

# **Macroeconomics**

## *for Emerging East Asia*

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## 7. Finance

*A financial system channels funds from net savers to net spenders. But it does more than that, for the pie need not be fixed in size. Through its power of credit creation, the financial system can fuel economic expansion. The process is prone to fragility, however, and overshoot can end in crisis.*

The Great Financial Crisis of 2008 brought attention to the role of finance in macroeconomic fluctuations. The economics profession was caught off guard by such an event emanating from the US. Financial crises had come to be regarded as a malady of the developing world. In retrospect, the US financial system clearly succumbed to excess. But the clarity of that hindsight has not made foresight and prevention any more assured, in the US or elsewhere.

We begin this chapter by outlining the basic elements of a financial system, then go on to examine the dynamics of financial deepening and financial innovation. Through the course of this discussion, we develop notions of risk and consider mechanisms for dealing with it. We flesh out the concepts with an empirical overview of the economies of Emerging East Asia to reveal widely differing stages of financial development across the region. Hong Kong is featured for in depth discussion in view of its position as a globally important financial hub. Foundations laid, we develop the link between the financial system and the macroeconomy by explaining how the market for loanable funds determines a key macroeconomic price, the interest rate, and then delve into the implications of interest rate movements for asset valuation. We end with a brief statement foreshadowing later chapters on how the vital function of the financial system to support growth is prone to instability.

### A. Elements of a Financial System

The essential function of a financial system is to bridge the gap between those operating in surplus as net providers of funds and those operating in deficit as net users of funds. The efficiency of a system is judged by how well it allocates funds among competing uses to generate the highest return adjusted for risk. Risk is inherent in the financing of undertakings that incur costs up front in exchange for payoffs to be realized in the future. Will investment in a new business generate a profit? Will research in product development yield a breakthrough? Will pursuing a college degree lead to a good job? Will a public infrastructure project boost growth and expand a community's tax base to enable debt servicing? All such endeavors involve risk and uncertainty for both users and suppliers of funds. For those on the supply side, the risks are compounded by the difficulty of discerning the reliability of potential users of funds and the worthiness of their projects, and of monitoring those projects once they are underway.

A financial system embodies an array of mechanisms to contain and package risk to suit the varied characteristics and preferences of market participants. In this section we consider how the elements of a financial system are designed to handle risk at the micro level, reserving for the next section attention to risk at the macro, or systemic, level. Risk at the micro level pertains to individual parties, whereas at the systemic it extends to the economy as a whole. Financing

arrangements that appear to carry only moderate risk at the individual level may nonetheless combine to heighten systemic risk when the arrangements are pursued in sufficient numbers. For example, a home loan to an individual of low credit standing may not seem terribly risky in itself provided the lender has recourse to repossess the home and sell it to recover the loan amount. However, if a great many such loans are made and default occurs on a wide scale, property values can fall broadly such that the debts become unrecoverable collectively. Guarding against systemic risk of this sort is no easy task.

In categorizing the elements of a financial system, a basic distinction is made between financial intermediaries, which issue claims against themselves in order to provide funds to users, and financial markets, which facilitate the direct exchange of claims between suppliers of funds and users of funds. We discuss financial intermediaries and financial markets in turn.

### ***Financial Intermediaries***

Commercial banks are the quintessential financial intermediary. Their core business has traditionally involved taking deposits and making loans. By intermediating between lenders and borrowers, banks mitigate and spread risk. There are two forms of risk that banks specialize in managing. One is the adverse selection process that tends to make less creditworthy candidates more eager to seek loans. This is sometimes known as the “lemons” problem, taking terminology from the used car trade. Lemons refer to the defective vehicles that are particularly likely to end up on used car lots because their owners want to get rid of them. The problem arises in credit transactions due to asymmetric information between borrowers and lenders. Lenders generally do not know as much about borrowers as borrowers know about themselves regarding the likelihood of repayment. To overcome this problem, banks develop screening methods to assess creditworthiness and are able to apply these methods systematically across a large pool of prospective borrowers to select those of highest quality.

The other form of risk that banks are in a position to ameliorate is moral hazard. Borrowers are spending other people’s money and, left unsupervised, may not be as prudent as if the money were their own. Banks typically develop multi-faceted relationships with their clients, providing them with a range of financial services and keeping tabs on their affairs. This allows bankers to monitor their borrowers’ activity and enforce compliance with the terms of the loan.

Financial intermediaries that are similar to banks in taking deposits and making loans vary in specifics across countries reflecting diverse trajectories of coevolution between business organization and regulatory system. Institutions often develop to cater to niche markets. For example, credit unions serve a particular organizational clientele, such as a university, while rural credit cooperatives focus on providing credit to farmers.

For the protection of depositors – and in turn the economy broadly – banks are favored with government support in various guises but are at the same time subject to a high degree of regulation. Support takes the form of governments insuring bank deposits to ward off any sudden losses of confidence that would tend to be self-fulfilling if depositors in large numbers sought withdrawals simultaneously. Further, central banks stand ready to act as lenders of last resort to commercial banks should they become stressed for liquidity in meeting the demand for withdrawals. In turn, banks are subject to prudential regulation to contain risk. Specifically, they are required to hold reserves against customer deposits and to maintain capital (owners’ equity)

at a prescribed threshold relative to assets. In addition, banks must meet extensive disclosure requirements. The upshot is that holding wealth in the form of bank deposits carries very little risk, but commensurately, yields relatively low returns.

Types of financial intermediaries that do not rely on deposit taking, known as fiduciaries, include mutual funds, pension funds, hedge funds, private equity funds, insurance companies, and finance companies. This is the realm of “shadow banking”, broadly conceived. The Financial Stability Board, an intergovernmental body housed at the Bank for International Settlements, defines shadow banking as “credit intermediation involving entities and activities outside the regular banking system.” The nature of such entities and how their activities can contribute to the build up of systemic risk will be fleshed out in the next section which deals with financial innovation.

The various non-deposit-taking intermediaries are differentiated by the forms of assets and liabilities they hold. Assorted types of investment funds obtain resources from shareholders for the purchase of asset types that differ by risk and expected return. Specifically, mutual funds and pension funds invest mainly in tradable securities of the sort described in the next sub-section. Hedge funds, in original concept, were meant to pursue investment strategies that would result in gains whether securities markets rose or fell, meaning they could hold short positions (commitments to sell or repay instruments they do not own). As the construct has evolved, however, hedge funds have turned to supporting all manner of bets on market outcomes. These funds are highly leveraged (indebted) and lightly regulated, but impose investment thresholds that limit access to high net worth individuals who are presumed able to assess and tolerate the risks involved. Private equity funds take full ownership of corporations with the intent of reorganizing them and selling at a profit, either as a whole or broken up into parts. Finance companies lend to certain kinds of borrowers or for certain kinds of purchases, for example, automobiles. Insurance companies obtain funds from policy holders who collect on condition of specific untoward contingencies.

Financial intermediaries contribute positively to the economy in a number of ways. They aggregate funds to spread risk and achieve economies of scale in investment. They mitigate risk by screening and monitoring borrowers. And they provide liquidity to their depositors, who may withdraw funds on short notice, even as they offer long-term credit to borrowers. Such liquidity transformation is possible because routine withdrawals and deposits occur in large numbers that tend to be offsetting, thereby allowing long-term loans to rest on a base of liquid funding that remains stable in the aggregate.

