



WP/06/117

IMF Working Paper

A Superior Hybrid Cash-Flow Tax on Corporations

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IMF Working Paper

Fiscal Affairs Department

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May 2006

Abstract

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This paper proposes a new hybrid cash-flow tax on corporations that, on one hand, taxes only excess corporate profits as they accrue, and, on the other hand, treats real and financial transactions neutrally. It is, therefore, a superior tax compared to the cash-flow tax on real transactions that seems to have gained common acceptance. The hybrid tax is a modified version of the cash-flow tax on real and financial transactions combined. The modification involves replacing expensing of fixed assets with normal depreciation allowances, but the undepreciated value of fixed assets is carried forward with interest at the opportunity cost of equity capital.

JEL Classification Numbers: H20, H25

Keywords: Corporate income tax, cash-flow tax, tax reform

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¹ Helpful comments from Richard Bird, Isaias Coelho, John Isaac, Michael Keen, Russell Krelove, and Peter Mullins are gratefully acknowledged. Discussions with John Isaac have been particularly valuable. The usual disclaimer applies.

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I. INTRODUCTION

As is well known, the corporate income tax (CIT) in its conventional form engenders a number of serious economic distortions, the two most notable ones being that it creates a wedge between pre- and post-tax rates of return to corporate investment, and it provides a tax-induced incentive for debt financing. Administratively, it is also a most complex tax to enforce effectively, because it requires the correct attribution of profits in a world in which there are myriad ways taxable profits could be easily disguised, transformed, deferred, shifted out of the tax jurisdiction, or otherwise evaded. Problems of transfer-pricing and thin capitalization that plague the conventional CIT are notoriously difficult to tackle satisfactorily, and, if ad hoc administrative rules are used to deal with them (such as advance pricing agreements and debt-equity ratio ceilings), such rules could well inject distortions of their own.

There has certainly been no shortage of proposals by academics and tax practitioners to reform the conventional CIT since the publication of the landmark tax reform study by the Institute for Fiscal Studies (1978)—commonly referred to as the Meade Committee study. The most notable of such proposals, which are comparatively summarized in Table 1, include: (1) the comprehensive business tax (CBIT) proposed by the U.S. Department of the Treasury (1992); (2) the CIT with an allowance for corporate equity (ACE) proposed by the Institute for Fiscal Studies (1991); (3) various versions of the cash-flow tax (CFT) proposed by the Meade Committee itself and others; and, finally, (4) various versions of the accounts-based value-added tax (VAT)—which are to varying degrees conceptual cousins of the CFT—proposed by a number of researchers either as a way of taxing corporations at the local level (e.g., the business value tax (BVT) of Bird and Mintz (2000)) or as part of a broader, fundamental tax reform program (e.g., the subtraction-method VAT (S-VAT) as a component of the so called “USA” tax as described in Seidman (1997)).² Needless to say, these proposals vary in focus and ambition, but none is completely successful in overcoming all of the conventional CIT’s problems.³ Furthermore, some introduce problems of their own.

By denying the tax deductibility of interest expenses, the CBIT succeeds in leveling the field between debt and equity financing by raising the cost of debt to that of equity, but only at the price of further increasing the tax burden—and hence the economic distortion—on corporate investment. In contrast, the CIT with ACE takes the opposite track by providing an allowance equal to the opportunity cost of equity capital, and thus succeeds in leveling the field between debt and equity financing by lowering the cost of equity to that of debt. In

² The basic difference between a CFT and an accounts-based VAT is that wages are a deductible expense under the former but not under the latter. Because of its conceptual similarity to the CFT, such a VAT is not further discussed below. Surely the desirability of taxing wages at the business level would in part depend on how wages are taxed at the personal level—a subject that is not pursued in this paper.

³ For a recent discussion of these and other proposals, see Devereux and Sørensen (2005)

Table 1. Alternative Proposals for Reforming the Conventional CIT

Legends

Real transactions

Cash inflows:

S = total sales

ES = exported sales

Cash outflows:

W = wages and salaries

K = net acquisitions of fixed assets

M = total purchases of nonlabor, noncapital inputs

IM = imported nonlabor, noncapital inputs

Financial transactions

Cash inflows:

B = net borrowing

DF = dividends from investment abroad

Cash outflows:

I = net interest expenditure

IF = net investment in foreign shares

C = net increase in cash balance

Share transactions

Cash inflows:

H = net increase in own shares issued

DD = dividends from domestic investment

Cash outflows:

D = dividends paid

VD = net investment in domestic shares

Other variables

P = pre-tax profits

$= S - M - W - I - DEP (+ DF)$

DEP = depreciation

E^0 = equity at beginning of period

E^1 = equity at end of period

$= E^0 + H + P + DD - D - VD$

T = tax payment

r = representative rate of interest

	Conventional CIT	Income-based variants			Consumption-based variants		
		CBIT	CIT with ACE	S-CFT	BYT	R-CFT	S-VAT
Tax base							
Accounting basis	P	$P + I$	$P - rE^0$	$(D + VD) - (H + DD) \ 1/$	$P + W + I$	Origin basis: $S - W - K - M$ Destination basis: 2/ $S - ES - W^* - K^* - M^* + IM^*$	Origin basis: $S - K - M$ Destination basis: 2/ $S - ES - K^* - M^* + IM^*$
Economic substance	Total corporate profits (return to equity).	Total corporate income (return to debt and equity).	Corporate profits in excess of "normal" rate of return r (excess profits).	Net cash outflow in share transactions, which by accounting identity is equivalent to net cash inflow of real and financial transactions combined.	Value-added of the income type.	Net cash inflows in real transactions.	Value-added of the consumption type.
Notable deviation(s) from conventional CIT	...	Nondeductibility of net interest expenditure.	Deduction of imputed opportunity cost of equity.	Tax liability arises only upon net distribution of dividends, less net acquisition of equity shares.	Nondeductibility of wages and net interest expenditure.	• Nondeductibility of net interest expenditure. • Full expensing of capital purchases.	• Nondeductibility of wages and net interest expenditure. • Full expensing of capital purchases.
Possible treatments of international transactions							
Source/origin basis 3/	Foreign-sourced profits are exempt.	Foreign-sourced income is exempt.	Foreign-sourced profits are exempt. Foreign equity investment (IF) is treated on par with domestic equity investment, with foreign-sourced dividends (DF) exempted from tax.	Foreign-sourced dividends (DF) are not counted as inflows, and foreign equity investment (IF) is not counted as an outflow. Tax base adjusted accordingly.	Foreign-sourced profits are exempt.	Exports and imports are treated on par with domestic sales and purchases.	Same as R-CFT.
Residence/destination basis 4/	World-wide profits taxed, with credits for foreign taxes paid.	World-wide income taxed, with credits for foreign taxes paid.	World-wide profits taxed, with credits for foreign taxes paid. Foreign equity investment not deducted from base for computing ACE.	Tax base is as stated. However, reduction to the tax base resulting from foreign equity investment may justify denial of standard double-tax relief.	World-wide profits are taxed, with credits for foreign taxes paid.	Proceeds from exports are excluded from computing inflows, and payments for imports are excluded from computing outflows.	Same as R-CFT.

