
How Effective is the Tobin Tax in Coping with Financial Volatility?

Tobin Vergisi Mali Oynaklıđı Azaltmada Ne Kadar Etkindir?

Yrd.Doç.Dr. M. Mustafa ERDOĐDU*
Yrd.Doç.Dr. Hale BALSEVEN**

Abstract: *The last two decades have witnessed increasingly frequent and severe financial crises that many related to short-term speculation. Consequently, James Tobin's proposition of a small tax on cross-border currency transactions to reduce such speculation has featured prominently in the discussions on the future of the international financial system. Opponents claim that such a tax can easily be circumvented and would not be effective. This paper scrutinizes these claims in the light of recent refinements made in the literature to make an assessment for the Tobin tax's effectiveness in coping with financial volatility. Evaluation of the paper suggests that such a tax, indeed, would not only be effective in reducing financial volatility but also technically feasible and relatively easy to apply.*

Key words: *Globalization, Short-Term Capital Movements, Tobin Tax*

Öz: *Son yirmi yılda çođu gözlemcinin kısa vadeli spekülasyonla ilişkilendirdiđi, giderek artan sıklık ve şiddette mali krizlerle karşı karşıya kalınmıştır. Bu durum, kısa vadeli spekülasyonları azaltmak için James Tobin'in döviz işlemleri üzerinden ufak bir vergi alınması şeklindeki önerisinin, uluslararası mali sistemin gelecekteki yapısını şekillendirme tartışmalarında ağırlık kazanmasına yol açmıştır. Karşıtları, böyle bir vergiden kolayca kaçınılabileceđi ve sonuçta verginin etkin olmayacağı iddiasındadırlar. Bu makale, Tobin vergisinin mali oynaklıđı (volatility) azaltmadaki etkinliğine ilişkin söz konusu iddiaları literatürdeki gelişmeler ışığında irdelemektedir. Makaledeki değerlendirmeler, böyle bir verginin sadece mali oynaklıđı azaltmada etkin olmadığı, aynı zamanda teknik olarak uygulanmasının olanaklı ve oldukça kolay olduğunu ortaya koymaktadır.*

Anahtar sözcükler: *Küreselleşme, Kısa Vadeli Sermaye Hareketleri, Tobin Vergisi*

* Marmara University, Istanbul, Turkey

E-posta: mustafaerdogdu@marmara.edu.tr

** Akdeniz University, Antalya, Turkey

E-posta: halebalseven@akdeniz.edu.tr

1. INTRODUCTION

High volatility (*Volatility can be described as the tendency of financial markets to change abruptly at the whims of investors*) in exchange rate markets has been a recurrent problem for the global financial system, particularly after the demise of the Bretton Woods system in the early 1970s. Following the dissolving currency system, fashionable opinion held that unfettered free markets, a reduced role for the state, and integration into the global economy provided the best formula for development. This formula came to be known as the “Washington Consensus,” which many economies followed by removing virtually all restrictions on cross-border capital flows. The consequence was that these economies become increasingly dependent on short-term foreign borrowing and portfolio flows. New market conditions and very high profits from currency trading pushed volumes almost steadily upwards.

Table 1. Global Trade, Foreign Exchange Trading and Global Official Reserves

Year	Daily Foreign Exchange Turnover* (Billion US\$)	Annual Global Foreign Exchange Volume (Trillion US\$)	Annual World Exports (Trillion US\$)	Export/Foreign Exchange	Global Official Foreign Exchange Reserves (Billion US\$)	Reserves/Daily Turnover
1977	18.3	4.6	1.31	28.5	265.8	14.52
1980	82.5	20.6	1.88	9.1	386.6	4.69
1983	119.0	29.8	1.66	5.6	339.7	2.85
1986	270.0	67.5	1.99	2.9	456.0	1.68
1989	590.0	147.5	2.91	2.0	722.3	1.22
1992	820.0	205.0	3.76	1.8	910.8	1.11
1995	1,190.0	297.5	4.80	1.6	1,202.0	1.01
1998	1,490.0	372.5	4.10	1.1	1,636.1	1.10
2001	1,200.0	300.0	5.63	1.9	2,021.5	1.68
2004	1,880.0	470.0	8.40	1.8	3,319.1	1.76

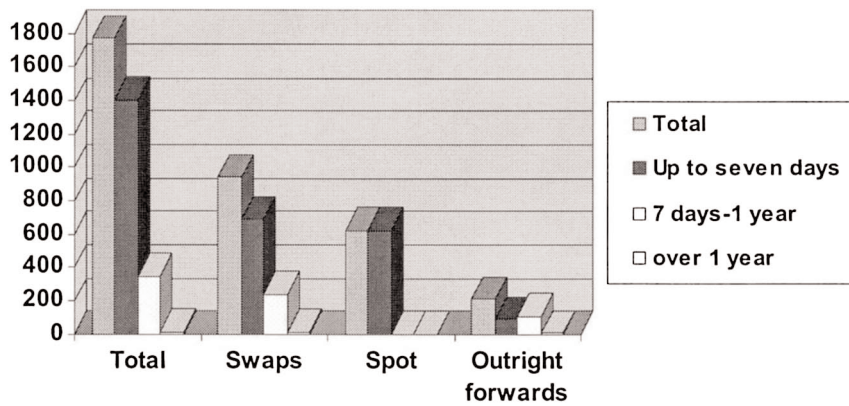
Source: Bank for International Settlements (2005); International Monetary Fund (2004); and World Bank (2005).

* Adjusted for local and cross-border double-counting.

Table 1 presents comparative data for world export and global currency trade increases between 1977 and 2004. Although there is a significant increase in world export, increase in the volume of global currency trade is much larger. World-wide currency turn-overs have raised from 70 billion in 1970 to a volume of 1.9 trillion US dollars per business day in April 2004. Only about 2 percent of such currency transactions are directly linked to real

economy and they basically serve to transfer liquidity from one financial centre to the other, often at extremely short notice. Thus, there has been a significant *excess liquidity* (*Liquidity is not a problem per se. Quite to the contrary, it is necessary for the frictionless functioning of trade, real investment, and international credit relationship. By contrast, excess liquidity denotes the supply of liquidity which exceeds the amount needed for these real economic transactions. According to Wahl and Waldow (2001: 6), excess liquidity causes two intertwined problems: (a) it increases exchange rate volatility, and (b) it is a destabilising factor in itself by its sheer volume and by the speed at which it travels around the world*) which is mainly driven by speculation. Overall volume is dangerously high and prone to speculative runs and damaging volatility. (Bennett (2004) cites an observation of Ms Tumpel-Gugerell of the European Central Bank that: “Before 1997, the volatility on the leading stock indexes hovered around 15% in France and Germany and in the United States both in terms of historical volatility and of implied volatility. From 1997 onwards, the typical value of those volatilities doubled. This doubling was the result of a slow but steady rising trend, lasting more than six years. A doubling period as short as six or seven years is certainly quite remarkable.”). It is estimated that over 80 percent of all transactions occur within seven days or less and more than 40 percent of all transactions involve round trips of fewer than three days (BIS 2005).

