

## **Taxation of Financial transactions, A means for more sustainable development**

*by Burghard Ilge*

### **1 – Introduction**

*The financial crisis as a wake up call*

During the summer of 2007 a growing number of US based financial institutions started to face serious problems. The growing uncertainty about the exposure of investors to increased risks of default led banks to hoard liquid assets which led to a sharp increase of the cost for lending between banks, causing the biggest financial crisis in the western hemisphere since World war II

Investors were forced to realize that they were unable to quantify the value and risk of the increasingly complex financial products, which directly or indirectly were linked to assets of real estate, when the booming housing sector in the US declined.

In September 2008 the failure of Lehman Brothers led to the final collapse of confidence in the global banking sector. Through the complex network of bilateral contracts between banks, investors and other institutions this crisis quickly spread to other countries and brought the fragile global financial system to the brink of a total melt down.

The resulting collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets led to substantial financial commitments incurred by governments, and a significant decline in economic activity. The IMF estimated that while the majority of the losses had still to be realized, in the US alone this could reach over 2 trillion US dollars.

Governments now still face huge fiscal challenges, which lead to sever budget cuts which are expected to hit the most

vulnerable groups of society hardest. Also financial resources, needed to anticipate to climate change and to meet the globally agreed Millennium Development Goals, are under threat.

This is in harsh contrast with the conduct of a part of the financial industry, which in the past successfully lobbied for financial deregulation which is now being identified to have contributed to the crisis. Not only has the financial sector been highly under-taxed, it also made huge profits from the financial turbulences caused by the crisis. [\[For the example of Goldman Sachs see Box 2\]](#)

Various reasons have been given why a crisis of such dimensions could develop. However, it quickly became apparent that this crisis could not just be explained by the irresponsible behavior of a few individuals, but that the causes are more systemic.

During the last decades, the governance of increasingly integrated international financial markets [\[I1\]](#) was further challenged by the pace of financial innovation.

But adapting to these changes has not been the only challenge.

In particular legal reform aiming a flexibilisation and deregulation of the financial services industry undermined the required governance needed to ensure a well functioning and sustainable international financial sector [\[I2\]](#) [\[For some examples for the US markets see Box 1\].](#)

It is widely recognized that regulatory financial sector reform is urgently needed. It will have to reverse the unsustainable past deregulation agenda advocated on behalf of the Financial service industry. Such reforms will have to address in particular the increasing importance of the shadow banking system, the increased role of trade in financial derivatives and off-balance sheet financing.

Beside financial deregulation one aspect, which is widely seen to have accelerated the unsustainable development of financial

### Box 1:

Some financial reforms in the USA which have been identified to have contributed to the financial crisis:

1) 1980: The "*Depository Institutions Deregulation and Monetary Control Act*" (DIDMCA) phased out a number of restrictions on banks' financial practices, broadened their lending powers, and raised the deposit insurance limit from \$40,000 to \$100,000

2) 1982: The "*Garn-St. Germain Depository Institutions Act*", provided for adjustable-rate mortgage loans

3) 1999: The "*Gramm-Leach-Bliley Act, repealed part of the Glass-Steagall Act*" of 1933. This repeal has been criticized for reducing the separation between commercial banks (which traditionally have a conservative culture) and investment banks (which have a more risk-taking culture).

4) 2000: The "*Commodity Futures Modernization Act of 2000*". Derivatives such as credit default swaps (CDS) can be used to hedge or speculate against particular credit risks. The volume of CDS outstanding increased 100-fold from 1998 to 2008, with estimates of the debt covered by CDS contracts, as of November 2008, ranging from US\$33 to \$47 trillion. Total over-the-counter (OTC) derivative notional value rose to \$683 trillion by June 2008

markets, has been the drastic reduction in financial transaction costs. This allowed to shift financial decision-making process from a more long-term perspective to new selling and buying strategies with the aim to harvest and maximize short term profit gains.

Besides, through regulatory changes this has also been driven by technological changes. While in movies trading at stock exchanges is still represented by men shouting at one another on the trading floor, trading nowadays more or less exclusively happens electronically inside of computers, where a growing number of computer programs take the decision about selling or buying orders based on changes of market data on the level of milli- and microseconds.