Table 1. Alternative Proposals for Reforming the Conventional CIT (concluded)

	Conventional CIT	Income-based variants			Consumption-based variants		
		CBIT	CIT with ACE	S-CFT	BVT	R-CFT	S-VAT
Main meriti(s)	<ul style="list-style-type: none"> • Prevailing international practice. • Generally accepted principles and conventions. 	<ul style="list-style-type: none"> • Neutrality between debt and equity finance. • Effective capture of interest income in the tax base. 	<ul style="list-style-type: none"> • No tax wedge between pre- and post-tax rates of "normal" return to investment. • Neutrality between debt and equity finance. 	<ul style="list-style-type: none"> • Inclusive of those found in a CIT with ACE. 5/ • Administrative simplicity as only a few transactions need to be monitored. 	<ul style="list-style-type: none"> • Inclusive of those found in the CBIT. • Neutrality in capital-labor mix in production. • Broadness of base could allow a relatively low rate. 	<ul style="list-style-type: none"> • Inclusive of those found in a CIT with ACE. • Exclusion of financial transactions greatly simplifies administration. • Elimination of transfer pricing if implemented on destination basis. • No border monitoring needed for source basis. 	Same as R-CFT, except for having a broader base (because wages are not deductible).
Main limitation(s)	<ul style="list-style-type: none"> • Tax wedge between pre- and post-tax rates of return to investment. • Bias in favor of debt over equity finance. • Source-based tax is prone to foreign tax competition. • Residence-based tax does not completely mitigate foreign tax deferral and profit shifting devices. 	<ul style="list-style-type: none"> • Tax wedge between pre- and post-tax rates of return to investment remains. • Foreign tax competition is reduced (thin capitalization removed) but not eliminated. • Complexity arising from establishing franking account necessary to track interest and dividends paid out from tax-exempt income (if dividends not taxed in the hands of recipients). 	<ul style="list-style-type: none"> • Difficulty in choosing the "right" rate r of ACE. • Different treatments of corporations earning above and below "normal" profits. • Narrowing of the tax base requires a higher tax rate to meet a given revenue target. • Issues of foreign tax competition left unaddressed. • Foreign countries may regard a CIT with ACE not an income tax and deny foreign tax credits. 	<ul style="list-style-type: none"> • Annual revenue yield could be severely limited if profits are retained rather than distributed as dividends. • Form of tax is drastically different from a conventional CIT, and most likely will not be recognized as such by most countries for foreign tax credit purposes. 	<ul style="list-style-type: none"> • Inclusive of those found in the CBIT. • Greater deviation from the conventional CIT than the CBIT, potentially giving rise to greater problems of its recognition as an income tax. 	<ul style="list-style-type: none"> • Form of tax is drastically different from a conventional CIT, and most likely will not be recognized as such by most countries for foreign tax credit purposes. • Destination basis requires border monitoring. • Source basis vulnerable to foreign tax competition (except thin capitalization). 	Same as R-CFT.
Country experience(s)	Most countries.	...	Belgium (effective 2007), Brazil, and Croatia and Italy (both discontinued)...	Estonia.	As local tax in Italy and United States (Michigan).	Proposed in the United States (destination basis).	Japan. 6/

Source: Author's compilation.

1/ As stated, the tax is viewed as an income tax (as is common). However, as explained in the text, the S-CFT can also be viewed as a consumption tax that can be implemented on either the origin or the destination principle.

2/ Asterisks denote inputs used only in the production of domestic sales. Apportioning such inputs between exports and domestic sales is required.

3/ In income taxation, the source principle refers to taxing income arising from within the relevant country. The counterpart in consumption taxation is the origin principle, which taxes the value (however defined) of goods and services produced in the relevant country.

4/ In income taxation, the residence principle refers to taxing the world-wide income of residents of the relevant country. The counterpart in consumption taxation is the destination principle, which taxes the value (however defined) of goods and services consumed in the relevant country.

5/ From the accounting identity governing inflows and outflows and the definition of accumulation of the equity base, the base of the S-CFT can be stated alternatively as $P - (E^1 - E^0)$. In the long run, equity accumulates at the rate of "normal" return r , i.e., $E^1 = (1 + r)E^0$, so that the base of the S-CFT is identical to that of a CIT with ACE.

6/ Japan's S-VAT (known as the consumption tax) co-exists with a conventional CIT.

doing so, this approach produces the attractive result that only excess profits (rents) of corporations are taxed, or, equivalently, of a zero marginal effective tax rate (METR) on investment. Unfortunately, taxable profits under it must still be determined according to conventional CIT rules, thus leaving all the problems of tracking and attributing such profits associated with the conventional CIT intact.

