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# Switching to Territorial Taxation: FDI Effects for Host-Countries of Foreign Subsidiaries

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## Abstract

The paper explores the effects of the switch to territorial taxation on outbound FDI. Rather than employing standard FDI statistics, the paper uses data which reports the location of the ultimate owner. We use a quasi-experimental approach that exploits the timing of reforms. In order to provide a counterfactual we employ synthetic-control methods. Our results document a substantial increase of Japanese FDI in Germany after the switch from worldwide to territorial taxation in Japan in 2009. In contrast, the switch in the UK in the same year is not found to exert any significant effects on investment of UK multinationals in Germany. These findings support the view that only the switch in relatively high-tax countries exerts FDI effects.

## Key Words:

FDI; Dividend Exemption; Tax Competition; Synthetic Control Method

## JEL Classification:

H25; F23

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## 1 Introduction

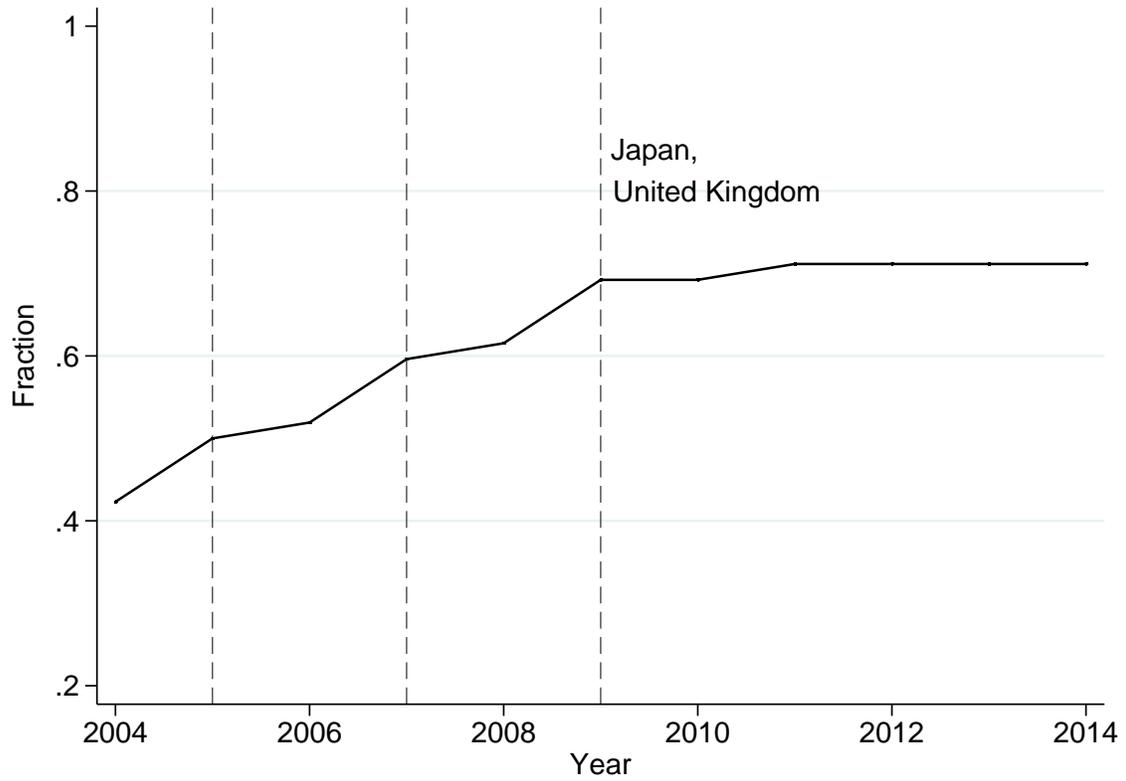
The taxation of profits of multinational corporations or enterprises (MNE) follows basically one out of two different principles. Under the principle of worldwide taxation all profits repatriated from abroad would be subject to profit taxation in the home country of the multinational. The alternative principle, so called territorial taxation, basically exempts profits of foreign subsidiaries from taxation in the home-country (for a discussion see, *e.g.*, Gresik, 2001).

