

Working Paper

Do Tax Havens Divert Economic Activity?

Mihir A. Desai

Harvard University and NBER

C. Fritz Foley

Harvard University and NBER

James R. Hines Jr.

Stephen M. Ross School of Business
at the University of Michigan
and NBER

Ross School of Business Working Paper Series

Working Paper No. 1024

April 2005

This paper can be downloaded without charge from the
Social Sciences Research Network Electronic Paper Collection:
<http://ssrn.com/abstract=891211>

Do Tax Havens Divert Economic Activity?

Mihir A. Desai
Harvard University and NBER

C. Fritz Foley
Harvard University and NBER

and

James R. Hines Jr.
University of Michigan and NBER

April, 2005

The authors thank several seminar participants for helpful comments on an earlier draft, and the Division of Research at Harvard Business School for financial support

©2005 by Mihir A. Desai, C. Fritz Foley, and James R. Hines Jr. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Do Tax Havens Divert Economic Activity?

ABSTRACT

When multinational firms expand their operations in tax havens, do they divert activity from non-havens? Much of the debate on tax competition presumes that the answer to this question is yes. This paper offers a model for examining the relationship between activity in havens and non-havens, and discusses the implications of recent evidence in light of that model. Properly interpreted, the evidence suggests that tax haven activity enhances activity in nearby non-havens.

JEL Classifications: H87, F23, F21.

Mihir A. Desai
Harvard Business School
Morgan 363
Soldiers Field
Boston, MA 02163
mdesai@hbs.edu

C. Fritz Foley
Harvard Business School
Morgan 389
Soldiers Field
Boston, MA 02163
ffoley@hbs.edu

James R. Hines Jr.
Department of Economics
University of Michigan
611 Tappan Street
Ann Arbor, MI 48109-1220
jrhines@umich.edu

1. *Introduction*

Economic federations typically struggle with the impact and desirability of tax policy diversity among member states. In particular, there is widespread concern that low-tax areas within a federation impose a fiscal externality on other countries in attracting investment that would otherwise locate in high-tax areas within the same regions. There are no reliable estimates of the magnitude of such diversion. Moreover, there has been little consideration of the possibility that reducing the costs of using of low-tax jurisdictions *facilitates* foreign investment and economic activity in high-tax jurisdictions within the same regions. The latter possibility arises if the ability to relocate taxable profits into low-tax jurisdictions increases the return to investing in high-tax areas, if low-tax jurisdictions facilitate deferral of home-country taxation of income earned elsewhere, or if affiliates in low-tax areas offer valuable intermediate goods and services to affiliates in high-tax areas.

Tax havens also figure prominently in current debates over the scope and consequences of tax competition. Countries competing for mobile foreign investment may have incentives to reduce taxes to levels below what they would be in the absence of foreign competition; indeed, there are circumstances in which international tax competition drives optimizing governments to reduce all capital tax rates to zero.¹ Tax havens are widely believed to accelerate the process of tax competition between governments. However, it is conceivable that the tax avoidance opportunities presented by tax havens allow other countries to maintain high capital tax rates without suffering dramatic reductions in foreign direct investment. Hence the proliferation and widespread use of tax havens may retard what would otherwise be aggressive competition between other countries to reduce taxes in order to attract and maintain investment. Indeed,

¹ The literature on tax competition since Oates (1972), as reviewed in Wilson (1999) and Gordon and Hines (2002), has largely been theoretical, and focused on the possibility that tax competition may result in an inefficient underprovision of public goods. An alternative stream of this literature emphasizes the virtues of tax competition in restraining an expansive state, as argued in Brennan and Buchanan (1980) and modeled in Edwards and Keen (1996). Further extensions of these models incorporate the political economy of fiscal policy and explore the associated consequences for the efficiency of tax competition, as in Gordon and Wilson (2003) and Janeba and Schjelderup (2002). Empirical efforts to consider the salience or consequences of tax competition include Devereux, Lockwood and Redoano (2002), who estimate parameters of reaction functions within the OECD to measure the extent to which tax competition has operated between 1982 and 1999, and Mendoza and Tesar (2002), who simulate the dynamics of tax competition within Europe. Buettner (2003) analyzes fiscal competition within Germany by considering the investment effects of tax policies in adjacent jurisdictions.

despite the incentives in place to compete over tax rates, the tax burden on corporate income in OECD countries has fallen little, if at all, over the past 25 years (see Griffith and Klemm (2004)).