Fortunately, however, the CIT with ACE is not the only tax that could deliver the desirable property of a zero METR. As is well known, a CFT also has this property.⁴ Following the Meade committee study, it is now conventional to refer to a CFT as having three versions: (1) a real transactions-based CFT (R-CFT)—real transactions being those associated with the sales and purchases of goods and services; (2) a combined real and financial transactions-based CFT ((R+F)-CFT)—financial transactions being those associated with lending and borrowing, as well as interest receipts and payments; and (3) share transactions-based CFT (S-CFT)—share transactions being those associated with a corporation's equity account (see Table 1). Since, by accounting identity, the net cash inflow of real and financial transactions combined must equal to the net cash outflow of share transactions,⁵ there are only two conceptually-independent versions of a CFT (although there are genuine administrative differences among all three versions).⁶

Modern discussions of the CFT have tended to focus on the R-CFT,⁷ probably because the S-CFT is largely seen as a tax on profit distributions, and therefore susceptible to deferral at the discretion of the taxpayers. It will be argued below that this deferral problem, though real, is probably limited in practice for a number of reasons. Nevertheless, the R-CFT has recently gained added prominence through a series of influential papers by Bradford (2001; 2003; 2004), who championed its adoption on a destination basis as the business tax component of

⁴ It is perhaps worth mentioning in passing about a frequent argument by tax practitioners against the CFT (or for that matter, any tax that deviates from the conventional CIT): the possibility that it will not be regarded by countries that operate a residence-based tax system as a creditable tax, and hence may deter foreign investment. This argument is largely irrelevant (with one possible caveat) with respect to any tax that taxes only excess profits or rents. Given that normal profits are not taxed, foreign investors are unlikely to find such a tax unattractive even if it is not creditable at home, as long as the combined tax rate of home and host countries does not reached 100 percent. The one caveat concerns lumpy investments that may prevent the full exploitation of all excess profits.

⁵ The bulk of these transactions comprises distributions to shareholders, and will be so characterized as a shorthand reference in the rest of the paper. However, there are clearly other share-related transactions, such as the issuance of new shares (an inflow) and purchases of shares in other domestic corporations (an outflow)—see Table 1 for a more precise definition of different types of transactions.

⁶ Let R be the net cash inflow of real transactions, F be the net cash inflow of financial transactions, and S be the net cash outflow of share transactions. Then, $R + F \equiv S$, which is the well-known accounting identity. In the rest of the paper, unless stated otherwise, the labels “S” and “R+F” will be used interchangeably.

⁷ It is, for example, the business tax component of the celebrated flat-tax proposal of Hall and Rabushka (1995).

his so-called “X” tax proposal.⁸ That Bradford’s business tax idea has recently been adopted by the president’s advisory panel on federal tax reform in the United States (henceforth the U.S. tax reform panel) can only further strengthen the R-CFT’s policy acceptability as a viable option for replacing the conventional CIT.⁹

The fundamental argument being advanced in the present paper is that, while the destination-based R-CFT is without question a better tax than the conventional CIT, it is not the best reform option available. A far superior choice would in fact be the S-CFT, suitably modified to produce, in effect, a hybrid CFT. This tax, henceforth referred to as the modified S-CFT, would have all the merits of the R-CFT but not its limitations. It would, therefore, be the ideal candidate as the conventional CIT’s replacement. Before describing the nature of the modified S-CFT, provided in Section III, the comparative merits and limitations of the R-CFT and S-CFT are first discussed in the next section. Section IV concludes the paper.

II. MERITS AND LIMITATIONS OF R-CFT AND S-CFT

Both the R-CFT and the S-CFT clearly share the hallmark of any CFT: the expensing of fixed assets. However, the economic implications of removing such assets from the tax base are different under them, because of their different treatments of financial transactions. To underscore this difference, and to lay the groundwork for discussing the modified S-CFT in the Section III, the merits and limitations of these two versions of the CFT are assessed from two different perspectives: distortion on investment and administrative complexity.

A. Distortion on Investment

To bring out the comparative impacts of the R-CFT and S-CFT on investment in as transparent a manner as possible, a simple example will suffice. Consider the following stylized two-period investment project requiring the purchase of fixed assets at a cost of 1 in the first period, in return for yielding an income in the amount of $(1 + \rho)$ in the second, after which the assets have no salvage value. For simplicity but without loss of generality, it is assumed that no other inputs are required to generate this second-period income.

The investment can be financed by either equity capital (no distinction is made between new equity and retained earnings for simplicity) or debt at the prevailing interest rate r . The opportunity cost of equity capital is clearly also r , since the investor can forego undertaking the project and invest the funds in debt instruments instead. To fix ideas, assume that the proportions of debt and equity used to finance the project is α and $(1 - \alpha)$, respectively,

⁸ The X tax consists of the destination-based R-CFT at the business level and a progressive labor compensation (wage) tax at the personal level.

⁹ See U.S. Report of the President’s Advisory Panel on Federal Tax Reform (2005).

where $1 > \alpha > 0$ is a given constant.¹⁰ In a no-tax world, the project entails cash flows in the two periods given in the following table (an outflow is indicated by a minus sign).

	1 st period	2 nd period
Real transactions		
Purchase of fixed assets	- 1	--
Income	--	$1 + \rho$
Total	- 1	$1 + \rho$
Financial transactions		
Issuance of debt	α	--
Debt amortization	--	$-\alpha$
Interest expense	--	$-\alpha \cdot r$
Total	α	$-\alpha \cdot (1 + r)$
Total of all transactions	$-(1 - \alpha)$	$(1 - \alpha) + (\rho - \alpha \cdot r)$

Hence, the project requires a net outflow of cash of $(1 - \alpha)$ in the first period (which amount is, of course, precisely equal to the injection of equity capital), in return for a net inflow of cash of $[(1 - \alpha) + (\rho - \alpha \cdot r)]$ in the second. The first component of the second-period inflow simply recoups the first-period outflow, and the second component represents the project's net return. The implied rate of return (v) to this project is, therefore,

$$(1) \quad v = \frac{(1 - \alpha) + (\rho - \alpha \cdot r)}{1 - \alpha} - 1$$

$$= \frac{\rho - r}{1 - \alpha} + r.$$

Equation (1) is particularly instructive in that it shows that the rate of return v can be stated as a sum of two components: the first represents the excess of income yielded by the project over the opportunity cost of equity, while the second is the opportunity cost itself. Whenever excess profits, or rents, exist (i.e., $\rho > r$), v can be raised by increasing the debt proportion α . In reality, there are, of course, other factors not captured in this simple stylized example that would probably place some upper limit on the extent to which investors could rely on debt financing. In a no-tax competitive economy, one would expect projects to be undertaken to the point where ρ and r would be equalized, so that the marginal project would be characterized by $\rho = r$. Consider now the impact of introducing different taxes at the rate t . Purely for reference, the conventional CIT is first briefly discussed.

