Developing Domestic Financial Markets

Based on Client Presentation

October 2010

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Outline

- The Benefits of a Domestic Market
- Developing the Government Bond Market
  - Link to debt strategy
  - Sequencing the development
  - Developing the secondary market
- Problems in Practice
- Annexes
  - Links to other Markets
  - Instruments and Techniques
  - Borrowing by sub-National Governments and State-owned Enterprises (SOEs)
  - Auction Format: Multiple or Uniform Price – Some issues arising

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Why Issue Domestically?

- NB: domestic issuance is a substitute not complement to external issuance
  - Underlying macro conditions just as important
- Reducing portfolio risk
  - Especially market risk
  - Widening access to funds; reducing cost of funds
  - Greater resilience at time of financial crisis
- Developing efficient local financial markets
  - Development of viable domestic money and fixed-income markets
- An objective both derived and independent

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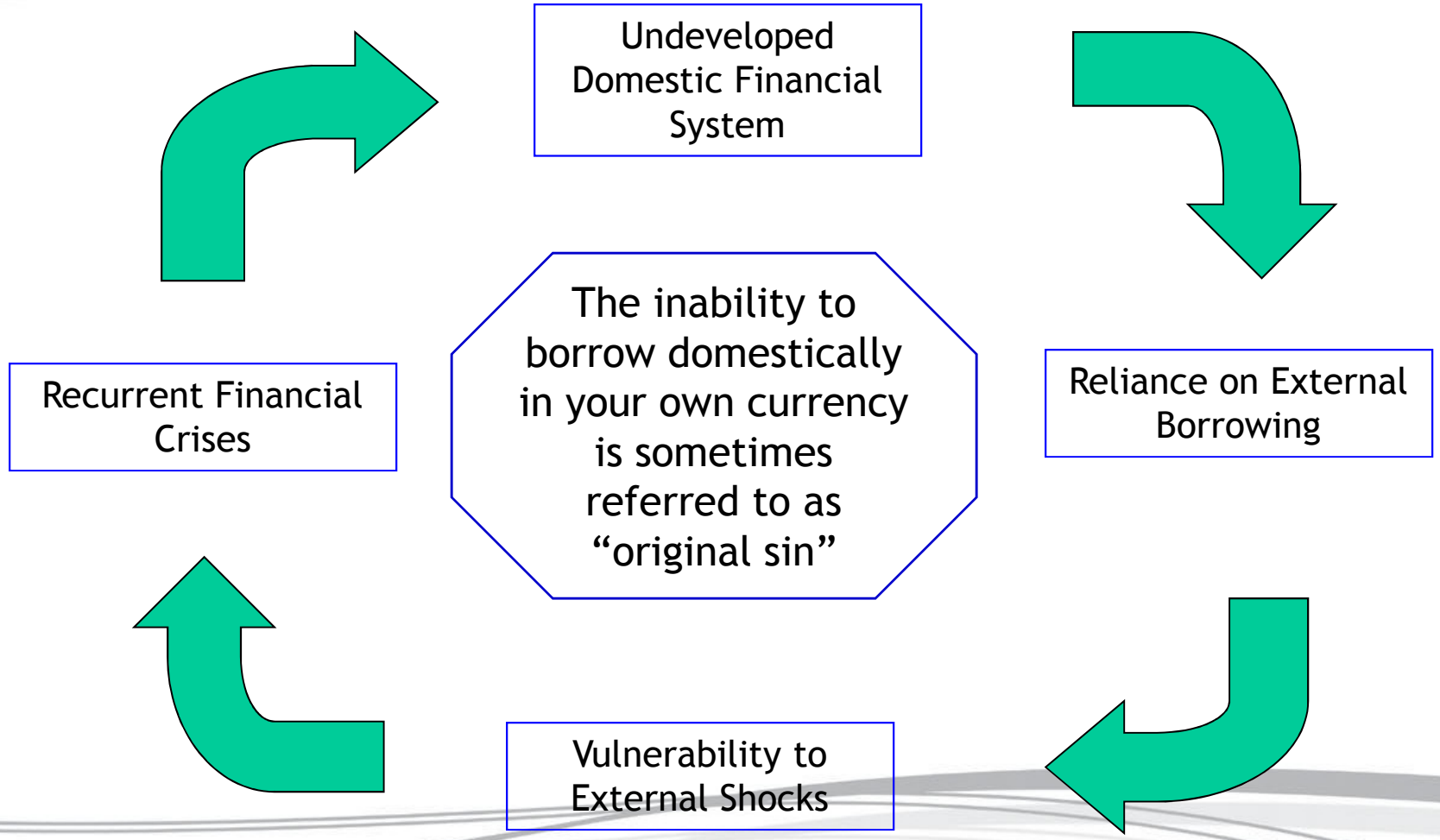
Breaking the Vicious Circle



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Benefits for the Private Sector

- Greater predictability and increased competition for the banking system
- Liquid market reduces risk
  - Opens up borrowing and lending options
  - Improves flow of finance to borrowers
  - Enhances resilience of the economy to adverse shocks
- Benchmark curve
  - Makes pricing more efficient and more transparent
  - Allows development of hedges
- Risk-free asset facilitates portfolio construction

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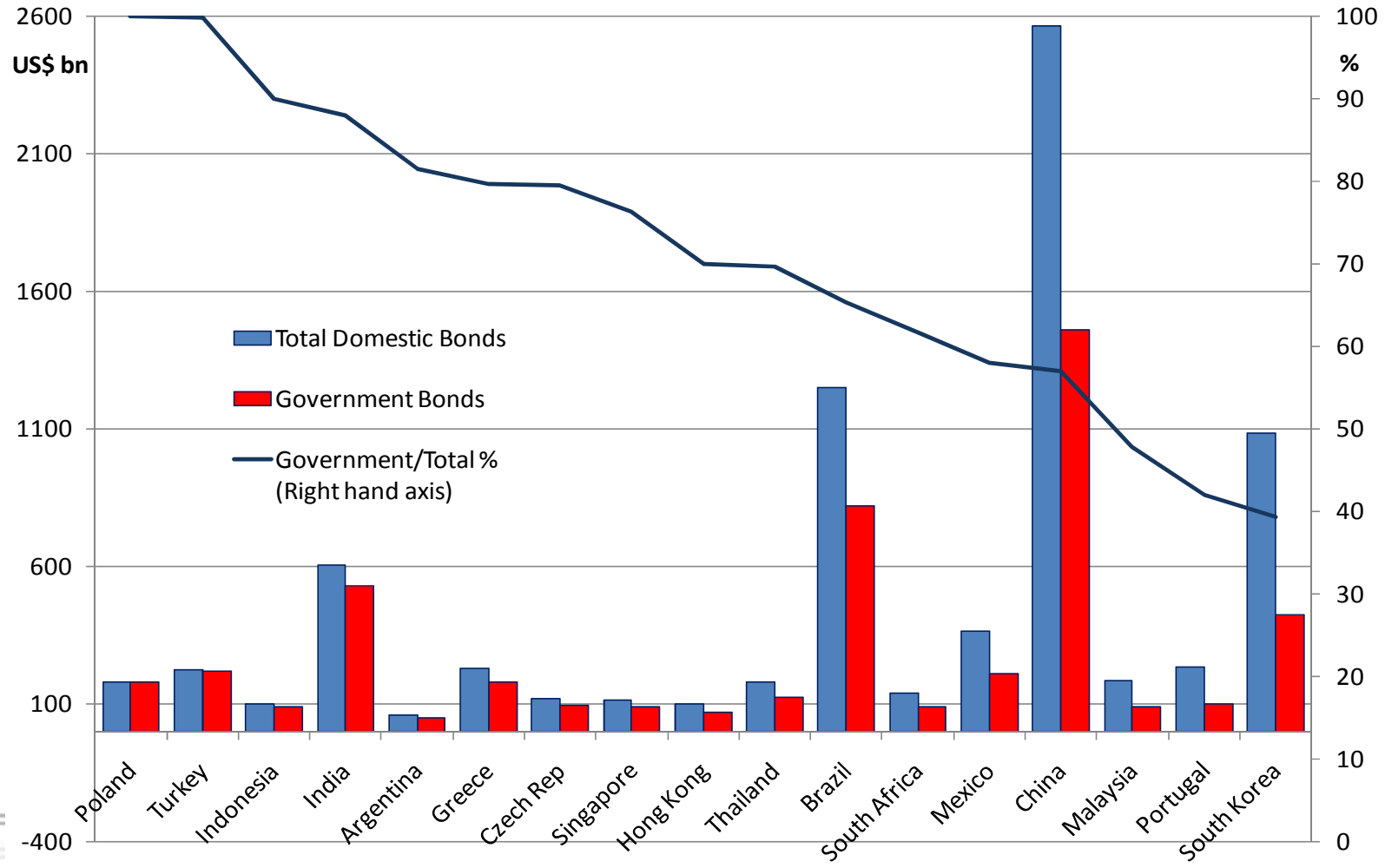
Composition of Domestic Debt Market

Outstanding Domestic Debt Securities, end 2009 US$ bn



Source: BIS Quarterly Review June 2010

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Benefits depend on Efficient Bond Market

- Efficiency means:
  - Low transactions costs
  - Competitive market processes
  - Liquidity - ability to buy and sell close to market price
  - High substitutability between financial instruments
  - Completeness – allow maturity transformation and allocation of capital to productive uses
- Integrate efficiency objectives with domestic financing strategy