## **Financial Markets**

Financial markets place claims on users of funds directly into the hands of providers of funds without intermediation by banks or fiduciaries. These claims are broadly distinguished between equities (or stocks) and debt. Debt instruments with terms of less than one year trade on money markets. Bonds, which carry terms of a year or more, along with stocks trade on capital markets. Resting on these asset markets are markets in derivatives, which are instruments that derive their value from the assets, the purpose being to allow hedging against, or profiting from, risk. Finally, offshore markets offer trading of securities

Financial markets
• money market
• capital market
◦ stocks
◦ bonds
• derivatives market
• offshore market

denominated in foreign currencies to effectively move transactions beyond the reach of national government regulation.

Equities represent ownership shares in corporations. Shareholders are the residual claimants of corporate earnings after all debt obligations have been met. The price of a stock, in principle, reflects the present value of the expected stream of a company's future earnings. Given the uncertainties surrounding future earnings, stock prices tend to fluctuate a great deal, and stock ownership thus involves considerable risk.

Money market instruments include commercial paper, letters of credit, bank acceptances, and short-term government securities such as US treasury bills. Commercial paper is generally backed by a bank loan commitment which effectively guarantees the paper to the bearer thus shifting the risk of loss to the bank. Letters of credit and bank acceptances also involve bank commitments.

Bonds are referred to as "fixed income securities" since they generally pay interest at a fixed rate relative to the face value to be paid at maturity, although bonds with variable interest rates do exist. Bond holders face two types of risk: credit risk that the issuer of the bond will default; and market risk that prevailing interest rates will rise and prices of bonds outstanding will consequently fall to realign their values with the new higher yielding bonds available in the marketplace.

While investing in securities is inherently risky, government regulation aims at ensuring transparency and fairness. Issuers of stocks and bonds are required to follow standardized accounting procedures and to provide regular disclosure of financial data. For stocks, insider trading involving those with privileged access to information is prohibited. For bonds, private agencies evaluate risk and report ratings. The investing public is thus aided in assessing risk under rules of the game that level the playing field.

Derivatives offer a hedge against risk for holders of underlying assets or, in effect, a way to place bets on changes in asset values for those who do not hold the assets. Derivative contracts derive their value from that of other assets – stocks, bonds, loans, commodities, or foreign currencies. Swaps, options, and forwards are important types of derivatives. Interest rate swaps involve the exchange of interest obligations between two parties, a fixed rate commonly being swapped for a floating rate. Currency swaps involve an exchange of payment obligations across currencies. Options entitle the holder to buy (call option) or sell (put option) a given amount of a financial asset at a fixed price within some period of time. Forwards are more constrained, requiring the exchange of a given amount of a financial asset at a fixed price at a specified point in time. Normally with derivatives, the assets themselves are not transacted; rather, only the difference between the value of the asset at the contracted price and its realized market value changes hands. As investments, derivatives are highly risky since their value is extremely sensitive to market price fluctuations, although as hedges, this risk is structured to offset the risk of holding the underlying assets. In the Great Financial Crisis, losses on derivatives brought down major financial institutions.

Offshore markets operate in one country for securities denominated in the currency of another country. The practice took off with "Eurodollars" in the 1970s as accumulation of US dollars in the hands of oil exporting nations motivated a demand for investment opportunities

beyond the control of US regulatory and taxing authorities. Dollar bank deposits and dollar bonds held in Europe met this demand. The practice of offshoring banking and securities trading has proliferated to a variety of currencies and markets. The Hong Kong bond market, for example, shows listings as of October 2021 for: Malaysian petroleum company Petronas in US dollars; the Province of Ontario in Canadian dollars; and Hong Kong and Shanghai Banking Corporation in Singapore dollars.

Transactions in financial markets are facilitated by brokers and dealers under the umbrella of investment banking, also known as merchant banking. Dealers take ownership of assets temporarily on their own accounts while brokers manage the transfer of assets between other parties. By standing ready to buy or sell at announced bid/ask prices, dealers, also known as market makers, help to supply liquidity to markets. A vital function of investment banks is the launch of new corporate share issues. Investment banks underwrite the new shares, purchasing them on their own account, then selling them through their client networks to raise funds for corporate expansion. For a company selling shares to the public for the first time, the issuance is known as an initial public offering (IPO). Established public companies may also issue new shares to raise capital. Once issued, public shares trade on secondary markets.

## B. Financial Deepening and Innovation

In the course of economic development, financial systems grow in size relative to GDP and become more complex. Up to a point, this secular process of financial deepening is a positive force. Evidence suggests, however, that the beneficial effects reach a plateau, and moreover, that excessively rapid growth in credit can be destabilizing. Episodes of very rapid credit growth can spring from innovations in financial products or organizational forms. That such innovations have overshot their usefulness is too often revealed only in the aftermath. In this section, we take up the topics of financial deepening and financial innovation, then apply the concepts to interpreting the credit boom in the US that led to the Great Financial Crisis.

### *Financial Deepening*

In the early stages of economic development, saving and investment rates are typically low, with the mobilization of saving for investment purposes taking place largely through internal or informal means. Small business investment and major household purchases are generally funded by family and friends or by local money lenders. Bigger businesses may have access to bank credit, but still tend to rely heavily on retained earnings to support expansion.

As economic development takes off, national saving rates rise while at the same time production becomes more capital intensive creating a need for greater concentration of funds. The resulting opportunities for financial intermediation between savers and investors stimulate growth of the banking industry. For businesses to grow larger still and for savers to reap higher returns in conjunction with taking on more risk, direct forms of financing via capital markets must come into play. Capital market development requires significant advances in legal and regulatory capacity to ensure investor protections and foster competition. This involves structures for enforcing contracts and property rights, for implementing accounting and disclosure standards, and for promoting effective corporate governance. In many emerging market economies, stock markets have been jump started by share issuance of state enterprises.

Similarly, bond markets have been launched through government debt offerings. Thus kindled, these formative capital markets in time come into their own to take on mobilization of funds for private sector investment. The ultimate in financial maturity is marked by the emergence of derivatives markets for hedging risk.

At its best, a financial system serves economic development by allocating funds to their highest valued uses adjusted for risk. It does this by aggregating diffuse savings to support large projects and broaden risk sharing; by affording borrowers access to long-term funding while preserving liquidity to lenders through short-term deposits and active secondary markets in securities; by identifying and packaging risk, and subjecting it to market pricing and exchange; and by providing oversight of managerial performance and exposing laxity. These many benefits of a strong financial system notwithstanding, empirical work indicates that a positive correlation between financial depth and economic development exists only to a point. Beyond some threshold, further financial deepening fails to yield discernible increments to growth. Explanations proposed for a disappearing or even negative relationship are that a bloated financial sector may divert resources, especially human talent, from more productive uses, and that taken to excess, financing becomes fragile and inclined toward feeding speculation rather than supporting productive investment.