¹⁰ In a more complete analysis, the optimal financing mix, i.e., the value of α , would be determined endogenously by the investor's profit-maximizing calculus. But this issue is not an essential aspect of the present paper.

Conventional CIT

Under the conventional CIT, interest is a deductible expense for tax purposes and a depreciation allowance d is given for fixed assets. Note that d need not be the same as the true economic depreciation (actual physical wear and tear) of such assets. The real and financial transactions associated with the project are the same as before, except that now there are additional tax calculations involved, as summarized below.

	1 st period	2 nd period
Tax calculations		
Income	--	$1 + \rho$
Deductible expenses		
Interest	--	$-\alpha \cdot r$
Depreciation	--	$-d$
Taxable profits	--	$(\rho - \alpha \cdot r) + (1 - d)$
Tax	--	$t[(\rho - \alpha \cdot r) + (1 - d)]$
Post-tax net cash flow	$-(1 - \alpha)$	$(1 - \alpha) + (1 - t) \cdot (\rho - \alpha \cdot r) - t(1 - d)$

Total net outflow of cash in the first period is unchanged from before, since there are no tax consequences to the transactions that transpired in that period under a conventional CIT, while the total net inflow of cash in the second period is now reduced by the tax liability. The implied post-tax rate of return (v_C) to the project is, therefore,

$$(2) \quad v_C = \frac{(1 - \alpha) + (1 - t) \cdot (\rho - \alpha \cdot r) - t \cdot (1 - d)}{1 - \alpha} - 1$$

$$= (1 - t) \cdot \left(\frac{\rho - r}{1 - \alpha} + r \right) - t \cdot \frac{1 - d}{1 - \alpha}.$$

Putting the term involving depreciation aside for the moment, the significance of equation (2) is clearly that the conventional CIT taxes not only the excess profits, but also the opportunity cost of (normal return to) equity capital. A comparison between equations (1) and (2) reveals that the wedge between the pre- and post-tax rates of return is simply

$$(3) \quad v - v_C = t \cdot \left(v + \frac{1 - d}{1 - \alpha} \right).$$

Equation (3) highlights the importance of tax depreciation as a variable affecting the profitability of the project: its pre-tax rate of return necessarily exceeds its post-tax rate of return as long as the tax depreciation does not exceed economic depreciation, i.e., $1 \geq d$. The converse could result if d exceeds unity and is sufficiently large, as it could happen if a large

tax incentive in the form of an investment allowance is given to the investor.¹¹ If tax depreciation coincides with economic depreciation, i.e., $d = 1$, then the tax wedge, expressed as a proportion of the pre-tax rate of return, equals precisely the tax rate: $t = (v - v^*) / v$, which is a well-known result in the tax literature.

R-CFT

As explained earlier, the R-CFT provides expensing of fixed assets but ignores financial transactions. In the context of the above stylized investment project, debt proceeds and amortization, as well as the associated interest expense, are not part of the cash flows for tax purposes. Tax calculations under it would then be as follows.

	1 st period	2 nd period
Tax calculations		
Pre-tax cash flow of real transactions	- 1	$1 + \rho$
Tax 1/	- t	$t \cdot (1 + \rho)$
Post-tax net cash flow 2/	$-(1 - \alpha - t)$	$(1 - \alpha) + (\rho - \alpha \cdot r) - t \cdot (1 + \rho)$

1/ A tax preceded by a minus sign represents a tax credit.

2/ It is assumed that $(1 - \alpha - t) > 0$, for otherwise there would be net-of-tax cash inflows in both periods, which is not economically meaningful.

The implied post-tax rate of return (v_R) to the project becomes:

$$(4) \quad v_R = \frac{(1 - \alpha) + (\rho - \alpha \cdot r) - t \cdot (1 + \rho)}{1 - \alpha - t} - 1$$

$$= \frac{(1 - t) \cdot (\rho - r)}{1 - \alpha - t} + r.$$

Equation (4) illustrates the well-known property of the R-CFT as a tax only on excess profits; a marginal project would bear no tax burden and, therefore, the METR would be zero. A far more important implication of equation (4) is, however, that if the investor has access to debt financing (i.e., $\alpha > 0$), the R-CFT could actually confer a subsidy on the project.¹² To ascertain the possible subsidy element, subtract v in equation (1)—the no-tax rate of return—from v_R in equation (4) to obtain:

¹¹ One common argument against the CFT is that, due to its expensing of fixed assets, it would have a narrower tax base than the conventional CIT for this reason alone. However, accelerated depreciation and investment allowances of varying extents are often found under the latter tax. Hence, it is not at all clear a priori that, when such features exist, which tax in fact has a broader base. In a recent study, Becker and Fuest (2005) found that switching from the conventional CIT to either an R-CFT or an S-CFT in Germany would have surprisingly small revenue effects.

¹² If the investor has no access to debt financing (i.e., $\alpha = 0$), the R-CFT would duplicate the no-tax environment.

$$(5) \quad v_R - v = \frac{t \cdot \alpha \cdot (\rho - r)}{(1 - \alpha - t) \cdot (1 - \alpha)} > 0 \text{ as } \rho > r.$$

Hence, for any project earning excess profits, the post-tax rate of return under the R-CFT would actually exceed the rate of return in a no-tax environment. This result comes about because the denial of interest deductibility cannot fully offset the benefit of expensing whenever the fixed assets are yielding a return in excess of the interest cost of debt. Although seldom mentioned in the literature, it is a decidedly undesirable property of the R-CFT.

In principle, the above potential subsidy element can be neutralized in a straightforward manner: instead of granting the tax credit in the first period as a result of expensing, the tax credit is simply carried forward with interest at the rate r . In other words, the net cash outflow in the first period is restored to $(1 - \alpha)$, while the net cash inflow in the second period is increased by $[t \cdot (1 + r)]$. It then follows that the post-tax rate of return in this case becomes:

$$(6) \quad v'_R = \frac{(1 - t) \cdot (\rho - r)}{1 - \alpha} + r.$$

Compared to the no-tax environment, it is clear from equation (6) that the R-CFT, as modified, will always impose a tax burden at the rate t on any investment with excess profits.