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Liquidity

- Liquidity has three important dimensions
  - Market depth - the size of trade required to change prices by a given amount. Indicator - ratio of turnover during a period to the average outstanding stock
  - "Tightness" – cost of turning around a position over short period. Indicator: width of bid/offer spreads on trades.
  - Resilience - speed with which prices recover from a random, uninformative shock
- In emerging economies, growth & development of domestic bond markets not been accompanied by a corresponding increase in secondary market liquidity. Two broad underlying causes:
  - On the demand side, a narrow investor base, dominated by local banks. (Even in Asia >50% domestic debt securities held by banks — significantly higher than that in developed economies)
  - On the supply side, liquidity can be deterred both by small size of individual issues and by the small size of the bond market as a whole.
- Source [and next two slides]: Malcolm Knight, "Promoting Liquidity in Domestic Bond Markets", BIS, May 2006

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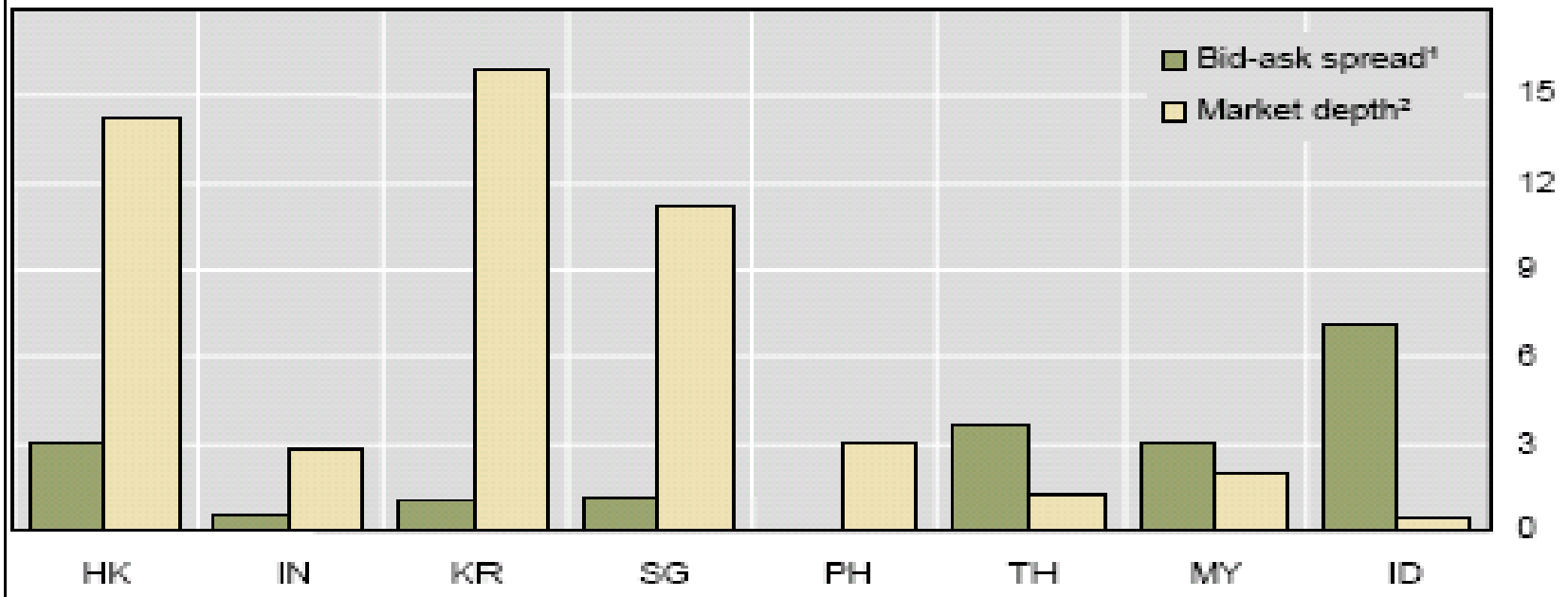
Liquidity Indicators

Indicators of liquidity



Note: HK = Hong Kong, IN = India, KR = Korea, SG = Singapore, PH = Philippines, TH = Thailand, MY = Malaysia, ID = Indonesia.

[1] Average spreads on government bonds as compiled by Barclays. [2] Annual turnover as a percentage of outstanding stock.

Sources : Barclays;Deutsche Bank; and HSBC.

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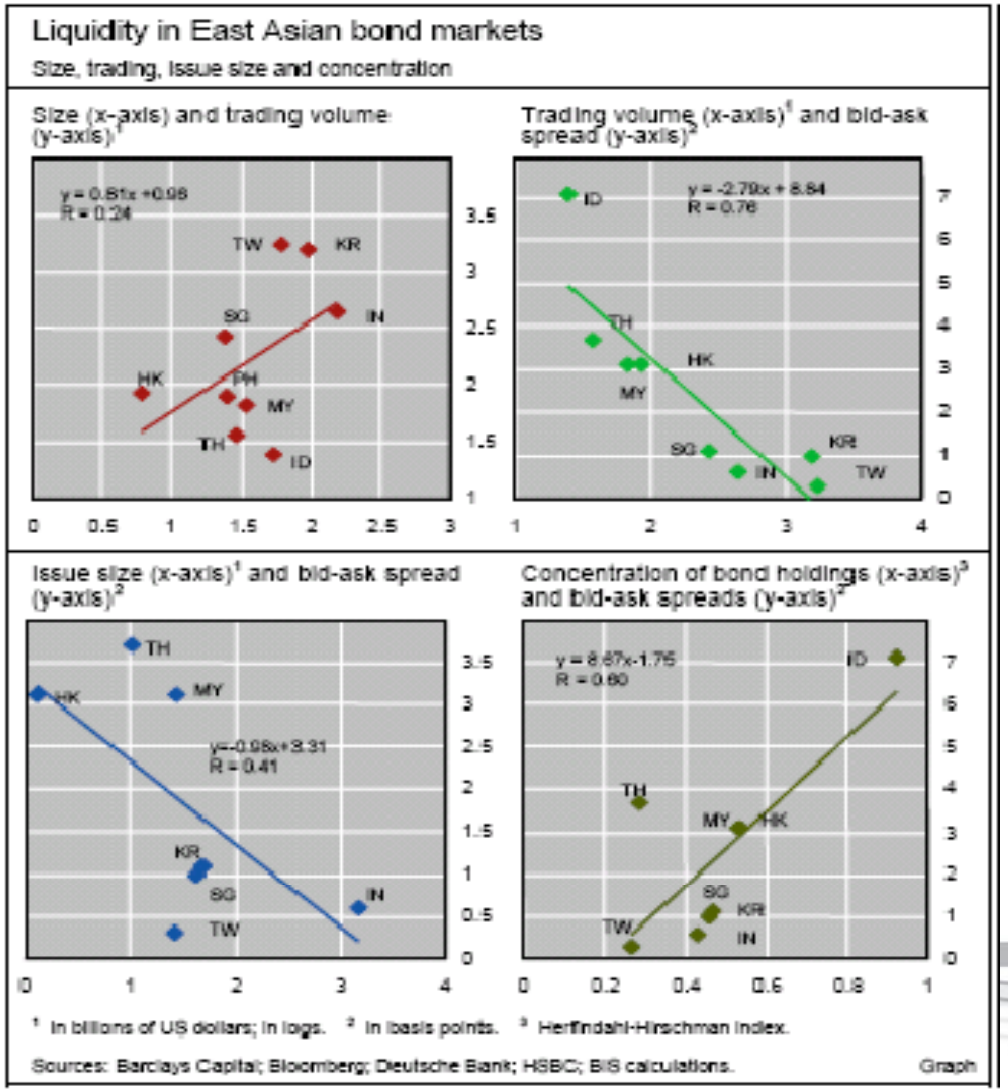
Influences on Liquidity



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An Unpromising Background

- Inherited problems of Emerging Market Economies (EMEs)
  - Shallow financial markets
  - Underdeveloped and undercapitalised banks
  - Lack of long-term savings funds
  - History of capital controls, insensitive regulation
  - No transparent trading mechanisms, inadequate settlement and other market infrastructure
- Heavy short-term domestic debt issuance
  - Driven by macro failures or economic shocks – not by debt strategy
  - Refinancing risk for government
  - Distorts domestic interest rate structure, complicates monetary policy, distorts capital flows
  - Discourages growth of intermediation, increases banking sector risk exposure
  - Crowds out private sector investment
- Even when successfully issued bonds; often
  - Limited yield curve, secondary market undeveloped
  - Significant short-term debt
  - Too many tiny bonds => no liquidity

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Developing the Market

- Development challenges
  - Primary markets
    - Initially strengthen short-term instrument market
    - Move up yield curve
  - Market infrastructure
  - Grow the investor base
    - Banks are forced holders - but leaves interest rates distorted and markets thin
  - Secondary markets
- NB: Avoid borrowing from central banks

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Some Pre-Conditions

- Link to Debt Strategy
  - Lower financing costs
  - Reduced portfolio risk
    - Less reliance on external borrowing
    - Lengthening maturity
    - Increase fixed rate
    - Smooth redemption profile
- Credible and stable government
  - Sound regulatory and legal framework
- Macroeconomic & financial stability
  - Essential to avoid risk premia, create investor appetite
  - Efficient bond market strengthens macroeconomic stability
    - Allocates capital more efficiently across the economy
    - Facilitates better and more effective debt management
    - Improves credibility of monetary policy
    - Improves monetary policy implementation - with Govt. bonds
    - Facilitates exchange rate flexibility
- Keep it Simple
  - Step by step; avoid complexity
  - Value of transparency