Given tax competition for FDI, statutory tax rates have been reduced substantially in many countries of the world. Under a system of worldwide taxation, multinational corporations benefit less from lower taxes abroad and avoiding higher taxes at home requires to defer repatriation of profits. This issue has played a role in the debate preceding the recent decision of the US to switch to territorial taxation. However, the US is only following a global trend. A number of countries have switched recently to a system of territorial taxation.

Figure 1 displays the fraction of OECD/EU-member countries that follow a territorial approach in the period between 2004 to 2014. In 2004 the fraction is at 40% and at the end of the period the fraction has increased to about 75%. Some individual countries that have switched to this approach are noted in the figure. This includes Japan and the United Kingdom in 2009.

The choice of the tax-treatment of foreign earnings by the home-country of the multinational has potentially important effects on the host countries of the foreign subsidiaries. In particular, the sensitivity of these subsidiaries with respect to local taxation will be different (Hines, 1996, Bénassy-Quéré *et al.*, 2005), and a reallocation of investment might take place. Under world-wide taxation local taxes paid by foreign subsidiaries are credited against taxes paid in the home country. As a consequence, international tax-differences are of limited importance for foreign direct investment. This is different under territorial taxation, as the definitive tax burden faced by foreign subsidiaries is determined by the host country. Hence, a switch

Figure 1: Territorial Tax Regime among OECD/EU Members



Note: Number of countries with dividend exemption among a sample of 52 OECD/EU countries.  
Source: Ernst & Young, Annual Corporate Tax Guides, own calculations.

to territorial taxation may exert fiscal externalities on potential or actual host-countries of foreign subsidiaries.

To explore the effects of switches towards territorial taxation on FDI, this paper uses data on bilateral foreign direct investment in Germany that, in contrast to standard FDI data, takes account of the chain of ownership. We employ a quasi-experimental approach that exploits the timing of reforms. In order to provide a counterfactual, we employ the synthetic-control method (SCM) pioneered by Abadie and Gardeazabal (2003). Our results document a significant increase in inbound FDI into Germany by Japanese multinationals due to the switch from worldwide to territorial taxation in 2009. The switch in the UK in the same year is not found to exert any significant effects on inbound FDI in Germany. These different effects support the view that only a switch towards territorial investment in high-tax countries exerts effects on FDI outflows. Since, by the time of the reform, the Japanese statutory corporate tax rate exceeds the German rate by around 11 percentage points whereas the British rate basically matches the German rate.

Our paper contributes to the literature by providing evidence of potentially strong effects of the switch to territorial taxation in the country of the ultimate owner on outbound FDI. The existing literature on the switch to territorial taxation is limited. Hasegawa and Kiyota (2009) explore the effect of the switch to territorial taxation in Japan on repatriation of profits from foreign subsidiaries. More recently, Egger *et al.* (2015) investigate repatriation effects of the switch to territorial taxation in the UK. The effects of switches towards territorial taxation in Japan and the UK on the number of foreign acquisitions is analyzed by Feld *et al.* (2016). The authors find that the switch in Japan exerts particularly strong effects, a finding that they relate to the relatively high tax rate in Japan. Liu (2018) investigates the effect of the shift in the UK using microdata for UK multinationals finds a significant increase of FDI in low tax countries elsewhere in Europe.

The paper proceeds as follows. The following section 2 discusses the data. Section 3 lays out the methodology, and section 4 provides the results. Section 5 concludes.

## 2 Data

Standard foreign direct investment statistics (as, for instance, provided by the OECD) reports bilateral FDI by the country of the immediate investor. While this “first-shot” FDI data might be useful in order to report international capital flows, it could be quite misleading for a study of tax effects. In Europe, in particular, the common-market comprises a large number of countries with different tax systems and substantial variation in corporate tax burden. Facing these differences, multinational corporations often set-up a complex structure of subsidiaries in different European countries in order to avoid paying high taxes and to minimize the tax burden. This involves the establishment of holding entities in countries that provide special tax benefits for holdings that accumulate earnings from their European affiliates.<sup>1</sup> As a consequence, foreign direct investment often involves complex chains of ownership (Mintz and Weichenrieder, 2012).

