

5 Secondary market

5.1 Learning outcomes

After studying this text the learner should / should be able to:

- Define the secondary equity market.
- Evaluate the significance of secondary equity market.
- Explain the structure of secondary equity market.
- Name and detail the participants in secondary market.
- Provide an outline of the ATS trading system.
- Appreciate the mechanics of dealing (from point of view of client).
- Define clearing and settlement.
- Interpret equity market indices.
- Understand the significant role of information in financial markets in general.
- Explain the three standards of financial market efficiency.



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5.2 Introduction

We now turn our attention to the issues surrounding trading of equities in the secondary equity market. The following is the outline:

- Definition of secondary market.
- Significance of secondary market.
- Structure of secondary equity market.
- Participants in secondary market.
- Trading system: automated trading.
- Mechanics of dealing (from point of view of client).
- Clearing and settlement.
- Cost of dealing.
- Equity market indices.
- Equity market efficiency.

5.3 Definition

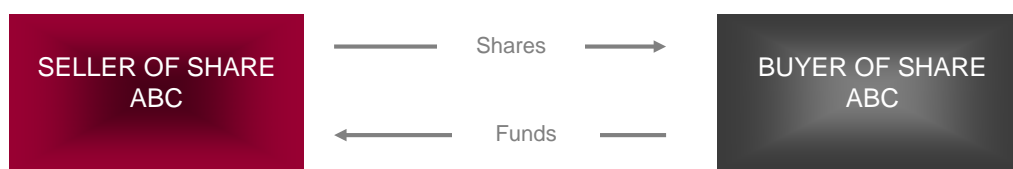


Figure 1: exchange of value in the secondary equity market

As mentioned before, the primary market is the market for the issue of newly created securities, and the *secondary market* is the market for the exchange of previously issued securities. The issuer of the securities does not receive funds in the secondary market – the seller does (see Figure 1).

It is the market that enables *holders* of previously issued securities to acquire funds by disposing of their holdings (sellers), and enables investors to invest funds by purchasing existing securities (buyers). It also enables issuers to buy back their own securities, assuming they have the authority to do so, and speculators/arbitrageurs to endeavour to profit from short-term price movements and/or price variances in different markets.

The *secondary equity market* may be defined formally as the conventions, facilities and legal prescriptions that exist for the exchange of equities in issue.

5.4 Significance of secondary market

It was noted earlier that the secondary securities market plays a significant role in the financial system. In the case of the secondary equity market, the following advantages may be mentioned:

- Price discovery. The interplay of the supply of and the demand for shares brings about the establishment of prices for them. Some shares are actively traded while others are not. The issue of market efficiency is discussed later.
- An active secondary equity market facilitates primary market issues, i.e. improves the capacity of issuers to place newly created equities. The knowledge by investors that they will be able to dispose of securities if they so desire, i.e. an exit mechanism, brings this about.
- An active secondary market gives rise to the raising of capital at a price that is often cheaper than in the absence of this market. In other words well-run companies are rewarded with the ability to raise capital cheaply in comparison with companies that are not well run. This can be called a “discipline” factor.
- An active secondary market provides the benchmark for the determination of the pricing of new issues.
- An active secondary equity market registers changing market conditions rapidly, indicating the receptiveness of the market for new primary issues.
- An active secondary equity market enables investors to rapidly adjust their portfolios in terms of size, risk, return, liquidity and maturity.

5.5 Structure of secondary equity market

The organisational structure of spot financial markets is presented in Figure 2.

Equity markets are formal (exchange) or OTC. In the US all bonds are OTC and many shares are traded OTC.

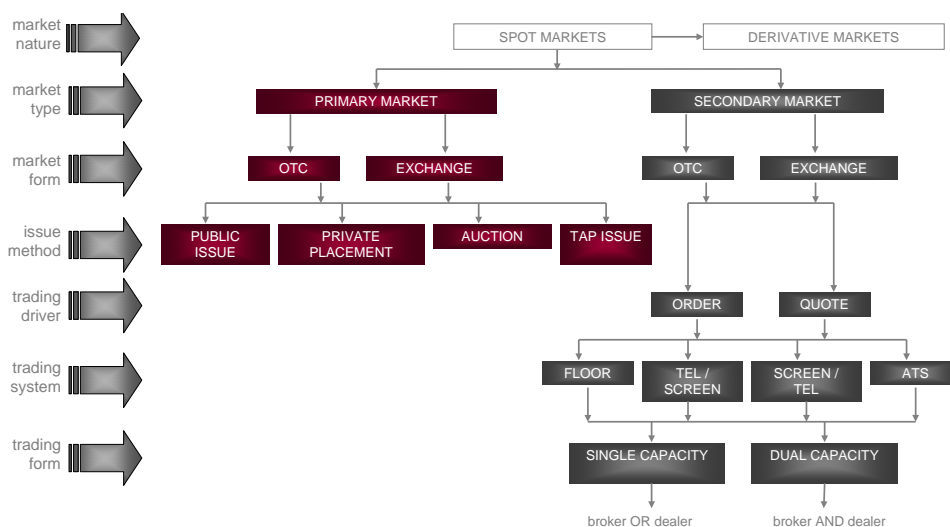


Figure 2: organisational structure of spot financial markets
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The best foreign example of an OTC market is NASDAQ (National Association of Security Dealers Automated Quotation System). It is an electronic OTC market. In this market the client calls a broker, who in turn contacts a number of dealers in NASDAQ quoted shares for quotes. S/he obviously accepts the best quote. “Dealer” here means market maker. There are a number of “dealers” in each share, and they continuously make a market in the shares in which they specialise.

However, in most countries the secondary equity market is *formalised* in the form of an exchange. It is formalised because risk-management processes that protect both the consumer of its services (the investors, speculators and so on) and the members of the exchange are “collectivised”. This means it is cheaper to pool risk management devices than for each broker to introduce them individually. The consumer draws more comfort from dealing with a member of an exchange than with a non-regulated broker-dealer, and this enhances market liquidity, which has major benefits in terms of price discovery (and other functions of the secondary market).