The concern that financial depth leads to increased speculative activity and thus macroeconomic fragility is not supported empirically, however. Indeed, to the contrary, the evidence suggests that greater financial depth affords more resilience and better capacity for shock absorption. Simple bank dominated systems in less developed countries have a storied history of susceptibility to crisis. Nevertheless, complex financial systems in advanced countries can spill into crisis as well, the US offering a notable example in 2008. Rather than the level of depth, the rapidity with which credit expands seems to be the more telling predictor of instability. Rapid expansion of credit often follows from innovations in financial instruments or financial organization. Let us proceed to explore the nature of financial innovation, with particular attention to the origins of the Great Financial Crisis.

### ***Financial Innovation***

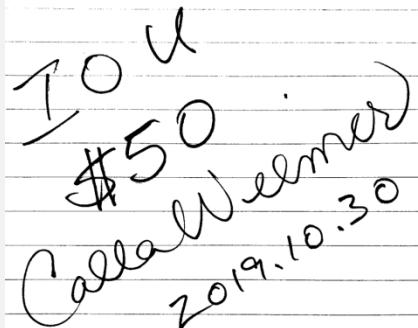
Recall from Chapter 6 that money, in effect, represents claims on an economy. Creating money seems easy enough. Central banks do it by issuing liabilities against themselves in exchange for government debt securities or other assets. Commercial banks do it by recording deposits in support of new lending. In principle, the capacity to create money is even broader than this. As Hyman Minsky put it, “Everyone can create money ....” How that is so is described in Box 7.1.

### Box 7.1: “Everyone can create money ...”

The quote in the header is from Hyman Minsky, known for his work on business cycles. In full it reads:

*Everyone can create money; the problem is to get it accepted.*

Minsky (2008), p. 255.



Here's how it works: Suppose the author of this text writes an IOU (I owe you) as depicted at left. Perhaps the payee has lent \$50 in cash to the author or maybe he has rendered some service to be met with delayed compensation. This IOU note captures what Minsky means by creating money. The problem getting such a thing accepted is obvious. Even if Wiemer's credit is good with the original payee, for that individual to find someone else who will likewise accept this note as payment will not be easy.

In principle, the inking of this note is no different than what a bank does when it creates money. In granting a loan, the bank issues debt (an IOU) in the form of a deposit liability. This deposit can then be spent – through the writing of a check or the use of a debit card – moving on to become someone else's deposit at some other bank. The money supply would expand in the same way if Wiemer's IOU were to pass from hand to hand in support of purchases.

Money issued as debt of the banking system supports spending. Banks grow their business by increasing the amount of this debt in tandem with corresponding loan assets. For the economy as a whole, however, excessive infusions of debt-fueled purchasing power can be inflationary, as explained in Chapter 6. When channeled into asset markets, increases in purchasing power can give rise to bubbles, sowing the seeds of later collapse. Governments therefore impose regulations to limit growth in the financial sector's balance sheet. Inevitably, however, entrepreneurial financiers devise ways around such regulation with new and creative ways to expand bank lending. Box 7.2 demonstrates how the process can work.

The loan securitization process described in Box 7.2 increases credit in the economy in circumvention of the power of the central bank to control the amount of deposit money. This new credit supports growth in spending. The increase in credit is associated with an increase in debt of a short-term, highly liquid nature even as the lending it supports may be long term. The commercial paper issued by the shadow banks is indeed so liquid that it is included in broad definitions of the money supply. Expansion of the financial sector balance sheet in this way has a stimulatory effect on the economy.

### Box 7.2: Securitization – Liquidity is generated, debt is piled on

Commercial banks generate revenue by charging interest on loans. The more they lend, the better for their business (provided of course the loans are repaid on time). Bank lending is constrained, however, by regulation requiring that reserves be held against deposits and that capital be held against assets. Banks naturally look for ways around these impediments to “making money”. One ploy is to securitize loans and move them off bank balances sheets with the aid of the shadow banking system. The process is outlined in the T-accounts below.

<b>COMMERCIAL BANK</b>		<b>SHADOW BANK</b>	
<b>Round 1</b>		<b>Round 1</b>	
Assets	Liabilities	Assets	Liabilities
Loans	120	Deposits	180
Reserves	30		
Other	50	Capital	20
<b>Round 2</b>		<b>Round 2</b>	
Loans	20	Deposits	180
Reserves	130		
Other	50	Capital	20
Off Balance Sheet Vehicle			
Loans	100	Securities	100
<b>Round 3</b>		<b>Round 3</b>	
Loans	120	Deposits	180
Reserves	30		
Other	50	Capital	20
Off Balance Sheet Vehicle			
Loans	100	Securities	100

In Round 1 the commercial bank holds capital at 10 percent of assets, and reserves at about 17 percent of deposits. Let us suppose these ratios are pressing up against regulatory limits.

In Round 2, the commercial bank finds a way to unleash new lending potential. It bundles together \$100 in loans and sells claims on the income streams from the loans in the form of tradable securities. Since the new holders of these asset-backed securities bear the risk exposure to the loans, and bank owners and depositors do not, the bank is able to move the package of loans and securities into a special purpose vehicle off its balance sheet. The asset backed securities are purchased by a shadow bank providing the commercial bank with a \$100 increment to its reserves. To obtain the necessary funds to make the purchase, the shadow bank is established with \$10 in capital and issues \$90 in commercial paper.

Finally in Round 3, the commercial bank lends out the \$100 it raised by selling securities in Round 2. Since this brings it back up against its lending limit, the bank may wish to repeat the securitization exercise all over again.

To sum up the results: the financial system expanded with the establishment of a shadow bank and a special purpose vehicle off the balance sheet of the commercial bank; liquidity increased through the transformation of illiquid loans into tradable securities; and the overall level of debt rose through multiple channels involving asset-backed securities, commercial paper, and new loans. All this occurred despite regulation on bank reserves intended to keep lending in check.

Historically, entrepreneurs have proven adept at devising all manner of new methods for expanding the financial sector balance sheet. Important innovations in this spirit that have become established elements of today's financial landscape include checking accounts, credit cards, and mutual funds. Regulatory authorities strive to keep pace with new developments. The trick is to facilitate financial innovation that is supportive of economic growth yet to impose enough restraint on the process to prevent asset bubbles from inflating and unsustainable debt loads from accumulating.

### ***US Credit Boom of the 2000s***

The US credit boom of the 2000s had its basis in the model of Box 7.2 – securitization of loans supported by a shadow banking system that was itself funded by short term debt. Securitization of loans per se was nothing new. The basic concept is that income streams, most notably in the form of interest paid on loans (with other possibilities ranging from real property rents to credit card receivables to student loan repayments) are bundled and used as collateral to back the issue of tradable debt instruments. The innovation of the 2000s started from the premise that even in a high risk bundle of loans, not all would go bad even if all the borrowers as individuals were poor credit risks. Mortgage backed securities were structured into tranches such that the bottom tranche would be exposed to losses from default first while the top tranche would bear exposure only if the entire pool fell into default. The top tranches were granted high AAA ratings and were much in demand. The less desired lower tranches were submitted to a further round of bundling and structuring with the top tranches again emerging as AAA rated products. In this way, mortgage loans made to borrowers of poor "subprime" credit standing were transformed into ostensibly low risk investment vehicles.

