

At a cost: The real effect of transfer pricing regulations on multinational investments

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At A Cost: the Real Effect of Transfer Pricing Regulations on Multinational Investment

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Extended Abstract

This issue of tax-motivated income shifting within multinational firms – or “base erosion and profit shifting” (BEPS) – has attracted increasing global attention in recent years. By exploiting differences between the tax system of two different jurisdictions, multinationals can often reduce their tax liabilities in either or both countries. For example, recent empirical evidence suggests that German MNCs paid 27 percent less in taxes than a group of comparable domestic firms in 2007 (Finke, 2013). In the UK, taxable profits relative to total assets reported by foreign multinational subsidiaries are 12.8 percentage points lower than those of comparable domestic standalones, based on analysis using UK corporate tax return data (Habu, 2016).

In response, many countries have implemented policies to limit the extent of profit shifting by multinationals—for example transfer pricing regulations or thin capitalization rules—with the objective of raising domestic revenue collection and curbing unfair competition that affects the profitability and growth of domestic firms competing with lower-taxed multinationals (OECD, 2013; Fuest et al, 2013). However, multinationals are often at the global productivity frontier, providing positive externalities for other firms in the local economy (Andrews et al, 2015). Because multinationals are often more mobile than domestic firms, the potential benefits of anti-avoidance legislation could be undone if multinationals respond by cutting their investment and reducing their presence in the local economy. In consequence, “*unilateral movement to restrict opportunities for tax planning might affect multinationals investment and reinforce tax competition...*” (Keen, 2001; Janeba and Smart, 2003; Peralta et al, 2006; Bucovetsky and Haufler, 2008)

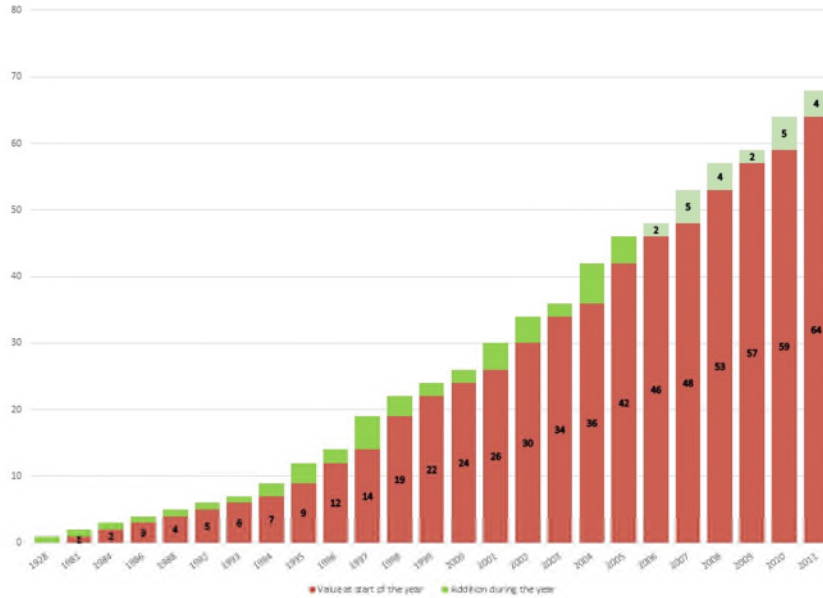
Though this important issue has largely been ignored in the current policy debate, we consider in this paper the impact of anti-avoidance regulations on investment in fixed assets by multinationals in the introducing countries, using variation in the introduction and enforcement of transfer pricing regulations and thin capitalization rules (Figure 1). Data on

