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The recent actions of the US Treasury to reign in corporate tax inversions leave their rationale largely intact: the potential tax benefits of inversions remain unchanged and huge. A change in corporate residence still means that average dividend repatriation tax rates can be up to 10 percentage points lower than before. This applies to current or future foreign profits of US based corporations. Tax inversion is an example of profit shifting by multinational enterprises leading to erosion of corporate tax bases; not a unique US problem but a worldwide concern high on the international agenda with the BEPS – initiative of the G20 and the OECD.¹

In September 2014, the US Treasury Department announced measures to reign in corporate tax inversions. A tax inversion is a restructuring of a multinational company whereby it moves its legal residence to another country in order to avoid high tax burdens in the country of its previous residence. In general it involves little or no shift in actual economic activity. A flux of planned tax inversions by large US based corporations and concern for the erosion of the US corporate tax base prompted the Treasury to take the recent measures. Among these corporations are pharmaceutical companies, such as Pfizer, Abbvie and Mylan, but Burger King, too, is planning a merger with restaurant chain Tim Hortons, and moving its headquarters to Canada.

Abbvie Inc. planned a \$54 billion acquisition of Irish-based biopharmaceutical company Shire for: a merger involving tax inversion. The deal was called off end October citing the new Treasury measures. At the same time, however, Mylan Inc. expects its \$5.3 billion deal to acquire Abbott Laboratories' generic European operations to close in the first quarter of 2015. This merger involves creating a new holding company in the Netherlands.

Several tax analysts have claimed that the Treasury actions may not seriously affect the pending merger deals.² Basically the reason for this is that the tax rationale for the inversions does not change. The tax benefits of inversion most often mentioned are the switch to a country with a territorial (exemption) system instead of a worldwide (tax credit) system and a lower rate of the corporate income tax. The US taxes worldwide corporate income, with a credit for foreign taxes, whereas in a territorial system foreign corporate income is exempt from taxation in residence countries under territorial systems. Specific to the US tax code is that the tax liability is only incurred upon actual repatriation of foreign earnings. Repatriation, and thus taxation, can be deferred; a practice widely used by US multinationals (see for instance Zucman, 2014). The Treasury measures are generally acknowledged to be effective when accessing accumulated foreign earnings is the prime motive for tax inversion.

We present a straightforward systematic analysis of the tax benefits of inversion. We do not only take into account the rates of the corporate income tax and the double tax relief methods that countries apply but also the reduced rates of withholding tax in bilateral tax treaties. We compute average dividend repatriation tax rates by country and find that the US taxes foreign profits more than 10 percentage points higher than the rate of a large number of other

¹ See for instance <http://www.oecd.org/ctp/beps.htm>

² Robert Willens: 'not a mortal blow'; <http://blogs.wsj.com/pharmalot/2014/09/24/inversion-rules-are-not-a-mortal-blow-to-pending-deals-willens-explains/>

countries. This means that a US based multinational can, potentially, reduce its tax burden on its foreign earnings with more than 10 percentage points by inverting.

This note proceeds with a brief discussion of the Treasury measures. Next a simple model of the tax benefits of inversion is presented. Inserting the parameters of the international tax system into the model yields the above mentioned results. After tying up two loose ends, we conclude that, notwithstanding the Treasury's actions, the potential benefits of tax inversion remain largely intact.

Requirements for tax inversion

Prior to September 2014 the US already had anti-inversion rules in place. One important rule was, and still is, that the tax benefits of inversion are denied if the original US shareholders own 80 percent or more of the post-inversion company. This rule was introduced with the American Jobs Creation Act of 2004. Basically, it ended inversions to tax havens where no real business activity takes place, such as Bermuda and the Cayman Islands (see Marples and Gravelle, 2014).