### Financial Transaction Taxes [FTT's]

There is now a growing interest in the potential role of financial transaction taxes (FTT's).

Financial Transaction Taxes are not only a mechanism to generate urgently needed financial resources in the aftermath of the recent crisis; they also can have a regulatory effect.

Transaction taxes can be raised on the sale of specific financial assets (such as stock, bonds, futures or other financial

### Box 2:

The Goldman Sachs Group is one of the biggest players in the international financial service industry.

It has been reported that Goldman Sachs, which depends for 68 % of its revenue on trading [GS1], made an approximate \$4bn profit from betting on the sub-prime collapse ensuring that "2007 was a bumper year for the bank" [GS2]. Goldman Sachs is believed to have been one of the biggest profiteers from the crisis [GS4]. The same bank was one of the biggest beneficiaries of government interventions during the crisis.

When in response to the subprime mortgage crisis a new lending facility was created by the Federal Reserve in spring 2008. Goldman Sachs was one of the heaviest users of these loan facilities. In the period 15 September - 26 November 2008 Goldman Sachs borrowed a total of \$588 billion at interests rates between 1,25 - 2,5% against collateral such as corporate market instruments and mortgage-backed securities [GS6].

In 2010 Goldman Sachs was also criticized for its involvement in the 2010 European sovereign debt crisis. Between the years 1998-2009 Goldman Sachs has been reported to systematically having helped the Greek government to mask its national true debt facts. In September 2009, though, Goldman Sachs among others, created a special Credit Default Swap (CDS) index for the cover of high risk national debt of Greece. The interest-rates of Greek national bonds have soared to a very high level, leading the Greek economy to the brink of bankruptcy in March 2010 and yet again in May 2010. [GS5]

Goldman Sachs reported for the year 2010 net revenues of US \$ 39,16 billion [GS3]

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derivatives). They can be applied to currency exchange transactions or can be general taxes levied against any mix of different transactions of different financial products.

The idea of financial transaction taxes FTTs is not new. After briefly touching on the ideas of major economists in the past we will present a few country examples of the currently existing praxis to use Financial Transaction Taxes on the national level. After this we will briefly look at estimates of the resources which are expected to be mobilized by a broader application of Financial Transaction Taxes.

## 2- The ideas of Major economists

The idea to use a Financial Transaction Tax (FTT) to prevent market failure and to stabilise financial markets is not a new one. Since we can not present her the wide body of related scientific literature we just want to present her briefly the key ideas of some major economist

*Keynes' financial transaction tax*

**John Maynard Keynes** was one of the first proponents of a financial transaction tax. In his book from 1936 "The General Theory of Employment, Interest and Money" he argued that the excessive speculation by financial traders increased volatility of stock prizes and instability of financial markets. He explained the difference in stability between the markets in the US and in the UK by the different costs to speculate at the national stock exchanges. He suggested to artificially increase the lower transactions cost for speculators at Wall Street to a more sustainable level through the introduction of a financial transactions tax.

*The introduction of a substantial Government transfer tax on all transactions might prove the most serviceable reform available, with a view to mitigating the predominance of speculation over enterprise in the United States.[A1]*

*Currency Transaction Tax [CTT]*

Nobel Lauriat **James Tobin** first formulated the idea of a currency transaction tax in 1972 [B1]. The main idea of such a tax was to use it as a means for controlling exchange-rate volatility. This was driven by his concern that

*National economies and national governments are not capable of adjusting to massive movements of funds across the foreign exchanges, without real hardship and without significant sacrifice of the objectives of national economic policy with respect to employment, output, and inflation. [B2] ...*

*My proposal is to throw some sand in the wheels of our excessively efficient international money markets...*

*The proposal is an international uniform tax on all spot conversions of one currency into another, proportional to the size of the transaction. [B2]...*

*Let me return to my proposed tax, and provide just a few more details. It would be an internationally agreed uniform tax, administered by each government over its own jurisdiction. Britain, for example, would be responsible for taxing all inter- currency transactions in Eurocurrency banks and brokers located in. London, even when sterling was not involved. The tax proceeds could appropriately be paid into the IMF or World Bank. The tax would apply to all purchases of financial instruments dominated in another currency – from currency and coin to equity securities. ...*

