# Tackling Instability in Financial Markets with a Panic Tax

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**Abstract** The motivation for much recent debate on introducing a financial transaction or 'Tobin' Tax is to generate revenues for public goods – this is the main aim of the 'Robin Hood Tax' campaign. But James Tobin first proposed his idea in order to enhance market stability. The evidence suggests that a Tobin Tax might not reduce instability. However, a Panic Tax – a simple mechanism to tax panic rather than trade – could promote stability by dampening crashes and booms and providing policy space for more orderly adjustments in the financial markets.

## 1 Introduction

There has been much debate recently about the idea of imposing a financial transaction tax – a broader version of the 1972 idea by Nobel Prize winner James Tobin – to discourage speculative behaviour by imposing a small tax on foreign exchange transactions (Tobin 1978). For example, Gordon Brown, then UK Prime Minister, raised it at a G20 meeting in the immediate aftermath of the global financial crisis. Subsequently, the idea has been enthusiastically championed by the French President, Nicholas Sarkozy, with some support from the German Chancellor, Angela Merkel. This has stimulated several significant pieces of policy analysis on the issue (European Commission 2010; IMF 2010); Leading Group on Innovative Financing for Development 2010), as well as a comprehensive systematic review (McCulloch and Pacillo 2011).

The proponents of a financial transaction tax (FTT) have two major motivations. First, taxing financial transactions would be a highly visible way to extract revenue from the banking sector; this would meet the generally perceived need for the financial sector to play, and pay, a more significant contribution to the society in which it is embedded. Second, FTTs could raise significant revenue. At a time when the finances of several Western nations are in a parlous state, a significant new source of revenue is viewed with great interest. Indeed, securing additional funding for social development is also the main objective of the 'Robin Hood Tax' campaign, run by a consortium of national and development NGOs, as well as churches and unions.[1]

It is interesting to note, therefore, that raising revenue was not Tobin's original intention. He saw the tax as a mechanism to reduce the excess volatility in foreign exchange markets by discouraging short-term trading in favour of longer-term investments. The idea was simple – a tax on transactions costs a long-term investor very little – but if the investor is speculating on a daily or hourly basis, then paying a transaction tax for each trade is extremely costly. By taxing speculation in this way, Tobin suggested that markets might be induced to be more stable.

It is important to recognise that, if an FTT would have such a stabilising effect, this could have significant economic benefits, since it could reduce risk and uncertainty and thereby encourage greater investment. Indeed, as the recent crisis shows, it is perfectly possible that the benefits from greater stability could far outweigh the potential revenue gains, although providing a precise estimate of such benefits is extremely difficult. However, these benefits will only arise if an FTT actually does stabilise markets. This article draws on a recent systematic review (McCulloch and Pacillo 2011) of the evidence about whether FTTs stabilise markets. We find that much of the evidence points in the opposite direction – that such a tax

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would, if anything, increase volatility rather than reduce it. A simple amendment to the Tobin Tax is then proposed, entitled the Panic Tax, which may be more effective in stabilising markets.

## 2 Financial transaction taxes and market volatility – the evidence

Would an FTT dampen volatility in financial markets or would it squeeze out liquidity, potentially making volatility worse? There are two approaches to this question. First, there is extensive theoretical literature examining whether such taxes would stabilise markets, along with simulations showing how market participants might react to the imposition of such a tax. Second, there is empirical work examining the actual impact on markets when similar taxes have been imposed in various countries.

### *2.1 Theoretical models*

Over the last 20 years, a new generation of theoretical models has looked at the 'microstructure' of financial markets to try and explain the behaviour of real financial markets. These models typically assume that market actors apply rules of thumb when making decisions to buy or sell.

A distinction is usually drawn between 'fundamentalist' traders (i.e. those that trade based on a view about the fundamental value of the assets) and 'noise' traders (i.e. speculators). The volatility of the market is therefore driven by what share of market traders are noise traders (who increase volatility) and what share are fundamentalists (who reduce it). In such models, an FTT will have an effect on volatility if the imposition of the tax changes the share of noise traders in the market.

Generally speaking, theoretical models find that an FTT should reduce volatility by reducing the number of noise traders. But many models also suggest that care should be taken in choosing the size of the tax. If it is too large, the reductions in market trading and liquidity could result in an increase rather than a decrease in volatility (see Westerhoff 2008 and McCulloch and Pacillo 2011, for more comprehensive treatment of the theoretical literature).