While excess profits are taxed under the R-CFT with the above carry-forward of tax credits with interest, there is still the well-known implication that, under it, as fixed assets are expensed, the government essentially assumes the role of a silent partner in any and all private investments, thus exposing government revenue to the same investment risks as those faced by private investors. These risks cannot be completely mitigated simply by requiring that the total net tax credits in a given period be carried forward, since in a more realistic setting with multiple and concurrent investment projects, the overall profitability of a corporation in each period is an amalgamated outcome of successful and unsuccessful projects. This aspect of the R-CFT is an inherent limitation of any version of the CFT that has the expensing feature.

S-CFT

The S-CFT is a tax on the net cash outflow from transactions associated with the shareholders' account (e.g., distribution of profits) of a corporation. As noted earlier, by accounting identity, it is equivalent to a tax on the net cash inflow from real and financial transactions combined. Hence, the tax calculations under such a tax are as follows.

	1 st period	2 nd period
Tax calculations		
Pre-tax cash flow of all transactions 1/	$-(1 - \alpha)$	$(1 - \alpha) + (\rho - \alpha \cdot r)$
Tax 2/	$-t \cdot (1 - \alpha)$	$t \cdot [(1 - \alpha) + (\rho - \alpha \cdot r)]$
Post-tax net cash flow	$-(1 - t) \cdot (1 - \alpha)$	$(1 - t) \cdot [(1 - \alpha) + (\rho - \alpha \cdot r)]$

1/ It is assumed that the second-period cash inflow is actually paid out to the investor.

2/ A tax preceded by a minus sign represents a tax credit.

In the first period, a tax credit is granted to the investor on account of the net cash outflow, while a tax liability arises in the second period on account of the net cash inflow. As a result, the implied post-tax rate of return (v_s) to the project is:

$$(7) \quad v_s = \frac{(1-t) \cdot [(1-\alpha) + (\rho - \alpha \cdot r)]}{(1-t) \cdot (1-\alpha)} - 1$$

$$= \frac{\rho - r}{1 - \alpha} + r,$$

which is identical to the rate of return in a no-tax environment (see equation (1)). Hence, the S-CFT does not affect a project's rate of return at all—even if the investment earns excess profits. Clearly, the S-CFT not only produces a zero METR, it also produces a zero average effective tax rate. This startling but well-known result is achieved by making no differentiation in the tax treatment between real and financial transactions, and is a fundamental implication of the accounting identity that ensures that the government's tax intake in the second period represents exactly the recouping of the first-period tax credit at the project's pre-tax rate of return.¹³ With such a tax, therefore, the role of the government as a silent partner of the investor is brought out even more starkly than before.

Just as in the case of the R-CFT, the first-period tax credit $[t \cdot (1 - \alpha)]$ available under the S-CFT could be required to be carried forward with interest at the rate r into the second period to offset the tax liability in that period. In other words, the net cash outflow in the first period is restored to $(1 - \alpha)$, while a tax credit in the amount of $[t \cdot (1 - \alpha) \cdot (1 + r)]$ becomes available in the second period, thus reducing the tax liability in that period to $[t \cdot (\rho - r)]$. The post-tax rate of return with such a carry-forward provision is:

$$(8) \quad v'_s = \frac{(1-\alpha) + (\rho - \alpha \cdot r) - t \cdot (\rho - r)}{1 - \alpha} - 1$$

$$= \frac{(1-t) \cdot (\rho - r)}{1 - \alpha} + r,$$

¹³ This statement is strictly true only if the S-CFT is implemented on an origin basis, as explained below.

which is exactly the outcome that would have been obtained under the R-CFT with a similar carry-forward provision (see equation (6)). Hence, apart from the S-CFT's potential deferral problem (i.e., taxpayers can delay tax payments by engaging in lending activities), which is further discussed below, the two versions of the CFT can be rendered economically identical to each other through the carrying-forward of tax credits with interest. Moreover, for the same reason noted earlier with respect to the R-CFT, this carry-forward provision would likewise not be sufficient to completely mitigate the government's exposure to private-sector investment risks under the S-CFT. As will be shown in Section III, the modified S-CFT being proposed in this paper is able to overcome this inherent limitation of a CFT and at the same time preserve its desirable zero-METR property. Before turning to that issue, however, it is important to compare the administrative implications of the two versions of the CFT. It is here that the S-CFT has a decisive advantage over the R-CFT.

B. Administrative Complexity

Issues of administrative complexity arise with any tax primarily in two contexts: the extent to which non-neutralities in the system can be exploited by taxpayers, and the ease with which the tax base can be artificially shifted outside the domestic tax jurisdiction. In the case of the CFT, the two relevant considerations are the distinction between real and financial transactions, and the origin vs. the destination basis on which to apply the tax.

Real and financial transactions

Bradford's (2001; 2004) support for the R-CFT seems to be based entirely on the view that, by ignoring financial transactions in determining cash flows, tax administration is made simpler. In reality, however, the differential tax treatments of real and financial transactions as required under the R-CFT amount to injecting a major non-neutrality into the system, from which the kind of complications it may entail could easily overwhelm whatever superficial simplicity that is afforded by not taking financial transactions into account.

The first, and more obvious, type of complications has to do with the tax treatment of the financial sector. Clearly, the R-CFT cannot be applied to financial institutions without modifications, for otherwise most such institutions will never have any tax liabilities. A seemingly straightforward approach to address this problem, as is adopted by the U.S. tax reform panel, is to treat loan proceeds and amortization, as well as interest receipts and payments, as real transactions for a defined set of financial institutions to which the application of such a treatment is deemed necessary. In effect, such institutions would be subject to the (R+F)-CFT rather than the R-CFT. However, this approach does not resolve all difficulties. For one thing, the problem of defining the relevant financial institutions will arise. In most cases, the correct definition may be self-evident, but there will also be many situations where the cases will not be clear-cut, such as when a nonfinancial corporation operates a business unit that in all substantive aspects resembles a standard financial institution. More importantly, cash flows from transactions between financial and nonfinancial institutions typically comprise a mixture of real (e.g., financial services) and financial (interest and principal) elements. Disentangling these elements correctly—as it will

be required under the R-CFT—will present almost insurmountable difficulties as a practical matter.¹⁴ The U.S. tax reform panel's suggestion to overcome this problem is to require financial institutions themselves to separate and disclose to their customers the real and financial elements in all their transactions. Needless to say, leaving to the taxpayers to decide what elements are taxable and what are not can only invite (at best) creative interpretation and (at worst) outright abuse.