*Doubtless there would be difficulties of administration and enforcement. Doubtless there would be ingenious patterns of evasion. But since these will not be costless either, the main purpose of the plan will not be lost. At least the bank facilities which are so responsible for the current troublesome perfection of these markets would be taxed, as would the multinational corporations. [B2]*

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*Together the major governments and central banks are making fiscal and monetary policy for the world, whether or not they recognise the fact*

The interest in such a Tobin Tax grew in the nineties when various financial crises shook the international markets [B7]. One of these events was the so called "Black Wednesday" (16th of September 1992) when the bank of England had to give in to the pressure from financial markets and devaluated the English pound by twenty percent. Hedge funds with substantial financial means who speculated against the Pound Sterling were identified to play an important role in this event.

For example the "Quantum Fund sold short (betting on a decline in value) more than \$10 billion worth of pounds sterling [B4]". The profits this hedge fund made through this speculation have been estimated at around £1 billion [B5]. While the cost to the UK treasury reserves of devaluating the pound sterling have been estimated to be £3.3bn [B6]

The idea of Tobin was then further developed by **Paul Bernd Spahn** [B3]. While Tobin originally suggested one tax at a rate of 0,5-1% Spahn proposed a taxing regime which would consist of two different tax rates. While all financial transactions would be taxed at very low rate (of only 0.01%), a second much higher tax rate (50-100%) would be triggered if price swings exceeded a specific limit.

The idea of such a "Spahn Tax" had then been further developed in to concrete **national law in Belgium** which in 2004 had been approved by the Belgium Federal parliament. This law however is not yet in force since its application is conditional on the requirements that a similar law would be implemented by all countries of the eurozone.

In the next chapter we want to look at financial transaction taxes which have been implemented at the national level. We will see that there already exists a wide variety of financial transaction taxes

### 3- National FTTs

Financial transaction taxes are currently only applied on the national level. Getting an up to date overview of the applicable tax regimes world wide is a challenging task, since national tax law is continually developed. Various overviews of national financial transaction taxes have been published (see ANNEX). One of the most recently produced overview is the EU commission staff working document SEC (2010)1166/3. Which based its study on data provided by the IBFD "European tax survey" database (as of 22/07/2010) However with the exception of the country studies on Switzerland and Thailand this study only looks at the tax policies of EU member states.

This is somewhat unfortunate since national tax policies outside the EU, in particular those of developing and emerging economies, provide an interesting source for alternative approaches which are already brought in daily practice.

While we will have to limit our self here to provide only a few illustrative examples, we hope that this raises the interest to furthest explore such national examples.

One of the countries in Latin America which currently applies a Financial Transaction Tax is **Argentina**. The tax on financial transactions is levied on debts and credits in current account at a rate of 0.6% per transaction. In combination with Argentinean law on income tax this leads to an effective tax rate of 1% for a complete collection/payment cycle [NF1]

Another country in Latin America which uses a national FTT is **Columbia**. Columbia applies various taxes on financial transactions. First there is a stamp tax of 1% on the nominal value of registered shares not listed at the stock exchange and of 1 % on nominal shares. In addition a 0.4% FTT is imposed on all withdrawals from current and saving accounts, including accounts with the central bank. Saving accounts for low-income housing are exempted, as are transactions on

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interbank market, where banks lend money to each other, and on the sale or purchase of foreign currency. Transfers between a current and savings account within the same institution when the account belongs to the same account holder are also exempt. Remittances from Columbians working abroad are exempt from the FTT for up to COP 1.2 million [~475 Euro] per transaction. In addition individual saving accounts have an exemption for annual withdrawals of COP 7 million [~2700 Euro]. This value is annually adjusted for inflation.

