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# Financial Transactions Tax: Panacea, Threat, or Damp Squib?

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*The authors argue that attempts to raise a significant percentage of gross domestic product in revenue from a broad-based financial transactions tax are likely to fail both by raising much less revenue than expected and by generating far-reaching changes in economic behavior. They point out that, although the side effects would include a sizable restructuring of financial sector activity, this would not occur in ways corrective of the particular forms of financial overtrading that were most conspicuous in contributing to the crisis. Accordingly, such taxes likely deliver both less revenue and less efficiency benefits than have sometimes been claimed by some. On the other hand, they may be less damaging than feared by others. JEL codes: G28, H25*

Corrective taxes have the double attraction for policymakers of not only improving the efficiency of resource allocation, but also of potentially contributing to revenue at the same time. Various forms of Financial Transactions Tax (FTT) have often been seen as attractive from this point of view.

In his *General Theory* Keynes proposed a securities transactions tax (STT) to reduce destabilizing speculation in equities; Tobin's similar currency transactions tax (CTT) dates from 1972 and had the goal of reducing destabilizing currency speculation. The revenue from such an anti-speculator tax could, its advocates have often suggested, be channeled for the purpose of development assistance.

Other forms of FTT also have their advocates as potentially reducing the efficiency costs of the tax system as a whole. Bank debit taxes have been employed in several countries, especially in Latin America. The explosive growth in financial derivative transactions over the past quarter century introduces a range of further possibilities. Capturing these, Feige (1990, 2000) proposed a comprehensive

“automated payments tax” (APT), applied at a very low rate, which he sees as replacing a wide range of other taxes and greatly reducing the deadweight cost of the entire tax system.

More recently, taxation of the financial sector, and FTTs in particular, have come center stage again in the policy arena following the collapse of the mortgage-backed securities market and its knock-on effects on the world’s financial and economic systems in the crisis that began in mid-2007. Against this background, leading policymakers from several G20 countries have floated the broad-based international introduction of an FTT. This time asset price volatility has been somewhat overshadowed as a target for corrective tax policy by comparison with imprudent or reckless lending and especially the use of overcomplex financial derivatives as a means of apparently reducing risk while actually increasing it. Over-reliance on extreme maturity transformation in the short-term financing of long-term mortgage-backed securities and other lending was also a key problem in the rapid unwinding of imbalances that proved so dangerous in the onset of the crisis. Regulation of contract types and agent reward structures has been the focus of much policy attention here, but a tax solution—even if partial—could also be considered. The enthusiasm for taxing the financial sector means that coordinated international action seems to be available to an extent not known in the past, potentially reducing the leakage that has often been seen as the Achilles heel of the Tobin tax.

Curiously though, the main tax proposals currently in play—a levy on uninsured liabilities of banks, a tax on an approximation to bank value added (roughly profits plus staff remuneration), a surcharge on profit tax, a surcharge on income tax levied on executive bonuses, and an FTT—are mostly remote from the causes of the excesses.<sup>1</sup> It is not clear to what extent an FTT could be designed as a corrective tax, operating as a useful complement to regulation in adapting incentive structures so as to ensure that they are better aligned to social welfare in this area, and in reducing the adverse impact of market failures.

Revenue is also a goal of the current attention being given to financial sector taxes, reflecting not only the direct costs that have been imposed on governments where banks have failed, but also the sharp increase in debt and deficits as governments have struggled to maintain aggregate demand in the face of the economic downturn.

We look again at FTTs from the two classic perspectives, efficiency and revenue. We consider the potential efficiency gains and costs: these seem less than either advocates or critics have suggested. In particular, a broad-based FTT would do nothing to correct the excesses that caused the crisis. Incidence of a broad-based FTT is also likely to fall mainly outside the financial sector. We then look at potential revenue. Undoubtedly there is a significant revenue potential (as indeed has been seen in some countries which have introduced taxation of a

limited range of financial transactions). But the overblown revenue projections of some advocates of a broad-based FTT must be rejected: the ability of the financial sector to adapt its operations to avoid much of even a small tax is very considerable, even if international coordination could be achieved.

## Efficiency

### *The Efficiency Pendulum in Respect of FTTs*

Almost all taxes alter some relative price and hence change equilibrium behavior. Where markets are already efficient, efficient tax design seeks to minimize distorting effects of this type; where there is market failure, the impact of an efficient tax will be to move relative prices in the direction of a socially efficient outcome.

It is well understood that the financial sector is highly responsive to the design of tax rules. Product design and innovation and location decisions can be heavily dependent on their tax treatment. The effects can be large and rapid. Taking account of efficiency effects is therefore even more important for financial sector taxation than for taxation of other sectors: there is a greater danger of imposing costs, yet a greater opportunity for correcting market failure.

There was a tendency until fairly recently for the financial sector in different countries to be subjected to distorting taxes and quasi taxes such as unremunerated reserve requirements, transactions taxes, taxes on gross interest receipts or payments, prohibition on the deduction of incurred but not realized loan losses, and the like.<sup>2</sup> At that stage, economists concentrated most of their attention on financial sector taxation to giving advice to developing country policymakers on the need to remove the most distorting taxes.

Subsequently two factors made national authorities more alert to the distortions that financial sector taxes could introduce into the economy. The first of these factors was a growing awareness of the systemic importance of the financial sector in underpinning and accelerating economic growth: that distortions to this sector could be especially damaging to economic welfare on a broad front. The second factor was the rapid increase in financial globalization which had the effect of increasing the elasticity of financial sector responses to any given tax, as financial tax bases simply migrated abroad.

Now the pendulum has swung beyond its midpoint. No longer satisfied with merely achieving tax neutrality, policymakers are again paying attention to the corrective potential of taxation. Like the perceived need for ramped-up regulation, this responds to the conspicuous failures and excesses exposed by the financial crisis.

Can the design of tax policy be used actively to realign financial sector activity in line with social welfare of the economy as a whole, for example by reducing

systemic prudential risks? After all, if finance responds powerfully to price and rate of return incentives, the job of the regulator is eased if tax-inclusive prices and returns faced by financial firms correspond to the social costs and benefits of the relevant activities and products.<sup>3</sup>

### *Market Volatility and Mispricing*

In years gone by, the main efficiency focus for the use of FTTs had been excessive asset price and exchange rate volatility, and possible sustained “mispricing” of financial assets (or deviations from fundamental equilibrium prices) resulting from short-term speculative flows.<sup>4</sup>

Keynes, focusing on mispricing in securities markets, argued for an STT on these grounds. This idea has been subjected to a variety of empirical tests which do indeed suggest, not surprisingly, that an STT has consequences, not least through lowering the price of assets which by their nature are likely to be traded frequently (Bond, Hawkins and Klemm, 2004). But it remains quite unclear from this literature whether an STT would increase or decrease volatility. After all, speculation in a liquid market can be stabilizing, and this turns out to be possible in practice as well as in theory.