The delusion the marketplace succumbed to was that complicated financial products had diversified risk and transferred it to willing bearers for a higher expected return. In fact, however, all sight of risk had been lost in an opaque piling on of complicated debt instruments. The forgotten reality was that subprime mortgages were widely configured for interest rate resets that would hit fragile borrowers in a nationwide wave. Meanwhile, property values had been bid up to unsustainable levels which stimulated an oversupply of new construction. Collapse was in the cards. By 2007, hedge funds and investment banks were taking sizeable losses on subprime mortgage securities as mortgage debt went into default. The bankruptcy of investment bank Lehman Brothers in September 2008 sent the financial sector into full-on panic. The next year would see a series of financial giants fail or succumb to acquisition. All told, bank losses in the US are estimated by the IMF to have reached \$855 billion with total global losses put at \$2.28 trillion.

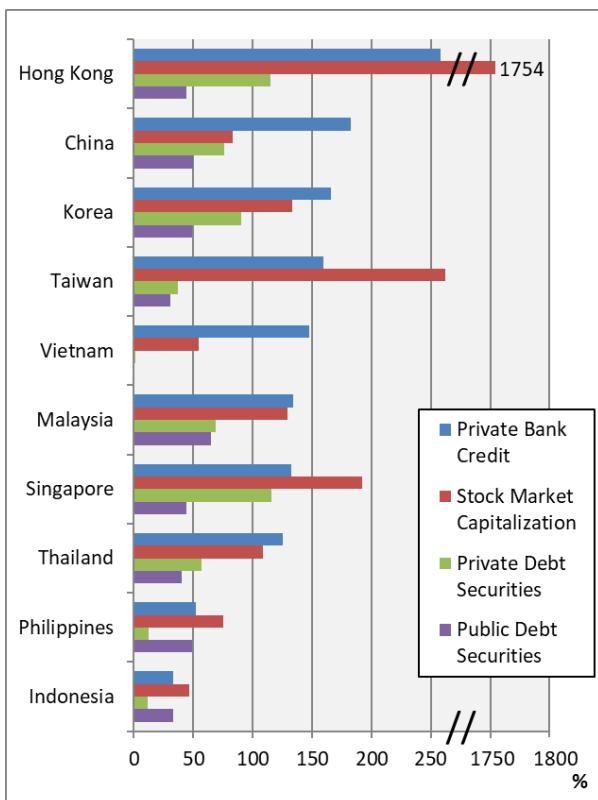
## **C. Finance in Emerging East Asia**

Variation among the economies of Emerging East Asia is nowhere more stark than in the realm of finance. Hong Kong is home to the highest ratio of financial assets to GDP in the world while in the least developed economies of the region banking systems are rudimentary and capital markets little more than an idea. In this section we compare measures of financial sector development and performance and consider the implications. With respect to standard indicators of depth, liquidity, volatility, and fragility, the range of outcomes runs the gamut.

## Depth

The Asian Financial Crisis of 1997 sounded a warning on the pressing need for local capital market development. In the run up to the crisis, domestic saving had been diverted outward through both official reserve accumulation and private acquisition of foreign assets. Meanwhile capital flowed inward in the form of foreign direct investment and loans, the latter being mostly short term yet applied to the funding of long-term projects. This resulted in a double mismatch on domestic corporate balance sheets: long-term, illiquid assets against short-term liabilities in need of constant rollover; and domestic currency assets against foreign currency liabilities. When local currencies depreciated sharply, many borrowers found themselves unable to pay back or refinance their debts. The conclusion drawn from the crisis was that domestic capital markets were needed to provide better local investment opportunities for savers and to generate long-term domestic currency funding for capital formation.

**Chart 7.1 Financial Asset-to-GDP Ratios, Select Economies, 2020**



market capitalization figures overstate the role of the stock market in raising capital for investment. At over 1700 percent, Hong Kong's ratio of stock market capitalization to GDP speaks to its role as a financial center for China. Taiwan's stock market, too, bears Mainland Chinese influence with major listed firms (TSEC, Acer, ASUS) basing their manufacturing operations across the straits, and Singapore as well serves a broader hinterland. Ratios around 110-130 percent for Korea, Malaysia, and Thailand indicate well developed stock markets serving domestic corporations.

From a small base, capital markets have developed impressively since the crisis in much of Emerging East Asia, although bank finance still predominates in Cambodia, Laos, Myanmar, and Vietnam. Chart 7.1 presents asset to GDP ratios in 2020 for four asset categories: private bank credit; stock market capitalization; private debt securities; and public debt securities. Debt securities include both local and foreign currency issues.

The ratio of private bank credit to GDP lies in a fairly tight range of 125 to 180 percent for Thailand, Singapore, Malaysia, Vietnam, Taiwan, Korea, and China. For Hong Kong the ratio lies well above this band while for the Philippines and Indonesia, it is somewhat lower.

Stock market capitalizations (total market value of all shares) in Emerging East Asia have received a major boost from the listing of state-owned enterprises. Given the high degree of market capitalization accounted for not just by state shares sold to the public but also by shares still held by the state,

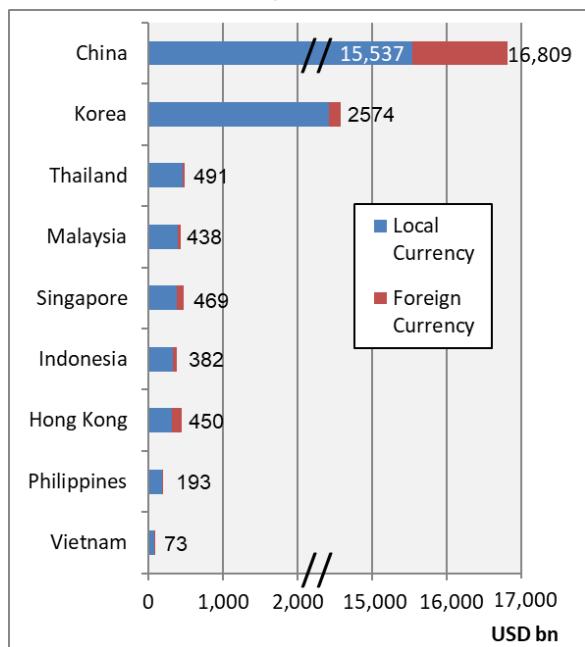
Ratios of private debt securities to GDP lie in the range of about 60 to 120 percent for Hong Kong, China, Korea, Singapore, Malaysia, and Thailand, and fall well below this level for Taiwan, the Philippines, and Indonesia while for Vietnam the ratio is minuscule. For public debt securities, the ratio to GDP is led by Malaysia at 64 percent with Hong Kong, China, Korea, Singapore, Thailand, and the Philippines following at 40-50 percent.

Although in broad terms financial deepening is readily seen to accompany economic development, the structure of financial systems varies greatly even among the world's most advanced economies. The US in 2020 had a ratio of private bank credit to GDP of only 52 percent in contrast to Japan's 122 percent and Britain's 94 percent. Conversely, the US ratio of stock market capitalization to GDP stood at 194 percent versus 149 percent for the UK and 71 percent for Japan. Europe and Japan in general rely more on bank financing, the US more on capital markets. Many factors influence these outcomes, important among them regulatory environment and tax provisions. Over time, though, a common trend is apparent for a broad cross section of economies in an expanding role for capital markets relative to bank finance. This is a result of stock and bond markets becoming increasingly accessible to savers, both directly and through fiduciaries, to offer the liquidity of banks but with higher expected returns for those prepared to bear the risk.