A second, and far more intractable, type of complications has to do with the ease with which real transactions can be disguised as financial transactions solely for avoiding tax. A typical technique would be to rearrange or re-characterize a part of a transaction involving the purchase or sale of a good or service as a financial payment (e.g., interest). As discussed in great detail in McLure and Zodrow (1996), whenever there are transactions between entities that are subject to the R-CFT and those (e.g., tax-exempt entities, foreign entities, consumers etc.) that are indifferent between real and financial receipts and payments, myriad avoidance schemes can be devised to benefit at least one party involved in the transactions. Moreover, such schemes do not always have to involve related parties. Indeed, this problem was deemed by these authors to be so difficult to prevent or contain that they were led to conclude that the only workable solution would be not to differentiate between real and financial transactions, that is, to adopt the (R+F)-CFT, or, equivalently, the S-CFT. To be sure, Bradford (2003; 2004) was aware of the problem, but suggested only a very narrow remedy: the bundling of real and financial elements in a transaction whenever it is not conducted on an arm's length basis. But this begs the question of detection. Non-arm's length transactions are perhaps easy to detect when they are conducted directly between two related parties (such as between a corporation and its foreign subsidiary), but to expect effective detection of non-arm's length transactions in general between unrelated parties (or between related parties that go through a third party) seems unrealistic. Naturally, all of the aforementioned complications arising from the need to separate real and financial transactions become moot under the S-CFT.¹⁵

Origin vs. destination basis

There is no denying that transfer-pricing and thin capitalization problems will pretty much go away under a destination-based R-CFT.¹⁶ Although hardly ever discussed in the literature, there is nothing in theory that says that the S-CFT cannot be implemented on the same basis. Just like the destination-based R-CFT, under which real transactions with non-residents are

¹⁴ This is conceptually the same problem that has plagued the VAT treatment of the financial sector on a transaction-by-transaction basis. For further discussions and a possible solution, see Zee (2005).

¹⁵ However, the S-CFT does need to distinguish between interest and dividend flows, but this requirement seems simpler to control by several orders of magnitude than the general need to separate real and financial transactions.

¹⁶ An origin-based R-CFT would also be effective, by default, against thin capitalization (but not transfer-pricing) problems.

ignored (exports receipts are not counted as inflows of cash and import payments are not counted as outflows of cash), the destination-based S-CFT would ignore all transactions—both real and financial—with non-residents. Hence, for example, interest receipts from non-residents will not be counted as cash inflows, and interest payments to them will not be counted as cash outflows. Likewise for cash flows involving lending and borrowing. In effect, border-tax adjustments are now applied to financial transactions in the same way as they are applied to real transactions. As a consequence, transfer-pricing and thin capitalization problems are rendered equally moot under a destination-based S-CFT.

What exactly would be the base of a S-CFT with border-tax adjustments? It is easy to see the implications of such adjustments if one starts with the origin-based S-CFT without the adjustments. In that case, as noted earlier, the accounting identity ensures that $S \equiv R + F$. Hence, the tax base of the S-CFT implemented on an origin basis is either S or (identically) $(R + F)$. The net cash inflow from real transactions can be decomposed into two parts: the net inflow that arises from domestic sales (R^D) and that arises from exports and imports (R^*). The net cash inflow from financial transactions has, however, two components: net borrowings (B) and net interest receipts (I), each of which can in turn be decomposed into the part that arises from transactions with residents and the part that arises from transactions with non-residents. Using the same scheme of superscripts as before, the accounting identity can now be re-written as:

$$(9) \quad S \equiv (R^D + R^*) + (B^D + B^*) + (I^D + I^*).$$

To transform this tax base from an origin to a destination basis, simply re-arrange the terms of the above identity to get:

$$(10) \quad S - R^* - B^* - I^* \equiv R^D + B^D + I^D.$$

Hence, the tax base of a destination-based S-CFT is either $(S - R^* - B^* - I^*)$ or (identically) $(R^D + B^D + I^D)$.¹⁷ Note that the variables R^* (net trade surplus), B^* (net borrowing from non-residents), and I^* (net interest receipts from non-residents) can each be of either sign. The important implication from this is clearly that tax liability can now arise even if no dividends are distributed (i.e., when $S = 0$).

¹⁷ For ease of presentation, it has been assumed here that transactions with residents and non-residents are completely independent and separable from each other. This is not typically the case in reality, of course. For real transactions, as when domestic inputs are used in producing exports, apportioning of the cash outflows arising from purchasing such inputs between exports and domestic sales is necessary for any destination-based tax (R-CFT or S-CFT). The same apportioning would need to apply to financial transactions under a destination-based S-CFT, as when (say) a bank uses domestic nonfinancial inputs (wages, overhead costs, etc.) to support financial transactions with non-residents. Such inputs would also have to be apportioned, such as based on the shares of cash inflows from financial transactions with residents and non-residents in the total of such inflows.

At first glance, there seems to be an opportunity under the destination-based S-CFT for a domestic corporation (say, a bank) to reduce its tax liability by borrowing from non-residents (which does not count as a cash inflow) and lending to residents (which does count as a cash outflow). However, any perceived tax benefit associated with such transactions is illusory: the corporation has merely succeeded in delaying its tax payment (since any loan made to residents would become taxable upon repayment), but this delay confers no tax benefit. The reason for this is that the interest the corporation pays to the non-resident creditors is not tax deductible, but the interest it receives from the resident borrowers is taxable. The outcome is tax neutral in present-value terms.¹⁸

In summary, border-tax adjustments can be applied to both real and financial transactions with equal effectiveness (when applied to financial transactions, the residency status of the debtor or creditor would need to be ascertained, but this requirement should hardly present problems for corporations). While such adjustments in general do entail some added administrative complexity relative to origin-based taxes that do not require them, they seem to be a small price to pay for addressing transfer-pricing and thin capitalization problems.