Further more there is a 1% registration tax for all public and private documents that state the existence, modification or extinction of obligations on transactions involving more than COP 48.9 million [~19400 Euro] [NF2]

**Peru** also applies a FTT on credit and debit transactions in local bank accounts. The so called "impuesto a las transacciones financieras" (ITF) has a much lower rate than the one of Colombia of only 0.05%. This tax has been implemented in 2004 as a temporary measure but has been made permanent in 2007 [NF3] it had been reduced to 0.05% from a rate of 0.06% in 2009 and apparently the government intended to review this tax at the end of 2010 [NF4]

In the second half of 2009 the **Brazilian** government got increasingly concerned about the appreciation of the Brazilian Real against the U.S. dollar by 46.8% with respect to its low in December 2008. This was driven by foreign capital inflows of investors seeking participation in the Brazilian economy. In the first nine months of 2009 nearly US\$20 billion had entered Brazil for investment in the equity capital market [NF5]. In response the Brazilian government issued Decree 6,983/09 which came in force at 20 October 2009 to prevent speculative trading in the Brazilian currency. Since then a 2 % FTT applies to all fixed income and equity investment by foreign investors. Brazil has a long tradition of FTTs. This tax is called "Imposto sobre Operações Financeiras" (IOF) and already existed since some time. What changed by

the decrees in October was that the IOF on equities which previously had been set to 0% was increased to 2%. The IOF must be paid in any foreign exchange transaction when the foreign investor is buying BRL in all transactions, be it at the Brazilian stock exchanges or at the OTC market. It covers private investment funds as well as Brazilian treasury notes and any other fixed income securities. Outflow of funds from Brazil are not affected by this FTT.

**South Africa** has a similar problem as Brazil. A weak dollar, higher prices for the commodities that South Africa exports, and local interest rates which offer a better return than in developed economies, increased the value of the South African Rand.

In August 2010 the Rand reached the highest value compared to the US dollar since 2.5 years. This makes South African exports more expensive and less competitive on world markets, while imports become cheaper and may displace local producers.

This has led to some lively discussions within the ANC. Should South Africa take similar tax measures as Brazil? After a leak to the press of a related ANC internal document in early August 2010 this discussion moved to the public domain [NF6]

South Africa already has a Security Transaction Tax (STT). Since 1968 South Africa already applied a tax (stamp duty) for the registration of transfer of unlisted securities. This was complemented 30 years later by a tax on changes in beneficial ownership of listed securities.

In 2007 a new Securities Transfer Tax (Act No. 25 of 2007) was introduced to replace the two different tax types on securities with a single tax. It has been implemented in 1 July 2008 and now applies for any transfer of listed and unlisted securities and simplified the related tax administration. [NF7]. The applicable tax rate is 0.25%.

There are several exceptions from this tax, like transfers between registered pension funds or, to prevent double taxation, like

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transfers covered by the (Transfer Duty Act No. 40 of 1949 ). It is unclear in how far traders in securities are excluded from this tax since one explicit exception includes "member[s] who [have] purchased that security for the account and benefit of another person.". [NF8]

**Turkey** which like many countries does not apply VAT on trade in financial products is another country that has a Financial Transaction Tax. What is taxed is the income which arises from the financial transactions made by the financial services industry at a general rate of 5%. Besides Banks and insurance companies this Banking and Insurance Transactions Tax (BITT) also applies on activities of all other financial institutions that are continuously engaged in the purchase and sale of marketable securities either for themselves or on behalf of others, intermediation in the purchase and sale of marketable securities, collection of deposits or any other funds for the purpose of providing any kind of interest. Based on this definition brokerage companies, consumer financing companies, factoring companies and asset management companies are BITT taxpayers for their mentioned activities.

Within the BITT foreign exchange transactions are treated separately. Here the base for the tax levy is the value of foreign exchange sold, in Turkish Lira. Since here the *value* of the transaction and not the *income from* the transactions are taxed a lower tax rate of only 0,1% is applied for foreign exchange sale.[NF9]

Turkey also applies a Stamp Tax on a wide range of financial documents, including, but not limited to, contracts, agreements, notes payable, letters of credit and letters of guarantee, financial statements and payrolls. Stamp duty is levied as a percentage of the value stated on the document at rates ranging from 0.15% to 0.75%. However there is a tax exemption under the Capital Market Law No.4487, by which "futures and options contracts based on economic and financial indicators, capital market instruments, commodities,

precious metals and foreign currency, and all other derivatives and the capital market instruments traded in an organized market are exempt from the stamp duty." [NF10]

#### **4 - The revenues generated by a Securities Transaction Tax**

Besides the potential regulatory effect Financial Transaction Taxes might have the revenues such taxes might generate will always be an important argument which will be decisive for the political decision to implement such taxes.

