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Cleaning the gears: Counter-cyclical asset trading with financial transactions taxes

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ABSTRACT

This paper analyzes the effect of financial transactions taxes (FTT) and idiosyncratic income risk on counter-cyclical asset trading. The model is in the class of DSGE models with incomplete markets. The paper is able demonstrate the potential welfare loss from the imposition of FTT on agents through two factors: higher coefficient of variation of consumption and higher incidence of constrained credit. The paper is also able to demonstrate the effect of FTTs on the market through three factors: significantly lower trading volume, higher variance in unencumbered markets, higher volume in unencumbered markets.

1. Introduction

Though financial transactions taxes (FTTs) have been the debated since at least the time of John Maynard Keynes, this subject gained renewed interest following the financial crisis of 2008.[1] In Matheson (2011), for example, there is large survey that looks at empirical and theoretical research on taxation in financial markets. The policies of taxation stem from the desire to decrease volatility and the number of short term transactions in the financial markets. One solution is to create friction in the market. In fact, in the United States, James Tobin's "sand in the well-greased wheels" comment in his 1978 Eastern Economic Association address (see Tobin, 1978) was one of many proposals to reduce trading (and also volatility) in the markets. Lawrence and Victoria Summers have also advocated for a transaction tax since 1989 (Summers & Summers, 1989). What has not been determined, however, is how this FTT would affect the volume of trading that is used by agents for risk sharing and consumption smoothing, rather than short term "speculative" trading. This is the primary goal of this paper.

There was a brief period where the risk sharing purpose of the financial market was emphasized through a suggestion of partial privatization of Social Security, whereby individual accounts would be created with individual investing options (like 401(k) plans).[2] These proposals presuppose that access to the equity market is an important risk sharing vehicle. It is thus important to understand the effect of any change in financial market access (whether greater or lesser) on risk sharing. This paper looks to fill this gap with an analysis of the effect of trading friction and consumption smoothing on agents in an economy with incomplete markets. The results show that for even small levels of trading friction introduced, volume falls dramatically (as much as 60% in some instances), and agents have higher variation of income. The loss of risk sharing due to the reduction of trading in the financial market is mostly offset by trade in other markets (for example a riskless asset like a loan or bond).

In models with incomplete markets, or markets where agents are unable to insure against certain risks, agents make use of financial instruments to share risk. Two elements involving asset trade need to be discussed: Whether agents actually use financial markets to smooth their consumption, and why incomplete markets models of trading volume are useful for this type of modeling. The first question requires agents to use financial markets for risk-sharing and consumption smoothing. In Mankiw and Zeldes (1991), it was found that there is a difference between

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[1] See European Commission discussion of the implementation of a financial transaction tax (http://ec.europa.eu/taxation_customs/taxation/other_taxes/financial_sector/index_en.htm).

[2] See social security administration advisory council deliberations 1994–1995 (http://www.ssa.gov/history/reports/adcouncil/tirs1.html#PolicyOptions) which was reintroduced during the Presidency of George W. Bush.

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the consumption of stockholders and non-stockholders. Crucially, they find that stockholders have consumption that is much more highly correlated with stock returns than non-stockholders, implying that agent's decisions in the financial market are affecting their consumption directly. In DeJong and Espino (2011), trading volume shows several cyclical dynamics, such as lead-lag patterns, and they can match some of the trade in a production economy model. Since the suspension of fixed trading commissions and other liberalizing innovations of 1970s, trading volume has become more counter-cyclical (i.e. the negative correlations between trading volume and GDP has increased in magnitude). We can see this most clearly in Table 2 with the cyclical correlation between volume and GDP increasing in magnitude from −0.20 to −0.45. Furthermore, looking at the lead-lag correlations (as in DeJong and Espino (2011)) we can see that the negative correlations are persistent within two quarters of GDP data.[3] An explanation for why there are negative correlations is provided below.

This paper is therefore an extension of the incomplete markets framework with a focus on asset volume rather than asset prices. It is therefore an extension of the structure and framework of Heaton and Lucas (1995) (where they find that incomplete markets models are able to explain a portion of the equity premium puzzle and generate trade) and of Telmer (1993) (which uses incomplete markets to show risk sharing between agents able to trade only one asset). Furthermore, Aiyagari (1993) demonstrates that asset trading volume cannot be studied in the typical representative agent framework. This paper also extends the findings of Storesletten, Telmer, and Yaron (2004) (who find that labor income volatility increases by 90% during downturns) in generating the investor heterogeneity necessary for trade to occur. Finally, as in DeJong and Espino (2011), this work examines the relationship of several measures of trading volume with aggregate output. This paper thus contributes to the literature by extending the scope of incomplete markets models and applying recent empirical results to study frictions in the market.

