The Effects of UK's Switch to Territoriality on Domestic and Outbound Investment: Evidence from Micro-Level Data

Li Liu*

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Abstract

The United Kingdom switched from a system of worldwide taxation to a territorial system which exempts all foreign-earned income from taxation in 2009. This fundamental change increased investment incentives faced by UK multinationals in countries with a lower corporate tax lower compared to the UK. In this paper I use data on multinational affiliates located in 27 European countries and employ the difference-in-differences approach to assess the causal effect of dividend exemption on real investment by UK-owned multinational affiliates. I find that UK's switch to dividend exemption increased outbound investment by UK multinationals in low tax countries and decreased outbound investment by UK multinationals in high tax countries. In contrast, the tax reform had no clear impact on domestic investment behaviour of UK multinationals in the UK.

*Liu: Oxford University Centre for Business Taxation, Saïd Business School, Park End Street, Oxford, OX1 1HP, UK (email: li.liu@sbs.ox.ac.uk).

I Introduction

Between the two major systems of international taxation, the territorial system is gaining its popularity over the worldwide system. The number of current OECD member countries with territorial tax system has doubled since 2000. As of 2014, 28 of the 34 OECD member countries have adopted territorial tax system. Several major developed economies, including New Zealand, Norway, Japan and the UK, have all switched to the territoriality system in the past decade. The United States, among a very small number of countries with a worldwide system, is also in the process of reviewing its international taxation system, with many independent advisory board, working group, and federal agency recommending that the U.S. pivot toward a territorial system.[1,2]

The key difference between the two tax systems lies in the home-country taxation of foreign-earned income. Under the territorial method, active business income earned abroad is largely exempt from home country tax. In other words, domestic and outbound investment by UK multinationals, for example, is taxed at the same effective rate regardless of the country of origin. In comparison, the worldwide system taxes profit repatriated to the home country in the form of dividends with a credit for foreign taxes paid up to the limit of the home country liability. Under the worldwide method, investments are treated the same for tax purposes in the home country regardless of the destination. Not only do the two tax systems have distinct impact on tax revenues of home government, they also have important implications on the real business activities of multinational corporations, including the location of headquarter, reallocation of income (via transfer pricing and inter-company loans, for example), and direct outbound investment of multinationals.

In 2009, the UK fundamentally changed its international taxation regime by switching from the worldwide tax system to territoriality. The government introduced a permanent exemption for foreign-source dividends upon repatriation to their UK parent firms, with an explicit aim to "enhance the competitiveness and attractiveness of the UK as a location for multinational business (HMRC, 2007)". The reform further allowed domestic tax deductions for foreign-source expenses, which is comparatively generous to foreign income and similar to most other territorial systems. Thus, with the introduction of the dividend exemption

[1] These include the President's Advisory Panel on Federal Tax Reform (2005), the President's Advisory Board (2010), Council on Jobs and Competitiveness (2012), Commission on Fiscal Responsibility and Reform (2010), the President's Export Council (2010), the President's Council of Advisors on Science and Technology (2011), Board (2010), Council on Jobs and Competitiveness (2012), Commission on Fiscal Responsibility and Reform (2010), Joint Committee on Taxation (2005), U.S. Department of the Treasury, Office of Tax Policy (2007), and the House Committee on Ways and Means (2011).

[2] China, as the world's second largest economy, also employs a worldwide system to tax the international business income.

system, the UK corporate tax system moved to a territorial tax system in 2009.

This reform allows me to direct identify the effect of territoriality on domestic and outbound investment of UK multinationals, exploiting differential changes in the dividend tax rates across destination countries in the EU-27 as identifying variation. There are two key factors that determine whether UK's switch to the dividend exemption system would have any impact on dividend repatriation and investment: (1) the level of corporate tax rate in the host country relative to that in the UK, and (2) the marginal source of finance faced by UK-owned multinational affiliates. Theoretically, the introduction of dividend exemption should decrease the tax burden on dividend repatriation in countries where the corporate tax rate is lower than the UK rate, but should have no impact on the tax burden on dividend repatriation in countries where the corporate tax rate is higher than the UK rate. To illustrate the role of finance, I present a simple model which shows that a reduction in dividend taxes paid by the UK parent firm will increase investment by foreign affiliates in the low-tax countries, while the timing of the increase will depend on whether the marginal investment is financed by new equity or retained earnings. Pragmatically, if UK multinationals invest strategically in both low and high tax countries to minimize their overall foreign tax liability through tax planning, one may expect the introduction of dividend exemption to have significant impact on multinational investment in both low and high tax countries.

I use the Amadeus database provided by Bureau van Dijk as the primary source for affiliate-level data. This micro-level database provides information on the financial and operating characteristics of multinationals in European countries between 2005 and 2011. The data provides information on ownership structure and allows me to identify affiliates with a multinational parent firm in each of the EU-27 countries. I distinguish between low and high tax countries using the Oxford Centre for Business Taxation Tax Database. I examine the causal effect of dividend exemption on investment by UK-owned affiliates, separately in low and high tax countries, with a difference-in-difference estimation approach and non-UK multinational affiliates as the control group.

I find evidence that UK's switch to the exemption system had a significant and positive effect on investment by UK affiliates after 2009 in the low-tax countries. This finding is robust to controlling for a wide range of non-tax factors including firm-specific investment opportunities, time-varying host country and home country characteristics, as well as unobserved affiliate heterogeneity, unobserved parent firm heterogeneity, and aggregate macroeconomic shocks that are common to all multinational affiliates in the same host country. Qualitatively, the introduction of dividend exemption increased investment by UK affiliates by 6.2 percentage point in the low tax countries, which translates to an elasticity of investment respect to dividend taxes of around -0.33. Given that decrease in the dividend tax

rates might be overestimated due to deferral or onshore pooling of excess credit, this elasticity estimate represents a lower bound on the true elasticity of investment with respect to dividend taxation.

Interesting, I find evidence that UK's switch to the exemption system had significantly decreased investment by UK affiliates after 2009 in the high-tax countries. Comparing to a non-UK multinational affiliate, the average UK affiliate in high-tax countries decreased its investment by around 0.46 million Euro after the tax reform. Since dividend exemption did not directly affect dividend repatriation taxes in the high-tax countries, a significant negative response of investment by UK affiliates provides suggestive evidence that UK multinationals invested strategically in high-tax countries to minimize their overall foreign tax liability. A positive investment response in the low-tax countries coupled with a negative investment response in the high-tax countries also suggests that the introduction of dividend exemption induced UK multinationals to relocate some of their overseas activities from high-tax to low-tax countries to take advantage of increased after-tax profitability.

Aggregate data on the net earnings associated with UK outbound direct investment shows a substantial increase in the net earnings from the low tax countries, in contrast with a flat level of net earnings in the high tax countries. In the case that UK multinationals are financially constrained, one may also expect a positive impact of dividend exemption on dividend repatriation and domestic investment in the UK. I further examine the effect of dividend exemption on domestic investment by UK multinationals in a difference-in-difference estimation setting, and find no clear evidence that the exemption system had systematically affected domestic investment by UK multinational affiliates.

Implication (TO BE ADDED)

Related Literature (TO BE ADDED)

The paper proceeds as follows. The next section describes the policy background on the introduction of dividend exemption in the UK and provides some aggregate evidence on net investment abroad. Section III sets the theoretical prediction of how investment undertaken by UK-owned affiliates would respond to the dividend exemption. Section IV describe the data that I use for empirical analysis. Section V discusses the empirical strategy and specification. Section VI presents empirical results on the effect of dividend exemption on UK outbound investment in low and high tax countries, respectively. Section VII presents empirical results on the effect of dividend exemption on domestic investment by UK multinational affiliates. Section VIII concludes the study.

II Policy Background

A UK's Switch to the Exemption System in 2009

I briefly summarize the tax treatment of foreign earnings of UK-headquartered multinationals before and after 2009. Until 2008, the UK operated under a worldwide system of corporate income taxation. The total earnings of UK-incorporated companies, including from activities both in the UK and abroad, are liable to corporation tax. Dividends from foreign profits are taxed upon repatriation to the UK. To avoid double taxation on the same income, HMRC provides a credit for corporate taxes paid by UK-owned subsidiaries in foreign jurisdictions. For example, if a UK firm has an investment in Ireland, it will pay corporate tax in Ireland at the Irish rate of 12.5%. When the profit is repatriated as a dividend from the Irish subsidiary to its UK parent, the profit is liable to a UK tax of 28% net of the Irish tax paid, which means the tax bill due in the UK is 15.5%.[3]

The foreign tax credit is limited to the amount of corporation tax that would be owed if the profits were earned in the UK. If the dividends are remitted from subsidiaries in a country where the statutory corporate tax rate is higher than that in the UK (a high-tax country), the UK parent company would pay no additional tax on the repatriated dividends in the UK. For example, if a UK firm has an investment in France, it will pay corporate tax in French at the French rate of 35%, which is higher than the UK rate. When the dividend is repatriated from the French subsidiary to its UK parent, the profit is no longer liable to any additional UK tax. In general, the additional UK tax on each pound of repatriated dividend ($\tau_{UK,div}$) depends on the difference between the statutory tax rate in the source country (τ_j) and in the UK (τ_{UK}):

$$\tau_{UK,div} = \begin{cases} \tau_{UK} - \tau_j & \text{if } \tau_j \leq \tau_{UK}, \\ 0 & \text{if } \tau_j > \tau_{UK}. \end{cases}$$

In June 2007, the Treasury and HMRC issued a discussion document, proposing for the UK to move from a worldwide tax system to an exemption system. On April 3, 2009, the Finance Bill 2009 introduced the exemption system, which became effective on July 1, 2009 and exempts most foreign dividends from UK taxation.[4] Profits repatriated to a UK parent company from abroad are no longer liable for UK corporation tax and require no foreign tax credit. The foreign profits are now only taxed in the foreign source country. This reform introduced differential change on the tax burden on repatriated dividends, depending on whether the statutory corporate tax rate in the source country is lower than the UK rate.