### *2.2 Empirical evidence*

Real financial markets do not necessarily behave the way that theoretical models predict. Most of the studies examining the link between transaction costs and volatility find a *positive* relationship between the two – that is higher transaction costs are associated with more, rather than less volatility. For example, Bessembinder and Rath (2002) analyse stocks moving from the NASDAQ stock market to the New York Stock Exchange (NYSE). They find strong evidence that the newly NYSE listed stocks reduce both trading costs and the volatility of daily returns. Similarly, Hau (2006) studies French stocks, finding that a 20 per cent increase in transaction costs generates an increase in volatility of about 30 per cent.

Studies of foreign exchange markets also suggest that higher transaction costs are associated with greater volatility. For example, Aliber *et al.* (2003) look at transaction costs, volatility and trading volume in foreign exchange markets. They find that an increase of 0.02 per cent in transaction costs leads to an increase of volatility of 0.5 percentage points.

Lanne and Vesala (2010) confirm this finding with both daily and intra-daily data on Deutsche mark to US dollar and yen to US dollar exchange rates from 1992 to 1993. They estimate the relationship between the volatility of this market and the transaction costs involved in trading. Their results show that the effect of transaction costs on volatility is positive and significant. An increase of 0.01 per cent in transaction costs raises the variance of the Deutsche mark by 1.16 per cent relative to its average; the increase for the yen is 1.21 per cent, substantially larger than the increase calculated by Aliber *et al.* (2003).

Turning to the few studies of actual transaction taxes, we find a similar story. Sweden introduced a 1 per cent round trip tax on equity transactions in 1984, which was increased to 2 per cent in 1986. Umlauf (1993) compares the performance of the Swedish stock market under the no tax, 1 per cent and 2 per cent tax regimes. He concludes that the imposition and increase of the transaction tax increased volatility. He also notes that there was huge market diversion from the Swedish towards the London stock market as a result of the tax.

On the other hand, Saporta and Kan (1997) find no significant effect of UK stamp duty imposition on the volatility of equity prices in the UK. Similarly, Chou and Wang (2006) examine

the impact of the decision by the Taiwanese government in 2000 to reduce the tax levied on Futures transactions on the Taiwan Futures Exchange and find no significant effect on price volatility, although the amount of trading was significantly reduced. Phylaktis and Aristidou (2007) also find that a securities transaction tax (STT) – an FTT on equities – on the Athens Stock Exchange had no overall impact on volatility, although it decreased volatility in 'bull' periods and increased it in 'bear' periods. Finally, Su and Zheng (2011) have analysed the impact of changes in STT rates in the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE). They find, paradoxically, that both increasing and reducing the STT increased volatility. In the former case, increasing the tax reduced market liquidity, pushing up volatility; in the latter case, the lower transaction tax induced more speculation, also raising volatility.

It is important to note that the empirical literature reviewed above suffers from a number of methodological weaknesses. Studies use a range of different measures of volatility, making it hard to compare the results across studies. Moreover, all of the empirical studies focus on day-to-day (or shorter period) volatility. However, such short-run fluctuations may not matter very much to the broader economy. By contrast, crashes and major market adjustments can have significant and long-lasting effects. Indeed Tobin's original intent was that the tax should help to make exchange rates reflect long-term fundamentals, rather than short-run volatility. Theoretically, a tax on transactions might discourage equity financing in favour of bank financing. If reliance on bank financing creates greater systemic instability than equity financing, an FTT might increase the probability of crashes. At the same time, if a tax was successful in discouraging destabilising trades, then it could reduce this probability. Unfortunately, to our knowledge, there are no papers which look at the impact of FTTs on the probability of a crash or adjustment taking place.

Nonetheless, the overall conclusion from the empirical evidence is more one-sided than the theoretical work. The balance of evidence suggests that there is a positive relationship between transaction costs and volatility, although the size of this effect varies across different studies. Whether a Tobin Tax would affect volatility in the same way as underlying market transaction costs is not clear. The Swedish experience of imposing a tax on equity transactions may have increased volatility, but the size of the tax was large; there is no evidence that UK stamp duty had any effect on volatility, although it clearly affected returns on equity. Certainly, however, there appears to be little support for the idea that an FTT would significantly reduce the volatility of real markets.

## 3 Discouraging manias and panics

As noted above, the empirical literature on the relationship between FTTs and market volatility has focused on day-to-day volatility. However, it is the herd behaviour associated with mass entry into, or exit from, a market that first creates and then bursts asset price bubbles. These major market realignments cause far more damage than small changes in day-to-day volatility, yet the existing literature tells us almost nothing about the impact of FTTs on panics and crashes. This said, it would seem likely that a small transaction tax will have practically no effect in either tempering booms or preventing crashes; if the market rises by several percentage points, traders are unlikely to be dissuaded from entry or exit by a small FTT (0.05 per cent, the typical magnitude proposed).[2] In short, 'sand in the wheels of finance' will do nothing to prevent booms or crashes.[3]

This naturally begs the question of whether there might be another type of tax that would be more effective. Specifically, might it be possible to design a tax to promote market stability by discouraging manias and panics?

