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"Policy Options to Address Corporate Profit Shifting: Carrots or Sticks?"

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SCHEDULE FOR 2016 NYU TAX POLICY COLLOQUIUM
(All sessions meet on Tuesdays from 4-5:50 pm in Vanderbilt 208, NYU Law School)

1. January 19 – Eric Talley, Columbia Law School. "Corporate Inversions and the unbundling of Regulatory Competition."

2. January 26 – Michael Simkovic, Seton Hall Law School. "The Knowledge Tax."

3. February 2 – Lucy Martin, University of North Carolina at Chapel Hill, Department of Political Science. "The Structure of American Income Tax Policy Preferences."

4. February 9 – Donald Marron, Urban Institute. "Should Governments Tax Unhealthy Foods and Drinks?"

5. February 23 – Reuven S. Avi-Yonah, University of Michigan Law School. "Evaluating BEPS"

6. March 1 – Kevin Markle, University of Iowa Business School. "The Effect of Financial Constraints on Income Shifting by U.S. Multinationals."

7. March 8 – Theodore P. Seto, Loyola Law School, Los Angeles. "Preference-Shifting and the Non-Falsifiability of Optimal Tax Theory."

8. March 22 – James Kwak, University of Connecticut School of Law. "Reducing Inequality With a Retrospective Tax on Capital."

9. March 29 – Miranda Stewart, The Australian National University. "Transnational Tax Law: Fiction or Reality, Future or Now?"

10. April 5 – Richard Prisinzano, U.S. Treasury Department, and Danny Yagan, University of California at Berkeley Economics Department, et al. "Business In The United States: Who Owns It And How Much Tax Do They Pay?"

11. April 12 – Lily Kahng, Seattle University School of Law. "Who Owns Human Capital?"

12. April 19 – James Alm, Tulane Economics Department, and Jay Soled, Rutgers Business School. "Whither the Tax Gap?"

13. **April 26 – Jane Gravelle, Congressional Research Service. "Policy Options to Address Corporate Profit Shifting: Carrots or Sticks?"**

14. May 3 – Monica Prasad, Northwestern University Department of Sociology. "The Popular Origins of Neoliberalism in the Reagan Tax Cut of 1981."

Policy Options to Address Corporate Profit Shifting: Carrots or Sticks?

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Congressional Research Service

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Issues surrounding the U.S. tax treatment of foreign source income, focused in large part in the past on real investment, may, to some degree, have given way to concern about tax minimization strategies that allow firms to shift profits into low and no tax countries. Firms can benefit from profit shifting because, although the United States has a worldwide income tax system with a credit for foreign taxes paid, income earned by U.S. multinationals' foreign subsidiaries is not subject to tax until it is repatriated, that is, paid to the parent firm as a dividend. (Current law requires some income easily subject to abuse, called Subpart F income, to be taxed currently). In addition, firms can shield repatriated profits from low tax countries from U.S. tax if they have excess foreign tax credits from operations in high tax countries. Profit shifting is largely a problem of lost revenue rather than inefficient location of investment, although widespread manipulation of the tax rules to avoid taxes also may undermine voluntary compliance with the tax system by others.[1]

This paper first reviews the magnitude of profit shifting and then explores the potential effectiveness of policies that provide incentives to reduce profit shifting (carrots) and policies that reduce profit shifting through compulsion (sticks).

The Existence, Magnitude, and Techniques of Profit Shifting

While the magnitude of corporate profit shifting by U.S. multinationals into low or no tax countries is uncertain, there is overwhelming evidence of its existence and its increase in recent years. According to estimates by Gravelle, profits relative to GDP in

[1] Profit shifting may have real effects, as well. Investments in R&D in the United States may be expected to be more profitable if there is an expectation of that some profits will eventually go untaxed or taxed at low rates through profit shifting. At the same time, profit shifting may encourage activity abroad (manufacture, sales, or further research abroad) to facilitate profit shifting.

the remaining six of the G-7 countries was 0.6% in 2004, rising to 0.7% in 2010.[2] The large tax havens showed much higher ratios and, in some cases, extraordinary growth: 7.6% to 41.9% for Ireland, 18.2% to 127% for Luxembourg, 4.6% to 17.1% in the Netherlands, and 3.5% to 12.3% for Switzerland. A pronounced increase also occurred in the small island tax havens: from 645.7% to 1,614% for Bermuda, from 354.7% to 1,803% for the British Virgin Islands, and from 546.7% to 2,065.6% for the Cayman Islands.

The magnitude is difficult to determine and a variety of estimates, relying on different techniques, have been made. One potential guide to the magnitude is the Joint Committee on Taxation's (JCT's) estimate of the revenue loss from deferral of tax on foreign source income of $108.9 billion for FY2016.[3] The Administration estimates a lower amount of $67.8 billion.[4] Both of these would be increased (by $7 billion for the JCT[5] and $5 billion for the Administration[6]) to reflect the permanent deferral of active financing income adopted at the end of 2015. Compared to corporate tax revenue projected by the Congressional Budget Office (CBO) at $327 billion,[7] these amounts are

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[2] Jane G. Gravelle, Tax Havens: International Tax Evasion and Avoidance, Congressional Research Service Report R40623, January 15, 2015, which can be found at https://www.fas.org/sgp/crs/misc/R40623.pdf. This study uses data from the Central Intelligence Agency to measure GDP. A chapter in the Economic Report of the President, February 2015, at https://www.whitehouse.gov/administration/eop/cea/economic-report-of-the-President/2015 reports ratios of similar magnitude for tax havens, but differ, in part, because of the use of United Nations data on GDP.

[3] Joint Committee on Taxation, 'Estimates of Federal Tax Expenditures," JCX-141R-15, December 7, 2015, https://www.jct.gov/publications.html?func=select&id=5.

[4] *U.S. Budget FY2017, Analytical Perspectives*, p. 228, https://www.gpo.gov/fdsys/pkg/BUDGET-2017-PER/pdf/BUDGET-2017-PER-5-3.pdf.

[5] Joint Committee on Taxation, Estimated Revenue Budget Effects of Division Q of Amendment #2 to the Senate Amendment to H.R. 2029 (Rules Committee Print 114-40), The "Protecting Americans From Tax Hikes Act of 2015," JCX-143-15, December 16, 2015, at https://www.jct.gov/publications.html?func=startdown&id=4860.

[6] *U.S. Budget FY2017, Analytical Perspectives*, p. 228, https://www.gpo.gov/fdsys/pkg/BUDGET-2017-PER/pdf/BUDGET-2017-PER-5-3.pdf.

[7] Congressional Budget Office *The Budget and Economic Outlook: 2016 to 2026* , January 2016, https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51129-2016Outlook.pdf

35.2% and 22.1% respectively. However, for issues that arise subsequently in this report, it is more appropriate to measure this revenue as a percentage of corporate tax liability before credits. In 2012, the corporate tax liability after credits was $267 billion while liability before credits was $402 billion,[8] or a 0.66 ratio, implying shares of 23.3% and 14.7%.

These estimates for deferral could be either an overstatement or an understatement of the cost of tax avoidance. Some of the lost revenue from deferral may be due to real investments in countries with lower tax rates, making this number an overstatement of the cost of profit shifting. At the same time, to the extent profits are shifted to countries with positive rather than zero corporate tax rates (such as Ireland) deferral understates the revenue effect of profit shifting because the firm will pay creditable foreign taxes which would not have been paid if profits had remained allocated to the United States.

Zucman's approach to measuring the magnitude of profit shifting was to attribute the unrepatriated profits in tax havens to profit shifting.[9] His numbers suggest a magnitude of about 20% of U.S. profits, suggesting a similar share of corporate tax prior to credits. His estimate could be overstated to the extent some profit is shifted from other higher tax countries (a caveat that applies to the results discussed below as well).

Another approach is a study looking at differences in pre-tax rates of return.[10] Profit shifting could be seen as the difference between the actual and average rate of

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[8] IRS Statistics of Income, *2012 Corporation Complete Report*, https://www.irs.gov/pub/irs-soi/12coccr.pdf.

