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Possibility: Which Currencies Would Take the Lead and  
What Rate Could they Charge?**

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# **Adopting a Currency Transaction Tax When Avoidance is a Possibility: Which Currencies Would Take the Lead and What Rate Could they Charge?**

David Stubbs<sup>1</sup>

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## **Abstract:**

The need for more funding to address development goal is crucial. Acceptance is growing that transaction taxes of all types can be a useful supplement traditional forms of development finance. This paper looks at currency taxes in particular. In agreement with much of the literature, it concludes that imposition of currency taxes, even by one country unilaterally, is now feasible. The paper then adds to the literature by calculates revenue achievable for simultaneous global adoption and gradual bilateral adoption both under the condition that market participants are either able to avoid the tax or not. The path of bilateral adoption under the possible of avoidance is considered in detail The path of adoption is determined by economic and political factors within countries and the rate chargeable is then determined by calculating the maximum rate chargeable that doesn't trigger avoidance.

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<sup>1</sup>New School for Social Research, NY, USA. Stubd811@NewSchool.edu

## Introduction:

The need for more funds to address the development challenges facing us is pressing. Many of the laudable goals set out by the United Nations at the start of the new millennium look set to be missed by a wide margin (United Nations, 2009; United Nations 2011). Many scholars point to the persistent failure of aid levels to reach the amounts previously pledged by advanced countries as a major contributing factor to this situation (Sachs, 2005; United Nations, 2011). As disillusionment with traditional aid has grown, the development community has looked for new ways to raise funds for development. A range of initiatives, collectively known as innovative sources of development finance (IDF), have either been launched to good effect or remain on the drawing board (Atkinson, 2005; United Nations, 2009; Leading Group, 2010). One of the major IDFs identified but as yet not implemented is a tax on currency transactions.

James' Tobin's initial suggestion to tax currency transactions was aimed at curbing speculation and reducing volatility in the foreign exchange markets (Tobin, 1974; Tobin, 1978). The revenue raised by the tax was a side issue. Since then, development advocates have suggested a much smaller tax that would not aim to shape market function<sup>2</sup> but which would still raise large amounts of money for development purposes. These proposals are known as currency transactions taxes (CTTs), and are distinct from the original proposals for a Tobin Tax (Leading Group, 2010; WWF, 2010; Darvas and Weizsacker, 2010).

Most papers on CTTs proceed in a formulaic way. Estimates of revenue are generated by applying tax rates to total foreign exchange (FX) flows, sometimes multilaterally and sometimes on a single currency. There then follows a pro-forma debate on the issues of concern on implementation: would there be a migration to different products? And would firms evade the tax somehow? In 2005 and 2006, Stephan Spratt released two interesting papers (Spratt, 2005, 2006) which took a different approach. The starting point was the current administrative system for a large part of the FX market, including the advent of the *Real Time Gross Settlements System* (RTGS), the SWIFT messaging system and the trade settlement systems within the Continuous Linked Settlement (CLS) bank. Taken together, Spratt argued that these innovations have changed the way currencies are exchanged to the point

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<sup>2</sup> Even if they do not explicitly aim to alter market function they may well impact those markets in several ways. Economists disagree whether a small tax would make markets more unstable by reducing liquidity or more stable by reducing the number of financial connections between market participants that cause rapid contagion in times of market stress.

where the imposition of a CTT is easy, cheap and all but impossible to avoid. He pointed out that even if firms could avoid the initial tax, they would not face an incentive to do so, as the current system provides them with annual cost reductions that vastly exceed the tax revenue that could be raised by the tax. Indeed this was the conclusion of a recent report by the United Nations Development Program:

Today foreign exchange trading and settlement infrastructure has become even more organized, centralized, and standardized, making a currency transaction tax easier than ever to implement...Foreign exchange activity in the currencies of nearly every country depends on a few electronic communications networks (ECNs), for trading and on CLS Bank and SWIFT for settlement. Now each of those countries can apply the CTT unilaterally to its own currency. (Schmidt and Bhushan, 2011)

This paper expands Spratt's analysis and contributes to the literature in a number of ways. It estimates potential CTT revenue for each currency traded on the CLS system, and then discusses the possibilities for adoption amongst all currencies or by individual countries, under different assumptions about the constraints that possible avoidance by market participants would place on tax authorities. The first section outlines the current structure of the FX market, and existing international legal agreements, which makes imposing a tax more feasible than ever before. The second section outlines the benefits, both quantitative and qualitative, that accrue to the participating firms in the system. The third section discusses the simultaneous imposition of a CTT on all currencies within the CLS settlement system, both with the assumption that avoidance is possible and impossible. The fourth section analyses how a CTT could be implemented on a currency-by-currency basis, both with the assumption that avoidance is possible and impossible. The fifth section provides forecasts for how a CTT would gradually be adopted by all the currencies in the CLS settlement system, and the optimal rate that could be charged as each currency joined the CTT, given the assumption that participants would leave the system if the tax rate is set too high. The sixth section concludes.

## **The Institutional Environment is Ripe for Imposing a Currency Transaction Tax**

Today's foreign exchange market makes imposing a CTT more feasible than in any previous period, thanks to several changes that have taken place in recent decades. As Spratt (2005, 2006) makes clear, Large Value Payment Systems (LVPS), usually run by the financial authorities in a country such as its central bank, allow economic agents to send and receive large sums of money to clear transactions between them. LVPS are needed to allow the smooth functioning of a market economy. The danger of a participant defaulting, known as 'settlement risk', has been a constant worry of the authorities, as such an event would have large detrimental impacts upon the functioning of the financial system.

Before today's systems existed, settlements were made at the end of the working day in order to be settled on a net basis, reducing liquidity requirements on the participants within the system and the authorities running it. This method is known as Deferred Net Settlement (DNS) and exposed the system to risks relating to the timing of payment. If someone defaults during the day, many netted payments may have to be unwound because they have not been settled yet. Recognition of this risk led to the replacement of the DNS system with Real Time Gross Settlements Systems (RTGS). In RTGS systems, trades are settled on a gross basis, thus eliminating settlement risk. This is done on either a payment versus payment (PvP) basis, or as delivery versus payment (DvP) for securities transactions.

Despite the downsides of being settled on a gross basis, which forces participants to hold more liquidity than in net settlement systems (thereby reducing their efficiency), RTGS grew in popularity near the end of the last century as central banks took the view that concerns over systemic risk trumped other considerations.

The success of RTGS was aided by improvements in communication during the period, most notably the development of the Society for Worldwide Interbank Financial Telecommunications (SWIFT), which provides secure messaging services between financial institutions. The modern day version, the web-based SWIFTNet FIN messaging service, provides secure messaging services to the vast majority of major LVPS globally, as well as to major international payment and settlements systems, which have been developed in recent years. When focusing on the

settlement of FX transactions the most relevant of these is the Continuous Linked Settlement (CLS).

Being a RTGS, the CLS system tries to settle transactions in real time, but in foreign exchange markets which almost by definition are cross-border, this is often not possible due to different time zones. This leads to the risk that some payments may not arrive. This is known as Herstatt Risk<sup>3</sup>. Historically, institutions have tried to mitigate this risk through bilateral and then multilateral netting systems. These bilateral systems enabled pairs of financial institutions to offset concurrent obligations to each other, leaving only each institution's 'net-net' position to be settled. The Exchange Clearing House (ECHO) subsequently extended this function from two participants to a wider group, where each institution's net-net position was settled through a central party. In the following years, mergers between ECHO and other systems allowed the industry to consolidate as it had become clear that, in order to operate efficiently and cost-effectively, multilateral netting systems needed to include a high proportion of significant international banks (Spratt, 2005, 2006). Then in 1997, the G20 announced the plan to develop the CLS Bank, so as to eliminate settlement risk in the FX market by including the highest possible proportion of relevant participants. The CLS Bank became operational in September 2002, and since that point its market share has grown rapidly (Spratt, 2005; 2006).

The CLS system – like the national RTGS systems – settles transactions on a PVP basis, thereby eliminating Herstatt Risk. The CLS Bank is linked to all the national RTGS systems, and settles FX transactions during a five-hour window when the time zones of the major LVPS overlap. Up until 06:30 CET, members are able to submit settlement instructions to the CLS Bank and by midday, assuming no problems have arisen, all funds will have been dispersed to members (Spratt, 2005; 2006).

The CLS Bank is owned by 71 shareholders, which comprise the major international banks that are active in the global FX market. To be a member of the CLS Bank, and therefore be entitled to hold a multi-currency account, it is necessary to also be a shareholder. There are also a larger – and growing – number of third-party members

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<sup>3</sup>On 26th June 1974 at 15:30 CET, the German authorities closed BankhausHerstatt, a middle-sized bank with a large FX business. Prior to the closure, however, a number of Herstatt's counterparty banks had irrevocably paid Deutsche marks into Herstatt but, as US financial markets had just opened, had not yet received their dollar payments in return. This failure triggered a ripple effect through global payment and settlement systems, particularly in New York. Ultimately, this fed into New York's multilateral netting system, which over the following three days, saw net payments going through the system decline by 60%. The type of risk became known as Herstatt Risk (Spratt, 2005)

of the CLS Bank, who do not hold their own accounts, but are customers of settlement members, who act on their behalf in settling FX trades. In addition, the CLS Bank is becoming increasingly attractive to non-bank financial institutions, and is specifically targeting this market with a number of initiatives<sup>4</sup> (Spratt, 2005; 2006).

Today, the CLS Bank settles around 57% of all FX trades globally, and 60% of all interbank FX trades. This represents a doubling of market penetration in the past year, and it now settles 90% of all its members' FX trades. The stated aim of the CLS Bank is to settle 95% of all FX trades globally, and if current growth rates continue, it seems likely that they will reach this figure within a few years. (Spratt, 2006; Schmidt and Bhushan, 2011).

The status of the CLS system as the "gold standard" for currency trading makes the system ideal for imposing a small tax<sup>5</sup>. But it has other benefits as well. The main worry of early proponents of a CTT was that there would be avoidance as market participants would use other instruments that were not taxed. The CLS system limits this risk in two ways. Firstly, it already handles types of derivatives including FX swaps, outright forwards, options and interest rate swaps. Secondly, even if new instruments were developed, hedging activity related to any new FX derivative contracts would also leave a significant 'footprint' in the traditional FX market, which would be subject to the CTT. Most sellers of options (mostly banks and big financial institutions) and other contingent derivatives will not carry a 'naked' or unhedged position, which is fundamentally risky, but will cover their exposed positions through a series of hedging transactions in the traditional market. This means that option (and other contingent derivative) transactions are not stand alone but are intimately linked to the underlying traditional market and generate a significant footprint in these markets. So by virtue of having sold an option, a bank will in most cases increase its transactions in the traditional markets. Also, while most options (and other contingent derivatives) expire worthless, some will be exercised – in which case the currency value that changes hands will be captured by the traditional markets in any case.

#### Legal constraints to avoidance

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<sup>4</sup>In particular, through its 'Enhanced Fund FX' programme, the CLS Bank has the capability to settle FX trades for both treasury and securities clearing. The CLS Bank expects the next wave of participants to be fund managers working in the pension fund sector, as well as the asset management divisions of banks and insurance companies. In 2005 this process has already begun and the proportion of fund managers using the CLS system is expected to grow steadily. (Spratt, 2005; 2006)

<sup>5</sup> See Spratt (2006) and Schmidt and Bhushan (2011) for full details of the collection operation and the data demands national tax authorities would make on the SWIFT and CLS systems.