Although an exchange exists, in many markets there is no legal impediment to investors trading amongst themselves. The large investors (institutions²⁹) do sometimes trade between themselves, but this is rare. These off-market deals are generally reported to the exchange and included in the turnover data.

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There are two methods / systems of price determination (trading driver): quote-driven systems and order-driven systems. Most countries have an *order-driven* system, and some have a combination of the two systems: order-driving and market making (quote-driving). Where the latter exists the clients are usually informed as such.³⁰

There are four trading systems as indicated in Figure 2, and two apply in exchange-driven equity markets:

- Floor (also known as “open outcry”).
- Automated Trading System (ATS).

The floor (open outcry) trading system is where members of the exchange (we use the generic term broker-dealers) meet on a physical “floor” (i.e. a room) and “cry out” orders which they have from clients. They cry out in order to “advertise” the order, hoping to find another member with an opposite order, so that the order can be fulfilled. If an opposite order is found and a deal is consummated the buyer and seller principals pay / receive the agreed price less the commission of their broker-dealer.

When a deal is done it is recorded in some fashion: a chalk board or an electronic board, and is made available immediately to the general public in the interests of transparency. There are some variations on the theme of open outcry, such as the “call-over” system in small markets such as the Malawi Stock Exchange.

There are disadvantages to the open outcry system, such as a particular broker-dealer may be known to transact for a particular client (a large fund manager) which could have a major price effect (in small markets).

Under the ATS trading system transactions are effected via a single centralised trading system, and trades are matched according to a price-time priority. The system ensures anonymity and guarantees efficient price determination and instantaneous dissemination of price and volume information (i.e. market transparency).

As indicated in Figure 2, there are two “capacities” of trading by the members (broker-dealers) of exchanges: single capacity trading and dual capacity trading. *Single capacity trading* is where the member trades in either the capacity of principal / market maker or in the capacity of agent. “Agent” does not mean that the two principals to a deal are disclosed to one another (such as in the property market). “Agent” in the context of the equity market means (see Figure 3):

- The buyer (investor) does a deal with his broker-dealer and receives a broker’s note (which is a note confirming the transaction).
- The seller (investor) does a deal with his broker-dealer and receives a broker’s note.

- The buyer and seller do a deal with a single broker-dealer who happens to have the two clients with matching orders, and both receive a broker’s note from the broker (see illustration).
- The broker-dealer does not buy or sell for own account (i.e. to or from a portfolio position); the broker-dealer merely makes the offer to buy from or sell to the “market” (in the case of an ATS merely inputs the deal into the system).

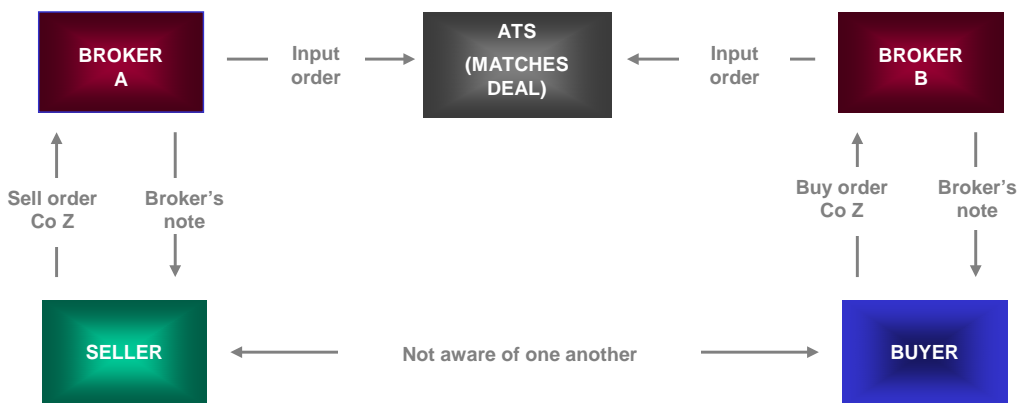


Figure 3: broker-dealer deals on agency basis

The aim of single capacity trading is to avoid the classical conflict of interest inherent in *dual capacity trading* (where the member acts on behalf of clients and for own account): whose deal is done first, the broker’s or the client’s?

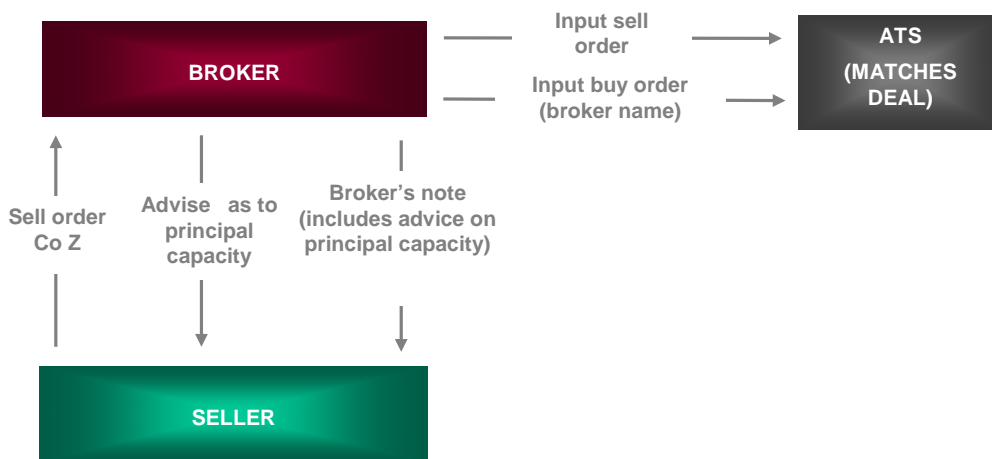


Figure 4: broker-dealer deals on principal basis

Dual capacity trading is permitted in many markets but only under certain conditions. The member has the option of dealing as an agent or as a principal with clients, subject to the disclosure of the capacity dealt in and the obtaining of a signed mandate from the client to deal as a principal. Principal dealing by a member may be depicted as in Figure 4.

5.6 Participants in secondary market

5.6.1 Introduction

We describe the participants in the secondary market with the assistance of Figure 5.