[9] Gabriel Zucman, "Taxing Across Borders: Tracking Personal Wealth and Corporate Profits," *Journal of Economic Perspectives*, Vol. 28, No. 4, Fall 2014, pp. 121-48.

[10] Charles W. Christian and Thomas D. Schultz, ROA-Based Estimates of Income Shifting by Multinational Corporations, *IRS Research Bulletin*, 2005 http://www.irs.gov/pub/irs-soi/05christian.pdf. This paper found $30 billion of revenue loss compared to $151 billion of revenue for a share of 19.9%.

return. This estimate found about $30 billion, indicating a share of 19.9% of post credit revenues and 14.9% of pre credit revenues. This study was prepared in 2005 and reflects data from 2001, and may be understated compared to current levels.

Finally, an approach used by Clausen involves estimating the elasticity of profits based on how reported profits of U.S. affiliates in a given country respond to rate changes and then using that elasticity to simulate how revenues would rise if rates were equated.[11] Clausen estimated eight elasticities ranging from 1.848 to 4.613, and used the average of 2.92. This particular relationship is in the form of a semi-elasticity and means that a percentage point reduction in the tax rate leads to a 2.92% increase in profits. Clausen estimated $111 billion in profits shifted in 2012, equal to 45% of post credit tax revenues (and thus around 30% of pre-credit taxes).[12]

This elasticity may be high. The amount is large compared to estimates of the cost of deferral (which were even smaller in 2012) Second, of the elasticities estimated by Clausen, the 1.848 elasticity could be argued to be the best specification since it included the most variables as well as including fixed effects (which allow control for the unique characteristics of a particular country). This elasticity would suggest a pre-credit share of around 19%. Other recent estimates of elasticities have been lower. Dhammika Dharmapala reviewed the literature on profit shifting elasticities and concluded that recent estimates using firm level data tended to yield lower elasticities; he placed the consensus elasticity at 0.8. Reducing the Clausing estimates proportionally suggests a

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Using the ratio of post credit and pre credit revenue at that time of 0.75, the numbers imply 14.9% of corporate revenues before credits.

[11] Kimberly A. Clausing, "The Effect of Profit Shifting on the Corporate Tax Base in the United States and Beyond," January 2016 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2685442. The results are also in another article, Kimberly A. Clausing, "The Effect of Profit Shifting on the Corporate Tax Base," *Tax Notes*, January 25, 2016, pp. 427-438.

[12] Clausen also used an alternative data series that produced an estimate of $77 billion, a 31.8% share of revenue after credits, and thus approximately 21% of tax liability before credits.

share of pre credit taxes of around 5%).[13] Dowd, Landefeld and Moore used data from tax returns to estimate an elasticity.[14] They found an overall elasticity of 1.41 (suggesting a share of 15%).

One issue that can be raised with using elasticities to estimate profit shifting is whether they are constant across tax rates. Dowd, Landefeld and Moore found elasticities to be larger with changes at low tax rates (4.7 for a change in tax rate from 5% to 4%), and lower at higher rates (0.7% for a change from 30% to 29%). Such results could indicate that many firms from higher tax countries have shifted profits as much as the law appears to allow and it is the competition between competing tax havens that is more important.

Profit shifting can arise from a variety of techniques, and evidence suggests the main sources are leveraging (loading debt in the high tax country) and transfer pricing of intangibles. The current tax system, in general, requires arms-length pricing, where transfers between related affiliates should be priced the same as sales between unrelated firms. In practice, it is hard to find comparable prices, particularly for intangible assets. Thus, if the U.S. parent sells rights to a low tax subsidiary to an intangible for a price below arms length, profit is shifted out of the United States. A study in 2003 by Grubert estimated that each method was responsible for about half of profit shifting.[15] More

[13] Dhammika Dharmapala, "What Do We Know about Base Erosion and Profit Shifting: A Review of the Empirical Literature," *Fiscal Studies*, Vol. 35, No. 4, 2014, pp. 421-448,
[14] Tim Dowd, Paul Landefeld, and Anne Moore, "Profit Shifting of U.S. Multinationals," January 2016, at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2711968..
[15] Harry Grubert, "Intangible Income, Intercompany Transactions, Income Shifting, and the Choice of Location," *National Tax Journal*, Vol. 56, March 2003, Part 2.

recently, Heckemeyer and Overesch, in a review of 25 studies, found transfer pricing to account for 72% of profit shifting.[16]

The estimates refer to profit shifting by U.S. multinationals to locations abroad. Profit shifting affecting the United States can also occur when foreign multinationals shift profits out of U.S. subsidiaries. Such an estimate is more difficult because the other activities of the parent firm cannot be observed, and studies have generally been unable to find an effect, with the exception of inverted firms.[17] (The new country-by-country reporting rules proposed by the OECD and currently being implemented in many countries, including the United States, may supply data for better estimates). U.S. subsidiaries of foreign parents accounted for 17% of U.S. corporate taxes paid in 2012 with the largest share paid by manufacturing (40%).[18] Profit shifting in this case is expected to arise from leveraging (since the foreign parent would not wish to shift profits from its intangibles into the U.S. subsidiary).

Carrots: Incentives to Reduce Profit Shifting

In this section, three incentives to reduce profit shifting are discussed: a general decrease in the corporate statutory tax rate; a reduction in tax rates associated with

[16] Jost H. Heckemeyer and Michael Overesch, Multinationals' Profit Response to Tax Differentials: Effect Size and Shifting Channels, Center for European Economic Research, Discussion Paper 13-045, 2013, http://ftp.zew.de/pub/zew-docs/dp/dp13045.pdf.

[17] See U.S. Department of Treasury, *Report to Congress on Earnings Stripping, Transfer Pricing and U.S. Income Tax Treaties*, November 2007; Jennifer L. Blouin, Julie H.Collins, and Douglas A. Shackelford, "Does Acquisition by Non-U.S. Shareholders Cause U.S. firms to Pay Less Tax?" *Journal of the American Taxation Association*, Spring 2008, pp. 25-38; Harry Grubert, Debt and the Profitability of Foreign Controlled Domestic Corporations in the United States, Office of Tax Analysis Technical Working Paper No. 1, July 2008, http://www.ustreas.gov/offices/tax-policy/library/otapapers/otatech2008.shtml#2008; Jim A. Seida and William F. Wempe, "Effective Tax Rate Changes and Earnings Stripping Following Corporate Inversion," *National Tax Journal*, vol. 57, December 2007, pp. 805-828.

[18] James R. Hobbs, Foreign-Controlled Domestic Corporations, 2012, IRS Statistics of Income Bulletin, Summer 2015, https://www.irs.gov/pub/irs-soi/soi-a-coit-id1511.pdf.

intangibles via a "patent box," (or "innovation box"), and a reduction in the tax rate on foreign royalties. The patent box approach comes in many flavors, but particular attention will be devoted to proposed legislation sponsored by Representatives Boustany and Neal. All of the incentives are considered in light of the expectation of revenue neutrality.

Lowering Statutory Tax Rates

The U.S. statutory tax rate (35% for the federal tax plus four or so percentage points for state and local taxes) has been a constant focus of corporate tax reform, often with a discussion focused on "international competitiveness" and investment. Yet, while the U.S. statutory tax rate is well above the average statutory rate in other countries, it is the effective marginal tax rate that should govern real investment. That marginal tax rate is affected by both the tax rate and the base. While the U.S. statutory tax rate of 39.2% was estimated to be over ten percentage points above the statutory tax rate in the rest of the OEC (28.4% weighted by GDP), the marginal effective tax rate was 22.2% compared to 16.3%, or six percentage points.[19] Moreover, if these investments are eligible for the production activities deduction in the United States, the tax rate is 20.2%, or only four percentage points higher.