Chart 1. Foreign Exchange Turnover by Instrument in April 2004 Daily Averages in Millions of US Dollars



Source: Bank for International Settlements (2005).

Short-term capital inflows are often a cause of concern because their potential exit carries a severe exchange rate risk.

Changes in exchange rates are often greater than can be explained by the “underlying economic fundamentals,” especially in the short term. As indicated by Derviş with Özer (2005: 106), “[f]inancial markets surge and collapse, often without any discernible change in the ‘fundamental’ economic environment.” There is now an extensive literature which indicates that financial market prices can be over- or under-valued for substantial periods of time. (See for instance Kindleberger (2000) and Shiller (2001, 2004)). High volatility

creates a serious risk, which would cause real negative effects on the individual economies. In this regard, the important point to note is the linkage between unregulated cross-border capital inflows and frequent outbreaks of global financial turmoil observed in the past two decades. While such global crises would be the result of many other factors, excessive short-term inflows far beyond the quantities required for the financing of trade can be seen as an important causative factor leading to the dramatic rise in frequency of the financial crises and near crises. The damaging effects of unfettered capital flows have been seen to affect more severely the developing market economies, given their fragile financial infrastructure in defending against massive flows of exchange. In the wake of the drastic devaluations in Europe in 1992/93, there have been a series of major financial crises in eight countries: Mexico (1994/95), Thailand (1997), Indonesia (1997), South Korea (1997), Russia (1999), Brazil (2000), Turkey (2000/01), and most recently Argentina (2002). These crises have generally been preceded by either their sudden financial liberalization or improved access to global markets and were either triggered or exacerbated by financial speculation.

Because of escalating frequency and intensity of financial crises, these crises can no longer be dismissed as mere aberrations in an otherwise well-functioning global capital market. As Eichengreen and Wyplosz (1996: 16) put, “[t]he financial crises around the world cannot all be attributed to the mismanagement of a national economy, as we can observe from instances of the contagion effect [*In times of market stress, the combination of short-termism, herding behaviour and a generalised use of similar risk management techniques could amplify the homogeneity of behaviours and contribute to financial crisis (Jetin, 2003). For herd behaviour and contagion effects see also R. Flood and M. P. Taylor (1996)*] ... Rather than condemning or blaming individual country policies, there is the need to find proper measures of governing the global issue in the global context.” Sharing this view, widespread support for capital account liberalization in developing market economies has recently shifted to scepticism calling for measures to reduce destabilizing speculation and improve macroeconomic performance.

There are many control devices that have been suggested and have been used in regulating free flows of short-term capital, in particular of portfolio type. The list includes, for example, the dual exchange rate regime, administrative prohibition and compulsory deposit requirements on bank lending and borrowing from non-residents (Epstein *et al.* 2003). Amongst these proposals, a place of honour is given to an idea which a Nobel-laureate economist James Tobin had first developed during the 1970’s - that of a tax on foreign exchange transactions. The root of the Tobin tax idea is that many financial market transactions are purely speculative and as such they merely reallocate the ownership of existing financial assets without any beneficial impact on the productive economy. The main goal of the Tobin tax is to reduce foreign exchange volatility through discouraging short-term, “speculative” foreign exchange transactions. It is expected that such a tax may serve to reduce speculation and global economic instability, while affecting genuine investment only marginally. Since its first introduction, both James Tobin himself and other economists have worked on this tax and refined it. The objective of this paper is to make an assessment for the Tobin tax’s effectiveness in coping with financial volatility in the light of recent refinements made in literature.

The Tobin tax has considerable potentials but it is also highly controversial. Controversies of the tax are examined in this paper particularly focusing on its effectiveness. Section 2

reviews objectives and benefits of the tax. Section 3 assesses the effectiveness, limitations and feasibility of the tax. Since no country on earth applied the Tobin tax so far, it is hardly possible to carry out an empirical research. Hence, assessments in the paper rely heavily on theoretical arguments. The only exception in this respect is the results of a model developed recently by Frank Westerhoff (2003, 2004) to study the effectiveness of the Tobin tax. After the evaluation of theoretical arguments and the available empirical research, the final section presents the main findings of the paper.

2. OBJECTIVES AND BENEFITS OF THE TOBIN TAX

The Tobin tax is a proposition of a relatively small tax on cross-border currency transactions to reduce speculation and volatility while promoting autonomy of national macroeconomic and monetary policies. The basic principle of the proposed tax is simple. A small ad valorem charge would be levied on every transaction involving the exchange of one currency for another. Unlike local measures such as the foreign exchange controls which nations can impose, the Tobin tax has a universal calling - as such, it has a non-hierarchical character.

James Tobin's original proposal was for a charge of between 0.1% and 0.5%. Although he proposed as much as 1% later, his most recent suggestion was that the rate better not to exceed 0.25% and 0.1% might be satisfactory. Tobin (1996) amended his original proposal to encompass forward and swap transactions as well. Since Tobin first presented his tax on currency trading, the market in foreign exchange has expanded about one hundred times. It is not surprising, therefore, that his original concept has been seriously modernized to fit in today's market conditions. In this respect, it needs to be acknowledged the work of Paul Bernd Spahn, who contributed an important new element to Tobin's proposal in 1995 by suggesting that the tax should include a second, much-higher rate that would come into force whenever signs of major speculation arise - when price movement exceeds a pre-established limit. This second-tier tax would discourage speculative currency runs, for which a low rate would not be sufficient disincentive.

The main objective of the Tobin tax is to reduce foreign exchange-volatility through discouraging short-term, "speculative" foreign exchange transactions, while affecting genuine investment only marginally. The imposition of even a small tax on short-term exchange operations certainly appears a significant deterrent for speculative actions. Such a tax discourages speculation by making currency trading more costly and the volume of destabilising short-term capital flows would decrease, leading to greater exchange rate stability. The Tobin tax would achieve its purpose through an extremely simple "filtering" of currency trading. For example, suppose a 0.1% tax is levied on all foreign exchange transactions, and that the (annualised) domestic interest rate is 5.0%. Then, with a one-year holding period, the interest rate on a comparable foreign currency denominated asset would have to be at least 5.2% to make foreign investment attractive. If instead the foreign asset is held for only a month then the foreign interest rate must be at least 7.4% to offset the tax. For one-day round trips foreign rates would have to be at least 77%. Thus, a small and enforceable Tobin tax could virtually shut off short-term capital flows. This brief illustration highlights two important points. First, the effective annualised rate of tax on the capital sum involved would rise in inverse proportion to the turn-around period.

A secondary objective of the Tobin tax is to preserve and promote autonomy of national macroeconomic and monetary policies. The free movement of capital on an international scale has reduced the ability of national economies to conduct monetary and other economic policies on the basis of purely domestic criteria. As seen in Table 1, although central banks of many countries have increased their foreign exchange reserves about 12.5 times during 1977-2004 period, this was significantly behind the 102 times increase in world-wide currency trades. Hence, most central banks have significantly lost their autonomy today and increasingly at the mercy of international capital flows. Speculative pressure on an exchange rate, for example, can result in interest rates higher than is warranted by internal monetary conditions, with a damaging effect on economic growth and employment.