This paper presents a model that can be used to analyze the implications of evidence that firms with growing activity in high-tax countries are also the firms most likely to initiate tax haven operations. The complementarity between haven and non-haven activity, evident in this empirical pattern, implies that reduced costs of using tax havens are likely to stimulate investment in nearby high-tax countries. These results stand in contrast to the assumptions in much of the tax competition literature and the beliefs of many concerned policymakers.

2. *A Model of Haven and Non-Haven Activity*

Consider the incentives facing a firm with the option of making a discrete investment in a tax haven location. Part of the return to investing in the tax haven comes in the form of reducing the effective tax rate on the firm's other foreign investments. Let τ_1 denote the tax rate on the firm's foreign investments outside of tax havens, and let τ_2 denote the effective tax rate on these profits if the firm also has a tax haven operation. To the extent that the firm is able to use tax haven investments to reduce effective foreign tax rates on income earned outside of havens, it follows that $\tau_2 \leq \tau_1$.

The firm produces output in countries other than tax havens with a production function $Q(K_1, K_2)$, in which K_1 is the level of capital investment in non-havens, and K_2 is the level of investment in tax havens. Firms are assumed to invest equity capital for which there is a shadow cost represented by λ . The tax haven investment is taken to be discrete: the firm either invests zero, or else invests a fixed amount of capital given by K_2^* . The return to the tax haven investment is earned in the tax haven itself (where it is denoted $\tilde{Q}(K_2^*)$) and possibly by augmenting profits earned in other foreign countries. Finally, there is a firm-specific cost of c_1 per unit of capital invested in foreign countries outside the tax haven, and a cost of c_2 per unit of capital invested in the tax haven.

If the firm elects not to invest in the tax haven, its after-tax returns are given by:

$$(1) \quad \pi_1 \equiv (1 - \tau_1)Q(K'_1, 0) - \lambda c_1 K'_1,$$

in which K'_1 is the profit-maximizing level of foreign investment, characterized by the first-order condition:

$$(2) \quad (1 - \tau_1) \frac{\partial Q(K'_1, 0)}{\partial K_1} = \lambda c_1.$$

If the firm instead chooses to invest in the tax haven, its returns are given by:

$$(3) \quad \pi_2 \equiv (1 - \tau_2)Q(K_1^*, K_2^*) + \tilde{Q}(K_2^*) - \lambda(c_1 K_1^* + c_2 K_2^*),$$

in which K_1^* satisfies:

$$(4) \quad (1 - \tau_2) \frac{\partial Q(K_1^*, K_2^*)}{\partial K_1} = \lambda c_1.$$

The first-order conditions (2) and (4) together imply that K'_1 and K_1^* satisfy:

$$(5) \quad \frac{\partial Q(K_1^*, K_2^*)}{\partial K_1} = \frac{(1 - \tau_1)}{(1 - \tau_2)} \frac{\partial Q(K'_1, 0)}{\partial K_1}.$$

Equation (5) identifies two channels by which the tax haven investment affects desired levels of investment in other countries. The first comes from the tax rate reduction: since $\tau_2 \leq \tau_1$, it follows that the ratio in the first term on the right side of (5) is less than or equal to one, which implies that the favorable tax treatment afforded by tax havens may reduce the required pretax marginal product of capital for non-haven operations of firms that simultaneously invest in havens. The second effect of tax haven investment appears through the impact of such investment on the marginal product of capital outside of havens.

Two extreme cases illustrate potential impacts of these two effects. If the marginal product of capital in non-havens is not a function of the level of tax haven investment, or, more formally, if $\frac{\partial Q(\hat{K}_1, K_2^*)}{\partial K_1} = \frac{\partial Q(\hat{K}_1, 0)}{\partial K_1}, \forall \hat{K}_1, K_2^*$; and if $\tau_2 < \tau_1$ and the firm's production function

exhibits the usual concavity in K_1 , then the use of tax havens reduces the required marginal product of capital elsewhere, so, from (5), $K_1^* > K_1'$. Alternatively, it is possible that tax havens do not appreciably reduce effective foreign tax rates, so $\tau_2 \cong \tau_1$; and if the marginal product of capital in non-havens falls as more capital is invested in havens (specifically, if $\frac{\partial^2 Q(K_1, K_2)}{\partial K_1 \partial K_2} < 0$), then it follows that $K_1^* < K_1'$. As these extreme cases make clear, the net effect of tax haven investment on non-haven investment is ambiguous theoretically and must be resolved empirically.