This difference narrows further if bonus depreciation, which allows 50% of equipment investment to be expensed, is considered. Bonus depreciation is increasingly appearing to be a permanent feature of the tax code. It was enacted as a stimulus in 2008 and has been extended numerous times, usually one year at a time. At the end of 2015, it was extended through 2019, although it was phased down. Bonus depreciation reduces

[19] Jane G. Gravelle, International Corporate Tax Rate Comparisons and Policy Implications, Congressional Research Service Report R41743, January 6, 2014, https://www.fas.org/sgp/crs/misc/R41743.pdf.

the tax rate for equipment from 21.2% with the production activities deduction to 11.9%, lower than the OECD rate of 18.3%. It reduces the overall tax rate to 16.6%, about the same as the OECD rate of 16.3%.[20]

Trading a statutory rate reduction for corporate base broadening is typically a measure that increases the effective tax rate if the proposal is truly revenue neutral.[21] A statutory rate reduction applies to old capital and thus yields a windfall benefit, while base broadening, such as slowing depreciation, or the recovery of R&D expenses, applies only to investment. Moreover, this effect would be especially pronounced for many of the investments that multinationals are likely to make, such as equipment investment and research and development. Thus, lowering the statutory tax rate for purposes of encouraging real investment in the United States, in a revenue neutral tax change, is not a sensible policy.[22]

Under these circumstances, the main reason for focusing on reductions in the statutory tax rate should be to discourage profit shifting. The issue with profit shifting is largely the loss of revenue.

To consider the effectiveness of such an approach, note that:

(1) R= tB-C

[20] Jane G. Gravelle, Bonus Depreciation: Economic and Budgetary Issues, Congressional Research Service Report R43432, October 17, 2014, https://fas.org/sgp/crs/misc/R43432.pdf.

[21] See statement of Jane G. Gravelle, Senior Specialist in Economic Policy, Congressional Research Service, Before The Committee on Finance, United States Senate, March 6, 2012 on Tax Reform Options: Incentives for Capital Investment and Manufacturing, which discusses the trade-off between accelerated depreciation and rate reduction, http://www.finance.senate.gov/imo/media/doc/Testimony%20of%20Jane%20Gravelle.pdf.

[22] Moreover, proponents of lowering the statutory tax rate are often also proponents of moving to a territorial tax, also for purposes of "competitiveness," which makes foreign investment more attractive and appears at cross purposes.

Where R is revenues, t is the corporate tax rate, B is the taxable income base and C is the amount of credits. Assuming credits are fixed, and denoting a change with a d, that is, a change in x equals dx:

(2) $dR = dtB+tdB$

To relate the total corporate base to the change in the foreign base, B_f, note that:

(3) $dB_f/B_f = -Edt$,

where E is the semi-elasticity (as reported in the studies above). In addition,

(4) $B_f/B = s$

where s is the share of pre-tax income (and revenue) resulting from profit shifting. Substituting (4) into (3):

(5) $dB_f = -EsBdt$

and in turn substituting (4) into (2), we obtain:

(6) $dR = dt\ B-tEsBdt$

The feedback (share of revenue loss from the statutory tax rate reduction that is recaptured by reducing profit shifting) is tEs. Consider cutting the tax rate by ten percentage points, so that the tax on shifted profits is 0.25. Consider three elasticities and their respective shares: from Clausing, a 1.848 elasticity and a 19% share, from Dowd et al., a 1.41 elasticity and a 15% share, and from Dharmapala, a 0.8 elasticity and a 5% share. Using the largest of these implies a 9% return (0.25*1.848*0.19), that is, for each dollar of revenue lost, nine cents is recouped from profit shifting. For the Dowd et al.

study, the share would be five cents on the dollar, and for the Dharmapala study, the share would be one cent on the dollar.[23]

Cutting the statutory tax rate to entice firms to reduce profit shifting appears to be throwing the baby out with the bath water, with the collateral damage (in a revenue neutral environment) of discouraging real investment by raising the effective marginal tax rate.

Not only is cutting the corporate statutory tax rate an undesirable step (in a revenue neutral environment) for encouraging real investment, it is also a relatively fruitless endeavor for discouraging profit shifting.[24]

A third issue is that it is very difficult in any case to find a way to reduce the statutory tax rate significantly without losing revenues. Estimates suggest that even repealing every corporate tax expenditure (except for international provisions such as deferral which are generally not on the agenda for many who favor rate reductions) would reduce the corporate tax only to slightly below 30%.[25] And that would include eliminating provisions whose true target is not the corporate sector, such as the low income housing credit, charitable deductions for corporations, and tax exempt bond interest. How, then, is it that former Chairman Camp's proposed Tax Reform Act of 2014 lowered the tax rate to 25%? Some part of it was due to provisions not considered tax

[23] These estimates may be somewhat understated because they do not deal with the possibility that foreign tax credits may decline with the tax rate and don't deal with profit shifting by U.S. subsidiaries of foreign parents.

[24] An objective is sometimes to encourage firms to repatriate income, although the tool for that is often claimed to be a territorial tax. Lowering the statutory rate for that purpose is intimately associated with profit shifting, since there would be little purpose to profit shifting if earnings were repatriated. Note, however, that any system where repatriation does not trigger taxation would end the incentive to defer earnings abroad, including ending deferral or a minimum tax, both discussed in the assessment of tools to address profit shifting through compulsory measures.

[25] Jane G. Gravelle, International Corporate Tax Rate Comparisons and Policy Implications, Congressional Research Service Report R41743, January 6, 2014.

expenditures, such as net operating losses and capitalizing advertising costs, but some was due to transitory effects such as phase-ins, phase-outs, temporary provisions (such as the deemed repatriation of accumulated earnings abroad) and provisions that yield more revenue in the budget horizon than in the steady state (such as slowing depreciation).[26]

Patent and Innovation Box Proposal

Another approach to providing an incentive to report income in the United States is providing a lower tax rate on income generated by intangibles. This policy focuses on profit shifting through transfer pricing rather than leveraging. Such approaches are termed patent boxes or innovation boxes. A patent or innovation box separates certain income associated with innovations into a separate income category which is taxed at a lower rate.

The effect of a patent or innovation box depends on its design. Narrowly focused patent boxes might restrict coverage to licensing fees and royalties from patented inventions, while a broader scope would include income embedded in products produced with patented inventions. An even broader scope would extend the benefits to income embedded in products produced from non-patented innovations. The benefits could also be extended further to items not reflecting technological innovation such as trademarks, business names, and copyrights.

[26] For an estimate that the steady state cost in 2023 dollars is $22 billion (4.5% of revenues) for the corporate tax and at least $120 billion (4% of revenues) for the individual tax (including unincorporated businesses) see Jane Gravelle, "The Dynamics of Congressional Policy Making: Tax Reform," *in The Evolving Congress*, Prepared by the Congressional Research Service for the U.S. Senate Committee on Rules and Administration, S. Prt. 113-30, December 2014.

A number of countries, primarily in Europe, have adopted patent or innovation boxes.[27] A patent box regime restricted to royalties would have a narrow application since many firms wish to exploit their innovations themselves (e.g. the Apple phone, the Google search engine). The features of patent boxes surveyed in twelve European countries indicated that five of those countries allow income embedded in the sales of products.[28]

Once embedded income is eligible, then the challenge to patent box design is to determine what share of a firm's income is allocated. Some countries simply leave it to tax administrators, requiring arms-length pricing, which, of course, leads to uncertainty on the part of the firms, artificially large allocations, and administrative costs. Some use formulas (such as the UK).