The 80 percent ownership requirement also explains why mergers are a vehicle for tax inversion: the foreign company brings in non-US prior ownership. However, when a US company is large it may be difficult to find a suitable foreign company to merge with, and various ways have been used, therefore, to meet the 80 percent rule. Without going into details, the Treasury specifically targets these actions to size down the US company or to beef up the foreign company. The Treasury's measures do not touch the tax benefits *per se*, but they reinforce the requirements to gain access to these benefits (see the US Treasury Fact Sheet, 2014).

Other new Treasury measures target specific methods of inverted companies to gain access to the accumulated deferred foreign earnings of the former US subsidiary. These measures concern deferred past earnings and not the potential tax benefits on present or future earnings. We examine the latter below.

A simple model of tax inversion

We consider a multinational corporation that operates in at least three countries: A, B and C. Country A, says the US, is the country where the multinational has its legal residence. Country B is the country targeted for a tax inversion, possibly a European country but Canada is also in the picture. And country C represents the rest of the world where the multinational has subsidiaries.

Activities in the three countries lead to pre-tax profits of X , Y and Z , respectively. We assume throughout that the corporate income taxes (CIT) of the source countries are paid at the rates of t_A , t_B and t_C . Then after-tax profits are x , y and z , defined as: $x = (1 - t_A)X$, etc. We assume that the after-tax profits in the host countries are not affected by the tax system in the residence country A. In fact, we ignore tax planning strategies such as transfer pricing, hybrid constructs, intra-company loans, royalty payments, etc.

Figure 1 Dividend flows depending on residence



When the after-tax profits y and z are repatriated to the parent company in country A more taxes may be due, such as (final) dividend withholding taxes levied in the source countries B and C, and corporate income tax in residence country A, depending on its system of double tax relief. Now take these additional dividend repatriation taxes together, from origin to destination, i.e. from source to residence: t^e_{BA} and t^e_{CA} . Then the total net profits for the parent company in A are given by:

$$\text{Residence in A:} \quad x + (1 - t^e_{BA})y + (1 - t^e_{CA})z$$

Assuming no shift in activities, a parent's residence in country B involves different repatriation taxes.

$$\text{Residence in B:} \quad y + (1 - t^e_{AB})x + (1 - t^e_{CB})z$$

The condition for a profitable tax inversion (moving company residence from A to B), simply is the comparison of total repatriation taxes.

$$t^e_{BA}y + t^e_{CA}z \geq t^e_{AB}x + t^e_{CB}z$$

We examine this condition. First assume that the net profits in the rest of the world are negligible, $z=0$. Alternatively, assume that the two repatriation tax rates from the rest of the world are (nearly) equal, i.e. $t^e_{CA} = t^e_{CB}$. Then the result of the comparison depends on only two products of a tax rate and tax base. Even if the repatriation tax rate from A to B is higher than the rate from B to A (but not zero), the size of the activities in A relative to those in B may make tax inversion unprofitable. The larger country, at least in terms of economic activities, can levy higher taxes without the risk of inversion.³

$$y/x \geq t^e_{AB}/t^e_{BA}$$

Next assume that the earnings in the rest of the world, z , are sizable. In addition, take the activities in the candidate inversion country, y , to be negligible relative to the size of the activities in the old residence country, x . Then, or when $t^e_{BA} = 0$, we may ignore the term $t^e_{BA}y$.

³ Bucovetsky (1991) finds a similar result in an asymmetric two-country model.

The condition then reads as follows.

$$(t_{CA}^{e} - t_{CB}^{e}) \geq t_{AB}^{e} X / Z$$

The formula shows that tax inversion becomes less attractive if foreign profits are relatively small and the repatriation tax from A to B is high, given low profits in country B. With domestic earnings twice as high as foreign earnings, and a repatriation tax rate of 5 percent from A to B, the difference in repatriation tax rates vis-à-vis the rest of the world must be 10 percent or more to make inversion profitable.