The original Tobin tax (CTT) proposal was to put “sand in the wheels of finance” to inhibit speculative cross-border flows in foreign exchange markets, again with the aim of reducing volatility and mispricing. Here again it is unclear whether such a tax would indeed be stabilizing.

Close analysis of the minute-by-minute microstructure of the foreign exchange market reveals that most foreign exchange transactions (spot and forward) have nothing to do with speculation, but are instead undertaken to hedge risk and ensure liquidity.<sup>5</sup> (The same would be true of interest rate swaps.) This observation, which can probably be extrapolated to markets whose microstructure is less well understood, provides a very strong additional reason why transactions taxes might not stabilize markets. As will be mentioned later, this alternative perspective on the motivation for the bulk of transactions in securities markets has implications for revenue also.

### *Could an FTT Have Stemmed Excesses Leading to the Recent Crisis?*

Volatile prices and short-term speculation have taken a back seat in current discussions about financial market failure, being replaced by such concerns as (i) the valuation and rating of structured financial products, especially collateralized debt obligations (CDOs) constructed directly or indirectly from portfolios of mortgage-backed loans (Coval, Jurek, and Stafford 2009), and (ii) the misallocation of risk and possible market manipulations associated with credit default swaps (CDS).<sup>6</sup>

Outright prohibition of some of these products is one approach, being pursued by some policymakers in recent times, but attempting to suppress markets through prohibition has a long history of unintended side effects. Outright prohibition and a prohibitive rate of tax may be close to the same thing, but graduated discouragement through taxation might work better by eliminating excesses without removing the potential social gains from the relevant products. But the question is whether an FTT could be effective in this respect now for CDOs and CDS.

*CDOs.* Interestingly the failures in this structured finance market have little to do with frequent trading or with complex sequences of transactions such as would be discouraged by a transactions tax. The complexity is largely in the combination of and reallocation of contractual claims, rather than in the payments themselves. Even though derivatives transactions represent the bulk of financial transactions, a comprehensive FTT would have no appreciable impact on the construction and sale of mortgage-backed securities and their derivatives. These are typically buy-to-hold securities and certainly are not sufficiently liquid to be repeatedly traded on a minute-to-minute basis as are foreign exchange and major financial indices. The major problem with these assets relates to the fact that so many of them were so highly rated (“about 60 percent of all global rated structured products were AAA-rated in contrast to less than 1 percent of corporate issues”), and these ratings were highly sensitive to assumptions notably about likely default correlations of the underlying assets and about the likely default rates on underlying securities, both of which were grossly underestimated by the rating agencies (Coval, Jurek, and Stafford 2009).

With a high proportion of structured finance products that had initially been rated AAA having been downgraded to junk status, investors lost confidence in this market. By late 2008 the structured finance market had virtually closed down, with almost no new issues, and specialists did not expect it to reopen for years. Its reopening since then has been selective and subdued.

Nor was there ever much revenue potential in these securities. Quarterly issuance of them peaked in 2006–07 at around US\$100 billion per quarter. As primarily buy-and-hold securities, the transactions tax revenue from the primary issue would be a high fraction of the total lifetime tax revenue from that issue—a mere US\$10 million for the peak quarter for a tax rate of 0.01 percent.<sup>7</sup>

*CDS.* The relatively sudden emergence of the credit default swap market starting in the late 1990s has been identified as a significant contributor to the growing distortions of the credit market during the following decade (Tett 2009). By 2008 the gross amount of debt insured through CDS was thought to exceed US\$60 trillion, though many of the contracts were back-to-back and resulted in negligible net risk.<sup>8</sup> The net amount of CDS-insured debt may not have exceeded

US\$15 trillion. These amounts have subsequently declined. Even on this net amount, the flow of premiums was only a fraction of the sums insured (especially considering that most of the debt insured was highly rated). Indeed the first CDS contracts entailed annual premiums of just 0.02 percent of the nominal amount insured. Riskier debt of course carries a much higher premium. Even on the sovereign debt of some European Union countries, CDS premiums have exceeded 500 basis points (5 percent) at times during the recent crisis.

The critique of CDS as a destabilizing force is two-fold. First, it is argued that these contracts served to transfer risk from those who wished to shed it, not to those able to absorb it, but to those who didn't understand it—or alternatively to those who did understand it as a tail risk which would be passed to the taxpayer (as indeed it was in the case of the failed insurance company AIG). This refers mainly to the primary market and not to repeated trading in the secondary market. Second, it is argued that this market can be manipulated because of the thinness of the secondary market in CDS or because the volume of insurance bought on particular names greatly exceeds the volume of their debt outstanding.<sup>9</sup> By operating in both the primary market for a company's debt and in the CDS market, a manipulative investor could make money by driving the company into default. This refers mainly to trading in the secondary market, though not necessarily repeated trading.

This double critique of CDS as destabilizing the financial system is not unproblematic. Clearly these instruments could also be used—and were—as a way of spreading and distributing risk in a stabilizing way also. Arguably, if subjected to certain administrative controls and traded only in well-organized exchanges, these instruments could be a strong force for stability. However, even if one granted the premise that CDS have been destabilizing and need to be discouraged, it would be hard to argue that a transactions tax applied at a low rate would be effective in reducing the damage.

After all, a transactions tax applied only to the actual premiums paid would of course have no effect on secondary market trading, and indeed a standard transactions tax applied to CDS premium payments would have negligible effects both in revenue and market behavior.<sup>10</sup> Applying a transactions tax to the nominal volume of debt insured would be more promising from the revenue point of view but, at the much-less-than-one-per-cent levels envisaged for a standard across-the-board transactions tax, it would not have much effect on the two efficiency problems mentioned for CDS—wrong ultimate holder and market manipulation.

## Revenue

This section looks at the revenue potential of FTTs.

## Revenue

The financial sector has long been a reliable revenue source for governments—even though from time-to-time (as at present) bank failure events have triggered large fiscal outlays to limit depositor losses and protect the smooth functioning of the payments system. Revenue raising has been a key, if not *the* key, objective of most of the FTTs that have been brought into effect, especially the bank debit taxes of Latin America.

*Revenue from CTT.* As mentioned above, the Tobin CTT tax was originally conceived of as a corrective tax, but it has increasingly been seen as a suitable revenue source for development assistance.<sup>11</sup> Because of the concentration of foreign exchange trading in just a few international financial centers (according to the latest BIS survey, fully three-quarters of traditional foreign exchange market transactions are conducted in just 6 centers: the United Kingdom, the United States, Switzerland, Japan, Singapore, and Hong Kong), proponents of the Tobin tax as a revenue source have seen it chiefly as being international in its revenue goals and not suitable as a source of national revenue (Spahn 2002). Of course another problem with getting national revenue from the tax is the fact that unilateral tax increases on foreign exchange dealings are likely to result in considerable base migration.