FTTs implemented on the national level have already proven to be efficient tools to generate substantial financial revenues. For example the revenue of the British tax of 0,5% on any purchase of shares of UK companies is between 3 and 5 billion euro per year. Taiwan, Province of China, generates from its national Securities Transaction Tax annual revenues of up to 1,07% of the value of its national GDP. [f00]

Here we now want to focus on current estimates of revenues which could be generated from a broadly applied Securities Transaction Tax, similar to the ideas proposed in the past by John Maynard Keynes, James Tobin and others.

*Estimated annual revenues of unilateral application of Securities Transaction Tax on US Financial markets.*

In 2003 Pollin et al.[P1] published a study on the application of a Securities Transaction Tax for US financial markets, based on trading data from the 1990s. Since annual trading volume have now more than tripled one can estimate that the revenues from Securities Transaction Tax as proposed by Pollin et al.[P1] to be now somewhere between **200 billion and 400 billion US dollar** annually. This estimate is in agreement with the findings by Baker et al. [BA1] which predict between \$176.9 billion and \$353.8 billion annually based on 2008 trading volumes. Even under the most pessimistic assumption of a 50 percent reduction in trading volume they

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conclude that this would raise more than **\$1.7 trillion during the 10-year** budget horizon of the United States.

While these studies used different tax rates for the different financial instruments - varying between 0,01% for Bonds and 0,5% for Options on the premium paid - most other studies apply only one fixed tax rate for all financial instruments like in the following examples.

*Estimated Revenues from a Securities Transaction Tax implemented in Developing countries*

While international financial trading is now mainly limited to a handful of trading places in OECD countries a brief look on the expected revenues such STTs could be derived from developing countries might be useful. In a recent study from September 2010, Daiana Beitler [D1] estimated that the total revenues which would be generated by the 78 developing countries studied could add up to **10 billion US \$ per year**. This estimate has been based on the trading volumes of 2003. The applied tax rate for the calculation was 0,5%. The resulting numbers depend on the estimated reduction of trading volume cause by this additional tax measure and gave an upper bound of 14,5 billion if no change in trading volume would take place and 7,2 billion US\$ annually if a reduction in trading volume of 50% would take place.

The revenues on individual country level vary widely. While for more than a quarter of the studied countries (27%) no or less than 100.000 US \$ annually would be derived from such a tax, about a fifth of all countries (19%) would generate more than 100 million US \$ per year in additional tax income. However about 70% of all revenues in developing countries would be generated in only 4 countries in Asia (China; Korea; Taiwan, Province of China; and India) were they are estimated to be 1 billion or more per year.

*Estimates Revenues for the World, Europe and the Netherlands from a Securities Transaction Tax.*

While the estimates of Beitler are based on a tax rate of a half percent, much lower tax rates are estimated to still generate substantial revenues if applied also outside of developing countries.

Schulmeister for example estimated that a **globally applied** STT of a 50 times lower rate than used by Beitler of 0.01% would still generate **287.3 bill. US \$** annually, assuming that trading declines due to the introduction of such a tax by roughly 30%. More than half of the revenues (164.4 bill. \$) would stem from derivatives transactions on exchanges (these transactions could be taxed most easily due to the use of electronic settlement systems). Taxes on spot transactions would amount to only 11.6 bill. US \$. In **Europe** (EU27 plus Norway and Switzerland) a STT at the (low) rate of 0.01% would yield roughly **130 bill. US \$ [S2]**

While there are various other proposals how to tax the financial sector a broadly applied financial transactions tax as proposed by Schulmeister and others could be of special interest for the Netherlands. One of the main reasons for this is that the estimated revenues which would be generated in the Netherlands by such a general STT would be bigger than those generated by alternative proposals. For example the currently discussed various forms of a Financial Activities Tax (FAT) would only generate - dependent on the specific type - between 29% and 3,5% of those revenues estimated for a STT [f0]

In addition such Financial Activities Taxes would put a stronger tax burden on the traditional banking sector and in contrast to the currently discussed STT would more or less exclude speculative short time trading in the derivatives markets [f1].