III. NATURE OF MODIFIED S-CFT

The discussions in the preceding section strongly suggest that, on administrative grounds, the S-CFT is clearly superior to the R-CFT. However, the government is exposed to possibly large revenue risks under either tax, which is clearly not reassuring news to any treasury that has to fund government programs on an on-going basis and would thus prefer a relatively reliable level of revenue collection. Fortunately, this limitation could be easily overcome by modifying the design of the S-CFT. The modification involves replacing expensing of fixed assets with normal depreciation allowances—but, crucially, the undepreciated value of the fixed assets is carried forward with interest at the opportunity cost of equity capital.¹⁹ It turns out that such a procedure would in fact produce an outcome that only excess profits would be taxed. To see this in the context of the stylized two-period investment project, note that a tax liability of $(t \cdot \alpha)$ now arises in the first period (due to the inflow of loan proceeds α), but a

¹⁸ Note that if the resident borrowers are taxable entities, the loan proceeds would be taxable in their hands immediately. In this case, there would not even be a timing difference on the flow of tax revenue to the treasury.

¹⁹ Bradford (1998; 2004) has proposed a similar scheme (depreciation plus an allowance equal to the interest on business assets) to manage the transition from a conventional CIT to an R-CFT, and argued that such a scheme is equivalent to (for a constant tax rate) the expensing of fixed assets in present value terms. The analysis in this paper shows that this equivalence is strictly true only for marginal projects. For projects earning excess profits, expensing—which provides an advantage that goes beyond a zero METR—will always be more beneficial to investors (whether under the R-CFT or S-CFT) than any scheme requiring some sort of carry-forward with interest. The cost of the added advantage to investors provided by expensing is borne, of course, by the government, in the form of either a lower level of revenue or a higher level of revenue risks, or both.

new tax deduction of $(1+r)$ becomes available in the second period (representing the depreciation allowance with interest).²⁰ The associated tax calculations are shown below.

	1 st period	2 nd period
Tax calculations		
Pre-tax cash flow of all transactions	$-(1-\alpha)$	$(1-\alpha) + (\rho - \alpha \cdot r)$
Tax	$t\alpha$	$t[(1-\alpha) + (\rho - \alpha \cdot r) - (1+r)]$
Post-tax net cash flow	$-[1 - (1-t)\alpha]$	$(1-t)[(1-\alpha) + (\rho - \alpha \cdot r)] + t(1+r)$

The post-tax rate of return in this case is, therefore,

$$(11) \quad v_S^* = \frac{(1-t) \cdot [(1-\alpha) + (\rho - \alpha \cdot r)] + t \cdot (1+r)}{1 - (1-t) \cdot \alpha} - 1$$

$$= \frac{(1-t) \cdot (\rho - r)}{1 - (1-t) \cdot \alpha} + r.$$

As is evident, the carrying-forward of the undepreciated value of fixed assets with interest at the rate r achieves the desired outcome that the tax burden only falls on excess profits as they accrue. The intuition behind this result is straightforward: the added depreciation allowance available due to the interest factor (as compared to the normal depreciation allowance without interest) means that only returns yielded by the depreciable fixed assets in excess of the interest rate would result in any taxable profits. A comparison between equation (11) with equation (8) indicates that $v_S^* < v_S'$, that is, carrying forward the undepreciated value of fixed assets with interest would result in a higher tax burden than carrying forward the tax credit with interest, as long as there is issuance of debt (which has tax implications because it generates a cash inflow). However, it is also clear that this increased tax burden does not affect the normal return to equity (which remains untaxed), and hence cannot distort investment at the margin. At the same time, since fixed assets are not expensed, government revenue would no longer be exposed to private-sector investment risks.

Note that under the modified S-CFT, a taxpayer has the ability to neutralize any discrepancy between v_S^* and v_S' by engaging in an appropriate series of financial transactions. To achieve this, the taxpayer could simply borrow sufficient funds to cover all tax payments in the first period and repay the loan in the second period with interest at the rate r .²¹ The amount of borrowing (B) needed for this purpose is simply

²⁰ For simplicity, it is assumed that the tax depreciation allowance given corresponds to the true economic depreciation of the fixed assets.

²¹ Of course, this begs the question why, if the taxpayer is able to borrow to finance the tax payment, he would not borrow more to finance the project itself. As noted earlier, there are probably other factors not analyzed here that would limit the extent to which the project could be leveraged by debt.

$$(12) \quad B = \alpha \cdot \frac{t}{1-t},$$

in which case the tax calculations become as follows.

	1 st period	2 nd period
Tax calculations		
Pre-tax cash flow of all transactions	$-(1-\alpha) + B$	$(1-\alpha) + (\rho - \alpha \cdot r) - B \cdot (1+r)$
Tax	$t \cdot (\alpha + B)$	$t \cdot [(1-\alpha) + (\rho - \alpha \cdot r) - B \cdot (1+r) - (1+r)]$
Post-tax net cash flow	$-(1-\alpha)$	$(1-t) \cdot [(1-\alpha) + (\rho - \alpha \cdot r) - B \cdot (1+r)] + t \cdot (1+r)$

The post-tax rate of return from the above cash flows is

$$(13) \quad v_S^{**} = \frac{(1-t) \cdot [(1-\alpha) + (\rho - \alpha \cdot r) - B \cdot (1+r)] + t \cdot (1+r)}{1-\alpha} - 1$$

$$= \frac{(1-t) \cdot (\rho - r)}{1-\alpha} + r,$$

where use is made of equation (12). Clearly, $v_S^{**} = v'_S = v'_R$, so the impact of the modified S-CFT on private investment could be rendered the same as that of the S-CFT and R-CFT by the investor's own voluntary actions without jeopardizing government revenue, provided that tax credits are carried forward under either of the latter two taxes.²²

The above result is actually an illustration of a crucial aspect of a CFT that includes financial transactions in the tax base. For such a tax, the taxpayer can always alter the time path (but not the present value) of tax payments through lending and borrowing. Hence, in principle, the modified S-CFT is as susceptible to the deferral problem as the S-CFT. But how serious is this problem in reality? In answering this question, it is important to bear in mind that an act of lending by one party is necessarily mirrored by an act of borrowing by another party. For the economy as a whole, such financial transactions would result in a net tax deferral only if the borrowing party is tax exempt (or in a tax-loss situation). Of course, one important class of tax-exempt borrowers would be non-residents, but even this leakage would be closed off if the tax is implemented on the destination basis. Hence, as a practical matter, the overall scope of tax deferral under either the S-CFT or modified S-CFT would seem to be limited.