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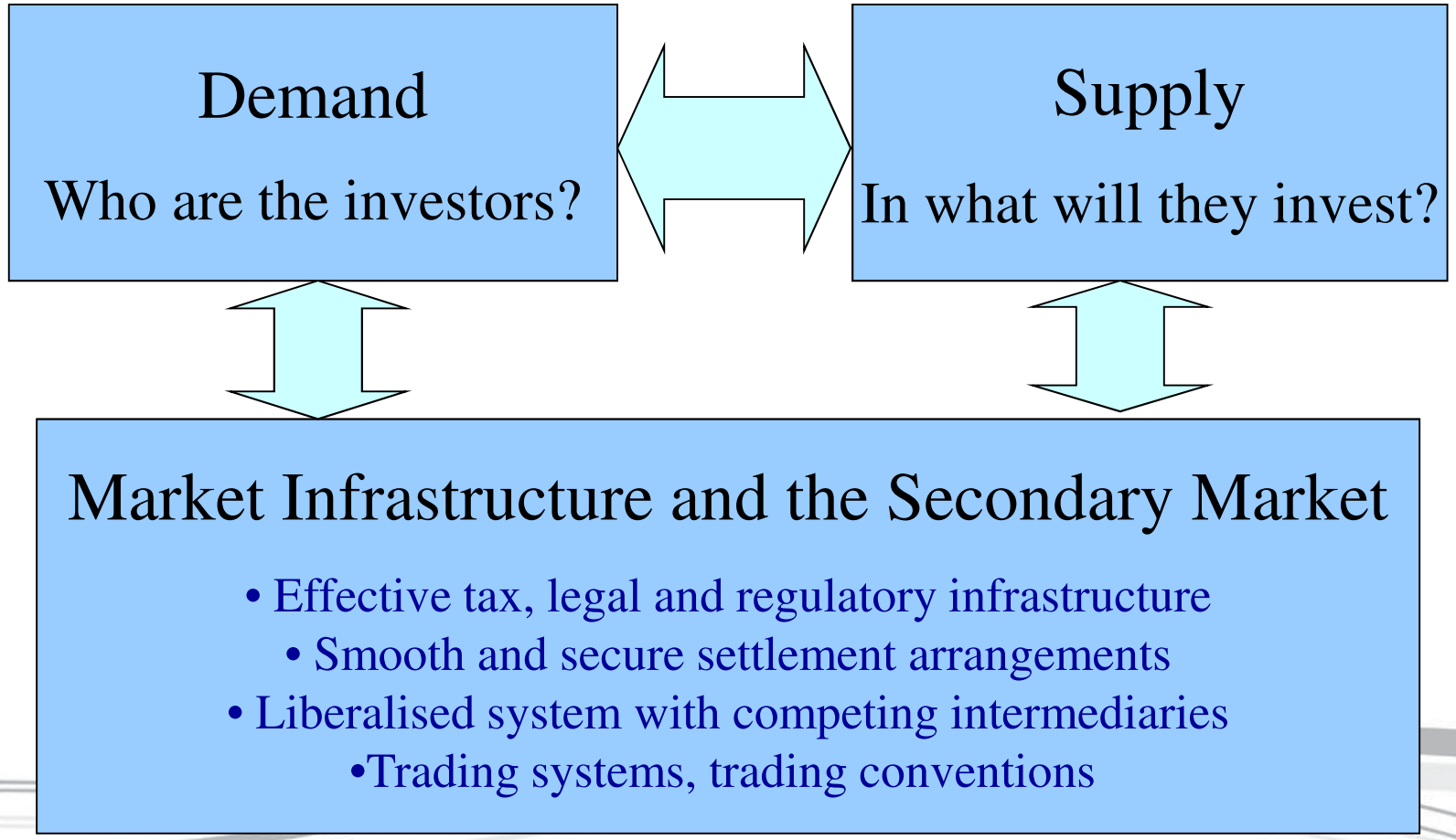
Develop on a Broad Front



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Investor Base - 1

- Diversification helps liquidity and reduces volatility – different time horizons, risk preferences and trading motives
- **Commercial banks** often dominant investors. But:
  - Inhibits development of demand for longer term securities
  - Risks to banking system
  - High margins (compensate for maturity transformation – worse when there is no liquidity)
- **Contractual savings** – pension and insurance funds
  - Development interacts dynamically with securities market development
    - Investors act as countervailing force v banks – creates competition and pressure for innovation
    - Can play a catalyst role in developing liquidity
      - E.g. Chile and Poland – pension reform trigger
  - May be limited help to secondary market if only buy-and-hold May be limited help to secondary market if only buy-and-hold

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Investor Base - 2

- Collective investment funds
  - Competitors to banks
- Retail investors
  - Market segmentation
  - May need special instruments and extra marketing and administrative costs
- Foreign investors
  - Positive pressure for reform
  - Broadens investor base and improves market liquidity

  But ...
  - May encourage speculative inflows and complicate monetary policy
  - Expect outflows at times of crisis (as in 2008)
- Speculative investors can also have a role to play
  - More active trading improves liquidity
- [Share of foreign investors in domestic debt markets (globally) nearly doubled from ~6% to ~12% over 2000-05 (source: IMF)
  - May have since fallen]

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Retail Instruments

- Huge variety internationally
- Savings certificates
  - Short-term v. long-term
  - Fixed rate v. variable rate
  - Tradable v. non-tradable (nor redeemable early)
- Savings deposits
- Lotteries, premium bonds
- Government bonds on preferential terms
  - Direct access at auctions (non-competitive bids]
  - Purchase between auctions [at what price?]
  - [Can complicate conversions etc]

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Retail Instruments: Pros and Cons

Potential Disadvantages

- Politically difficult to refuse early redemption
  - Can impose cash penalties
- Requires specialist marketing channels
  - Outlets
    - Postal offices
    - District Treasury Offices
    - Dedicated retail savings organisations (UK, Canada)
  - Database requirements
- Administratively expensive
- Competition with other savings providers

Potential Advantages

- Can be marketed directly
- Target tax regime to retail holders
- May cost less than wholesale market issuance
  - In UK National Savings department has objective to sell more cheaply than government bonds
  - But cost objectives confused by political or social objectives
- Avoids complicating wholesale government bond market with hybrid instruments
  - Although can take away issuance volume

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Supply - some Considerations

- Transparency (of objectives) and predictability (of issue) is important
  - Reduces uncertainty
  - Widens market participation – improving competition
- Match supply to demand
  - Otherwise investors reluctant to sell – inhibits growth of secondary market
  - Avoid forced purchasing
    - Distorts market – reduces demand from others
    - If investors have to hold they will not sell
- Avoid too many small issues; bigger bonds help to create liquidity
- Facilitated by consultative processes

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Sequencing the Development – Phase 1

- Initial priority to **strengthen short-end of market**
  - Treasury bills, repo, or secondary bill market; encourages participation of banks and builds money market liquidity (facilitating monetary policy operations)
  - Requires active participation of central bank
- Emphasis on **market related** auction procedures, interest-rate flexibility (no direct controls), greater predictability and transparency
- Development of **intermediaries, market infrastructure and secondary market**

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Sequencing the Development – Phase 2

- Move to longer-rate instruments
  - creep up the yield curve or issue linkers
- Ensure interaction with development of
  - investor base
  - repo market (source of financing and demand)
  - secondary market
- Fungibility, benchmark bonds
- Swaps and futures markets (leave to Phase 3)

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Secondary Market Development

- Emphasis on supporting basic transactions
  - Safe systems for execution and settlement of spot trades
  - Repos – benefit both monetary policy and private sector
- Developing the yield curve
- Intermediaries
  - Primary dealers / market makers create interest and liquidity; and facilitate selling of government bonds
  - Need benefits as well as obligations
- Trading systems, clearing and settlement systems, legal and regulatory framework, taxation…all matter

