On the Tobin Tax

by

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Abstract

This paper clarifies why a transaction tax, such as the one proposed by James Tobin, can stabilize financial markets. In markets that are already fairly deep, relatively small changes in trading volume are unlikely to have any impact (positive or negative) on volatility. Thus, a Tobin Tax can potentially have a stabilizing effect on international currency markets not because it reduces the excessive volume of transactions of speculators, but because it can slow down the speed with which market traders react to changes in prices of currencies. Moreover, it can lower their elasticity of future price expectations with respect to current price changes, which also has a stabilizing effect. Thus, to the extent that a Tobin Tax causes traders in financial markets to delay their decisions a few 'grains of sand in the wheels of international finance' can indeed be stabilizing. Whether or not that is sufficient to prevent speculative attacks on currencies is a different matter.

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I. Introduction

The tax proposed by James Tobin (1974, 1978, 1994, 1996)[1] on international currency transactions has the unique distinction of having attracted the ire of the US Congress. The Prohibition on United Nations Taxation Act of 1996, introduced by Bob Dole and three other politicians, sought to prevent UN officials and agencies from developing or promoting a Tobin Tax or any other international taxation scheme under a different name.[2] What made the Tobin Tax unacceptable to the US Congress was its potential to bolster national autonomy, and distribute the tax burden more equally around the globe. This ran "counter to current tide of liberalization, globalization, and tax reductions for the well-off" (Raffer, 1998, p. 530).[3]

In proposing his tax, Tobin's concern was to enhance government autonomy in macroeconomic policy by curbing currency speculation, which he thought was responsible for the frequent of exchange rate crises around the world in the era of capital liberalization. General arguments in favor of relying on a transaction tax to curb speculation in financial markets can be traced back to Keynes (1936, pp.159-60). More recently, similar arguments have been made by Summers & Summers (1989), Stiglitz (1989), Harcourt (1994) and Pollin *et al*. (2003), among others.[4] By now, a vast literature exists on the Tobin Tax, focusing on an array of issues that include its feasibility, its possible "distorting" effects, and its revenue raising potential (Nissanke, 2003).[5] Detractors from both the political right and the left have generally questioned its feasibility (De Simone, 1997), and challenged Tobin's contention that the tax would have a negligible effect on all except short-term speculative traders (Davidson, 1997, 1998; Terzi, 2003; Grahl & Lysandrou 2003). But, the core issue remains the contention that a

"small" transactions tax would stabilize international currency markets by reducing volatility. If the Tobin Tax is not stabilizing, then much of the rest of the discussion on its feasibility and other related issues are probably moot.

It has often been suggested that the Tobin Tax would reduce volatility by crowding out speculators (Westerhoff, 2003) and noise traders (Palley, 1999) in international currency markets in favor of the non-speculators. However, the question this raises is whether a reduced volume of transactions might have a destabilizing effect and thus increase, rather than decrease, volatility. For instance, in his criticism of the Tobin Tax, Davidson (1997, 1998) stresses that the main function of financial markets is to provide *liquidity*; and, as such, a thick market, with greater ease of exit, for holders of securities is likely to be more stable than a thin one.[6] It thus follows that reducing the volume of transactions by raising transaction costs would, if anything, increase market volatility. But, while reducing the *volume* of transactions in itself cannot decrease market *volatility*, it does not follow that a Tobin Tax would have no stabilizing effect. We simply do not know if, or by how much, trading volume would be reduced by a transactions tax of a 'modest' magnitude. In markets that are already fairly deep, such as the major currency markets, relatively small changes in trading volume will likely have no impact (positive or negative) on volatility.[7] So, the real stabilizing effect of a transaction tax is likely to be due to its negative impact on the *speed* of reaction of market traders to price changes rather than on trading volume. To the extent a transaction tax slows down traders in financial markets, a few "grains of sand in the wheels of international finance" can indeed be stabilizing.[8] Whether it would be sufficient on its own to prevent speculative attacks on currencies is another matter.