Despite earlier proposals for a CTT tax of as high as 1 percent, a consensus had emerged in the literature by the mid-1990s that 0.1 percent should be regarded as a ceiling on CTT rates beyond which they would reduce liquidity too much, thereby deterring international trade (Nissanke 2004).<sup>12</sup> Nissanke examines the revenue potential of rates in the region of 0.01 to 0.02 percent, which she believes would reduce transaction volumes only modestly and generate worldwide annual revenue in the range of US\$17–30 billion (on the basis of 2001 transactions).<sup>13</sup> Interestingly Mende and Menkhoff (2003) claim that sorting the Tobin tax proposals by their date of issue reveals that the suggested rates have become lower and lower over time. Spratt's (2006) version of this tax has a rather comprehensive base said to be over €100 trillion covering all spot and derivative foreign exchange transactions, but he proposes a very low tax rate of just 0.005 percent, designed to raise about €5 billion for development assistance. At this rate the tax should evidently have little effect on speculative flows; hence it does not have a corrective objective.

*Revenue from STT.* STTs are now as likely to be advocated for their revenue potential as for any dampening effect on speculation. That of Schulmeister, Schratzenstaller, and Picek (2008) is quite comprehensive for wholesale transactions, applying to spot transactions for stocks and bonds, and derivative transactions—both exchange

traded and over-the-counter (OTC). On the other hand, they consider low tax rates, ranging from 0.01 to 0.1 percent of the transaction value. This results in projected revenue yields of up to about 1 percent of GDP for Austria, France, Italy, Belgium, and the Netherlands; 2 percent in Germany; and 13 percent in the United Kingdom. In the latter two countries, exchange traded derivative transactions are important; elsewhere the bulk of the revenue comes from OTC transactions. Schulmeister, Schratzenstaller, and Picek do not appear to include cash withdrawals from the banking system as part of their base.

More comprehensive FTTs, such as Feige's (2000) APT (discussed further below) have an even larger ambition.<sup>14</sup>

*Bank Debit Taxes.* The transactions taxes that have actually generated the biggest revenues in practice have had a much more limited base. The most important of these have been in Latin America, where they have generally been introduced for revenue purposes. Their history is somewhat chequered (Coelho and others 2001; Kirilenko and Summers 2003; Baca-Campodónico, de Mello, and Kirilenko 2006). Revenue from the Latin American bank debit taxes has varied widely, but has typically been of the order of 1 percent of GDP. The highest revenue achieved in relative terms was the 3.4 percent of GDP reached in Ecuador's short-lived Impuesto a la Circulación de los Capitales ICC (1999–2000), but which was, however, creditable against income tax for which it been intended as a replacement.<sup>15</sup>

The biggest bank debit tax in absolute terms, Brazil's unpopular CPMF ("check tax"),<sup>16</sup> dating back to 1993, had levied a charge 0.38 percent (originally 0.25 percent) on all withdrawals from checking accounts and raised as much as US\$10 billion per annum or about 4 percent of total government revenue. This tax expired in December, 2007 (though another transactions tax known as the IOF was retained, albeit subject to modifications during 2008).<sup>17</sup> The much higher tax rate of 1.5 percent was imposed by Venezuela in its bank debits tax of 2007, but was limited to debits on behalf of enterprises (with individuals exempt) (Salon 2007).

Colabella and Coppinger (1996) were more ambitious for the revenue of the so-called WXT bank debit tax that they proposed. Its base was to be limited to nondebt generating withdrawals from banks, but they proposed the rather implausibly high rate of tax of 5 percent on this base, easily sufficient in their view to compensate for the abolition of all other taxes.

Interestingly not all bank debit taxes have had a revenue purpose. The Indian Banking Cash Transactions Tax of 2005–09, imposed at a rate of 0.1 percent on *cash* withdrawals from banks, was said by the finance minister to have "served a very useful purpose in enlarging the information system of the Income Tax Department." Its withdrawal was attributed to the relevant information being available through "other instruments introduced in the last few years"; it had yielded little more than 0.01 percent of GDP.



This also reminds us of the general proposition that a corrective tax that is prohibitive—one pitched at such a rate that it results in no activity and hence generates no revenue—may be optimal from the efficiency point of view: if it correctly measures the social bad of the taxed activity, the fact that it is prohibitive shows that this bad side effect outweighs the private gain from the activity.

### *The Base of a Comprehensive FTT*

It is not easy to get a precise fix on the potential base for a comprehensive FTT, such as that advocated by Feige. Data on financial transactions (as distinct from financial stocks) has been growing rapidly in the past decade or so, but they are still rather patchy.

*Payments Transactions.* Payments data, covering both the number and the aggregate value of payments, is available on an annual basis for some 13 countries in the so-called CPSS Red Book.<sup>18</sup> Data is shown separately for different payments methods employed by nonbanks, such as credits, direct debits, checks, e-money payment transactions, and card transactions of different types. Interbank transactions through the major automated clearing systems are also shown.

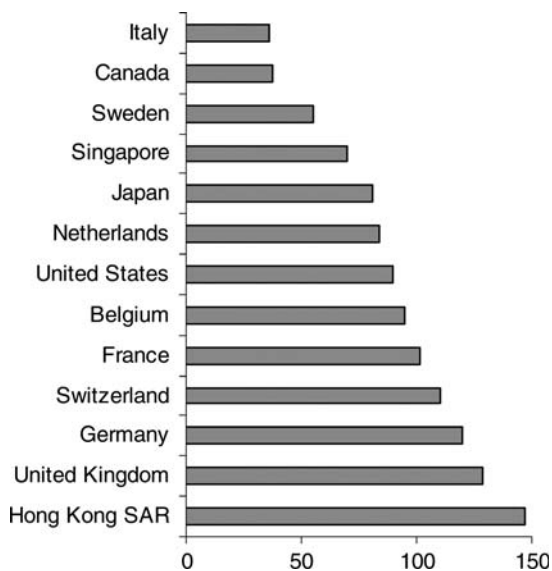
In 2007, aggregate payments of nonbanks reported in the Red Book came to US\$479 trillion, with US\$2,459 trillion in interbank payments. Adding these two together gives us a round figure of US\$3,000 trillion in payments. Since this is almost one hundred times the aggregate GDP of the countries included in the Red Book,<sup>19</sup> it becomes clear why it could seem superficially plausible that a very small tax rate—a fraction of 1 percent—might generate almost all the revenue any government could need.