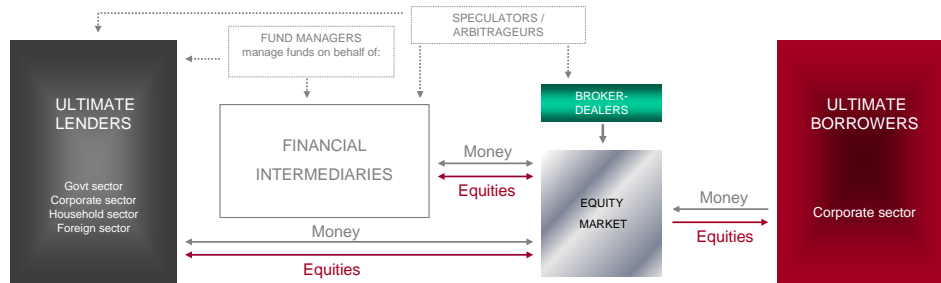


Figure 5: participants in secondary equity market

The participants in the secondary equity market are:

- Members of the exchange (stockbrokers).
- Ultimate borrowers: corporate sector.
- Financial intermediaries.
- Ultimate lenders.
- Fund managers.
- Speculators and arbitrageurs.



5.6.2 Members of the exchange (stockbrokers)

The stockbrokers (broker-dealers) are the obvious participants. They are the members of the exchange and facilitate transactions between the principals. However, as we noted, the members are able to choose their dealing capacity, i.e. agent or principal (single capacity) or both (dual capacity). In many markets of the world some members themselves are also speculators in shares; in fact there are some members that speculate only (i.e. have no clients).

5.6.3 Ultimate borrowers: corporate sector

As is well known by now, the only issuers of equity are corporate entities that have a share capital. However, the corporate entities that have listed their shares on the exchange also have a role in the secondary market, albeit a small one. This is to the extent that they *repurchase their shares*. In most countries the law allows companies to repurchase their shares under certain conditions. These shares are held as “treasury shares / stock” and may be sold (i.e. issued) again. This will of course only occur when it is propitious to do so.

5.6.4 Financial intermediaries

As seen earlier, the contractual intermediaries (CIs), specifically the retirement funds and insurers, the collective investment schemes (CISs) (specifically the securities unit trusts) and some hedge funds are the largest holders of equities. As such, they are also the largest participants in the secondary market. These intermediaries are active in the market as buyers of equities as they acquire funds for investment and also as buyers and sellers as they change the nature and size of their equity portfolios in response to the changing market conditions.

The banks are also holders of equity, but the amount is relatively small; most banks hold shares opportunistically.

5.6.5 Ultimate lenders

The ultimate lenders are made up of the four broad sectors of the economy: the household, corporate, government and foreign sectors. The government is a small holder of equities (listed and unlisted equities in public enterprises). The other three sectors are sometimes large holders of equities.

The *foreign sector* is a considerable participant in the equity markets of some countries as both a buyer and a seller. The sovereign funds (i.e. funds of countries – either the central bank or government) are a prime example.

The foreign sector is also a large participant in *emerging market* with an active secondary equity markets, as well as active foreign exchange markets. These are the ingredients sought by foreign investors, and they enter and exit the market frequently with the purpose of making handsome returns from dividends and capital gains.

The *corporate sector* is a large holder of equity, both in the form of investments in subsidiaries and in the form of “normal” investments. As such they are active in the secondary market.

The *household sector* is of course comprised of individuals, and they are large holders of equity. They either manage their own portfolios or outsource this function to stockbrokers or to professional fund managers. As large holders, individuals are large participants in the secondary market as they change the nature and size of their portfolios in response to changing market conditions and expectations.

5.6.6 Fund managers

The fund managers are the largest participants in the equity market – not as principals, but as managers of the funds of principals. The principals that outsource their fund management requirements are the securities trusts, the majority of insurers and retirement funds and certain individuals.

Certain stockbrokers also fulfil this function on behalf of individuals.

5.6.7 Speculators and arbitrageurs

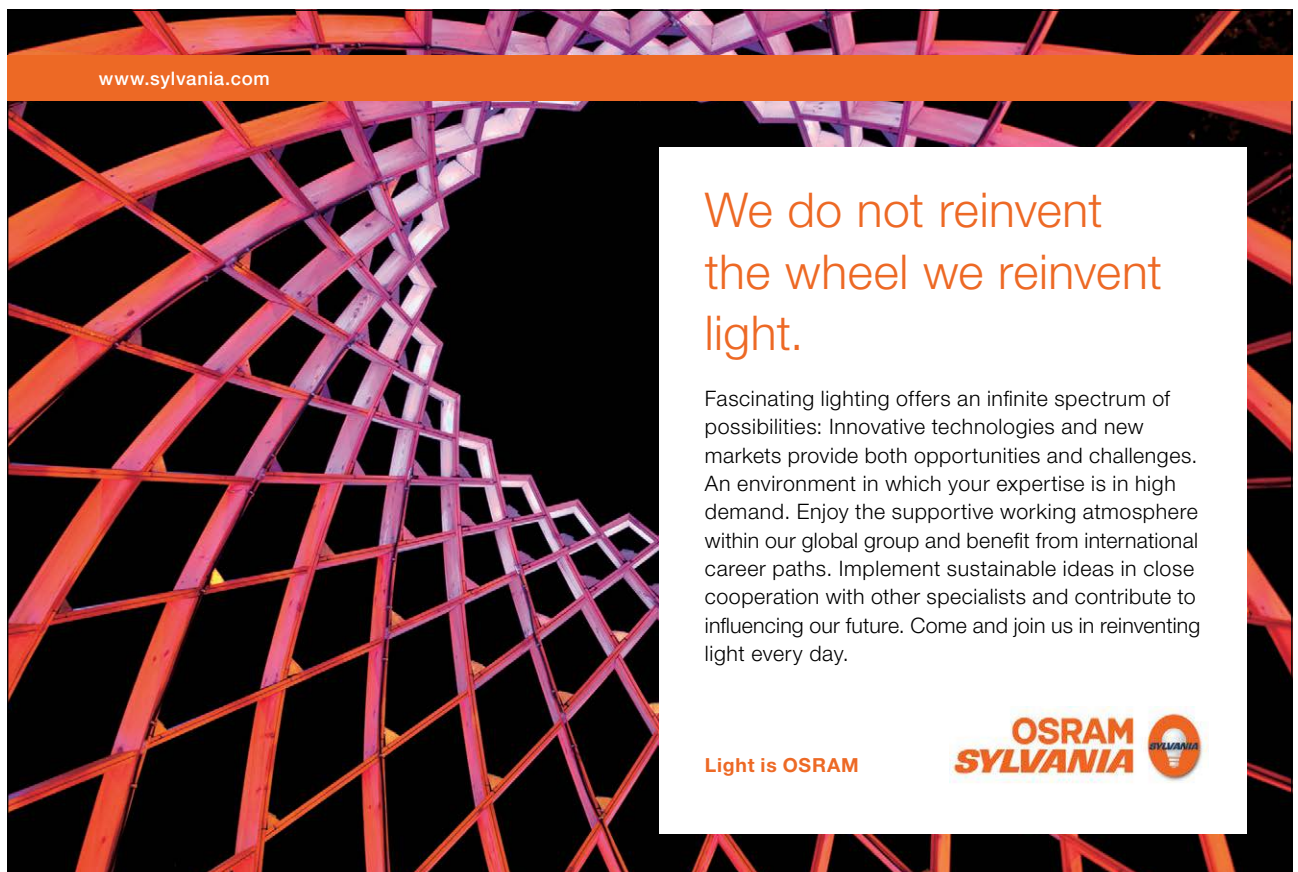
Speculators and arbitrageurs are important participants on the equity market in that they add “liquidity” to the market and thereby add to pricing efficiency. Speculators and arbitrageurs do not constitute a separate group of participants; they are part of the categories mentioned above. For example, certain financial intermediaries, such as banks and hedge funds, fall into this category, as do certain retirement funds and securities unit trusts.