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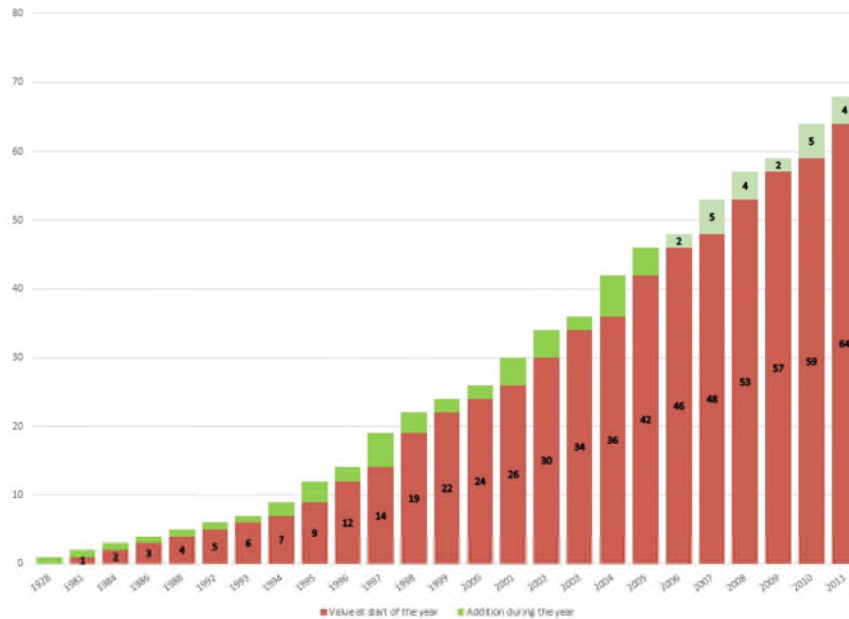
transfer pricing regulation are from Mescall and Klassen (2014), while data on thin capitalization rules are from the IMF's Fiscal Affairs Department database.

Figure 1. Worldwide Introduction of Anti-Avoidance Measures

Panel A. Transfer Pricing Regulations



Panel B. Thin Capitalization Rules



Theoretical Consideration. We first illustrate the impact of anti-avoidance measure on the scale of multinational in a simple framework similar to that in Crevelli et al (2015), distinguishing the differential impact of anti-avoidance measure on the scale of real

investment by multinational affiliates in the host country, and on the scale of real investment worldwide by the multinational group. It does so by adding the possibility of profit shifting to the standard model for analyzing international tax effects of real investment (Zodrow and Mieskowski (1986) and Wilson (1986)), while allowing for anti-avoidance measures to increase the cost of profit shifting. Specifically, the model predicts that the scale of real investment by multinationals would decrease unambiguously in the strictness of the anti-avoidance rules. On the other hand, the impact of any change in the anti-avoidance measure in country i on the scale of total investment by the multinational group would depend on a number of additional factors, including how the introduction of the anti-avoidance measures affects the difference between the after-tax rate of return in country i and the after-tax rate of return in the global capital market.

Data. Our primary dataset for empirical analysis is an unbalanced panel of 130,062 companies in 29 countries for the years 2006 to 2014. It is constructed by using unconsolidated financial statements of affiliates of domestic and multinational company groups in the commercial ORBIS database provided by Bureau van Dijk. A company is defined as a multinational affiliate if it has an ultimate parent company owning at least 50% of its shares and locating in a foreign country. A company is defined as a domestic affiliate if it has an ultimate parent company (owning at least 50% of its shares) locating in the same country, and all the other affiliates of its parent company are located in the same country.²

The main accounting variables are investment in fixed capital assets, sales, cash ow, and earnings before interest and tax (EBIT). We compute investment spending (I_t) as changes in fixed capital assets (including the net book values of tangible and intangible fixed assets) plus depreciation, i.e. $K_{t+1} - K_t + depreciation$, where K_t denotes the book value of fixed asset in year t . Gross investment rate, $Investment_t$, is defined as the ratio between current-year gross investment spending and beginning-of-year net fixed capital asset. Sales refers to operating revenue and profit margin is calculated as earnings before interest and tax (EBIT) divided by sales. All ratio variables are winsorized at top and bottom 0.01 percentile to minimize influence of outliers. Data on other country-level variables including the statutory corporate tax rate and macroeconomic characteristics (including GDP per capita, the growth rate of GDP per capita, population and unemployment rate, that capture the aggregate market size and demand characteristics in the host country) are from the IMF's World Economic Outlook database. Table 1 present the summary statistics of the key variables used in the regression analysis.

² The comparison is thus between investment by multinationals and by domestic group, excluding all independent, stand-alone companies.