Focusing on the US we may assume sizable earnings in the rest of the world, which certainly applies to a number of US-based pharmaceutical companies, and that the activities in new residence country are small relative to the size of the operations in the US. Moreover, we know that for some candidate inversion countries the dividend repatriation tax rate from the US, t_{AB}^{e} , is low or zero. In other instances the earnings in the old residence country, x , need not be paid as dividends to the holding company in the new residence country. The profitability of a tax inversion then mainly depends on the dividend repatriation tax rates from the rest of the world: $t_{CA}^{e} \geq t_{CB}^{e}$. These rates can be derived from the international tax parameters.

Using parameters of the international corporate tax system

In a study on tax treaty shopping we consider the international corporate tax system as a network of 108 countries including tax havens (Van 't Riet & Lejour, 2014). For each country pair we determine the tax cost of repatriating dividends directly. Given these 'tax distances' we employ an algorithm that finds the 'shortest tax route' between each pair of countries in the network. The algorithm is very much like the one in the navigation tool in your car. For 67 percent of the country pairs an indirect tax route through other countries is found to 'cost' less tax than direct dividend repatriation. This finding can be taken as an indication of the divergence of national tax codes.

We illustrate the potential benefits of tax inversion with the repatriation tax rates on direct routes. These bilateral tax rates are constructed from the general rate of non-resident dividend withholding tax of the source country and the double tax relief method of residence country. For relief methods other than participation exemption also the CIT rate of the home country of the investments must be taken into account. Moreover, the two countries may have signed a double tax treaty, reciprocally agreeing on reduced withholding tax rates and, possibly, on a more lenient double tax relief regime for the treaty partner.

Table 1 Tax parameters 2013 - selected countries

Country	CIT %	DTRM	DIV %	No. trts	US-div %
Canada	26.3	credit /exempt	25	75	5
Ireland	12.5	exempt	20	52	5
Luxembourg	29.2	exempt	15	57	0
Netherlands	25	exempt	15	74	0
Switzerland	21.1	exempt	35	71	5
United Kingdom	23	exempt	0	51	0
USA	39.1	credit	30	54	
World average	29.2		17.1		

Source: Van 't Riet and Lejour (2014), mainly based on EY (2013).

Table 1 shows this information for a selection of countries: the US and a number of candidate inversion countries: Canada, Ireland, Luxembourg, the Netherlands, Switzerland and the United Kingdom. The tax parameters are the CIT rate, the double tax relief method (DTRM), the general rate of the dividend withholding tax (DIV), the number of treaties and the US withholding taxes for the six treaty partners shown in the table. Canada grants the participation exemption for dividends from its treaty partners, 75 out of 108 countries, and thus it *de facto* has a territorial tax system.

An unambiguous result: large differences in world average dividend repatriation tax rates

Given the parameters of a corporate tax network of 108 jurisdictions all pairwise repatriation tax rates have been computed. Next, worldwide average inbound tax rates are calculated for individual countries, using GDP-weights for the source countries.

Low average tax rates for inbound dividends make a country attractive for corporate residence. The Netherlands and the United Kingdom head the ranking of countries in this respect, with average rates of 3.4 and 3.8 percent; see table 2. In sharp contrast, the average rate for the US is 16.7 percent, ranking 64th. Other candidate inversion countries can also be found in the top of the list. Ireland is not in the top 10, but it has other factors contributing to its tax charm, among others, its CIT rate of 12.5 percent. And Canada, candidate for the Burger King tax inversion, is ranked 28th; it has an average inbound dividend repatriation tax rate of 7 percent, still a difference of almost ten percentage points with the US.