A draft legislative proposal sponsored by Representatives Boustany and Neal, The Innovation Promotion Act of 2015, proposes a formula driven patent box that includes embedded income.[29] This proposal would first identify qualifying income, which would

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[27] For discussions of the features of patent boxes, see Gordon Gray, Key Elements of a Potential U.S. Patent Box, American Action Forum, August 24, 2015 http://americanactionforum.org/research/key-elements-of-a-potential-u.s.-patent-box; Peter R. Merrill, et al., "Is it Time for the United States to Consider a Patent Box? *Tax Notes*, March 26, 2012, pp. 1665-1675, https://www.pwc.com/us/en/washington-national-tax/assets/merrill0326.pdf; Lisa Evers, Helen Miller, and Christoph Spengel, "Intellectual Property Box Regimes: Effective Tax Rates and Tax Policy Considerations," *International Tax and Public Finance*, Vol. 22, 2015, pp 502-530, http://link.springer.com/article/10.1007%2Fs10797-014-9328-x Bernard Knight and Goud Maragani, "Is it Time for the United states to Implement a Patent Box Tax Regime to encourage Domestic Manufacturing*?"* *Stanford Journal of Law, Business and Finance*, Vol. 19, no. 1, Fall 2013, pp. 39-62, .PriceWaterhouseCoopers, Global Research and Development Incentives Group, May 2015, https://www.pwc.com/gx/en/tax/assets/pwc-global-r-and-d-brochure-may-2015.pdf. Note that the OECD base erosion and profit shifting (BEPS) initiative proposes a substantial activities requirement for patent boxes (Action %) which is met by the Boustany Neal proposal. The OECD proposals are at http://www.oecd.org/tax/beps-2015-final-reports.htm.

[28] Lisa Evers, Helen Miller, and Christoph Spengel, "Intellectual Property Box Regimes: Effective Tax Rates and Tax Policy Considerations," *International Tax and Public Finance*, Vol. 22, 2015, pp 502-530, http://link.springer.com/article/10.1007%2Fs10797-014-9328-x

[29] For the press release announcing the plan see "Boustany and Neal Release Innovation Box Discussion Draft," July 29, 2015 https://boustany.house.gov/114th-congress/boustany-neal-release-innovation-box-discussion-draft/. For a more detailed summary see "U.S. Representatives Boustany and Neil Release

include direct income as well as income from the sale of products that use patents, formulas, inventions, etc. To allocate income in the embedded case certain expenses would be subtracted (such as cost of goods sold and interest) and the remainder would be allocated between intangible income and the earnings from physical capital investments based on the share of expenses. Intangible income would have a 10.15% tax rate on net income (provided by a 71% deduction) and other income would have the full 35% rate.

A proposal has also been made to finance the revenue cost of the patent box by amortizing research and experimental expenditures over five years,[30] rather than expensing them (a provision that appeared in former Ways and Means Chairman Dave Camp's 2014 tax reform proposal).[31]

There are three issues that might be raised about the patent box as a way to encourage firms to report more of their income in the United States. The first is that the formula approach means that the tax rate applied to an additional dollar of income for a given activity is not 10.15%, but the weighted average of the two rates, which depends on the firm's research intensity. For example, if half the expense is research and half other costs, the tax rate will be the average of the two, or 25.575%. That is, if a firm simply relocates profit from an intangible without changing investment, the combined rate applies. This rate is a much smaller reduction in the tax rate. Merrill suggested that the

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Innovation Box Draft as Part of International Tax Reform Deliberations," Ernst and Young, July 31, 2015. http://www.ey.com/Publication/vwLUAssets/US_Representatives_Boustany_and_Neal_release_innovation_box_draft_as_part_of_international_tax_reform_deliberations/$FILE/2015G_CM5649_US%20Reps%20Boustany%20and%20Neal%20release%20innovation%20box%20draft%20as%20part%20of%20intl%20tax%20reform%20delibs.pdf. For the text of the legislative language see http://waysandmeans.house.gov/wp-content/uploads/2015/07/Innovation-Box-2015-Bill-Text.pdf.

[30] Luca Gattoni-Celli, "Ryan Eyeing Research Cost Recovery to Pay for Innovation Box," *Tax Notes*, August 24, 2015, p. 824.

[31] See Joint Committee on Taxation, Estimated Revenue Effects of the Tax Reform Act of 2014, JCX-20-14, February 26.2014. https://www.jct.gov/publications.html?func=startdown&id=4562 for revenue estimate.

lowest combined tax rate estimated for a U.S. firm's domestic income subject to the patent box regime was 27%.[32]

It is possible, at least in theory, to design a formula that would impose the 10.15% rate on the marginal dollar reallocated to the United States. For example, a return could be imputed to tangible assets (and other costs such as advertising), with the residual eligible for the 10.15% rate (although there might need to be some minimum amount of R&D spending as a share of costs to keep this imputation limited to firms with significant intangibles). Even in this case, however, the patent box would probably lose more revenue than would be gained by the induced reduction in profit shifting.

To develop a rough estimate of the effect, assuming a design with a 10.15% marginal rate, begin with an estimate that 13% of the stock of capital is R&D.[33] Return to equation (2), dR = dtB+tdB and assume that profits are proportional to the capital stock Since the reduction in the tax rate from 35% to 10.15% applies to only 13% of the capital stock equation six would be adjusted to be: dR = dt(0.13) B-tEsBdt, and the ratio revenue gained from profit shifting relative to revenue loss would be tEs/0.13. The estimates of profit shifting shares in the previous three scenarios are 19%, 15% and 5%, and the corresponding elasticities are 1.848, 1.41, and 0.8. Because this approach applies primarily to profits shifted through transfer pricing and not leveraging, these shares should be multiplied by 70% (the share of profit shifting estimated to be associated with intangibles). For example, the ratio of 19 to 13 is 1.46, multiplied by 0.7, it is 1.02. When the value tEs/0.13 with E the three elasticities and t at 0.1015 is used to estimate that each dollar of revenue loss would yield a 19 cent (0.1015 times 1.848 times 19/13 times 0.7),

[32] Peter Merrill, PriceWaterHouse Coopers, Patent Box Briefing, October 13, 2015.
[33] See Jane G. Gravelle, International Corporate Tax Rate Comparisons and Policy Implications, Congressional Research Service Report R41743, January 6, 2014, Table 6.

12 cent (0.1015 times 1.41 times 15/13 times 0.7), or 3 cent (0.1015 times 0.8 times 5/13 times 0.7) revenue offset.

If the primary motivation of a patent box is to reduce profit shifting, which is in turn primarily an issue of revenue, then the patent box will lose revenue. If the rate remains a weighted average, the effect would be smaller. In this case, in equation (2) dR = dtB+tdB , the change in t in the first term on the right hand side is the difference between 35% and 10% or 25 percentage points, while in the second term that determines profit shifting, the change, using the lowest rate estimated by Merrill, is from 35% to 27% , or 8 percentage points. Therefore, each estimate above would be multiplied by 0.08/0.25, leading to estimates of a 6 cent, 4 cent and 1 cent revenue offset.

Third, the patent box as proposed will lose revenue but will not have an incentive effect on the marginal R&D investment. Currently R&D receives a credit along with expensing of most intangible costs (estimated at more than 85% of a typical R&D investment). The tax rate without the credit is 0% under the current tax rate as well as the patent box proposal because R&D is expensed. (See Appendix.) If subjected to a five year amortization, the effective tax rate is 7%. With the credit, the effective tax rate is estimated at a negative 99% under current law and with the patent box, and at negative 75.3% if five year amortization is combined with the patent box rate.

Moreover, five year amortization will not likely be adequate to make up the revenue loss. The tax expenditure estimate for expensing of R&D (a steady state estimate) is $5.2 billion in FY2016,[34] which, given projected corporate revenues of $327 billion, is 1.6% of total revenue. This however, is an estimate at a tax rate of 35%; if the

[34] Joint Committee on Taxation, "Estimates of Federal Tax Expenditures," JCX-141R-15, December 7, 2015, https://www.jct.gov/publications.html?func=select&id=5.

tax rate were 10.15% it would be multiplied by 0.1015/0.35 = 0.29, or 0.5% of total revenue By contrast, in estimating the patent box, if 13% of profit is from R&D intangibles, then the share of the corporate tax before credits should be a similar share. If the rate is dropped from 35% to 10.15%, the revenue loss would be 0.25/0.35 or 9.3%. This number, however, should be divided by 0.66 (to make it a percent of post credit revenues) or 14% of revenues.[35] Thus, the moving to economic depreciation (which is slower than a five year amortization and should yield more revenue in the steady state) would recover less than 3.6% of the loss. Even if a large fraction of firms did not elect patent boxes, it is clear that this change is inadequate to offset the revenue loss.