One important reason for this beneficiary effect of an STT for the Netherlands is that even so most of the trade in financial derivatives takes place in the UK, were 71% of the revenues of a Europe wide Securities Transaction Tax would be collected; only Germany and France would collect more tax revenue from the proposed tax than the Netherlands. Current estimates used by the European commission are based on trading data from 2006 and use a tax rate

the European commission are based on trading data from 2006 and use a tax rate of **0,1%** predict that such a tax would generate **5,1 billion Euro**[f2] in the **Netherlands** per year. [EU1] The major part of these substantial amounts (between 80% and 90% of the revenue, depending on the assumptions about the reduction of transactions) would be collected from taxing transactions in derivatives [EU1].

The expected revenues in the Netherlands will depend as well on estimates of the expected reduction of trading volume caused by the STT as on the applied tax rate. If one uses the newest figures for the Dutch GDP [IMF1] and the original model used by the European commission [S1] the following revenues can be derived [f3] [Table 1]:

<b>Annual tax revenue in the Netherlands from a general STT</b>			
Reduction in transaction volume	Tax rate		
	<b>0,1%</b>	<b>0,05%</b>	<b>0,01%</b>
<b>low</b>	US \$ <b>10,4</b> billion	US \$ <b>6,7</b> billion	US \$ <b>2,5</b> billion
<b>medium</b>	US \$ <b>7,5</b> billion	US \$ <b>5,2</b> billion	US \$ <b>2,2</b> billion
<b>high</b>	US \$ <b>4,6</b> billion	US \$ <b>3,1</b> billion	US \$ <b>1,9</b> billion

**Table 1 Overview of expected annual tax revenue in the Netherlands from a general STT, for different tax rates and different scenarios of resulting reduction in transaction volume.**

It is important to note that the original values used by the European Commission [EU1] were a tax rate of 0,1% assuming the scenario of a *medium* reduction in transaction volume.

However even a ten times lower tax rate, as currently proposed by the German government [HB1], of only **0,01%** would **still** derive between **1,5 and 1,9 billion Euro** per year of tax revenues **for the Dutch state** [f4]

#### 4 - Conclusion and Recommendations

It is clear that if as recently the national financial press reported that the German government already included revenues to be derived from a STT in its budget for 2012 [HB1] and motions get adopted in the European Parliament [EP1] that Financial Transactions Taxes are no longer a purely academic issue discussed by heterodox economists and NGOs.

2011 might be the crucial year to decide on its wider application. We believe that the taxation of financial transaction might not only be a viable option to generate urgently needed financial resources but are also a necessity to achieve more global tax justice.

By putting higher levies on specific financial products and transactions of questionable macroeconomic benefit, or with higher associated risk, such taxation policies could help to promote sustainable development while at the same time generating the revenues need to pay for it.

We hope that through this paper we made a useful contribution to stimulate the needed wider political debate on this crucial issue.

#### References and Notes

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[B1] in his Janeway Lecture at Princeton, published in 1974 as "*The new Economics One Decade older*", pp.88-92

[B2] Quotations from James Tobin, "*A proposal for international monetary reform*" 1978 (this paper has been Prof Tobin's presidential address at the 1978 conference of the Eastern economic Association Washington D. C).

[B3] Paul Bernd Spahn "*International Financial Flows and Transaction Taxes: survey and options*" 1995, IMF Working Paper WP/95/60.

