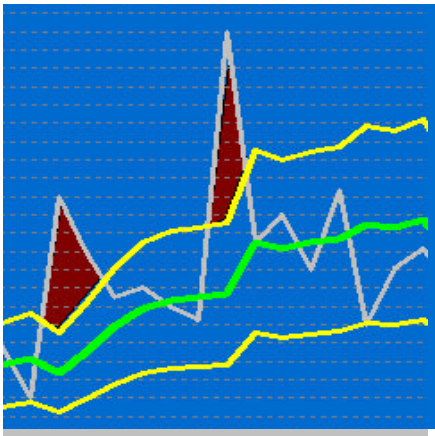

Chapter 4: Implementation
How could the PFTT be realized?

In this Chapter, I shall examine the question how a PFTT could eventually be realized. The focus will be on technical aspects that have to be observed when implementing the tax. This centers around the question, which provisions must be made in order to limit potential evasive reactions to the tax.

◗ **Principles of taxation.** A consistent approach to taxing foreign exchange transactions requires proper principles of action. For instance one has to decide at which point the tax should be levied—when concluding a contract at the trading desk, when entering the trade into the books of account, or when the trade is finally settled. Moreover it has to be clarified who should be responsible for withholding the tax and to whom the tax is to be paid. These questions require both theoretical and practical considerations. It is also important that the tax be simple to administer, i.e. tax collection should be tailored to the conditions of the market in order to keep the costs of administration as low as possible.

The answer to these questions hinges not only on the transaction technology, but also on the legal possibilities to assess potential taxpayers and to enforce probable sanctions. One must keep in mind that the PFTT is a unilaterally levied tax (for instance by the EU). This could offer options for taxpayers to avoid the tax by a single legal action that transfers his/her activity to a place outside the jurisdiction of the PFTT. It is also illusory to count on the willingness of non-taxing governments to cooperate in this matter as long as they can expect to draw benefits from these evasive actions.

Peter Kenen (1996) has presented a remarkably detailed proposal for the realization of a PFTT. In his paper he discusses a number of important principles of taxation that are relevant in this context.

As to the tax object, Kenen raises the question, at which point the tax should be levied: (i) when the dealing is struck, (ii) when the contract is issued and entered into the books of account at the back office, or (iii) when the trade is settled, i.e. payment is effected. He dismisses the book because he (rightly) deems that this can be kept at any place on earth and the tax could therefore be avoided.[3] However the back office is the place where the contract is usually verified and finally confirmed. It is often also the place where a proper judicial paper (or electronic) trail will start.[4]

Moreover Kenen discounts the possibility to levy the tax at the point of settlement. He mentions two reasons for this:

1. First, foreign exchange transactions are always netted before being entered into an official settlement system, i.e. all claims and obligations in the various currencies that materialize over the day will continuously be cleared "in house". Only the net position at the end of the trading day will be put into an official clearing or settlement system in order to close the open position.
2. And second, the national settlement systems are unable to distinguish transactions in accordance with their underlying business. A payment order to the German settlement system RTGS^{Plus} for instance could be one leg of a foreign exchange transaction (say, the settlement of a liability in euros that corresponds to a purchase of yen); yet it could equally correspond to a payment in euro for a commercial transaction *within* the European Monetary Union.

For these reasons, Kenen decides that the point of taxation should be the trading desk.

By contrast, Rodney Schmidt (1999, 2001) has recently argued that the tax could be levied at the point of settlement (more precisely: payment), which would better correspond to the nature of foreign exchange markets and possess the better perspectives in the future. He points to a number of particularities of foreign exchange markets and their developments that aim at discounting Kenen's arguments.

An examination of the advantages and disadvantages of both approaches, different as they are, requires a deeper analysis of the transactions technology used in foreign exchange markets, which I shall focus on in this Chapter. Before doing so I have to discuss some further taxing principles.

As to the definition of the taxable sub-

[3] Bookkeeping of foreign exchange transactions is of course made electronically and the various trading desks are connected with the back office through networking. There is a trend toward concentrating all bookkeeping onto one platform (for instance Citibank administers all its worldwide foreign exchange trades in London), but this type of concentration does not offer an advantage for levying the tax because bookkeeping could of course equally be effected in New York.