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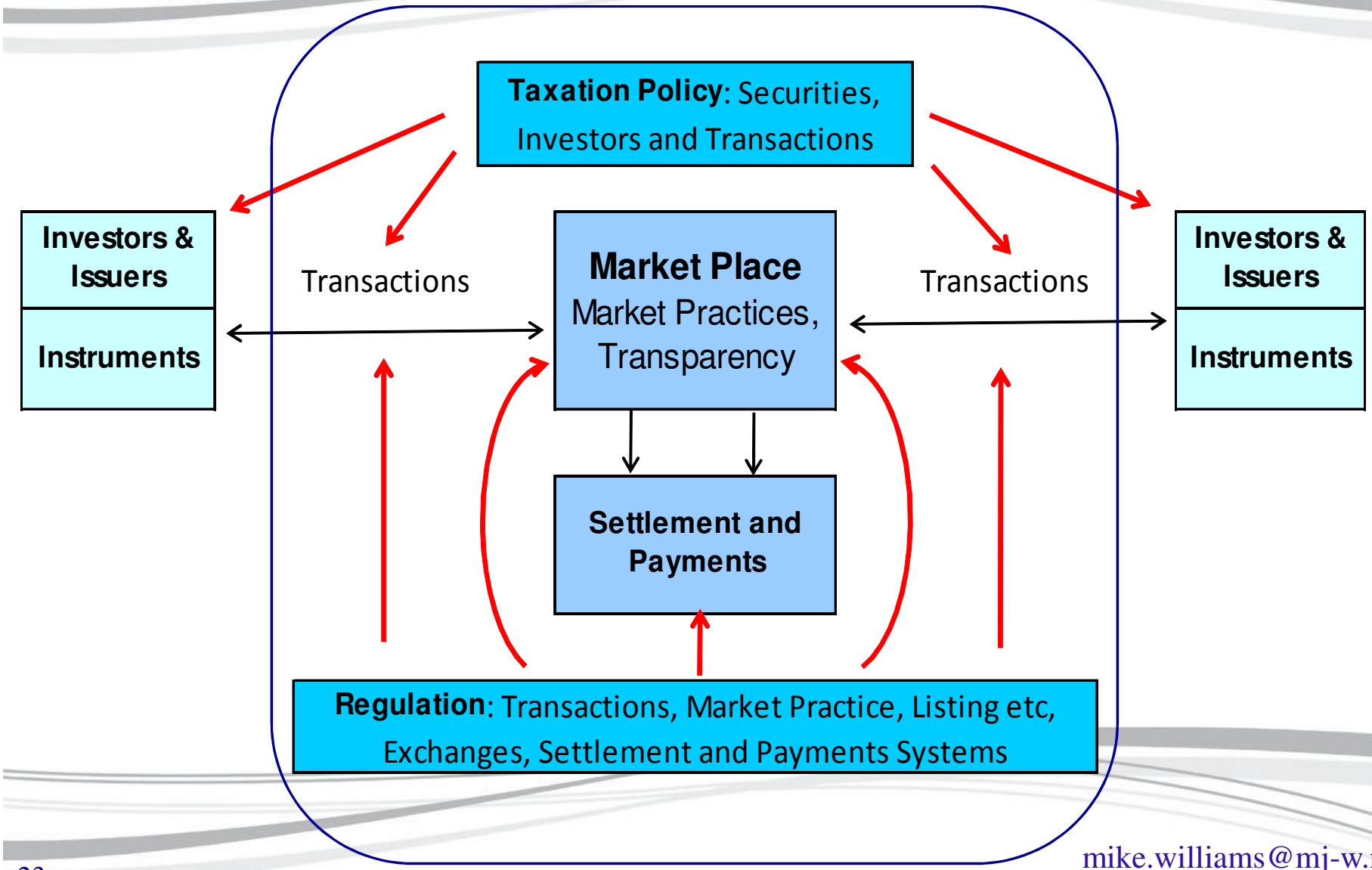
What is Infrastructure?



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Financial Market Infrastructure

Necessary conditions for well-functioning financial markets

- Adequate and well-enforced contracts
- Insolvency procedures
- Governance structures
- Accounting and disclosure standards
- Transparency(role of credit rating agencies)
- Protection against market abuse, misinformation
- Adequate physical infrastructure – settlement, payment, custodial systems

Builds confidence in the integrity of the market

- Regulatory Framework
  - Strong and independent supervisory authority
  - Deter fraud
  - Evolve with market development
  - Market conduct rules
    - Price transparency
    - Market abuse provisions
    - Reporting provisions
- Tax Framework
  - Aim for tax neutrality
  - Treat all incomes all investors / intermediaries the same
  - Transactions reflect views on value of underlying instrument rather than tax incentives
  - Reduce operational costs associated with collecting tax
- Legal Framework
  - Investors' rights protected by insolvency / bankruptcy provisions
  - Enforceability of financial contracts
  - Contractual relationships should be well defined

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Payment & Settlement Systems

- Short settlement cycle => lower cost and less risk
  - Facilitated by dematerialized (or immobilized or book entry) securities
  - Supported by centralized custodians or registrars
  - Connectivity important – supported by strong operational risk control
- Mechanism
  - Gross or net?
  - Delivery versus payment (DVP) – real time or overnight
  - Central counterparty?
  - Connected to high value payment system
- Legal issues include:
  - Can securities be issued in electronic / dematerialized form?
  - Are finality of settlement provisions robust?
  - Is claim to title unambiguous?
- International CPSS / IOSCO standards – 2001
  - [Committee on Payment & Settlement Systems of International Organisation of Securities Commissions]

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Secondary Market Practices

- Rules of engagement
  - Trade reporting
  - Dispute resolution
  - Trade fails
- Trading mechanism
  - Retail vs. wholesale
  - Dealer (or quote driven) vs. order book
  - Exchange vs. OTC
  - Central counterparty
- Trading hours
  - Periodic call auction
  - Continuous market
- Price Transparency
  - Necessary for investor confidence
  - But trade-off with liquidity
- Pre-trade
  - Information dissemination
  - Indicative or committed
- Post-trade
  - Inventory risk
- Official prices
  - Yield curve
  - Reference prices

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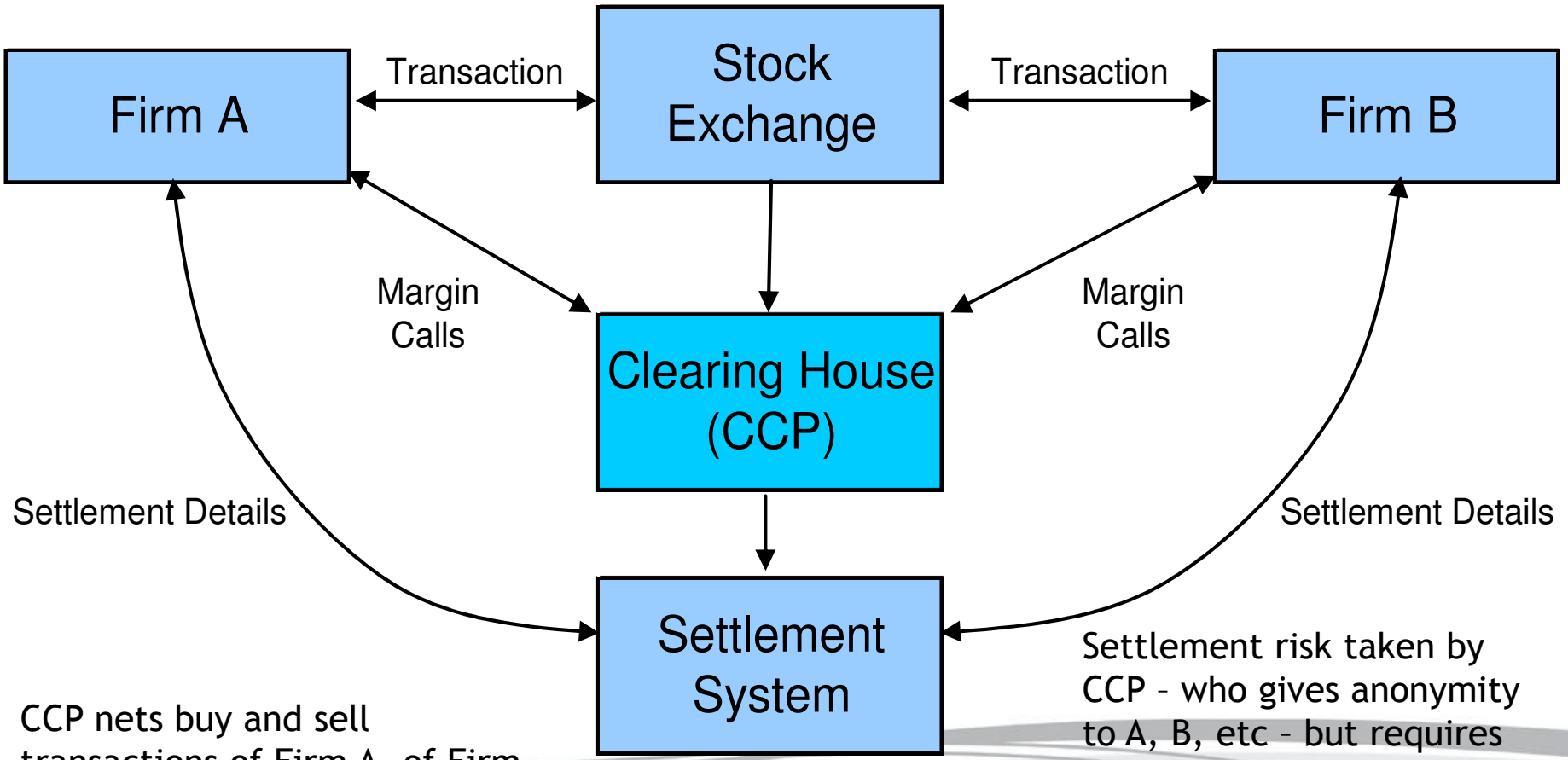
Role of Central Counterparty



CCP nets buy and sell transactions of Firm A, of Firm B etc, in any one security and settles net position

Settlement risk taken by CCP – who gives anonymity to A, B, etc – but requires margin to cover risk

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Summary: Bond Market Development

- Key requirements for liquid government bond market
  - Efficient, well-functioning primary market
  - Appropriate infrastructure to promote secondary market
  - Mix of market participants
- Developing securities markets is a dynamic process based on
  - Continued macroeconomic and financial sector stability
  - Adequate institutional and regulatory reforms
- Proceed in parallel
  - Develop market conventions, settlement practices, infrastructure etc
  - Develop demand and supply – issuance practices and investor base
- It is a project
  - Establish priorities and sequencing
  - Identify risk and bottlenecks
  - Take and give responsibility
- Ensure momentum is maintained – keep issuing!