[B4] quote taken from <http://www.georgesoros.com/faqs/archive/category/finance/>

[B5] David Litterick, *"Billionaire who broke the Bank of England"* the Telegraph (UK) 13 September 2002

[B6] Matthew Tempest, *"Treasury papers reveal cost of Black Wednesday"*, the Guardian, 9 February 2005

[B7] e.g. 1994 the peso crisis in Mexico, the 1997 Asian Financial Crisis, and the financial crisis in Russian 1998

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[D1] Daiana Beitler, *"Raising Revenue. A review of Financial Transaction Taxes through the world"*, Health Poverty Action and Stamp Out Poverty September 2010

[EP1] Climate Action Network Europe: <http://www.climnet.org/policywork/eu-energy-and-climate-policy/193-european-parliament-passes-resolution-on-financial-transaction-tax->

[EU1] EU commission Non-paper on Financial Sector taxation *"Annotated Outline: Options for the taxation of financial sector"*, European commission 19/08/2010

[f00] See e.g. T. Matheson, *"Taxing Financial Transactions: Issues and Evidence"*, IMF 2010

[f0] see Table 5 and Table 7 in the Issue Note by the European commission from august 2010, reference [EU1]

[f1] like so called *"noise trading"* or automatic trading by computer programs so called *"algorithmic trading"* also know as *"automated trading"*, *"algo trading"*, *"black-box trading"* or *"robo trading"* (see for more information [http://en.wikipedia.org/wiki/Algorithmic\\_trading](http://en.wikipedia.org/wiki/Algorithmic_trading))

[f2] the original data were give in US dollar the Europeans commission used an exchange rate of 1.2556 USD/EUR

[f3] see in comparison with older GDP date the values given in Table A5 in [S1]

[f4] this is dependent on the estimated reduction in transaction volume. If one uses the

same "medium scenario" as before in the EU study one would get 1,7 billion euro annually. We used here an exchange rate of 1,3 USD/EUR

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[GS1] Christine Harper *"Goldman Had More Trading-Loss Days Than Morgan Stanley, Lehman"*, Bloomberg April 9, 2008

[GS2] see: James Quinn, *Goldman's traders, not bosses, deserve credit* The Telegraph UK, 18 Dec 2007

[GS3] Press release of Goldman Sachs 19 Jan 2011: <http://www2.goldmansachs.com/our-firm/press/press-releases/current/pdfs/2010-q4-earnings.pdf>

[GS4] Phillip Inman, *"Goldman to make record bonus payout, Surviving banks accused of undermining stability"*, The Observer, Sunday 21 June 2009

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[GS6] calculation based on the data provide by the Federal Reserve through their website on the Primary Dealer Credit Facility (PDCF): <http://www.federalreserve.gov/newsevents/files/pdcf.xls>

[HB1] Jens Tartler, *"Jetzt kommt Schäubles 0,01-Prozentsteuer"*, Financial Times Deutschland, 16.12.2010: <http://www.ftd.de/finanzen/maerkte/anleihen-devisen/:geld-fuer-die-staatskasse-jetzt-kommt-schaeubles-0-01-prozentsteuer/50205915.html>

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[IMF1] International Monetary Fund, World Economic Outlook Database, October 2010: Nominal GDP list of countries. Data for the year 2011

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[NF1] source: Deloitte, International Tax and Business Guide Argentina, 2010

[NF2] source: Deloitte, International Tax and Business Guide Columbia, 2010

[NF3] by legislative degree 975 in March 2007

[NF4] source: Economist Intelligence Unit, Jun 01 2010

[NF5] Simpson Thacher & Bartlett LLP "*Brazil Increases Tax on Foreign Exchange Transactions Related to Foreign Investments in the Brazilian Financial and Capital Markets*", October 22, 2009

[NF6] Mariam Isa, "*ANC moots inflows tax to pin back strong rand*" 3 Aug 2010, Businessday.

[NF7] Source: SARS (South African Revenues Service), Nov. 2010

[NF8] For more information on the South African STT see <http://www.sars.gov.za/home.asp?pid=8413>

[NF9] Sources: PWC 2003, "*Turkey: transaction tax on BCM*" and Revenue Administration, Department of Taxpayer Services, Turkey]

[NF10]Source PWC 2003

[P1] Pollin, R. D. Baker, and M. Schaberg. 2003 *Securities Transaction Taxes for U.S financial markets*, Eastern Economic Journal 29/4:527-58

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[S1] S. Schulmeister , M. Schratzenstaller and O. Picek 2008 "*A General Financial Transaction Tax*" , Österreichisches Institute für Wirtschaftsforschung, Wien

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