Current legal structures present significant hurdles to firms wishing to exit the CLS system in order to avoid a tax. Due to the Basel 2 and now Basel 3 rules, as well as the money-laundering regulation brought in after 9/11, any system that banks would migrate to would have enough transparency and centralized record collection to allow a tax to be implemented very easily. Given that avoiding the tax would be a breach of the law, the banks would be faced with having no means of avoiding it that the authorities could not observe. (Spratt, 2005)

Furthermore, the Lehman Brothers debacle illustrated to authorities the enormous danger that the failure of major counterparty can pose to the financial system. The enormous rise in the perception of risk in the aftermath of such a failure caused huge disruption to the financial sector and the wider economy. Any major firm that wanted to leave the CLS system would come under enormous pressure from regulators either to stay in the system or to ensure that the new one had counterparty risk mitigation properties similar to the CLS system, which would of course allow a CTT to be collected within it.

### **If a tax was levied on the CLS system would revenue be eroded by participating firms leaving the system?**

Indeed, not only does the present system allow a tax to be implemented, but the system in place provides the users with such efficiency and cost saving benefits that if a new tax was imposed it would not provide an incentive to leave the system. Indeed, if a firm were to leave the CLS it would lose the benefits it gains from the system, which Spratt calculated to be around \$17 billion (it is important to note that these benefits are for all currencies in traded in the CLS, not just the Euro or Sterling). The revenue calculations Spratt made for taxing just the Euro currency transactions in the system was \$2.2 billion per year, assuming a tax rate of 0.005% (Spratt, 2005), and \$1 billion per year if the Sterling block were to implement CTT at the same rate (Spratt, 2006). So if either block implemented a tax, the benefits of the system would be eight times the amount withdrawn through tax in the Euro's case, and around seventeen times the tax in the case of Sterling.

To update the study and compare the benefits in terms of the possible tax revenue from a CTT the first step is to calculate the benefits to participants using updated data on the foreign exchange markets.

#### Quantifiable benefits for firms staying in the CLS system



### *Fixed Costs*

The choice of whether to join the CLS or leave it is first impacted by the fixed costs of changing a firm's systems. Spratt (2005, 2006) listed the costs of joining the CLS settlement system as:

- A \$5 million subscription fee, which accords the firm shareholder status of the CLS Bank.
- \$4 million in investment for the top 25 member banks, and an average \$2 million investment for the remaining 25 members. Third-party participants are assumed to have incurred upfront investment costs relating to IT systems of approximately \$0.5 million each. (Tower Research Group, Via Spratt, 2005)

If a firm wanted to leave the system it might be able to sell its shareholding – assuming another party wished to buy it – therefore it should be possible to recoup some or all of this upfront investment. However the systems they had developed – at a cost of up to \$4 million per bank – would not be compatible with any potential alternatives. Therefore, not only would the \$4 million be effectively lost, but also IT systems would have to be fundamentally changed to be compatible with another system, at considerable additional costs.

### *Variable Costs*

CLS system participants enjoy significant benefits in terms of lower variable – or operating – costs. These can be split into three distinct categories: efficiency gains, operating costs reductions and liquidity / net funding cost reductions. Figure 1 sets out the calculation of these benefits.

Figure 1: Annual Estimates for System wide Benefits to Participating Firms

| Row Number | Category   | Input   | Spratt 2005    | 2005           | 2006           | 2007           | 2008           | 2009           | 2010           | 2011           |
|------------|--|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1          | FX Market in CLS                                   | Current CLS Volume (1)                                    | 2000           | 2000           | 2,200          | 3,500          | 4,000          | 3,500          | 4,200          | 4,773          |
| 2          |  | Assumed % reduction due to tax                            | 2.50%          | 2.50%          | 2.50%          | 2.50%          | 2.50%          | 2.50%          | 2.50%          | 2.5%           |
| 3          | Efficiency Gains                                   | Profit / spread (2)                                       | 0.00015        | 0.00015        | 0.000147       | 0.000143       | 0.00014        | 0.000137       | 0.0001333      | 0.000130       |
| 4          |  | Net CLS system daily trade volume (bn) (3)                | \$1,000        | \$975          | \$1,073        | \$1,706        | \$1,950        | \$1,706        | \$2,048        | \$2,327        |
| 5          |  | Profit per day (bn)                                       | \$0.150        | \$0.146        | \$0.157        | \$0.245        | \$0.273        | \$0.233        | \$0.273        | \$0.303        |
| 6          |  | Operational efficiency gains (4)                          | 32%            | 32%            | 32%            | 32%            | 32%            | 32%            | 32%            | 32%            |
| 7          |  | Profit per day in CLS (bn)                                | \$0.198        | \$0.193        | \$0.208        | \$0.323        | \$0.360        | \$0.308        | \$0.360        | \$0.399        |
| 8          |  | Profit increase due to CLS (bn)                           | \$0.048        | \$0.047        | \$0.050        | \$0.078        | \$0.087        | \$0.075        | \$0.087        | \$0.097        |
| 9          |  | <b>Annual profit increase (assuming 260 days) (bn)</b>    | <b>\$12.48</b> | <b>\$12.17</b> | <b>\$13.09</b> | <b>\$20.35</b> | <b>\$22.71</b> | <b>\$19.40</b> | <b>\$22.71</b> | <b>\$25.17</b> |
| 10         | Operating Costs                                    | Non-CLS cost per trade (4)                                | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         |
| 11         |  | CLS cost per trade (4)                                    | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         |
| 12         |  | CLS saving per trade                                      | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         |
| 13         |  | Number of trades CLS settles per day (5)                  | 100,000        | 100,000        | 175,000        | 250,000        | 325,000        | 400,000        | 475,000        | 550,000        |
| 14         |  | Daily saving  | \$240,000      | \$240,000      | \$420,000      | \$600,000      | \$780,000      | \$960,000      | \$1,140,000    | \$1,320,000    |
| 15         |  | <b>Annual Cost Saving (assuming 260 days) (bn)</b>        | <b>\$0.062</b> | <b>\$0.062</b> | <b>\$0.109</b> | <b>\$0.156</b> | <b>\$0.203</b> | <b>\$0.250</b> | <b>\$0.296</b> | <b>\$0.343</b> |
| 16         | Liquidity / Net Funding Costs                      | Gross CLS system daily trade volume (bn) (6)              | \$2,000        | \$1,950        | \$2,145        | \$3,413        | \$3,900        | \$3,413        | \$4,095        | \$4,654        |
| 17         |  | Reduction in net funding (7)                              | 90%            | 90%            | 90%            | 90%            | 90%            | 90%            | 90%            | 90%            |
| 18         |  | Daily liquidity saving (bn)                               | \$1,800        | \$1,755        | \$1,931        | \$3,071        | \$3,510        | \$3,071        | \$3,686        | \$4,189        |
| 19         |  | % financed externally (8)                                 | 10%            | 10%            | 10%            | 10%            | 10%            | 10%            | 10%            | 10%            |
| 20         |  | Daily external liquidity saving (bn)                      | \$180          | \$176          | \$193          | \$307          | \$351          | \$307          | \$369          | \$419          |
| 21         |  | Annual external liquidity saving (assuming 260 days) (bn) | \$46,800       | \$45,630       | \$50,193       | \$79,853       | \$91,260       | \$79,853       | \$95,823       | \$108,904      |
| 22         |  | Assumed Annualized Labor Rate (9)                         | 3.00%          | 3.00%          | 2.52%          | 2.05%          | 1.57%          | 1.10%          | 0.62%          | 0.15%          |
| 23         |  | <b>Annual Liquidity Saving</b>                            | <b>5.40</b>    | <b>5.20</b>    | <b>4.90</b>    | <b>6.30</b>    | <b>5.50</b>    | <b>3.40</b>    | <b>2.30</b>    | <b>0.61</b>    |
| 24         | <b>Total Annual Savings in Variable Costs (bn)</b> |   | <b>\$17.94</b> | <b>\$17.43</b> | <b>\$18.10</b> | <b>\$26.80</b> | <b>\$28.42</b> | <b>\$23.05</b> | <b>\$25.31</b> | <b>\$26.12</b> |

\* Settlement volume is different from, and roughly twice the size of traded volume. For details of the differences and methodology for converting one into another, see <http://www.cls-group.com/SiteCollectionDocuments/CLS%20market%20share%20Feb%202011.pdf>

Sources:

- (1) CLS Group, Author's Calculations
- (2) Spratt (2002), Rabbobank, 27th September 2011
- (3) CLS Group
- (4) Z/Yen Research Group via Spratt (2005)
- (5) CLS group <http://www.cls-group.com/Media/Pages/NewsArticle.aspx?id=85>
- (6) CLS group, CLS Market share February 2011
- (7) CLS group via Spratt (2005)
- (8) Bank of England (2003) via Spratt 2005; Bank of England: 2011 Financial Stability Report
- (9) Over night Libor, Google Finance, 27th September 2011

Efficiency gains are a function of increasing the amount of FX traded whilst needing less staff to process transactions that are now cleared centrally. Spratt cites the Z/Yen Research Group as calculating a 32 per cent direct reduction in costs for CLS participants. The amount traded is the volume of foreign exchange in the CLS system. The CLS bank data in row 1 include both sides of all transactions, and so must be halved. We must also take into account the assumed drop in volumes in row 2<sup>6</sup>. The volume for transactions for this part of the calculation is in row 4. Spratt's initial calculations produced an annual benefit of \$12.48 billion. Using this adjusted volume and the spread as a profit margin, the updated calculations estimated the 2011 benefit as \$25.17 billion (in row 9).

Operating cost reductions, which were estimated in the same y/Zen survey, relate to internal transaction costs which are estimated to drop from \$3.70 to \$1.30 when a firm enters the CLS system. By multiplying the difference between the two by the number of transactions in the CLS system, the total benefit can be calculated (row 15).

Liquidity or net funding costs emerge from the fact that whilst transactions are settled in gross form, they are funded on a net basis. By providing settlement members with a multilateral net position on which to base necessary daily funding rather than gross transaction-by-transaction funding, CLS reduces necessary funding by over 90 per cent. This feature of the CLS system brings real financial benefits to participating banks, which we assume fund 10 per cent of their net funding requirements in the interbank market. The 10 per cent figure is the average funding gap faced by major UK banks from 2000–2003 (which was the basis for its inclusion in the Spratt papers) and by coincidence was roughly 10 per cent in 2011 (Bank of England, 2011). The funding gap represents the difference between the banks' total deposits and total lending. This shortfall must be met by external borrowing, either domestically or overseas. Clearly, the activities of individual banks in the domestic loan and international FX markets are very different. However, at a group level, a liquidity saving (in terms of a 90% reduction in net funding requirement for CLS Bank financing) frees up group-wide liquidity for other functions. The result is a reduction in the funding gap, and therefore a decrease in the quantity of funds that must be externally raised to support the bank's activities. The size of this reduction, it can reasonably be assumed, directly reflects the reduced liquidity requirement resulting from CLS Bank membership.