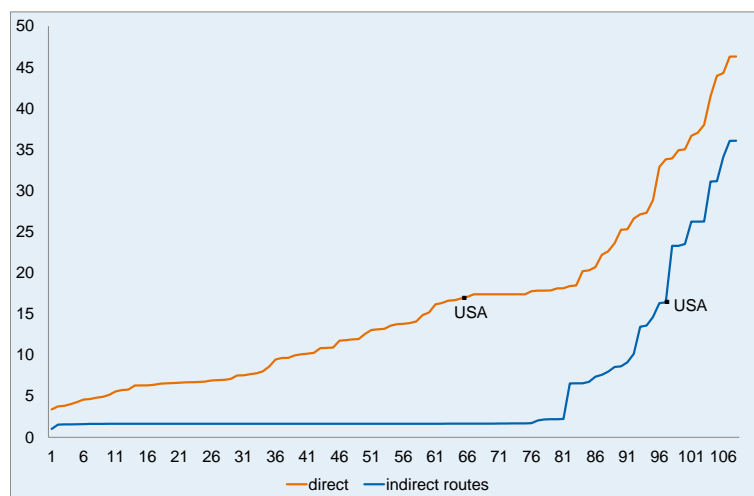
Table 2 Average repatriation tax rates for inbound dividends

Reference situation				
Country	Direct	Rank	Indirect	Rank
Netherlands	3.4	1	1.7	67
United Kingdom	3.8	2	1.7	75
Luxembourg	4.0	4	1.6	34
Switzerland	4.9	9	1.6	59
Ireland	5.6	11	1.6	45
Canada	7.0	28	1.6	5
United States	16.7	64	14.6	95
World average	12.1		6.0	
US - territorial tax system				
United States	6.7	25	2.0	77
World average	10.4		3.9	
Source: Van 't Riet and Lejour (2014) and new calculations.				

The possibility of indirect tax routing increases the differences in repatriation tax rates. Multinational corporations can channel investments through third countries to take advantage of tax treaty provisions not found on the direct route. The full potential tax benefit of this *treaty shopping* amounts to a worldwide average reduction of 6 percentage points of the tax burden for multinationals. For dividend flows to the US the average tax rate falls 2 percentage points. And *treaty shopping* creates a well-connected group of some 80 countries among which dividend repatriation is inexpensive, with average tax rates below 2 percent; see figure 1. The

group contains the EU-countries and various tax havens.⁴ Countries with a worldwide tax system are not part of it.

Figure 2 Distributions of average dividend repatriation tax rates



Finally, as an illustrative example, we report the calculations for the US applying a dividend participation exemption, which implies a territorial system. Its average inward repatriation tax rate drops to 6.7 percent, ranking 25th, above Canada, see table 2. And with the full potential benefit of *treaty shopping* the rate becomes 2 percent. In this situation the US will also be part of the ‘well-connected’.

And repatriation taxes on ‘domestic’ earnings can be avoided

The condition for profitable tax inversion also contains a term representing repatriation taxes from the earnings in the old residence country to the new residence country. Could these taxes counteract the tax benefits on foreign earnings, i.e. what about t_{ABX}^e ? Certainly when the US activities are sizable relative to those abroad these taxes may matter.

These repatriation taxes, however, are nil when the tax rate is zero. This is the case with tax treaty partners Luxembourg, the Netherlands and the UK: they face a US non-resident dividend withholding tax of zero percent, see table 1. This zero rate is conditional on the US subsidiary being owned for 80 percent or more by the foreign parent. With an inversion this condition is, in principle, easily met. Combined with dividend exemption in the new residency country the repatriation tax rate is zero. For candidate inversion countries Canada, Ireland and Switzerland there is a treaty rate for the dividend withholding tax of 5 percent. This rate may already be sufficiently low to make inversion pay, if overseas profits are relatively large; see the analysis above.

An obvious way to avoid repatriation taxes on the former ‘domestic’ earnings would be a partial inversion, reducing variable x in the comparison. The part of the company with the foreign business can be spun-off or split-off, as a separate corporation, while the bulk of the US operations remain with the US-based company. The planned Abbott / Mylan deal moving its residence to the Netherlands is an example of such a ‘spin version’. The true motive for this

⁴ Important in this finding is the EU’s Parent-Subsidiary directive which stipulates intra-EU withholding tax rates of zero and dividend participation exemption.

approach, however, is another legal 80 percent ownership requirement: to realize the tax benefits of an inversion the original shareholders of the US firm cannot own 80 percent or more of the new company. The Treasury notice addresses the 'spin version' practice to satisfy the less than 80 percent ownership requirement.