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Market Development in Practice*

- Not proved easy in practice
- Markets often too small (need to cover fixed costs)
- Inconsistent approaches of local regulators
- Limited range of financial institutions, demand insufficiently diverse
- More progress in primary market than secondary market. Marked disparity in market depth – but lower turnover ratios and wider bid offer spreads in EMEs
  - Domination of banks
  - Too many small issues
  - Unresolved asset valuation questions

* This and next slide borrows from "Developing the Domestic Government Debt Market: from Diagnostics to Reform Implementation" World Bank (2007)

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Some things have worked

- Internationalisation of market has helped small countries (Singapore, Taiwan)
  - Foreign banks increase competition
  - Offshore entities to hold an issue local currency bonds
  - Foreign investors can hold bonds locally
- More sophisticated primary market operations require active money market and effective cash management
  - Building benchmarks, effective primary dealers
  - Liability management operations
- Competition improves trading activity and liquidity
  - Facilitated by competition among dealers
  - Liquidity also improves when activity is consolidated in a small number of liquid instruments, transactions costs are minimized, market infrastructure is sound and robust, market participants have varying transactions needs and investment horizons

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Annex I: Government Bond Market - links to other Markets

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Government Bond Market links to other Markets

- Money Market
  - Repo and stock-lending - hedging instrument, enhances monetary policy implementation
  - Treasury bills – collateral in payment systems, risk free
- Corporate bond markets
  - Intermediaries can hedge
  - Yield curve is pricing reference
  - Establish level playing field with government
- Sub-national bond market
- Equity market
  - Corporate issuers
  - Range of investors
- Foreign currency market
  - Mixed retail/wholesale market; interacts directly with domestic money market
  - Influenced by capital controls, exchange rate policy etc
- Derivatives markets
  - Futures, forwards, swaps – other hedges
  - Repo and futures mutually supportive
  - OTC and exchange traded
  - Linked to bond, money and equity markets
  - Likely to need CPP – may need government encouragement

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Importance of Efficient Money Market

- Supports effective monetary policy & financial stability
- Promotes broader financial market development
- Key requirement for liquid capital markets, including bond market
  - Provides mechanism for funding positions
  - Supports active risk management by participants
- Supports debt management
  - Source of domestic short-term funding
  - Place to invest excess cash balances
  - Reduce risk of auction failure
  - Enhance investors' confidence, reduce liquidity risk premia

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Efficient Money Markets

- Move to market-based instruments for monetary policy
  - Reduce reliance on standing facilities
  - Enhance activity in inter-bank market
- Inter-bank market
  - Credit concerns
  - Anonymity: brokers can help
- Repo market
  - Removes credit concerns
  - Facilitates liquidity of government bond market
  - Ideal instrument for monetary policy operations
- Sound government cash and debt management
  - Good cash forecasting
  - Discourage central bank borrowing
  - Regular auctions of Treasury Bills

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Co-ordination with Monetary Policy

- Dangers in lack of co-ordination or failure to share information
- Allocate responsibilities:
  - MoF: fiscal deficit and its financing, including cash management
  - Central Bank: monetary control aimed at inflation via control of liquidity and interest rates
  - Central bank supplies services to MoF, inc fiscal agent
  - Joint: market infrastructure
- In time, achieve separation – greater clarity and avoids conflict of interest

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Monetary Policy Operations should support Debt Management

- Central Bank should keep required reserves close to that needed by the banking system
  - Helps develop interbank market; reduce interest rate volatility
  - Create incentives for banks to trade with each other
    - Avoid generous deposit facilities at central bank
    - Exempt interbank transactions from reserve requirements
- Using same instrument for Treasury's funding and Central Bank monetary policy operations can avoid market fragmentation – e.g. add-ons
- Timing and amounts of Government auctions should fit with bank's monetary policy operations
- Requires information sharing

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Resolving the Conflicts

- Enhance credibility of monetary policy
  - Independence of Central Bank
  - Supportive fiscal policies
- Move to a market based system
  - Stopping ad hoc borrowing by government from the bank and reducing control of bank financing
  - Developing an active money market
    - Developing a Treasury Bill or repo market that allows the Bank to conduct open market operations (OMOs)
  - Remove direct controls
  - Promote a strong and competent financial sector
  - Develop secondary trading market.

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Annex II: Instruments and Techniques

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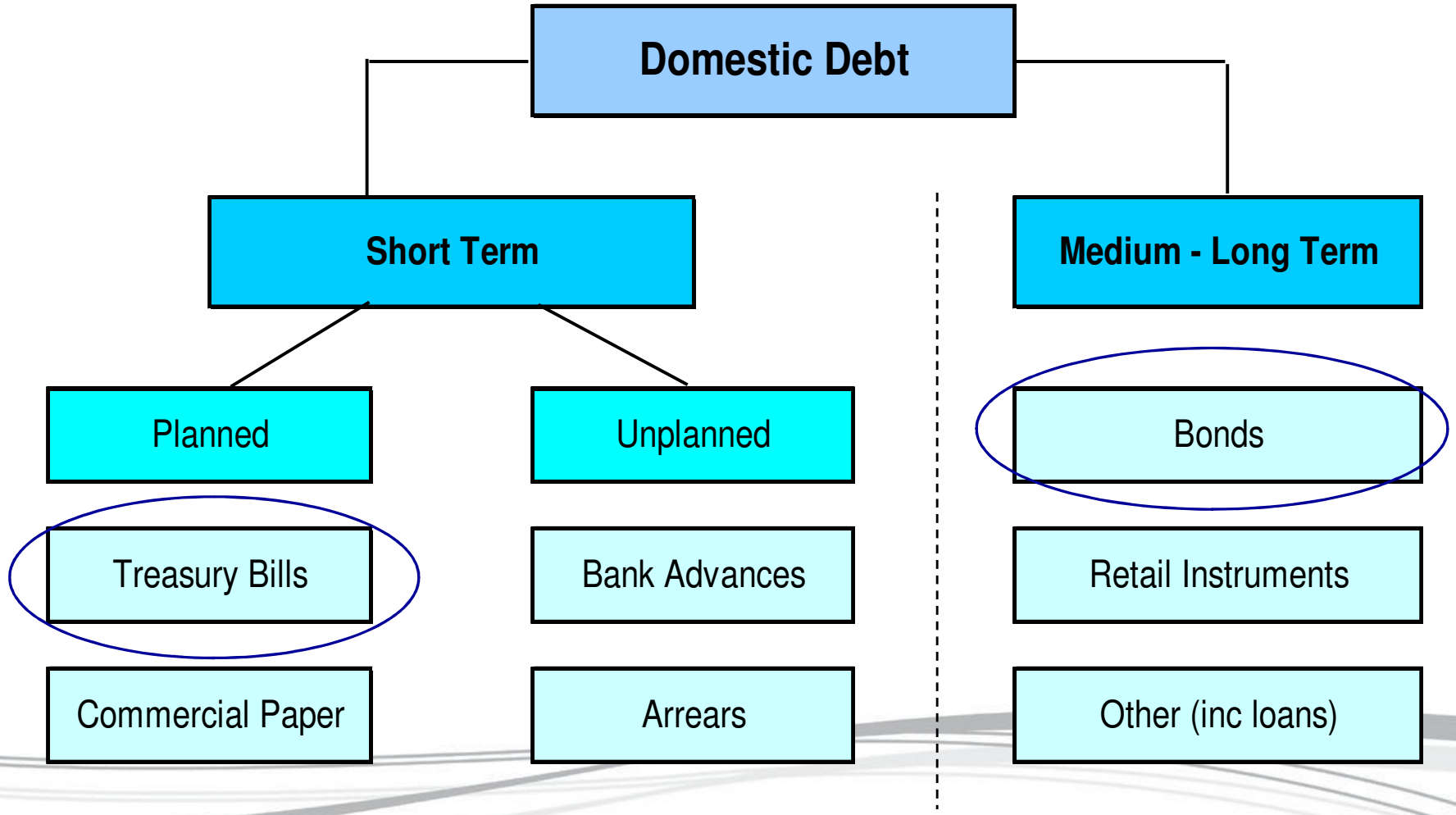
Debt Instruments – Categorisation



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Treasury Bills

- Short-term discount instruments (<1yr)
  - Issued at a discount with 1 payment at redemption
  - Yield to redemption

    = [(Par-Price)/Price]x[365*100/Days to maturity]
- Simple, tradable, useful at early stages of debt market
- NB TBills also instrument of monetary policy, and cash management
- But: need to be frequently rolled over
- Also "commercial bills", "bank bills" from other issuers

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Bond Types

- Fixed Rate – "Conventionals"
  - Short, medium or long-term
  - Long-term bonds hedge against supply shocks
    - Inflating away debt when output is falling
  - Investors demand risk premium
- Floating Rate
  - Short, medium or long term
  - Coupon reset every 3 or 6 months to a reference rate (e.g. LIBOR) plus margin
  - Popular with banks (for liquidity management, no capital risk)
  - Expose issuer to interest-rate risk (although floating rate => less liquidity risk)
  - Encourage debt management / monetary policy conflict
- Indexed-linked Bonds ("linkers")
  - Return determined by the performance of a specific index
    - Usually retail price index (CPI); but also e.g. GDP or commodities
    - Index typically applies to both coupon and principal

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Also consider…

- Bond design
  - Standard design
    - Enhances familiarity
    - Reduces costs – issuer and investor
  - Market conventions (Act/Act; coupon period)
- Benchmarks?
  - Reopen to build bond size
  - Must be identical (same ISIN) to ensure fungibility
  - Enhances liquidity in secondary market
  - But … increases roll-over risk
- "Preferred habitats"
  - Target investor preferences

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Price of Bond at Issue

$$P = \frac{c}{(1+r_1)^1} + \frac{c}{(1+r_2)^2} + \frac{c}{(1+r_3)^3} + \cdots + \frac{c+R}{(1+r_n)^n}$$

- Where:
  - P = 'dirty price' (ie including accrued interest)
  - c = annual coupon
  - r_i = % rate of return which is used in the i-th period to discount the cashflow (in this example, each period is one year)
  - R = redemption payment at time n