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<sup>6</sup> Transactions are assumed to drop by 2.5% to account for some reduction in ultra-high frequency trading volumes that may occur due to the imposition of a tax. This is an assumption that originated in the work of Nissanke (2003) and was also used by Spratt (2005, 2006)

In 2011, it is estimated that CLS Bank's members executed an average daily value of \$4.7 trillion through the CLS system. Gross funding would therefore necessitate the entire \$4.7 trillion being available for settlement – unlike the previously halved data, however, this is an accurate reflection of the real situation, since both parties to the transaction would, in the absence of any netting, be required to provide the full quantity as liquidity. By reducing the net funding requirement by 90 per cent however, the system requires only about \$465 billion to be made available, a saving to CLS Bank participants as a whole of roughly \$4.1 trillion per day in liquidity. If we assume that, on average, 10 per cent of this would have been financed externally, the figure 'saved' in this regard becomes \$419 billion per day. To fund this every day at an overnight LIBOR rate of 0.15 per cent would cost \$0.61 billion over the course of a year. This therefore represents a saving to CLS Bank participants, which is a direct result of their participation in the system, of \$0.61 billion per year (row 23).

As with the previous estimate, the savings will clearly be considerably higher for the largest participants with the greatest number of trades. However, the savings are perhaps most relevant when viewed at the level of the entire CLS system. There are some issues with the initial calculations by Spratt<sup>7</sup>, but in 2011 the system benefited participants to the tune of \$26.12 billion per year. Therefore, assuming firms would leave the system if costs exceed the benefits, had a tax been implemented in 2011, the total revenue generated would have to be less than or equal to \$26.12 billion<sup>8</sup>.

### Unquantifiable Benefits of remaining in the system

Beyond the benefits outlined above to which quantitative estimates can be cautiously applied, there are further benefits that are unquantifiable, but would serve as an additional argument to remain within the system should a tax be levied on it.

Firstly, as Spratt lays out in his 2005 paper, some trading intermediaries such as Reuters are starting to include the phrase 'this price CLS only' in their trading quotes,

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<sup>7</sup> The gross volume of FX in the CLS system looks to be wrong. Spratt cannot say where the number came from except that it was supplied, verbally, by the CLS system administrators. He also applies a 2.5% reduction in volume when accounting for the tax revenue but fails to make the same adjustment when calculating the benefit of the system to participants.

<sup>8</sup> The Spratt trade off which this paper updates and extends assumes that the revenue generated by the tax will all come from the banks that use the wholesale FX CLS system. Yet in the same paper, as in many other publications, it is alleged that any costs from the tax would be passed on by the banks to their customers therefore spreading the impact of the tax throughout the economic system. If this was the case then the trade-off between system benefits and taxation costs is a false one, or at least needs to be modified. If, for example, we assumed that banks could pass on 50% of any increases cost base caused by the tax. Then the tax rate possible, and the revenue generated, would double

suggesting that the CLS's 'gold standard' position in the market is starting to create a price advantage for CLS Bank Participants. Spratt (2005) also cites survey evidence that suggests some participants in the CLS system are favouring other counterparties that use the CLS system, in some cases extending larger trading lines than to non-CLS counterparties.

Secondly, given that the CLS participants are free of settlement risk, some rating agencies have begun to suggest that future ratings of market players will take CLS participation into account.

Thirdly, as more and more of their FX business is settled through the CLS system, firms are beginning to wind down the expensive Nostro<sup>9</sup> accounts in separate currencies which had previously been a necessary part of their business. Although this is a financial gain, there was no data immediately available to the author that would allow quantification of this benefit.

### **Simultaneous Global Adoption – What Rate Could be Charged?**

There are many estimates in the literature of how much revenue could be generated from a universal tax on global currency transactions. Schmidt (2008), using estimated foreign exchange volumes at around US\$3 billion a day, and a rate of 0.005 per cent, estimates that a global CTT would raise more than US\$30 billion a year. A more recent estimate by an international group of experts (Taskforce on International Financial Transactions for Development, 2010) estimated a similar amount, of \$33.5 billion as a central scenario with a similar level of tax. Obviously, a higher rate would increase its revenue potentials with some estimates going as high as the \$60 billion range (Ocampo, Kregel and Griffith-Jones, 2007, p. 103).

#### Assuming participants won't leave the system

Given that we are relying on the institutional make-up of the CLS system as the starting point for the introducing a CTT, estimates must be calculated using only the turnover in the CLS system. If one assumes that the participants in the system, and future entrants into it, will not be persuaded to leave the system except under the most draconian of tax regimes, it would in theory be possible to tax the entire FX

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<sup>9</sup>Nostro Accounts are accounting terms used to distinguish an account held for another entity from an account another entity holds. For more information see:

[http://en.wikipedia.org/wiki/Nostro\\_and\\_vostro\\_accounts](http://en.wikipedia.org/wiki/Nostro_and_vostro_accounts)

turnover within the CLS system without fear of erosion by firms abandoning the CLS system.

The table below calculates the potential revenue that such a tax could have generated in the past and could possibly generate in the future. The volume of foreign exchange turnover in the 17 countries included in the CLS system was sourced from table 3 in BIS (2010). The data is only collected every three years so the intervening years were calculated using straight line interpolation. Volumes for 2011 to 2020 were then calculated using the Excel trend function<sup>10</sup>. A similar interpolation between historical data points and then trending to calculate future values was used to produce annual estimates and forecasts of the market share of the CLS system.

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<sup>10</sup> One exception is the Danish Krone. The decline in volumes for that currency cause a simple trend formula forecasting methodology to lead to negative volumes in the later years of the forecasting period. Given that no clear trend was visible in the historical data available to the author at time of writing, volumes were assumed to maintain steady at the most recent record level, that of 2010.

Figure 2: Annual Estimates for Multilateral CTT Revenue in CLS System

|  |                    | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    | 2018    | 2019    | 2020    |
|--|--------------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| FX Turnover<br>Volume by<br>Currency Per<br>Year* (\$bn) | US dollar          | 221318 | 270848 | 320378 | 369908 | 392984 | 416059 | 439135 | 483374  | 516276  | 549178  | 582079  | 614981  | 647882  | 680784  | 713686  | 746587  | 779489  |
|  | Euro               | 94082  | 116073 | 138064 | 160055 | 174090 | 188125 | 202160 | 222560  | 239550  | 256540  | 273530  | 290520  | 307510  | 324500  | 341490  | 358480  | 375470  |
|  | Japanese yen       | 52379  | 59767  | 67155  | 74544  | 82425  | 90306  | 98187  | 105674  | 113372  | 121070  | 128768  | 136466  | 144164  | 151862  | 159560  | 167258  | 174956  |
|  | Pound sterling     | 41487  | 49074  | 56660  | 64247  | 65042  | 65838  | 66633  | 72861   | 76179   | 79497   | 82815   | 86133   | 89450   | 92768   | 96086   | 99404   | 102722  |
|  | Australian dollar  | 15142  | 19627  | 24111  | 28596  | 32138  | 35681  | 39223  | 43520   | 47412   | 51304   | 55197   | 59089   | 62982   | 66874   | 70767   | 74659   | 78551   |
|  | Swiss franc        | 15161  | 19936  | 24712  | 29487  | 30635  | 31783  | 32932  | 36981   | 39477   | 41972   | 44468   | 46963   | 49459   | 51954   | 54450   | 56945   | 59440   |
|  | Canadian dollar    | 10560  | 13219  | 15879  | 18538  | 21465  | 24392  | 27319  | 30032   | 32860   | 35687   | 38515   | 41343   | 44170   | 46998   | 49826   | 52653   | 55481   |
|  | Hong Kong dollar   | 4423   | 6845   | 9267   | 11689  | 11867  | 12044  | 12222  | 14195   | 15206   | 16218   | 17229   | 18240   | 19251   | 20263   | 21274   | 22285   | 23297   |
|  | Swedish krona      | 5513   | 7565   | 9617   | 11670  | 11559  | 11448  | 11338  | 12957   | 13650   | 14343   | 15035   | 15728   | 16421   | 17114   | 17806   | 18499   | 19192   |
|  | New Zealand dollar | 2666   | 4508   | 6350   | 8193   | 8206   | 8219   | 8232   | 9708    | 10400   | 11093   | 11785   | 12478   | 13170   | 13862   | 14555   | 15247   | 15940   |
|  | Korean won         | 2870   | 3578   | 4287   | 4995   | 5942   | 6888   | 7834   | 8590    | 9449    | 10307   | 11165   | 12023   | 12881   | 13739   | 14597   | 15455   | 16313   |
|  | Singapore dollar   | 2278   | 3200   | 4122   | 5044   | 5806   | 6567   | 7328   | 8218    | 9039    | 9860    | 10681   | 11502   | 12324   | 13145   | 13966   | 14787   | 15608   |
|  | Norwegian krone    | 3468   | 5342   | 7217   | 9092   | 8342   | 7592   | 6842   | 8192    | 8417    | 8642    | 8867    | 9092    | 9317    | 9542    | 9767    | 9992    | 10217   |
|  | Mexican peso       | 2782   | 3743   | 4703   | 5663   | 5940   | 6217   | 6494   | 7318    | 7848    | 8379    | 8910    | 9441    | 9971    | 10502   | 11033   | 11563   | 12094   |
|  | South African rand | 1820   | 2526   | 3232   | 3938   | 3873   | 3807   | 3741   | 4293    | 4514    | 4735    | 4956    | 5177    | 5398    | 5619    | 5841    | 6062    | 6283    |
|  | Danish krone       | 2181   | 2667   | 3153   | 3638   | 3404   | 3170   | 2935   | 2935    | 2935    | 2935    | 2935    | 2935    | 2935    | 2935    | 2935    | 2935    | 2935    |
|  | Israeli new shekel | 281    | 410    | 538    | 667    | 704    | 740    | 776    | 887     | 957     | 1028    | 1099    | 1170    | 1240    | 1311    | 1382    | 1453    | 1523    |
| Total (\$bn)   |                    | 478410 | 588928 | 699446 | 809964 | 864420 | 918876 | 973333 | 1072296 | 1147543 | 1222789 | 1298035 | 1373281 | 1448527 | 1523773 | 1599019 | 1674265 | 1749511 |
| CLS Market Share   |                    | 50%    | 51%    | 52%    | 53%    | 55%    | 56%    | 57%    | 58%     | 59%     | 60%     | 61%     | 63%     | 64%     | 65%     | 66%     | 67%     | 68%     |
| Total Volume in CLS (\$bn)                               |                    | 239205 | 301195 | 365710 | 432752 | 471726 | 511945 | 553409 | 621932  | 678689  | 737167  | 797364  | 859281  | 922918  | 988275  | 1055352 | 1124149 | 1194666 |
| Adjusted Total** in CLS (\$bn)                           |                    | 233225 | 293665 | 356567 | 421933 | 459933 | 499147 | 539574 | 606384  | 661722  | 718738  | 777430  | 837799  | 899845  | 963569  | 1028969 | 1096045 | 1164799 |
| Revenue at rate of 0.001%                                |                    | 2.3    | 2.9    | 3.6    | 4.2    | 4.6    | 5.0    | 5.4    | 6.1     | 6.6     | 7.2     | 7.8     | 8.4     | 9.0     | 9.6     | 10.3    | 11.0    | 11.6    |
| Revenue at rate of 0.005%                                |                    | 11.7   | 14.7   | 17.8   | 21.1   | 23.0   | 25.0   | 27.0   | 30.3    | 33.1    | 35.9    | 38.9    | 41.9    | 45.0    | 48.2    | 51.4    | 54.8    | 58.2    |
| Revenue at rate of 0.010%                                |                    | 23.3   | 29.4   | 35.7   | 42.2   | 46.0   | 49.9   | 54.0   | 60.6    | 66.2    | 71.9    | 77.7    | 83.8    | 90.0    | 96.4    | 102.9   | 109.6   | 116.5   |

\* Assuming 260 working days per year = Daily total \* percentage of volume accounted for by currency \* 260. Data for 2004, 2007 and 2010 sourced from BLS. Other years interpolated or forecasted.