[4] For the OTC business, and in particular for the „open outcry" by which traders or brokers handle multiple businesses often simultaneously at the telephone, there is a risk of misapprehension that will have to be clarified by the back office through bilateral exchanges of data (and eventually on the basis of telephone tapings). This is the exact point where the tax would have to be levied because auditing is possible only from this point on. Kenen, who opts for the trading desks as the point of taxation, realizes this difficulty and requires that the final contract confirmed by the back office and all pertaining documentation be transferred back to the trading desk. He also mentions the possibility that a trading desks could be located in a country whose legislation forbids this transmission of information, but he overlooks that this could also be true for the back office.

ject, i.e. of the persons or companies liable to pay the tax (the taxpayer), Kenen develops two principles:

- *The national principle*.[5] In this case the head offices of the firms are required to collect all data on foreign exchange transactions that are made by their desks *worldwide*, and the tax would be levied on the global transactions of the firm by the residence country of the head office.
- *The market principle*.[6] In this case the tax is levied on foreign exchange transactions where they occur, and they are paid to the country in which the trading desk is located.

This would mean concretely that, under the *national principle*, all British traders/banks residing in London would have to pay tax for their worldwide currency operations if the EU would introduce such a tax unilaterally. However American firms would not pay the tax even though their foreign exchange transactions would be effected predominantly in London. Under the *market principle*, all trading in London would be subject to the tax irrespective of the nationality of the trader/bank—whether British, American, or other. However offshore trading by British traders/banks (i.e., trading outside the EU) would remain tax-free.

It is understood that the national principle would lead to significant distortions in the market, by which European traders/banks would suffer a serious competitive disadvantage. This cannot be accepted by the city of London (not by the EU for that matter). It would mean that foreign exchange trading in the EU would exclusively be carried out by non-European banks. This is why Kenen opts for the market principle of the tax.

There is however a further, quite interesting variant of the so-called national principle. One must not necessarily opt for the legal headquarter of a firm for taxation purpose; one could also opt for the accreditation or licensing of foreign exchange trading at a particular financial center. In this case, American banks would become subject to European tax legislation when taking up a license to carry out foreign exchange transactions, say, in London. It would apply to the totality of their foreign exchange transactions worldwide.[7] I have discussed this option in my paper (Spahn 1995) and still think it could be an interesting model once a decision is made to levy the tax at the trading desk.

Of course the modified form of the national principle entails significant problems of law enforcement (as is the case for the income tax with the citizens' principle) because legal obligations[8], effective auditing, and the persecution of illegal activities are all difficult outside the realm of the tax. This is an important objection to both variants of the national principle.[9] For this reason, the significance of the market principle in Kenen's terminology is certainly more appropriate, whereby all traders/banks would be liable to pay the tax to the place of their accreditation, but only on their

[5] In public finance one also speaks of the „residence principle" (for instance for the income tax).

[6] This principle is called „source principle" in the case of the income tax.

[7] This interpretation of the national principle has also a corollary of income taxation: the citizens' principle that used by the USA. It requires all ("accredited") US citizens to pay income tax on their worldwide incomes to the American Revenue Service, independent from the fact whether they reside in the US, or not.

[8] On the question of legal obligations see below.

[9] Kenen mentions further objections against the national principle, for instance that financial institutions would have to carry an undue administrative burden when having to report their worldwide activities. This argument is not convincing. Large corporations (such as Citicorp) record their worldwide foreign exchange operations centrally even now.

local transactions.

Both principles focus on the trading desk however. If one follows the proposition of Rodney Schmidt and levies the tax at the point of settlement, one would probably have to define a further taxing principle, which I would call "rule of access". Under this principle all institutions would become liable that make use of an official settlement system. The obligation to pay the tax follows from access to official systems (such as RTGS^{Plus} or TARGET) and will be linked to the netting operations that precede settlement (net clearing, automated brokerage systems) through contractual "chaining". How this could operate will be taken up further below.

If the tax were levied at the desk according to the market principle, financial institutions would have an incentive to migrate to tax havens, according to Kenen, but the governments of these countries would have no incentive to create such havens because refraining from taxing would not represent an option to provide competitive advantages to their own companies.[10] If there were still tendencies of dislocation, Kenen hopes to contain these through certain hindrances (such as a penalty tax on transactions with off-shore financial centers). This point will be taken up later.

Dislocation of desks is not the only strategy to circumvent the PFTT. It may also be achieved through untaxed financial instruments. For instance Garber and Taylor (1995) have pointed out that

> „gross trading in these claims" *(i.e. foreign exchange trading in the spot market)* „will be effectively eliminated in favor of T-bill swaps in currencies with liquid (same-day) T-bill markets. The swapped T-bills will be immediately sold for deposits" (p. 179).

In concrete terms this would mean that traders would no longer trade in central bank monies, but would start transacting predominantly or exclusively in short-term public securities. Alternatively they could use money market funds and mutual funds.