[3]The corporate tax rate of 28 percent was the main rate that applies to corporate taxable profit above £1.5 million between financial year 2008 and 2010. The main rate was reduced to 26 percent in 2011.

[4]Except where the receipt is similar to interest or distributions paid in respect of certain securities.

Specifically, it decreased the tax rate on dividends remitted from a low-tax country from τ_{UK} to τ_j, where $\tau_j < \tau_{UK}$. By contrast, the tax rate on dividends remitted from a high-tax country where $\tau_{j'} > \tau_{UK}$ remained as $\tau_{j'}$ and hence was not directly affected by the introduction of the exemption system.

Note that, the differential tax rate, $\tau_{UK} - \tau_j$, represents the maximum tax savings on every pound of dividend repatriated from a low-tax country j after the introduction of dividend exemption. This is because under the pre-2009 worldwide tax system, the UK allowed for on-shore pooling of foreign tax credit when a UK parent company received dividends from more than one source country. Part of the excess credits from highly taxed income can be pooled against the additional UK tax on dividends from low-tax countries. The amount of the excess credits that can be offset against any remaining UK tax was restricted to be up to 45 per cent of the dividends, and can be either carried back for three years or carried forward.

The eligible excess credits generated by dividends from high-tax countries can shield, to some extent, other overseas dividends from low-tax countries from any residual UK tax. This feature of the pre-2009 credit system suggests that the tax consequences of dividend repatriation and investment abroad depend on the circumstances of the taxpayer. For example, certain corporations may be able to set up their operations in a way that either avoided repatriation of foreign profits through deferral or avoids taxation on repatriated foreign profits through onshore credit pooling.[5] With either approach some UK companies might have effectively been taxed as if under a territorial tax system, suggesting that their dividend repatriation and outbound investment be insensitive to the tax reform. In fact, the amount of tax revenue collected on repatriated dividends consisted a very small share of corporation tax revenue. The Treasury has estimated a figure of £650 million as the revenue impact during a three-year period from 2009-10 to 2011-12. The total UK corporation tax receipts is £103,715 million over the same period, implying that on average, the foregone tax revenue is less than one percent of the corporation tax liability.[6]

[5] Unlike the U.S. international tax system, the Financial Act 2000 and 2001 disallowed offshore pooling of foreign tax credit. UK multinationals could no longer avoid repatriation taxes by way of indirect ownership of foreign affliate, either through holding comapnies or through affiliate in tax havens that do not impose repatriation taxes.

[6] In relation to passive income, the controlled foreign companies (CFCs), effective between 2001-02 and 2009-10, restricted the ability of UK-based groups to retain profits overseas without paying a full UK tax charge. Specifically, the retained profits of subsidiaries that are located in countries where the corporation tax is less than three quarters of the rate applicable in the UK can be apportioned back to the UK and taxed as income of the parent. UK parent companies were also liable to UK taxes on interest or royalties income from foreign subsidiaries, with a credit for any withholding taxes paid abroad.

B Aggregate Evidence

Figure 1 provides some aggregate evidence on the effect of dividend exemption by presenting time series of net UK outbound investment (Panel A) in other EU-27 countries and the associated net earnings (Panel B) during 2003-2012.[7] Net direct investment flows abroad by UK companies includes acquisitions/disposals of equity capital, reinvestment of earnings, and inter-company debt. Net earnings from direct outbound investment include earnings of outbound investment arising from both equity and debt. To identify the direct effect of dividend exemption on dividend repatriation and investment in low-tax countries, each panel shows a breakdown of the time series in low-tax and high-tax countries, where countries in the low-tax/high-tax category in general tax corporate profit at a lower/higher rate than the UK, respectively.

Panel A shows some distinctive patterns of UK outward investment by country groups. In particular, UK outbound investment in high-tax countries is much more volatile. It peaked in 2007, started to decrease drastically until 2009, and recovered slightly since 2010. This trend is mainly driven by the recent economic crisis. UK outbound investment in low-tax countries, by exerting a steady decrease between 2006 and 2010, is relatively more stable and decreased to a less extent in 2009 relative to that in high-tax countries. Interestingly, the two investment series moved in different directions immediately after the introduction of exemption system in the years of 2009-2011. However, it is clear that aggregate investment trends track closely with the business cycle and masks the effect of tax reform in the time series, highlighting the importance of using micro-level data to identify the causal effect of dividend exemption on investment.

There is a clearer effect of dividend exemption on net earnings of UK outbound investment as shown in Panel B. Net earnings on UK outbound investment in both groups increased from 2004 to 2008 and started to diverge in 2009. There is an immediate drop in net earnings from high-tax countries in 2009 and 2010, while the net earnings from low-tax countries continued to increase in 2009, peaked in 2010 and started to decrease again afterwards. In the two years following the introduction of the exemption system, there is an evident increase in net earnings from UK outbound investment in the low-tax countries relative to the high-tax countries.

[7] Sources: Office for National Statistics, UK Balance of Payment 2012, available at *http://www.ons.gov.uk/ons/rel/fdi/foreign-direct-investment/2012-sb/stb-fdi-2012.html.* A negative value indicates a net disinvestment abroad, or a decrease in the amount due to the UK. Statistics in Figure 1 do not include those from UK offshore.

III Conceptual Framework

I consider in a simple two-period model the effect of dividend taxation on firm investment, which is based on Bond, Devereux and Klemm (2005) and Chetty and Saez (2010). At the beginning of period 0, a UK-owned foreign affiliate has an initial level of cash holdings of C. In period 0 it invests an amount of I, which can be financed out of the internal retained earnings, or by issuing new shares of $E \geq 0$. At the end of period 0, the foreign affiliate pays to its UK parent a dividend in the amount of $D = C + E - I$. In period 1, the foreign affiliate produces output and earns revenue with the production function $f(I, E)$, where $f(\cdot)$ is strictly concave, strictly increasing, continuos and continuously differentiable. At the end of period 1, the affiliate repatriates the entire net wealth to the parent firm in the UK by paying a dividend. A tax rate of t_d is levied on dividend payments in both periods. First assume that t_d remains constant between the two periods. The foreign affiliate chooses I and E to maximize its present value, given by:

$$V = (1 - t_d)(C + E - I) - E + \frac{1 - t_d}{1 + r} f(I, E),$$

where r is the risk-free interest rate between the two periods, subject to the non-negativity constraints on dividend payments and new share issues. The foreign affiliate thus maximizes:

$$V = (1 - t_d)(C + E - I) - E + \lambda^D (C + E - I) + \lambda^E E + \frac{1 - t_d}{1 + r} f(I, E),$$

where λ^D and λ^E are shadow values associated with the non-negativity constraints. The first-order conditions for investment and new issues are respectively:

$$f_I = (1 + r) \left[1 + \frac{\lambda^D}{1 - t_d} \right],$$

and

$$f_E = \frac{1 + r}{1 - t_d} - (1 + r) \left[1 + \frac{\lambda^D + \lambda^E}{1 - t_d} \right].$$

As is well known from the tax literature on international direct investment, new equity is never a tax-preferred way of financing if dividends trigger a tax on distributions. The foreign affiliate will never choose to repatriate dividends ($D > 0$) and make equity transfers from the UK parent ($E > 0$) simultaneously. Dosing so results in an unnecessary tax payment to the home country government of t_d in period 0 and leaves the UK parent with only $1 - t_d$ Pound to invest abroad. It is more tax efficient for the multinational to retain the initial earnings and avoid a tax on dividends. The optimal strategy of finance therefore depends on the

level of initial cash flow C relative to the firm-specific investment opportunities. Specifically, when $f_I \leq 1+r$,or $\lambda^D \leq 1-t_d$, the foreign affiliate relies on retained earnings C as the marginal source of investment. When $f_I > 1+r$, the foreign affiliate relies on new equity as the marginal source of investment. In other words, the UK parent firm makes equity transfer to the foreign affiliate by issuing new shares.

A Financed by New Equity

When the marginal investment is financed by issuing new shares, this implies that $D = 0$ so that $\lambda^D > 0$, and $E > 0$ so that $\lambda^E = 0$.The first-order conditions are

$$f_I = (1+r)\left[1 + \frac{\lambda^D}{1-t_d}\right], \tag{1}$$

and

$$f_E = \frac{1+r}{1-t_d} - (1+r)\left[1 + \frac{\lambda^D}{1-t_d}\right]. \tag{2}$$

In this case, the foreign affiliate invests all the cash it has: $I = C + E$ to the point where the marginal net-of-tax return equals the return on risk-free investment $(1+r)$. Implicit differentiating of equation (1) and (2) suggests that $\partial f_I/\partial(1-t_d) < 0$ and $\partial f_E/\partial(1-t_d) < 0$. These are the standard "old view" results that a decrease in the dividend tax rate, as in the case of the 2009 dividend exemption in the UK, will tend to increase both investment and new share issues.