\*\* Assuming 2.5% decline in volumes after imposition of tax on CLS system

The calculations conclude that a tax of 0.005 per cent (the most commonly suggested rate in the literature) could raise approximately \$33 billion this year rising to over \$50 billion by the end of the decade.

Assuming participants will evade if tax revenue exceeds quantifiable benefits

If one assumes that avoidance is possible, then it is only likely to occur when tax revenue withdrawn from participants in the system exceeds the quantifiable benefits of remaining in the system. Those benefits are calculated annually out to 2020 in the table below which uses the same methodology as in table 1 (originally used in Spratt 2005), along with forecasted values for the necessary inputs.



Figure 3: Annual Forecasts of Quantifiable Benefits for Participants of CLS System

| Row Number | Category   | Input   | 2012           | 2013           | 2014           | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|------------|--|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1          | FX Market in CLS                                   | Current CLS Settlement Volume* (bn) (1)                   | 5,213          | 5,556          | 5,687          | 6,275          | 6,807          | 7,015          | 7,453          | 7,809          | 8,265          |
| 2          |  | Assumed % reduction due to tax                            | 2.5%           | 2.5%           | 2.5%           | 2.5%           | 2.5%           | 2.5%           | 2.5%           | 2.5%           | 2.5%           |
| 3          | Efficiency Gains                                   | Profit / spread (2)                                       | 0.000127       | 0.000123       | 0.000120       | 0.000117       | 0.000113       | 0.000110       | 0.000107       | 0.000103       | 0.000100       |
| 4          |  | Net CLS system daily trade volume (bn) (3)                | \$2,542        | \$2,708        | \$2,773        | \$3,059        | \$3,319        | \$3,420        | \$3,633        | \$3,807        | \$4,029        |
| 5          |  | Profit per day (bn)                                       | \$0.322        | \$0.334        | \$0.333        | \$0.357        | \$0.376        | \$0.376        | \$0.388        | \$0.393        | \$0.403        |
| 6          |  | Operational efficiency gains (4)                          | 32%            | 32%            | 32%            | 32%            | 32%            | 32%            | 32%            | 32%            | 32%            |
| 7          |  | Profit per day in CLS (bn)                                | \$0.425        | \$0.441        | \$0.439        | \$0.471        | \$0.496        | \$0.497        | \$0.512        | \$0.519        | \$0.532        |
| 8          |  | Profit increase due to CLS (bn)                           | \$0.103        | \$0.107        | \$0.106        | \$0.114        | \$0.120        | \$0.120        | \$0.124        | \$0.126        | \$0.129        |
| 9          |  | <b>Annual profit increase (assuming 260 days) (bn)</b>    | <b>\$26.78</b> | <b>\$27.79</b> | <b>\$27.68</b> | <b>\$29.69</b> | <b>\$31.29</b> | <b>\$31.30</b> | <b>\$32.24</b> | <b>\$32.73</b> | <b>\$33.52</b> |
| 10         | Operating Costs                                    | Non-CLS cost per trade (4)                                | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         | \$3.70         |
| 11         |  | CLS cost per trade (4)                                    | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         | \$1.30         |
| 12         |  | CLS saving per trade                                      | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         | \$2.40         |
| 13         |  | Number of trades CLS settles per day (5)                  | 625,000        | 700,000        | 775,000        | 850,000        | 925,000        | 1,000,000      | 1,075,000      | 1,150,000      | 1,225,000      |
| 14         |  | Daily saving  | \$1,500,000    | \$1,680,000    | \$1,860,000    | \$2,040,000    | \$2,220,000    | \$2,400,000    | \$2,580,000    | \$2,760,000    | \$2,940,000    |
| 15         | <b>Annual Cost Saving (assuming 260 days) (bn)</b> | <b>\$0.390</b>  | <b>\$0.437</b> | <b>\$0.484</b> | <b>\$0.530</b> | <b>\$0.577</b> | <b>\$0.624</b> | <b>\$0.671</b> | <b>\$0.718</b> | <b>\$0.764</b> |                |
| 16         | Liquidity / Net Funding Costs                      | Gross CLS system daily trade volume (bn) (6)              | \$5,083        | \$5,417        | \$5,545        | \$6,118        | \$6,637        | \$6,839        | \$7,266        | \$7,613        | \$8,059        |
| 17         |  | Reduction in net funding (7)                              | 90%            | 90%            | 90%            | 90%            | 90%            | 90%            | 90%            | 90%            | 90%            |
| 18         |  | Daily liquidity saving (bn)                               | \$4,575        | \$4,875        | \$4,991        | \$5,506        | \$5,973        | \$6,155        | \$6,540        | \$6,852        | \$7,253        |
| 19         |  | % financed externally (8)                                 | 10%            | 10%            | 10%            | 10%            | 10%            | 10%            | 10%            | 10%            | 10%            |
| 20         |  | Daily external liquidity saving (bn)                      | \$457          | \$488          | \$499          | \$551          | \$597          | \$616          | \$654          | \$685          | \$725          |
| 21         |  | Annual external liquidity saving (assuming 260 days) (bn) | \$118,942      | \$126,750      | \$129,760      | \$143,163      | \$155,308      | \$160,038      | \$170,032      | \$178,151      | \$188,573      |
| 22         |  | Assumed Annualized Labor Rate (9)                         | 0.15%          | 0.15%          | 0.15%          | 0.15%          | 0.15%          | 0.15%          | 0.15%          | 0.15%          | 0.15%          |
| 23         | <b>Annual Liquidity Saving</b>                     | <b>0.66</b>   | <b>0.71</b>    | <b>0.72</b>    | <b>0.80</b>    | <b>0.87</b>    | <b>0.89</b>    | <b>0.95</b>    | <b>0.99</b>    | <b>1.05</b>    |                |
| 24         | <b>Total Annual Savings in Variable Costs (bn)</b> |   | <b>\$27.84</b> | <b>\$28.93</b> | <b>\$28.89</b> | <b>\$31.02</b> | <b>\$32.73</b> | <b>\$32.81</b> | <b>\$33.86</b> | <b>\$34.44</b> | <b>\$35.34</b> |

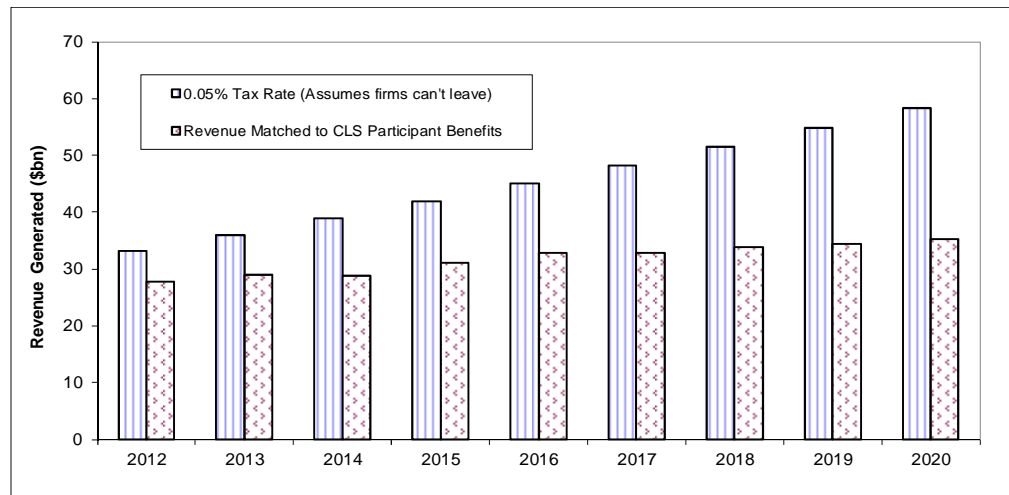
\* Settlement volume is different from, and roughly twice the size of traded volume. For details of the differences and methodology for converting one into another, see <http://www.cls-group.com/SiteCollectionDocuments/CLS%20market%20share%20Feb%202011.pdf>

Sources:

- (1) CLS Group, Author's Calculations
- (2) Spratt (2002), Rabbobank, 27th September 2011
- (3) CLS Group
- (4) Z/Yen Research Group via Spratt (2005)
- (5) CLS group <http://www.cls-group.com/Media/Pages/NewsArticle.aspx?id=85>
- (6) CLS group, CLS Market share February 2011
- (7) CLS group via Spratt (2005)
- (8) Bank of England (2003) via Spratt 2005; Bank of England: 2011 Financial Stability Report
- (9) Over night Libor, Google Finance, 27th September 2011

Table 3 estimates that tax revenue will reach, but not exceed, \$27.12 billion this year rising to \$35.34 billion by the end of the decade. Limiting tax revenue to these figures means that revenue would start at about 84% of the revenue that would be generated by a tax of 0.005 per cent (as shown in table 2) and would end up at around 61 per cent of such revenue at the end of the decade. The levels and growth profile for tax revenue under the two scenarios are shown below in chart 1.

*Figure 4 Differing Revenue Estimates from a CTT*



The revenue possible when avoidance is considered grows slower than the 0.005 per cent tax rate and no avoidance scenario, despite increases in the market share of the CLS system, because the bid/ask spread is assumed to compress further, reducing the profits of the participating firms and limiting the amount of revenue that could be extracted from them. Those assumptions of the bid/ask spread are shown on row 3 of table 3.

Using the estimates for foreign exchange volume and CLS market share derived shown in table 2, as well as the calculated future benefits to participants in table 3, table 4 calculates the maximum possible rate chargeable to keep revenue from exceeding quantifiable benefits under the scenario of simultaneous multilateral adoption of the CTT. The simulations assume adoption of the CTT this year and calculate the rate chargeable for each year up to 2020.