Interestingly, though, there is a sizable variation across countries in the ratio of payments transactions to GDP, varying—for the most recent year available, that is 2007—from 36 times in Italy and 55 times in Sweden (2006) to 129 in the United States and 147 in Hong Kong (even though the Hong Kong data only includes interbank transactions (figures 1 and 2)). The reasons for the wide variation are not altogether clear. It is not merely a function of whether or not the country hosts a global financial center: Germany and France also have multiples in excess of 100, while Singapore has one of the lowest ratios. It may be that the differences are attributable to relatively unimportant and neglected differences in the organization and technology of payments arrangements in different financial systems. If so, these differences might quickly vanish in response to a tax on transactions which would have the effect of incentivizing financial sector firms to rearrange their activities in such a way as to avoid as much of the tax as possible, perhaps adopting the procedures of the countries which at present have the lowest ratio of transactions to GDP.

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**Figure 1.** Value of Payments as Multiple of GDP, 2006, for All Available Countries

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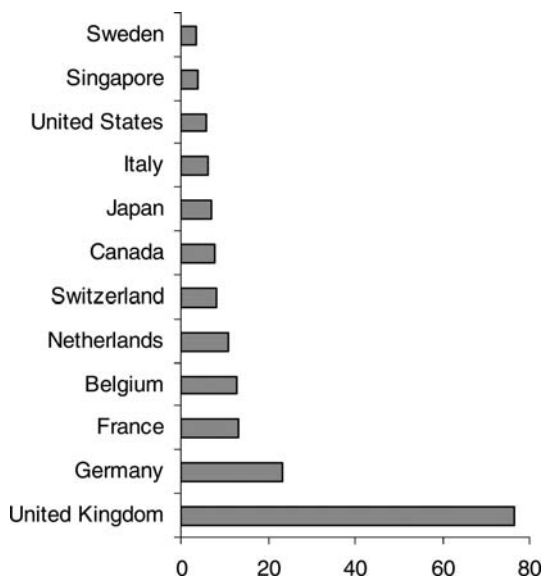
Source: Based on data in CPSS (2009).

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**Figure 2.** Value of Nonbank Payments as Multiple of GDP, 2006, for All Available Countries

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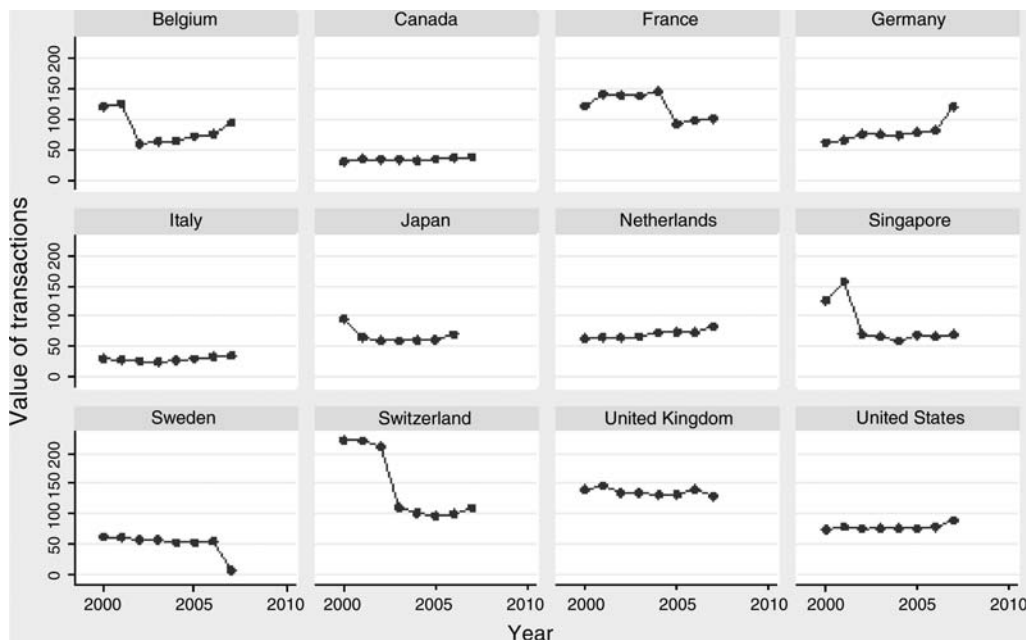
Source: Based on data in CPSS (2009).

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The wide variation suggests that payments transactions may not be stable in response to influences such as the imposition of a transactions tax. The volatility over time in the ratio is also sizable in some countries (figure 3; tables 1 and 2), with a coefficient of variation as high as 40 percent in Switzerland—though it is likely that much of that is attributable to some institutional or definitional changes.

Turning to non-interbank payments transactions, the aggregate value ratio to GDP for the reporting countries is *much* lower at under 15. Furthermore the figure for the United Kingdom—77—is a wide outlier, certainly reflecting its status as a financial center and likely especially reflecting London’s dominant role in the foreign exchange market. Removing this outlier reduced the aggregate value ratio to GDP to under 9. Suddenly one realizes that a bank debit tax which does not apply to interbank transactions and is applied at a small rate simply cannot raise current levels of revenue. Even if transactions were completely insensitive to the rate of tax, the required minimum tax rate to replace all other taxes and cover government expenditure jumps from an average of less than 0.5 percent to over 3 percent (table 3). These points are further elaborated in the Appendix.

**Figure 3.** Payments as a Percentage of GDP over Time



Source: Based on data in CPSS (2009).

**Table 1.** Summary Statistics of Various Transactions: GDP Ratios

<i>Variable</i>	<i>Mean</i>	<i>Std. dev</i>	<i>Min</i>	<i>Max</i>
Total payments/GDP	82.2	42.2	6.5	220.7
Nonbank payments/GDP	21.8	28.4	2.8	112.3

*Source:* Based on data from CPSS (2009).

**Table 2.** Rate of Transactions Tax Required to Generate Current Revenue, percent

	2000	2001	2002	2003	2004	2005	2006	2007
Belgium	0.14	0.14	0.30	0.29	0.29	0.22	0.20	0.15
Canada	0.63	0.54	0.56	0.56	0.56	0.53	0.49	0.47
France	0.42	0.36	0.37	0.38	0.36	0.57	0.53	0.51
Germany			0.64	0.64	0.65	0.60	0.56	0.37
Italy	1.01	1.12	1.12	1.15	1.14	1.01	0.91	1.10
Japan			0.59	0.61	0.58	0.57	0.51	
Netherlands	0.42	0.41	0.42	0.42	0.40	0.41	0.40	0.36
Singapore	0.16	0.15	0.26	0.21	0.24	0.19	0.21	0.19
Sweden	0.49		0.52	0.50	0.54	0.50	0.50	3.79
Switzerland	0.04	0.05	0.04	0.09	0.10	0.10	0.09	0.09
United Kingdom	0.28	0.28	0.31	0.31	0.32	0.34	0.31	0.34
United States	0.24	0.23	0.26	0.26	0.26	0.26	0.25	0.23

*Notes:* Assumes no response of the tax base. All payments taxed. The table shows the ratio of government revenue to the total of automated payments in percent.

*Sources:* International Monetary Fund (2009); CPSS (2009).