B Financed by Retained Earnings

When the marginal investment is financed out of retained earnings C, this implies that $D > 0$ so that $\lambda^D = 0$, and $E = 0$ so that $\lambda^E > 0$. The first-order conditions (**??**) and (**??**) become

$$f_I = (1+r), \tag{3}$$

and

$$f_E = (1+r)\left(\frac{1}{1-t_d} - 1\right). \tag{4}$$

Equation (3) implies that the cost of capital and the optimal level of investment does not depend on the repatriation tax rate t_d. This is because provided the tax rate on dividends is constant, a dividend tax lowers both the cost of investment and the return on the investment in the same way, and thus has no effect on the cost of capital. Neither investment nor dividends payments depend on the repatriation tax rate paid by shareholders. This is the

"new view" of dividend taxation, which is developed by King (1974), Auerbach (1979) and Hartman (1985). Comparing Equation 3 with 1 shows clearly that retained earnings are a cheaper form of finance than new share issues, suggesting that firms should finance their investment by first exhausting the internal funds before turning to new share issues.

The irrelevance result of dividend taxation, however, no longer holds when there is a temporary change in the rate of dividend tax. Suppose that the parent firm anticipates in period 0 that the rate of dividend tax will decrease in the next period so that $t_d^0 > t_d^1$, with t_d^0 and t_d^1 denoting the dividend tax rate in period 0 and 1, respectively. In this case, the first-order condition with respect to I that determines the optimal level of investment is

$$f_I = \left(\frac{1 - t_d^0}{1 - t_d^1}\right)(1 + r) < (1 + r). \tag{5}$$

Equation (5) suggests that when the dividend tax rate in period 0 is higher relative to its level in the next period, it reduces the marginal productivity of investment below $(1 + r)$. This result implies that the optimal investment level in period 0 would be higher than the level determined by equation (3) in the absence of any tax change, even when the marginal source of finance for new investment is retained earnings.

IV Data

A Main Dataset

The primary dataset for empirical analysis is unbalanced panel of 190,978 multinationals affiliates in one of the EU-27 countries for the years 2005 to 2011. It is constructed by using unconsolidated financial statement of multinational subsidiaries in the commercial database Amadeus database, which is provided by Bureau van Dijk. The Amadeus database includes approximately 8 million public and private companies in 38 European countries. It combines data from over 35 specialist regional information providers and provides information on financial statement and basic ownership structure for medium and large-sized European companies.[8] A company is defined as a multinational affiliate if it has an ultimate parent company owning at least 50% of the ownership shares and is located in a different country from the parent company . The ultimate owners in the dataset locate in one of 161 countries.

[8]Specifically, a company is included in the AMADEUS database if it satisfies at least one of the following size criteria: for the UK, Germany, France and Italy - operating revenue equal to at least 1.5 million Euro, total assets equal to at least 3 million Euro, number of employees equal to at least 15; for all other countries: operating revenue equal to at least 1 million Euro, total assets equal to at least 2 million Euro, number of employees equal to at least 10.

Table 1 shows the country distribution of affiliates.

The main accounting variables are flows of investment, sales, cash flow, and earnings before interest and tax (EBIT). Investment spending (I_t) is computed as changes in fixed capital assets based on the net book values of tangible and intangible fixed assets plus depreciation, i.e. $K_{t+1} - K_t + depreciation$, where K_t denotes book value of the fixed asset in year t. Investment rate, I_t/K_{t-1}, 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 0.025 percentile to minimize the influence of outliers. Table 2 contains summary statistics for the main variables. The investment rate variable takes a mean of 0.483 and a median of 0.133. On average, an affiliate has sales of 53 million Euros and a cash flow of 4 million Euros. (How much percentage of worldwide FDI am I modeling?-add one or two lines)

A limitation of the Amadeus data, however, is that information on the ownership structure refers to the last reported date, which is year 2011 for most observations in the sample. I assume that the parent-affiliate ownership structure for 2011 applies to the earlier years and there may be potential misclassification of parent-subsidiary-connections due to change of ownership structure over the sample period.[9] However, in line with previous studies, I am not too concerned about this issue. Suppose that UK's moving to an exemption system increases the competitiveness of UK parent company in the international market, acquiring more foreign subsidiaries in low tax jurisdictions.[10] By including these newly acquired subsidiaries in the analysis, the estimation results will in addition capture the investment response to moving to the exemption system at the extensive margin via merge and acquisition.

I merge data on the statutory corporate tax rate at the affiliate location provided by Oxford Centre for Business Taxation (CBT) Tax Database.[11] This is a measure of total statutory tax rate by capturing the sum of all statutory tax rates (including top corporate tax rate at federal level, any surcharge levied, and any local corporate tax rate and taking into account the deductions available) levied at the corporate profit in a given country in a given year. For the subsidiaries in the sample, the statutory corporate tax rate ranges from 0.10 to 0.404 with a mean of 0.285. The theoretical consideration predicts that UK's switch to an exemption system would bear different implication on UK outbound investment in low-

[9] This caveat is acknowledged in previous studies exploring the ownership structure in the AMADEUS data. See, e.g. Budd, Konings and Slaughter (2005), Dischinger and Riedel (2011) and Dharmapala and Riedel (2013).

[10] Feld et al. (2005) estimates that the abolishment of repatriation taxes in the UK in 2009 has increased the number of acquisitions abroad by Bristish firms by 3.9%.

[11] Available at: http://www.sbs.ox.ac.uk/ideas-impact/tax/publications/data

versus high-tax countries. Accordingly, I define an indicator variable *low tax* which takes on value 1 if a country sets its corporate tax rate consistently below the UK rate in 2005-2011 and 0 otherwise. A list of low-tax countries defined in this way are depicted in dark blue in Figure 2 and include: Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Hungary, Ireland, Lithuania, Latvia, Poland, Romania, Sweden, Slovenia, and Slovakia.

I further merge data on subsidiary-level country characteristics including GDP per capita, population and unemployment rate to capture the aggregate market size and demand characteristics in each of the EU-27 countries. Similarly, I include additional parent-level country characteristics to capture marcoeconomic conditions at the parent location. These variables include the growth rate of GDP per capita (as a proxy for the economic situation), a Transparency, Accountability and Corruption rating and a Business Regulatory Environment rating (as a proxy for perceived quality of governance and the business environment respectively).[12]

B Ownership Structure of UK Multinationals

Another limitation of the Amadeus data is that it provides very basic ownership information for each company. For example, while it allows me to identify the UK parent company of a foreign affiliate, it does not allow me to identify all the other subsidiaries controlled by the same UK parent company (except for those large and medium-sized European affiliates which are also included in Amadeus) nor the countries where these subsidiaries locate which may be a joint decision by the UK parent. To obtain a comprehensive picture of ownership structure of UK-headquarted multinationals, I use ownership information from the FAME ((Financial Analysis Made Easy) database to identify worldwide location of UK-owned affiliates.[13] For each company in FAME the BvD ownership database reports its ultimate owner along with basic characteristics of this owners well as each of its subsidiaries. An ultimate owner is a single shareholder that owns at least 25 percent of a firm, directly or indirectly via other firms. When there is no such shareholder a company can be owned by itself. A UK parent company, by definition, must be owned by itself. For each subsidiary there is information on the level of subsidiary in the ownership chain, the country of location, type of the subsidiary, and date of incorporation.

Relying on this ownership information, I distinguish among the population of UK re-

[12]Subsidiary-level country data is collected from the European Statistical Office (Eurostat), available at http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/. Parent-level country data is collected from the World Development Indicators Database, available at http://data.worldbank.org/data-catalog/world-development-indicators.

[13]FAME database is also published by BvD and contains detailed financial and ownership information for more than 1.9 million companies in the UK and Ireland. (which disk version did I use?)

gistered companies in FAME three types of ownership structure: (1) stand-alone companies, (2) ultimate parent of a UK company group, and (3) subsidiaries of a UK or foreign-headquarted company group. Focusing on the parent companies of UK company groups, I distinguish between UK parent of a domestic company group, which by definition has incorporated all the subsidiaries in the UK, and UK parent of a multinational company group, which by definition has as least one subsidiary incorporated abroad. Table (A ownership breakdown) provides a breakdown of ultimate owners' types in FAME.[14] Subsidiaries that are part of a UK multinational group identified in this way locate in one of ??? countries, for which I merge data on country-level statutory corporate tax rates provided by Oxford CBT Tax Database.

(Add one paragraph on the distribution of subsidiaries in the UK, low-tax countries, and high-tax countries)[15]

V Empirical Strategy and Specification

This section describes the empirical strategy designed to identify the causal effect of dividend exemption on investment by UK-owned multinational affiliates. Specifically, I exploit plausibly exogenous time-series variation in the relative cost of equity financing following UK's switch to the exemption system. If dividend exemption decreased the tax burden of equity financing faced by UK affiliates in low-tax countries, we would expect an increase in investment by UK-owned affiliates after 2009 if new equity is the main marginal source of finance. To explicitly control for variation in investment by UK-owned affiliates due to non-tax factors, I include a control group which consists non-UK multinational affiliates located in the same host country and hence are exposed to aggregate shocks similar to those experienced by UK affiliates. Specifically, I subtract the resulting investment change in the control group that was not affected by dividend exemption from that in the treatment group of UK-owned affiliates. As long as the treatment and control groups are affected by time-varying confounding variables in a similar way, the difference in these two difference estimates will reflect the effect of the legislation. Formally, I examine investment by UK-owned affiliates compared to non-UK affiliates in the standard difference-in-difference (DD) specification:

$$\frac{I_{ikt}}{K_{ik,t-1}} = a_i + d_t + \beta_{DE} DE_t + \beta_{\mathbf{x}} \mathbf{x}_{ikt} + \beta_{\mathbf{z}} \mathbf{z}_{kt} + \varepsilon_{ikt}, \tag{6}$$

[14] Similar numbers with Table 1 reported in Criscuolo, Martin and Muûls (2006).