Figure 5: Maximum Rate Chargeable with Simultaneous Global Adoption

|   |                    | 2012           | 2013           | 2014           | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
|---|--------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| FX Turnover<br>Volume by<br>Currency (\$bn) * | US dollar          | 516276         | 549178         | 582079         | 614981         | 647882         | 680784         | 713686         | 746587         | 779489         |
|   | Euro               | 239550         | 256540         | 273530         | 290520         | 307510         | 324500         | 341490         | 358480         | 375470         |
|   | Japanese yen       | 113372         | 121070         | 128768         | 136466         | 144164         | 151862         | 159560         | 167258         | 174956         |
|   | Pound sterling     | 76179          | 79497          | 82815          | 86133          | 89450          | 92768          | 96086          | 99404          | 102722         |
|   | Australian dollar  | 47412          | 51304          | 55197          | 59089          | 62982          | 66874          | 70767          | 74659          | 78551          |
|   | Swiss franc        | 39477          | 41972          | 44468          | 46963          | 49459          | 51954          | 54450          | 56945          | 59440          |
|   | Canadian dollar    | 32860          | 35687          | 38515          | 41343          | 44170          | 46998          | 49826          | 52653          | 55481          |
|   | Hong Kong dollar   | 15206          | 16218          | 17229          | 18240          | 19251          | 20263          | 21274          | 22285          | 23297          |
|   | Swedish krona      | 13650          | 14343          | 15035          | 15728          | 16421          | 17114          | 17806          | 18499          | 19192          |
|   | New Zealand dollar | 10400          | 11093          | 11785          | 12478          | 13170          | 13862          | 14555          | 15247          | 15940          |
|   | Korean won         | 9449           | 10307          | 11165          | 12023          | 12881          | 13739          | 14597          | 15455          | 16313          |
|   | Singapore dollar   | 9039           | 9860           | 10681          | 11502          | 12324          | 13145          | 13966          | 14787          | 15608          |
|   | Norwegian krone    | 8417           | 8642           | 8867           | 9092           | 9317           | 9542           | 9767           | 9992           | 10217          |
|   | Mexican peso       | 7848           | 8379           | 8910           | 9441           | 9971           | 10502          | 11033          | 11563          | 12094          |
|   | South African rand | 4514           | 4735           | 4956           | 5177           | 5398           | 5619           | 5841           | 6062           | 6283           |
|   | Danish krone       | 2935           | 2935           | 2935           | 2935           | 2935           | 2935           | 2935           | 2935           | 2935           |
| Israeli new shekel                            | 957                | 1028           | 1099           | 1170           | 1240           | 1311           | 1382           | 1453           | 1523           |                |
| Total (\$bn)                                  |                    | 1147543        | 1222789        | 1298035        | 1373281        | 1448527        | 1523773        | 1599019        | 1674265        | 1749511        |
| CLS Market Share                              |                    | 59%            | 60%            | 61%            | 63%            | 64%            | 65%            | 66%            | 67%            | 68%            |
| Total Volume in CLS (\$bn)                    |                    | 678689         | 737167         | 797364         | 859281         | 922918         | 988275         | 1055352        | 1124149        | 1194666        |
| Adjusted Total** in CLS (\$bn)                |                    | 661722         | 718738         | 777430         | 837799         | 899845         | 963569         | 1028969        | 1096045        | 1164799        |
| Calculated Benefits to Participants (\$bn)    |                    | 27.8           | 28.9           | 28.9           | 31.0           | 32.7           | 32.8           | 33.9           | 34.4           | 35.3           |
| <b>Maximum rate chargeable (%)</b>            |                    | <b>0.0042%</b> | <b>0.0040%</b> | <b>0.0037%</b> | <b>0.0037%</b> | <b>0.0036%</b> | <b>0.0034%</b> | <b>0.0033%</b> | <b>0.0031%</b> | <b>0.0030%</b> |

\* Assuming 260 working days per year = Daily total \* percentage of volume accounted for by currency \* 260. Data for 2004, 2007 and 2010 sourced from BLS. Other years interpolated or forecasted.

\*\* Assuming 2.5% decline in volumes after imposition of tax on CLS system

Table 4 estimates that initially the tax rate would have to be set at 0.0042 per cent in order to keep the revenue generated below the level of quantifiable benefits of the firms in the CLS system. Furthermore, that rate drops to 0.003 per cent the end of the decade.

### Governance in a multilateral system

If a CTT was implemented in a coordinated fashion across the main currency blocks of the world and the use of the funds was determined at the global level, this would raise a number of difficult governance issues. The fate of the 'power to tax', one of the key attributes of the modern nation state, in an era of globalization is one the pressing issues that humanity faces. Tax sovereignty is shaped and constrained in important ways by the international tax regime which has gradually evolved from the 1920s, when it was solely concerned with the avoidance of double taxation, up to the present era of international tax competition. (Rixen, 2008)

The imposition of any global tax on any instrument for any purpose is likely to be resisted strongly by many nations, including the United States, on the grounds that no supranational authority has the right to impose taxes on their citizens. This is a key tension that is highlighted in the choices humanity must make about which

“feasible globalization” we choose. As Rodrick (2002) lays out, the nation-state system, democratic politics, and full economic integration are mutually incompatible. Of the three, at most two can be had together. The Bretton Woods/GATT regime was successful because its architects subjugated international economic integration to the needs and demands of national economic management and democratic politics. A renewed "Bretton-Woods compromise" would preserve some limits on integration, while crafting better global rules to handle the integration that can be achieved. But this would still leave a tension between international taxation on the one hand and the democratic nation state as the dominant political unit on the other. Some authors have pointed to the CTT as the starting point of a new international system, arguing that action at an international level would form the centrepiece of transformative international policy or an “icebreaker in international law”. (Book, 2005)

Even if it was agreed that one central body was to receive and allocate the money generated by a CTT, which one would it be? While it is beyond the scope of this paper to address each of the multilateral institutions that could be expected to receive the funds from a multilateral CTT, it is clear that all the existing multilateral bodies have their own faults in terms of coverage, representation and operational capacity. (Buir, 2005; Truman, 2006).

Furthermore, there is a serious public relations issue with any international body, especially the UN, suggesting international taxes whose revenue would be controlled by the institution itself. This would be seen as an attempt by the institution to generate revenues that were not directly controlled by member states. Many would claim this was not an altruistic attempt to improve the international system but a self-interested initiative to further the goals and interests of the institution itself along the lines of Public Choice theory. (Downs, 1957)

There is always the option of creating a new development body, funded almost solely through CTT revenues. Patomaki and Deny (2002) propose a Currency Transactions Tax Organization (CTTO), which would be established in the first phase of the actual implementation of a CTT at the international level, which would manage the income from the CTT and decide how the money is used. Given the emphasis in this paper on the using the CLS system, the leadership of the organization and the representation of individual countries within it would be controversial issues, especially in the light of existing inadequacies of representation and the fact that only 17 currencies would be involved if the CTT was implemented today. Perhaps a greater issue is that this would mean the addition of yet another intergovernmental development organization exacerbating the existing fragmentation of the development finance world that contributes, in part, to

disappointing development results achieved in recent times. (United Nations, 1999, 2001, 2009, 2011). Despite this concern, some authors have greater hopes for the catalytic impact of the creation of a new international body to administer a global currency tax. Denys (2004) suggests that a global CTT and its administering institution could be an easily recognizable example of post-sovereign legal principles that enable efficient re-regulation and taxation in the world economy.

Those hopes seem ambitious. Certainly, a political realist would suggest that a decentralized structure would be the way forward if all currencies were to be involved. This would avoid being perceived as an encroachment on countries' fiscal sovereignty, presenting proposals for global taxation in support of development as financing tools that are nationally applied but internationally coordinated. However, global agreement even on a decentralized system is highly unlikely and any CTT would most likely begin with unilateral implementation that is then gradually adopted by other currency zones. The later part of this paper looks at possible rates that could be charged and the revenue that could be generated by the unilateral channel in detail, but it is important to discuss how the revenues would be used.

While there are no CTTs in place anywhere in the world<sup>11</sup> at least 40 countries have experimented with FTTs of one sort or the other over the years (Beitler, 2010). The United States and other countries use FTT revenues to fund market regulators (the SEC), while countries like the UK put revenues into public coffers. Other countries have earmarked revenues for specific non-regulator expenditure. Examples include Peru, where the funds are meant for emergency measures during hyperinflation; Brazil which chooses to fund healthcare and Chile which uses the money generated to fund the bailout of financial institutions (Schmidt and Bhushan, 2011). Therefore, despite the inherently international nature of currency transactions, and the substantial advocacy efforts that would be forthcoming from civil society, it seems likely that some of the revenue generated would go towards domestic priorities and only the rest may be used for development issues.

## **Bilateral Adoption – What Rates Could be Charged?**

### Assuming participants won't leave the system

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<sup>11</sup> The closest contenders are in Brazil, which has a tax called *impostosobreoperações de crédito, câmbio e seguro (IOF)* which is imposed when foreign currency is converted into Reals, and in Chile, which experimented with the unremunerated reserve requirement.

In theory, without the possibility of participants leaving the CLS system, a country could levy a large tax on the transactions in its currency. The only constraint would be the market reaction to the imposition of such a tax and the possible damage to sectors of the real economy that need to use the foreign exchange markets. Both risks would be hard to judge a priori so it likely that any tax would initially be levied at a very low rate, and then raised gradually to a level judged the maximum rate consistent with perceived national interest. The revenue generated at different taxation rates for a section of years is shown in table 5 below. The table assumes initial introduction of a miniscule tax rate of 0.001 per cent which is then raised in stages to the probably unachievable 1 per cent.

Figure 6: Revenue each country to generate through a CTT of different rate in 2012, 2015 and 2020.

|  |                    | 2012   |        |       |        | 2015   |        |        |       | 2020   |        |        |        |       |        |        |
|--|--------------------|--------|--------|-------|--------|--------|--------|--------|-------|--------|--------|--------|--------|-------|--------|--------|
|  |                    | 0.001% | 0.005% | 0.05% | 0.5%   | 1%     | 0.001% | 0.005% | 0.05% | 0.5%   | 1%     | 0.001% | 0.005% | 0.05% | 0.5%   | 1%     |
| Revenue by<br>Currency, Year<br>and Rate<br>Charged (\$bn) | US dollar          | 3.0    | 14.9   | 148.9 | 1488.5 | 2977.1 | 3.1    | 15.7   | 157.5 | 1574.8 | 3149.7 | 3.4    | 17.2   | 171.9 | 1718.6 | 3437.3 |
|  | Euro               | 1.4    | 6.9    | 69.1  | 690.7  | 1381.3 | 1.5    | 7.3    | 73.1  | 730.7  | 1461.4 | 1.6    | 8.0    | 79.7  | 797.4  | 1594.9 |
|  | Japanese yen       | 0.7    | 3.3    | 32.7  | 326.9  | 653.8  | 0.7    | 3.5    | 34.6  | 345.8  | 691.6  | 0.8    | 3.8    | 37.7  | 377.4  | 754.8  |
|  | Pound sterling     | 0.4    | 2.2    | 22.0  | 219.6  | 439.3  | 0.5    | 2.3    | 23.2  | 232.4  | 464.7  | 0.5    | 2.5    | 25.4  | 253.6  | 507.2  |
|  | Australian dollar  | 0.3    | 1.4    | 13.7  | 136.7  | 273.4  | 0.3    | 1.4    | 14.5  | 144.6  | 289.2  | 0.3    | 1.6    | 15.8  | 157.8  | 315.7  |
|  | Swiss franc        | 0.2    | 1.1    | 11.4  | 113.8  | 227.6  | 0.2    | 1.2    | 12.0  | 120.4  | 240.8  | 0.3    | 1.3    | 13.1  | 131.4  | 262.8  |
|  | Canadian dollar    | 0.2    | 0.9    | 9.5   | 94.7   | 189.5  | 0.2    | 1.0    | 10.0  | 100.2  | 200.5  | 0.2    | 1.1    | 10.9  | 109.4  | 218.8  |
|  | Hong Kong dollar   | 0.1    | 0.4    | 4.4   | 43.8   | 87.7   | 0.1    | 0.5    | 4.6   | 46.4   | 92.8   | 0.1    | 0.5    | 5.1   | 50.6   | 101.2  |
|  | Swedish krona      | 0.1    | 0.4    | 3.9   | 39.4   | 78.7   | 0.1    | 0.4    | 4.2   | 41.6   | 83.3   | 0.1    | 0.5    | 4.5   | 45.4   | 90.9   |
|  | New Zealand dollar | 0.1    | 0.3    | 3.0   | 30.0   | 60.0   | 0.1    | 0.3    | 3.2   | 31.7   | 63.4   | 0.1    | 0.3    | 3.5   | 34.6   | 69.2   |
|  | Korean won         | 0.1    | 0.3    | 2.7   | 27.2   | 54.5   | 0.1    | 0.3    | 2.9   | 28.8   | 57.6   | 0.1    | 0.3    | 3.1   | 31.5   | 62.9   |
|  | Singapore dollar   | 0.1    | 0.3    | 2.6   | 26.1   | 52.1   | 0.1    | 0.3    | 2.8   | 27.6   | 55.1   | 0.1    | 0.3    | 3.0   | 30.1   | 60.2   |
|  | Norwegian krone    | 0.0    | 0.2    | 2.4   | 24.3   | 48.5   | 0.1    | 0.3    | 2.6   | 25.7   | 51.3   | 0.1    | 0.3    | 2.8   | 28.0   | 56.0   |
|  | Mexican peso       | 0.0    | 0.2    | 2.3   | 22.6   | 45.3   | 0.0    | 0.2    | 2.4   | 23.9   | 47.9   | 0.1    | 0.3    | 2.6   | 26.1   | 52.3   |
|  | South African rand | 0.0    | 0.1    | 1.3   | 13.0   | 26.0   | 0.0    | 0.1    | 1.4   | 13.8   | 27.5   | 0.0    | 0.2    | 1.5   | 15.0   | 30.1   |
|  | Danish krone       | 0.0    | 0.1    | 0.8   | 8.5    | 16.9   | 0.0    | 0.1    | 0.9   | 9.0    | 17.9   | 0.0    | 0.1    | 1.0   | 9.8    | 19.5   |
|  | Israeli new shekel | 0.0    | 0.0    | 0.3   | 2.8    | 5.5    | 0.0    | 0.0    | 0.3   | 2.9    | 5.8    | 0.0    | 0.0    | 0.3   | 3.2    | 6.4    |
|  | TOTAL (\$bn)       |        | 6.6    | 33.1  | 330.9  | 3308.6 | 6617.2 | 7.0    | 35.0  | 350.0  | 3500.4 | 7000.8 | 7.6    | 38.2  | 382.0  | 3820.1 |