Accessing accumulated past foreign earnings as a motive for tax inversion

The tax parameters from 2013 amount to large differences in repatriation tax rates. The parameters in the past have not been very different and US based multinationals have had an incentive to defer repatriation of dividends and thus their taxation. Hence, foreign earnings have accumulated in foreign subsidiaries of US companies (Zucman, 2014). Gaining access to these overseas funds (deferred earnings), without paying repatriation taxes, may be another motive for tax inversion. One way to achieve this is a 'hopscotch loan', whereby the new foreign parent borrows from the old foreign subsidiary. These funds can then be used to pay dividends to shareholders. A loan to the old US parent would have been considered a form of repatriating dividends and thus subject to taxation. Again, the new Treasury notice does address this technique; it considers these loans as 'US property'. This measure is cited to have caused the Abbvie / Shire deal to be called off.

We do not distinguish between past and future foreign earnings, but the Treasury measures apply to the former, for the latter they are irrelevant. Nor do we take into account possible opportunities for earnings stripping that inversion may create. However, since we are dealing with corporations with foreign affiliates we submit that the opportunities for base erosion are already manifest.

Conclusion

We have hypothesized that the tax benefits that can be realized on repatriation of foreign earnings are the main driver for tax inversion. Dividend repatriation tax rates have been computed based on parameters of the international corporate tax system. For the US the rate is more than 10 percentage points higher than the rate of a number of European countries and tax havens. This constitutes a strong incentive for tax inversion. The recent Treasury measures raise legal obstacles, which may make inversion costlier. Moreover they may have eliminated the tax benefits on accessing accumulated past foreign earnings. At the same time we observe that the Treasury measures do not target the potential tax benefits regarding future foreign earnings.

Legal intervention may of course be effective. Marples & Gravelle (2014) argue that the American Jobs Creation Act of 2004 has put an end to the first wave of tax inversions in the late 1990s and early 2000s to tax havens, such as Bermuda and the Cayman Islands. Our analysis suggests that the pressure on the system remains. And at some point in time a new technique will be found, just as happened with the Jobs Act which did not prevent a second wave of (pending) inversions. Not surprisingly, the Treasury has announced the possibility of new measures to curtail tax inversions.

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Annex: Average dividend repatriation tax rates (percentages)