Specifically, the model below analyzes the effect of FTTs by incorporating trading friction into an incomplete markets model that has labor income calibrated to the PSID (Panel Study of Income Dynamics) as well as with labor dynamics as in Storesletten et al. (2004). Incomplete markets models are necessary in that they include uninsurable risks that can be transferred using the financial markets.[4] In Heaton and Lucas (1996), they find that there are three critical factors for determining the quantitative effects of these types of models: the extent of trading frictions in the market, the size and persistence of idiosyncratic shocks, and the correlation of idiosyncratic and aggregate shocks. The model described below will apply each of these factors to an analysis of trading volume in the presence of trading frictions. The key factors in these papers are that agents are not able to fully insure against fluctuations in their income, therefore they require a mechanism to allow them to smooth their consumption over time. Thus in the model presented below, agents will be subject to idiosyncratic risk in the form of their labor income as well as aggregate risk in the distribution of dividends.

The paper is organized as follows: Section 2 gives empirical evidence for the relationship between equity trading volume and GDP, Section 3 describes the model, Section 4 provides the results, and Section 5 concludes.

[3] Details of the lead lag patterns are saved for an appendix.

[4] For a discussion of *dynamically* complete markets, see (Judd, Kubler, & Schmedders, 2003).

Table 1
Trading volume definitions.

Measure	Definition	Abbreviation
Trading volume	Aggregate number of shares traded of all NYSE stocks over quarter	Vol.
Value of volume	Aggregate number of shares traded of all NYSE stocks over quarter multiplied by average price of each share	Val Vol.
Float	Average number of shares available to be traded (i.e. not held by firm)	Float
Market capitalization	The average number of shares available to be traded multiplied by average price	Market Cap.
Turnover	Trading volume divided by float	Turn
Value of turnover	Value of volume divided by float	Val Turn.

2. Empirical evidence and motivation

In order to fully understand the model, it is important to understand the nature of the financial markets on which the model is based. The data used for calibration of the model comes from the PSID to measure the labor dynamics, while data from the New York Stock Exchange (NYSE) is used to calibrate several measures of trading volume. The motivation of the paper stems from the use of the financial markets for risk sharing and consumption smoothing purposes. The NYSE data from 1947 to 2005 includes all of the postwar period but not including the financial crisis.[5] The NYSE represents the largest market in the US, thus gives the most accurate picture of stock trading.

There are several ways to measure stock trading volume on the NYSE. Trading volume is described as the number of shares bought and sold in a particular issue. As GDP data is available quarterly, trading *volume* is aggregated to quarterly frequencies. As firms may increase or decrease the number of shares available to trade (through stock splits, secondary offerings, and stock buy backs), *float* describes the shares available to trade at any point. *Turnover* is thus the number of shares traded divided by the number of shares available to be traded. Since the model has normalized its equity shares to 1, this is the most directly comparable data point. Finally, one can multiply volume or turnover by the average price per share, giving a measure of the *value of volume*. In Table 1 are described the definitions which will be used throughout the paper.

In Figs. 1 and 2 we see that (compared to quarterly GDP growth) the volume measures are much more volatile (note that the scale of GDP is smaller than volume). Though the graphs are quite volatile (and thus contain noise), we can see many instances where the troughs of GDP growth are matched with a peak in volume. Since the subject of this paper is cyclical trading of assets, we can get a better understanding of the relationship between GDP and trading volume if we filter out the non-business cycle frequencies. This has the advantage of eliminating high frequency noise and trends in the data. The Cristiano–Fitzgerald random walk filter is a band pass filter which removes all harmonics not at business cycle frequencies (6–32 quarters).[6] We can see in Fig. 3 a great reduction in

[5] Another reason to stop in 2005 is that SEC regulation NMS (of August 2005) changed how each of the markets (e.g. NYSE and NASDAQ) trade and report trades.

[6] See Christiano and Fitzgerald (2003) for a description of the filter and its application to GDP.