Trading with short-term treasury bills or money market certificates is indeed common, but such instruments must still be regarded to represent an *aliud* compared to spot transactions of foreign exchange. Securities are not only subject to the exchange-rate volatility of their respective currency, but they also bear a market risk, even a sovereign risk. Central bank money serves exclusively to hedge against immediate exchange-rate risks. As long as this is the case, and the maturities of potential substitutes in the form of securities cannot be fully synchronized with spot trading (which is difficult to imagine), trading in securities must always be more expensive than spot transactions.

This is partly explained by the fact that there could be problems for price setting of such securities, which renders additional hedging transactions necessary.[11] Moreover such swaps always require several consecutive transactions: a money transaction when purchasing the security/money market fund, and another when selling it. Only the intermittent swap of securities would go tax-free. This is why securities may be used as collateral in foreign exchange trading, but not as a primary mean of transactions.

If can be expected that such trading would not survive in view of further

[10] It should however be mentioned that there are also indirect advantages (e.g., creation of jobs) that could motivate countries to attract such firms through tax competition.

[11] Se also Kenen (1996, p. 119).

developments in the trading technology, if they would ever come to bear. They would simply be too expensive.

Nevertheless the argument of Garber and Taylor has to be taken seriously, in particular with regard to the probably more important money market funds (not mentioned by Garber/Taylor). Should these strategies penetrate the market—contrary to my expectations—, it is always possible to bring them into tax net by a legislation that would qualify such operations to be abusive. This is also possible as to further financial innovations that could surface as surrogates of foreign exchange transactions.[12]

◗ Measures against potential dislocations of trading desks.

I share Kenen's point of view that the risk of a dislocation of trading desks is small, although I build this on different arguments. As has become clear from Chapter 3 I have come to believe—notably after discussions with representatives from the financial industry—that the dislocation of trading desks entails prohibitively high costs. As discussed before the comparative advantages of London as a financial center and a regional "natural monopoly" for foreign exchange trading are so enormous compared to all other financial centers, including those outside its time zone, that a PFTT with a tiny rate could constitute only a negligible cost factor. [13]

Kenen illustrates the structural rigidities of networks by referring to a trader who decides—first on his/her own—to dislocate his/her trading desk. He/she would then have to do all dealings with actors of the former trading place, which alone entails significant additional costs. Moreover Kenen proposes to charge all transactions with a penalty rate (also proposed by Spahn 1995), for instance 500 basis points instead of his regular 2.5 basis points. However he argues against the background of a tax that is levied universally at the ten most important foreign exchange centers in the world. These centers could enforce the tax collectively through a penalty rate.

The example is not very helpful for a *unilateral imposition* of a PFTT, say, by the EU. It is simply unacceptable that transactions of European trading centers with centers such as New York and Tokyo would be charged with "penalty rates".[14] This is however totally unnecessary because any dislocation of a trading desk entails significant costs. The costs depend on the target country for an eventual dis-

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[12] It may be useful to remind at this point that even the income concept is all but simple. If this tax was conceived in rather simplistic terms initially, it has become one of the most complicated of all taxes today. This results from the fact that the legislature had to implement rules to contain tax avoidance strategies of all sorts over time. It is almost certain that the PFTT will also further tax avoidance strategies, which—according to my perception—would be much easier to cope with than in the case of the comprehensive global income tax.

[13] One may also consider that London dominates as a financial center in spite of high office rents, high salaries for financial professionals, and—in another segment of the market—in spite of a tax on the transactions of stocks. This advantage is even more pronounced for foreign exchange transactions.

[14] By contrast Huffschmidt (2001) is in favor of such penalties even in these instance. His argument: The euro does not constitute a mean of payment outside the EMU, so *any* transaction to places outside the EU *must* be considered to be speculative. („Da entweder Steuerhinterziehung oder Finanzspekulation die wesentlichen, wenn nicht die einzigen Gründe für derartige Transaktionen von Euro hier zu Euro im Ausland sind—denn im Ausland sind Euro weder als Recheneinheit noch als Zahlungsmittel noch als Wertaufbewahrungsmittel nützlich—sollte die Steuer bei der Überweisung von Euro in die USA ansetzen, was erfassungstechnisch keine Probleme bereitet."). He therefore stipulates the Tobin tax to be levied in Europe as an "exit tax" whenever the euro leaves its constituency. This position is totally at odds with the nature of liquidity trading and deserves no further comment.

location. It is of decisive whether the target place lies inside or outside the time zone.