The first effect of a Tobin tax is a reduction in the overall volume of foreign exchange transactions. This would mean that central banks need less financial clout to intervene. Its second effect is to increase official resources for intervening to stabilize exchange rates. Thus, the Tobin tax would to a certain extent free national interest rate policy from the task of defending that country's currency. It would no longer be necessary to implement hikes in the interest rate as a proportion of the desired rise in the currency - and this would make it easier monetary policy to serve the interests of investment (Frankel 1996: 57-58). Moreover, the transactions tax revenue would provide more scope for national economies to implement full employment and other welfare goals without being sandbagged by anticipatory capital flight (Patterson and Galliano 1999).

The Tobin tax has also the potential to raise huge amount of revenue. Estimates of the amounts which would be raised by a Tobin tax depend upon several variables: the rate of the tax; the extent to which it achieved its desired effect of reducing short-term speculation; the extent to which certain transactions were exempt; and the amount of "leakage" to non-conforming financial centres and into non-taxable transactions. Using 1995 currency transactions figures, Felix and Sau (1996: 238 - 40) estimate the global revenues from a Tobin tax of 0.1% to be between \$148 billion and \$180 billion. If the tax were set at 0.05%, the revenue estimate is between \$90 billion and \$97 billion. Using 2001 data, Pollin et al. (2002) consider a joint Tobin - Keynes tax that applies within just the US to all currency, equity, and bond market transactions. They estimate that this would rise on the order of \$70 - 100 billion a year. However, pointing to several important changes in foreign exchange markets in recent years, Nissanke (2003) suggests that the revenue may be much smaller than those derived from earlier studies. Nissanke estimates that a Tobin tax at 0.02 percent applied to wholesale transactions would generate annual revenue of about US\$30-35 billion, while at 0.01 percent would produce \$17-19 billion.

3. EFFECTIVENESS AND FEASIBILITY OF THE TOBIN TAX

The foundation for the Tobin tax argument is that some speculators and noise traders are after short-term profits and their short-term speculative efforts drives up trading volume and generates disruptive, inefficient price movements that are inconsistent with stability. The fundamental investors in the market are neither sufficiently numerous nor active to overwhelm the effects of this behaviour. Instead, the speculators and noise traders have a decisive impact on the market and thus impose costs from noisy price signals onto the fundamental investors. If the fundamental investors were left alone in the market, their

investment activities would result in more efficient and less volatile markets. Imposition of a currency transaction tax may raise the cost of the trading so that drive the speculators and noise traders partially or completely out of the market while leaving the fundamental investors to dominate the market (Dodd, 2003: 37-8). The central issue in the Tobin tax debate is the role of speculation in the market stability. While neo-liberals regard speculation useful for market stability, opponents see it economically disruptive and destabilizing. The following sections will review this debate and make an assessment according to available empirical findings.

3.1. The Relationship between Speculation and Stabilisation

Neo-liberals oppose a Tobin tax on the ground that anything that increases transactions costs is economically inefficient. Their view is that the tax will simply damage liquidity without ending currency runs or reducing volatility. Indeed, they say it might even increase volatility by driving out stabilising contrarian speculators. From the perspective of opponents, the Tobin tax is a device that tends to decrease market efficiency by creating liquidity problems for the day-to-day operations of currency markets, affecting adversely the bid-ask spreads and hence deterring arbitrage transactions. Those critics believe that the right solution is to reform faulty policies, not tax transactions.

Neo-liberal criticism is based on the supposedly obvious link between market liquidity and market stability. Starting with Milton Friedman (1953) and the Monetarists, and continuing with the School of Rational Expectations, many people's view of the financial markets has been dominated by the idea that irrational or inefficient speculators will tend to lose money, giving irrational traders a short enough half-life to make them irrelevant. Thus, speculation has been perceived as a factor of stabilisation. Yet this link has never been proven. Empirical investigations do not confirm the existence of any correlation between an increase in market volumes and an increase in market stability (Grunberg et al. 1996: 5). Over the last two decades, it has even been possible to observe a parallel increase in the volumes traded on the currency markets, and a rise in foreign exchange instability. Arestis and Sawyer (1997) observe that there is not only strong volatility in exchange rates but also the swings tend to be sustained for a long period. This cannot be explained by the orthodox neoclassical rationality. Since 1980, the monthly average of the standard deviation of the sterling/DM rates was 3.9% with the ratio of the minimum to maximum per year ranging from 5% to 22%.

Above and beyond the absence of empirical proof, the arguments in favour of unfettered market liquidity, as a supposed guarantee of exchange rate stability, are also theoretically weak. From a theoretical point of view, the idea that speculation is always a factor of stability is tantamount to an act of faith: one must believe that an equilibrium exchange rate exists, that speculators know what it is, and that their actions are always taken in reference to it, thus spurring the return of prices to their one, single equilibrium. However, the hypotheses that make it possible to demonstrate the existence, uniqueness, and stability of an equilibrium price are so radical as to be hardly credible. If there were a multiplicity of equilibrium prices, speculative attacks against exchange rates could be successfully unleashed, even in the absence of the macro-economic imbalances to which speculators are supposedly so sensitive (Eichengreen and Wyplosz 1996: 20; Dooley 1996: 89-91). In light of the recent powerful backlash against the "efficient market

hypothesis” in the finance literature, Friedman’s contention now appears far from persuasive, if it ever was.

It became increasingly clear that capital markets are subject to the profound human influences and substantial amounts of herd behaviour captured in Alan Greenspan’s now-famous phrase, “irrational exuberance.” Financial markets surge and collapse, often without any discernible change in the “fundamental” economic environment. Robert J. Shiller (2001) points out that, “[e]ven completely rational people can participate in herd behaviour when they take into account the judgements of others, even if they know that everyone else is behaving in a herd-like manner.” Mass psychology and behaviour promote the speculative bubble and under this influence the markets may have been bid up to unusually high and unsustainable levels. (*The Dow Jones Industrial Average stood at around 3,600 in early 1994. By 1999, it had passed 11,000, more than tripling in five years, a total increase in stock market prices of over 200%. At the start of 2000, the Dow passed 11,700. However, over the same period, basic economic indicators did not come close to tripling. US personal income and gross domestic product rose less than 30%, and almost half of this increase was due to inflation. Corporate profits rose less than 60% and that from a temporary recession-depressed base. Viewed in the light of these figures, the stock price increase appears unwarranted (Shiller, 2001)*). Consequently, the market can “go through significant mispricing lasting years or even decades.” When the number of firms and households indulging in these practices grows large, bringing in segments of the population that are normally aloof from such ventures, speculation for profit leads away from normal, rational behaviour to what has been described as “manias” or “bubbles.” (*The word mania emphasizes the irrationality; bubble foreshadows the bursting. In the technical language of some economists, a bubble is any deviation from “Fundamentals,” whether up or down. A good case study of all the great financial disasters of the last few hundred years (From the Dutch Tulip mania of 1637 – in which tulip bulbs were eventually valued more than gold – to the crash of 1987) can be found in a recent book written by Charles P. Kindleberger (2000)*).