The modified S-CFT, as described above, possesses the crucial zero-METR property but does not have the administrative complexity of the R-CFT in having to treat real and

²² Note that, in a more general setting with multiple concurrent projects extending over multiple years, this equivalence holds only if tax credits are carried forward under either the S-CFT or R-CFT on a project-by-project basis. Moreover, the tax credits associated with each project have to be spread over the life of the project in proportion to the economic depreciation of the project's underlying fixed assets.

financial transactions differently. There are other advantages as well: by not having the expensing feature, the modified S-CFT is highly unlikely to lead to many taxpayers having negative cash-flow positions for tax purposes—a distinct likelihood under the R-CFT (somewhat less so—but still quite possible—with the S-CFT). Apart from risk considerations, the revenue stream under the R-CFT would also likely be much more volatile than that under the modified S-CFT, due to the volatility of investment over business cycles (see Becker and Fuest (2005)). Of course, the modified S-CFT does involve retreating somewhat from a conceptually pure CFT—the incorporation of the depreciation feature essentially renders it a hybrid tax on income and cash flows—but the benefits from doing so seem absolutely compelling from the standpoint of reliable revenue collection.

Transitional issues always complicate any fundamental tax reform, such as replacing the conventional CIT with a CFT. However, the modified S-CFT has significantly less transitional complications to deal with than the R-CFT. First and foremost, interest expenses would continue to be deductible under the modified S-CFT as under the conventional CIT, thus rendering any measures for transitional relief that would be highly desirable under the R-CFT all but unnecessary. Secondly, the tax treatment of fixed assets under the modified S-CFT represents only a relatively small change to that under the conventional CIT; the carrying forward of the undepreciated value of fixed assets with interest could—if desired—be applied to all such existing assets without the need to separate new from old investments. The associated revenue loss from transitioning into a modified S-CFT will be far less than transitioning into an R-CFT, since new fixed assets will not be expensed.

Of course, not all transitional issues will be absent with the modified S-CFT, such as those connected with the tax treatments of outstanding loans extended by financial institutions and of existing business inventory holdings at the time the modified S-CFT comes into effect. These issues are generically the same as those that would arise if there are tax rate changes over time. For example, the tax effect of taking out a loan would be different from the tax effect of its repayment if the applicable tax rate had changed over the life of the loan. As in all major tax reforms, administrative rules would probably be required in practice to resolve these issues. The complexity of such rules would depend on the nature of the affected assets: a simple loan arrangement may only require a relatively straightforward basis adjustment at the time of its repayment before the principal amount is added to (subtracted from) the creditor's (debtor's) tax base, while a more complicated financial arrangement may well call for elaborate rules that may, at best, still yield only an approximate solution. Problems associated with tax rate changes afflict all versions of the CFT to varying degrees; the basic viability of any CFT is thus ultimately predicated on the presumption of a relatively stable tax rate.

Finally, a cautionary note should be made about the modified S-CFT: because a CFT (be it the R-CFT or S-CFT) is a consumption tax in substance (due to the expensing of fixed assets), implementing it on the destination basis would be on a par with implementing a

normal transaction-based VAT on the same basis—a universal practice.²³ In contrast, a modified S-CFT does not technically have the expensing feature (although it does produce the same substantive outcome as any version of the CFT). Hence, implementing the modified S-CFT on a destination basis could potentially raise a question about whether it would amount to an export subsidy. On economic grounds, it would seem that if a destination-based modified S-CFT fails the export subsidy test, so would any version of a destination-based CFT. This is certainly a compelling, but obviously untested, proposition. Of course, this uncertainty can always be removed by going to the origin basis, but then the problems of transfer pricing and thin capitalization that afflict the conventional CIT would re-surface, although such problems are never worse under a CFT than under the conventional CIT.

IV. CONCLUDING REMARKS

This paper has argued that, while replacing the conventional CIT with a CFT is unquestionably a desirable tax reform, the version of the CFT that should be adopted is not the R-CFT that seems to have received common acceptance, but a modified S-CFT that is essentially a hybrid tax on income and cash flows. The crucial limitation of the R-CFT is that it treats real and financial transactions differently, which amounts to injecting a major non-neutrality into the tax system. This non-neutrality opens the door to all sorts of administrative complexities, including the correct tax treatment of financial services provided by financial institutions and the myriad ways real transactions can be disguised as financial transactions between not necessarily related parties. The regular S-CFT does not have this limitation, but it, just like the R-CFT, has the important drawback of exposing the government to possibly large revenue risks. The modified S-CFT remedies this drawback but otherwise retains the regular S-CFT's neutral tax treatment of real and financial transactions.

The proposed modification to the S-CFT involves replacing the expensing of fixed assets—a typical feature of a CFT—with normal depreciation allowances, but, crucially, the undepreciated value of fixed assets is carried forward with interest at the opportunity cost of equity capital. This modification produces the desirable economic outcome of a zero METR—only excess profits are taxed as they accrue so that there is no distortion to investment at the margin. Furthermore, transitional complications are far less significant with the modified S-CFT than with any version of the CFT. Hence, the modified S-CFT is clearly a superior policy choice.

Just like a CFT, the modified S-CFT can be implemented on the destination basis, and thus would be equally effective in overcoming transfer-pricing and thin capitalization problems that plague the conventional CIT. However, there is some uncertainty regarding whether a destination-based modified S-CFT—by not being a pure consumption tax—would constitute an export subsidy. Nevertheless, since the economic outcome of the modified S-CFT is

²³ A transaction-based VAT on the destination basis would zero-rate exports (thus effectively freeing exports from tax) and tax imports.

substantively the same as any version of the CFT, a compelling economic case could be made that they would in fact face identical scrutiny on this as yet untested question. Implementing the modified S-CFT (or for that matter any version of the CFT) on an origin basis would render the question moot, but then transfer-pricing and thin capitalization problems would re-surface—although such problems are never worse under any version of the CFT than under the conventional CIT.

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