- If one assumes the dislocation to take place *within the time zone*, namely out of the EU (plus Switzerland)[15] to another European location (such as Andorra or Warsaw), it should be apparent how limited realistic options of dislocation are under this restriction. Moreover many non-EU members in the time zone (such as Poland) are interested in joining the EU in the future and drop therefore out as potential competitors. This form of dislocation can totally be disregarded.
- If one assumes however that the target place is *outside the time zone* (for instance the Bahamas or, more likely, one of the existing foreign exchange centers), this would of course be feasible in technical terms (and certainly be less onerous than starting up a new trading place from scratch), but it would also mean *to forego all time-zone specific and other advantages* that distinguish London and its European financial satellites. Therefore this option is also likely to play a negligible role in foreign exchange trading, provided however that the PFTT operates with a very moderate rate.

These considerations demonstrate that a trade-off has to be struck maintaining the net advantages of trading foreign exchange in London and its European branches in spite of the PFTT. They also emphasize the necessity of a coordinated fiscal approach of all European financial centers. These can preserve their time-zone specific monopoly rents only conjointly. If they would try to increase their respective market shares through rivaling with each other via "tax competition", this would mean the failure of a PFTT for Europe.

The PFTT as a „payments tax".

The considerations of this Chapter were so far contingent on the PFTT being levied at the trading desk. This requires a sophisticated reporting system, which is further complicated by the fact that the desks have nothing to do with the settlement of the trade and that the proper auditable paper or electronic trail often begins in the back office.

In contrast to this, Rodney Schmidt (1999, 2001) has pointed to the interesting possibility, rejected by Kenen (1996), that the tax could be levied at the "end of the chain": at the point of payment or settlement. Since payments and settlement systems are highly concentrated —unlike the decentralized trading desks—, this method of assessing foreign exchange transactions would conform much better to the conditions of electronic markets and they would be easier to administer. Tax collection at the point of settlement could be largely made automatic and an extensive and sophisticated reporting system would not be required.

Every country has normally its own payment and settlement systems for financial transactions of all kinds. These systems possess different institutional, legal, and technical components.

In the following I shall focus on cashless payment systems (that dominate foreign exchange markets)[16] and I

[15] It is important to include Switzerland as an important financial center outside the EU, but within the European time zone, because of potentially unfair competition. If Switzerland would be uncooperative in this matter, the EU could of course consider to use "penalty rates" when trading with Zurich.

[16] I do not think it to be necessary to tax retail transactions of foreign exchange, for instance currency exchange by tourists. Such transactions are insignificant compared to the transactions in wholesale markets.

define a "payment" as the instruction to transfer a money amount on the basis of a legal obligation, and "settlement" the definitive and irrevocable transfer of the money that is the purpose of this payment. For instance if someone pays with a check for a purchase, payment is effected when the check is handed out. However settlement is effected when the check is cleared and cashed in, or credited to the account of the recipient.[17]

For the settlement of financial transactions of all kinds, there are different options: cash, automated clearing, electronic transfers (in particular for interbank trading). Each of these systems has its own rules. Electronic transfers play a particular and increasing role. Whereas electronic trading accounts only for 0.1 percent of the number of all financial transactions in the USA (including domestic settlements)[18], their share of the total volume is more than 80 percent (Cross 1998). Electronic settlement systems play a decisive role for trades between banks, foreign exchange traders, and institutional investors.

In the USA there are two competing payments and settlement systems: CHIPS (*Clearing House Interbank Payments System*), a private settlement system of the New York Clearing House; and Fedwire, a service provided by the American central banking system. In the United Kingdom, the pound-sterling leg of a foreign exchange transaction is usually settled through CHAPS (*Clearing House Association Payments System*). The functioning of a clearing system is explained in Box 1.[19]

In the Federal Republic of Germany, the settlement of payments is effected

BOX 1: CHIPS AS AN EXAMPLE OF A CLEARING SYSTEM

In contrast to Fedwire, settlement on accounts of the central bank system is effected only once a day under CHIPS. During the day, all claims and obligations of the participating financial institutions that result from business activities are administered by CHIPS and continuously cleared through netting. At the end of the day the net balance will be settled collectively for all participants through Fedwire (in the form of central bank money). The central bank accounts of CHIPS participants with net claims will be credited, and the accounts of participants with obligations be debited. If a participating bank with net obligations against CHIPS transfers central bank money to its customer before the end of the day, it assumes a settlement risk, because CHIPS could eventually refuse to settle for some reason. In order to cover this risk, the current deficits of each participant are limited (net debit caps) and the participants are also obliged to participate collectively in covering any possible losses that have to be collateralized with capital or securities.