The idea that speculation is a factor of stabilisation has been challenged from a number of directions. One challenge comes from rational expectations theory of behaviour which shows how asset price bubbles can be rationally self-fulfilling. All that is needed is that market participants expect that the future price will be higher, and they will buy now in anticipation of this higher future price. In this fashion, “market beliefs” can become the driving fundamental, and if speculators share and shape this belief they can drive prices away from the level warranted by economic conditions (Palley, 2003: 11).

A second challenge comes from the literature on herd behaviour that points market investors may rationally act as a herd. For instance, informational frictions may cause herding behaviour, in which a large number of individuals react the same way to new information, thereby creating an over-reaction in aggregate. They might react in this way-in full knowledge that there is likely to be an aggregate overreaction to the news-because they would suffer reputational damage if they did not react like their competitors. Derviş with Özer (2005: 108) suggest that “[i]here are many situations ... where *people know* that ‘values are exaggerated’ and buy nonetheless, believing, often correctly, that others will follow and hoping they can be the first to exit once the bubble bursts.” In this case, the “behaviour of others” becomes the market fundamental, and the actions of speculators can trigger herd-driven exchange rate movements that have no relation to underlying economic conditions.

A third challenge to the traditional view comes from the noise trade literature that shows market participants who trade purely on the basis of noise may come to dominate the market. Forex market noise traders look to make gains on very small basis points movements. Because they are indifferent to risk, they earn a higher rate of return than ordinary risk-averse persons. As a result, noise traders can come to dominate the market, and though the market remains stable, it produces socially sub-optimal outcomes (Palley, 2003: 11-2).

A fourth strand of work, emphasising economic efficiency concerns, focuses on how speculators may cause damage to other market participants when they cash out of their investments. This seems to have been particularly prevalent in East Asia, where the decision to cash out and repatriate investments led to a fall in the exchange rate that then increased the debt burden of those East Asian entrepreneurs who had used foreign currency borrowings to finance their business expansions. In such instances, speculators impose a negative externality on other investors, the economy and on the monetary authority (Palley, 2003: 12; Haberler, 2003: 31).

The above arguments explain why foreign exchange markets exhibit the patterns they do and why these patterns are inefficient and sub-optimal. Speculation is caused by noise traders whose presence creates market volatility risk, and these traders profit from the induced volatility premium. This is economically disruptive and destabilizing. Conventional economic theory advises that policy makers should tax activities having negative externalities to discourage them. This is well-known theory of Pigouvian taxes. Viewed from this vantage, the Tobin tax can help improve the situation.

3.2. Effectiveness of the Tobin Tax

In a recent article, Ertürk (2002) reveals that stability depends on both the elasticity of traders' expectations of future prices in response to changes in present prices and the reaction speed. If a transaction tax delays the decisions of traders in the face of asset price changes, then, *ceteris paribus*, the Tobin tax is stabilizing. The Tobin tax can also have a stabilizing effect by lowering the elasticity of expectations. The market perception of systematic risk, and thus the risk premium, is reduced by the transaction tax. Even if the tax increases transaction costs and might reduce the liquidity of the market, it could very well have the net effect of lowering the risk premium by diminishing the traders' perception of the unpredictability of trader sentiment in currency markets. Hence, transaction costs could even fall owing to the changed composition of traders, with noise traders kept largely out of the market by the presence of the Tobin tax.

The main use of the Tobin tax would be to intervene upstream from the markets, that is, before a speculative bubble is created. A rise in the current exchange rate above its normal value would not lead traders to expect a further rise, since the cost of the tax would discourage them from buying enough of this rising currency so as to magnify its strength. It would therefore be easier for the monetary authorities to intervene and to maintain exchange rate stability. The Tobin tax would make a positive contribution to the stabilisation of exchange rates by acting as an "uncertainty reducing institution" through the influence that it would exert in the creation of expectations (Arestis and Sawyer 1997). By definition, if the Tobin tax is successful at eliminating noise trading, it will reduce market volume. However, that does not automatically imply that the market will be thin.

As Table 1 shows, daily forex market turn-over has recently reached to 1,880 billion and it is the largest market. Even if some trading were discouraged, they would most likely to remain highly liquid and would continue to have larger volumes than twenty years ago. The markets were stable back then, and there is no reason to believe that they would not be now.

Calculations show that the Tobin tax, unlike some forms of capital control, would fall far more heavily on short-term transactions than long-term (Frankel 1996). Thus, by its disproportionate impact on short term transactions, the Tobin tax would contribute to a reinforcement of long term expectations which by nature create greater stability, based on the fundamental variables of macro-economics. Traders would have to take the Tobin tax into account, and include it in their assessments of a situation - that is, in their convention. The tax would make it more difficult for a minor and temporary speculative attack to generate a speculative bubble, which could then be transformed into a major speculative attack.

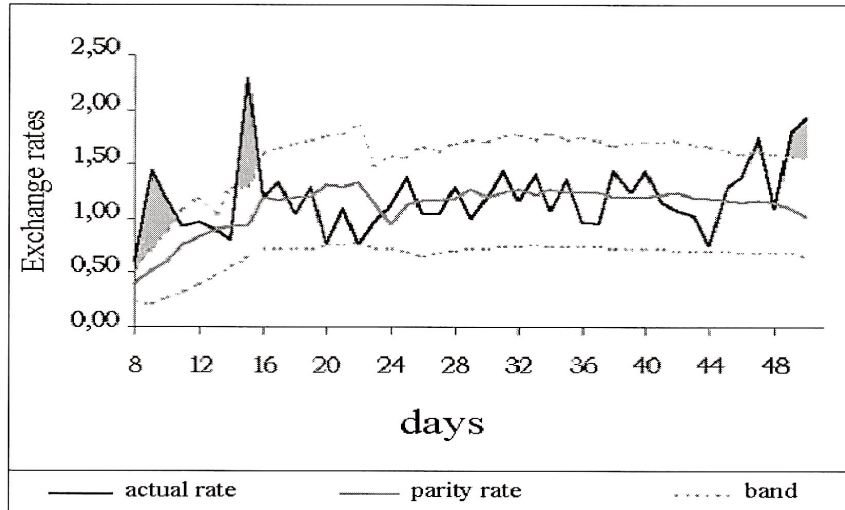
In addition to reducing daily foreign exchange market volatility, the Tobin tax may also help reduce medium term exchange rate swings that have so distorted the international economy. Here, the argument is that these swings can result from momentum foreign exchange trading strategies. Once the wagon gets rolling, traders extrapolate that it will keep rolling, and they therefore have an incentive to jump on board. When everybody does this, the trading strategy can become self-fulfilling. A Tobin tax may be able to prevent this by stopping momentum from developing (Palley, 2003: 13).