Table 1 illustrates the differences in bilateratal FDI statistics that result from the different methods of measurement using data for Germany in 2004. Column (1) documents the main inbound investors and column (2) reports the aggregate investment in Billion Euro according to the OECD FDI statistics based on the first-shot data. The largest investor with an amount of 180 billion Euro is the Netherlands. It exceeds even the investment by US investors, and the third most important source of investment is Luxembourg with almost the same volume of German investments.

Columns (4) and (5) reports inbound investment by the country of the ultimate owner using Bundesbank data. According to this statistic, the distribution of owners of FDI is vastly different. Consistent with size of its economy, the US is the most important source of inbound investment into Germany, with almost triple the amount of investment from the Netherlands. Against this background, we base our analysis on ultimate owner statistics.

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<sup>1</sup>More recently, firm establish “patent-boxes” that enjoy tax benefits for earnings specifically associated with immaterial property (see *e.g.* Evers et al., 2015).

Table 1: FDI in Germany: Bilateral and Ultimate-Owner FDI

| Bilateral FDI |             | Ultimate-Owner FDI |             |         |
|---------------|-------------|--------------------|-------------|---------|
| (1)           | (2)         | (3)                | (4)         | (5)     |
| 1             | Netherlands | 179,918            | USA         | 148,426 |
| 2             | USA         | 116,704            | UK          | 94,428  |
| 3             | Luxembourg  | 113,597            | Netherlands | 55,390  |
| 4             | France      | 68,993             | France      | 45,849  |
| 5             | UK          | 62,295             | Switzerland | 34,341  |
| 6             | Switzerland | 41,877             | Luxembourg  | 18,986  |
| 7             | Austria     | 16,866             | Japan       | 15,084  |
| 8             | Belgium     | 16,086             | Finland     | 10,678  |
| 9             | Japan       | 14,231             | Austria     | 9,954   |
| 10            | Finland     | 13,645             | Schweden    | 9,835   |

Foreign direct investment stocks in Germany in 2004 (in Billion Euro).

Source: OECD (Bilateral FDI). Deutsche Bundesbank (Ultimate-Owner FDI).

### 3 Methodology

The empirical analysis exploits a distinct tax reform in host country  $i$  and explores its consequences for inbound investment into Germany. We consider an empirical model of FDI in period  $t$  with ultimate owner in country  $i$ , formally

$$FDI_{i,t} = a_{0,i} + b \cdot I(TR)_{i,t} + x'_{i,t}a_1 + a_{2,t} + \lambda_t \cdot \mu_i + \epsilon_{i,t}, \quad (1)$$

where  $a_{0,i}$  is a country-fixed effect,  $a_{2,t}$  is a time-fixed effect, and  $x'_{i,t}$  is a vector of control variables.  $\epsilon_{i,t}$  is a random disturbance.  $I(TR)$  is a binary indicator reflecting all periods during which a territorial tax regime is implemented in country  $i$ . The coefficient on  $I(TR)$  in equation (1),  $b$ , reveals whether and to what extent FDI changes under a territorial tax regime.

While it seems straightforward to employ a difference-in-differences approach in order to estimate (1), a crucial requirement is the common trends assumption for treated and non-treated countries. It should be noted that controls are included which capture potentially important drivers of differences in FDI such as GDP, EU membership or the corporation tax

rate. However, given substantial heterogeneity between countries FDI developments, there are still important time-trends and time effects among subgroups of the population captured by  $\lambda_t \cdot \mu_i$ .

To provide consistent estimates of  $b$ , we apply the synthetic control method (SCM) estimator following Abadie *et al.* (2010). We define a pool of countries (“donors”) that stick to a system of worldwide taxation during the observation period. Among this pool of countries we construct a weighted average of observations to produce a counterfactual series of inbound FDI, *i.e.* a synthetic control.

$$\widehat{b} = FDI_{j,t} - \sum_{j=1}^J w_j FDI_{j,t}$$

The weights  $w_j$  are chosen such that the difference between the pre-intervention characteristics of the treated and non-treated observations is minimized. The SCM estimator is then the difference between the post-intervention values, in our case inbound FDI, of the treated country and the synthetic control. In order to implement the SCM estimator, we employ STATA’s *synth* command.