The principal effect of the patent box proposal is a windfall gain to returns to existing R&D, with little effect on profit shifting and no effect on the marginal incentive for R&D spending. To remain revenue neutral, other base broadening provisions are needed that would increase the effective marginal tax rate and discourage real investment in the United States.

Note that, unlike a rate reduction, this provision should not affect profit shifting out of U.S. subsidiaries of foreign parents, which is primarily via leveraging.

A Lower Tax Rate on Royalties Earned Abroad

A third possible incentive to reduce profit shifting is a reduced rate on royalties (and license fees) from abroad, which are immediately taxable under current law. A

[35] The gain from amortizing intangibles would be larger in the budget horizon, In the Camp proposal, amortizing R&D over five years, yielded an average of $19 billion over ten years, evaluated between 35% and 25%, around four times the static estimate. See Joint Committee on Taxation, Estimated Revenue Effects of the Tax Reform Act of 2014, JCX-20-14, February 26.2014. https://www.jct.gov/publications.html?func=startdown&id=4562.

lower tax rate on royalties might encourage less profit shifting because companies might be more willing to set higher payments from their affiliates. This section considers a 15% tax, similar to the proposal made in the Camp bill. The purpose of this provision was, in part, to offset the loss of foreign tax credits that shielded some portion of foreign royalties in a system moving to a territorial tax where the foreign tax credit would no longer exist. This proposal can, however, be considered as a stand-alone provision in the light of the existing system.

According to IRS tax statistics, royalties and rents were $132 billion in both 2010 and 2012.[36] A negligible share is likely to reflect rents. The National Income and Product Accounts report $125 billion in payments for intellectual property in 2012, and $129 billion in 2013.[37]

One of the major issues in considering a lower tax rate on royalties is their interaction with foreign tax credits in the current system. Active royalties are sourced as foreign income and are eligible for foreign tax credits. Since royalties are generally deductible by the payor, they are not generally responsible for generating foreign taxes (other than perhaps some small withholding taxes), but are eligible for shields from the U.S. tax in some cases by excess foreign tax credits.

The magnitude of this shielding is unclear. One study estimated that two thirds of royalties are shielded from the U.S. tax, although this estimate was for the year 2004.[38] This share may have declined as some countries reduced their corporate tax rates. In

[36] IRS statistical tables on foreign tax credits and royalties are located at https://www.irs.gov/uac/SOI-Tax-Stats-Corporate-Foreign-Tax-Credit-Statistics. Table 1 contains overall data and Table1.1 contains data on firms in the excess credit position.
[37] National Income and Product Accounts, Data in Table 3, Trade in Services, https://www.bea.gov/scb/pdf/2014/07%20July/0714_international_transactions_accounts_tables.pdf.
[38] Harry Grubert and Rosanne Altshuler, "Corporate Taxes in the World Economy: Reforming the Taxation of Cross-border Income," in *Fundamental Tax Reform: Issues, Choices, and Implications*, Ed. John W. Diamond and George R. Zodrow, Cambridge, MIT Press, 2008, pp. 326-327.

2010, the IRS published separate data for firms that had excess (unused credits), which meant that all royalties in this category would have been shielded from tax. These data indicated that 26% of royalties were in this category. Since some of the royalties in the firms in the excess limit position (having used up all their foreign taxes as credits) might have been partially covered, a significant share of royalties still appear to be shielded from taxes and therefore not able to benefit from a lower rate. This shield reduces the scope of the effect of a lower tax rate on royalties on encouraging lower profit shifting.

In addition, a share of royalties is associated with payments between unrelated firms. Data for 2010 indicated that 60% of royalties were from foreign affiliates of U.S. parents, 3% were from foreign parents of U.S. subsidiaries, and the remaining 37% were from unrelated parties.[39] The latter category should not have a problem with being understated, but will be part of the revenue cost, making the offset of the revenue loss from induced profit shifting smaller.

The best way to try to estimate the revenue gain from reduced profit shifting is to assume that the same proportion of profit shifting occurs with firms with and without shields by excess credits as the proportion of royalties, so that income from royalties and profit shifting can be proportionally scaled down (and thus the approach that measures a ratio can be used). Calculations can be made with the $125 billion amount. Thus the ratio of profit shifting to revenue loss is determined by the original revenue loss from profit shifting divided by the revenue cost from royalties.[40] The further adjustments to this ratio (in addition to multiplying by the respective elasticities), are to multiply by 0.7 (because this change only affects shifting through intangibles), to multiply by 0.63 to adjust for the

[39]See Table 3, Trade in Services, https://www.bea.gov/scb/pdf/2011/07%20July/0711_itaq-tables.pdf..
[40] The ratio on the denominator (to go with the 19%, 15% and 8% shares) is 0.35 times $125 billion times 0.66 divided by $242 billion, or 12%.

share of royalties between affiliates, and to multiply by 0.15, for the new tax rate on royalties. This calculation yields a return of 19 cents, 12 cents and 4 cents for each of the cases.

The effects are similar to those of the patent box, although the measure would be smaller in scale (in part, because of the share of currently shielded royalties). Exempting foreign royalties will raise some complicated issues about how to deal with the foreign tax credit when a particular type of income eligible for that credit is taxed at a lower rate and, as in the case of the patent box, require offsetting base broadening measures.

While rate reductions should also reduce profit shifting associated with U.S. subsidiaries of foreign parents, as is the case for the patent box, lower rates on foreign royalties generally would not.

Sticks: Reducing Profit Shifting by Compulsory Measures

Assessing compulsory measures to reduce profit shifting involves considering more ideas, but requires less analysis about revenue effects. These proposals, in general, raise revenue, or can be designed to raise revenue or be neutral. Thus there is less need to evaluate them on their revenue consequences and more to consider any particular advantages or disadvantages. In particular, two basic issues will be discussed: what is the scope of effect (does the provision relate to shifting by transfer pricing, by leveraging, or both and does it affect U.S. subsidiaries of foreign parents as well as foreign subsidiaries of U.S. parents) and what behavioral responses might occur that may or may not be desirable.

The provisions considered are (1) ending deferral (and possibly cross crediting). (2) imposing a minimum tax on a current basis, (3) other restrictions on deferral, (4) expanding the scope of Subpart F (the provision that taxes some easily abused income currently), (5) allocating interest, (6) addressing inversions, and (7) formulary apportionment.

Ending Deferral (and Possibly Cross-Crediting).

Ending both deferral and cross crediting would probably be the biggest stick of all. It should eliminate incentives for U.S. multinationals to shift profits as long as adequate restrictions could be applied to prevent U.S. firms from inverting (moving their headquarters abroad, as discussed below). Since ending deferral alone would raise, depending on the source of the revenue estimates (discussed earlier), from $65 billion to $108 billion, a provision that also imposes a per country limit on the foreign tax credit would raise even more revenue. It would affect earnings not only artificially shifted to low tax countries but earnings on real investments as well. The incentives would be lessened if cross crediting were allowed to continue.

Ending deferral would affect profit shifting, regardless of technique, by U.S. parents to foreign subsidiaries, but would not affect profit-shifting between U.S. subsidiaries and their foreign parents.

Adopting this type of tax system, which would lead to significant increases in taxes, would also increase the incentive for firms to invert, and locate their headquarters in other countries that permit territorial taxes where income of foreign subsidiaries is not taxed. While restrictions enacted in 2004, and subsequent regulations have made so-

called naked inversions (where a single firm changes headquarters without other changes) almost impossible, there is considerable scope for inversion by merger with a smaller (but not too small) foreign firm. Currently, U.S. firms can invert as long as their shareholders subsequently own less than 80% of shares of the new firm, although there are additional restrictions for ownership between 60% and 80%. Therefore, a move to end deferral would probably require additional provisions. Restricting inversions is discussed below as a separate topic.

Another possible response is that firms might locate more profits that were formerly in low-tax or no-tax countries to other foreign countries where taxes are imposed. Since these taxes would be creditable against U.S. liability, to some extent they would reduce profits to U.S. firms (largely owned by U.S. citizens) without yielding U.S. tax revenue. This outcome may be more efficient but likely reduces U.S. welfare.