Arbitrage is usually defined as the seeking and taking advantage of price anomalies in the same security in different markets, for example the spot equity and the equity futures markets. An arbitrageur may also find an anomaly between the price of a share quoted on both the local market and the London Stock Exchange, buy the share on the one exchange and sell it on the other, and profit from the difference in price.

Speculators actively seek capital gain opportunities and undervaluation / overvalued opportunities, and take advantage of these by taking “positions” in equities. Taking positions in equities means:

- Purchasing equities with own funds to hold for a period. This is done to profit from a rise in prices.
- Purchasing equities with borrowed funds, i.e. have an equity position “carried” for a period, with the same purpose as aforementioned.
- “Going short” of a share, and borrowing the relevant share in order to deliver the share to the buyer. This is done with the purpose of profiting from a fall in the price of the relevant share. For example, a speculator may believe that the price of a particular share is about to fall. S/he sells 1 000 of the particular share at the current share price of LCC100 per share, borrows 1 000 of the same share in order to deliver it to the buyer (a broker-dealer). Assuming the share price does fall to LCC90, the speculator buys 1 000 of the relevant share at this price, and delivers them to the institution from which it was borrowed. S/he profits by LCC10 per share less the borrowing cost for the borrowing / speculation period. See Figure 6 for an example.

The broker-dealer members of the exchange also fall under this category. As noted, they are active in the secondary market either as pure brokers or as principals. In the latter case they are obliged to disclose this fact to their clients, as well as get from them a signed mandate in this regard.



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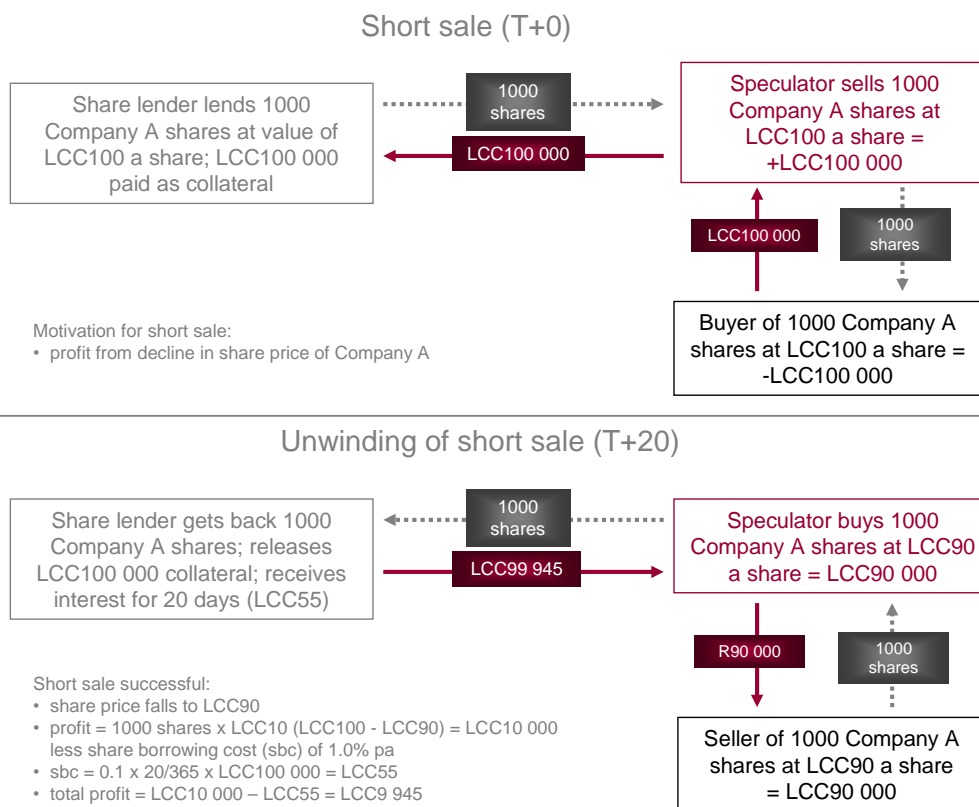


Figure 6: short sale and unwinding of short sale (money as collateral)

5.7 Trading system: automated trading

Because many countries are adopting the ATS system of trading, it is useful to describe the system in some detail. An ATS system generally is a major upgrade from an “open outcry” floor trading system and fundamentally changes the structure of trading to:

- Continuous *order*-driven market with central market principles.
- Dual trading capacity, complemented by member firms voluntarily acting as market makers.
- Fully negotiable brokerage with clients.