**Table 3.** Rate of Transactions Tax Required to Generate Current Revenue, percent

<i>Variable</i>	<i>Mean</i>	<i>Std. dev</i>	<i>Min</i>	<i>Max</i>
Tax rate all payments	0.46	0.44	0.04	3.80
Tax rate nonbank payments	3.24	2.42	0.09	10.70

*Note:* Assumes no response of the tax base.

*Source:* Based on data from International Monetary Fund (2009); CPSS (2009).

*Derivatives Transactions.* What of other financial transactions? Spot foreign exchange transactions worldwide in 2007 can be estimated at about US\$250 trillion, based on grossing up the daily average figures in the BIS triennial survey for that year. Presumably these spot foreign exchange transactions are already counted in the payments transactions data of the CPSS. That would also be true of outright securities purchases and sales.

But not all of the large and growing volume of derivative transactions are included in payments transactions as to their full national value, as settlement for

these is generally on some form of net basis. If the scope of general transactions was extended to derivatives also, and applied to their full nominal value, this would expand the base of the tax considerably.

Data on over-the-counter transactions in foreign exchange and interest rate derivatives are collected on a sample basis for one month every three years from 54 reporting countries (BIS 2007). More comprehensive data on exchange-traded derivatives is also collected from the main organized exchanges (BIS 2009b, table 23). Finally every six months the BIS (2009a) collects figures on the outstanding stock of (but not the transactions in) OTC derivatives, including credit and equity-related derivatives not counted in triennial surveys.

An overall summary of the transactions data is as follows: Total turnover (nominal value) of futures and options derivatives quoted on organized exchanges came to US\$2,214 trillion in 2008. (About two-thirds were interest rate futures and rather more than a quarter were interest rate options.) Estimated turnover in OTC exchange rate and interest rate derivatives came to US\$1,250 trillion, of which two-thirds related to exchange rate contracts and the remainder to interest rate contracts.<sup>20</sup> Thus in broad terms, the total turnover of derivatives is of the same order of magnitude as payments transactions, if slightly smaller. Unfortunately we have no full breakdown of how many of these transactions relate to nonfinancial firms.

Extending the scope of a general transactions tax from payments transactions to transactions involving derivatives and applied to the total nominal value of the objects of those derivatives about doubles the initial base of the tax. As discussed in the next section, the elasticity of the base of tax on derivatives to the tax rate may, however, be much higher.

### *The Elasticity of the Tax Base*

The base of a transactions tax is likely to be very elastic in response to a tax. The top of the Laffer curve might be reached at a surprisingly low level.

Mende and Menkhoff (2003) have argued rather convincingly that even a very small tax would dramatically alter the way in which wholesale participants in the foreign exchange market operate. Drawing on a specialized literature which studies the microstructure of the foreign exchange market (see Lyons 2001), they point out that the strategy of the typical bank participant involves buying and selling foreign exchange as if it was a hot potato. Dealers are reluctant to accumulate a significant stock of foreign exchange in case they are uninformed about a change in prospects. Mende and Menkhoff report as an example a bank with a median open position of about US\$2 million, which nevertheless trades about US\$50 million per day. It is inconceivable that a strategy necessitating such

frequent trading would survive even a very small transactions tax. Instead banks would deal in the market in some entirely different way.

Here it's not just a question of a modest substitutions away from a taxed good: it amounts to the assertion that the very transactions-intensive trading technologies that underlie the remarkable scale of overall financial transactions volumes would vanish if even a small tax were imposed. These technologies are profligate in their use of transactions that cost essentially nothing: a small tax would totally undermine them.

A similar argument could apply also to the microstructure of trading in the interest rate derivatives market. Take interest rate swaps, which account for over two-thirds of the OTC turnover in interest-rate related derivatives. Although invented to allow corporate borrowers to lock in a long-term interest rate even though they had borrowed at floating rates, use of interest rate swaps has "since grown into one of the most useful and liquid derivatives markets in the world . . . used across the fixed-income markets to manage risks, speculate, manage duration and lock in interest rates" (Pimco 2008). Indeed swap rates are now in some respects a more important indicator of bond market conditions than Treasury bill rates.

It seems impossible in this context to decompose fully the multiple uses of such derivatives in hedging and assuming risk. We can conjecture that such a multi-function instrument traded with such low transactions costs will have a very high elasticity of demand with respect to these costs.

This view is reinforced by a reading of the theoretical and empirical literature on securities market microstructure in general. This literature which emphasizes the way in which the pattern of price quotations and trading can be influenced by modest differences in flow of information and the organization of the market (for example in some markets informed traders place quantity orders, whereas in others the wholesale liquidity providers post prices at which they are prepared to trade).

Formal models illustrate how, when new information arrives, whether from the flow of orders received by specialist traders or otherwise, the required adjustments in the optimal portfolio (of any class of assets) both of informed and uninformed investors can be very considerable (see O'Hara 2003). However, different assumptions about the way in which information arrives in the market, how it is distributed, and the way in which the market is organized have very different implications for the volume of trading and how it varies. There can also be multiple equilibria with higher volumes of trading associated with lower spreads and higher social welfare (see for example Biais, Glosten, and Spatt 2005, pp. 225–7). This could explain the way on which trading volume clusters at certain times of the day.

If the continuous flow of information in the market necessitates repeated readjustments of dealer inventory and portfolio rebalancing, the imposition of a transactions tax could, for example, lead to market arrangements shifting from

continuous trading to a periodic “call.” This might not cause much welfare loss, but substantially lower revenue from the tax.

Even setting aside the high end financial market transactions, the distorting effect of a transactions tax can be significant even if it referred directly only to real sector transactions. Other consequences—for the way in which wages are paid: cash or credit, or in the degree to which suitcases of cash are carried physically across borders—could also have damaging side effects.

Suescún (2004) models the cascading of a transactions tax through the production process and concludes that it need not have severe distorting effects. His model does disregard the potential effect on the efficiency of financial intermediation, and thus the conclusions on deadweight loss might not capture important effects if financial intermediation is important to generating economic growth.

Although deadweight costs for a given tax rise with the square of the tax rate, it is fallacious to suppose that different taxes can be ranked as to their deadweight costs by reference only to the rates of tax. The elasticity of the tax base also matters. A low rate of tax applied to a very elastic market could result in more costly distortions of that market than results from a higher rate of tax applied to a market with lower elasticity.

### *International Leakages*

A constant preoccupation of critics of international FTTs has been the potential for very substantial leakage if the tax is not applied in all jurisdictions. Time and again, one hears that taxes on the financial sector cannot be applied because funds will migrate (see Reisen 2002). The above discussion shows that the base could shrink dramatically even if there is no question of migration to an untaxed jurisdiction.

In practice, the possibility of achieving a coordinated approach to financial taxation covering all of the major international centers seems higher now than at any time in the past, reflecting the work of the G20 and the political environment following the financial crisis.