BOX 2: FEDWIRE AS AN EXAMPLE OF AN RTGS-SYSTEMS

If a payment is effected through Fedwird, a regional Federal Reserve Bank will debit the central bank account of the sending bank, and will credit the amount to the recipient bank. In this way it is assured that there is an immediate and simultaneous transfer of central bank money (assets in the central bank system). A Fedwire-payment is settled through the crediting of the amount to the central bank account of the recipient bank. In order to limit risks, the Federal Reserve will charge for overdrafts during the business day if these go beyond a certain predetermined limit.

[17] If cash is used, payment and settlement are of course simultaneous actions.

[18] The larger part consists of cash, checks, and credit card payments.

[19] The exposition of the two Boxes is based on Cross 1998.

mainly through RTGS[Plus]. The shorthand RTGS stands for „real-time gross settlements". The real-time settlement of each single gross transaction eliminates the settlement risk. The functioning of an RTGS system is described in Box 2 for Fedwire as an example.

The introduction of the euro in 12 countries of the European Monetary Union has not changed the structure of national payments and settlement systems significantly. Every country settles its payments through an individual RTGS system. However the interface between the different RTGS systems has been standardized in order to facilitate cross-border payments between member countries of the monetary union. This interface, the "link" (but occasionally also the totality of the national systems, including the link) is called TARGET (*Trans-European Automated Real-time Gross settlement Express Transfer system*).

In contrast to RTGS, the clearing systems (such as CHIPS or CHAPS) function as netting systems between the participants of the clearing system before settlement through central banks. All individual positions are cleared (i.e. "netted"), which are then settled through central bank money once a day. This does not exclude the settlement risk, in contrast to the RTGS systems of central banks.

In the case of a foreign exchange transaction, there are two simultaneous transfers in opposite directions. It always implies the use of two settlement systems of two countries. This entails an additional settlement risk if distinct, i.e. non-integrated, payment and settlement systems are used—especially if they operate in different time zones. In this case one also speaks of a "Herstatt risk"—according to a spectacular case of this kind in the 1970s.

Foreign exchange markets have to rely on payment and clearing systems, which ultimately decide on the success or failure of a particular transaction. Rapid access to central bank money through national RTGS systems is crucial in this context, but also the existing clearing systems help to limit this settlement risk.

In order to facilitate the automated access to central settlement systems, the interface is largely standardized. This does not only apply to TARGET (the link between the national systems in the European Monetary Union), but also to the access through automated private brokerage systems (such as FXNET).

Until the mid-1990s, the private brokerage systems functioned mainly OTC *via* direct broking per telephone („open outcry"). They have since been largely automated and consolidated. One speaks of „automated order-matching systems". The most important ones are the Electronic Brokerage System EBS[20] and Reuters[21]. Today roughly 50 to 70 percent of all foreign exchange transactions are cleared and settled through these systems. In 1998 the share had been 40 percent, and in 1995 only 10 percent (Galati 2001, p. 43).

These developments have contributed to reducing the volume of foreign exchange trading significantly. This is partly explained by improvements in the price-discovery process. The trader can observe the bid/ask on the screen and react quickly electronically

[20] EBS was founded in 1993 by 12 of the larges trading companies and it is now the leading provider of electronic brokerage services. At the same time it is licensed to provide bilateral netting through FXNET (see below).

[21] Reuters offers a number of information products and also manages the clearing and settlement of transactions with financial instruments such as foreign exchange, money market funds, stocks, etc. The electronic conversations on foreign exchange markets run through the platform „Dealing 3000-Direct". Reuters is also a participant of consortia such as ATRIAX (of Citibank) or FXALL, which have developed separate platforms for foreign exchange dealings.

on a mouse click. Misapprehension is significantly reduced compared to the open outcry, and back offices are automatically informed. The automated order-matching systems are therefore extremely reliable and fast.

In addition the expansion of such systems has reduced the possibility of traders/banks to engage in so-called „leveraged trading" (Galati 2001, p. 44). This entails a reduction of the volume of interbank trading that is triggered by a primary transaction of a final customer of the non-financial sector.[22]

Traders/banks employ a number of typical netting (or clearing) systems before settlement. Foreign exchange accounts

- are first settled "in house" on a continuous basis, i.e. Deutsche Bank, for instance, would clear all claims that develop on foreign exchange accounts of its customers with corresponding customer obligations („in-house clearing"); and
- are also cleared bilaterally among trader banks. For instance Deutsche Bank maintains a foreign exchange account with Citigroup (and reciprocally), where mutual claims and obligations are continuously cleared during the day.