		Direct	Indirect	Rank-indirect(a)
1	Netherlands	3.39	1.65	67
2	United Kingdom	3.75	1.69	75
3	Sweden	3.83	1.65	61
4	Luxembourg	4.03	1.64	34
5	Belgium	4.28	1.65	62
6	Denmark	4.58	1.64	48
7	Finland	4.64	1.64	46
8	Austria	4.82	1.65	58
9	Switzerland	4.92	1.65	59
10	Germany	5.15	1.71	76
11	Ireland	5.58	1.64	45
12	Estonia	5.73	1.64	30
13	Hungary	5.79	1.64	47
14	Poland	6.29	1.66	68
15	Latvia	6.31	1.64	33
16	Lithuania	6.31	1.64	37
17	Ukraine	6.37	1.65	57
18	Slovenia	6.51	1.64	35
19	Iceland	6.56	1.64	23
20	Malta	6.59	1.64	24
21	South Africa	6.63	1.65	66
22	Russian Federation	6.68	1.53	2
23	Czech Republic	6.70	1.64	55
24	Bulgaria	6.72	1.64	40
25	Spain	6.76	1.67	72
26	France	6.91	1.69	74
27	Italy	6.94	1.68	73
28	Canada	6.98	1.57	5
29	Korea Republic	7.10	1.57	3
30	Cyprus	7.52	1.64	27
31	Romania	7.54	1.64	51
32	Kazakhstan	7.67	1.63	9
33	Norway	7.77	1.64	54
34	Australia	8.01	2.04	77
35	China	8.59	1.01	1
36	New Zealand	9.46	1.64	41
37	Indonesia	9.64	1.66	71
38	Portugal	9.66	1.64	49
39	Trinidad and Tob.	9.96	1.64	32
40	Belarus	10.09	1.64	43
41	Israel	10.17	1.64	50
42	Barbados	10.27	1.64	21
43	Singapore	10.84	1.65	56
44	Venezuela	10.86	6.73	85
45	Turkey	10.91	1.59	6
46	Greece	11.75	1.64	53
47	Malaysia	11.81	1.65	63
48	Japan	11.90	9.12	91
49	Croatia	11.94	1.64	38
50	Philippines	12.57	2.16	78
51	Slovak Republic	13.05	1.64	42
52	Serbia and Mont.	13.12	1.64	11
53	Untd Arab Emirates	13.19	1.64	52
54	India	13.57	7.98	88
55	Albania	13.76	1.64	29
56	HongKong	13.80	1.65	60
57	Pakistan	13.89	8.62	90
58	Azerbaijan	14.08	1.63	10
59	Mauritius	14.86	1.64	28
60	Taiwan Province	15.18	1.66	69
61	Oman	16.16	1.64	39

62	Liechtenstein	16.32	1.64	20
63	Brunei Darussalam	16.60	1.64	26
64	United States	16.67	14.61	95
65	Colombia	16.88	1.65	64
66	Nigeria	17.07	2.19	79
67	Virgin Islands U.K.	17.38	1.64	13
68	Aruba	17.38	1.64	12
69	Cayman Islands	17.38	1.64	15
70	Curacao	17.38	1.64	16
71	Guernsey	17.38	1.64	17
72	Isle of Man	17.38	1.64	18
73	Jersey	17.38	1.64	19
74	Bermuda	17.38	1.64	14
75	Bahamas	17.39	1.64	22
76	Peru	17.76	2.20	80
77	Argentina	17.83	8.55	89
78	Brazil	17.84	7.60	87
79	Egypt	17.85	1.65	65
80	Namibia	18.10	7.36	86
81	Dominican Rep.	18.12	1.63	8
82	Puerto Rico	18.38	2.22	81
83	Thailand	18.47	1.57	4
84	Qatar	20.20	1.64	44
85	Jamaica	20.30	1.64	31
86	Suriname	20.69	10.14	92
87	Virgin Islands U.S.	22.18	13.59	94
88	Saudi Arabia	22.62	1.66	70
89	Mongolia	23.59	1.64	25
90	Kuwait	25.24	16.40	97
91	Jordan	25.30	6.56	83
92	Chile	26.60	1.62	7
93	Bahrain	27.11	23.51	100
94	Macao	27.31	13.44	93
95	Lebanon	28.82	1.64	36
96	Mexico	32.88	31.10	104
97	Libya	33.81	6.56	84
98	Ecuador	33.91	23.28	99
99	Botswana	34.92	23.28	98
100	Algeria	35.01	26.23	103
101	Panama	36.67	26.23	101
102	Uruguay	37.04	26.23	102
103	Tunisia	38.01	31.15	105
104	Costa Rica	41.46	6.55	82
105	Seychelles	43.96	34.10	106
106	Gabon	44.29	16.30	96
107	Equatorial Guinea	46.30	36.06	108
108	Angola	46.31	36.06	107

(a) The high rankings of China, Russia and South Korea are explained as follows. They are part of the 'well-connected' group of countries but have relatively high outbound repatriation tax rates. Given the size of their economies, these rates contribute to higher inbound repatriation tax rates for the other countries in the group and thus the three stand out with lower average inbound rates.



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