- Note negative relationship between price & interest rate

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Redemption Yield

- A redemption yield is that rate of interest at which the total discounted values of future payments of income and capital equate to its

$$P = \frac{c}{1+y} + \frac{c}{(1+y)^2} + \frac{c}{(1+y)^3} \cdots + \frac{c+R}{(1+y)^n}$$

Where
- P = dirty price (ie including accrued interest)
- c = coupon
- R = redemption payment
- n = no of periods
- y = redemption yield

Comparing bond market and money market yields

- Valuing a one-year security using bond conventions and money market conventions
  - The following formulae are used:-

$$P = \frac{c}{(1+r)^{t/365}}$$ Bond market convention

$$P = \frac{c}{\left(1+\frac{r \times t}{365}\right)}$$ Money market convention

Where P = price
c = cash flow
r = rate of return/discount rate
t = time (days)

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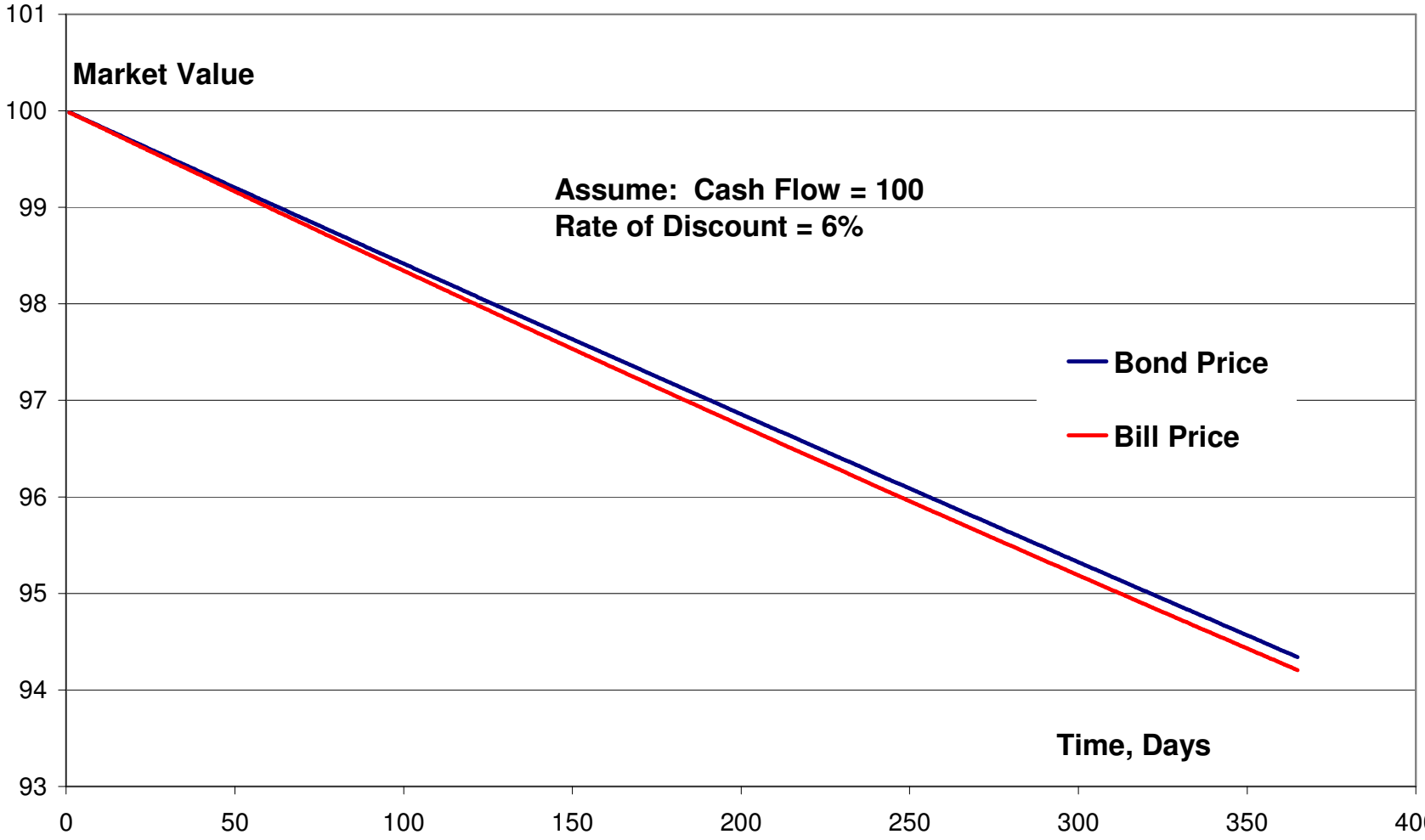
Valuing a Short-term Cashflow



Yield Curve

- Relationship between yield of a bond and time to maturity
- Yield to maturity is internal rate of return
  - Single value of y that satisfies: Price = $\sum C_t / (1 + y)^t$
- Yield curve can be constructed by:
  - Isolating individual cash flows within a bond – "bootstrapping"
  - Fitting curve to prices of bonds in market
  - See "The DMO's Yield Curve Model" (UKDMO 2000 on www.dmo.gov.uk/gilts/public/research/yldcrv.pdf)

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Bootstrapping

If we know the spot rate (r_1) of a one-year bond, then we can determine the two-year spot rate (r_2).

Using an existing two year bond:-

$$P_2 = \frac{c}{1+r_1} + \frac{c+R}{(1+r_2)^2}$$

As the other variables are known, r_2 can be calculated.

Then, r_3, the third period spot rate, can be found from looking at a 3 year bond:

$$P_3 = \frac{c}{1+r_1} + \frac{c}{(1+r_2)^2} + \frac{c+R}{(1+r_3)^3}$$

This process continues to obtain the zero coupon curve.

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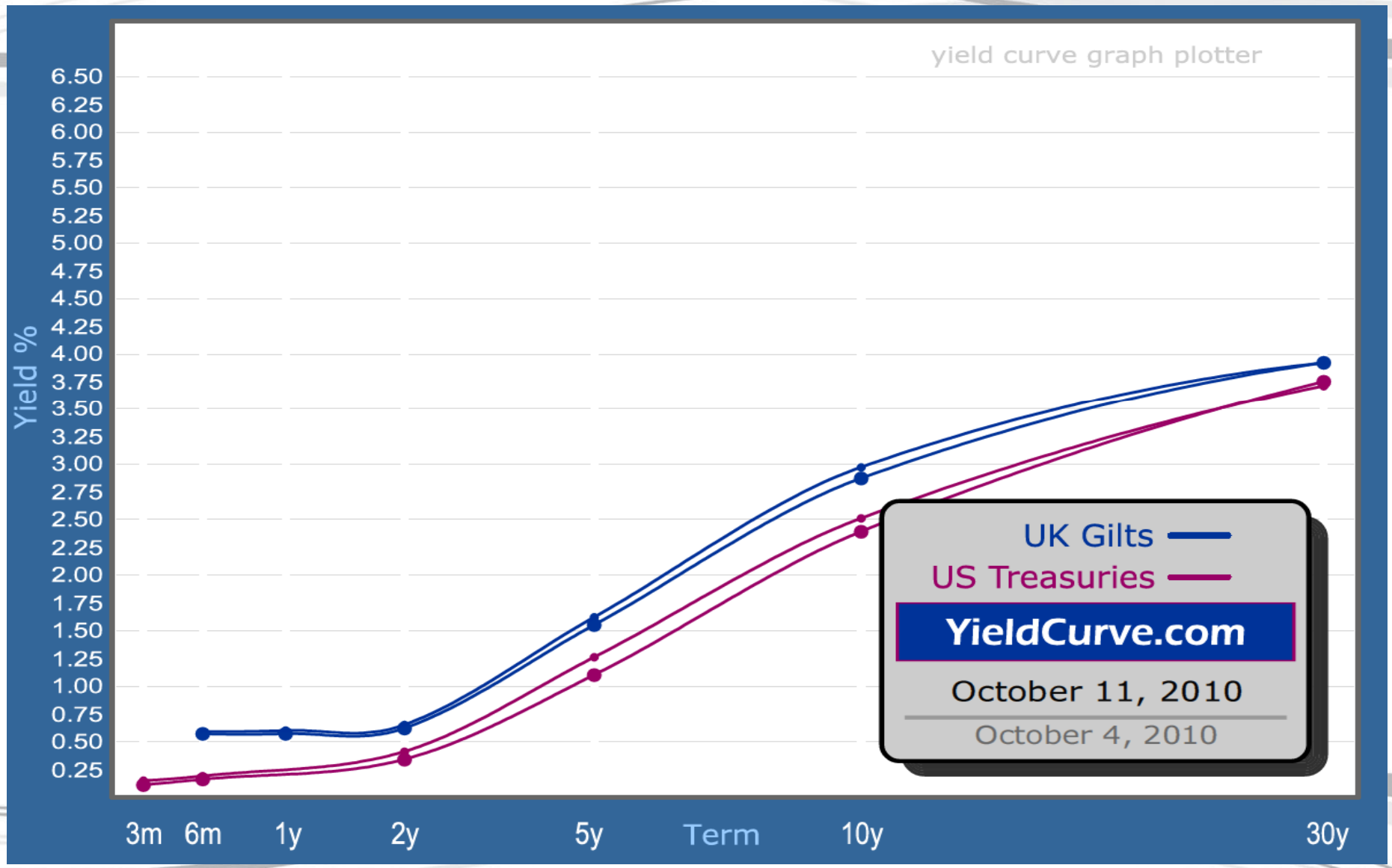
UK & US Zero-Coupon Yield Curves