That would still leave offshore tax havens as a potential channel of leakage, if financial transactions that would otherwise be taxed in accordance with an internationally agreed FTT could be booked in an offshore center and as such remain untaxed. Although some transactions would still be booked in the major jurisdictions, by routing complex transactions into a noncompliant offshore center, banks might be able to reduce their liability by a lot. Nevertheless the survival of tax havens in the face of such attempts to evade an FTT introduced jointly by the major economies could be questioned.

Already coordinated worldwide action to restrict the movement of financial flows to tax havens has emerged on the policy agenda. Heightened international

official concern about the role of tax havens in eroding the tax base of both advanced and developing economies is evident not least from the communiqués of recent G20 summits.<sup>21</sup> This is not a new concern (Christian Aid 2008), and there is little indication that tax havens have had a significant effect in contributing to the financial crisis (Loomer and Maffini 2009). But the increased awareness of it is indisputable. Here we take this heightened agenda as a given and consider only its broad implications for the financial sector. Regardless of the motivation of such restrictions, if effective, they open to policymakers the possibility of using a wide range of taxes hitherto seen as ineffective and of increasing taxes on others. Good or bad, this would change the landscape of financial taxation.

For, if there is an effective crackdown on tax havens, this could have the effect of closing the bolt holes that allow tax bases to migrate away from high tax jurisdictions. It is important to recognize that low tax rates are not in themselves a sufficient criterion for designation as a tax haven; exchange of information and transparency issues are also relevant. Nevertheless, the removal of these bolt holes would have the effect of reducing the elasticity of any tax base that was liable to migrate to a tax haven if subjected to a high rate of tax. This applies to many forms of tax base, but especially to the highly mobile tax bases of the financial sector. With the lower elasticity, the potential revenue would increase and the distortions on product supply and employment from taxing these bases would decline.

In short, an effective crackdown on tax avoidance would make it easier to introduce new or higher taxes without fear that the tax base will migrate away. Taxes which, because of that fear, have been infeasible to date would become potentially viable.

In addition, offshore financial sectors that are currently dependent on offering a low tax environment would shrink, with specific consequences for the host economies. This is potentially serious for a small number of very small countries (and territories—many of the tax havens of the developing world, including the largest, the Cayman Islands, are in fact dependencies of OECD countries such as the UK).

## Concluding Remarks

Although conditions are better than ever for the introduction of a broad-based FTT, expectations for such a tax are likely to be disappointed. Even if the bolt holes of tax havens to which transactions might migrate is effectively shut off, neither the revenue nor the efficiency gains hoped for by big picture tax reformers are likely to materialize.

The tax base, whether measured by the total value of automated payments transactions or broadened to include the gross nominal value of derivatives



transactions, is certainly large. But much of the base is strikingly concentrated in a small number of countries. This reflects the dominance of multiple technical transactions among wholesale financial market participants as they manage the risks of acting as market makers in foreign exchange and securities trading. The volume of such transactions would collapse with the imposition of even a small transactions tax undermining its potential to generate sufficient revenue to replace all other taxes as has been hoped for by some.

Market makers would change their method of handling risk in any of a variety of ways that would sharply reduce the volume and total value of transactions. To the extent that these alternative risk management procedures left the market makers with higher risk, spreads in these markets would increase and liquidity (as measured for example by the degree to which large trades could be absorbed without moving prices) would decline. And a transactions tax would have little effect in discouraging the activities of the credit default swap market, the market in securitized subprime mortgages, or other derivatives-based markets whose malfunction is thought to have contributed to the recent crisis.

In short, attempts to raise a significant percentage of GDP in revenue from a broad-based FTT are likely to fail both by raising much less revenue than expected and by generating far-reaching changes in economic behavior. Although the side effects would include a sizable restructuring of financial sector activity, this would not occur in ways corrective of the particular forms of financial overtrading that were most conspicuous in contributing to the crisis.

Certainly not a panacea, and more likely a damp squib in terms both of revenue and of efficiency gains (and perhaps more likely to result in efficiency losses), FTTs could be a threat to fiscal stability if overoptimistically seized upon as a reason for abolishing some of the more reliable revenue sources.

## Appendix: Calculating the Lower Bound for a Unitary Tax on Automated Payments

As a first step to judging the revenue potential for transaction taxes, it is instructive to estimate the ratio of government expenditure to the tax base. If the tax base were insensitive to the imposition of a tax, a transactions tax at this rate would generate enough revenue to pay for all the expenditure. In principle, then, one could imagine all other taxes being replaced by the transactions tax.<sup>22</sup> Therefore we call this rate the minimum unitary transactions tax rate. It is a minimum because it does not take account of the elasticity of the tax base; unitary because it could replace all other taxes. Of course this calculation also neglects other endogenous responses of the economic system to such a drastic change in conditions. It is only a baseline indication of the scale of taxes required.

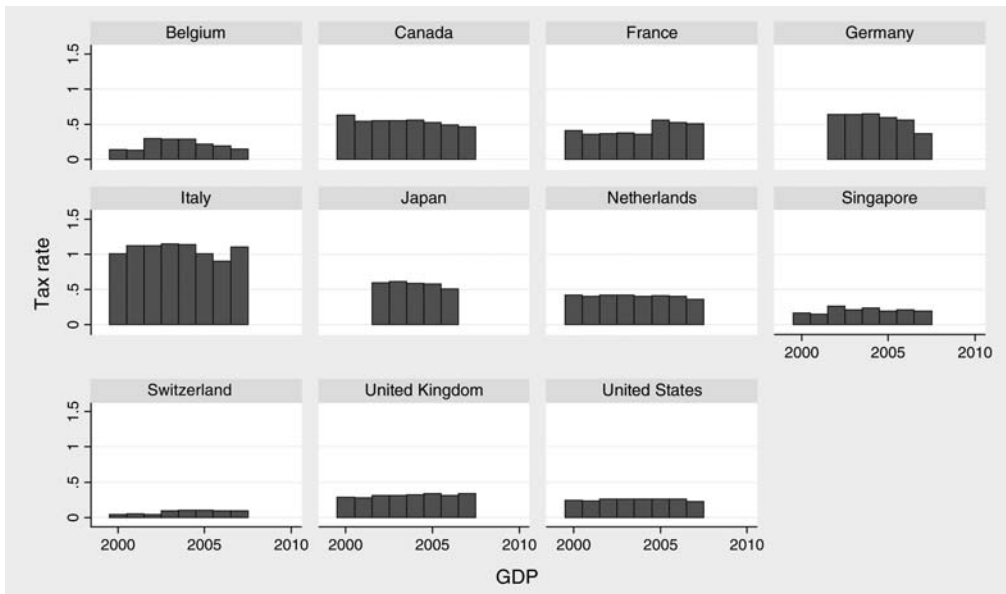
The tax rate was generated using data from the Bank for International Settlements and from the International Monetary Fund.<sup>23</sup> These data were designed by taking the total level of expenditures in a country for a given year<sup>24</sup> and dividing this total by a summation of nonbank payment transactions and all intermediation transactions in a country.<sup>25</sup>

Figure A1 depicts the tax rate needed to cover current general expenditures for selected countries.<sup>26</sup> These rates exemplify the different needs across countries. Each nation has different needs and transaction tax bases upon which to tax.