The firm's optimization problem also suggests a method of evaluating the relationship between haven and non-haven investment, since if having a tax haven operation increases the desired level of non-haven investment (i.e., if $K_1^* > K_1'$), then it is also the case that greater non-haven investment increases the desirability of establishing a tax haven operation. What is the impact on non-haven countries when an economic federation admits a tax haven as a new member country, thereby reducing the cost that taxpayers incur in obtaining tax benefits from tax haven operations? In the context of the model, such a move is represented as a reduction in c_2 , the cost of operating in the tax haven. A change in tax regulations that reduces the cost of tax avoidance through haven operations is another example of a policy that reduces c_2 . Any reduction in c_2 increases the benefit $(\pi_2 - \pi_1)$ associated with owning tax haven affiliates, thereby encouraging firms to establish new haven affiliates. These new haven operations affect investment elsewhere insofar as K_1^* differs from K_1' . While it should be possible to estimate the effect of changes in c_2 on foreign investment in high-tax locations, the practical difficulty of identifying and measuring sufficient changes in the costs of using tax havens makes alternatives considerably more appealing. One such alternative is to consider the effect of a change in c_1 , the cost of investing in non-havens, on the likelihood of establishing a tax haven affiliate, which is an increasing function of $(\pi_2 - \pi_1)$.

Taking other features of the economic environment to be fixed, it is possible to write (maximized) firm profits with and without tax haven operations as functions of investment costs, thus $\pi_2(c_1, c_2)$ and $\pi_1(c_1)$. From the envelope condition characterizing profit maximization,

$\frac{\partial \pi_2(c_1, c_2)}{\partial c_1} = -\lambda K_1^*$ and $\frac{\partial \pi_1(c_1)}{\partial c_1} = -\lambda K_1'$. Hence the change in $(\pi_2 - \pi_1)$ as c_1 changes is given

by:

$$(6) \quad \frac{\partial \pi_2(c_1, c_2)}{\partial c_1} - \frac{\partial \pi_1(c_1)}{\partial c_1} = -\lambda(K_1^* - K_1').$$

Equation (6) indicates that, if $K_1^* > K_1'$, a reduced cost of investing in non-haven countries increases the likelihood of establishing tax haven operations. Alternatively, if $K_1^* < K_1'$, a reduced cost of investing in non-haven countries decreases the likelihood of establishing tax haven operations. Equation (6) suggests that by observing changes in demand for tax haven operations as c_1 changes, it is possible to infer the effect of tax haven operations themselves on investment elsewhere.

3. *Empirical Evidence*

In order to implement the empirical method suggested by equation (6) it is necessary to obtain a measure of c_1 . A natural candidate is Tobin's q , the ratio of the market value of capital to its replacement cost, effectively a transformation of the user cost of capital. While Tobin's q is notoriously difficult to measure, it is, in theory, directly related to investment and other measures of economic activity related to investment. Taking the q model of investment to imply that $I = \beta q$, in which I is a firm's investment level and β a scalar, it follows that $q = \beta^{-1} I$. Consequently, a firm's level of foreign direct investment serves as a proxy for q , and therefore c_1 . Of course, the endogeneity of investment to tax haven demand makes it necessary to use an instrument for investment in order to estimate the impact of costs in non-havens on the likelihood of establishing a tax haven affiliate.

A natural instrument for the change in firm i 's level of foreign direct investment in non-tax haven countries is the economic growth rate of the countries in which it invests, weighted by the levels of its initial investments. This instrument reflects country differences in q : economies experiencing declining real costs of production, rising factor productivity, deregulatory episodes, or other changes that increase the rate of local economic growth are also ones in which foreign

investors face lower net costs and are likely to expand their operations. Consequently, American firms that invested heavily in economies that subsequently grew quickly tend to exhibit more dramatic increases in foreign direct investment than do firms that instead invested heavily in economies that subsequently grew slowly. Using this instrument, it is possible to evaluate the effect of predicted changes in foreign investment in non-havens on the likelihood of establishing a tax haven affiliate, thereby measuring the relationship expressed in equation (6).