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Shape of the Yield Curve

- Various theories to explain the shape of the curve
- Demand Side: investors' preferences or views.
  - **Liquidity Preference Theory:** risk premia increase with time => rising yield curve (other things equal)
  - **Pure Expectations Hypothesis:** forward rates govern the curve - simply expectations of future spot rates
  - **Segmented Markets Hypothesis:** depends on supply and demand in different sectors; each sector of only loosely connected to others
  - **Preferred Habitat:** investors have a maturity preference - will shift from their preferred maturity only for much higher yield
- Supply-based factors include:
  - Government policy: fiscal position, views on risk, portfolio objectives
- See: Joanna Place (2000) Basic Bond Analysis (Centre for Central Banking Studies, Bank of England, Handbook No 20)

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Using the Yield Curve

- Yield curve allows valuation of any bond
  - Coupon-paying bond is sum of value of individual payments – using the rates from the yield curve
  - Price = $\sum C_t / (1 + r_t)^t$ (including final repayment at maturity)
- Information about investors' demand
  - Normally upward sloping as investors' demand risk premium for longer dated bonds
    - Not in UK <= strong demand from pension funds
    - Developed countries' curves pulled down at short end as a result of financial crisis
  - Slope is key input into debt strategy analysis

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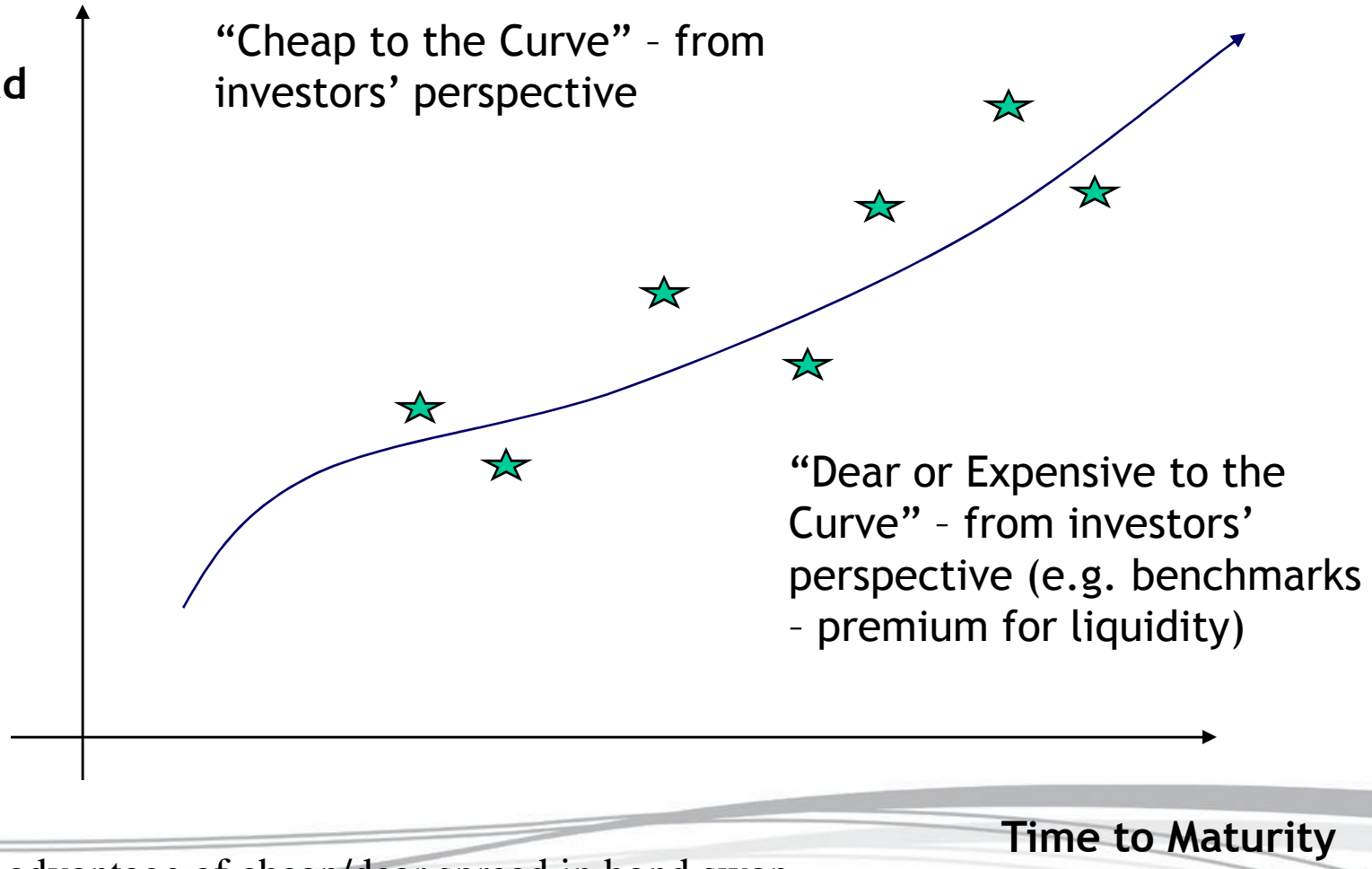
"Cheap-Dear" Analysis



Take advantage of cheap/dear spread in bond swap

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Indexed Bonds: Costs & Benefits

- Gain to government if inflation falls faster than expected
  - Should only issue when determined to control inflation
  - "sleeping policemen"
- Investors pay for inflation insurance – and may allow government to issue longer-date securities
- Provides measure of inflation expectations; and completes markets – allow real terms investments
- Hedge to revenue flows
- But
  - Index must be relevant and not open to manipulation
  - Tend to be less liquid

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Annex III: Borrowing by sub-National Governments and State-owned Enterprises (SOEs)

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Central Government needs Control

- Central government must have [some] control over sub-national tiers of government and SOEs
  - To manage aggregate economic size of government
    - Avoid increasing the tax burden
    - Reduce risk of crowding out
  - To reduce exposure to contingent liabilities
    - By provinces or cities over-extending themselves
    - By SOEs unable to service guaranteed loans
    - Costs of implicit liabilities can be very high
      - Moral hazard
      - Government pays twice – extra spread and bail-out
- Sub-national responsibilities often exceed resources

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Control Options

- **Centralised:** Finance sub-national tiers and SOEs by on-lending from central government
- **Decentralised:** Allow sub-national tiers and SOEs to borrow on own credit – with **no** guarantee from government
- **Intermediate options**: e.g. different treatment for:
  - Internal or external borrowing
  - Sub-national tiers and SOEs
  - Profitable and unprofitable SOEs
  - SOEs in competitive or monopolistic markets

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Control Mechanisms

- **Direct Controls:** Direct approval of individual loan or debt operations
- **Indirect controls:**
  - Allow flexibility within (legislative) constraints: e.g.
    - On size of total budgets
    - On subsidy from central government
    - On annual borrowing or total indebtedness
    - Relating borrowing or guarantees to revenue
    - Apportionment of debt limits
  - Levelling the playing field between borrowing from public or private sector (mark-up on government loans)
  - Selective use of guarantees

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Sub-national Bond Markets: Central Government Requirements

- Avoid risk of fragmentation
  - Manage auction timetable
  - Issue by placement
- Level the playing field – apply same regulatory regime as to private sector
- Reduce moral hazard: improved budgeting & transparency
- Avoid implicit liability
- Require central data collection
- [Control aggregate – depends on fiscal policy objectives]

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Sub-national Bond Markets: Benefits & Risks to Central Government

Potential Advantages

- Helps deepen capital markets
- Can tap different investment sources
  - Structured bonds
  - Project-related, non-recourse bonds
- Frees up central resources for regions that will not be able to access capital markets over the medium term

Potential Problems

- Fragments the market – adds to costs for both central and local government
  - Government can issue and on-lend

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Annex IV: Auction Format Multiple or Uniform Price – Some issues arising

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Auction Choices

- Bid by price (more usual) or yield (less unusual for bills)
- Several types of auctions:
  - Uniform price – securities allocated to highest bidders but at lowest price of a successful bidder ["Dutch" auction]
  - Bid-price (multiple price) each successful bidder pays the price it bids ["American" auction]
  - Hybrid (as in Spain)
  - Choice depends on:
    - Implications for participation
    - Information asymmetries, winner's curse
    - Risks of collusion
- More unusual
  - Open outcry (Mongolia)
  - Eastern Caribbean Currency Union: bids (not name of bidder) transparent to all bidders – allows bidder to improve offer to ensure purchases