Of course, such an objective assessment of the rate is likely to be a rather naïve expectation. In reality, the political economy of each country is likely to have an overwhelming influence on the rate charged in a CTT. Indeed it will have a heavy influence over whether countries adopt a CTT at all, not just over what rate they could charge once they do. A detailed study of the political cleavages of each country would be needed in order to make a definitive statement on whether a tax would be implemented and how high the rate would be. That is beyond the scope of this paper, but in its place it may be possible to provide a useful guide on this issue using measures of economic and political acceptability of taxation in each country.

### *The Political Acceptability of Taxation Index*

Given the recent embrace of many financial transaction taxes in Europe, it seems the Eurozone would be the most likely to be first to adopt a CTT. This supports the existing contention in the literature that if unilateral adoption of a CTT is to occur it will start in Europe. Susan George (2004) arrives at the following conclusion:

“The only hope I can see is that European governments, as a result of well-coordinated pressure applied by European citizens, decide to make Europe the first area where such a tax is applied. Acting on European states is feasible – tough to achieve, but feasible. Acting directly at the international level or begging banks and brokers to tax themselves is clearly impossible” (quoted in Book, 2005)

But apart from the possible European leadership it is unclear which currency is more likely than another, perhaps with the exception of the obvious opposition in the United States. To generate a guide to which currency blocks may join the CTT earlier or later than others, the author constructed an index of political acceptability of taxation (PAT) index. The PAT index has five components - two economic and three political.

The economic factors are Government Spending as % of GDP (the higher the more likely they are to accept a tax) and real GDP per capita (the lower it is the more likely they are to adopt a tax), both of which were sourced from the IMF database.

The first of the political factors is a measure of checks and balances on the executive contained within the Database of Political Institutions 2010 (for full details see Beck et al., 2001 and Keifer, 2010). The imposition of new taxes is usually harder the more “veto points” in the system. These veto points allow opposition parties to obstruct the process and provide an opportunity for special interests who oppose the tax to wield their influence and block it. Hence it is assumed that the greater the veto points the less likely that a new, controversial tax that hurts powerful financial interests is likely to be implemented.

The second measure complements the first: a Herfindahl Index of concentration amongst ruling parties in the legislature (for full details see Beck et al., 2001 and Keifer, 2010). This measure accounts for the fact that if a legislature is dominated by one party the checks and balances may be easier to overcome (through negotiation between fewer parties of dominance of the ruling parties in decision making bodies and committees). So this measure is seen as promoting a CTT if the power in the legislature is more concentrated (the Herfindahl Index is larger). Finally, the PAT includes an index of ethnolinguistic fragmentation (sourced from Alesina et al, 2003) which accounts for the strength of the social contract within societies that is a key

determinant of the political system's ability to tax economic activity. Hence, the more homogenous the country is the more likely they are to adopt a tax.

Data for 190 countries was collected. All five components for each country were normalized from 0 to 1<sup>12</sup> and a weighted average<sup>13</sup> was taken to create the index for the country<sup>14</sup>. Countries were then ranked by their weighted PAT score and assumed to adopt the CTT in that order.

Figure 7: Country PAT Scores

|                | Economic Variables              |                 | Political Variables |                               |                               | Weighted PAT Score | Weighted PAT Rank |
|----------------|---------------------------------|-----------------|---------------------|-------------------------------|-------------------------------|--------------------|-------------------|
|                | Government Spending as % of GDP | GDP per Capita* | Checks              | Concentration of Legislature* | Fractionalization of Society* |                    |                   |
| WEIGHT         | 25%                             | 25%             | 12.50%              | 12.50%                        | 25%                           |                    |                   |
| Eurozone       | -                               | -               | -                   | -                             | -                             | 1.00               | 1                 |
| South Africa   | 0.15                            | 0.47            | 0.76                | 0.48                          | 0.90                          | 0.57               | 2                 |
| Singapore      | 0.56                            | 0.04            | 0.76                | 0.52                          | 0.90                          | 0.56               | 3                 |
| New Zealand    | 0.50                            | 0.15            | 0.76                | 0.37                          | 0.51                          | 0.35               | 4                 |
| Israel         | 0.60                            | 0.17            | 0.33                | 0.12                          | 0.69                          | 0.31               | 5                 |
| Australia      | 0.46                            | 0.05            | 0.33                | 0.52                          | 0.69                          | 0.27               | 6                 |
| Japan          | 0.64                            | 0.13            | 0.60                | 0.44                          | 0.31                          | 0.25               | 7                 |
| United Kingdom | 0.40                            | 0.11            | 0.99                | 0.52                          | 0.31                          | 0.25               | 8                 |
| Norway         | 0.42                            | 0.03            | 0.10                | 0.29                          | 0.90                          | 0.22               | 9                 |
| Canada         | 0.41                            | 0.08            | 0.10                | 0.52                          | 0.69                          | 0.19               | 10                |
| Sweden         | 0.57                            | 0.09            | 0.10                | 0.16                          | 0.69                          | 0.17               | 11                |
| Korea          | 0.28                            | 0.19            | 0.76                | 0.52                          | 0.31                          | 0.11               | 12                |
| Denmark        | 0.62                            | 0.10            | 0.10                | 0.18                          | 0.51                          | 0.10               | 13                |
| United States  | 0.26                            | 0.05            | 0.33                | 0.52                          | 0.31                          | 0.03               | 14                |
| Hong Kong      | 0.01                            | 0.09            | 0.97                | 0.52                          | 0.14                          | 0.03               | 15                |
| Switzerland    | 0.05                            | 0.06            | 0.60                | 0.09                          | 0.51                          | 0.02               | 16                |
| Mexico         | 0.00                            | 0.34            | 0.10                | 0.52                          | 0.31                          | 0.01               | 17                |

\* Figure is 1 - percentile rank

The PAT provides some insight into which currency areas might follow the lead of the Eurozone and adopt a CTT. Countries with a higher PAT score could also be theoretically expected to charge higher rate on their unilateral CTT if there was no concern about participants leaving the system in response.

<sup>12</sup> In three of the measures: GDP per capita, the measure of checks and balances on the executive and the measure of ethnolinguistic fragmentation, the countries were given an inverse percentile rank to ensure that a larger value meant a greater favorability towards a CTT.

<sup>13</sup> The two economic variables each received a 25% weighting, as did the measure of ethnolinguistic fragmentation. The other two political variables are related and so they each received a weighting of 12.5% so as to avoid them having excessive influence on the final index

<sup>14</sup> The Euro was given a score of 1 as it is deemed likely to be the first mover given recent statements. 'Other countries' obviously had to be excluded from this exercise



Assuming participants will evade if tax revenue exceeds quantifiable benefits

Spratt (2005, 2006) makes the case that a CTT is perfectly implantable on a unilateral basis for any currency within the CLS system. His estimates for revenue if the Eurozone were to go it alone was about \$2.2 billion per year if a rate of 0.005 per cent was levied. His estimate for the UK was about \$1 billion for the same rate. If one currency adopting the CTT started a chain reaction drawing in other currencies as they see the feasibility and revenue potential of the tax, then sooner or later the tax revenue would exceed the quantifiable benefits to participant firms laid out above. This will mean that the tax rate that is chargeable by the early-adopters at the start may not be achievable later on as more and more of the CLS traffic is taxed. To model this scenario and estimate potential tax rates and revenue the first step is to lay out the size of each currency this year and the revenue potential if it unilaterally adopted a CTT at the rate of 0.005 per cent.

*Figure 8: Updated Revenue Estimates by Country, 2012*

| Currency              | Adjusted (1) Annual Value of Transactions (\$bns) | Annual revenue raised (\$bns) using rate of: |   |
|-----------------------|---|--|---|
|                       |   | 0.005%                                       | Annual revenue raised in the CLS (\$bns) () using rate of 0.05% and market share of |
|                       |   |  | 59%   |
| US dollar             | 503369  | 25.17  | 14.89   |
| Euro                  | 233561  | 11.68  | 6.91  |
| Japanese yen          | 110538  | 5.53   | 3.27  |
| Pound sterling        | 74275   | 3.71   | 2.20  |
| Australian dollar     | 46227   | 2.31   | 1.37  |
| Swiss franc           | 38490   | 1.92   | 1.14  |
| Canadian dollar       | 32038   | 1.60   | 0.95  |
| Hong Kong dollar      | 14826   | 0.74   | 0.44  |
| Swedish krona         | 13309   | 0.67   | 0.39  |
| New Zealand dollar    | 10140   | 0.51   | 0.30  |
| Korean won            | 9212  | 0.46   | 0.27  |
| Singapore dollar      | 8813  | 0.44   | 0.26  |
| Norwegian krone       | 8207  | 0.41   | 0.24  |
| Mexican peso          | 7652  | 0.38   | 0.23  |
| South African rand    | 4401  | 0.22   | 0.13  |
| Danish krone          | 2862  | 0.14   | 0.08  |
| Israeli new shekel    | 933   | 0.05   | 0.03  |
| <b>All currencies</b> | <b>1,118,853.95</b>                               | <b>55.94</b>                                 | <b>33.1</b>   |

(1) Assuming 260 working days per year = Daily total \* percentage of volume accounted for by currency \* 260. Data for 2004, 2007 and 2010 sourced from BLS. Other years interpolated or forecasted. Total then adjusted to assume 2.5% decline in volume of transactions when 0.005% tax is implemented

(2) Current CLS market share estimated at 59%

As one can see, due to the growth in FX markets the revenue from a tax on Euro transactions in the CLS system would be \$6.95 billion if implemented in 2012, up from \$2.2 billion in Spratt's original calculation. Likewise, a Sterling CTT in the CLS would now yield \$2.21 billion up from \$1 billion.

The table also shows that if every currency joined the tax then it would raise about \$33 billion per year. In that case the revenue raised would exceed the quantifiable benefit from staying in the CLS system (roughly \$28 billion), providing a powerful incentive to leave the system and hence avoid the tax. The actual maximum rate chargeable to remain below the \$28 billion is 0.0042 per cent as calculated in table 4 where simultaneous global adoption was considered.