Although ending deferral belongs in a list of provisions to limit profit shifting, such a change is politically unlikely. Many members of Congress have proposed moving in the opposite direction, to a territorial system where income is not taxed at all, although that change may be politically unlikely as well. Modified versions of moving toward current taxation of foreign source income, including a minimum tax or expansions of Subpart F income, discussed subsequently, might be more feasible.

A Minimum Tax

An alternative that is between a territorial tax and current taxation without deferral is a minimum tax. With a minimum tax, income of foreign subsidiaries is taxed currently but at a lower rate. To be effective, the provision should apply country by

country with a per country limit on the foreign tax credit (otherwise, the lower rate would probably be swamped by foreign tax credits).

Proposals of this nature were made by a 2013 discussion draft of the Senate Finance Committee under then-Chairman Baucus. The proposal taxed some foreign-source income in full and provided lower rates on others, while retaining the foreign tax credit. The discussion draft described two options, one in which income (other than Subpart F income) would be taxed at 80% of the U.S. rate and one in which active income would be taxed at 60% of the U.S. rate and passive income at 100%. The 80% and 60% figures were only suggestions.[41]

President Obama included a proposal for a minimum tax in his recent budgets.[42] The rate would be set at 19% and the proposal was estimated to raise $350 billion over FY2017-FY2016, an average of $35 billion a year.[43] The proposal would allow a foreign tax credit equal to 85% of taxes paid in each country. The proposal also would allow an exemption from the minimum tax base for an allowance for corporate equity (ACE). This provision allows a risk-free return on active assets invested in the country. Since profit shifting returns generally exceed the risk-free return, the tax should capture these profits. It would therefore both capture some of the revenue lost from profit shifting, as well as decrease the incentive to shift profits.

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[41] Senate Finance Committee, Baucus Unveils Proposals for International Tax Reform, November 19, 2013, at http://www.finance.senate.gov/newsroom/chairman/release/?id=f946a9f3-d296-42ad-bae4-bcf451b34b14.

[42] The explanations of the President's tax proposals can be found in the "Green Books" which are at https://www.treasury.gov/resource-center/tax-policy/Pages/general_explanation.aspx. The numbers in this section are from the latest budget estimates, *General Explanations of the Administration's Fiscal Year 2017 Revenue Proposals*, Department of Treasury, February 2016.

[43] Note that this proposal's estimate was made assuming an interest allocation proposal that should reduce the amount of income abroad, so the gain from the minimum tax might be larger as a stand-alone proposal.

Both of these proposals would impose a tax on previously deferred earnings, the Baucus staff proposal at 20% and the President's proposal at 14%.

Former Ways and Means Chairman Dave Camp's proposal, The Tax Reform Act of 2014, contained a limited minimum tax of 15% that applied to intangible income in a bill that otherwise moved to a territorial tax.

Minimum tax provisions, as is the case with ending deferral generally, would have effects only on U.S. multinationals (regardless of the shifting technique) and not U.S. subsidiaries of foreign multinationals. It would also, to a lesser degree, encourage inversions and shifting of profits to other high tax countries. It would raise revenue in the low-tax or no-tax countries that are the targets of profit shifting, but should have little effect in most countries where real activity takes place and where U.S. tax due is offset by foreign tax credits.

Restricting Deferral and Cross-Crediting Through Interest allocation and Foreign Tax Credit Pooling

Before adopting the minimum tax proposal, President Obama proposed alternative methods of restricting deferral, provisions that were originally contained in H.R. 3970, a tax-reform plan introduced in 2007 by Chairman Rangel of the Ways and Means Committee. These proposals would disallow certain deductions of parent-company costs (the most important being interest) that reflect the share of income that is deferred. This proposal also included a foreign tax credit pooling proposal, which would allow a share of foreign tax credits equal to the share of income repatriated. This provision limits the

ability of firms to repatriate income from high-tax countries and use excess foreign tax credits to shield income from low-tax countries from the foreign tax credit.

The last budget to contain these proposals, the FY2015 budget, projected the interest provision to raise $43.8 billion over 10 years (FY2015-FY2024), and the foreign credit pooling provision to raise $74.6 billion over 10 years, a total of $118.4 billion, or around $12 billion a year.

The first provision would focus on profit shifting by leveraging for U.S. multinationals and the second would affect techniques of both transfer pricing and intangibles. These provisions would, like the others, encourage inversions and possibly shifting of profits into other higher tax countries. Arguments were also made that the foreign tax credit proposal might cause more profits to be retained abroad because they would be less likely to be fully shielded from U.S. tax by foreign tax credits.

Taxing Certain Types of Income Currently by Expanding the Scope of Subpart F

Subpart F is the provision that defines income currently subject to tax because it constitutes income easily abused. It includes certain passive income (such as interest and dividends), sales and service income that are earned on goods produced and used outside the country of incorporation and similar items. The rules apply to controlled foreign corporations (CFCs), to any shareholder that owns ten percent of a foreign firm that is 50% owned by U.S. shareholders.

Before the Obama Administration adopted the minimum tax approach, it proposed (along with the two provisions discussed in the previous section) to treat excess income from transferred intangibles in low tax countries as Subpart F income and also to

separate this income into a different category (called a basket) for applying limits on the foreign tax credit. This foreign tax credit change would prevent the U.S. tax on this intangible income from being offset by excess foreign tax credits from other baskets of income. The rule would apply to countries with tax rates below 10% and be phased out between 10% and 15%. This provision was projected to raise $30 billion from FY2015-FY2024).

In the FY2017 budget were proposals to expand Subpart F coverage. One proposal would expand what is termed foreign base company income which includes, among other components, sales income related to property purchased from or sold to a related party manufactured and sold outside of the country. There is a similar provision for service income. This provision expands the definition to include digital income and services, at a projected revenue gain of $9.1 billion from FY2017-FY2026. A second provision would expand foreign base company sales income to include property manufactured on behalf of the CFC at a gain of $19.2 billion.

There are a number of minor provisions that could capture excess profits. One provision would be to restore passive income earned by the banking and insurance firms to Subpart F status. This type of income was originally excepted from the Subpart F rules that captured passive income (when Subpart F was enacted in 1962), but that exception was repealed by the Tax Reform Act of 1986. The exception was restored in 1997, but as a temporary provision. It was extended in 1998 with some modifications requiring substantial activity and that activities must take place in the CFC's home country. After many years of extensions for a year or two at a time, this provision was made permanent in the Consolidated Appropriations Act at the end of 2015.

Another extender, the look-through rule codified and extended a regulatory provision, check-the-box, adopted in the late 1990s. Check-the-box allows entities, such as subsidiaries of a U.S. multinational's foreign subsidiaries to be "disregarded" and not treated as a separate entity, which excludes transactions that would otherwise be included in Subpart F. For example, interest on a loan from a Cayman Islands (a zero tax) subsidiary to its own subsidiary in a high tax country (where it could deduct interest) would, without check-the-box, be included in Subpart F. Check-the-box makes this transaction disregarded by treating the two subsidiaries as one. The look through rule expands the number of circumstances where disregarding an entity can reduce Subpart F income. It has been extended through 2019.

There are some other ways in which Subpart F can have a broader scope (some of them discussed in the President's budget).

Expansion of Subpart F would affect profit shifting of U.S. multinationals and not of U.S. subsidiaries of foreign parents. Perhaps the principal concern with some of these provisions is the possible behavioral responses that would result in additional revenue collected by other countries. If the objective is maximizing U.S. welfare, reducing profits of multinationals reduces the welfare of stockholders who are largely U.S. citizens. Taxing intangibles in low tax countries could result in firms shifting profits to countries that have rates high enough to avoid the tax but lower than the U.S. tax rate. Eliminating check-the-box may largely benefit other countries, if firms cease the activity that has been occurring at the expense of foreign treasuries. This latter outcome, however, is probably desirable for the fair allocation of taxes across countries.