These operations avoid settlement risks via „payment *versus* payment (PVP)" through continuous clearing. Bilateral net clearing is provided for instance by FXNET[23] or SWIFT[24]. On may note however that such systems are primarily service providers of the software industry. They are not traders/banks themselves, and are therefore not subject to public banking supervision.[25]

Apart from bilateral netting, there were also systems specializing in *multilateral* clearing among traders/banks (ECHO or Multinet). These have been acquired (and temporarily deactivated) by a real-time-PVP system that is being developed at present, and is likely to start operating in the fall of this year: CLS (*Continuous Link Settlement)*. I shall come back to this path-breaking development on foreign exchange markets later on.

At present the routing from the individual trading desk to the central RTGS[Plus] of the Bundesbank can be schematically described as follows:

Bank A in Germany and bank B in the USA exchange information on a trade through SWIFTNet Services and settle the payment through a standardized SWIFT platform that has direct access to RTGS[Plus]. Both banks maintain accounts with the Deutsche Bundesbank in this case. If this is not true for the foreign bank B, the trade will be settled through a third bank (correspondence bank) that maintains an account with the Bundesbank and

[22] Galati (2001, p. 44) develops the following example: Assume that a non-financial customer asks his trader bank to sell $100 million against yen. If the trader expects the dollar to fall, he would probably sell more than $100 million hoping to buy back the excess balance as a market maker. This triggers transactions that exceed the original amount of $100 million. Electronic order-matching systems handle such transactions in a neutral and non-speculative way, which does not entail an extension of the trading volume.

[23] FXNET is a consortium of 13 of the largest trader banks; it started its operations in 1987. Today it is part of the EBS Dealing Resources of Citicorp.

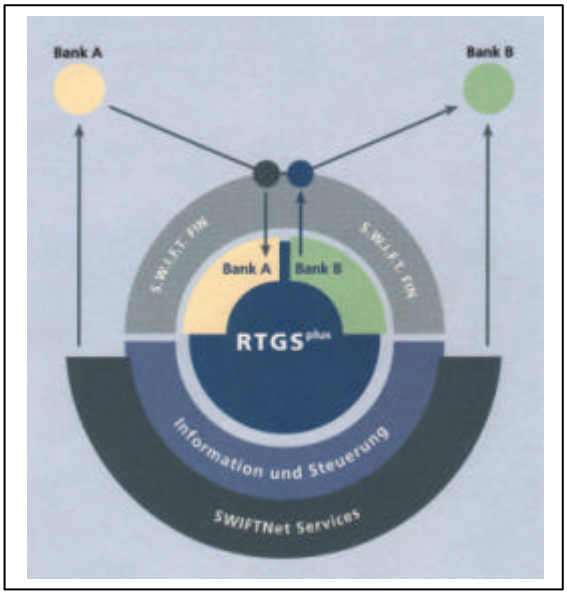
[24] SWIFT (*Society for Worldwide Interbank Financial Telecommunication*) is a platform for the electronic exchange of financial data. It started its operations in 1977, and it counts on more than 7,000 customers in 192 countries with some 1.3 bill. messages per year. SWIFT has substantially contributed to the standardization of the clearing and settlement process.

[25] There is a clear-cut trend to engage software firms for complex information processing services. One may mention in this context COGNOTEC (another brokerage technology) or Currenex (an internet-based trading system). There is of course competition among these firms, but recently a clear trend towards cooperation and even consolidation of the sector is noticeable.

can clear a claim she has against bank B (for example through SWIFT *via* bilateral netting).

This illustrates that the official national RTGS systems represent something like the "kernel" of a payment system that is based on central bank money. Service providers such as electronic order-matching systems will gather around this core. However RTGS sees only the "tip of the iceberg" in foreign exchange trading because traders will have netted, before entering the settlement system, all possible in-house and bilateral transactions through clearing in order to reduce costs and risks.

Moreover the RTGS even does not „know" which kind of underlying trade is settled when it accepts and executes a payment instruction. Payments in European currency that result from a foreign exchange trade are settled without distinction together with all other payments.[26]



The latter could of course be easily remedied, for instance through a simple identifier (0 or 1) that indicated whether the purpose is to settle a domestic or a foreign exchange trade. There could also be an obligation to hold two accounts at the central bank and settle in accordance with the nature of the trade.[27]

It is much more difficult to cover the internal and bilateral clearing operations within and among financial institutions. Clearing and net settlement among financial institutions and systems has become a conventional procedure worldwide. In particular in-house clearing is something difficult to monitor.