But if we assume initial adoption in one currency block and then gradual adoption by others afterwards, how would the rate charged and revenue generated evolve as more countries implemented the CTT? If the tax is gradually imposed by more countries, at what point does the revenue taken from the firms exceed the benefits those same firms get from using the CLS system?

The key to answering this is the order which one assumes that the currencies adopt the tax. Columbia implementing a tax on the peso is not as consequential as the U.S. Dollar joining a CTT. As the CTT is adopted by more and more currencies, there would come a point when the volume of transactions in the system yielded revenue in excess of the benefit to the firms, estimated to be \$27.84 billion in 2012. At that point the rate charged must fall, otherwise an incentive to exit the system would be present. Indeed, in theory, initially the rate chargeable could be well above the rate of 0.005 per cent assumed by Spratt, as the entire \$27.84 billion would be available for capture by a small currency. Determining what rate could be charged by all CTT adherents depends on the order of currencies entering and the number and size of those already involved when a new currency is added. Different adoption orders are considered below

#### *Order by Size, Descending*

The first ordering is the one presented below, by size with the largest going first. The maximum rate chargeable is calculated based upon the total volume of transactions in the system as each currency joined from the largest (the U.S. Dollar) to the smallest. The table below shows those results:

Figure 9: Rate Chargeable as Countries Entering CTT in Descending Order of Size

| Order 1: By Size, Descending |   |  |                             |                                       |
|------------------------------|---|--|-----------------------------|---------------------------------------|
| Currency                     | Adjusted (1) Annual (2) Value of Transactions in the CLS System | Cumulative Adjusted (1) Annual (2) Value of Transactions in the CLS System | Maximum Tax rate Chargeable | Revenue Raised (\$ billions per year) |
| US dollar                    | 297707  | 297707   | 0.0094%                     | 27.84                                 |
| Euro                         | 138135  | 435842   | 0.0064%                     | 27.84                                 |
| Japanese yen                 | 65375   | 501217   | 0.0056%                     | 27.84                                 |
| Pound sterling               | 43928   | 545145   | 0.0051%                     | 27.84                                 |
| Australian dollar            | 27340   | 572485   | 0.0049%                     | 27.84                                 |
| Swiss franc                  | 22764   | 595249   | 0.0047%                     | 27.84                                 |
| Canadian dollar              | 18948   | 614197   | 0.0045%                     | 27.84                                 |
| Hong Kong dollar             | 8769  | 622966   | 0.0045%                     | 27.84                                 |
| Swedish krona                | 7871  | 630837   | 0.0044%                     | 27.84                                 |
| New Zealand dollar           | 5997  | 636834   | 0.0044%                     | 27.84                                 |
| Korean won                   | 5448  | 642283   | 0.0043%                     | 27.84                                 |
| Singapore dollar             | 5212  | 647495   | 0.0043%                     | 27.84                                 |
| Norwegian krone              | 4854  | 652349   | 0.0043%                     | 27.84                                 |
| Mexican peso                 | 4526  | 656874   | 0.0042%                     | 27.84                                 |
| South African rand           | 2603  | 659477   | 0.0042%                     | 27.84                                 |
| Danish krone                 | 1693  | 661170   | 0.0042%                     | 27.84                                 |
| Israeli new shekel           | 552   | 661722   | 0.0042%                     | 27.84                                 |

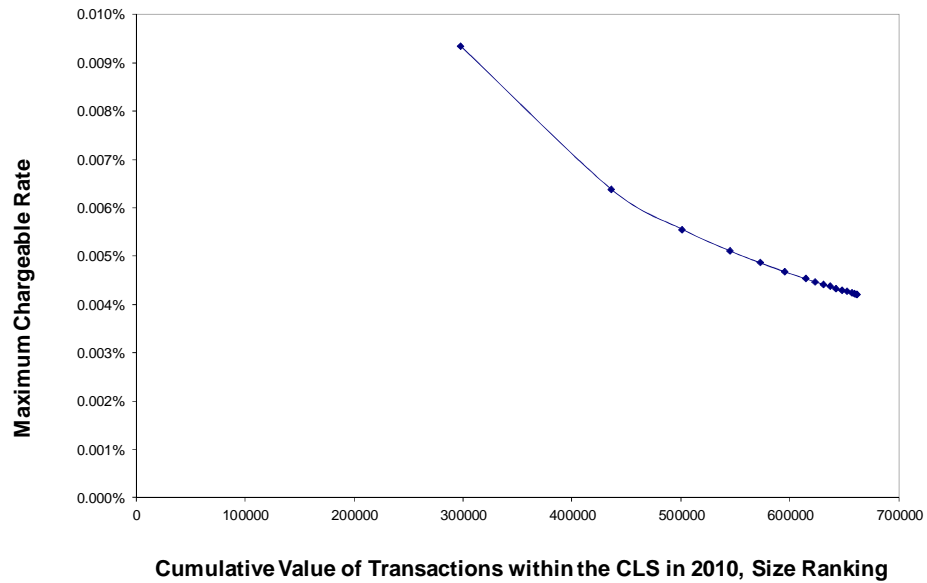
(1) Assuming 260 working days per year = Daily total \* percentage of volume accounted for by currency \* 260. Data for 2004, 2007 and 2010 sourced from BLS. Other years interpolated or forecasted. Total then adjusted to assume 2.5% decline in volume of transactions when 0.005% tax is implemented

(2) Current CLS market share estimated at 59%

If the U.S. Dollar was first to adopt the CTT, the U.S. would be able to charge around 0.0093 per cent and capture over \$27 billion in revenue without exceeding the estimated benefits that accrue to firms and therefore would not have to worry about an exodus from the CLS system. As other currencies adopt the CTT the rate then progressively falls to a low of 0.0042 per cent when the smaller currencies are being added near the bottom of the table.

The graph below tracks the rate chargeable as the number of transactions taxed rises. Notice how the dots get closer together as the size of the currency entering currency drops.

Figure 10: Gradual adoption of CT in descending order of size



While this order has the benefit of simplicity, it is highly unlikely that the U.S. would be the first to implement such a tax.

#### *Order by Size, Ascending*

An easy way to create a more interesting picture is to reverse the order and have the countries join in ascending order of size. The table below shows those results.

Figure 11: Rate Chargeable as Countries Entering CTT in Descending Order of Size

**Order 2: By Size, Ascending**

| Currency           | Adjusted (1) Annual (2) Value of Transactions in the CLS System | Cumulative Adjusted (1) Annual (2) Value of Transactions in the CLS System | Maximum Tax rate Chargeable | Revenue Raised (\$ billions per year) |
|--------------------|---|--|-----------------------------|---------------------------------------|
| Israeli new shekel | 552   | 552  | 5.0421%                     | 27.84                                 |
| Danish krone       | 1693  | 2245   | 1.2400%                     | 27.84                                 |
| South African rand | 2603  | 4848   | 0.5742%                     | 27.84                                 |
| Mexican peso       | 4526  | 9374   | 0.2970%                     | 27.84                                 |
| Norwegian krone    | 4854  | 14227  | 0.1957%                     | 27.84                                 |
| Singapore dollar   | 5212  | 19440  | 0.1432%                     | 27.84                                 |
| Korean won         | 5448  | 24888  | 0.1118%                     | 27.84                                 |
| New Zealand dollar | 5997  | 30885  | 0.0901%                     | 27.84                                 |
| Swedish krona      | 7871  | 38757  | 0.0718%                     | 27.84                                 |
| Hong Kong dollar   | 8769  | 47525  | 0.0586%                     | 27.84                                 |
| Canadian dollar    | 18948   | 66474  | 0.0419%                     | 27.84                                 |
| Swiss franc        | 22764   | 89238  | 0.0312%                     | 27.84                                 |
| Australian dollar  | 27340   | 116577   | 0.0239%                     | 27.84                                 |
| Pound sterling     | 43928   | 160506   | 0.0173%                     | 27.84                                 |
| Japanese yen       | 65375   | 225881   | 0.0123%                     | 27.84                                 |
| Euro               | 138135  | 364015   | 0.0076%                     | 27.84                                 |
| US dollar          | 297707  | 661722   | 0.0042%                     | 27.84                                 |

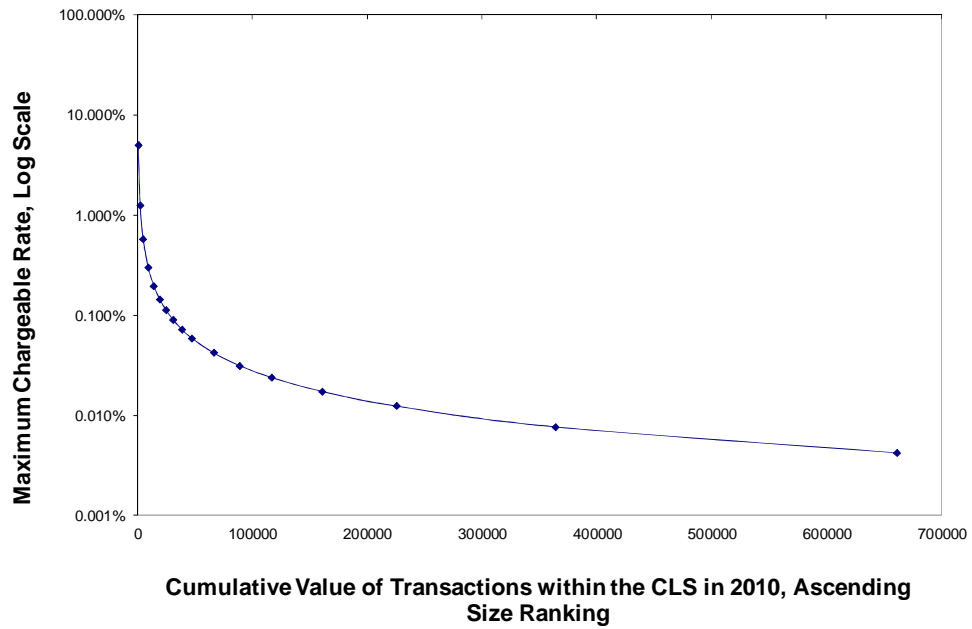
(1) Assuming 260 working days per year = Daily total \* percentage of volume accounted for by currency \* 260. Data for 2004, 2007 and 2010 sourced from BLS. Other years interpolated or forecasted. Total then adjusted to assume 2.5% decline in volume of transactions when 0.005% tax is implemented

(2) Current CLS market share estimated at 59%

As one can see, the rate that the small currencies that join first could charge is very high relative to the usual suggestion for CTT rates, so high in fact to probably be unrealistic. In any case, the rate falls only very slowly as each currency only adds a small amount of transactions. When the Dollar finally joins, the rate falls to 0.0042 per cent, the same as the bottom of the previous table because at that point in both orders all the currencies are involved and the number of transactions is identical.

The graph below tracks the rate chargeable as the number of transactions taxed rises. Notice in this chart how the dots get progressively further apart as the size of each currency adopting the CTT grows. The difference in chargeable rates is so great that a log scale had to be used on the y-axis.

Figure 12: Gradual adoption of CT in ascending order of size



*Using the PAT to determine the order in which countries would adopt the CTT*

A far more interesting and realistic ordering of countries would be to assume that they adopt a CTT in order of their rank in the above-mentioned Political Acceptability of Taxation Index. The table below runs with that assumption to determine the rate achievable as each currency entered.