Interest Allocation

Thus far, none of the proposals for "sticks" have an effect on U.S. subsidiaries of foreign parents. Current law does impose limits on interest deductions (the thin capitalization rules of Section 163(j)) which are also common in other countries.[44] This rule disallows interest deductions in excess of 50% of income before deductions for taxes, interest and depreciation, if the debt to equity ratio exceeds 1.5. One target of these provisions is U.S. subsidiaries of foreign parents, where parents may desire to finance subsidiaries in large measure by loans. Proposals have been made to eliminate the debt to equity safe harbor and limit the interest cap to 25%. This proposal was originally in the House version of the legislation adopted in 2004 (The American Jobs Creation Act), and was recently advanced (either for all firms, or for inverted firms) in wake of the wave of inversions in 2014.

Recently (on April 4, 2016), the Treasury announced proposed regulations (Reg-108060-15) on debt and equity instruments that could have significant consequences for the use of leveraging to shift profits out of the United States, especially by foreign acquirers of U.S. firms. This regulation should have consequences, although it is not specifically confined to, inverting firms.

An alternative, or perhaps a supplement, to thin capitalization rules is interest apportionment, that is allowing interest deductions only up to the share of some measure that equalizes interest shares of profits (i.e. allocate interest in the same way as pre-tax

[44] For a review of rules see in Stuart Webber, Thin Capitalization and Interest Deduction Rules: A Worldwide Survey, Reprinted from *Tax Notes Int'l*, November 29, 2010, p. 683 http://corit-academic.org/wp-content/uploads/2011/12/60TI0683-Webber.pdf. Webber suggests an allocation rule equalizing interest ratios across firms and subsidiaries, the proposal in the Presidents FY2017 budget.

profits or assets). The United States currently allocates parent company interest from the U.S. to foreign source income in order to determine the limit on the foreign tax credit, so allocation rules are not unfamiliar. These rules have never been applied generally to the allocation of interest between U.S, multinationals' domestic and foreign operations, although as noted above, one initial proposal of the Administration was to extend this allocation to disallow a proportion of U.S. interest deductions to the extent that income is deferred.

The recent budget proposals contain a broader provision that would allocate interest of financial groups based on their share of earnings before depreciation and interest deductions. This provision is estimated to raise $70 billion from FY2017-FY2026. It would apply to U.S. multinationals, as well as U.S. subsidiaries of foreign parents. There is also an option of allowing an interest deduction capped at the sum of interest income and 10% of earnings, although firms who choose the allocation rule would not be subject to 163(j).

This allocation provision should eliminate or significantly reduce profit shifting through leveraging for U.S. multinationals and for U.S. subsidiaries of foreign parents. It is one of the few ways to address profit shifting associated with the latter. In addition, it would also be seen as a way to remedy the problem of inversions (discussed next) because it should end the ability of inverted firms to strip profits out of the United States through leveraging.

Provisions Addressing Inversions

Inversions, where companies change their headquarters from the U.S. to a foreign jurisdiction, have been a policy challenge in the last two years, through mergers with smaller foreign firms. This "new wave" of inversions follows the inversions beginning in the late 1990s, where a firm simply reincorporated as a paper transaction. As a result of legislation and regulations, inversion by merger with a foreign firm is largely the only method of inversion available.[45] In a merger, the U.S. firm has to own less than 80% of the new combined firm; otherwise, it continues to be treated as a U.S. firm. More recently a number of mergers where the U.S. firm's shareholders held between 60% and 80% of stock occurred, largely among pharmaceutical firms but also in other activities (including Burger King). These firms were subject to some penalties but were nevertheless not treated as U.S. firms.

The benefits of these inversions were that the firm may obtain access to accumulated foreign earnings of the prior U.S. firm's foreign earnings without paying tax through techniques such as loans to the new parents, they would be in a position to move future activities into a territorial tax regime, and they would be better poised to take advantage of leveraging and other techniques to reduce the share of income subject to U.S. tax rates. Therefore, inversions tend to facilitate profit shifting in part because profit shifting is more attractive in a territorial regime (where tax is not deferred, but never due) and in part because a foreign parent may be better able to shift profits out of the United States.

[45] A firm can invert alone if 25% of its business is in the new headquarters company, but that is very difficult to achieve once the requirement was increased to this level (from 10%) in T.D. 9592, June 12, 2012.

In response to a number of inversions through merger announced in 2014, the Treasury announced regulations (2014-52) which would treat transactions such as intercompany loans from U.S. subsidiaries to the new parent (called "hopscotch" loans) as repatriations (along with some other restrictions). Subsequent regulations also prevented headquartering in a third country that was not the home of the foreign firm (Treasury Notice 2015-79). On April 4, 2016, Treasury announced additional regulations (Reg. 135734-14) that would take into account mergers in the past three years. For example, if a previous merger within the past three years had expanded the now foreign acquirer to the point of accounting for more than 40% of ownership, that firm would be considered inverted and thus subject to restrictions such as those on hopscotch loans. Also on that same day, Treasury announced the proposed regulations on debt and equity (Reg. 108060-15) that would make it more difficult to move debt into the new U.S. subsidiary following an inversion.

Several proposals were made to limit inversions. One, as mentioned above, was to allocate interest, either only for inverted firms or for all firms. Another would be to consider the firm a U.S. firm as long as the original U.S. shareholders held 50% or more of the stock. Both of these provisions were in the FY2017 budget, with interest allocation rules applying generally. The firm would also be considered inverted if it was managed and controlled in the United States or if it does not conduct substantial business activities in the new firm headquarters.

Another option is to provide an "exit tax" by requiring firms to treat existing earnings of the U.S. parent deferred in foreign subsidiaries as repatriated and subject to

U.S. tax. This proposal was discussed in 2014, and has been supported by presidential candidate Hillary Clinton.

Formulary Apportionment

A full-scale formulary apportionment approach, where income of a multinational would be allocated based on some measurable factors such as property, payroll, or sales, is probably not feasible. This method is used in the states of the United States and in the Canadian provinces, but has never got beyond academic discussion in the United States. The European Union had a project to develop a common definition of corporate income and to permit formulary appointment, but this project was discontinued.

A discussion of the complexities and issues surrounding formulary apportionment is beyond the scope of this paper. Briefly, however, supporters of formulary apportionment argue that having objective factors to allocate income of multinationals among countries will address what many consider major failures of the arms-length pricing approach. Studies have also found that this approach would raise revenues, although it is not clear what the gain would be after behavioral responses, including adopting tax minimization strategies.[46] The latest of the estimates are more than ten years

[46] Douglas Shackelford and Joel Slemrod estimate a 38% revenue increase from an equally weighted three-factor system. See "The Revenue Consequences of Using Formula Apportionment to Calculate U.S. and Foreign Source Income: A Firm Level Analysis," *International Tax and Public Finance*, vol. 5, no. 1, 1998, pp. 41-57. Reuven Avi-Yonah and Kimberly Clausing estimate a sales based system would raise about 35% of additional corporate revenue, or $50 billion annually over the 2001-2004 period. See Reforming Corporate Taxation in a Global Economy : A Proposal to Adopt Formulary Apportionment, Brookings Institution: The Hamilton Project, Discussion paper 2007-08, June 2007. Rosanne Altshuler and Harry Grubert find a system based on property would gain revenue on a static basis but probably not with behavioral responses, in "Formula Apportionment: Is it Better than the Current System and Are There Better Alternatives?" *National Tax Journal*, vol. 63, no. 4, pt. 2, December. For discussions of some of the tax minimization strategies, see Susan Morse, Revisiting Global Formulary Apportionment, *Virginia Tax Review*, Vol. 29, 2010, pp. 593-644 at http://poseidon01.ssrn.com/delivery.php?ID=611103021078104114120006086118070112034072042037055057122116106022104008025123081096028012000000098030047020005079094113109097111025000

old. The growth of multinationals such as Google, Apple, and Yahoo, who have significant sales abroad, might change this calculus. For example, the asset transferred abroad by Google was the European rights to advertising, which is driven by their search engine developed in the United States, and an allocation according to sales will transfer large amounts of tax revenue to European countries that are not collecting this tax under the current standards of allocation of profit according to value creation.