Recently, Frank Westerhoff (2003, 2004) has developed a model of heterogeneous interacting agents to study the effectiveness of the Tobin tax. His model involves two distinct markets, which he can tax independently, but with traders having knowledge of both markets. He finds that the imposition of a Tobin tax leads to a crowding out of speculators and decrease the volatility of the market in which it is introduced, while increasing the volatility of the second market. However, the imposition of a uniform tax on all transactions stabilizes both markets. His results suggest that if regulators of a market introduce a transaction tax, other markets are likely to follow to avoid becoming more volatile.

3.3. Limitations of the Tobin Tax

There is not much disagreement that a Tobin tax would eliminate speculation where only small parity changes were expected. Most critics, however, suggest that the tax would be unlikely to have much effect on the massive position taking in the markets that usually precipitates a major currency upheaval. For example, the events in the ERM of September 1992, the fall of the East Asian currencies in 1997 or of the Brazilian real in 1999. In such cases a 0.1% or even a 1% tax is trivial by comparison with expected parity changes. Nor does the Tobin tax by itself, implemented at the low rates, have sizeable effects on restoring macroeconomic policy autonomy. The low range of the tax would not deter speculative attacks on pegs, when much higher gains are at stake. Too high rates, on the other hand, risk reducing unduly liquidity necessary for arbitrage operations as well as deterring international trade transactions and long-term investment. In order to address this trade-off and to deal effectively with speculators' different motivations depending on market conditions, a flexible multi-tier system of taxes would be required (Nissanke, 2003: 6, 8). The "circuit-breaker" variation of the Tobin tax was designed precisely by Paul Bernd Spahn (1995, 2002) to deal with this problem.

Figure 1. The Spahn Tax Surcharge Mechanism



Source: Spahn (1996: 26).

Graph 1 demonstrates workings of this mechanism. The first tier of this variation would be low, (such as 0.01%) and raise revenue at a moderate scale without necessarily distorting financial operations or encourage tax avoidance. (*Jetin (2003: 119) suggests that "[a] higher tax of 0.1% (10 basis points) would not be foretold chaos."* He seems right to say that "...the rate of the ordinary tax is a purely empirical question. If, by experience, it appears too high, then it can be lowered. If it appears too low, it can be increased."). It focuses on spot transactions, but could also be employed on derivative trades, at a standard lower rate. This would allow derivatives markets to function at low costs, yet prevent the emergence of derivatives as a tax avoidance device. In times of exchange rate turbulence, the second tier of the tax would come into effect. This second tier would be a punitively high rate and act as a circuit-breaker, akin to that used in stock markets where computer-trading programs are suspended when prices fall a given amount. While the first tier will help reduce volatility somewhat, greater reduction in volatility would come from the operation of the tax surcharge. The tax surcharge makes the currency trade unprofitable and thus prevents currency crashes. (*According to Dodd (2003: 37), the Spahn version of the tax will not help if the speculator lays on the position before the higher rate is triggered. He also argues that the transaction tax will not stop or substantially discourage short-term banking lending or so-called "hot money" from flowing between developed and developing countries since rolling-over loans does not require currency conversion and thus would not be subject to such a tax.*) Once the panic had passed, the tax would be reduced to a lower standard level. The two taxes would be fully integrated, the former tax constituting the operational and computational vehicle for the latter. Some recent studies (*See particularly, Balseven and Erdoğan (2005) and Erdoğan (forthcoming) for their work on Turkey.*) suggest that it is possible for individual countries to apply a two-tier Tobin tax with considerable success.

Williamson (2000) highlights the important point that bands are stabilizing when credibility to defend is maintained. Therefore, it is crucial first and foremost to build credibility so that expectations are formed in a stabilizing manner. (*Indeed, once such a system is seen to be operating efficiently with credibility, a threat of the surcharge levy alone may be sufficient to keep exchange rates within a target zone*). The tax surcharge would not affect liquidity or efficiency of market functioning in a less volatile condition. It can, however, change incentives reducing the likelihood of such speculative attacks and even they do occur reduce the likelihood of their success. Thus, Spahn's proposition is one of the most promising methods of mitigating the damage to stabilising transactions, while retaining the deterrence to speculation. Nevertheless, it should not be seen as a panacea. As Kavaljit Singh (2005: 11) suggests, the Tobin tax "is very important, very significant and very necessary. But it is not adequate to solve all the problems facing the present global financial landscape."

Two reasons for why currency transaction taxes (CTTs) are not sufficient tools for preventing financial crises of the sort that have become all too common in developing countries were given by Gabel (2003: 95-6) as follows: "First, CTTs are not designed to dampen speculation in all of the sectors of the economy that are prone to bubbles. For example, speculation in real estate and construction contributed significantly to the creation of a fragile financial environment in the East Asian countries that were party to the 1997-98 financial crisis. Second, even in those sectors that do fall under the authority of CTTs, the presence of a tax is unlikely to reduce speculation dramatically. A low CTT would not be sufficient to undermine the attractiveness of activities and financing strategies that aggravate fragile financial environments, particularly in the context of rising expectations during an economic boom." Moreover, the presence of a relatively small tax on currency (or securities) sales would be unlikely to discourage investor exit if investors have reason to fear massive capital losses due to declining securities prices and/or a significant currency depreciation (Crotty and Epstein, 1996; Dodd, 2003; Palley 2001). Furthermore, CTTs cannot reduce the risk of contagion from financial crises that originate elsewhere. It is important to note, however, that a dual or a variable STT-CTT has a greater potential to reduce financial volatility and mitigate the severity of financial crisis than does a traditional CTT (Gabel, 2003: 96).

3.4. Implementation Difficulties and Feasibility of the Tobin Tax

As it is the case with any tax, there are certain difficulties to achieve certain objectives of the Tobin tax. For instance, it aims to target only noise trading. However, distinguishing between beneficial, stabilising transactions, and those that are speculative and destabilising, presents serious problems. Examples can be given as hedging operations of traders and the operations of market-makers. In order to remove the resulting bias against high frequency trading for hedging purpose, Spahn (1995) suggests that transactions involving derivatives should be taxed at half the rate involving spot transactions, which would allow the derivative markets to function for hedging purposes. In his more recent study, however, Spahn (2002) proposes that in addition to all spot transactions, outward forwards and swaps up to one month would be taxed, while options and other financial derivatives would not be taxed (though they are taxed indirectly through the spot and forward transactions they trigger). Another difficulty is that, there would be considerable

problems in defining the scope of transactions to which the Tobin tax would apply. James Tobin's original proposal was for a tax on cash transactions. Levying it on small currency-conversions by tourists, small businesses, etc., however, would be unpopular and almost certainly damaging to trade.

Technically there are two different ways to impose a Tobin tax. You can tax the currency trading desks in a particular jurisdiction or you can tax a currency. Both methods have arguments for them, but it is more difficult to evade the tax if it is imposed on the currency. Under the first proposal, any country with the authority to tax could adopt a currency transactions tax unilaterally. Collection of the tax would then be the responsibility of the national central bank that imposes the tax and subject to all the tax laws of the implementing nation. Once adopted, the Tobin tax would then automatically apply to every transaction involving the taxed currency, anywhere in the world. Kapoor (2004) explains the second mechanism as follows: "If the UK signs up to the CTT - then all pound transactions, wherever they are conducted in the world, are taxed - so trading pounds in the Cayman Islands will not avoid the tax. This is so because a pound is essentially a claim on the Bank of England. Foreign holders of pounds have to hold them as claims on banks in the UK (nostro accounts) and thus they eventually end up as claims on the Bank of England."