Figure 13: Rate Chargeable as Countries Entering CTT in PAT Index Rank Order

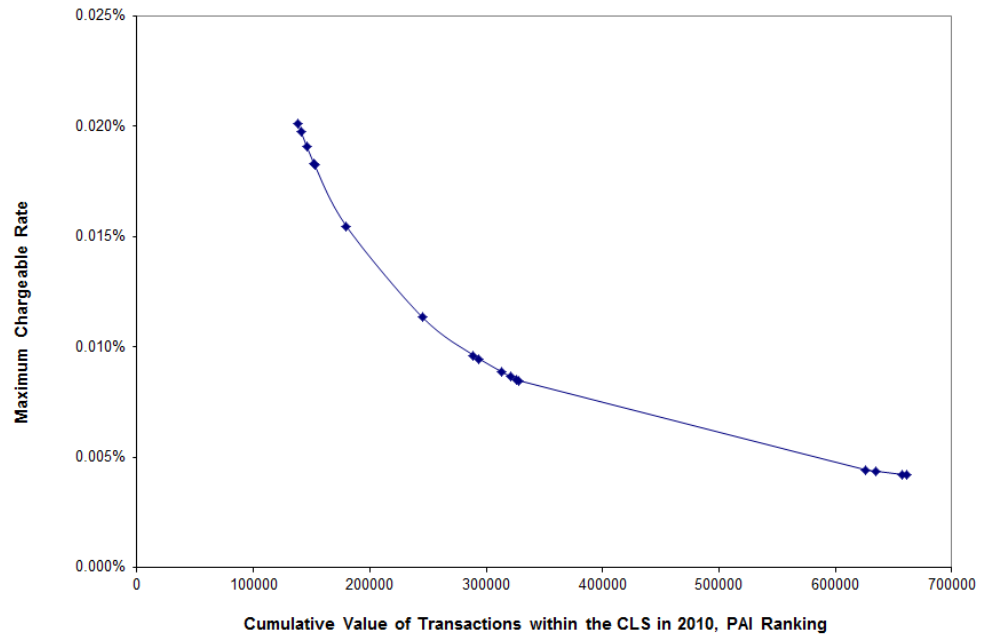
| Order 3: By PAI Ranking |                    |                    |   |  |                             |                                       |
|-------------------------|--------------------|--------------------|---|--|-----------------------------|---------------------------------------|
| Weighted PAT Rank       | Weighted PAT Score | Currency           | Adjusted (1) Annual (2) Value of Transactions in the CLS System | Cumulative Adjusted (1) Annual (2) Value of Transactions in the CLS System | Maximum Tax rate Chargeable | Revenue Raised (\$ billions per year) |
| 1                       | 1.00               | Euro               | 138135  | 138135   | 0.0202%                     | 27.84                                 |
| 2                       | 0.57               | South African rand | 2603  | 140738   | 0.0198%                     | 27.84                                 |
| 3                       | 0.56               | Singapore dollar   | 5212  | 145950   | 0.0191%                     | 27.84                                 |
| 4                       | 0.35               | New Zealand dollar | 5997  | 151948   | 0.0183%                     | 27.84                                 |
| 5                       | 0.31               | Israeli new shekel | 552   | 152500   | 0.0183%                     | 27.84                                 |
| 6                       | 0.27               | Australian dollar  | 27340   | 179839   | 0.0155%                     | 27.84                                 |
| 7                       | 0.25               | Japanese yen       | 65375   | 245215   | 0.0114%                     | 27.84                                 |
| 8                       | 0.25               | Pound sterling     | 43928   | 289143   | 0.0096%                     | 27.84                                 |
| 9                       | 0.22               | Norwegian krone    | 4854  | 293996   | 0.0095%                     | 27.84                                 |
| 10                      | 0.19               | Canadian dollar    | 18948   | 312945   | 0.0089%                     | 27.84                                 |
| 11                      | 0.17               | Swedish krona      | 7871  | 320816   | 0.0087%                     | 27.84                                 |
| 12                      | 0.11               | Korean won         | 5448  | 326264   | 0.0085%                     | 27.84                                 |
| 13                      | 0.10               | Danish krone       | 1693  | 327957   | 0.0085%                     | 27.84                                 |
| 14                      | 0.03               | US dollar          | 297707  | 625664   | 0.0044%                     | 27.84                                 |
| 15                      | 0.03               | Hong Kong dollar   | 8769  | 634432   | 0.0044%                     | 27.84                                 |
| 16                      | 0.02               | Swiss franc        | 22764   | 657196   | 0.0042%                     | 27.84                                 |
| 17                      | 0.01               | Mexican peso       | 4526  | 661722   | 0.0042%                     | 27.84                                 |

(1) Assuming 260 working days per year = Daily total \* percentage of volume accounted for by currency \* 260. Data for 2004, 2007 and 2010 sourced from BLS. Other years interpolated or forecasted. Total then adjusted to assume 2.5% decline in volume of transactions when 0.005% tax is implemented

(2) Current CLS market share estimated at 59%

The graph below shows how the rate would evolve as the Eurozone countries adopt it and is then followed by other currencies.

Figure 14: Gradual adoption of CTT in ascending order of size



### Forecasting the size of the foreign exchange market and the actual path tax rates would take

The above simulations of the chargeable rate under different orders of country CTT adoption were carried with a “static” assumption: the maximum revenue that could be raised by any number of countries was set at the estimated benefit to firms in the system in 2012. But that figure, \$27.84 billion, is not stable. It is dynamic and would change as the foreign exchange market evolves, the CLS market share rises and as the profit and cost structures of the firms in the CLS system change over time. Table 3 forecasted this evolution out to 2020, when the benefits to firms in the system was estimated to be over \$35 billion. To model the actual rates that are chargeable the maximum revenue in each year has to be set equal to the forecasted benefits of the participating firms. Furthermore, if one is to assume at all 17 countries will adopt a CTT by 2020, then it must be assumed that, as well as adopting the tax in order of PAT index rank, more than one currency must adopt the CTT each year. The table below puts all the previous forecasts together with those assumptions to produce a picture how the rate and the revenue would change as the CTT gained popularity up to full adoption by 2020.



Figure 15: Dynamic forecasts of rate and revenue during gradual CTT adoption

| Year   | 2012               | 2013                                   | 2014                                     | 2015                              | 2016                              | 2017                             | 2018                       | 2019                          | 2020                        |        |
|--|--------------------|--|--|-----------------------------------|-----------------------------------|----------------------------------|----------------------------|-------------------------------|-----------------------------|--------|
| Forecasted Benefits / Total Revenue Raised (\$bns) | 27.84              | 28.93                                  | 28.89                                    | 31.02                             | 32.73                             | 32.81                            | 33.86                      | 34.44                         | 35.34                       |        |
| Countries Entering                                 | Euro               | South African rand<br>Singapore dollar | New Zealand dollar<br>Israeli new shekel | Australian dollar<br>Japanese yen | Pound sterling<br>Norwegian krone | Canadian dollar<br>Swedish krona | Korean won<br>Danish krone | US dollar<br>Hong Kong dollar | Swiss franc<br>Mexican peso |        |
| PAT RANK   | Currency           |  |  |                                   |                                   |                                  |                            |                               |                             |        |
| 1  | Euro               | 138135                                 | 150790                                   | 163825                            | 177238                            | 191030                           | 205200                     | 219749                        | 234677                      | 249983 |
| 2  | South African rand |  | 2783                                     | 2968                              | 3159                              | 3354                             | 3554                       | 3758                          | 3968                        | 4183   |
| 3  | Singapore dollar   |  | 5796                                     | 6397                              | 7017                              | 7656                             | 8312                       | 8987                          | 9680                        | 10391  |
| 4  | New Zealand dollar |  |  | 7058                              | 7612                              | 8181                             | 8766                       | 9366                          | 9982                        | 10612  |
| 5  | Israeli new shekel |  |  | 658                               | 714                               | 771                              | 829                        | 889                           | 951                         | 1014   |
| 6  | Australian dollar  |  |  |                                   | 36049                             | 39125                            | 42288                      | 45538                         | 48875                       | 52298  |
| 7  | Japanese yen       |  |  |                                   | 83254                             | 89557                            | 96031                      | 102677                        | 109494                      | 116483 |
| 8  | Pound sterling     |  |  |                                   |                                   | 55568                            | 58663                      | 61831                         | 65074                       | 68391  |
| 9  | Norwegian krone    |  |  |                                   |                                   | 5788                             | 6034                       | 6285                          | 6541                        | 6802   |
| 10   | Canadian dollar    |  |  |                                   |                                   |                                  | 29720                      | 32063                         | 34469                       | 36938  |
| 11   | Swedish krona      |  |  |                                   |                                   |                                  | 10822                      | 11458                         | 12110                       | 12778  |
| 12   | Korean won         |  |  |                                   |                                   |                                  |                            | 9393                          | 10117                       | 10861  |
| 13   | Danish krone       |  |  |                                   |                                   |                                  |                            | 1889                          | 1922                        | 1954   |
| 14   | US dollar          |  |  |                                   |                                   |                                  |                            |                               | 488748                      | 518973 |
| 15   | Hong Kong dollar   |  |  |                                   |                                   |                                  |                            |                               | 14589                       | 15511  |
| 16   | Swiss franc        |  |  |                                   |                                   |                                  |                            |                               |                             | 39575  |
| 17   | Mexican peso       |  |  |                                   |                                   |                                  |                            |                               |                             | 8052   |
| Total Turnover with CTT                            | 138135             | 159370                                 | 180907                                   | 315042                            | 401028                            | 470218                           | 513884                     | 1051197                       | 1164799                     |        |
| Rate Chargable                                     | 0.0202%            | 0.0182%                                | 0.0160%                                  | 0.0098%                           | 0.0082%                           | 0.0070%                          | 0.0066%                    | 0.0033%                       | 0.0030%                     |        |

Table 9 estimates that the maximum chargeable rate will have dropped to 0.002 per cent by 2020. As discussed above, this is driven by the reduced profitability of firms in the CLS which causes the benefits that accrue to them to grow slower than FX volumes within the CLS system.

## **Conclusion:**

Multiple researchers have concluded that financial transaction taxes could play a major role in raising needed funds for development. Within the sphere of the FTTs, it is taxes on currencies that have the best chance of both being implemented and having the funds directed to development, due their international nature and the likelihood that fiscal pressure will keep any revenue from domestic FTTs in the individual countries. Opponents of CTTs used to say that they were impossible to implement and would damage markets. But the existence of other FTTs and the structure of the foreign exchange market today make both arguments obsolete.

The last argument to overcome is about whether implementation at the local level is possible. Of course, a coordinated global move towards a small tax on currency transactions would be an ideal scenario. If a tax rate of 0.005 per cent was used, this would generate an estimated \$33 billion this year and around \$58 billion in 2020.

But this paper has laid out the path that a gradual adoption of a tax, country by country, could take. Early adopters would have an advantage as they would be able to capture a large slice of the total taxable amount within the system. After the first currency adopted the CTT successfully, there would likely be a domino effect as countries followed its lead. Convincing all adopters to give the funds to development projects would however, be a challenge politically.

The case for a CTT should be considered in the broader debate about future policy in both the spheres of international development and financial markets. A CTT could play a minor yet valuable role in reducing the scale of the financial sector and the leverage employed within it, if combined with suitable complementary policies, some of which are mentioned above. Chapter three makes the case for radical reform in another policy sphere: employer-based pensions. The reforms detailed below would go a long way to

enhancing retirement security for workers but should also have a calming influence on financial markets.

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