### *Liquidity*

Liquidity is vital for effective functioning of financial markets. Without active trading, meaningful asset prices cannot be arrived at. In debt markets, pricing involves the determination of interest rates and the assessment of risk. In equity markets, pricing is a vital tool of corporate governance, serving as a mechanism to assess manager performance.

**Chart 7.2 Bonds Outstanding, Select Economies, 2020**



The size and liquidity of an asset pool tend to be related. More liquid assets attract more investors because the assets can be readily converted back to cash, and consequently the asset pool grows. In turn, the bigger an asset pool and the greater the number of investors, the more transactions tend to be generated. A greater volume of transactions lowers transactions costs. In debt markets this results in lower spreads between the interest rate paid by borrowers and that received by lenders. The importance of scale economies in financial markets is evident from the high degree of concentration of assets among a small number of global financial centers.

Securities markets in Emerging East Asia remain generally small in size by global standards, which inhibits liquidity. The value of bonds outstanding for the region's economies in both local and foreign currencies is shown in Chart 7.2. Because China's economy is so large, even a

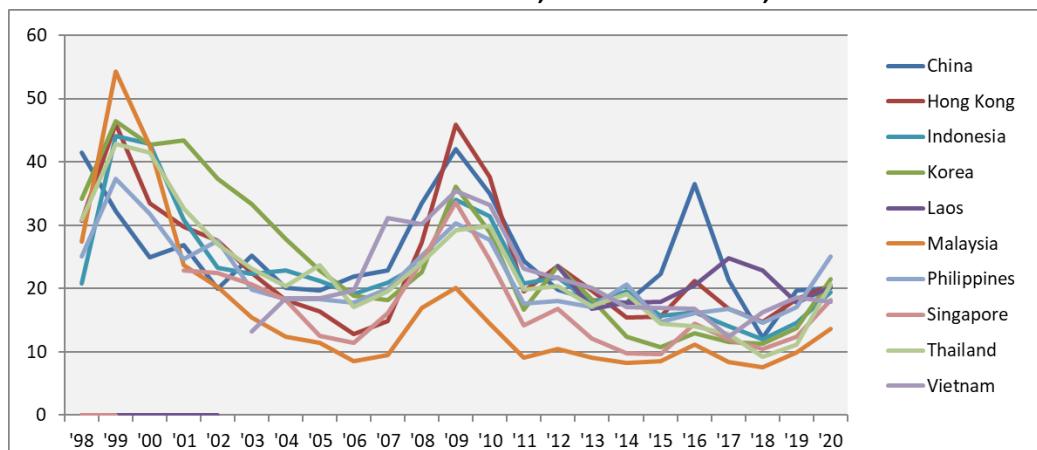
relatively small ratio of bonds to GDP implies a large asset pool, at nearly USD 17 trillion in 2020, of which renminbi denominated bonds amount to USD 15.5 trillion equivalent and US dollar denominated bonds account for the remaining 1.4 trillion. Korea is a distant second in bonds outstanding, with other economies positioned much further down at only a few hundred billion in US dollar equivalent.

A key indicator of liquidity is the turnover ratio, measured as transactions value during a given period of time relative to the stock of an asset. Equities exhibit turnover of close to two in the Chinese and Korean markets. This is on par with rates seen in mature financial markets, although equity turnover is prone to high variability from year to year with the numbers shooting up in times of stress. Equity turnover ratios are well below this level in other Asian markets. Markets for government bonds are generally more liquid than those for corporate bonds. For benchmarking purposes, it is worth noting that annual turnover for US corporate bonds stands around one and for US treasury bonds reaches a very liquid 30. In the Emerging East Asia setting, bonds are more often bought and held to maturity which depresses liquidity.

### ***Volatility & Fragility***

Stock prices are closely monitored in real time as the readiest barometer of economic sentiment. In troubled times, stock markets can become highly volatile reflecting increased uncertainty about the future. Chart 7.3 depicts market volatility as measured by the standard deviation of stock returns. The impact of the Great Financial Crisis comes through clearly with the spike in volatility in 2009. Hong Kong, with its openness to global capital, saw a particularly sharp increase in volatility, the standard deviation on returns rising from 17 in 2007 to peak at 47 in 2009. Further back in time, volatility during the Asian Financial Crisis was similarly high. A spike in volatility is evident for China in 2015-2016 in connection with a stock market boom and bust. At stake, characteristically for China, was not so much changing assessment of corporate fundamentals but skittish expectations about the long reach of government in influencing stock market behavior. Ripple effects from instability in China are visible across the region.

**Chart 7.3 Stock Return Standard Deviation, Select Economies, 1998-2020**



Stock market movement serves a function in registering economic shocks and communicating their consequences. Investors in equities understand that the greater risk associated with these fluctuations is tied to higher expected returns. Holders of bank deposits, on the other hand, need to feel secure in the knowledge their money is safe. A measure of fragility in the banking sector, known as the Z-score, is constructed as the sum of the return on assets plus the capitalization ratio divided by the standard deviation of the return on assets. A high capitalization ratio ensures owners bear the brunt of any losses in asset value thus shielding depositors. High returns and capitalization relative to volatility provide a buffer against shock. Malaysia has the highest score at over 30. China, Hong Kong, and Cambodia have scores over 20, with the Philippines and Singapore close to that mark. At the opposite end of the spectrum with the greatest risk in their banking systems are Myanmar, Thailand, and Indonesia. Z-scores in Emerging East Asia have shown fairly low volatility over time. Even the Great Financial Crisis caused no serious perturbations as the region's banks had little exposure to troubled US debt securities.

A diversified financial system presents a multiplicity of channels for absorbing shock. Provided diverse components of the system respond differently to various stressors, the overall effect of diversification is to increase resilience. The economies of Emerging East Asia bore the Great Financial Crisis through increased stock price volatility but no loss of security in their banking systems. A stable footing for banking facilitated recovery even as stock price fluctuations may have hindered the raising of equity capital. Under other circumstances, another kind of a shock could well have the opposite effect of destabilizing banking systems but leaving capital markets functioning effectively to support economic activity.

## D. The Special Case of Hong Kong

Hong Kong is unique in having its own currency and its own customs and immigration authorities despite being a city subsumed under a sovereign state. It functions as a distinct economy even as it interacts symbiotically with Mainland China. While Hong Kong has long served as an international financial hub, its capital markets exploded after the handover to the People's Republic in 1997. Between then and 2020, the number of listed companies on the Hong Kong Stock Exchange rose from 658 to 2,538. Bond listings took off later, rising from just 69 in 2010 to 1,574 in 2020.

In this section, we first look at Hong Kong's monetary institutions and their tailoring to the territory's distinctive circumstances. We then expand on the territory's role as a global financial hub and more particularly a platform for the internationalization of the renminbi.