However these problems will be substantially mitigated by more recent developments in foreign exchange markets, which entail a further concentration of bilateral and multilateral clearing before official settlement. This is because, in spite of a high degree of integration of payment and settlement systems, there is a residual settlement risk for national, but notably for international payments. This has motivated several banks to develop a worldwide real-time gross settlement system as a private initiative: the CLS bank that had been mentioned before. It is likely to determine future developments on foreign exchange markets, which render it necessary to offer some further explanations.

The CLS Bank is a foundation of a consortium of traders/banks with its headquarters in London.[28] Its objective is to eliminate the settlement risks for bilateral and multilateral clearing operations in foreign exchange mar-

[26] From the standard (MT 202) used for central bank clearing, the purpose of a payment cannot be identified. Not even reference numbers are mandatory, and if they are used they vary among banks.

[27] The consequence would of course be that different kinds of foreign exchange transactions cannot be distinguished at the time of settlement. Only resulting spot transactions would be settled. This would mean to define the tax base in a narrower sense. I have argued before that this could be accepted insofar as other foreign exchange transactions, such as swaps and options, also trigger spot transactions indirectly through arbitraging.

[28] The bank is subject to American law however.

kets altogether. This will be effected through a continuous and simultaneous crediting of "both legs" of a foreign exchange trade on the foreign exchange accounts of the trading banks. The currency pair is settled gross, i.e. there is no netting within the system. Only the balance will be settled officially for each currency through RTGS systems of central banks.

Moreover each trade is identifiable according to the purpose of the transaction, in particular as to the currencies used, the maturity of the payment, and the kind of trade. This allows a judicial tailoring of the PFTT and the tax collection process to its precise tax base.

The operation of CLS was initially intended to start last year already, but technical problems and problems of project management have delayed the start until the fall of 2002. Representatives of the bank expect the advantages of the system to attract about 80 percent of all foreign exchange transactions in five years. Member banks would be able to make use of the system directly; others would access the system indirectly through correspondence banks.

I believe that the concentration tendency in clearing and settlement as well as in automated order-matching systems will further escalate. This is not only explained by the advantages of real-time gross settlement systems, but also by some other problems of international liquidity management that could eventually be solved through CLS and other centralized systems. For instance CLS provides automatic cost-reducing „self-collateralizing overdrafts". This requires a sophisticated tracking system. I think further of strategies by which interest-free swing arrangements within mutual daily liquidity trading are now being abused, which has led to a unilateral encumbrance of some (mainly continental-European) financial institutions. CLS is likely to lead to a significant shortening of settlement delays, which will allow interest periods below the 24-hours limit, which would eliminate such interest-free swings. Forward transactions could automatically be activated at maturity, etc. These will all be significant advantages of CLS to attract business on a global scale.

Once the consolidation process of international foreign exchange markets will have come to an end, one can again expect a widening of the volume of transactions. This hinges on the cutting of maturities to hourly fractions and on the extended use of gross payments. These trends are promoted by centralized platforms such as CLS.

The centralization of payment and settlement systems as well as electronic order-matching systems will also facilitate the administration of an eventual PFTT: The tax could be determined through appropriate tax modules embedded in the transactions software, and the proceeds could be levied automatically and transferred to central banks through RGTS. The central banks would thus become the collecting agencies for the tax revenue.

Although these trends appear to be compelling, a comprehensive coverage of the tax is still fraught with problems:

- Despite these tendencies there will remain a substantial number of in-house clearing operations that call for a separate reporting system. This is facilitated by the concentration within the banking industry. Only the largest institutions would have to report for taxing purposes. Smaller institutions play almost no role as to their internal clearing potentials. The reporting requirement should hinge on a minimum transactions volume, whereby a large proportion of the small institutions would not have to report, or pay tax, at all. They

would be charged indirectly however when using correspondence banks or centralized settlement systems.

- Bilateral clearing between institutions that do not participate in centralized systems would also have to be subject to reporting. This is more costly than an automated assessment through computerized systems, which creates some incentives to make hook onto centralized systems in spite of the tax.

As has been discussed before in connection with the advantages of a financial center such as London, evasive reactions of centralized settlement or of electronic order-matching and brokerage systems are highly unlikely. The concentration onto a small number of large corporations renders this extremely difficult for them. Deutsche Bank, for instance, is unlikely to fraud on the tax by carrying out illicit foreign exchange transactions intentionally. But there are of course incentives to consider ways to avoid the tax legitimately. This is most prominent for in-house clearing operations, because this could lead to legal constructions by which clearing is sourced out to software firms residing outside the EU. These may not even be banks subject to banking supervision.