With SCM estimates, there is no straightforward test for the significance of the treatment effect. Therefore, we follow Abadie *et al.* (2010), and run a set of counterfactual or “placebo” estimations, in which the treatment is falsely assigned successively to each country in the set of “donor” countries out of which the synthetic control is formed. Comparing these results with the analysis of the actual treatment allows us to assess whether our findings differ from or are within the range of a set of random results. The resulting standard errors are then used to compute a confidence band around the predicted treatment effects. We report 90% confidence bands based on the assumption of a standard t-distribution.

The empirical analysis focuses on the territorial tax reforms of two large economies with a substantial volume of FDI in Germany: Japan and the UK. Both reforms took place in 2009. As the statutory tax rate in Japan is relatively high at the time of the reform (41%),

we expect a considerable increase in FDI from Japan in Germany whose statutory rate is around 30%. An interesting comparison offers the case of the UK, where the tax rate is not much different from the Germany's tax rate. Actually, at the time of the reform the tax rate in the UK (28%) was even below the German tax rate. In this case, therefore, we expect no effects of the switch towards the territorial regime on FDI in Germany.

While the ultimate owner FDI data provided by the Bundesbank provides bilateral FDI for multiple countries, the number of countries that constantly apply a worldwide tax system throughout the analysis period from 2004 to 2014s limited. For Japan and the UK, that both switched in 2009 to a territorial system, the pool of potential donors in the data is consequently limited to 11 countries: Brazil, Canada, Chile, China, Croatia, India, Ireland, Israel, Mexico, South Korea and the United States.

The list of variables used to predict the development in FDI are standard variables from the empirical FDI literature (*e.g.* Markusen, 1984; Yeaple, 2003). This includes GDP (in logs) and geographic distance to Germany (Berlin). To capture price developments we use the log of the consumer-price index. In addition, the corporation tax-rate as well as an indicator of EU membership is employed.

## 4 Results

As Japan and the UK have switched to a territorial tax-system in 2009, the period 2004 - 2008 is used to produce counterfactual FDI series. In the case of Japan, the optimal set of weights is USA (43,6 %), Canada (46,6 %) and Brazil (9,8 %). Table 2 provides descriptive statistics for Japan and the counterfactual.

Figure 2 depicts the development of FDI in Japan and the corresponding synthetic control over the time period from 2004 until 2014. The results indicates that Japanese direct investment to Germany increased substantially in the second year after the reform. Descriptive statistics on the treatment effect is also provided by Table 3. Accordingly, the average post-

Table 2: Descriptive Statistics: Reform Country and Synthetic Control

|  | Japan  | Synthetic Control |
|--|--------|-------------------|
| FDI stocks, log (in Euro)                  | 9.77   | 9.77              |
| Corporate tax rate                         | 41 %   | 37,6 %            |
| Inverse distance to Germany (in km)        | .00011 | .00015            |
| GDP total, log (in Euro)                   | 15.06  | 14.81             |
| CPI, log (2005=100)                        | 4.61   | 4.63              |
| EU 27                                      | 0      | 0                 |
| Root Mean Squared Prediction Error (RMSPE) |        | .036              |
|  | UK     | Synthetic Control |
| FDI stocks, log (in Euro)                  | 11.31  | 11.30             |
| Corporate tax rate                         | 29.6 % | 36.3 %            |
| Inverse distance to Germany (in km)        | .0011  | .00024            |
| GDP total, log (in Euro)                   | 14.50  | 15.54             |
| CPI, log (2005=100)                        | 4.63   | 4.64              |
| EU 27                                      | 1      | 0.152             |
| Root Mean Squared Prediction Error (RMSPE) |        | .100              |

