

Consequences of transactions costs

Susan Thomas Ajay Shah

Sri Lanka, 6 October 2007

Outline

- Impediment to speculation
- Impediment to arbitrage
- Noise trader risk
- Opening the blackbox of the market
- Other consequences

Part I

Impediment to speculation

The thought process of a speculator

Suppose fundamental analysis says a security is worth 100 but the market is showing 95. A speculator would like to buy at 95 and earn Rs.5 in return for his research and risk-taking.

Step in speculative strategy	Case I
Buy price	-95
Sell price	100
Profit	5

Assuming the market 'soon' gets to the correct price of Rs.100, the speculator gets a profit of 5.26% over a short time period - a good return to research and risk-taking.

How speculation gets hurt

Suppose fundamental analysis says a security is worth 100 but the market is showing 95. A speculator would like to buy at 95 and earn Rs.5 in return for his research and risk-taking.

Step in speculative strategy	Case I	Case II
Buy price	-95	-95
One-way t.c. at 2%		-1.9
Sell price	100	100
One-way t.c. at 2%		-2
Profit	5	1.1

A one-way t.c. of 2% forces down the profit of the speculator from 5.26% over a short period to 1.16%. Adversely affect investments into research and risk-taking by the speculator.

Transaction costs and arbitrage

- As a thumb-rule, if the one-way t.c. is 2%, the speculator won't do anything if a mispricing of 5% is seen.
- Sharp pricing in an efficient market requires tight low one-way t.c.

Part II

Impediment to arbitrage

Cost of carry arbitrage

Suppose $S = 100$, $F = 105$ on a one-month horizon.

Step in arbitrage strategy	Case I
Today:	
Buy on the spot	-100
Short the futures @ 105	0
At T (<i>S doesn't matter</i>)	
Deliver on the futures	105
Profit	5

A return of 5 on 100 in a month is 79.6% annualised – not bad for taking no risk.

Cost of carry arbitrage with one-way t.c. of 2%

Suppose $S = 100$, $F = 105$ on a one-month horizon.

Step in arbitrage strategy	Case I	Case II
Today:		
Buy on the spot	-100	-100
One-way t.c.		-2
Short the futures @ 105	0	0
One-way t.c.		-2.1
At T (S <i>doesn't matter</i>)		
Deliver on the futures	105	105
Pay storage charges		-0.1
Profit	5	0.8

Cost of carry arbitrage with one-way t.c. of 2%

Suppose $S = 100$, $F = 105$ on a one-month horizon.

Step in arbitrage strategy	Case I	Case II
Today:		
Buy on the spot	-100	-100
One-way t.c.		-2
Short the futures @ 105	0	0
One-way t.c.		-2.1
At T (S <i>doesn't matter</i>)		
Deliver on the futures	105	105
Pay storage charges		-0.1
Profit	5	0.8

A return of 5 on 100 in a month is 79.6%; a return of 0.8 on 100 in a month is just 10%!

Concept of “no-arbitrage band”

- In an ideal market, $F = (1 + r)^T S + \delta S$ exactly
- Arbitrage locks in the price.
- If the round-trip transaction costs are $2C$ then mistakes in the price of smaller than $2C$ can't be arbitrated
- For all values of F within $(1 + r)^T S + \delta S \pm 2C$ you are in a no-arbitrage zone.
- Anything can happen within this zone; it is immune to the discipline of arbitrage.

Different business plans get affected differently

- Some trading strategies in finance involve less trading.
- Some trading strategies involve a lot of trading.
- Trading-intensive business plans suffer more from t.c.
- Example: options arbitrage often involves much more transacting than futures arbitrage
- A level of t.c. that supports a liquid futures market might be inadequate for doing options arbitrage

Part III

Noise trader risk

The efficient markets dream

- Near-zero t.c.
- A large community of speculators, investing resources to produce high quality price forecasts, and then placing bets on them
- An active arbitrage community, identifying and removing all violations of formulaic relationships
- The key consequence: *You can count on a market inefficiency to be rapidly taken away.*

Noise trader risk

- Substantial t.c.
- Many speculators see a problem in the price but are unable to do anything about it.
- Many a mispricing falls into the no-arbitrage band and arbitrageurs are unable to step in.
- The price is less constrained by rationality
- *You are less able to count on a market inefficiency as something that will be rapidly taken away*
- If you see a mispricing, you can't jump on it knowing it'll soon be gone – *many a mispricing might actually worsen!*

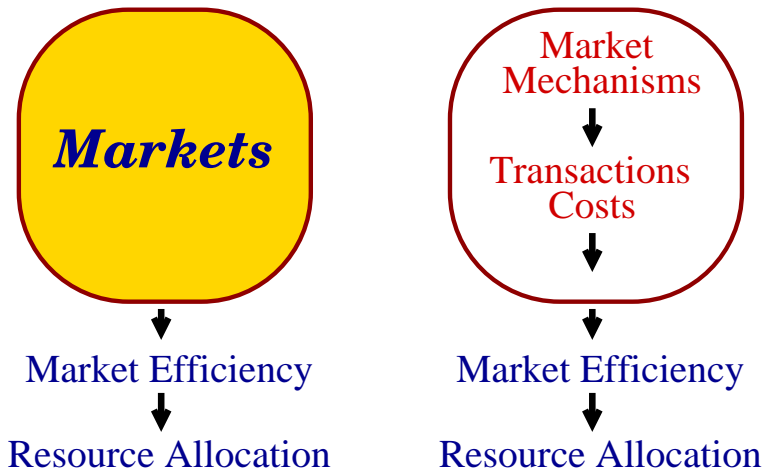
Part IV

Opening the blackbox of the market

Microstructure changes the way we think about markets



Microstructure changes the way we think about markets



Part V

Other consequences

Opportunity cost of trades which were not done

- A deeper consequence of t.c. is the speculative profits you don't make because of the trades that you don't do.
- It's possible to measure t.c. so you know how much you are spending
- It's not possible to measure the opportunity cost.

Liquidity premium

- Suppose the one-way t.c. is 2%
- Suppose a security is at 100
- Using normal risk-return thinking, you demand a 15% return for holding it for one year
- But now you know that you'll burn 2% on the way in and 2% on the way out
- Now the expected return that you demand from the security goes up to 19%
- *Liquidity premia are layered on top of normal risk-return considerations*
- T.c. drive up the cost of capital.

Liquidity black holes

- Sometimes financial markets are known to seize up
- Liquidity essentially vanishes for a few days or weeks
- These are called 'liquidity black holes'
- You are stuck holding positions
- Trading strategies that were counting on liquidity end up losing a lot of money because the power to transact is taken away.

Liquidity risk

- If t.c. were predictable, it's a cost of business
- You factor it into your speculation / arbitrage / investment
- But t.c. are hard to measure and hard to forecast
- The t.c. at a future date is a source of risk!
- The t.c. might be low; it might be high; liquidity might vanish altogether if you find yourself in a liquidity black hole.
- Perceptions of liquidity risk have a lot of impact on business planning in finance.

Jargon watch

no-arbitrage band • noise trader risk • liquidity premium •
liquidity black holes • liquidity risk

Thank you.