The essence of an ATS trading system is as follows³¹:

- The core of the system is the central order book (termed the “book”).
- The book is accessed by remote trading workstations linked to the ATS (computer) system (i.e. the broker-dealer companies’ offices and branch offices).
- Broker-dealers from over the country enter orders at their workstations. These orders have four elements to them: time of entry on system, size of order (number of shares), price and buy or sell.

- The orders of the broker-dealers are instantly included anonymously in the order book. All broker-dealers have access to this information.
- All deals on the system are available to the broker-dealers, making the full depth of the market discernible.
- The book is split into bid (buying) and offer (selling) sides and is organised on the principle of priority. Orders on the book are prioritised in terms of price, followed by time within price. The bid with the highest price and the offer with the lowest price are placed ahead of lesser orders.
- The computer system constantly seeks to match the bids and offers. It compares new orders with those in the book, and executes trades whenever the terms of the orders match. Where volumes do not match, but the price does, a deal is executed, with the balance of the volume remaining on the order book.
- Matched trades are advised immediately to the broker-dealer.

5.8 Mechanics of dealing (from point of view of client)

Clients wishing to buy or sell shares do so with companies/firms that are members of the exchange. The process of buying and selling shares (from the point of view of the client) is straightforward. In the case of *buying shares*, the (private) client follows the steps:

- The first step is to find a broker-dealer, i.e. a member of the exchange, with whom the client feels comfortable. “Feels comfortable” means that the member has a similar investment philosophy as the client, i.e. a similar view in respect of investment horizon, quality of shares to deal in, risk profile, etc. It is also important that the client trusts the broker-dealer unreservedly, and is prepared to divulge his personal wealth profile to him/her.
- Brokerage is negotiated, for example 0.25% of the consideration of the deal.
- The client and his broker discuss the shares to be purchased or the portfolio to be managed. The relationship with the broker can take on many forms:
 - Buying and selling upon client instruction.
 - Buying and selling upon client instruction after the advice of the broker-dealer has been sought.
 - Non-discretionary portfolio management by the broker-dealer (i.e. where the broker-dealer manages the portfolio, but is obliged to seek the client’s approval before the deal is executed).
 - Discretionary portfolio management, (i.e. where the broker-dealer has full discretion and does not need the sanction of the client before a deal is executed).
- A decision is made in respect of shares to be purchased (personally or for the portfolio; assume the former), and price P.
- The client instructs the stockbroker to purchase 1 000 of the shares of Company XYZ at price P.
- The stockbroker’s company/firm opens an account with the exchange (i.e. on the BDA³² system) in the name of the client.
- The broker-dealer instructs another broker-dealer in the employ of the company/firm to execute the order at price P, i.e. enter the order into the ATS system.

- An alternative is for the broker-dealer to advise the client to have price limits (above and below price P) within which the broker-dealer has carte blanche to deal. They decide to deal at price P only.
- The broker-dealer enters the order on his trading workstation (computer), and this is transmitted instantaneously onto the central order book managed by the trading system.
- The system seeks a matching opposite order (i.e. a sell order), and finds one.
- The deal is done at price P and the broker-dealer informs the client by telephone. A broker's note follows a day after the deal (T+1).
- The deal is cleared and settled (see next section).
- The client pays within 5 business days (T+5).
- The Transfer Secretary (TS) of Company XYZ records the change in shareholding in the company's share register.
- The CSD (if there is one) records the change in ownership.
- The share certificate (in the case of non-dematerialisation) follows after a few weeks. In the case of dematerialisation, the TS will forward an electronic confirmation of ownership.

In the case of the *selling of shares*, the mechanics is similar, except that the client has to deliver to the broker the share certificate, and sign a transfer deed (STF referred to before) (in the case of non-dematerialisation). This renders the shares sold transferable. The client receives payment within 5 working days of the sale (T+5)³³.



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5.9 Clearing and settlement

Equity *clearing* is usually defined as the matching of trades and the “netting out” of trades. This is given effect by the clearing system. “Netting out” means that the clearing system nets out the trades of each broker-dealer, and the broker-dealer has to deliver scrip / receive scrip on a net basis. With many transactions taking place daily, it is impractical for each trade to be cleared and settled individually.

Settlement means the exchange / delivery of equity scrip and the payment therefore. Part of clearing and settlement is to transfer ownership from seller to buyer.

5.10 Cost of dealing

The costs of dealing (called transaction costs) differ from country to country and may include the following:

- *Brokerage* (usually fully negotiated). An example is 0.25%. This amount is levied on the consideration, before the other costs are taken into consideration. If the amount of shares is 10 000 and the price dealt at is 745 cents, the consideration is LCC74 500.00. The brokerage on this consideration is LCC186.25 ($LCC74\ 500.00 \times 0.0025$).
- *CSD settlement costs*. The CSD levy is usually a flat amount per deal (e.g. LCC6.00).
- *Insider trading levy*. An example from one country is 0.00071% of the consideration. In the above example, the amount payable is LCC0.53 ($LCC74\ 500.00 \times 0.000071$).
- *Value Added Tax*. This applies in many countries. For example if VAT = 14% is payable on the above costs the amount is LCC26.99 ($0.14 \times (LCC186.25 + LCC6.00 + LCC0.53)$).
- *Marketable Securities Tax*. MST is usually only payable on purchase transactions and it is levied on the consideration. For example, at MST of 0.25%, in the above example the MST payable is LCC186.25 ($LCC74\ 500 \times 0.0025$).

All these costs are shown on the broker's note. In the above example, the total transactions costs are LCC406.02, which is equal to 0.54% of the consideration.

5.11 Equity market indices

5.11.1 Introduction

Individual share prices rise, fall, and rise and fall at different rates, all at different times. If an equity market has many hundred listed shares, how do investors know what is happening in the entire market and/or to different segments of the market, such as the transport sector shares or the gold mining sector shares?