### *Hong Kong Monetary Institutions*

Hong Kong's monetary system rests on an exchange rate peg. The peg at HK\$7.8 to the US dollar was established in 1983 to halt a downward spiral in the value of the Hong Kong currency precipitated by concerns about Hong Kong's future upon the expiry of the British lease on the New Territories. The fixing was intended to restore confidence, and succeeded in doing so. Hong Kong has stood by its peg through the handover to Chinese sovereignty, the swirling of financial crises, and much currency volatility in the region at large, with the credibility of the peg consequently well established.

With discretion removed from currency issuance, responsibility for this function is delegated to commercial banks. To issue Hong Kong dollar notes, the authorized banks must submit US dollars to the Exchange Fund of the monetary authority for which they obtain “Certificates of Indebtedness” that serve as backing for currency issuance. Conversely, to redeem US dollars banks must relinquish the Certificates of Indebtedness back to the monetary authority. In this way, the Hong Kong monetary base is entirely backed by US dollars.

This system has the advantage of being free of the intrusion of politics into monetary affairs. The Hong Kong money supply expands or contracts in response to market forces. The process is simple, transparent, and predictable, at least insofar as market forces themselves are so. A further advantage is that exchange rate risk is eliminated vis-à-vis the US dollar. Trade in goods and services and the transfer of financial claims can thus proceed without worry about exchange rate fluctuations with regard to the world’s foremost reserve currency.

The main disadvantage of the peg is that exchange rate adjustment cannot serve as a buffer in absorbing shock. Shocks may occur, for example, in the form of movement in the US dollar relative to other currencies, fluctuations in world commodity prices, or changes in US interest rates. Adjustment must take place through domestic prices, extending to wages, interest rates, and asset values as well as product prices. Hong Kong’s highly agile market economy generally allows for fairly quick and effective responses to maintain competitiveness. And the strong position of government fiscal affairs means repercussions for public debt are not a concern. Yet in times of broad based and steep depreciation in regional currencies, such as occurred during the Asian Financial Crisis, the burden to absorb economic adjustment without recourse to the exchange rate has been hard to bear. Nevertheless, the commitment to the peg has held.

### ***Hong Kong As a Global Financial Hub***

Hong Kong is an entrepot for finance just as it is for trade in goods and services. Financial institutions from all over the world set up shop in the territory with minimal barriers to entry. Banks take deposits and make loans not only in Hong Kong dollars but in other currencies as well, serving customers from near and far. Foreign companies list on the Hong Kong stock exchange, raising funds from investors worldwide. Business thrives in the managing of wealth for global private clients and the raising of venture capital for far-flung start-up firms. In 2019, Hong Kong’s foreign exchange market turnover ranked fourth globally, behind the UK and the US, and essentially tied with Singapore.

Referring to Chart 7.1, the asset class in which Hong Kong stands out most dramatically is equities. Early in the reform and opening of Mainland China in the 1980s, state enterprises began to tap funding indirectly in Hong Kong dollars. So-called “red chip” stocks were issued by firms incorporated in Hong Kong but with controlling share ownership tracing to the Mainland. Later on, firms incorporated on the Mainland began listing “H-shares” in Hong Kong, the first instance of this occurring with Tsingtao Brewery in 1993. Typically H-share listings involve parallel listings on Mainland exchanges in “A-shares” that are denominated in renminbi.

Historically, the debt market figured little in Hong Kong finance. An important reason for this is that the strong fiscal position of the Hong Kong government left it with no need to borrow. And without active trading in government debt, the market lacked benchmark interest rates to

signal a baseline low-risk cost of funds. To fill this void, the Hong Kong Exchange Fund initiated an aggressive program of debt issuance beginning in 2009. The Exchange Fund bills and notes sold under the program present a range of maturities from three months to 10 years in order to generate a yield curve for market reference. Once the public debt market was established, growth in the corporate debt market accelerated. This market includes issuance of renminbi denominated bonds, known as “dim sum” bonds, the first being issued by McDonald’s in 2010.

Banks in Hong Kong began taking retail deposits in renminbi as early as 2003. However, not until cross-border settlement of payments was established in 2010 did holding renminbi deposits find wide appeal. The banking and bond developments of 2010 set the renminbi on a path to internationalization even as capital controls continued to limit the currency’s flow across the Mainland border and to restrict access by foreign investors to markets onshore. China’s trade has increasingly been invoiced in renminbi, with Hong Kong meeting related demand for payment processing and credit.

Even as the Mainland has driven growth in Hong Kong’s financial markets, its own onshore markets have overtaken those of Hong Kong in absolute terms. Indeed, by the end of 2020, the combined market capitalization of the Shanghai and Shenzhen exchanges was double that of the Hong Kong exchange. As for bond markets, Hong Kong’s is minuscule relative to China’s, as shown in Chart 7.2.

Against the backdrop of the Mainland’s own mammoth financial markets, the question of just how much China needs Hong Kong as a financial entrepot has drawn attention as the political ground has shifted. Editorials in western publications have argued that despite the size of the Mainland financial system, Hong Kong’s role remains vital, a headline in the *Wall Street Journal* reading “Hong Kong is the Lung through Which Chinese Banks Breathe” (11 September 2019). Critically, what Hong Kong has had that the Mainland lacks is the rule of law. This is the foundation for a system of property rights, dispute adjudication, and corporate governance that permits fluid financial engagement with the rest of the world.

## E. Interest Rates and Asset Prices

Financial systems channel funds from savers to spenders. Savers seek to earn a return on the funds they supply, with that return meant to be higher the greater the risk and the longer the time commitment. Thus, users of funds must be prepared to pay back more than they borrowed. Generally, then, borrowed funds are directed toward investment – in plant and equipment, in education, in research and development, in infrastructure, or in assets that will appreciate in value over time.

The interest rate represents the price that lenders receive and borrowers pay for funds. In this section we first consider how the interest rate is determined in the market for loanable funds. We then examine the relationship between the interest rate and asset prices.

### *Interest Rate Determination*

Macroeconomics routinely references “the” interest rate. “The” interest rate is pivotal for an economy due to its effect on investment and in turn GDP growth. The notion of a singular interest rate is an abstraction, of course, for in actuality, the market for loanable funds generates

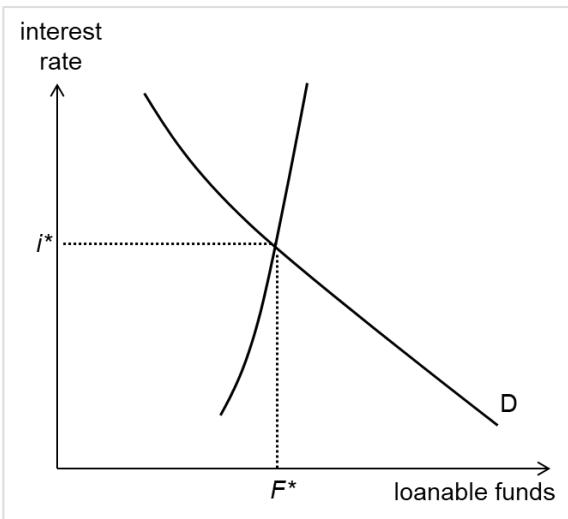
a wide spectrum of interest rates reflecting differences in risk and term to maturity. Nevertheless, in normal times interest rates as a whole tend to move in sync so that as an analytic construct “the” interest rate serves to capture the macroeconomic dynamic.