Table 1. Summary Statistics

Variables:	Mean	Std Dev	Median	P10	P90
<i>Firm-level variables:</i>					
Investment spending (\$1,000)	3,803	113,500	95.49	-59.59	3,398.20
Fixed Asset (\$1,000)	29,941	557,200	959.15	33.31	22,601.34
Investment rate (I_t/K_{t-1})	0.34	0.54	0.15	-0.06	1.02
Operating Revenue (\$1,000)	101,900	101,900	8,607	824	114,100
Cash flow rate	0.10	19.11	0.00	0.00	0.05
Profitability	0.09	0.17	0.06	-0.03	0.25
Sales Growth Rate (%)	6.34	30.06	2.66	-25.23	40.21
<i>Country-level variables:</i>					
CIT rate	0.28	0.06	0.28	0.19	0.33
Population (million)	36.64	28.38	44.36	5.40	63.70
Unemployment Rate (%)	9.36	5.06	8.10	4.87	17.88
Exchange rate (rel to USD)	28.24	149.31	0.75	0.68	7.65
GDP per capita	703,205	3,463,469	32,270	21,991	597,175
GDP Growth Rate (%)	0.97	2.89	1.24	-2.94	4.05

Empirical Strategy. We use a difference-in-difference (DD) to identify the causal effect of transfer pricing regulation on multinational investment, by exploiting plausibly exogenous time-series variation in the effective cost of capital following the introduction of TPR in many countries. Intuitively, if adoption of a TPR raises the effective cost of capital for multinationals, we would expect a subsequent reduction in their investment relative to investment by domestic company groups. Formally, we test the investment response in the standard DD specification:

$$Investment_{ikt} = a_i + d_t + \beta_{tp}MNC_i \times TPR_{kt} + \beta_X X_{ikt} + \beta_Z Z_{kt} + \varepsilon_{ikt}, \quad (1)$$

where i indexes firms, k indexes host countries, and t indexes time. The dependent variable $Investment_{ikt}$ denotes gross/net investment scaled by book value of fixed capital asset in (end of) year $t-1$. We control explicitly in this specification changes in investment due to other non-tax factors, by using a control group of domestic company group in the same host country which are exposed to aggregate shocks similar to those experienced by the multinationals and controls for additional non-tax determinants of firm-level investment. The

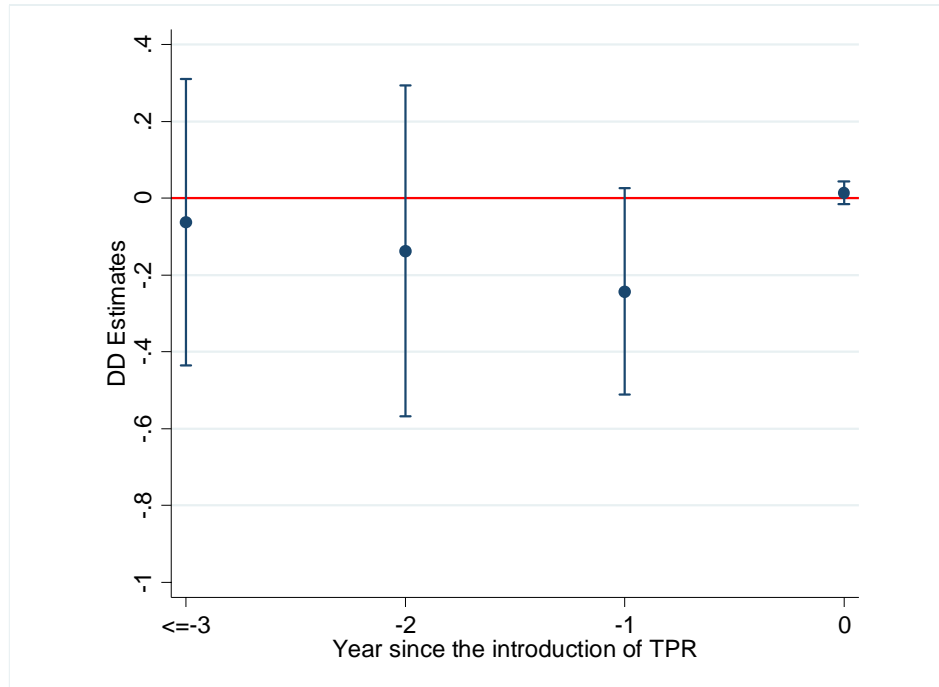
key variable of interest, TPR_t , is an interaction term between two indicators: an indicator equal to one for multinational affiliates and zero otherwise (MNC_i), and an indicator equal to one following the introduction of some transfer pricing regulation and zero otherwise (TPR_{kt}). The coefficient β_{tp} represents the difference-in-different estimate of the effect of transfer pricing regulation on investment by multinational affiliates, and is expected to be negative following theoretical discussion.