As discussed in the text, the response of interbank payments to even a small transactions tax could be very large. An alternative calculation of the minimum unitary tax excluded interbank payments and this gives much higher figures.

Ideally, the requisite tax rate would be the same for all countries within the APT tax perimeter. If the tax rate was not the same, then a normal distribution of tax rates would provide a solid foundation for creating the international consensus necessary to implement the multinational dimension of the APT tax proposal. The skewness and kurtosis present in the tax rate using all transactions suggest that the distribution of tax rates for each country-year is not Gaussian.

**Figure A1.** Tax Rate Needed to Cover Expenditure, 11 Countries, 2000–07



*Notes:* All payments taxed; using all transactions. This shows the ratio of total government expenditure to the total value of payments transactions. If transactions were insensitive to the imposition of a tax, this would represent the rate of transactions tax required to yield enough revenue to match government expenditure.

*Source:* Based on data in CPSS (2009)

Nonparametric estimation techniques allow for a more representative depiction of the distribution of tax rate density. Because tax rates are fundamentally continuous, the distribution should be analyzed as a continuous variable rather than discrete. Figures A2 and A3 depict the density estimates using an Epanechnikov kernel of the tax rate distribution, with A3 corresponding to the higher rates generated by not taxing interbank transactions. This figure shows a nontrivial density building around a transaction tax rate of 1 percent. This density suggests the possibility, even when using all transactions, of some form of tax clubs forming due to differences in expenditures.

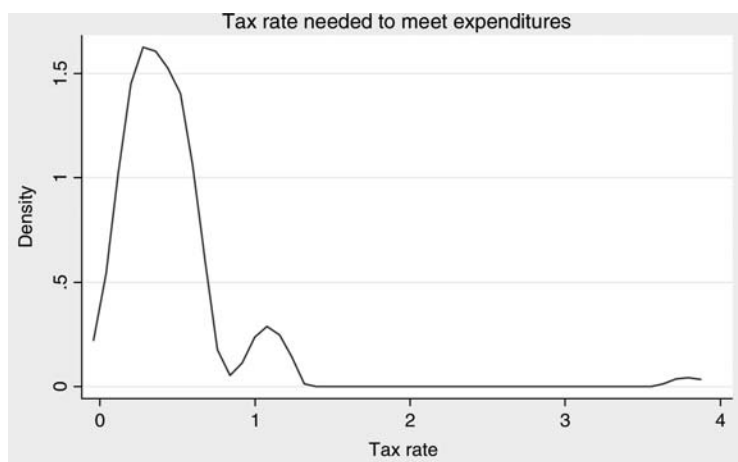
The distribution substantially changes when one looks at only end-user transactions. Figure A3 represents the distribution of tax rates for country-years relying only on the taxes generated from nonbank (end-user) transactions. This distribution represents a worst-case scenario where all back-end transactions used for financial intermediation are removed from the tax base.<sup>27</sup> Examination of Figure A3 reveals that many of the distortions in the distribution were smoothed over. The mean tax rate increased and dispersion widened.

Figures A1 through A3 illustrate the differences between each country in the desired tax rate. This illustrates the difficulties of deploying this proposal on a multinational scale.<sup>28</sup> The differences in dispersion illustrate the difficulties which could arise if the financial sector changes its transaction demands based upon the tax. National governments may well find themselves facing revenue shortfalls and

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**Figure A2.** Smoothed Probability Density of the Minimum Unitary Tax Rates (all Payments Taxed), 11 Countries, 2000–07

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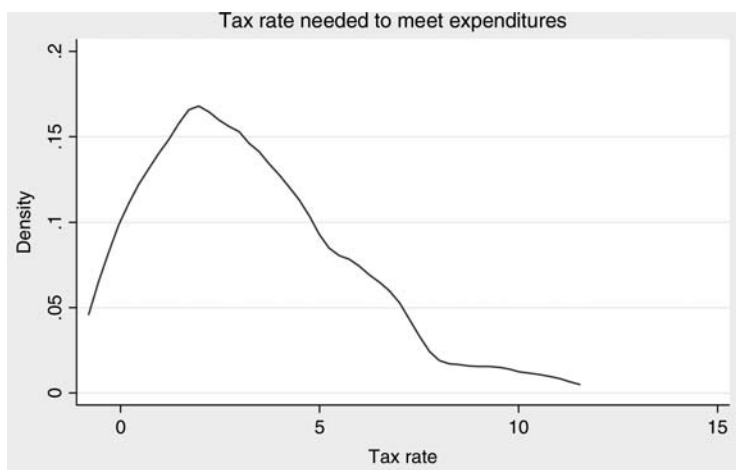


Notes: Univariate kernel density estimate of all transactions. Kernel = Epanechnikov; bandwidth = 0.0843.

Source: Authors' calculations.

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**Figure A3.** Smoothed Probability Density of the Minimum Unitary Tax Rates (only Nonbank Payments Taxed), 11 Countries, 2000–07



Notes: Univariate kernel density estimate of end-user transactions. Kernel = Epanechnikov; bandwidth = 0.8838.

Source: Authors' calculations.

a need to increase the tax rate rapidly to cover any decline in revenue caused by arbitrage. The possibility of tax clubs suggested from the nonparametric kernel density estimates should give pause to policymakers in selecting nations to be included in this proposal. Further examination of the circumstances leading to Italy's higher requisite tax rate seems warranted.

## Notes

At the time of writing, Patrick Honohan was Professor of International Financial Economics and Development and Sean Yoder was a Graduate Student in Economics at Trinity College Dublin; Honohan is now Governor of the Central Bank of Ireland, but the paper does not reflect an institutional position. Email addresses: [phonohan@tcd.ie](mailto:phonohan@tcd.ie); [yoders@tcd.ie](mailto:yoders@tcd.ie).

1. A well-designed surcharge on bonuses based on short-term profits would be an exception, but even this is not closely targeted on the particular markets and products which proved dysfunctional.

2. Until recently, the dominant interpretation of IFRS has been that such losses could not even be reported in a bank's accounts, let alone deducted from revenue before the calculation of taxable income.

3. In parallel to new thinking on tax policy, there has been much current discussion of the incentive effects of other aspects of government financial policy. For instance, under asymmetric information (moral hazard and adverse selection), the incentive effects of alternative intervention and bail-out strategies by the authorities can matter a lot. Good design of such strategies exploits these incentive effects to achieve an improved overall outcome as financial firms adjust their behavior to take account of the altered probability of being bailed out. Tax policy can be seen as aligning

financial firm behavior in dimensions that are less sensitive to strategic failure behavior, but instead relate to the more predictable aspects of financial firms' activities.

