.011)	(0.067)	(0.039)	(0.021)	(0.012)
Log TFP t-1/t-2					0.105**	0.144**
					(0.034)	(0.020)
Log TFP t-2/t-3	-0.040	0.088**	0.122**	0.282**	0.007	0.125**
	(0.042)	(0.022)	(0.047)	(0.032)	(0.043)	(0.024)
Log TFP t-3/t-4	0.131**	0.092**			0.096*	0.077**
	(0.041)	(0.024)			(0.043)	(0.027)
Log LPt-1			1.570**	0.843**		
			(0.066)	(0.038)		
Log LP t-1/t-2			0.100**	0.143**		
			(0.031)	(0.018)		
Log LP t-2/t-3			0.029	0.130**		
			(0.037)	(0.020)		
Log LP t-3/t-4			0.119**	0.133**		
			(0.035)	(0.022)		
Ever state	-0.787**	-0.292**	-0.773**	-0.369**	-0.693**	-0.406**
	(0.093)	(0.055)	(0.093)	(0.055)	(0.093)	(0.056)
Age			0.118**	0.131**	-0.103**	-0.170**
			(0.029)	(0.021)	(0.034)	(0.024)
Age squared			-0.015**	-0.017**	-0.001	0.001
			(0.002)	(0.001)	(0.002)	(0.002)
Industry FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
N	1,521,717		1,727,611		1,557,301	

Table A3. Normalized Differences Before and After Propensity Score Matching: Employment Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Full sample					Matched sample							
	Non-treated	Treated		Ndiff		Non-treated	Treated	Ndiff	Non-treated	Treated	Ndiff	Percent reduction	
		Tax haven	Non-tax haven	(2) vs (1)	(3) vs (1)		Tax haven	(7) vs (6)		Non-Tax haven	(10) vs (9)	(8) vs (4)	(11) vs (5)
Log Emp t-1	2.344	3.023	2.484	0.287	0.068	2.899	3.045	0.062	2.443	2.493	0.025	78.25	63.00
Log Emp t-1/t-2	-0.052	0.126	0.145	0.211	0.248	0.127	0.189	0.068	0.168	0.249	0.091	67.74	63.20
Log Emp t-2/t-3	-0.042	0.093	0.103	0.174	0.190	0.083	0.132	0.061	0.094	0.12	0.035	64.84	81.59
Log Emp t-3/t-4	-0.041	0.047	0.067	0.118	0.154	0.057	0.068	0.014	0.075	0.071	-0.006	87.89	103.88
Log TFP t-1	0.05	0.584	0.503	0.239	0.221	0.459	0.599	0.063	0.462	0.526	0.031	73.58	85.99
Log TFP t-2/t-3	-0.057	-0.034	0.019	0.016	0.055	-0.044	-0.028	0.013	0.023	0.019	-0.004	18.65	106.32
Log TFP t-3/t-4	-0.056	0.016	-0.027	0.054	0.023	0.013	0.012	0.000	-0.02	-0.006	0.013	100.64	43.49
Ever state	0.111	0.071	0.065	-0.101	-0.117	0.076	0.07	-0.017	0.067	0.061	-0.019	82.82	84.03

Table A4. Normalized Differences Before and After Propensity Score Matching: Labor Productivity Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Full sample					Matched sample							
	Non-treated	Treated		Ndiff		Non-treated	Treated	Ndiff	Non-treated	Treated	Ndiff	Percent reduction	
		Tax haven	Non-tax haven	(2) vs (1)	(3) vs (1)		Tax haven	(7) vs (6)		Non-tax haven	(10) vs (9)	(8) vs (4)	(11) vs (5)
Log Emp t-1	2.344	3.023	2.484	0.287	0.068	2.915	3.026	0.047	2.504	2.472	-0.016	83.52	123.57
Log Emp t-1/t-2	-0.052	0.126	0.145	0.211	0.248	0.107	0.124	0.020	0.142	0.143	0.001	90.55	99.46
Log Emp t-3/t-4	-0.041	0.047	0.067	0.118	0.154	0.079	0.051	-0.037	0.076	0.066	-0.014	131.06	108.99
Log TFP t-1	0.050	0.584	0.503	0.239	0.221	0.545	0.600	0.025	0.446	0.518	0.035	89.67	84.31
Log LPt-1	4.411	5.452	5.294	0.415	0.372	5.336	5.462	0.051	5.236	5.319	0.035	87.71	90.58
Log LP t-1/t-2	0.010	0.121	0.154	0.069	0.097	0.099	0.122	0.014	0.097	0.138	0.028	79.60	70.74
Log LP t-2/t-3	0.020	0.048	0.115	0.019	0.067	0.069	0.039	-0.021	0.081	0.111	0.020	211.49	69.61
Log LP t-3/t-4	0.027	0.084	0.055	0.041	0.021	0.064	0.088	0.017	0.046	0.061	0.011	57.53	48.94
Age	4.595	5.184	4.295	0.113	-0.061	5.372	5.301	-0.014	4.802	4.490	-0.064	112.14	5.40
Ever state	0.111	0.071	0.065	-0.101	-0.117	0.071	0.069	-0.006	0.074	0.062	-0.043	93.91	63.36