It can be argued that levying a transaction tax raises the 'cost of reversing decisions' to traders in financial markets and thus has the effect of increasing the 'risk premium.' A higher risk premium, in turn, implies greater volatility since prices of financial assets have to fall (rise) in the downturn (upturn) relatively more before traders are willing to buy (sell) in view of the higher risk (Bernstein, 1998). However, this argument is not correct if the tax is perceived to have a dampening effect on the market-wide "systematic" risk, as argued below.

The following discussion specifies how a transaction tax of the type proposed by Tobin can be stabilizing through its impact on the market *speed* of adjustment, independently of volume of transactions. The discussion is organized in three sections. Section II examines if and when speculation is destabilizing, and then shows how a transaction tax can have a moderating influence. Section III extends the discussion to mean reversion of asset prices in the longer run and points to the possible impact of the Tobin Tax on the risk premium. The paper ends with a few concluding remarks.

II. When is Speculation Destabilizing?

Ever since Friedman (1953) argued that destabilizing speculation would be unprofitable and thus unsustainable in the long run, mainstream economists have assumed that speculation could not be destabilizing. The rise of the efficient market hypothesis in the 1960s bolstered the influence of Friedman's argument, as it gave credence to the idea that the actual market prices of assets must be the best estimates of their *true* values at a given point in time.[9]

The intuition behind Friedman's argument rests on a simple view of arbitrage, in which the market is comprised of smart traders who know the true values, as well as misinformed noise-traders. If securities are undervalued, so the argument goes, the smart traders would continue to buy them until their prices are bid up to their true value. Likewise, if securities are overvalued, smart traders would sell them, bringing their price down to their true value. Under these conditions, speculation is always stabilizing and profitable. Misinformed noise traders create riskless arbitrage opportunities that smart traders profit from, while making losses themselves. This implies an adjustment process where the rate of current price change is a function of the difference between the current price and the expected future price, which is by assumption equal to *true* value. In simple terms:

$$\frac{dP}{dt} = j(P^e - P), \qquad (1)$$

where, P^e, the future expected price, is assumed to be constant ($P^e = \overline{P}$) and equal to the *true* value, and j is the adjustment coefficient indicating the speed with which traders respond to changes in current price. When

$$P > P^e \quad \text{then} \quad \frac{dP}{dt} < 0$$

and $$P < P^e \quad \text{then} \quad \frac{dP}{dt} > 0 .$$

The time path of price is given by,

$$P(t) = P(0)e^{-jt} + P^e,$$

which cannot be unstable. The stability condition $j > 0$ is always satisfied since the speed of adjustment is positive by definition.

Undoubtedly, the assumption that smart traders or speculators know with certainty what the true value is exceedingly unrealistic. But even under this strong assumption, it does not necessarily follow that the deviation of some current asset price from its true value creates a riskless arbitrage opportunity. Because traders in general have a finite time horizon, a speculator who sells overvalued assets short will be taking a risk, because s/he cannot be sure when and if the price will fall back to its true value. By the time s/he is supposed to close his/her position, s/he might find that the true value has increased, or, that the assets in question have become even more overpriced.[10] In both situations, the speculators who sold securities short would be making losses. Thus, even if the true value is known, it does not follow that it would be equal to the expected future price. Because smart traders would limit their initial positions in an over or undervalued asset for fear of making losses, the current price need not smoothly adjust to its true value. Needless to say, if we drop the assumption that speculators know what the true value is, the compensatory shift in their demand for undervalued assets will be smaller as the risk of loss stemming from uncertainty will be higher. That is why the modern behavioral approach to finance holds that *riskless* arbitrage is not effective in relation to the prices of shares or bonds as a whole, and is severely limited even when it comes to

the relative prices of individual assets (Shleifer & Summers, 1990; Shleifer & Vishny, 1997).