Throughout the various specifications based on equation (1), a full set of firm fixed effects (a_i) is always included to control for unobserved heterogeneity in firm-level productivity and in their parent company characteristics. Firm fixed effects further subsume host-country fixed effects (given that affiliates do not change their location), controlling for time-invariant differences across host countries that may affect the location choice of multinationals. These considerations could include, for example, perceived average quality of governance during the sample period, common language and/or former colonial ties with the home country, and geographical distance between the home and host country. We also include a full set of time dummies (d_t) to capture the effect of aggregate macroeconomic shocks, including the effect of the great recession, that are common to both multinational and domestic companies. X_{ikt} denotes a vector of firm-level non-tax determinants of investment including proxies for firm size, degree of financial constraints, and profitability, and ε_{ikt} is the error term.

Most specifications include the statutory corporate tax rate in the host country (or alternatively, a set of country-year fixed effects), to control for potential confounding effects of concurrent tax reforms on business investment. We also control for a set of time-varying country characteristics (Z_{kt}) for host countries, including GDP per capita, population size, and unemployment rate to capture the effect of time-varying local productivity, market size and demand characteristics on investment. More importantly, our most comprehensive specification includes a full set of industry-year fixed effects, country-year fixed effects and country-industry fixed effects that control for industry and country specific trends and macroeconomic factors that may differentially affect private investment by multinationals and would otherwise be captured by the DD estimates.

Our identification strategy rests critically on the assumption that prior to the introduction of transfer-pricing regulations, there is no differential changes in investment by multinationals relative to domestic companies, conditional on changes in non-TPR factors that are already controlled for empirically. We perform placebo tests to check the validity of the identification assumption by examining whether there was a differential change in multinational investment in any of the pre-TPR years. Figure 2 summarizes the pre-reform DD estimates and their corresponding 95% confidence interval. The results suggest that on average, there were no significant differential changes in investment for the treated group in any period before the TPR reform.

Figure 2. Placebo Test: DD estimates prior to Transfer Pricing Regulation



Summary of Main Findings Our main findings suggest that following the introduction of transfer pricing regulations, multinational affiliates reduce their investment as a share of fixed assets by 1 to 3 percentage point. The main regression results are summarized in Table 2. Column (1) reports results from the basic investment regression without inclusion of any country-level controls. The DD coefficient estimate is negative and significant at 1% level, indicating that the introduction of transfer-pricing regulation has a negative impact on multinational investment.³ The coefficient estimates on the non-tax firm-level determinants of investment are also highly significant and consistent with previous findings in the literature. In particular, the results suggest that firms that less financially constrained on average invest more in fixed capital assets than their cash-poor or less profitable peers. There is also a positive and significant relationship between firm-level investment and the rate of growth in sales.

³ A full set of firm fixed effects and year fixed effects are always included throughout varying specifications.

Column (2) checks the robustness of the baseline finding by including country-level statutory corporate income tax rate, population, unemployment rate, exchange rate, real GDP per capita, and GDP growth rate. This is to ensure that the DD estimate is not confounded with any other contemporaneous changes in the introducing country that may also differentially affect investment by multinationals. While the result remains qualitatively similar, inclusion of country-level characteristics slightly reduces the magnitude of the DD estimate from -0.027 to -0.024.⁴

The next three columns further check the robustness of the baseline finding by subsequently adding two-way country-year fixed effects in Column (3), two-way industry-year fixed effects in Column (4), and two-way country-industry fixed effects in Column (5). In the most comprehensive specification in Column (5), the DD estimate is around -0.01, suggesting that on average the adoption of the transfer-pricing regulation reduces investment by multinationals by around 1 percentage point. Given that the average investment per dollar of fixed asset is around xxx for multinationals in the sample, this translates to around xxx percent decrease in their investment.

Finally, column (6) includes a triple interaction term involving $tprisk_{kt}$, a variable that measures the overall strictness of the transfer pricing regulation. Intuitively, stricter transfer-pricing regulation would have a larger impact on the effective cost of capital faced by multinationals, therefore damping their investment by a larger extent. This is indeed the case as suggested by the negative coefficient estimate on the triple interaction term, which is around -0.021 and significant at 1% level.