Desai, Foley and Hines (forthcoming) present results that implement this approach. While Desai, Foley and Hines interpret these results as confirming the effects of size of non-haven activity on the demand for tax haven activities, it is possible to reinterpret their evidence in light of the model presented in section 2. In their first-stage regressions, weighted GDP growth rates correlate positively with growth of sales and growth of capital stocks in the same regions, suggesting that GDP growth rates serve as reasonable instruments for changes in activity outside of tax havens. The second stage regressions are fixed effect logit equations in which predicted values of changes in sales and capital stocks of non-haven affiliates are used as independent variables. The dependent variable takes the value one if a firm has no tax haven affiliates in the region in the base period but has one or more tax haven affiliates in the region by the next period in the analysis. The dependent variable is zero if a firm starts with one or more tax haven affiliates only to lose them subsequently. Observations of firms that never have tax haven affiliates, and those that always have tax haven affiliates, are excluded from the sample. This procedure, developed by Chamberlain (1980), corresponds to a logit model with firm fixed effects and permits straightforward estimation of how changes in non-haven demand, induced by reduced costs of investing in such environments, affects the demand for tax haven operations.

The results indicate that greater activity outside of tax havens is associated with greater demand for tax haven affiliates. Firms whose initial investments were concentrated in economies that subsequently grew rapidly are the most likely to establish new tax haven affiliates. The theory outlined in section 2 notes that this pattern implies that policies that reduce the cost of using tax haven operations should stimulate greater economic activity among foreign affiliates outside of tax havens. The regressions imply that, when evaluated at sample means, a one percent greater likelihood of establishing a tax haven affiliate is associated with 0.5 to 0.7 percent greater sales and investment growth outside of tax havens within the same region.

4. Conclusion

Contrary to many policy concerns and the assumptions of much of the tax competition literature, reduced costs of using tax havens do not appear to divert activity from non-havens. The empirical evidence indicates that firms facing reduced costs of establishing tax haven operations respond in part by expanding their foreign activities in nearby high-tax countries. Hence it appears that careful use of tax haven affiliates permits foreign investors to avoid some of the tax burdens imposed by domestic and foreign authorities, thereby maintaining foreign investment at levels exceeding those that would persist if tax havens were more costly.

The available macroeconomic evidence indicates that countries have not reduced their taxation of foreign investment, or of capital income, to anything approximating the degree implied by many models of capital tax competition. The use of tax havens by foreign investors may help to explain this empirical pattern, as high-tax countries are able to maintain high tax rates while continuing to draw significant levels of foreign investment. It is not even necessary that high-tax countries are aware of the importance of tax havens in preserving their ability to attract foreign investment. One further implication of this analysis is that tax harmonization within federations may actually foster, rather than restrict, tax competition. Some initiatives to harmonize tax rates would effectively raise the costs that investors face in order to obtain the benefits of using tax havens, thereby reducing foreign investment in the region. Downward pressure on national tax rates might well follow in an effort to attract investment, a process that could have been made less likely with the diversity afforded by allowing havens within a region.

References

- Brennan, Geoffrey and James Buchanan. (1980). *The power to tax: Analytical foundations of a fiscal constitution* (New York: Cambridge University Press).
- Buettner, Thiess. (2003). "Tax base effects and fiscal externalities of local capital taxation: Evidence from a panel of German jurisdictions." *Journal of Urban Economics* 54:110-128.
- Chamberlain, Gary. (1980). "Analysis of covariance with qualitative data." *Review of Economic Studies* 47:225-238.
- Desai, Mihir A., C. Fritz Foley and James R. Hines Jr. (forthcoming). "The demand for tax haven operations." *Journal of Public Economics*.
- Devereux, Michael P., Ben Lockwood and Michela Redoano. (2002) "Do countries compete over corporate tax rates?" CEPR Working Paper 3400.
- Edwards, Jeremy and Michael Keen. (1996). "Tax competition and Leviathan." *European Economic Review* 40:113-134.
- Gordon, Roger H. and James R. Hines Jr. (2002). "International taxation." in Alan J. Auerbach and Martin Feldstein (eds.) *Handbook of public economics*, vol. 4 (Amsterdam: North-Holland), 1935-1995.
- Gordon, Roger H. and John D. Wilson. (2003). "Expenditure competition." *Journal of Public Economic Theory* 5:399-417.
- Griffith, Rachel and Alexander Klemm. (2004). "What has been the tax competition experience of the last 20 years?" *Tax Notes International* 34:1299-1315.
- Janeba, Eckhard and Guttorm Schjelderup. (2002). "Why Europe should love tax competition – and the U.S. even more so." NBER Working Paper No. 9334.
- Mendoza, Enrique G. and Linda L. Tesar. (2003). "A Quantitative Analysis of Tax Competition v. Tax Coordination under Perfect Capital Mobility." NBER Working Paper No. 9746.
- Oates, Wallace. (1972). *Fiscal federalism* (New York: Harcourt Brace Jovanovich).
- Wilson, John D. (1999). "Theories of tax competition." *National Tax Journal* 52:269-304.