[15] For those large and medium-sized subsidiaries which are also included in the AMADUES, I link this ownership information back at the affiliate level to the main dataset.

where i indexes firms, k indexes host countries, and t indexes time. The dependent variable $(I_{ikt}/K_{ik,t-1})$ is gross investment scaled by book value of fixed capital asset in (end of) year $t-1$. The key variable of interest, DE_t, is an indicator equal to one for UK-owned affiliates starting in 2009, and zero otherwise. The coefficient β_{DE} represents the difference-in-difference estimate of the effect of dividend exemption on investment by UK-owned affiliates. Following the theoretical discussion in Section C, I expect β_{DE} to be positive and significant if a non-trivial amount of UK affiliates finance their marginal investment by new equity.

A set of firm fixed effects (a_i) is included to control for unobserved firm heterogeneity as well as unobserved time-invariant characteristics of the parent company. As discussion in Section B suggests, the tax consequence of dividend exemption on investment abroad depends critically on the ability of the UK parent to defer or minimize the overall taxes on dividend repatriation. Presumably, UK affiliates with a parent company that begin in excess credit status under the worldwide system would be less affected by the shift to territoriality than those beginning in excess limit and therefore it is important to controlling for the initial tax status of the parent company through firm fixed effects. Inclusion of firm fixed effects also controls for time-invariant differences across host countries that may affect location choice of multinationals, which include, for example, perceived average quality of governance during the sample period, common language and/or former colonial ties, and geographical distance between the home and host country. I further include a full set of time dummies (d_t) to capture the effect of aggregate marcoeconomic shocks, including the effect of the great recession, that are common to all multinational affiliates in the same host country. ε_{ikt} is a white noise term.

For robustness I include statutory corporate tax rates at source to control for the confounding effects of concurrent tax reforms in each of the host countries. I include separate year effects for each host country to assess whether specific countries exhibit differential time trends that would otherwise be captured by the DD estimates. In addition, I control for a set of time-varying country characteristics $(\mathbf{z}_{kt})$ for both host and parent country, including GDP per capita, population size and unemployment rate, to capture the effect of time-varying market size and demand characteristics on investment.

I employ two alternative approaches to address the concern that UK and control affiliates may not be identical in terms of observable characteristics, and that these differences can explain different trends in investment over time. First, I directly control for a set of variables that may capture firm-level investment opportunities $(\mathbf{x}_{ikt})$, which include lagged output, cash flow scaled by lagged asset, lagged profit margin as a measure of profitability, and firm age. Alternatively, I implement a matching DD strategy (Heckman, Ichimura and Todd (1997)). To this end, I replicate the DD tests on a subsample of matched firms based on

pre-reform characteristics. Depending on the differential effect of the tax reform on the cost of dividend repatriation and investment, I divide the sample to multinational affiliates in (1) low-tax countries, (2) high-tax countries, and (3) in the UK and perform the DD analysis separately for each country group. The key assumption underlying the DD technique is that investment trends in both the treated and control groups would be the same in the absence of dividend exemption. I examine any differences in the trends before the legislation in the next section.

VI The Effect of Dividend Exemption on UK Outbound Investment

A Graphical Evidence

Figure 3 shows the average investment rate for UK affiliates and non-UK affiliates around the dividend exemption reform in low-tax countries (Panel A) and in high-tax countries (Panels B). Average investment rates have some distinct patterns in the two panels. In the low tax countries, investment rate (relative to its 2006 level) of UK affiliates decreased at a slower rate than that of non-UK affiliates, but the difference between the two groups was quite small in the pre-exemption period of 2006-2008. Both groups continued to decrease their investment until 2009, and started to increase their investment after the financial crisis. Comparing to their non-UK peers, UK affiliates decreased their investment to a less extent after 2009, suggesting that dividend exemption had a positive effect on investment of UK affiliates in low-tax countries.

In the high tax countries, while investment rate (relative to 2006) of UK affiliates decreased more quickly than that of non-UK affiliates, changes in investment were quite similar in the years around 2009. Comparing to the widening gap of investment between the treated and control groups in the low tax countries, the difference between the two investment series is much more stable in the high tax countries.

There are two threats to identification. The first is that contemporaneous changes that are unrelated to the tax reform, which could have differential impacts on UK and non-UK affiliates. For example, UK affiliates might be more resilient to the financial crisis comparing to their non-UK peers, which could explain the smaller decline in their investment and highlights the importance of controlling for time-invariant affiliate and parent company characteristics in the regression analysis. Moreover, Japan also switched to a credit system in 2009. Given a statutory corporate tax rate of 38% in Japan, this implies that outbound equity-financed investment of Japanese affiliates are likely to increase in the sample, and will

cause a downward bias in the effect of dividend exemption. To summarize, the aggregate evidence presented in Figure 3 provides suggestive evidence on the effect of dividend taxation on UK outbound investment. In the following section, I consider regression analysis which control for a large set of confounding factors and provide conclusive evidence of a link between dividend taxation and investment by UK multinationals.

B Regression Results

B.1 Low-Tax Countries

Table 3 presents regression results from the difference-in-difference estimation of Equation (6), focusing on multinational affiliates operating in the EU-27 countries with a lower corporate tax rate compared to the UK. All regressions include a full set of firm fixed effects and year fixed effects. Heteroscedasticity-robust standard errors that are clustered at the country level are show in brackets below the coefficient estimates.[16]

Following the difference-in-difference specification in Equation (6), Column 1 regresses the subsidiary's investment rate on the DE_t variable, which is an interaction term between a UK affiliate indicator and an indicator for the year being 2009 onwards following the dividend exemption. The coefficient estimate for DE_t is positive and statistically significant, suggesting that the introduction of dividend exemption has systematically increased investment undertaken by UK-owned affiliates, relative to investment by affiliates with a non-UK parent company in the low-tax countries. In other words, UK-owned affiliates in the low-tax countries significantly increased their investment following UK's switch to the exemption system, which is consistent with the theoretical prediction if a non-trivial portion of their marginal investment is financed by new equity. To assess the robustness of this finding, Column 2 includes additional controls that capture firm-specific investment opportunities, which include lagged turnover, cash flow scaled by lagged asset, lagged profit margin, and firm age. The basic result remains unchanged.

To control for the confounding effects of concurrent tax reforms on investment in the host country, Column 3 include host country statutory tax rate on corporate income. In addition, Column 3 includes host-country GDP per capita, population size, and unemployment rate to control for the impact of market condition on investment that would otherwise be captured by the DE_t coefficient estimate. To examine the robustness of the results to differential country specific shocks, Column 4 includes separate year effects for each host country to

[16] Cluster at the country level addresses the common concern with tax reform studies that they understate the standard errors by assuming independence across firms within each tax jurisdiction (Bertrand, Duflo and Mullainathan, 2004). Standard errors clustered at firm level are slightly smaller than those clustered at the country level and hence are not reported.

allow for differential time trends in the host countries. The DE_t coefficient estimate remains positive and significant.

Time-invariant parent company characteristics and time-invariant home country characteristics are already controlled for with affiliate fixed effects (which subsume parent country fixed effects and parent company fixed effects, given that affiliates do not change their location or switch owners). However, UK-owned firms may be exposed to country-specific shocks at home which may systematically affect outbound investment by all UK affiliates abroad. To control for these effects Column 5 adds additional time-variant marcoeconomic characteristics of the home country including GDP growth rate and GDP per capita. This leaves the qualitative results essentially unchanged.

Quantitatively, Column 5 suggests that investment by UK-owned affiliates increased by 6.2 percentage points following the introduction of dividend exemption. This represents a 33.3% increase in the investment rate given an average investment rate across low-tax countries ($\overline{I}/\overline{K}$) of around 0.18. The average statutory corporate tax rate in the sample for low-tax countries is around 20.09%; given a UK rate of 28%, this suggests that the average dividend tax rate decreased from 7.91% to 0% in the low-tax countries. Evaluated at the mean, this implies the elasticity of investment respect to dividend taxes to be around -0.33 (or equivalently, a semi-elasticity of -1.1). Decrease in the dividend tax rates might be overestimated due to deferral or onshore pooling of excess credit, and if so this estimate represents a lower bound on the true elasticity of investment with respect to dividend taxation. Comparing to previous elasticity estimates of foreign direct investment, this lies in the low end. For example, the mean value of the 117 semi-elasticity that are obtained from panel studies and summarized in de Mooij and Ederveen (2008) is around -2.9.[17]Given that the average fixed asset across low-tax countries is around €9.9 million, the estimated investment coefficient suggests that the average UK-owned affiliate in low-tax countries increased its investment by around €0.6 million. By calculating a firm-specific increase in the invesment for all UK-owned affiliates in low-tax countries, in aggregate their investment increased by after 2009 as a result of UK's switch to territoriality.