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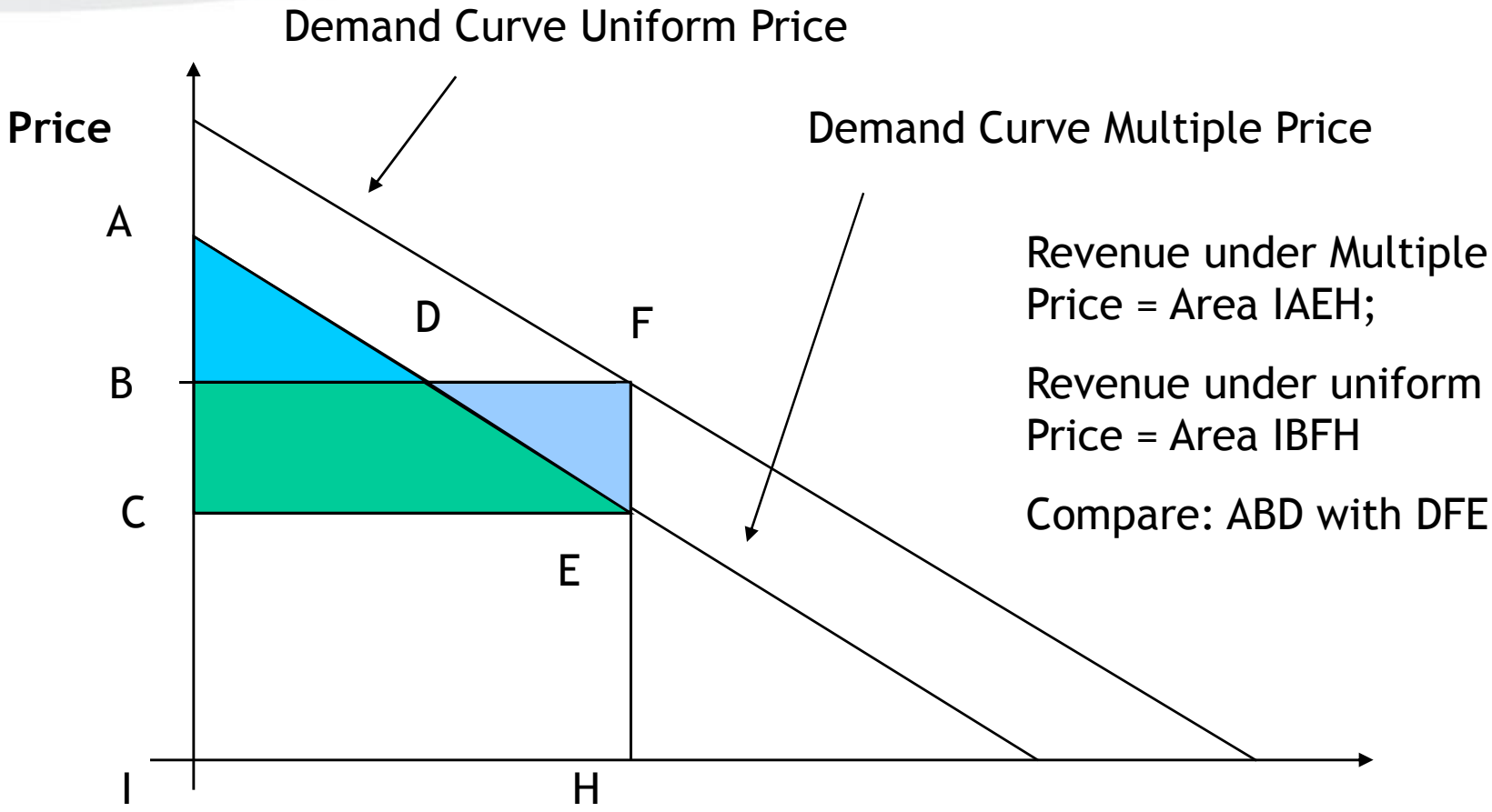
Uniform or Multiple Price Auction



Revenue under Multiple Price = Area IAEH;

Revenue under uniform Price = Area IBFH

Compare: ABD with DFE

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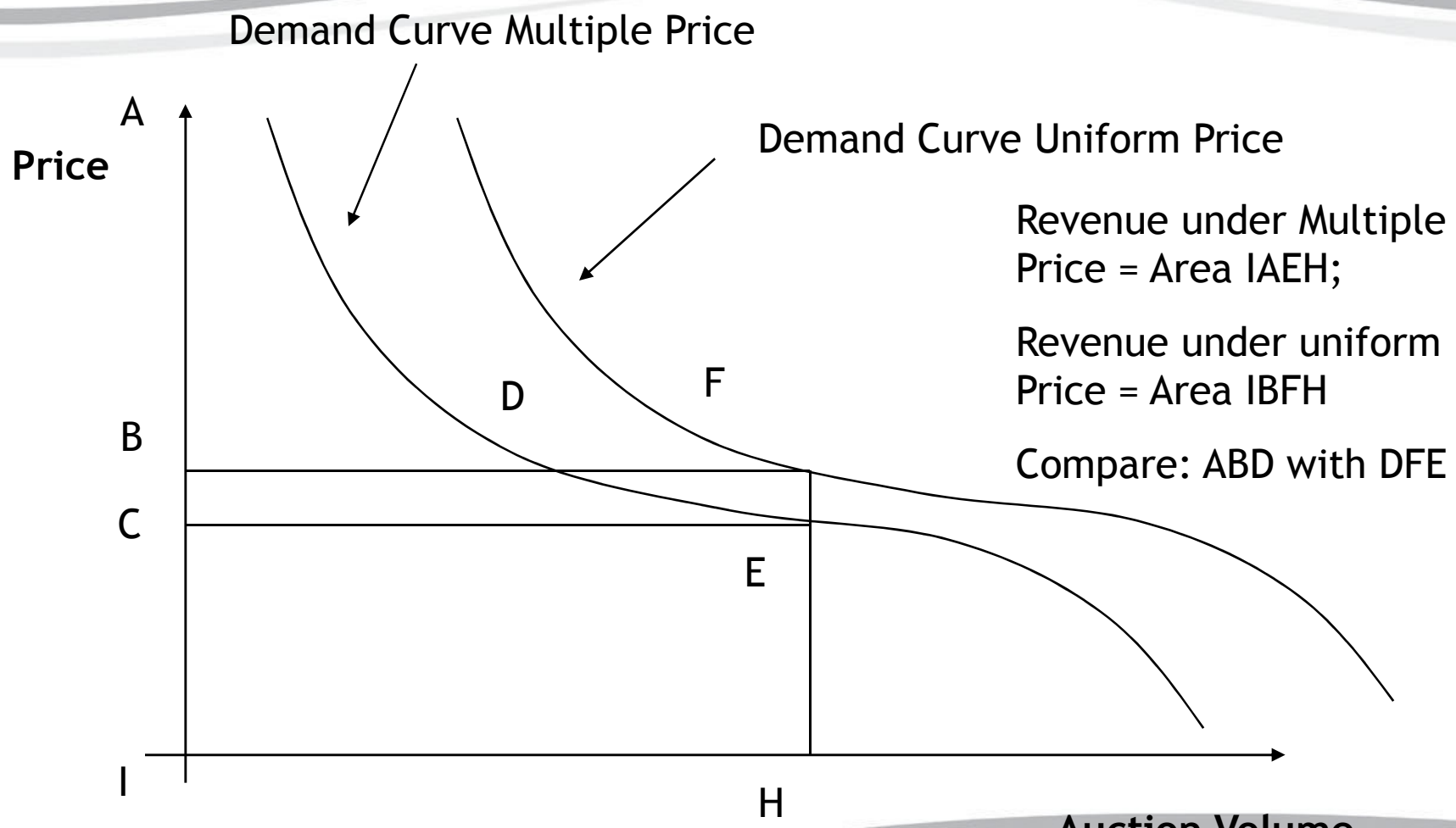
Uniform or Multiple Price Auction



Revenue under Multiple Price = Area IAEH;

Revenue under uniform Price = Area IBFH

Compare: ABD with DFE

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Advantages of Uniform Price

- Avoids "winner's curse"
  - Successful bidders in bid price auction pay above market clearing price; immediately have a mark to market loss
- Encourages a broader market
  - Less concern about inside information; reduces information costs
  - US Treasury move to uniform price to encourage wider participation
- Consistent with price signalling (e.g. central bank fixes auction price; and takes volume bids to drain)

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Disadvantages of Uniform Price

- Risk of greater volatility from auction to auction
  - particularly in thin markets or uncertainty about yield curve shape
  - clearing price may be set by single marginal bid which includes strong random component
  - problematic when policy signalling
- Encourages gaming
  - large participants bid high to ensure purchases, even though know they will not pay that
  - "bottom fishing"
- Risks of Collusion
  - cartel of intermediaries all benefit from low price

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Revealed Preference

- Treasury bill auctions tend to be multiple price
- Bonds also tend to be multiple price, especially in developed countries; but more variation
  - UK multiple price for conventional bonds and Treasury bills; uniform price for index-linked bonds
- In middle income and emerging market countries:
  - Multiple Price: China (bonds); India (1-year bills & bonds); Hong Kong; Malaysia; Brazil; Mexico; Czech Rep; Hungary; Poland; Israel; South Africa; Turkey; Kenya; Tanzania, CEMAC
  - Uniform price: China (discount securities); India (91-day bills); Singapore; Korea; Philippines; Chile; Colombia; Peru; Vietnam; ECCU

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Who Can Bid?

- Should a primary dealer group be give privileged access?
  - Potentially create interest and liquidity; and facilitate selling of government bonds
  - Need benefits as well as obligations – direct access to auctions is one of them; they then see market flows
  - But risks in appointing so soon
    - Market-making obligation unrealistic
    - May freeze developing market
    - How to avoid collusion? Some evidence that need at least 6. Uniform price may add to risks of collusion
  - Other choices
    - Same group for bonds and bills – often no group for bills
    - Same or different groups for bond/bill auctions and as OMO counterparties
- Other issues
  - Allowance for non-competitive or direct retail bids – common, subject to maximum

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Primary Dealers / Market-Makers / SVTs

Objectives

- Secure maximum participation in auctions
- Improve liquidity through market-making
- Develop financial market competition

Risks

- Creates an oligopoly - anti-competitive
- Collude against government – force auction prices down

Obligations

- Support auctions
- Make a market, inc to retail investors
- Provide information to MoF

Privileges

- Preferential access to auction
- Preferential access to central banks
- Other "sweeteners"

Conclusion: potential to contribute greatly to market development; but proceed carefully; and consider criteria

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