The first critical barrier formula apportionment faces, aside from the transition issues in moving toward a different system, is the need for coordination with other countries. As a unilateral change, formulary apportionment would lead to double taxation or no taxation as it intersects with rules of other countries. Obtaining multilateral agreement is probably impossible. Also, as a number of critics have pointed out, there are a number of techniques that would allow profit shifting to low- or no-tax countries to continue (such as selling to an intermediary in the Cayman Islands at a price that captures the value of intangibles and locating significant profits in that zero-tax country).

Finally, formulary apportionment is not the right answer to measuring profits, which should be determined by the location of the investment that created the return. Most of the disputes are about intangible property, which cannot be objectively measured, and none of the measures relate to this income. And, even if a multilateral system could be adopted, to the extent that formula apportionment reduces the profits of multinationals because those profits are inappropriately collected by the treasuries of other countries, U.S. welfare is reduced.

087019005001004077019114091055086011118031072005125006121094012106074114005031125085110127011125018115027113122100&EXT=pdf, and Julie Roin, "Can the Income Tax Be Saved? The Promise and Pitfalls of Adopting Worldwide Formulary Apportionment," *Tax Law Review*, Vol. 61. 2008, pp.169-240.

A formula approach might nevertheless be helpful as an element of the current arms-length systems, where transfer pricing simply does not work. For example, it might be better, as suggested by Benshalom, to allocate ownership of intangibles created by research and development based on the development costs in each jurisdiction.[47] In such a case, valuation determinations could be made on a post-profit basis rather than an arms-length ex ante basis (as in a case when intangibles are purchased initially, a problem which also arises with cost sharing approaches). One difficulty is that this allocation might affect the jurisdiction in which R&D is developed, and it would end the ability to use cost sharing arrangements for low tax subsidiaries to collect a share of ownership through financing contract research in the United States.[48] This issue might be of less importance now that the permanence of the research credit (enacted at the end of 2015) makes it very attractive to do research in the United States (compared to a low or no tax jurisdiction), and allows a negative effective tax rate on incremental investment.

Conclusion

This analysis has suggested that policy needs to employ sticks, rather than carrots, to address the concerns with profit shifting. Profit shifting concerns are generally about revenue, and incentives simply lose more revenue, or result in increases in effective marginal tax rates in efforts to make up the revenue.

[47] See Ilan Benshalom, "Sourcing the 'Unsourceable': The Cost Sharing Regulations and the Sourcing of Affiliated Intangible Related Transactions, Virginia Tax Review Vol. 26, 2007, pp. 631-707/

[48] Cost sharing arrangements might include an initial "buy-in" by a subsidiary, where some price is paid for the value of the research to date, and then a sharing of costs going forward. As noted, these costs can be financed by the subsidiary with the research conducted in the United States through a contractual arrangement. These costs are still eligible for the research credit.

The sticks that might work best for addressing profit shifting (such as ending deferral) probably face some significant political barriers, leading to the need to consider compromises, such as minimum taxes or other patches to the current system. One reform that should eliminate profit shifting due to leveraging is the allocation of interest. Addressing transfer pricing of intangibles is more difficult, although it might be attacked with a variety of techniques, even possibly apportioning self-created intangibles by allocation of ownership according to where development costs take place.

Appendix: Effective Tax Rates for the Patent Box

Estimates of effective tax rates use a discounted cash flow approach to estimate the required output of an investment to attract capital, given tax rules and a required after-tax return. Then the taxes are removed and the flow of income is used to determine the pre-tax return. The share of the pre-tax return that is paid in taxes is the effective tax rate and it is equal to the pre-tax return minus the after-tax return divided by the pre-tax return. The tax rate under the patent box proposal would apply to both deductions and the flow of income, the formula for the pre-tax return, r, is:

(A1) $r = (R+d)(1-uz)(1-k)/(1-u)-d$

where r is the pre-tax return, R is the after-tax real return, d is the economic depreciation rate, k is the tax credit, u is the corporate tax rate, and z is the present value of depreciation deductions (discounted at the nominal after-tax rate, which is the real rate,

R, plus the inflation rate p). Before the patent box proposal, u is equal to 35%; afterwards it is equal to 10% (see section on the effective statutory rate, below).

When z equals one, the statutory tax rate drops out of the equation. Without a credit, the pre-tax and after-tax return are the same and the tax rate is zero. If z is changed to a less than one value, as in the case of five year amortization, the required pre-tax return rises and the tax rate becomes positive.

Most investment in R&D is in intangibles (salaries for scientists and supplies) but a portion reflects tangible investment. A Canadian study used to compare taxation of intangibles across countries used a 7.3% share for equipment and a 6.6% share for structures.[49] So intangible investment, the objective in the patent box, constitutes the bulk of an R&D investment.

In the calculations in the text, the discount rate, R, is set at 5% and inflation at 2%. The effective tax rate is relatively insensitive to real discount rates, but is sensitive to inflation. With the 5-year amortization of intangible R&D expenses, z is 84.4 cents per dollar.

For the calculation that incorporates the research tax credit, firms may choose between two credits. One is a credit of 20% in excess of a rolling base that is unrelated to prior spending and thus has a marginal effective rate of 20%. The other is a credit of 14% in excess of 50% of the past three years of research expenditures. Because each dollar of research today increases the base in each of three future years (by 50 cents divided by 3) it reduces future credits, this offset must be taken into account. The credit is 14% times (1 minus 0.5 times the sum of $1/(1+R+p)$, $1/(1+r+p)^2$ and $1/(1+R+p)^3$ divided by 3). Given

[49] Canadian Department of Finance, An International Comparison of Tax Assistance for Investment in Research and Development, 2009, http://www.fin.gc.ca/taxexp-depfisc/2009/taxexp0902-eng.asp.

the weighted real discount rate of around 0.05, the result is an effective marginal rate of slightly more than half, or 7.9%. According to data on the research credit in the IRS Statistics of Income, the share claiming the 20% credit was 28%, leading to an average rate of 11.3%.

The final issue is whether the intangible investment in R&D is subject to the 10% patent box rate under the allocation formula. To examine this question, begin with a formula for the total taxes of the firm:

$$(A2)\ T = (xt+(1-x)p)\ (\prod + \prod_R)$$

where x is the share of costs associated with non-research spending, t is the ordinary tax rate, p is the patent box rate, $\prod$ is profits from non-research activities and $\prod_R$ is profits from research activities.

Totally differentiating (A2) while holding ordinary profits and costs constant:

$$(A3)\ \ dT = dx(t-p)(\prod + \prod_R) + (xt+(1-x)p)\ (d\prod_R)$$

The variable x will be a function of the costs of investment of each type. In order to relate to spending and costs, they are expressed as the cost of an additional unit of capital, either K for ordinary capital or K_R for research capital.

$$(A4)\quad x= C_K K/(C_K K+C_{KR} K_R)$$

where C_K is the cost of a marginal investment in K and C_{KR} is the cost of a marginal investment in research capital. Differentiating (A4):

(A5) $dx = (-C_K K C_{KR} dK_R)(t-p)/(C_K K + C_{KR} K_R)^2$

Multiplying the bottom and top of the right hand side of (A5) by K_R and substituting from (A4):

(A6) $dx = -x(1-x)(t-p)dK_R/K_R$

Since the rate of profit is constant for a small change,

(A7) $dK_R/K_R = d\prod_R/\prod_R$

Thus:

(A8) $dT = [-x(1-x)(t-p)(\prod + \prod R)/\prod R + (xt+(1-x)p)]\ (d\prod R)$

If the share of net profits is equal to the share of costs, then $(\prod + \prod R)/\prod R = 1/(1-x)$ and:

(A9) $dT/\ d\prod_R = [-x(t-p) + xt + (1-x)p) = p$

In the estimated effective tax rate analysis, the statutory rate for both deductions and income is assumed to be p. If profits are a smaller share than costs, the rate will be less than p and if profits are a larger share the rate will be greater than p.

The derivation below suggests that the effective statutory tax rate on income from R&D is equal to the patent box rate of 10% under the assumption that the shares of net profit and the shares of costs are equal and this rate is used in the effective tax rate calculations.