The finding of a positive investment response to dividend exemption suggests that a substantial amount of investment undertaken by UK multinationals in low-tax countries is financed by new equity at the margin. The evidence is broadly corroborated by previous findings in the literature. For example, Grubert (1998) estimates separate equations for dividend, interest, and royalty payments by 3,467 foreign subsidiaries to their parent American companies (and other members of controlled groups) in 1990, finding that high corporate tax rates in countries in which American subsidiaries are located are correlated with higher

[17]Most elasticities lie between -1.5 and 0 and most semi-elasticities between -5 and 0.

interest payments and lower dividend payout rates. The evidence provided in Desai, Foley and Hines (n.d.) indicates that 10 percent higher local tax rates are associated with 2.8 percent higher debt/asset ratios of American-owned affiliates, and that borrowing from related parties is particularly sensitive to tax rates.[18]

B.2 High-Tax Countries

Table 4 presents the difference-in-difference estimation results, focusing on multinational affiliates operating in the EU-27 countries where the corporate tax rate is higher compare to the UK rate. Similar to Table 3, all regressions include a full set of subsidiary fixed effects and year fixed effects. Each column follows the same specification in Table 3. Heteroscedasticity-robust standard errors clustered at the country level are show in brackets below the coefficient estimates.

Interestingly, regression results in Table 4 show that the introduction of dividend exemption has a negative effect on investment by UK-owned affiliates in high-tax countries. This negative effect of dividend exemption on investment in high-tax countries contrasts directly with a positive effect of dividend exemption on investment in the low tax countries. The coefficient estimate of DE_t is negative and highly significant across all specifications, which suggests that comparing to non-UK affiliates, UK-owned affiliates has decreased their investment by 3.7 percentage point since 2009. Given a mean value of lagged fixed asset of 17.36 million Euros for UK affiliates in high-tax countries, it suggests that the average UK affiliate in high-tax countries decreased its investment by around 0.46 million Euro after the tax reform.

Since the introduction of dividend exemption did not change directly dividend repatriation taxes in the high-tax countries, a significant negative investment response of UK-owned affiliates provides suggestive evidence that UK multinationals invested strategically in high-tax countries in order to utilize cross crediting to minimize their foreign tax liability.[19] A positive investment response in low-tax countries coupled with a decrease in investment in high-tax countries also suggests that the introduction of dividend exemption induced UK multinationals to relocate some of their overseas activities from high-tax to low-tax countries in response to increased after-tax profitability and the loss of foreign tax credits.

[18] I have data on debt/asset ratio and can run a regression separately in the low and high tax countries.

[19] I will add some statistics later on the percentage of UK multinational parent having subsidiaries in low-tax countries only, high-tax countries only, and in both low and high tax countries.

C Separating the Anticipation Effect

Although consultations for the exemption system were launched in late 2007, the Treasury and HMRC did not release the draft legislation until more than a year later in February 2009. At the time of its release, HMRC emphasized that the draft legislation was at an earlier stage of development than normal and therefore significant changes should be anticipated. Nor was there any date specified as to when the new legislation would take effect. The Financial Bill 2009, which became effective on April 3, 2009, formally introduced the exemption system which took effect on July 1, 2009. It is a 100% exemption rule for most dividends payable on or after 1 July 2009, including profits accruing before the date when the new rules became effective.

Despite a narrow three-month window between the announcement and implementation of the exemption system, UK multinationals may nevertheless have anticipated in 2008 the coming reduction in dividend taxation and strategically adjusted their outbound investment prior to implementation to maximize the tax savings. Following the theoretical discussion in Section III, investment of UK-owned affiliates would respond in opposite directions, depending on the marginal source of finance. If new equity is the marginal source of finance, a forward-looking profit maximizing UK-owned affiliate would delay some investment spending in low-tax countries in anticipation of a dividend tax cut until after the implementation of the policy, or maybe even until the firm's first complete tax year after the introduction of the exemption system, to avoid the apportionment of the tax benefit. In this case, there may be a temporary decrease in investment by UK affiliates in the low tax countries in 2008 and then an overshoot in investment in 2009, and the difference-in-difference coefficient estimate could reflect strategically timing of investment spending rather than a genuine increase in investment spending as a result of the tax reform.

On the other hand, Equation (5) shows that if the marginal investment is financed by retained earnings, the cost of internal fund faced by UK affiliates would become cheaper in 2008 in anticipation of a coming reduction in dividend taxes. In this case, a forward-looking profit maximizing UK-owned affiliate would increase some investment spending in the low-tax countries in 2008, driving a temporary increase in investment in 2008 relative to that in 2009. To identify the potentially different effect of anticipation on investment, I include in Equation (6) an additional interaction term between a Year_{2008} dummy and an indicator for an UK-owned affiliate:

$$\frac{I_{ikt}}{K_{ik,t-1}} = a_i + d_t + \beta_{2008}\text{Year}_{2008} \cdot \text{UK Affiliate} + \beta_1 DE_t + \beta_{\mathbf{x}}\mathbf{x}_{ikt} + \beta_{\mathbf{z}}\mathbf{z}_{kt} + \varepsilon_{ikt},$$

where Year_{2008} is a binary indicator equal to 1 for year 2008 and 0 otherwise, UK Affiliate is

a binary indicator equal to 1 for UK-owned affiliates and 0 otherwise, and all other variables are as previously defined. The β_{2008} coefficient captures any differential between investment by UK and non-UK affiliates in 2008, relative to the 2006 base-year level. A negative coefficient estimate of β_{2008} would suggest a relative decrease in investment by UK affiliate in 2008, consistent with the presence of anticipation effect on equity-financed investment. On the contrary, a positive coefficient estimate of β_{2008} would suggest a relative increase in investment by UK affiliate in 2008, consistent with the presence of an anticipation effect on investment financed with retained earnings.

Table 5 summarizes the estimation results. Column 1-3 focus on multinational affiliates in low-tax countries while column 4-6 focus on multinational affiliates in high-tax countries. Column 1 and 4 present regression results from the baseline specification without any additional controls, while column 2 and 5 present regression results from the most comprehensive specification which include additional controls at firm, host country and home country levels. Interestingly, the coefficient estimate of β_{2008} is statistically insignificant across all specifications, while the DE_t coefficient remains significant and has the same sign. An insignificant coefficient estimate of β_{2008} suggests the lack of evidence that UK affiliates strategically adjusted their investment prior to the implementation of dividend exemption.

Timing uncertainty associated with the dividend exemption reform might explain the lack of any anticipation effect. There are two components of reform proposed in the 2007 consultation: exemption of foreign-sourced income and a new Controlled Foreign Companies (CFC) regime. By 2008, however, implementation of the proposal was already "in jeopardy". This is due to HMRC's requirement that the dividend proposals must be "tax neutral", which required targeted measures to restrict the tax deductibility of interest and to use the CFC regime to generate additional tax revenues by including certain capital gains and income from intellectual property (IP). As a result, the proposed CFC regime has attracted wide criticism particularly from IP-rich companies and has led to a number of UK headquartered multinationals (such as Shire Pharmaceuticals and United Business Media) announcing their intention to relocate to a more tax friendly jurisdiction, such as Ireland. In view of these criticisms and a potentially significant number of companies seeking to leave the UK, HMRC announced that it would postpone the new CFC regime and instead, tighten up the existing rules. It intended to move forward with the dividend exemption but only if suitable measures to protect UK tax revenues could be found. It was therefore unclear in 2008, in retrospect, the exact time when the dividend exemption would come into effect.

To further examine how quickly outbound investment reacted to dividend exemption, regressions in column 3 and 6 replace the DE_t variable with three interaction terms between a year 2009/2010/2011 dummy and an indicator for an UK-owned affiliate, respectively.

Coefficient on each interaction term would capture the differential between investment by UK and non-UK affiliates in the corresponding year, relative to the 2006 base year level. Surprisingly investment by UK affiliates responded immediate in 2009, which is reflected by the significant estimate coefficient of the interaction term Year_{2009}·UK Affiliate. Neither coefficient estimate of the interaction terms which aim to capture investment responses in the following years is significant, suggesting that the overall investment response is quite immediate and largely temporary in nature.

D Robustness Checks

MORE ROBUSTNESS CHECKS TO BE ADDED

VII The Effect of Dividends Exemption on Home Investment

In this section I provide some suggestive evidence on the effect of dividend exemption on domestic investment, focusing on multinational affiliates operating in the UK. As Figure 1 Panel B shows, following UK's switch to the exemption system, there was an immediate and substantial increase in the net earnings of outbound direct investment in the low-tax EU-27 countries, in contrast with a flat level of net earnings from outbound direct investment in high-tax countries in 2009 and 2010. Egger et al. (2012) confirms with micro-level data that dividend exemption induced firms to pay out significantly more dividends and estimates that the average UK-owned affiliate paid out about US$ 2.15 million more dividends immediately after the reform than the counterfactual affiliate in the absence of the reform. Theoretically, a large cut in the dividend tax rate would have a positive impact on dividend repatriation and domestic investment of UK multinationals if they are financially constrained. Alternatively, absence of any positive effect would also be consistent if UK multinationals had generally structured their affairs to avoid tax on foreign dividends under the pre-2009 credit system.

The effect of dividend exemption on domestic investment is captured by β_{DE} from the difference-in-difference estimation of Equation (6) using multinational affiliates operating in the UK. Contemporaneous changes in domestic investment undertaken by UK affiliates due to non-tax factors are controlled for by using two different control groups: (1) non-UK multinational affiliates operating in the UK, and (2) standalone domestic companies as well as affiliates that are part of a domestic company group.[20]

[20] I identify stand-alone firms and domestic company group with all subsidiaries in the UK from ownership information on all UK companies in FAME.