This takes us very close to the world described in Keynes's (1936, Ch. 12) famous beauty contest, where speculators base their expectations of future asset prices not only on what they think the true values is, but more importantly, on what they think the average opinion about the average opinion is. In other words, *noise* moves prices (Black, 1986), just as much as information about true values, rendering the resale price uncertain. Uncertainty about the future resale price, in turn, means that traders lack a terminal value from which to bakwardize (Hirota & Sunder, 2003). This implies that they must not only form higher order expectations (i.e., on what others think others think) but also decide how much weight to assign them relative to what they think the true value is. Since no direct information exists on others' higher order expectations, traders have to infer them from market trends, i.e. the magnitude and direction of changes in current price.

For instance, if a trader observes that the price of an asset (or an asset group) which s/he thinks is already overvalued is still rising in price, s/he is led to surmise that either her/his opinion about the true value is wrong or that the price increase indicates a bubble, (i.e. a self-sustained rise in price on account of noise trading driven by the average opinion thinking that the average opinion thinks the price will keep on rising). In either case, the current price changes are likely to gain in importance in how the trader forms his/her expectation about the future price. They become either a proxy for the higher order expectations or a corrective on opinions about the true value or some combination of the two.

The weight that traders assign to their higher order expectations (i.e., what they think others think others think), relative to their own assessment of the true value, turns out to be the crucial determinant of whether speculation is stabilizing or not. The greater the responsiveness of the expected future price to the current price change, the higher the elasticity of future price expectations with respect to present price changes; and it is the magnitude of this variable that determines whether speculation is stabilizing or not (Kaldor 1939).[11]

If indeed the expected future price can be thought to comprise two parts, then we can write:

$$P^e = \overline{P} + \sigma \frac{dP}{dt}, \qquad (2)$$

where $\overline{P}$ is what the true value is believed to be (and is assumed constant for simplicity), and σ is the coefficient of elasticity for expected future price with respect to the current change in price.

Plugging (2) in (1) gives:

$$\frac{dP}{dt} = j[\overline{P} + \sigma \frac{dP}{dt} - P],$$

and rearranging we get;

$$\frac{dP}{dt} + \frac{j}{1-\sigma j} P = \frac{j}{1-\sigma j} \overline{P}$$

which, in turn yields the following time path of price;

$$P(t) = [P(0) - \overline{P}]e^{\frac{-j}{1-\sigma j}t} + \overline{P}$$

For Kaldor (1939), a less than unitary elasticity of expectations ($\sigma < 1$) is the condition of stability. The formulation above shows, however, that the speed of reaction is also a part of the stability condition, and that Kaldor's condition implicitly assumes an instantaneous reaction speed ($j = 1$) .[12] With a given elasticity of the future price expectation, a smaller value of j (indicating a slower reaction speed on the part of traders), increases, *ceteris paribus*, the possibility of stability. Thus, if a transaction tax delays the decisions of traders in the face of asset price changes, such that j is lowered to a point where $j < \frac{1}{\sigma}$, the Tobin Tax is stabilizing.

III. Mean Reversion in the Longer Run

Over the longer run, asset prices are expected to revert back to their average (true) values. For a broad class of financial assets, including stocks, bonds and foreign exchange from around the world, evidence shows positive autocorrelation at high frequencies and negative serial correlation at time horizons exceeding fourteen months (Cutler *et al.* 1991). As Kaldor (1939) remarks, this suggests that the magnitude of the deviation of

actual prices from true values also enter into how expectations about future prices are formed in longer horizons. In other words, one would expect that the elasticity of expectations is negatively affected by the magnitude of the deviation of the current price from the true value, and that this negative effect gets stronger over time.