### *3.1 Do not tax trade, tax panic*

Engineering provides a surprisingly simple solution to this problem. Taxing transactions using an FTT creates a form of 'resistance' in financial markets. As noted, this might (or might not) reduce the size of the peaks and troughs in the financial markets, but will not protect against sudden crashes or rises in the market. However, the fundamental problem lies not with the size of the peaks and troughs, but with how rapidly prices rise and fall (known in engineering as the *frequency* distribution).

Engineers routinely remove undesired high frequencies using 'low-pass filters' – in their simplest electronic form inductors (tightly

wound coils of wire) placed in a circuit. The resistance of the inductor changes proportionally to the rate of change of the current. Low frequencies face minimal resistance and the current passes through but when the frequency is high, increased resistance blocks the current. A tax with the same properties would help to prevent spikes.

An inductance tax, or Panic Tax, would tax transactions at a variable rate proportional to the rate of change of the *aggregate* market price – in contrast to a FTT's small fixed rate. Sales and purchases would incur virtually no tax during normal times when the aggregate market movement is very small. But during crashes and booms, when aggregate market movements are large, they would face heavy penalties. Thus, a market participant wanting to exit the market when everyone else is doing the same, would face extremely high taxation. This could act as an incentive to wait and, in so doing, would lessen the market panic. Similarly, during manias in which market prices are rising sharply, traders would be taxed heavily, dissuading them from further purchases and thereby, moderating the boom.

Similar ideas to the inductance tax have been proposed before. For example, Spahn (1996) proposed a two-tier Tobin Tax, where the tax rate would rise if market volatility rose above a certain threshold. The advantage of a Panic Tax is that it would not need to create arbitrary thresholds between the lower and upper tier tax rates – the tax rate will rise automatically proportionate to the change in the aggregate market price.

### *3.2 Queuing as a form of taxation*

One difficulty in implementing such a Panic Tax would be to persuade market participants to pay a tax, the value of which would only be known a short period in advance. An alternative could be to force people who wish to buy or sell an asset to wait in a queue. When more participants are attempting to leave (or join) the market at the same time, the queue will be longer and therefore the effective tax will be higher.

Furthermore, such a scheme would allow the market to determine the price of impatience. If some market participants value exiting or entering a market more highly than others, it would be possible to allow those queuing to sell their places. In this way, those who really need to sell immediately could purchase a place higher up in the queue.

Since a Panic Tax has never been implemented, it is hard to know exactly what its effect would be in practice. However, simulations by Varela and McCulloch (2011) show that a Panic Tax would be almost three times more effective than a Tobin Tax/FTT in reducing volatility in situations where market sentiment is strong.

## 4 Reimagining the financial markets

The havoc wreaked on many advanced economies by the global financial crisis means that, for the first time in over 30 years, serious efforts are under way to 'reimagine' the financial sector (Turner *et al.* 2010). A huge raft of legislation (e.g. Dodd-Frank Act) and new regulations (Basel III) have been put into place, most with the explicit objective of reducing systemic risk and ensuring that the financial sector makes a greater contribution in a broad sense. Among the many proposals still being considered, is the idea of a financial transaction tax or Tobin Tax, due to its purported ability to stabilise markets and raise revenue.

Despite some support from theoretical models, the empirical evidence suggests that an FTT would not stabilise markets, although, if appropriately designed, it would probably not destabilise them much either. However, a Panic Tax, in which the rate of taxation depends on the rate at which the aggregate market is changing, might be considerably more stabilising. By taxing panics and booms, rather than normal trade, it would focus attention on the market behaviour that does the most harm. Moreover, by discouraging entry during booms and exit during panics, it could help to reduce both, allowing policymakers time to make orderly adjustments during such crises. Furthermore, because such a tax would not collect a substantial sum of money during normal times, it would avoid the need for costly efforts to prevent substitution into untaxed assets or migration of trade to untaxed locations – one of the main practical objections to an FTT. A Panic Tax, therefore, might provide a useful complement to other regulatory measures in promoting more stable financial markets.

## Notes

1 See www.robinhoodtax.com for details.

2 Varela and McCulloch (2011) 'The Impact of a Panic Tax on Financial Market Volatility' shows that transaction costs play almost no role in reducing transactions when market sentiment is running high.

3 Indeed the failure of FTTs to address issues of systemic stability is the main reason given by the International Monetary Fund (IMF 2010) for opposing their introduction.

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