Table 6 summarizes the regression results using non-UK multinational affiliates/domestic firms as the control group in Panel A and B, respectively. Column 1-4 follow the same regression specification as in Table 3 and 4, while column 5 attempts to identify the presence of any anticipation effect in 2008. In Panel A, the coefficient estimate of DE_t remains negative and significant until the marcoeconomic conditions in non-UK home countries are controlled for in column 4 and 5. In Panel B, the coefficient estimate of DE_t is negative and insignificant across all specifications. Regression results in both panels provide suggestive evidence that the exemption system did not systematically affect domestic investment by UK affiliates. This finding is consistent with Dharmapala, Foley and Forbes (2011), which shows that repatriation following a 2004 tax holiday introduced by the Homeland Investment Act (HIA) did not increase domestic investment in the United States. Two major differences are worth noting. First, the HIA provides U.S. multinationals with a one-time deduction of 85 percent of dividends repatriated by their foreign affiliates. In contrary, UK's dividend exemption is permanent. Second, under the HIA, the 85 percent exemption applies only to "extraordinary dividends", which are defined as dividend payments exceeding average repatriations over a five-year period ending before July 1, 2003, excluding the highest and lowest years. Thus the exemption is limited to extraordinary dividends over and above the average level of dividends remitted. The UK's exemption applies to most dividends as discussed in Section B. The exemption permitted under the new system in the UK is different in nature and more generous than the exemption under the HIA in the United States. The regression results, however, do not capture domestic investment response of UK parent companies, which is the next step of this research. It is interesting to note that the absence of any effect on domestic investment by UK multinationals, relative to that by domestic companies, provides some suggestive evidence that outbound investment does not crowd out domestic investment.

VIII Conclusion

TO BE ADDED

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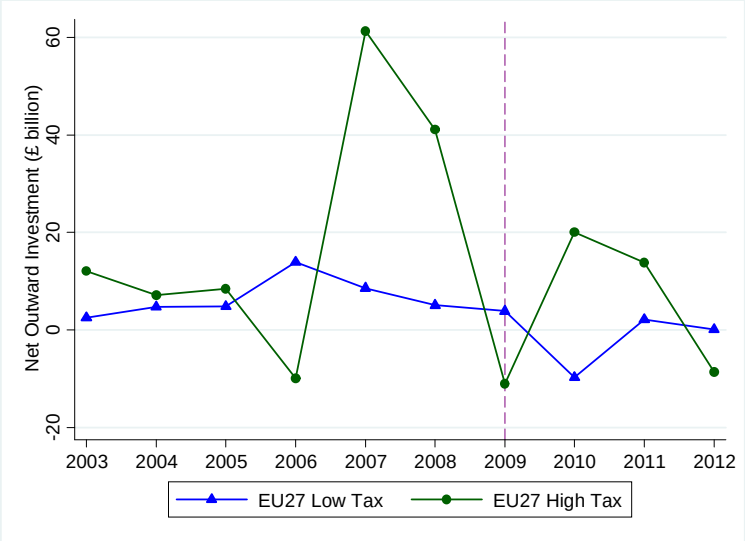
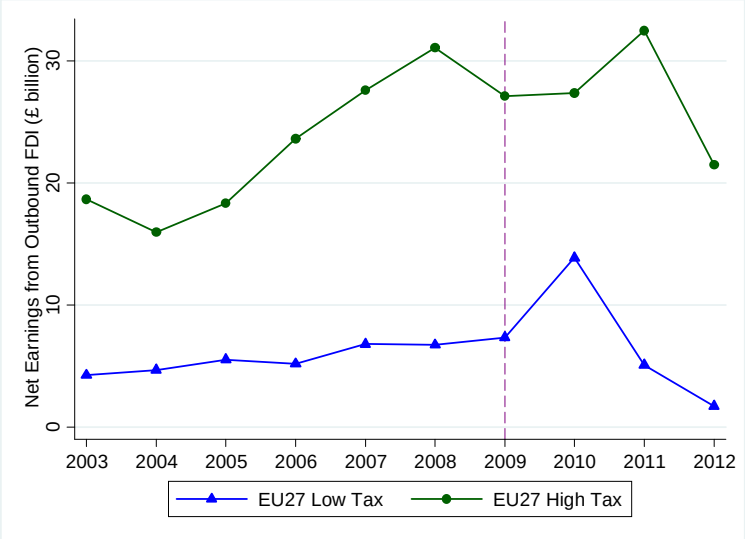
Figure 1. AGGREGATE EVIDENCE FROM EU27

Panel A. Net UK Outbound Investment

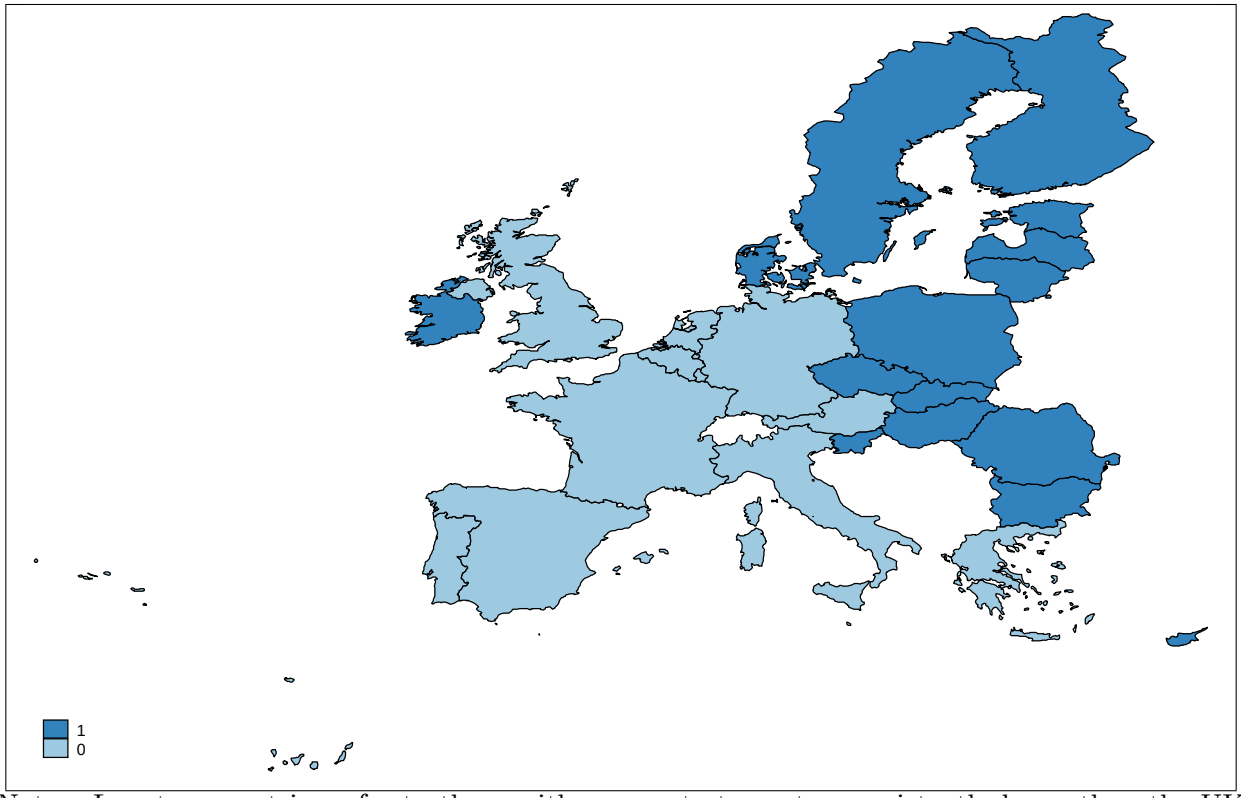


Panel B. Net Earnings from Outbound FDI



Notes: Net foreign direct investment flows abroad by main country, 2003 to 2012. Sources: Office of National Statistics, available at http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-329603.

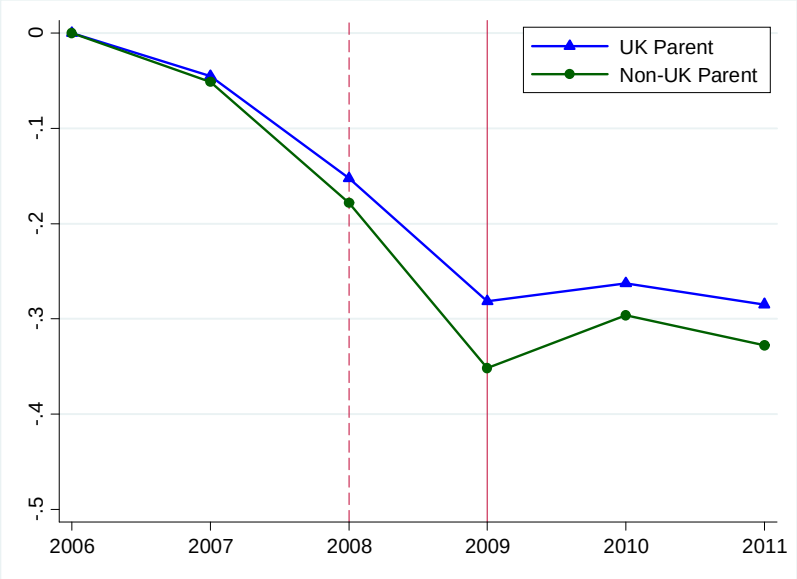
Figure 2. EU-27 CORPORATE TAX LEVEL



Notes: Low-tax countries refer to those with corporate tax rates consistently lower than the UK tax rate during 2005-2011. They are depicted in dark blue and include Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Hungary, Ireland, Lithuania, Latvia, Poland, Romania, Sweden, Slovenia, and Slovakia. High-tax countries refer to the rest of EU-27 countries and are depicted in light blue.