Many argue that the Tobin tax will fail, as speculators will find ways around payment. Two principal types are likely: first, the migration of the forex market to tax-free jurisdictions; and second, the substitution of tax-free for taxable transactions. If the burden of the tax became too great, it would pay many players to shift the booking of their transactions offshore to financial centres that would not impose the tax. Thus, the country imposing it might lose business from its own financial institutions to foreign competitors. (*Using 1995 data, Felix (1996) reports that 62% of currency trading takes place in the top five markets (UK, US, Japan, Singapore, and Hong Kong).* Since the top five key currency countries covers about 62 percent of all the global foreign exchange transactions, *(The other countries are mostly developing or transition economies. These countries are generally prone to many problems related to international capital flows such as price bubbles and bursts, herd behaviour and contagion. Depending on each country's specific conditions, it is advisable that such countries are better off not only apply a two-tier Tobin tax but also simultaneously apply more direct devices like capital restrictions and regulations against capital flows, particularly for short-term flows. Several recent studies for Turkey cover these issues in detail. See, for instance, Balseven and Erdoğan (2005) and Erdoğan (forthcoming)).* James Tobin proposed that even a simultaneous application of the tax in those areas with the addition of several other countries, would be quite enough for its effectiveness.

The second aspect concerns tracking. An earlier argument against the Tobin tax was that it would be impossible to implement it without the agreement of almost every conceivable jurisdiction. The increasingly electronic nature of the currencies market, however, means there are few technical barriers to the collection of the tax. As Rodney Schmidt (1999) makes the important point, the technology and enforcement mechanisms are already in place at the various settlement institutions for foreign exchange. There is no need to create an expensive new institution to collect the tax. All major currency transactions are tracked electronically and it is possible for governments to utilize the existing centralised and regulated structure through which banks exchange balances on the wholesale market (A

process of establishing a *de facto* global standard is facilitated by the fact that currency trading is highly concentrated. Using 1995 data, Felix (1996) reports that 84% of currency trading takes place in the top 9 (top 5 plus Switzerland, Germany, France, and Australia) countries. If these countries, plus the remaining G-7 countries (Italy and Canada) were to impose a Tobin tax, this would capture the vast bulk of the world's markets (Palley, 2000) to collect the tax. This is becoming even easier with the recent advent of the Continuous Linked Settlement (CLS) mechanism - a new system to significantly reduce the risk of large foreign exchange deals by making all payments to settle a currency transaction simultaneous and centralised. This prevents the possibility of any parties to the deal defaulting. However, it is widely accepted that it also makes the Tobin tax far easier to implement. The Tobin tax can, therefore, be practically implemented at low cost. Because the tax would be collected by each country's own central bank, individuals and institutions seeking to avoid the Tobin tax via tax havens could be penalized by refusing them the right to utilize that central bank's currency, which is a huge disincentive. Hence, a Tobin tax could be difficult to evade and quite easy to collect through the computer systems that record each trade. As Spahn (2002) suggests, all that is necessary are minor alterations of software packages in order to assess and collect the tax.

Finally, since all transactions affecting exchange rates are typically settled at central bank accounts, levying the tax at the stage of settlement is technically feasible and easy. This may not cover all transactions, for instance over the counter (OTC) operations. According to Jetin (2003: 139), however, this would not be a problem. OTC derivatives products that are not settled will be taxed at the point of negotiation. The progress in straight-through-processing will make it easier. For those OTC that are processed manually, the master agreement leaves a trace that fiscal authorities can check. Trading through telephone is also taped and therefore leaves a trace.

It is undoubtedly true that financial markets will innovate to avoid the Tobin tax. Once the tax was imposed, new financial products would be devised to escape it. However, new forms of transactions imply costs to traders and could make completion of transactions more complicated and risky. Feasibility of a Tobin tax implementation depends on the overall costs of doing business in a specific country. A Tobin tax would only fractionally raise the cost of doing business.

Incentive to evade the Tobin tax (or any tax) is to a large extent based on the level of the tax. Banks and other financial institutions will weigh the potential cost of evasion (penalty, suspension of licence, reputation risk and the actual technical costs of evasion through new legal entities and new instruments) against the costs of compliance (a small percentage of their total profits). At a tiny tax rate 0.005% it is believed that the incentive to evade would be very low as the costs of evasion would be much higher than the cost of compliance. This is supported by the fact that the vast majority of the financial system of the world located in a few developed countries. To redirect financial flows via offshore centres requires a costly infrastructure with expensive staff. It would also imply a break up of existing business relations. Thus, Wahl and Waldow (2001: 11) argue that these evasion costs will be even greater than the tax itself. In that respect, not only would it be feasible for the G-7 to go it alone in imposing a Tobin tax, even the US with one of the world's low cost producers of financial services, would successfully impose the tax unilaterally without necessarily losing business to other markets. (For an opposite view see Dodd (2003: 32-33)).

The extent of avoidance will depend critically on the design of the Tobin tax. To the extent that it is narrowly designed, avoidance by substitution will be larger. For example, if the tax focuses on “spot” transactions, this would clearly induce a shift of transactions into “futures” and “derivatives”. Thus, the real issue is how to design a tax that takes account of all the methods and margins of substitution available to traders. Taking account of these considerations implies a Tobin tax that is bigger in scope, and pushes the design toward a generalized securities tax (Palley, 2003: 6, 20).

While leakages via evasion and avoidance are real concerns (as they are with any tax), the problem can be reduced significantly if the tax rate is “punitive” and the participation is broadly multilateral (Rajan, 2003). At present, a robust international political authority with sufficient accountability and enforcement powers to levy global taxes does not exist. One option, as Tobin (1996) suggested, would be to make the planning and implementation of the tax the direct responsibility of an international organisation such as the IMF or the Bank for International Settlements. The problem of evasion via non-participating countries would be greatly reduced if applying the tax were a condition of IMF membership and of borrowing from it. Tobin has also suggested that those countries applying the tax, which would also generate most of the funds, could themselves levy the tax on transfers to those smaller centres that did not apply it.

It needs to be underlined that even if traders become successful finding ways to avoid the tax, this does not mean that a Tobin tax is unwarranted. All taxes are evaded to some extent and never capture the entire revenue stream they target. Difficulties never dissuaded governments from collecting taxes. The real question is how do you minimize evasion and create mechanisms to revise the tax as necessary? Thus, regulation is an ongoing process and the bodies responsible for the tax would need to expand their scope into “an ever-widening ring of securities and derivatives markets” (Patterson and Galliano, 1999).