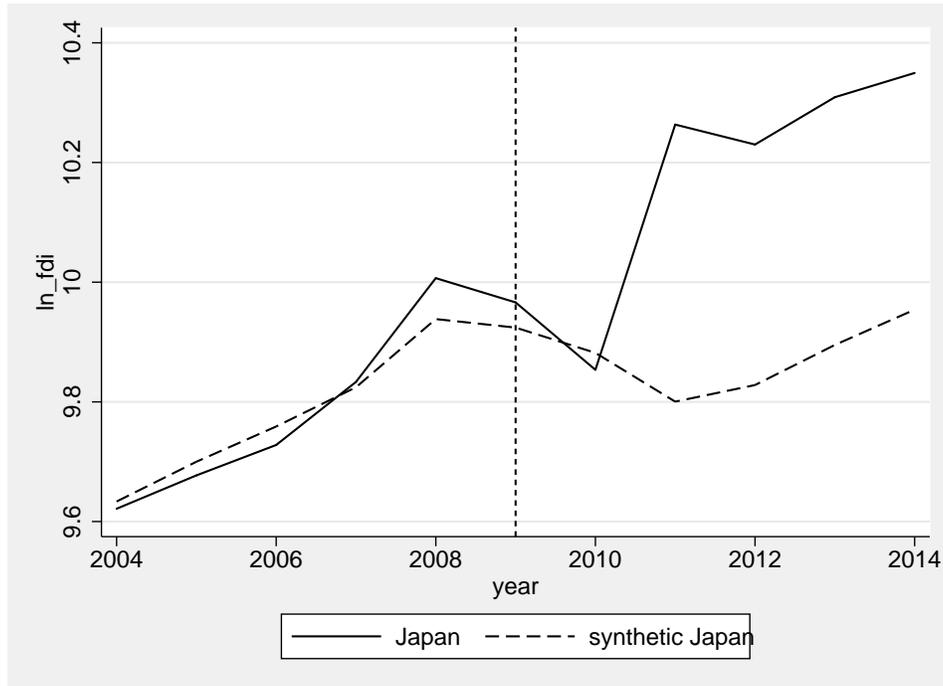
Means of variables in pre-treatment period.

Table 3: Actual *vs.* Predicted Outcomes

| Japan                | Actual | Synth. Control |
|----------------------|--------|----------------|
| <i>FDI</i> (post)    | 10.162 | 9.887          |
| <i>FDI</i> (pre)     | 9.773  | 9.778          |
| Av. treatment effect |        | .276           |
| RMSPE                |        | .036           |
| UK                   | Actual | Synth. Control |
| <i>FDI</i> (post)    | 11.315 | 11.404         |
| <i>FDI</i> (pre)     | 11.307 | 11.302         |
| Av. treatment effect |        | .005           |
| RMSPE                |        | .100           |

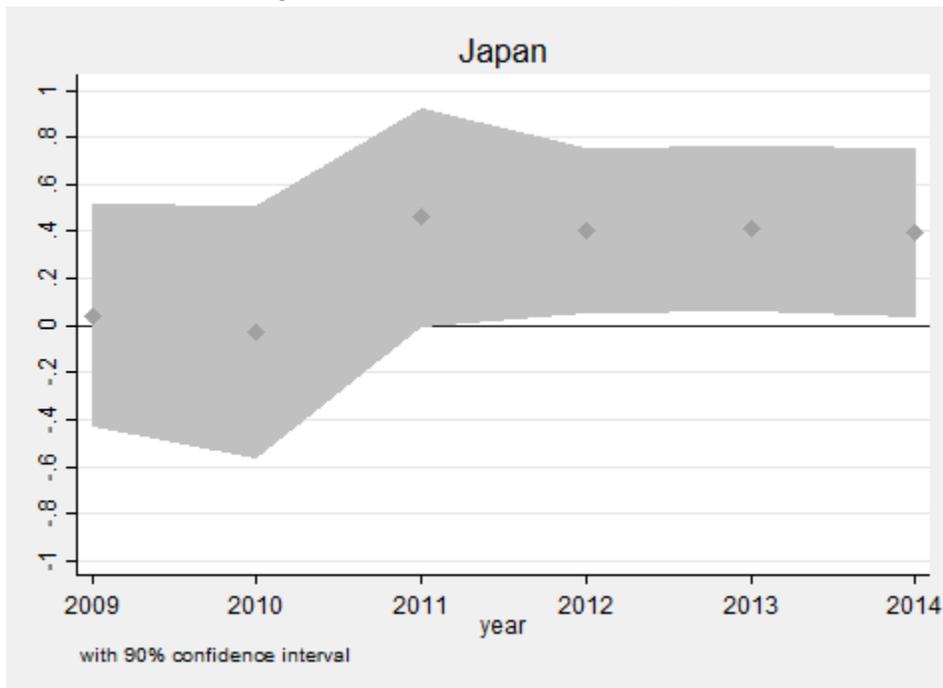
Notes: The table provides results of estimates obtained using SCM. It reports average pre- and post reform values for log FDI for Japan or the UK and their synthetic counterparts. The treatment effect reports the post-reform difference in this outcome variable. RMSPE reports the root mean square prediction error.