Figure 3. GRAPHICAL EVIDENCE

Panel A. Gross Investment Rate in Low-Tax Countries



Panel B. Gross Investment Rate in High-Tax Countries

Notes: Panel A plots the average investment rate in 2006-2011 for UK affiliates and non-UK affiliates in low-tax countries. Panel B plots the average investment rate in 2006-2011 for UK affiliates and non-UK affiliates in high-tax countries. The solid vertical line depicts the year when the exemption system became effective, and the dashed vertical line depicts the year when the policy reform was announced.

Table 1. COUNTRY STATISTICS

		Subsidiaries with Ultimate Parent in						
Country	Total	UK	Europe	North America	Asia	Africa	South America	Oceania
Austria	31,265	1,169	24,529	427	1,217	161	231	98
Belgium	30,765	1,932	20,650	217	1,750	105	49	280
Bulgaria	7,981	245	5,807	147	1,013	42	0	14
Cyprus	167	21	77	14	13	7	0	7
Czech Republic	43,091	1,687	34,155	467	1,960	273	21	105
Germany	149,319	11,640	96,275	1,743	10,692	539	189	1,141
Denmark	17,015	1,468	11,440	280	570	14	28	118
Estonia	10,326	517	8,033	307	560	7	0	28
Spain	57,945	5,033	38,954	798	2,835	147	399	364
Finland	12,419	749	9,251	98	462	7	7	56
France	108,608	8,886	67,259	1,454	5,558	1,181	189	587
United Kingdom	507,782	311,925	84,224	7,532	15,356	2,662	266	6,381
Greece	8,365	609	6,223	77	231	119	0	63
Hungary	7,159	236	5,733	35	280	14	7	14
Ireland	18,720	3,998	6,447	322	595	76	14	287
Italy	54,722	4,587	36,892	620	2,448	182	105	406
Lithuania	4,528	140	3,821	105	147	7	0	14
Luxembourg	16,730	2,413	8,460	516	322	140	14	154
Latvia	7,474	308	5,724	154	707	56	0	35
Malta	1,724	231	1,017	0	63	35	0	77
Netherlands	80,291	7,189	37,080	1,428	7,067	430	355	625
Poland	50,512	2,344	40,379	259	1,784	84	14	167
Portugal	12,365	523	9,655	49	419	139	91	91
Romania	58,293	1,613	44,532	614	6,127	634	21	143
Sweden	30,135	2,289	22,491	154	889	7	7	182
Slovenia	2,078	70	1,764	7	42	14	0	14
Slovakia	8,694	175	7,346	77	231	7	14	21
Total	1,338,473	371,997	638,218	17,901	63,338	7,089	2,021	11,472

Notes: Countries in each row refer to the host country where the multinational affiliate locate. Countries/Regions in each column refer to the home country/region where the ultimate parent of the multinational affiliate locate.

Table 2. DESCRIPTIVE STATISTICS

Variable	Obs.	Mean	Median	Min.	Max.
Investment	483,507	1,246.50	72	-3.84E+08	13,426,293
Fixed Asset	902,826	12,470.87	376	0	3.85E+08
Investment scaled by Lagged Asset	476,602	0.483	0.133	-0.368	5.714
Firm-level controls					
Sales	704,524	53,286	6226	0	1.30E+08
Cash Flow	584,454	4,403	347	- 9,048,264	29,299,210
Earnings before Interest & Tax (EBIT)	759,066	1,416	165	- 60,410,876	34,339,493
EBIT Margin	658,771	0.026	0.039	-1.768	0.907
Firm Age	1,335,654	16	11	0	268
Country-level controls					
Population	1,338,473	46,945,485	60,620,361	402,668	82,500,849
GDP per Capita	1,338,473	25,051	27,256	2,563	66,610
Unemployment Rate	1,338,473	0.075	0.075	0.031	0.217
Corporate Tax Rate	1,338,473	0.285	0.296	0.100	0.404
Parent country-level controls					
GDP growth rate (%)	1,302,128	1.47	1.85	-17.95	37.48
GDP per Capita	1,302,790	44,829	42,960	144	193,892
Transparency and corruption rating	8,542	3.38	3.50	1.00	4.50
Business regulatory environment rating	8,542	3.42	3.50	1.50	5.50

Notes: Unconsolidated values, in thousand Euros, current prices. All ratios winsorized at top and bottom 0.025 percentile. Country-level controls from the World Bank's World Development Indicators 2009. Country-level corproate tax rates collected from Oxford CBT Tax Database. CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high). CPIA business regulatory environment rating (1=low to 6=high).

Table 3. INVESTMENT RESPONSE IN LOW-TAX COUNTRIES

	(1)	(2)	(3)	(4)	(5)
DE_t	0.091**	0.088**	0.046*	0.045*	0.062*
	(0.035)	(0.034)	(0.025)	(0.024)	(0.033)
Year FEs	x	x	x	x	x
Affiliate FEs	x	x	x	x	x
Affiliate-Level Controls		x	x	x	x
Host Country-Level Controls			x	x	x
Host Country-Year FEs				x	x
Parent Country-Level Controls					x
N	108,216	101,500	101,500	101,500	100,021
R^2	0.03	0.02	0.03	0.03	0.03

This table reports difference-in-differences estimates of the effect of the 2009 dividends exemption on investment by UK affiliates in EU-27 countries which tax corporate profit at a lower rate than the UK. All columns display the coefficient on the DE_t variable, which is the interaction between a UK affiliate indicator and an indicator for the year being 2009 onwards, from a regression of investment rate on this interaction, affiliate fixed effects, year fixed effects and additional controls. Investment rate is gross investment scaled by book value of fixed capital asset in (end of) previous year. Affilate-Level controls indicates that the regression includes lagged turnover, cash flow scaled by lagged asset, lagged profit margin, and firm age. All firm-level ratio variables are winsorized at top and bottom 0.25th percentile to remove the influence of outliers. "Host Country-Level controls" indicates that the regression includes statutory corporate tax rate, GDP per capita, population size, and unemployment rate at the host country level. "Host Country-Year FEs" indicates that the regression includes two-way host country and year fixed effects. "Parent Country-Level controls" indicates that the regression includes GDP growth rate and GDP per capital at the parent country level. Heteroskedasticity-robust standard errors are clustered at country level. ***, **, * denotes significance at 1%, 5% and 10% level, respectively.

Table 4. INVESTMENT RESPONSE IN HIGH-TAX COUNTRIES

	(1)	(2)	(3)	(4)	(5)
DE_t	-0.028**	-0.036***	-0.038***	-0.037***	-0.037***
	(0.011)	(0.010)	(0.010)	(0.010)	(0.007)
Year FEs	x	x	x	x	x
Affiliate FEs	x	x	x	x	x
Affiliate-Level Controls		x	x	x	x
Host Country-Level Controls			x	x	x
Host Country-Year FEs				x	x
Parent Country Controls					x
N	193,407	177,853	177,853	177,853	175,590
R^2	0.01	0.01	0.01	0.01	0.01

Notes: This table reports difference-in-differences estimates of the effect of the 2009 dividends exemption on investment by UK affiliates in EU-27 countries which tax corporate profit at a higher rate than the UK. All columns display the coefficient on the DE_t variable, which is the interaction between a UK affiliate indicator and an indicator for the year being 2009 onwards, from a regression of investment rate on this interaction, affiliate fixed effects, year fixed effects and additional controls. Investment rate is gross investment scaled by book value of fixed capital asset in (end of) previous year. Affilate-Level controls indicates that the regression includes lagged turnover, cash flow scaled by lagged asset, lagged profit margin, and firm age. All firm-level ratio variables are winsorized at top and bottom 0.25th percentile to remove the influence of outliers. "Host Country-Level contro" indicates that the regression includes statutory corporate tax rate, GDP per capita, population size, and unemployment rate at the host country level. "Host Country-Year FEs" indicates that the regression includes two-way host country and year fixed effects. "Parent Country-Level controls" indicates that the regression includes GDP growth rate and GDP per capital at the parent country level. Heteroskedasticity-robust standard errors are clustered at country level. ***, **, * denotes significance at 1%, 5% and 10% level, respectively.