The answer is *equity indices*. Every equity market participant in the world has heard about the Dow Jones Industrial Average (DJIA) index. This is an index (i.e. a number) that demonstrates the performance of the 30 largest industrial companies listed on the New York Stock Exchange (NYSE). The DJIA is the first known equity index: it was started in May 1896 when Mr Dow summated the share prices of the 12 largest industrial companies and divided the numbers by the number of shares. Another eight shares were added to the index in 1916 and a further 10 in 1928.

Other well known foreign indices are the S&P 500 index, the NASDAQ composite, the NYSE composite, the FTSE 100, the DAX indices, the CAC indices, etc.

Share indices essentially provide an *image of the performance of the equity market*. An index may also be described as a tool that “describes” the share market at a point in time in terms of price levels, dividend yield and earnings yield. Portfolio trackers also use indices as benchmarks against which their portfolio performance is measured.

5.11.2 FTSE / Dow industry classification benchmark

Most share exchanges have accepted / adopted the industry classification system (called the *industry classification benchmark* – ICB) created in 2004 by index companies FTSE and Dow Jones. In terms of the ICB there are:

- 10 industries
- 18 supersectors
- 39 sectors
- 104 subsectors.

Table 1 shows all the industries, supersectors, sectors and subsectors of the ICB classification system.

Industry	Supersector	Sector	Subsector	
Oil & gas	Oil & gas	Oil & gas producers	Exploration & production	
			Integrated oil & gas	
		Oil equipment & services	Oil equipment & services	
			Pipelines	
Basic materials	Chemicals	Chemicals	Commodity chemicals	
			Specialty chemicals	
	Basic resources	Forestry & paper	Forestry	
			Paper	
		Industrial Metals	Aluminium	
			Nonferrous metals	
			Steel	
		Mining	Coal	
			Diamonds & gemstones	
			General mining	
	Gold mining			
Industrials	Construction & materials	Construction & materials	Building materials & fixtures	
			Heavy construction	
	Industrial goods & services	Aerospace & Defence	Aerospace & Defence	Aerospace
				Defence

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Industry	Supersector	Sector	Subsector
		General industrials	Containers & packaging
			Diversified industrials
		Electronic & electrical equipment	Electrical Components & Equipment
			Electronic Equipment
		Industrial engineering	Commercial vehicles & trucks
			Industrial machinery
		Industrial transportation	Delivery Services
			Marine Transportation
			Railroads
			Transportation Services
			Trucking
		Support services	Business support services
			Business training & employment agencies
			Financial administration
			Industrial suppliers
			Waste & disposal services
Consumer goods	Automobiles & parts	Automobiles & parts	Automobiles
			Auto Parts
			Tyres
	Food & beverage	Beverages	Brewers
			Distillers & Vintners
			Soft Drinks
		Food producers	Farming & fishing
			Food products
	Personal & household goods	Household goods	Durable household products
			Nondurable household products
			Furnishings
			Home construction
		Leisure goods	Consumer electronics
			Recreational products
			Toys
		Personal goods	Clothing & accessories
			Footwear
			Personal products
		Tobacco	Tobacco
Healthcare	Healthcare	Health care equipment & services	Health care providers
			Medical equipment
			Medical supplies

Industry	Supersector	Sector	Subsector
		Pharmaceuticals & biotechnology	Biotechnology
			Pharmaceuticals
Consumer services	Retail	Food & drug retailers	Drug retailers
			Food retailers & wholesalers
		General retailers	Apparel retailers
			Broadline retailers
			Home improvement retailers
			Specialised consumer services
			Specialty retailers
	Media	Media	Broadcasting & entertainment
			Media agencies
			Publishing
	Travel & leisure	Travel & leisure	Airlines
			Gambling
			Hotels
			Recreational services
			Restaurants & bars
			Travel & tourism
Telecommunications	Telecommunications	Fixed line telecommunications	Fixed line telecommunications
		Mobile telecommunications	Mobile telecommunications
Utilities	Utilities	Electricity	Electricity
		Gas, water & multiutilities	Gas Distribution
			Multiutilities
			Water
Financials	Banks	Banks	Banks
	Insurance	Nonlife insurance	Full line insurance
			Insurance brokers
			Property & casualty insurance
			Reinsurance
		Life insurance	Life insurance
	Financial services	Real estate	Real estate holding & development
			Real estate investment trusts
		General Financial	Asset managers
			Consumer finance
			Specialty finance
			Investment services
			Mortgage finance
	Investment instruments	Equity investment instruments	Equity investment instruments

Industry	Supersector	Sector	Subsector
		Non-equity investment instruments	Non-equity investment instruments
Technology	Technology	Software & computer services	Computer Services
			Internet
			Software
		Technology hardware & equipment	Computer Hardware
			Electronic Office Equipment
			Semiconductors
			Telecommunications Equipment

Basic data obtained from: www.jse.co.za

Table 1: FTSE / Dow Jones industry classification system (industry classification benchmark – ICB)

All countries have different indices. The South African equity indices, called the *FTSE/JSE Africa Index Series*, are shown in Box 1.

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Construction & materials
Aerospace & defence
General industrials
Electronic & electrical equipment
Industrial engineering
Industrial transportation
Support services
Automobiles & parts
Beverages
Food producers
Household goods
Leisure goods
Personal goods
Tobacco
Health care equipment & services

Pharmaceuticals & biotechnology
Food & drug retailers
General retailers
Media
Travel & leisure
Fixed line telecommunications
Mobile telecommunications
Electricity
Gas, water & multiutilities
Banks
Non-life insurance
Life insurance
Real estate
General financial
Equity investment instruments
Software & computer services
Technology hardware & equipment
ALL SHARE SUBSECTOR INDICES
Gold mining
Coal
Diamonds & gemstones
Platinum & precious metals
General mining
SECONDARY MARKETS
Development capital
Venture capital
SPECIALIST INDICES
SA all share financials & industrials
Property unit trust companies
Property loan stock
SA all share industrials
SA listed property index
Capped property index
Dividend+ index (launched in 2006)
SHAREHOLDER WEIGHTED INDEX SERIES
Shareholder weighted top 40
Shareholder weighted all share
JSE SRI INDEX
JSE SRI Index
STYLE INDEX SERIES
Style all share value
Style all share growth
Source: www.jse.co.za

Box 1: FTSE/JSE Africa index series

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5.11.3 Calculation of indices

In the calculation of indices, the following is pertinent:

- Only ordinary shares are included.
- At times index constituents (i.e. shares) are removed from the index, for example:
 - if a company is delisted
 - if the company control passes over to another that is also in the index
 - if a listed company is suspended for more than five days,
 - if liquidator has been appointed for the company.
- Changes to the classification of a company are accommodated in the indices
- Shares are ranked according to market capitalisation, but adjusted for *free float*, i.e. only shares that are freely tradable are included.