Figure 2: Actual and Counterfactual FDI: Japan



Japanese FDI (ultimate owner) in Germany in logs.

Figure 3: Treatment Effect: Japan



Relative change in FDI. 90% confidence band computed using placebo treatment for donor countries.

reform effect is about 27%. However, if the first two years after the reform are excluded, the average increase is estimated to be 41%.

Though the time-period is limited, the figure points to a permanent rather than a temporary increase. Qualitatively, this is in accordance with theoretical predictions, since Japan has a much higher tax rate than Germany during the observation period. Since in the pre-treatment period, the tax-rate in Germany is around 30%, the tax-differential is about 11 percentage points. This points to a semi-elasticity of FDI exceeding 3 percent. However, the precision of the estimate is low as is evident also from the confidence bands plotted in figure 3.

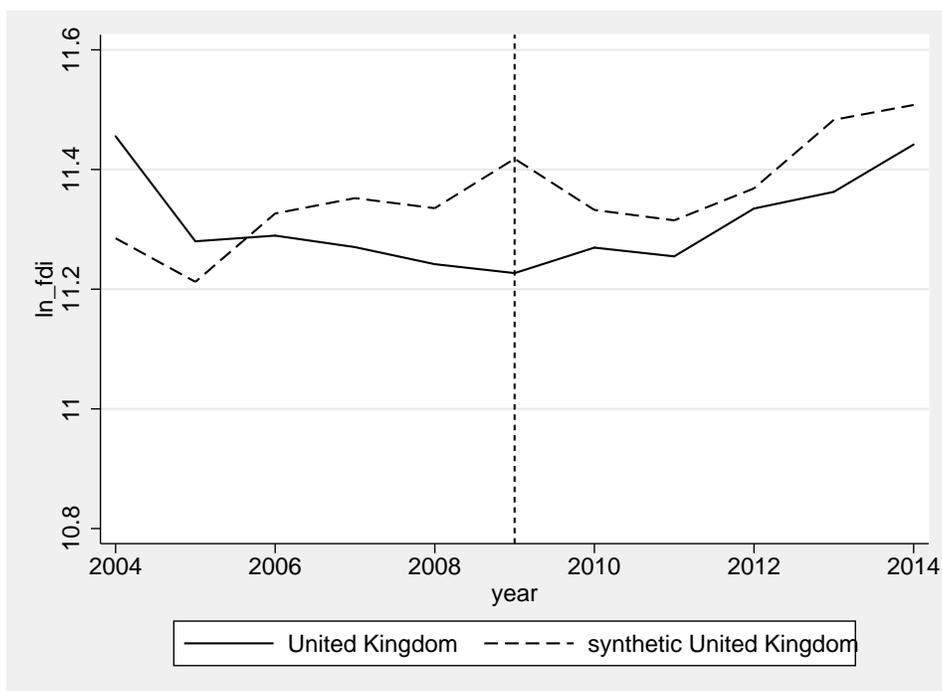
As the UK also switched to a territorial tax-system in 2009, the same period and set of potential donor countries is used to produce a counterfactual FDI series like in the case of Japan. While the set of “donors” is the same, the weights to construct the counterfactual FDI series differ from the Japanese case. A large weight is attached to the USA (84.8%) and the second country is Ireland (15.2%). Table 2 provides descriptive statistics for the UK and its counterfactual.