Above argument and the evidence suggest that the Tobin tax has merits and it is technically feasible. Clearly, the biggest barrier to the adoption of the Tobin tax is not technical or administrative, as critics claim, but political. The Tobin tax is viewed as a threat to financial community privilege and has been met with resistance by a sector with massive political clout. There are two key political issues involved in putting the Tobin tax in place: Firstly, how to get agreement amongst the major countries (*The US, for instance, is the main lobbyist against the idea of imposing a tax on the foreign exchange market. As an example Niskanen (2003: 13-4) points out that, in the second session of the 104th Congress of the US, Senator Bob Dole and three other politicians introduced a bill to prohibit the UN and UN officials from developing and promoting Tobin's idea or any other international taxation scheme*) and, secondly, how to collect and distribute the tax revenue. Since such international agreement seemed improbable, the tax was seen by many as a worthy but impracticable proposal. The recent work of economists and financial experts, however, has demonstrated that universal simultaneous adoption is not vital for a successful implementation. In the light of the political reality that the Tobin tax cannot be introduced universally or multilaterally in the first instance, Spahn (2002) suggests that a two-tier Tobin tax can be implemented unilaterally by a group of countries such as the European Union in cooperation with Switzerland. The recent conditional approval of a two-tier Tobin tax by the Belgian Federal Parliament (*On 15 June 2004, the Commission of Finance and Budget in the Belgian Federal Parliament approved the bill implementing*

a two-tier currency transaction tax. Belgium will introduce the tax if all countries of euro zone introduce the similar bill) is the latest major step to bring James Tobin's idea into reality.

As David Hillman (2004) indicates, "[t]he Belgian legislation shows that introducing such a tax is entirely feasible, and demonstrates how this can be done." This development, in particular, has contributed to re-activating the debate on the many-sided potential of the Tobin tax. Despite the overall merits of the Tobin tax and/or other similar devices, however, there has been the lack of political will in rich countries. Unlike the 1960s and 1970s, when governments considered it legitimate to regulate markets, the present era is not very favourable to the taxation of financial transactions. Nonetheless, it is possible to detect a crack in the currently dominant paradigm. For instance, French President Jacques Chirac suggested a tax on cross-border financial transaction in his speech to the World Economic Forum in 2005. This is the first time for a large advanced country leader to pronounce that a Tobin tax-type levy is worth serious consideration. However, Chirac's suggestion of 0.001% is such a low amount that it would have negligible impact on global capital speculation (Guardian, 28 January 2005).

4. CONCLUSIONS

Financial globalisation since the 1970s has spectacularly increased capital movements and this resulted in high volatility of foreign exchange transactions. This has culminated in increasing number of financial crises that we have witnessed in the last two decades. Financial crisis risk of any country depends heavily on the term structure of foreign borrowings it receives. Apparently, when a country has a short-term structure for its borrowings, its financial crisis risk is high. Thus, decreasing the share of short-term capital movements and increasing the share of foreign direct investments and long-term borrowings seems as the best policy. The Tobin tax serves to achieve this objective. The Tobin tax is a potentially effective tool to mitigate some of the disruptive effects of free capital movement and would make a positive contribution to the stabilisation of exchange rates by acting as an "uncertainty reducing institution" through the influence that it would exert in the creation of expectations. A Tobin tax would penalize all transactions but speculative round-trips would be hit more severely. Therefore, it would represent a significant extra cost to speculators, while affecting capital investment only marginally. As the evaluation in this paper suggests, a two-tier Tobin tax looks particularly promising. The first low rate of such a tax would raise revenue at a moderate scale without necessarily distorting financial operations or encouraging tax avoidance. The second higher rate would only come into action when the level of currency trading passed a certain threshold or safety margin and would act as a circuit-breaker. This surcharge makes currency trade unprofitable thus preventing most crises.

The Tobin tax is an effective and technically feasible form of taxation. When it is applied, the tax would enhance global fiscal stability and market efficiency. By making crises less likely, it would help to avoid the social devastation that occurs in the wake of a financial crisis. The tax revenue it raises would increase official resources for intervening to stabilize exchange rates while providing more scope for national economies to implement full employment and other welfare goals without being sandbagged by anticipatory capital flight. A Tobin tax, however, is only one of several possible mechanisms for combating

instability in international currency markets. No claim has been made that such a tax alone could solve the problems of financial instability or could prevent future economic turmoil. A Tobin tax would not prevent exchange rate collapses that are massively over-valued relative to the rate warranted by economic fundamentals. Thus, it should not be seen as a panacea and must be supplemented by other measures. Still, the Tobin tax implies greater control over short-term capital movements and serves to reduce the instability of the international monetary and financial systems. Best results from a Tobin tax can obviously be achieved when every country applies it at the same time. Nevertheless, it should not be underestimated that individual countries may apply a two-tier Tobin tax with considerable success. Lastly, depending on their own strengths and weaknesses it is advisable, particularly for developing countries, to apply different forms of regulations. Such measures are most likely to strengthen application of a global Tobin tax.

REFERENCES

- Arestis, P., and Sawyer, M. (1997).** The Tobin Financial Transactions Tax: Its Potential and Feasibility, *International Papers in Political Economy*, vol. 3, 1997, 1-32.
- Balseven, H. and Erdoğan, M. M. (2005).** Mali Kriz Riski Bağlamında Tobin Vergisi ve Türkiye’de Uygulanabilir Bir Versiyonu, *Marmara Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, Cilt: XX, 1, 297-319.
- Bank for International Settlements (2005).** Triennial Central Bank Survey: Foreign Exchange and Derivatives Activity in 2004, Basel, March.
- Bennett, P. (2004).** Why are Capital Markets catastrophic, and are they becoming more so, In Herbie Skeete (ed.) *The Handbook of World Stock, Derivative and Commodity Exchanges*, London: Mondo Visone. Available at <http://www.exchange-handbook.co.uk/articles.cfm>
- Crotty, J. and Epstein, G. (1996).** “In Defence of Capital Controls.” In L. Panitch (ed.), *Are There Alternatives? Socialist Register* 1996. London: Merlin Press, 118-49.
- Derviş, K. with Özer, C. (2005).** *A Better Globalization: Legitimacy, Governance, and Reform*, Washington, D.C.: Center for Global Development.
- Dood, R. (2003).** Lessons for Tobin Tax Advocates: The Politics of Policy and the Economics of Market Micro-structure, in J. Weaver, R. Dodd and J. Baker (eds.), *Debating The Tobin Tax: New Rules for Global Finance*, Washington, DC, November, 27-50.