Market capitalisation (MC) is therefore defined here as the number of shares outstanding that are freely tradable multiplied by the price of those shares:

$$MC = \text{number of free float shares} \times \text{price per share.}$$

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The indices are *arithmetic averages* of the prices of their constituent securities, weighted by their market capitalisation (adjusted for free float). This means that for a larger company with a large volume of free float shares, its share price movement would have greater effect on the index than that of a smaller company. In addition to the price indices, *earnings and dividends yields* are also calculated. Table 2 provides an example of the calculation of a price index. It will be apparent from this table that percentage change in each share from period to period is weighted by that share's market capitalisation.

BASE YEAR 31 DECEMBER 2005				
COMPANY	MARKET CAPITALISATION (NO OF FREE FLOAT SHARES X PRICE) (LCC MILLIONS)	MARKET CAPITALISATION (% OF TOTAL)	SHARE PRICE	INDEX VALUE
Company A	120 345	49.88	29.36	49.88
Company B	95 678	39.66	12.56	39.66
Company C	25 234	10.46	15.56	10.46
Total	241 257	100.00		100.00
YEAR 1: 31 DECEMBER 2006				
Company A	145 456	51.32	33.56	58.66
Company B	103 678	36.59	13.67	39.82
Company C	34 276	12.09	17.89	13.90
Total	283 410	100.00		112.38
Return over period 1: $\{[(112.38 / 100.00) - 1] \times 100\} = 12.38\%$				
YEAR 2: 31 DECEMBER 2007				
Company A	142 564	51.29	32.67	57.07
Company B	102 527	36.89	11.56	33.95
Company C	32 846	11.82	15.67	11.90
Total	277 937	100.00		102.92
Return over period 2: $\{[(102.92 / 112.38) - 1] \times 100\} = -8.42\%$				
YEAR 3: 31 DECEMBER 2008				
Company A	147 652	49.72	35.78	60.59
Company B	110 593	37.24	17.89	53.04
Company C	38 728	13.04	19.56	16.39
Total	296 973	100.00		130.02
Return over period 3: $\{[(130.02 / 102.92) - 1] \times 100\} = 26.33\%$				
Return over entire period: $\{[(130.02 / 100.00) - 1] \times 100\} = 30.02\%$				

Table 10.5: Example of calculation of index for industrial sector

In the first year (i.e. the *base year*, or the year from which performance is measured) the index value of each share is equal to its proportion of total market capitalisation expressed in percentage terms. The index value for the sector is equal to the total of each share's index value, i.e. 100.

At the end of each period each share's index value is equal to the new share price divided by the share price in the base year times the share's proportion of total market capitalisation (MC) expressed as a percentage. For example, the *index value of share A* at the end of the first period (year 1) is:

$$IV_{A1} = (P_{A1} / P_{AB}) \times PMC_{A1}$$

where

$$\begin{aligned} IV_{A1} &= \text{index value of shares of Co A at year 1} \\ P_{A1} &= \text{price of share of Co A at year 1} \\ P_{AB} &= \text{price of share of Co A in base year} \\ PMC_{A1} &= \text{proportion of Co A's MC of total MC at year 1 (\%)} \end{aligned}$$

The index value for the sector is the total of all the individual share index values:

$$[(P_{A1} / P_{AB}) \times PMC_{A1}] + [(P_{B1} / P_{BB}) \times PMC_{B1}] + [(P_{C1} / P_{CB}) \times PMC_{C1}].$$

The performance of the shares of *Co A* from the base year to the first year, in percentage terms, is:

$$[(P_{A1} / P_{AB}) - 1] \times 100 = [(33.56 / 29.36) - 1] \times 100 = 14.31\%.$$

Similarly, the performances of the share of *Co B* and *Co C* in the first period are:

$$\begin{aligned} [(P_{B1} / P_{BB}) - 1] \times 100 &= [(13.67 / 12.56) - 1] \times 100 = 8.84\% \\ [(P_{C1} / P_{CB}) - 1] \times 100 &= [(17.89 / 15.56) - 1] \times 100 = 14.97\%. \end{aligned}$$

The arithmetic average of these three numbers is 12.71%. The performance of the *sector* in the first period, however, is:

$$[(IV_{S1} / IV_{SB}) - 1] \times 100 = [(112.38 / 100.0) - 1] \times 100 = 12.38\%$$

where

$$\begin{aligned} IV_{S1} &= \text{Index value for sector for year 1} \\ IV_{SB} &= \text{Index value of sector for base year.} \end{aligned}$$

The difference between the two numbers, i.e. 12.71% and 12.38%, shows the influence of the weighting according to the market capitalisation of the shares.

For the second period the return is -8.42% $\{[(102.92 / 112.38) - 1] \times 100\}$, and for the third period the return is 26.33% $\{[(130.02 / 102.92) - 1] \times 100\}$.

The return for the entire period is equal to the index value for the period less the index value at the start of the period:

$$130.02 - 100 = 30.02\%.$$

The long way to get to this number is of course to use the formula:

$$[(130.02 / 100.00) - 1] \times 100 = 30.02\%.$$

It should be noted that the return excludes dividend payments received.

5.12 Equity market efficiency

It is appropriate to end this section on the secondary equity market with a brief discussion on the concept of *equity market efficiency*.³⁴ This is of interest given the significant role that the equity market plays in the economy and therefore in the lives of individual investors and in the substantial portfolios of the institutions.