Table A5. Normalized Differences Before and After Propensity Score Matching: Total Factor Productivity Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Full sample					Matched sample							
	Non-treated	Treated		Ndiff		Non-treated	Treated	Ndiff	Non-treated	Treated	Ndiff	Percent reduction	
		Tax haven	Non-tax haven	(2) vs (1)	(3) vs (1)		Tax haven	(7) vs (6)		Non-tax haven	(10) vs (9)	(8) vs (4)	(11) vs (5)
Log Emp t-1	2.344	3.023	2.484	0.287	0.068	2.932	3.029	0.042	2.51	2.485	-0.011	85.30	117.50
Log TFP t-1	0.05	0.584	0.503	0.239	0.221	0.591	0.599	0.004	0.521	0.525	0.002	98.23	99.18
Log TFP t-1/t-2	-0.06	0.052	0.064	0.071	0.087	0.025	0.053	0.018	0.064	0.064	0.000	74.29	99.53
Log TFP t-2/t-3	-0.057	-0.034	0.019	0.016	0.055	-0.007	-0.037	-0.021	0.039	0.036	-0.002	229.73	102.79
Log TFP t-3/t-4	-0.056	0.016	-0.027	0.054	0.023	-0.007	0.021	0.020	-0.026	-0.013	0.010	62.72	54.71
Age	4.595	5.184	4.295	0.113	-0.061	5.327	5.294	-0.006	4.594	4.527	-0.014	105.45	77.06
Ever state	0.111	0.071	0.065	-0.101	-0.117	0.07	0.069	-0.002	0.073	0.061	-0.040	98.41	65.74

Table A6. The Estimated Effect of Foreign Acquisitions, Firms with min employment >=5

	Employment			Labor productivity			Total factor productivity		
	OLS	FE	FE&FT	OLS	FE	FE&FT	OLS	FE	FE&FT
Tax haven foreign	1.106**	0.176**	0.017	0.645**	0.090**	0.000	0.434**	0.075**	0.002
	(0.043)	(0.022)	(0.017)	(0.038)	(0.027)	(0.025)	(0.038)	(0.027)	(0.025)
Non-tax haven foreign	0.598**	0.273**	0.080**	0.607**	0.172**	0.071**	0.464**	0.147**	0.068**
	(0.026)	(0.014)	(0.012)	(0.024)	(0.018)	(0.018)	(0.023)	(0.018)	(0.017)
R^2	0.205	0.145	0.081	0.339	0.106	0.124	0.616	0.393	0.333

Estimated coefficients (standard errors) for Eq.2 and Eq.3 in the text. *OLS* ordinary least squares, *FE* fixed effect. *FE&FT* firm fixed-effects and firm-specific trends. Sample includes firms with at least 5 employees in all years. The number of firm-year observations is 979,326 and the number of firms is 116,088. Number of tax haven firms is 1,855 and number of non tax haven firms is 3,540. Standard errors (corrected for firm clustering) are shown in parentheses. **=significant at 0.01.

Table A7. The Estimated Effect of Foreign Acquisitions, Firms with max employment >=5

	Employment			Labor productivity			Total factor productivity		
	OLS	FE	FE&FT	OLS	FE	FE&FT	OLS	FE	FE&FT
Tax haven foreign	1.159**	0.257**	0.008	0.785**	0.124**	0.048	0.445**	0.073**	0.039
	(0.038)	(0.022)	(0.018)	(0.033)	(0.026)	(0.025)	(0.032)	(0.025)	(0.025)
Non-tax haven foreign	0.622**	0.316**	0.108**	0.615**	0.172**	0.101**	0.415**	0.120**	0.095**
	(0.021)	(0.012)	(0.011)	(0.019)	(0.015)	(0.016)	(0.018)	(0.015)	(0.016)
R^2	0.185	0.163	0.050	0.255	0.073	0.087	0.601	0.433	0.321

Estimated coefficients (standard errors) for Eq.2 and Eq.3 in the text. *OLS* ordinary least squares, *FE* fixed effect. *FE&FT* firm fixed-effects and firm-specific trends. Sample includes firms with at least 5 employees in all years. The number of firm-year observations is 2,134,647 and the number of firms is 255,311. Number of tax haven firms is 3,114 and number of non-tax haven firms is 7,052. Standard errors (corrected for firm clustering) are shown in parentheses. **=significant at 0.01.