If a different method for taxing such transactions is chosen, for instance at the trading desk as proposed by Kenen, one has to ascertain that there is no double taxation due to a mix of assessment methods. I therefore propose to use the same tax object for in-house clearing operations as for all other foreign exchange transactions at settlement, and define those clearing operations legally to be equivalent to settlement.[29]

If transactions are not carried out through official or centralized payment systems and are therefore impossible to be taxed at well-defined points at payment/settlement, one has to operate with a reporting system for such transactions. As said before this is more costly and creates an incentive to participate in the less costly (and risk-diminishing) CLS system either directly or through correspondence banks, whereby the "rule of access" would apply for taxation.

One should not underestimate foreign exchange transactions within the non-financial sector however.[30] For instance Volkswagen or Daimler-Chrysler maintain important foreign exchange departments for internal clearing. These transactions would also have to fall under the tax law in order to avoid the dislocation of foreign exchange trading into the productive sector.[31]

For production companies—as for financial institutions that do not hook onto centralized RTGS systems—taxation must be based on reporting.[32] However there is a particular problem in that the market principle is more difficult to apply for those companies than for financial institutions (that are licensed at a certain financial center). On could however ask for a similar

[29] I think in particular of the attempt of the American legislature (although highly controversial politically and legally) to oblige American firms through the Helms-Burton Act to extend the trade embargo of Cuba to their non-American counterparts worldwide through contracting. A recently failed attempt by the German federal government to extend, in the interest of consumers, the information requirements onto suppliers outside its jurisdictions does not augur well for this approach however.

[30] Internal foreign exchange transactions of production firms are not included in the statistics of the BIS. The tax base is therefore likely to be higher in practice than assumed by most authors.

[31] The clarification of this issue is also required in view of the fact that automated brokerage and settlement systems are usually operations of non-banks, i.e. software companies.

[32] This could of course be waived if the firm decides to participate in a generally accessible centralized payment system and be subject to taxation according to the „rule of access".

accreditation for carrying out foreign exchange transactions by produces as for traders/banks. However production firms could dislocate their foreign exchange transactions into non-taxing jurisdictions. One must realize that it is much more difficult to follow these firms than financial institutions.

Summary

Questions relating to the implementation of a PFTT are non-trivial. First one has to fix general taxing principles that define the taxable object and the taxpayer. Thereby one can generally rely on the market principle, which would cover all traders/banks accredited at European financial centers (including Switzerland) as well as centralized automated order-matching and settlement systems. The same should apply to producers such as Volkswagen or Daimler-Chrysler.

For tax collection there are in principle two possibilities: At the trading desk, and at the point of settlement. Both procedures are technically feasible, but each has its own advantages and disadvantages.

Assessing the tax at the trading desk entails a reporting requirement that does not conform with the nature of the market. Automatic assessment at centralized clearing and settlement points would be more appropriate, but a differentiated registering of individual taxing purposes (such as swaps, options etc.) would be impossible because the relevant information is not handed down to the settlement stage. It implies that only spot transactions could be taxed at present. This is likely to change in the near future however—through new technologies that are being developed and will lead to continuous gross settlement on a PVP basis.

The further concentration of foreign exchange markets and in particular the introduction of a continuous gross settlement system will facilitate tax assessment and collection at payment/settlement considerably. This is why I prefer the PFTT in the form of a "payments tax". In this case taxation could be tied to the access to official settlement systems, with a contractual "chaining" of the taxing obligation onto in-house clearing systems. The central banks would collect the tax, which is however to be "pooled" Europe-wide for a common purpose.

One may expect however that a more comprehensive reporting requirement is still needed for those institutions that do not participate in a centralized payments system, nor have voluntarily accepted tax liability through "chaining". If both assessment and collection techniques are employed simultaneously there could be some double-taxation, which should be accepted however in view of the fact that it provides an incentive to join one of the official payment systems.

The often-emphasized evasion reactions to a PFTT are sternly exaggerated. The high concentration of foreign exchange trading clearly runs counter the possibility to avoid the tax, and this trend will be reinforced even further in the near future. I therefore think the PFTT to be technically feasible—albeit under restrictive preconditions as to the tax rate in order limit economic distortions.

The real problems are not to be found in the area of technology. The true nature of these problems could best be portrayed by a quotation found in a paper by Griffith-Jones (1996, p. 148), even though it is from an earlier paper of mine:

> *„Generally speaking, there do not seem to be major administrative problems associated with the operation of a Tobin tax, although specific difficulties may arise in detail, in particular for the derivative markets. The main riddle relates to international cooperation and legal enforcement."* (Spahn 1995).