4. Formal theoretical models such as that of [Westerhoff and Dieci \(2006\)](#) confirm that there are theoretical reasons to believe that such a tax could be stabilizing. See also [Jeanne and Korinek \(2010\)](#) for a recent discussion of the CTT as a Pigouvian tax.

5. Evidence on this point from the literature on market microstructure is provided by [Mende and Menkhoff \(2003\)](#). That this consideration undermines the "corrective tax" case for an FTT has been acknowledged by radical economists such as [Grahl and Lysandrou \(2003\)](#). On the other hand, [Galati and Melvin \(2004\)](#) is representative of observers who continue to assign medium-term speculative and hedging motives to the bulk of foreign exchange market transactions.

6. There is of course a broader critique of finance which rightly points the finger at distorted incentive structures for agents. This would include both traders and other operational officers of financial intermediaries and of CEOs and other senior staff who should be supervising operations and ensuring that the institution is set on a prudent course. Tax structures could be used to alter the incentive profile of senior staff, but so far attempts to design such structures have not been successful. For example, the cap since 1993 of US\$1 million on tax deductibility (for the firm) of senior directors' remuneration seems to have had little effect ([Rose and Wolfram 2002](#)). Clearly, while transactions taxes could have a significant effect on the profits of various lines of business that could indirectly affect the incentive structure facing individual traders and CEOs, they could not easily be fine tuned to achieve the desired realignment of the private incentives of these individuals with public goals.

7. Transactions data on CDOs is not collected by the BIS.

8. The BIS half-yearly estimate of the nominal value of outstanding credit derivatives (most of them CDS) peaked at USD 58 trillion at end-December 2007. At that date, the gross market value of the contracts was USD 2 trillion, a figure which jumped to USD 5 trillion by the end of 2008 because of the movements in premia and hence in the replacement values of each of the outstanding positions.

9. Transactions volume on CDS is not collected by the BIS.

10. If the average premium on US\$60 trillion is 50 basis points, a 0.01 percent transactions tax would probably not discourage many of these transactions, but would generate only US\$50 million in annual revenue.

11. The influential Leading Group on Innovative Financing for Development (<http://www.leadinggroup.org>), which was founded "after the Paris Ministerial Conference on Innovative Development Financing Mechanisms in 2006" and comprises 55 countries, together with international financial institutions (including the World Bank) and NGOs, has been looking at the CTT, and notes that it would generate "stable and predictable flows." France and Belgium have already committed to the adoption of a CTT provided all of the other member states of the EU also adopt one.

12. This reflects the fact that spread in the wholesale interbank foreign exchange market is well below 0.1 percent.

13. [Spahn \(2002\)](#) proposed a rate of 0.01 percent for a projected annual revenue of €17 billion (based on 2001 data).

14. Crisp proposes a 0.5 percent rate on US\$1,000 trillion of bank payments (said to apply to the United States in 2002), for a revenue of \$5 trillion comfortably in excess of twice current tax revenues.

15. Analyzing the transactions taxes of Argentina, Brazil, Colombia, Ecuador, Peru, and Venezuela, [Baca-Campodónico, de Mello, and Kirilenko \(2006\)](#) find that revenue decreases over time and that the rate of decrease is a direct function of the rate of the levy.

16. CPMF stands for Contribuição Provisória sobre Movimentação ou Transmissão de Valores e de Créditos e Direitos de Natureza Financeira. For a critique of the effects of this tax, see [Albuquerque \(2006\)](#).

17. Older forms of revenue tax such as the stamp duty on cheques in the United States and the United Kingdom and the Bank Account Debit tax in Australia were not applied at proportional rates. (For example, the Australian tax was €0.15 on amounts up to \$100, but only \$2 on any amount of \$10,000 or more.) The U.S. and U.K. stamp taxes on checks were at a fixed amount per

check, regardless of the face value. Lastrapes and Selgin (1997, p. 859) examine the U.S. check tax during the early to mid-1930s, concluding that it led to “about a 15 percent increase in the currency-demand deposit ratio, and about a 12 percent decline in the M1 money stock.” Importantly for the present discussion, transaction size substantially increased while the number of transactions significantly decreased (p. 868 and footnote 43). Revenues were only about half of what had been hoped for (see footnote 39). As with the annual charge of €40 on a credit or debit card applied by Ireland, taxes that are not proportional to the value of transactions are inherently limited in their revenue potential and need not be considered further here.

18. CPSS (2009). The first cross-country publication including statistics on payments systems covered the Group of ten industrial countries and Switzerland and referred to 1977–78. Since then, an annual survey, now conducted under the auspices of the Committee on Payment and Settlement Systems, has expanded and deepened its coverage but added only two additional countries (Hong Kong and Singapore), as well as the eurozone, to the original 11.

19. The ratio is actually 89 for 2007, and varies between 75 and 89 in the period 2000–07.

20. In contrast, the stock of OTC exchange rate related derivatives is only one-eighth that of interest rate derivatives. The exchange rate derivatives have a much higher ratio of turnover to end-period stock, probably reflecting in part their very short median maturity and the microstructure of this market discussed above.

21. “We stand ready to take agreed action against those jurisdictions which do not meet international standards in relation to tax transparency” (G20 communiqué April 2, 2009; see Owens and Saint Amans, 2009).

22. Although the Feige proposal intended to increase government expenditures by removing indirect subsidies, quantification of the value of indirect subsidies, and estimating how many of them will be carried forward into direct subsidies contains too many assumptions to contribute anything meaningful to the debate.

23. All data was calculated in terms of billions of U.S. dollars. When exchange rates were needed, the average exchange rate for the local currency to the U.S. dollar was used for the given year. When fiscal years do not occur within the calendar year, the numbers are assumed to be consistent for cross-year comparison so that no adjustments were made. IMF data generally used rows a1 and a2 whenever possible. However, data limitations necessitated the use of c1 and c2 for some nations. Whenever both were available, preference was given to a1 and a2. Occasionally, when both were available for some years, c1 and c2 were used to provide consistency with data obtained for previous years. Data available upon request.

24. International Monetary Fund (2009, line 82).

25. CPSS (2009).

26. Sweden was dropped due to a significant statistical outlier occurring with 2007 which was not statistically within the valid range. Hong Kong has been omitted from this analysis due to a lack of information about end-user based transactions and government expenditure or revenue.

27. Recall from the literature review of previous implementations of transactions taxes that many intermediation transactions were removed from the tax base.

28. As recently illustrated, statements from policymakers on trying to develop mechanisms addressing tax havens may provide a mechanism to prevent arbitrage caused by rate differences within the APT tax perimeter.

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