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Market efficiency is concerned with how well the equity market functions. However, this is not in terms of dealing efficiency, liquidity, or the spread quoted by market makers, but in terms of the degree to which share prices reflect available information about the listed companies and change to reflect new information. There are three standards (some call them measures) of market efficiency and all have been intensely researched in order to determine whether share prices do indeed reflect all information. The reason for the research was (and is) of course to make pots of money if the markets do not reflect all available information. The three standards are:

- Weak form market efficiency
- Semi-strong form market efficiency
- Strong form market efficiency.

Each standard has a different *objective* in terms of market efficiency:

- Weak form market efficiency – does the market reflect all past *market* information?
- Semi-strong form market efficiency – does the market reflect all information about *listed companies* that is available to the *public*?
- Strong form market efficiency – does the market reflect all possible information about companies, *including private information* (i.e. insider information)?

It should be apparent that the three forms are concerned with *how efficient* the equity market is. The degree of efficiency is significant because it determines the value the investor places on various *types of analysis* undertaken to select shares.

The evidence supports *weak form market efficiency* and holds that current prices reflect all historic information about *the market*. Thus stale news, price trends, trading volume data, rates of return, etc, are already incorporated in current prices, and are of no use in explaining or forecasting current and future prices. Thus, *weak form market efficiency* says that investors cannot earn more than the fair (or required) return, by using past information. This of course means that if a market is *weak form efficient* then technical analysis is of little use. However, it does suggest that superior fundamental research can produce returns that are in excess of the return that is consistent with the risk undertaken.

This theory is consistent with the *random walk hypothesis*, i.e. that *changes* in share prices follow a *random walk*, are independent of past price performance. Note the emphasis on *changes*; this is emphasised because the *levels of prices* are not determined randomly. They are efficiently determined by many factors such as earnings, interest rates, dividend (retention) policy, economic environment, etc, and any changes in these variables are rapidly reflected in share prices. However, new information is random because it is unpredictable (if it were predictable it would be incorporated in prices), and therefore prices *change* in response to new information.

Semi-strong form market efficiency is concerned with achieving abnormal returns upon the release of *new public information*. Thus, a market is *semi-strong form efficient* if new public information is imputed into prices immediately.

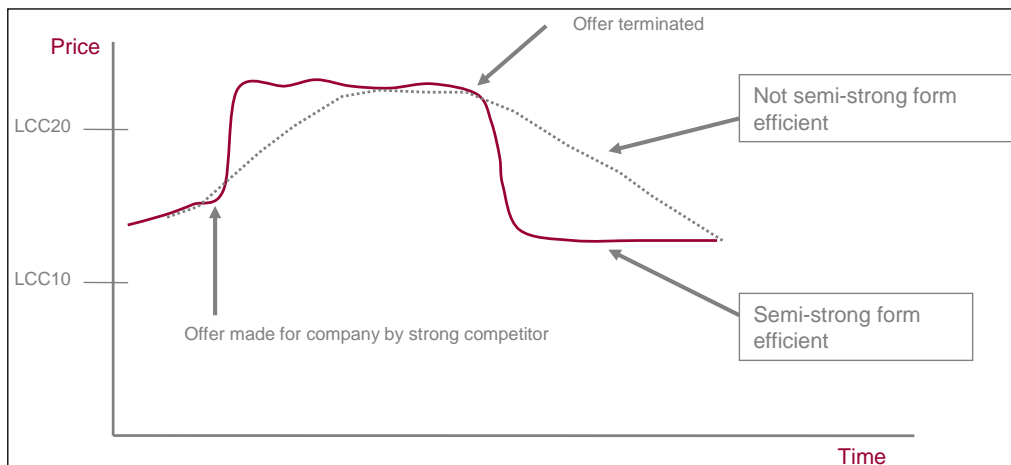


Figure 7: equity market efficiency: daily price of share ABC

The evidence suggests that this is the case. The test here is the quickness with which share prices adjust upon the release of new information about specific companies (see Figure 1). In the case of equity markets that are quote-driven, the market is *semi-strong form efficient* if the bid/offer quotes of the market makers are adjusted immediately without any transactions being done that someone can profit from. If the market adjusts slowly to the new level, based on many transactions that bring this about, then the market is *not semi-strong form efficient*.

Thus, no person / institution can achieve superior results to the market when the market is *semi-strong form efficient*. However, there is one exception to the contention that the market is *semi-strong form efficient*: when someone has insider information. The possessor of this information is able to achieve return results that are superior in a market that is *semi-strong form efficient*.

In the case of *strong form market efficiency* it is said that a market is *strong form efficient* if market prices fully reflect *publicly* announced and *private* information. This standard is difficult to test, because *inside information* is not available to the public (by definition). However, logic dictates that abnormal returns can be made on information that is not publicly available. It will be evident then that if this insider information is later made available to the public, and prices adjust immediately, it would not reflect *strong form efficiency*, but *semi-strong form efficiency*.

There have been cases where “insider trading” has taken place, and some perpetrators have been caught out because the relevant share price changed for “*no reason at all*”. This would be the comment of observers without the information. The *reason* of course becomes apparent after the release of the information. Investigations then take place as to why the share price changed “for no reason at all”, and the perpetrator is identified.

This of course means that the holder of private information is able to outperform the market, which points to the market *not being strong form efficient*. This is manifested in most countries having laws prohibiting this behaviour. The applicable statute in South Africa is the *Insider Trading Act of 1998*.

5.13 Summary

The secondary market is where existing equities are sold and bought, and where market prices are discovered. It is significant because it ensures that investors are not “locked in” and it reflects much information (apart from prices) such as the receptiveness of the market for new issues and their offer prices.

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There are many players in the secondary market, classified into ultimate lenders, financial intermediaries, members of the exchange and speculators / arbitrageurs. The latter are found within the first three categories. They all play a major role in the secondary market in terms of making it informationally efficient. A market is informationally efficient if it reflects all available information and this means that no one can do better than the market delivers (= a controversial but interesting theory).

5.14 Bibliography

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