In case of the the UK, the SCM procedure yields a less accurate representation of the pre-treatment FDI development. This is also reflected in the root mean squared error, which is three times larger than in the case of Japan. However, no deviation in FDI is found after the switch to the territorial system. This is confirmed by Figure 5 which plots the treatment effect together with a 90% confidence band. Since the UK statutory corporation tax rate is similar to the German tax rate, both just below 30% at the time of the reform, this is in accordance with theoretical expectations.

## 5 Conclusion

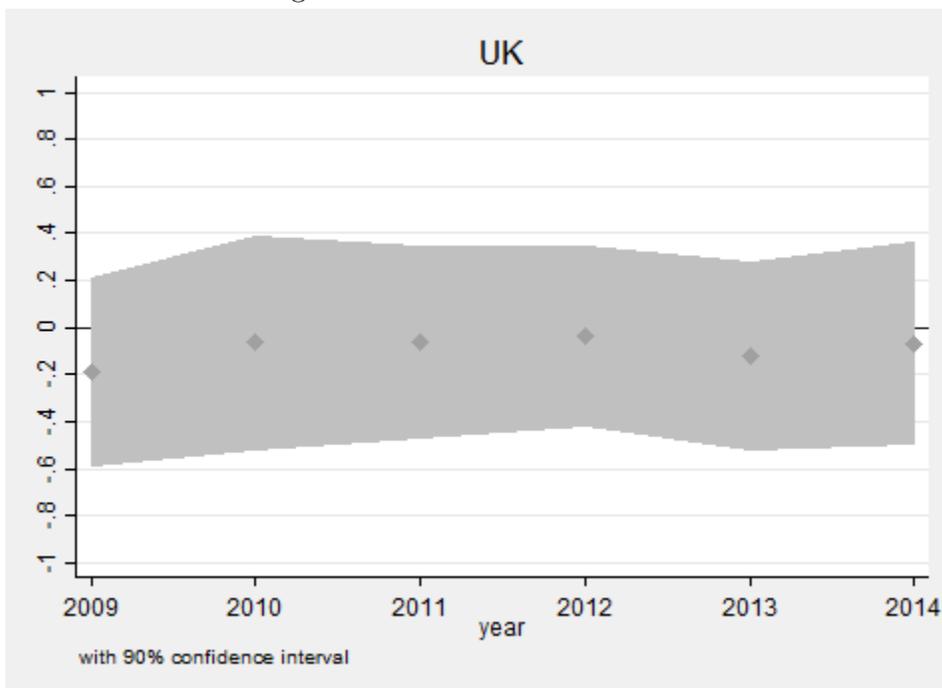
This paper has explored the FDI effects of a switch to a territorial tax system experienced by the host-countries of foreign subsidiaries. Since the standard FDI statistics do not reflect

Figure 4: Actual and Counterfactual FDI: UK



UK FDI (ultimate owner) in Germany in logs.

Figure 5: Treatment Effect: UK



Relative change in FDI. 90% confidence band computed using placebo treatment for donor countries.

the location of the ultimate owner of inbound FDI, the paper uses data from the German Bundesbank that takes account of the ownership chain and reports FDI in Germany by the location of the ultimate owner. To measure the effect on FDI that results from such a regime switch, the paper employs the synthetic control method to establish a counterfactual FDI development. The results suggest that the switch to a territorial tax system has very different effects depending on the tax-rate differential between the home country of the multinational and the host-country of its subsidiaries. For Japan whose statutory corporate tax rate exceeded the German by 11 percentage points at the time of the regime change, the switch to territorial taxation is found to be associated with a strong and persistent increase FDI in Germany by about 40%. For the UK whose statutory corporate tax rate is of similar magnitude like the German rate, we do not find any change of FDI in Germany due to the regime change.

From this perspective, the recent decision of the US government to abolish territorial taxation should give rise to increased FDI in foreign countries by US multinationals. However, parallel to the switch to territorial taxation in 2017, the US reduced its statutory corporate tax rate to 21% which clearly undercuts most of the statutory rates of large developed economies. From this perspective, the recent decision of the US government to abolish worldwide taxation will contribute to increase in FDI only in low tax countries.

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