Analysis of the response of savers and investors to changes in the interest rate rest on a rate expressed in real terms, that is, the nominal rate minus the rate of inflation. In practice, loan contracts are generally specified in nominal terms with the real interest rate revealed after the fact once the inflation rate becomes known. If inflation surprises on the high side, the real interest rate ex post will be lower than was anticipated ex ante, and vice versa. When inflation accelerates unexpectedly, the real interest rate can turn negative if the nominal rate has been set low enough. This amounts to a boon for borrowers, but a setback for lenders.

The market for loanable funds determines the interest rate, as represented in Figure 7.1. Savers enter the market on the supply side, investors on the demand side. In the microeconomic analysis of markets, studied in Chapter 3, the general representation of the supply curve as upward sloping rests on the argument that a rising price permits resources to be drawn at increasing opportunity cost from competing uses. Such an argument does not fit in this situation for we are looking at the choice to save in the aggregate rather than the choice to absorb saving in one use as opposed to others. To assess whether the supply of saving in the aggregate increases with the interest rate, we must inquire as to why people save. Saving represents the sacrifice of current consumption for future consumption. A higher interest rate yields a higher payoff for deferred consumption, and that may well be enticing to some savers. For others, however, if saving is motivated by a desire to reach a particular goal – a comfortable retirement, the purchase of a big ticket item, a basic sense of security against the unknown – a higher interest rate would make the goal more easily attainable with lower saving. In principle, then, the supply curve could slope backward. Given the ambiguity, Figure 7.1 shows the aggregate saving function as highly inelastic, as supported by empirical evidence.

The demand for loanable funds reflects borrower expectations about the prospects for making a return on various investment opportunities. As the interest rate falls, more potential projects are seen as viable and the quantity of funds demanded increases. A given demand relationship rests on the assumption that all factors other than the interest rate remain constant. Any change in an exogenous factor causes the entire demand curve to shift. The demand for loanable funds is in fact prone to pronounced volatility. This is because the decision to borrow money and commit to an investment project hinges on expectations about the future. Crowd psychology tends to take over such expectations. During boom times, optimism prevails and the

**Figure 7.1 Market for Loanable Funds**



The market clearing interest rate equates the supply of loanable funds with the demand for loanable funds.

demand to borrow runs high. Graphically, the demand curve shifts to the right and the interest rate rises. But booms are prone to overreaching. In the retrenchment that ensues, investor sentiment succumbs to pessimism and the demand curve shifts left dragging the interest rate down. Even as interest rates approach a lower bound of zero, investors may feel limited desire to borrow.

While the notion of a single interest rate is useful for some purposes in macroeconomics, the contours of the spectrum of rates can be telling for other purposes. The range of interest rates reflects differences in maturity and risk. The profile of interest rates associated with different maturities, which can extend from overnight to thirty years, is known as the term structure or yield curve. Normally, the yield curve rises as terms lengthen to reflect a premium paid to tie up funds and take on the greater uncertainty associated with a more distant future. Any expectation that inflation will increase will tilt the yield curve, as expressed in nominal terms, more steeply upward. In rare circumstances, the yield curve can become inverted meaning that short-term loans command higher interest rates than long-term loans. This pattern usually indicates fear of impending recession, which will increase the risk of loan default, perhaps combined with expectations of softening inflation.

The range of interest rates associated with perceived risk of borrower default is known as the credit spread. Credit spreads are prone to the psychology of boom and bust. In times of optimism and robust economic expansion, risk sensitivity relaxes and credit spreads narrow. Conversely, when the economy is in the doldrums and hopelessness prevails, risk sensitivity intensifies and credit spreads widen.

In emerging economies with immature financial systems, markets are not very effective in pricing risk. Nor do they generate a meaningful yield curve if trading across the range of maturities is not highly liquid. In such situations, financial markets show limited resonance with macroeconomic conditions. The dissociation is often compounded by government intervention in setting interest rates, sometimes coupled with outright assumption of bank ownership. Typically in such cases, governments repress interest rates and get involved in allocation of the resulting short supply of funds. This strategy is motivated by a possibly well-intentioned desire to lower the cost of public investment projects. The outcome, however, is that interest rates are neither fully responsive to macroeconomic conditions nor readily manipulated as policy instruments in macroeconomic management.

### ***Relationship between Interest Rates and Asset Prices***

The interest rate provides the link between present and future value. In the simplest application of this link, an asset currently valued at  $A$  that yields a rate of return  $i$  will be worth  $A(1+i)$  a year from now. Two years from now, it will be worth  $A(1+i)^2$ , allowing for the compounding of interest.

In the reverse calculation, the present value of the stream of returns on an asset is derived by discounting. Letting  $R_1$  represent a return on an asset to be yielded one year hence, the present value of the return is  $A = R_1/(1+i)$ . A return to be yielded after two years,  $R_2$ , has a present value of  $A = R_2/(1+i)^2$ . For a stream of annual returns extending to year  $t$ , where the final sum,  $R_t$ , includes the redemption value of the asset, the present value of the asset is given as:

$$A = \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + \cdots + \frac{R_t}{(1+i)^t}. \quad (7.1)$$

The interest rate in the above formula serves to discount, or capitalize, future receipts. The higher the interest rate, the steeper the trade-off between present and future. Discounting a given stream of future returns at a higher interest rate will result in a lower present value for the asset. Conversely, applying a lower interest rate means less differentiation between present and future resulting in a higher present value for given returns.

The relationship between interest rates and asset values may be illustrated with a bond. The face value of a bond is the amount to be paid at maturity, the coupon its annual interest payment. Consider a zero-coupon bond (meaning no payments are made until maturity) with a face value of \$100 maturing in 10 years. At the time of issue, let the risk-appropriate market rate of interest be 6.0 percent. The price of the bond is then  $\$100/(1.06)^{10}$ , or \$55.84. If over the ensuing year the market interest rate remains constant, the price of the bond will rise to  $\$59.19 = \$100/(1.06)^9$  reflecting the shorter time to maturity. But suppose instead that the market interest rate rises to 7.5 percent. The price of the bond then drops to  $\$52.16 = \$100/(1.075)^9$ . The increase in the interest rate results in steeper discounting to keep the price of the bond competitive with new bonds being issued with higher yields. In our example, this effect dominates the shortening of time till maturity. If the market interest rate had instead fallen, an existing bond issued at the previously higher interest rate would see its price rise. The risk that the price of a bond will fluctuate due to changes in market interest rates is known as interest rate risk.

Asset classes other than bonds are similarly subject to valuation changes in response to interest rate movements. In times of falling interest rates, asset values become generally buoyant. The couple of decades leading up to the Great Financial Crisis was such a time. This period saw real interest rates drop to unprecedented lows worldwide. Driving this, in the view of many observers including former chairman of the US Federal Reserve Alan Greenspan, was an abundance of global saving. Low inflation in economically important nations, and expectations that that would be sustained, also had a damping effect on interest rates in nominal terms. This stimulated a broad based increase in asset values. Feeling wealthier, people in turn spent with enthusiasm. This powered a great economic boom. The concern must be, however, that when the inevitable rise in interest rates arrives, events will play out in reverse with asset values falling and spending contracting to the detriment of economic growth. Some analysts argue that with the passing of another decade of low interest rates subsequent to the Great Financial Crisis, asset prices have again become inflated and are destined for a fall.