Table 5. SEPARATING THE ANTICIPATION EFFECT

	Low-Tax Countries			High-Tax Countries		
	(1)	(2)	(3)	(4)	(5)	(6)
Year 2008 × UK Parent	0.052	0.035	0.035	-0.037	-0.033	-0.033
	(0.057)	(0.042)	(0.042)	(0.032)	(0.036)	(0.036)
DE_t	0.115**	0.080*		-0.042*	-0.051**	
	(0.051)	(0.037)		(0.019)	(0.020)	
Year 2009 × UK Parent			0.097*			-0.065***
			(0.046)			(0.012)
Year 2010 × UK Parent			0.055			-0.040
			(0.044)			(0.027)
Year 2011 × UK Parent			0.095			-0.046
			(0.060)			(0.051)
Year FEs	x	x	x	x	x	x
Affiliate FEs	x	x	x	x	x	x
Affiliate-Level Controls		x	x		x	x
Host Country-Level Controls		x	x		x	x
Host Country-Year FEs		x	x		x	x
Parent Country-Level Controls		x	x		x	x
N	108,216	100,021	100,021	193,407	175,590	175,590
R^2	0.03	0.03	0.03	0.01	0.01	0.01

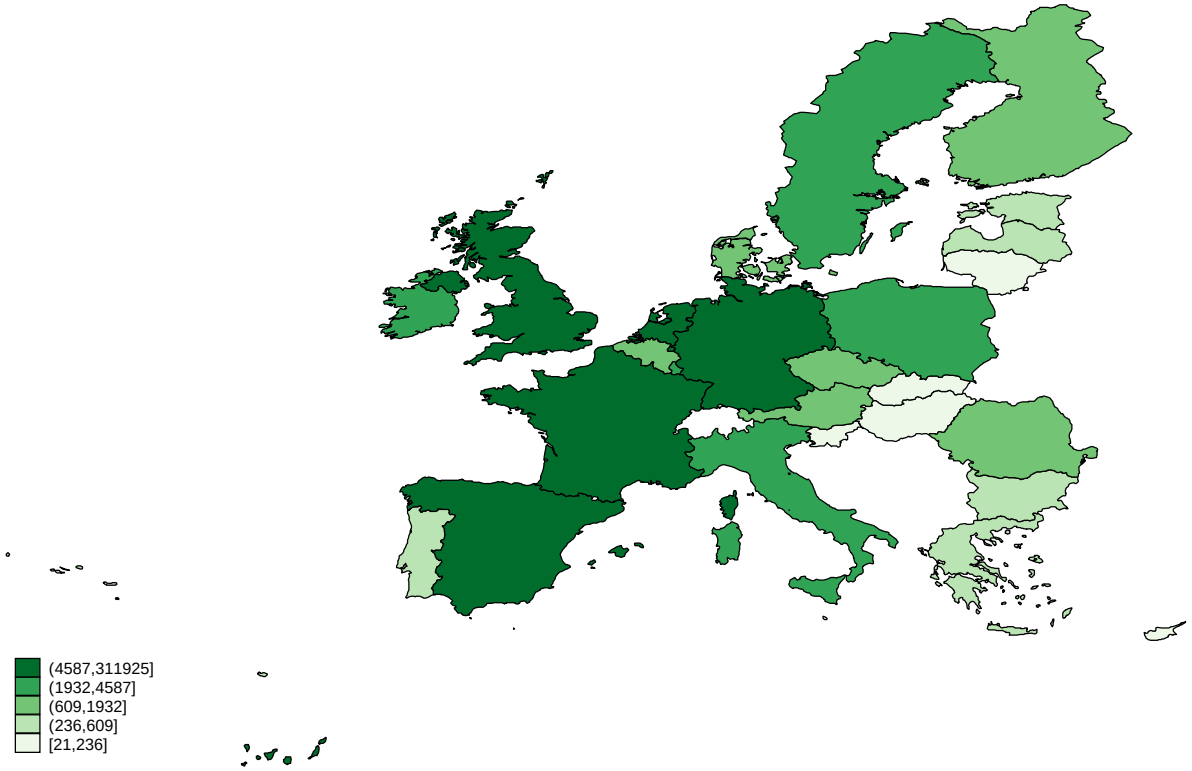
Notes: This table reports difference-in-differences estimates of the effect of the 2009 dividends exemption on UK outbound investment. Column 1-3 report results in countries which tax corporate profit at a lower rate than the UK, and Column 4-6 report results in countries which tax corporate profit at a higher rate than the UK. All columns display the coefficient on the interaction between a UK affiliate indicator and an indicator for the year 2008 when the reform was announced. Column 1-2 and 4-5 display the coefficient on the DE variable, which is the interaction between a UK affiliate indicator and an indicator for the year being 2009 onwards. Column 3 and 6 display the coefficients on the interaction terms between a UK affiliate indicator and a year indicator for 2009, 2010, and 2011, respectively.

Table 6. INVESTMENT RESPONSE IN THE UK

	(1)	(2)	(3)	(4)	(5)
Panel A: Non-UK Affliates as Control Group					
DE_t	-0.041***	-0.033**	-0.033**	-0.024	-0.028
	(0.012)	(0.014)	(0.014)	(0.019)	(0.023)
Year 2008 × UK Affiliate					-0.008
					(0.021)
N	136,105	103,511	103,511	101,378	101,378
R^2	0.01	0.01	0.01	0.01	0.01
Panel B: Domestic UK Firms as Control Group					
DE_t	0.010	0.009	0.009	0.009	0.001
	(0.014)	(0.018)	(0.018)	(0.018)	(0.021)
Year 2008 × UK Affiliate					-0.021
					(0.025)
N	100,969	64,536	64,536	64,536	64,536
R^2	0.02	0.02	0.02	0.02	0.02
Both panels include					
Year FEs	x	x	x	x	x
Affiliate FEs	x	x	x	x	x
Affiliate-Level Controls		x	x	x	x
Host Country-Level Controls			x	x	x
Parent Country-Level Controls				x	x

Notes: This table reports difference-in-differences estimates of the effect of the 2009 dividends exemption on investment by UK affiliates in the UK. All columns display the coefficient on the DE_t variable, which is the interaction between a UK affiliate indicator and an indicator for the year being 2009 onwards, from a regression of investment rate on this interaction, affiliate fixed effects, year fixed effects and additional controls. Panel A reports results using Non-UK multinational affiliates that operate in the UK as a control group. Panel B reports results using stand-alone firms and firms in domestic groups in the UK as a control group. All variables are defined as in Table 3. Heteroskedasticity-robust standard errors are clustered at firm level. ***, **, * denotes significance at 1%, 5% and 10% level, respectively.

Figure A.1. SPATIAL DISTRIBUTION OF UK SUBSIDIARIES



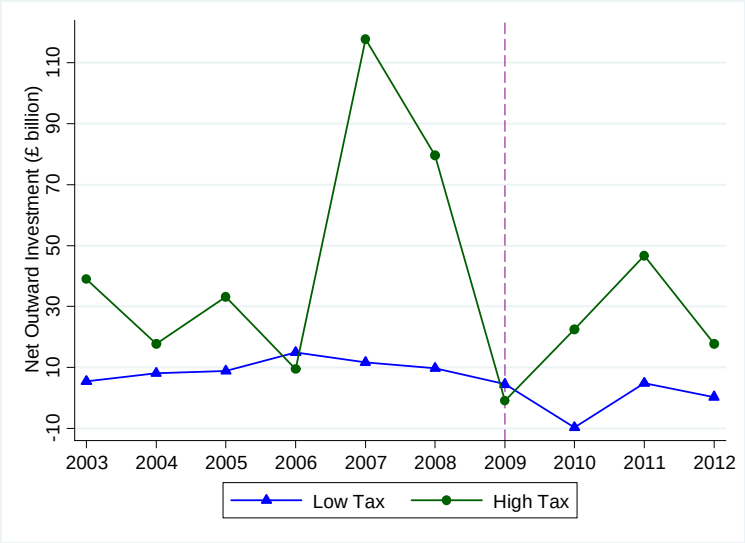
Notes: This figure shows the distribution of UK-owned affiliates in the EU-27 countries. Numbers in the square brackets refer to the five quantiles of the sample distribution.

A Appendix Figure

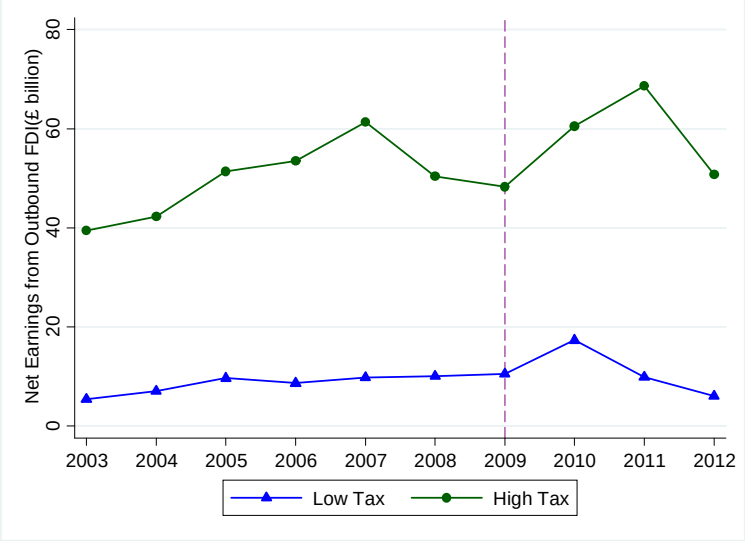
B Appendix Table

Figure A.2. AGGREGATE EVIDENCE FROM MAJOR TRADING PARTNERS

Panel A. Net UK Outbound Investment



Panel B. Net Earnings from Outbound FDI



Notes: Net foreign direct investment flows abroad by main country, 2003 to 2012. Sources: Office of National Statistics, available at http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcmfor 42 out of 53 main countries which attract UK outbound investment.

Table B.1. CORPORATE TAX RATES IN EU-27

Country	2005 (%)	2011 (%)
Low-Tax:		
Cyprus	10	10
Ireland	12.5	12.5
Bulgaria	15	10
Latvia	15	15
Romania	16	16
Hungary	17.52	21
Poland	19	19
Slovakia	19	19
Estonia	24	21
Slovenia	25	25
Finland	26	26
Czech Repulic	26	19
Denmark	28	25
Sweden	28	25
UK	**30**	**28**
High-Tax:		
Portugal	29	29
Austria	30	25
Luxemburg	30.38	28.8
Netherlands	31.5	25
Greece	32	24
Belgium	33.99	33.99
France	34.93	34.93
Malta	35	35
Italy	37.25	31.29
Germany	39.6	30.95
Spain	40.37	35.25