Over short time horizons, involving weeks or even a few months, this effect is likely to be quite insignificant, leaving the gist of the argument in the previous section unaffected. However, a transaction tax can reduce the time horizon at which the price deviation begins to exert a negative influence on the elasticity of expectations, and alter traders' beliefs about the risk characteristics of the market in which it is imposed. For instance, the higher equity premium is thought to reflect the greater unpredictability of trader sentiment about stocks in relation to other assets such as bonds (Mehra & Prescott, 1985). Thus, if traders on average think that the Tobin Tax will diminish the unpredictability of trader sentiment in currency markets, it will also have a stabilizing effect by reducing the time horizon at which the elasticity of expectations, σ, is reduced by price deviations. This means that market perception of systematic risk, and thus the risk premium, is reduced by the transaction tax itself, undercutting the intuition that reduced trading volume and lower liquidity would increase market volatility.

IV. Conclusion

This paper clarifies the conditions under which the Tobin Tax can have a stabilizing influence on speculation. In markets that are fairly deep, trading volume is unlikely to exert any influence on volatility one way or the other. Thus, the Tobin Tax is potentially stabilizing because it can slow traders' speed of reaction, and lower their elasticity of

future price expectations with respect to current price changes. This neither tells us what might be the optimal size of the Tobin's Tax, nor whether it can prevent abrupt changes in market sentiment in currency markets, but that it deserves to be taken seriously. While Keynes was well aware of its limitations, he on balance thought that a transaction tax in the stock market could help "mitigate the predominance of speculation over enterprise" (1936, pp. 159-160).

Notes:

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[1]See also, Eichengreen, Tobin & Wyplosz (1995).

[2] This unilateral "prohibition" on the UN appears to have been quite effective. UN folklore has it that the copies of a book on the Tobin Tax, edited by some UN officials, that had just been shipped from the printer were left unopened in their boxes in order not to raise the ire of the US.

[3] Likewise, Jetin & DeBrunhoff (2000) and Patomaki (2001) think that the Tobin Tax is a way to contest the excesses of the neo-liberal agenda.

[4] For Keynes's views on the desirability of a transaction tax to curb speculation, see Raines & Leathers (2000, Chp. 5) and also Dimand & Dore (2000).

[5] See, Haq *et al*. (1996) consists of a comprehensive set of papers both for and some against the Tobin Tax. On the increasing volatility of international short-term capital movements, see Griffith-Jones *et al*. (2001) and Griffith-Jones (1998).

[6] See Bernstein (1998) for a lucid statement of the view of financial markets that underlies Davidson's argument. Similar arguments have also been made earlier by IMF economists (Shome & Stotsky, 1995; Stotsky, 1996).

[7] For instance, in their study of currency markets, Frankel & Froot (1990) report a high degree of contemporaneous correlation between trading volume and volatility, but argue that this does not imply causation. In their view, the existence of conflicting forecasts leads to noise-trading, which in turn is the cause of both higher volume and greater volatility. So, in their view the causation runs from dispersion of expectations to the volume of trading and to volatility.

[8] The idea that 'excessive speed of adjustment' is the main source of the problem with speculation is explicitly stated in Tobin (1978, p. 154) and is implicit in Eichengree *et al*. (1995).

[9] The efficient market hypothesis has gained currency among economists with Samuelson's (1965) "proof" that in a market that is *efficient* in appropriating all available information stock prices should exhibit a random walk, and Fama's (1965) "demonstration" that they almost actually do. But, it turns out neither proposition is valid. It is shown that stock prices do not exhibit random walk, and that *unforeseeable* prices are neither necessary nor sufficient for *rationally* determined stock prices. See, among others, Shleifer & Summers (1990), Shleifer (2000), Lo & MacKinlay (2002), Bossaerts (2002) and Shiller (2000). In light of these developments in the finance literature, Friedman's contention now appears far from persuasive, if it ever was. For criticisms of Friedman (1953), see Kemp (1963) and Baumol (1957), among others.

[10] Shleifer & Summers (1990) call these, respectively, the *fundamental value* and *noise trader* risk.

[11] See also Hicks (1946, pp. 205-6).

[12] This result is similar, though only superficially, to Tobin's (1975) discussion of macroeconomic adjustment where he finds that a lower speed of adjustment of the general price level can have a 'stabilizing' effect.

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