Table 2. Baseline Findings

⁴ However, the difference in the DD coefficient estimates are not statistically significant.

Dependent variable:						
Investment per \$ of fixed asset	(1)	(2)	(3)	(4)	(5)	(6)
$MNC_t \times TP_{kt}$	-0.027*** (0.003)	-0.024*** (0.003)	-0.011*** (0.003)	-0.010*** (0.003)	-0.010*** (0.003)	
$MNC_t \times TP_{kt} \times tprisk_{kt}$						-0.021*** (0.004)
$\log(Sales_{t-1})$	-0.094*** (0.003)	-0.096*** (0.003)	-0.088*** (0.003)	-0.088*** (0.003)	-0.088*** (0.003)	
Cash flow per \$ of fixed asset	0.018*** (0.000)	0.018*** (0.000)	0.018*** (0.000)	0.018*** (0.000)	0.018*** (0.000)	0.019*** (0.000)
$Profitability_{t-1}$	0.076*** (0.007)	0.072*** (0.007)	0.065*** (0.007)	0.064*** (0.007)	0.064*** (0.007)	0.016** (0.008)
$Sales\ growth\ rate_{t-1}$	0.031*** (0.003)	0.029*** (0.003)	0.027*** (0.003)	0.027*** (0.003)	0.027*** (0.003)	-0.013*** (0.003)
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Country-Year FE	N	N	Y	Y	Y	Y
Industry-Year FE	N	N	N	Y	Y	Y
Country-Industry FE	N	N	N	N	Y	Y
R^2	0.317	0.318	0.324	0.325	0.325	0.359
N	679,555	679,555	679,554	679,554	679,554	492,087

Heterogeneity analysis. We also find that the negative impact of transfer-pricing regulation is mainly concentrated in large, more complex multinationals, and is smaller for multinationals with a higher share of intangible assets.⁵ We also find that MNCs reacted quickly in the first year following the introduction of the transfer-pricing regulations, which sees the largest reduction in their investment. This is consistent with that investment decision is forward-looking. The introduction of transfer-pricing regulations also has some lasting impact, given that multinational investment continues to exhibit a decreasing trend several years into the post transfer-pricing regulation regime. We further consider the joint impact of transfer pricing regulations and thin capitalization rules, and find that while the effect of thin capitalization rule is estimated to be insignificant, introduction of the transfer pricing rule remains to have a negative impact on multinational investment.

Next steps on the impact of transfer-pricing regulation on industry-level TFP. We will assess the impact of transfer-pricing regulations on industry-level revenue productivity that reflect the extent of resource misallocation across firms (Hsieh and Klenow, 2009). There are at least two channels through which the transfer pricing regulation may affect industry-

⁵ We provide two explanations for the latter finding. First, products of firms with a higher share of intangible assets are often more specialized, making it more difficult to find comparable price. This in turn makes it easier to shift profits through transfer mispricing and implies that transfer pricing regulations are less binding for firms with intensive intangible assets. In addition, multinationals often use a variety of profit-shifting methods, and alternative methods of profit shifting through licensing and royalty payment are easily available for firms that are intangible capital intensive.

level revenue productivity. First, given that the transfer pricing regulation would not affect the effective statutory tax rate on domestic firms, it would reduce the dispersion in effective tax rates between domestic and MNCs, hence leveling the playing field and reduce the extent of resource misallocation. On the other hand, transfer pricing regulation will also affect the production efficiency of MNCs. By raising their effective tax rate, it is likely to drive away less productive MNC investment, as the remaining investment needs to be relatively more productive in order to equalize the same after-tax rate of return in the introducing country. Therefore, while the introduction of TPR may reduce total production, it is likely to have a positive effect on industry-level total revenue productivity.

To carry out this empirical exercise, we will analyze changes in industry-level TFP post the introduction of transfer pricing regulation, relative to that in countries with no transfer pricing regulation during the sample period. We will also explore the share of multinational activities in each industry as a second source of variation for identification. We expect that this analysis would provide additional insights on the impact of anti-avoidance measures on the real economy.

Timing of this project. We are in the process of finalizing the productivity analysis, and aim to have a first-version working paper within the next month. The working paper incorporating additional new analysis will definitely be available before the summer symposium in June.

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