- Dooley, M. (1996).** The Tobin tax: Good theory, weak evidence, questionable policy, in M. Ul Haq, I. Kaul and I. Grunberg (eds.), *The Tobin Tax: Coping with Financial Volatility*, Oxford: Oxford University Press, 83-106.
- Eichengreen, B., and Wyplosz, C. (1996).** Taxing International Financial Transactions to Enhance the Operation of the International Monetary System, in M. Ul Haq, I. Kaul and I. Grunberg (eds.), *The Tobin Tax: Coping with Financial Volatility*, Oxford: Oxford University Press, 15-40.
- Epstein, G., Grabel, I, and Jomo, K.S. (2003).** *Capital Management Techniques In Developing Countries: An Assessment of Experiences from the 1990's and Lessons For the Future*, 8 February.
- Erdoğan, M. M. (forthcoming).** Türkiye'nin Mali Kriz Riskini Azaltabilecek Vergi Politikaları, *Öneri*.
- Ertürk, K. (2002).** Why the Tobin Tax Can Be Stabilizing, Working Paper No.366, The Levy Economics Institute and Department of Economics, University of Utah, December 2002. Available at http://www.levy.org/default.asp?view=publications_view&pubID=f73a203df5
- Felix, D. (1996).** *Financial Globalization versus Free Trade: The Case for the Tobin Tax*, UNCTAD Discussion Paper No. 108.
- Felix, D., and Sau, R. (1996).** On the Revenue Potential and Phasing in of the Tobin Tax, in M. Ul Haq, I. Kaul and I. Grunberg (eds.), *The Tobin Tax: Coping with Financial Volatility*, Oxford: Oxford University Press, 239-240.
- Flood, R. and Taylor, M. P. (1996).** Exchange Rates Economics: What's Wrong with the Conventional Macro Approach, in J. Frankel, G. Gali and A. Giovannini (eds.), *The Microstructure of Foreign Exchange Markets*, Chicago: The University of Chicago Press, 261-301.
- Frankel, J. (1996).** How Well Do Foreign Exchange Markets Work: Might a Tobin Tax Help, in M. Ul Haq, I. Kaul and I. Grunberg (eds.), *The Tobin Tax: Coping with Financial Volatility*, Oxford: Oxford University Press, 41-81.
- Friedman, M. (1953).** *The Case for Flexible Exchange Rates*, Essays in Positive Economics, Chicago: Chicago University Press.

- Grabel, I. (2003).** Currency Transactions Taxes: A Brief Assessment of Opportunities and Limitations, in J. Weaver, R. Dodd and J. Baker (eds.), *Debating The Tobin Tax: New Rules for Global Finance*, Washington, DC, November, 93-100.
- Guardian.** Chirac's Taxing Idea, January 28, 2005.
- Haberer, M. (2003).** Some Criticism of the Tobin Tax, January.
- Hillman, D. (2004).** Belgium clears path to developing world prosperity, *The Guardian*, 5 July.
- IMF (2004).** *IMF Annual Report 2004*, Washington, DC: The International Monetary Fund.
- Jetin, B. (2003).** How Can a Currency Transaction Tax Stabilize Foreign Exchange Markets?, in J. Weaver, R. Dodd and J. Baker (eds.), *Debating The Tobin Tax: New Roles for Global Finance*, Washington, DC: New Rules for Global Finance Coalition, November.
- Kapoor, S. (2004).** *The Currency Transaction Tax: enhancing financial stability and financing development*, Tobin Tax Network.
- Kindleberger, C. (2000).** *Manias, Panics, and Crashes: A History of Financial Crises*, 4th Edition, New York: Wiley, John & Sons.
- Nissanke, M. (2003).** Revenue Potential of the Currency Transaction Tax for Development Finance: A Critical Appraisal, Discussion Paper No. 2003/81, UNU-WIDER.
- Palley, T. I. (2000).** Destabilizing Speculation and the Case for an International Currency Transactions Tax, June. Available at <http://www.globalpolicy.org/soecon/glo-tax/currtax/palley1.htm>
- _____. (2003). The Economic Case for the Tobin Tax, in J. Weaver, R. Dodd and J. Baker (eds.), *Debating The Tobin Tax: New Rules for Global Finance*, Washington, DC, November, 5-26.
- Patterson, B., and Galliano, M. (1999).** The Feasibility of an International "Tobin Tax", Working Paper 03/99, Economic Affairs Series ECON-107 EN, European Parliament L-2929 Luxembourg.

- Patomäki, H. (2005).** Reactionary and Progressive Versions of the Tobin Tax, in J. Pettinen, V-K. Sorsa and M. Ylönen (eds.), *More Taxes - Promoting Strategies for Global Taxation*, ATTAC Finland, Vantaa, Finland, 16-45.
- Pollin, R., Baker, D. and Schaberg, M. (2002).** Securities Transactions Tax for U.S. Financial Markets, Working Paper Series Number 20, Political Economy Research Institute, University of Massachusetts Amherst, Revised October 2002.
- Rajan, R. S. (2003).** Taxing International Currency Flows: A Financial Safeguard of Financial Bonanza?, April.
- Reisen, H. (2002).** Tobin tax: Could it Work, *The OECD Observer*, No. 231/232, May, 23-25.
- Schmidt, R. (1999).** A Feasible Foreign Exchange Transactions Tax, *Working Paper*, VEEM - North-South Institute-Vietnam Economic and Environment Management, March, 1-20. Available at <http://attac.org/fra/toil/doc/veem.htm>
- Shiller, R. J. (2001).** *Irrational Exuberance*, New York: Broadway Books.
- _____. (2004). *The New Financial Order: Risk in the 21st Century*, Princeton University Pres.
- Singh, K. (2005).** Foreword from the “More Taxes. Global Tax Workshop”, in J. Pettinen, V-K. Sorsa and M. Ylönen (eds.), *More Taxes - Promoting Strategies for Global Taxation*, ATTAC Finland, Vantaa, Finland, 7-15.
- Spahn, P. B. (1995).** International Financial Flows and Transaction Taxes: Survey and Options, *IMF Working Paper*, 1-53.
- _____. (1996). Guest Article: The Tobin Tax and Exchange Rate Stability, *Finance & Development*, Vol. 33, Num. 2, June, 24-7.
- _____. (2002). On the Feasibility of a Tax on Foreign Exchange Transaction, *Federal Ministry for Economic Cooperation and Development*, 29 Mart 2002, 1-23, available at http://www.wiwi.uni-frankfurt.de/professoren/spahn/Spahn_010618.pdf.
- Tobin, J. (1978).** A proposal for international monetary reform, Vol. 4, *Eastern Economic Journal*, 153-59.
- _____. (1996). Prologue, in M. Ul Haq, I. Kaul and I. Grunberg (eds.), *The Tobin Tax: Coping with Financial Volatility*, Oxford: Oxford University Press, 1996, ix-xviii.

- Wahl, P., and Waldow, P. (2001).** Currency Transaction Tax - a Concept With a Future: Chances and Limits of Stabilising Financial Markets Through the Tobin Tax, Weed working paper, Bonn, February.
- Westerhoff, F. H. (2003).** Heterogeneous Traders and the Tobin Tax, *Journal of Evolutionary Economics*, 53-70.
- _____. (2004). The effectiveness of Keynes-Tobin transaction taxes when heterogeneous agents can trade in different markets: A behavioral finance approach, Working Paper Nr. 2004/01. Beiträge des Fachbereichs Wirtschaftswissenschaften der Universität Osnabrück, 2004.
- World Bank (2005).** *Global Development Finance: Mobilizing Finance and Managing Vulnerability*, Washington, DC: The World Bank.