## F. Finance and the Macroeconomy

The financial system supports economic growth by channeling saving to investment. But beyond the static transfer of funds, the system generates new debt to drive dynamic increases in spending. This is achieved by banks making loans through the creation of new deposit money. Managing the pace of debt creation is a challenge. If debt grows too quickly, the additional spending can drive inflation. Inflation in product prices is readily monitored and gauged against a stable course. Increases in asset prices, however, are trickier to benchmark. The value of assets represents the discounted value of expected returns stretching into the distant future. Real factors, such as technological advance and globalization, can boost productivity to justify sustained

increases in asset prices. But speculative fervor too can lift asset prices. And fueled by debt, a bubble can inflate, where a bubble by its nature must burst.

Finance is a pillar of growth but also a driver of volatility. Expansions are supported by new lending. Contractions are aggravated by a dearth of lending. Fluctuations up and down are amplified by the fickle nature of risk perception – that is, in booms the wildest gambles are imagined to pay off while in busts risk is seen as a danger to be avoided altogether. Monetary authorities attempt to rein in volatility through a combination of adjusting the monetary base and manipulating the ratio of deposit money to the monetary base. Nevertheless, financiers have proven adept at circumventing regulation when the boom is on and steadfast in hunkering down when boom turns to bust.

The economies of Emerging East Asia present particular vulnerabilities to financial instability. The Asian Financial Crisis demonstrated how quickly a crisis in one economy can spread across the region. The economies hit hardest showed similar weaknesses in their external debt profiles. But beyond the specifics of balance sheets, public perception is important in the timing and severity of a crisis, and perception is sensitive to circumstantial triggers. Changes in perception surrounding one economy can have a contagion effect. Greater openness to financial flows increases exposure to external shock even as it brings much in the way of benefit for economic development. Some economies in the region are already highly open to international capital flows, while others are moving in the direction of greater openness. The chapters that follow address the use of government policy to steer an economy along a steady course even when financial systems are open and impressionable.

We end this chapter with a take on finance in the broad sweep of human history. Box 7.3 presents the case that the innovations of paper money in the East and bonds in the West set the course for a fundamental divergence in the evolution of social structures and economic progress.

### **Box 7.3: The Great Divergence in Finance**

By one read of history, the great divergence in economic development between East and West traces to an early divergence in finance. Both regions gave rise to major financial innovations around the same time. In China the innovation was paper money in the 11<sup>th</sup> century, as detailed in Box 6.1. In Europe, it was bonds in the 12<sup>th</sup> century. For each region, the new financial instrument provided crucial support for waging war on a grand scale, and rebuilding in the aftermath. With that need met, the impetus to develop redundant mechanisms to serve the same purpose was seemingly forestalled. In neither region did the innovation of the other arrive until centuries later.

China under the Song Dynasty (960-1279) incurred a heavy financial burden defending its northern frontiers. Merchants who provisioned the garrisons were paid in government-issued paper notes, initially redeemable for coin by the cash-rich monopoly bureau. The northern region of the Song empire was eventually overrun by Jin invaders from the northeast, who themselves finally succumbed to the Mongols from the northwest. Holding its border cost the Song empire dearly. Wanton printing of money through the Song's waning decades resulted in severe debasement of the currency, leaving the conquering Mongols to start anew with their own currency upon consolidating the Yuan Dynasty (1272-1368). But the Mongols fell victim to the same temptation to pay their bills with excessive note issuance, until finally paper currency in China was debased to the point that it fell into obsolescence.

The Europeans took a different tack to finance their wars and reconstructions. In the 12<sup>th</sup> century, Italian city-states began borrowing from their citizenry. Initially the loans were voluntary, the wealthy being lured in by attractive interest rates. But as the need grew to fund wars against the Byzantines, the Turks, and each other, the city-states imposed bond purchase mandates on a broader populace at less compensatory rates of interest. The need thus arose for a secondary market for the unloading of bonds by unwilling buyers. The Venetians led the way in institutionalizing a system of negotiable bonds. Bond prices fluctuated with the state of war and peace, and the general degree of market confidence that obligations would be met.

Over the following few centuries bond financing became established routine for governments throughout Europe, although until the early 1800s the routine was limited to raising funds domestically in local currency. A new era was ushered in when the Rothschilds took the bond market international. With five brothers positioned each in a different country, the family was ideally situated to conduct financial business across borders. In the wake of the Napoleonic wars, European governments were in dire need of funds to pay off war debts in foreign currencies and recover from sovereign bankruptcy. The Rothschilds came to the rescue by launching an Austrian government bond in London that raised capital in British currency. In the years that followed, bonds would come to be issued simultaneously in multiple countries with interest payments collectible in a city of the bearer's convenience.

The development of bonds vs paper money may arguably have had far reaching consequences. The bond finance of Europe significantly broadened access to capital and enabled the pricing and spreading of risk. This reoriented the nature of wealth and power away from a landed aristocracy to a much more mobile – geographically and socially – capitalist class. And this in turn put Europe on the road to industrial development. Economic life in China, meanwhile, was dominated by a landed gentry that held firmly onto localized power. This kept it mired in subsistence agriculture.

Reference: Goetzmann and Rouwenhorst (2005).

## Data Note

Data on financial assets in Chart 7.1 come from a variety of sources: for bank credit, the IMF International Financial Statistics database with Taiwan data from the Central Bank of the Republic of China (Taiwan); for stock market capitalization, the World Federation of Exchanges; and for debt securities, the Bank for International Settlements. Historical data on these and many other financial indicators have been aggregated by the World Bank in its Global Financial Development Database. Unfortunately, this rich trove of information has not been updated beyond 2017 as of mid-2021. The metadata did, however, provide leads to the sources tapped for Chart 7.1. Comparison figures for advanced economies reported in the text are from the Bank for International Settlements.

In support of bond market development in Asia, the Asian Development Bank offers a wealth of data and analysis through its website Asian Bonds Online. The data for bonds outstanding in Chart 7.2 and bond turnover in Chart 7.3 are drawn from this source.

Hong Kong stock and bond magnitudes referenced in Section D are from the World Federation of Exchanges.

The IMF has put out a *Global Financial Stability Report* since 2002, now semi-annually, that is also a useful source of data and insight. The estimates of bank losses associated with the Great Financial Crisis of 2008 are drawn from the report of April 2010 (p. 12).

## Bibliographic Note

The claim that financial deepening supports economic development only up to a point finds support in an IMF study by Arcand et al (2012). Also from the IMF, Goyal et al. (2011) argue that greater financial depth increases resilience against shocks. Taylor (2012) makes the case that too rapid growth in credit can be destabilizing.

An accessible account of how the US spawned the Great Financial Crisis of 2008 and a few shrewd investors profited enormously from it may be found in Lewis (2010). A more technical analysis of the crisis is offered in Smith, Walter, and DeLong (2012).

On Hong Kong finance, Ho, Scott, and Wong (2005) is of historical value while the website of the Hong Kong Monetary Authority provides ongoing updates.

The role of finance in driving business cycles has been incisively articulated by Hyman Minsky (1986), whose insights are laid out more fully in Chapter 10.

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