

Macroeconomics

for Emerging East Asia

Calla Wiemer

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6. Money

The spending of money acts as fuel to an economy: not enough, and the economy will stall; too much, and it will overheat in inflation. Money is supplied to prospective spenders through a process that begins with the central bank and is amplified by the commercial banking system. Central bank authorities have a delicate balancing act to manage in getting this supply right.

Money represents claims on an economy. Bearers may obtain these claims by contributing to economic production, by selling assets, by borrowing, or by receiving transfers from others. They exercise the claims by purchasing goods and services.

The quantity of money in circulation and the velocity with which it moves from bearer to bearer in support of transactions jointly determine the total value of transactions over an interval of time. To narrow the focus from total transactions to GDP, it is useful to define velocity as the rate at which a unit of money is spent on final goods and services. Velocity so defined multiplied by the money supply yields nominal GDP. For given velocity, an increase in the money supply must be absorbed in nominal GDP either as an increase in real output or as higher prices, or as some combination of the two.

In this chapter we explore the relationship between money and the economy, in theory and empirically for Emerging East Asia. The case of Myanmar provides a particularly vivid illustration of the connection between money and inflation due to the pronounced fluctuations in money supply growth that have occurred there.

First, though, we examine what money is and where it comes from. Money creation is integrally related to the expansion of credit. Commercial banks play a vital role in the process by making loans through creating deposits which are themselves a form of money. Central bank monetary policy aims to guide this deposit money creation through indirect levers and subject to time lags. This makes for a challenge in keeping an economy on course, operating at its full potential but not straining beyond potential to heat up inflation.

Within the broad spectrum of financial assets, money lies at the liquid end, meaning it is easy to spend. Even within the range of assets known as “money”, some types are more liquid than others. Modern technology, however, has done much to increase fluidity among asset classes, and financial innovation has opened new channels of credit creation in support of spending. In thinking about the impact of purchasing power on an economy, then, and the role of credit in generating it, we are led to study the financial system more broadly. That we will do in the next chapter.

What Money Is

We consider the nature of money as to form and function first. We then abstract to treat money as a concept.

Form

Historically, money took the form of commodities of intrinsic value, most recognizably precious metals although a wide variety of other materials has also been used. Bolts of silk cloth, for example, served as money along the ancient Silk Road. A major drawback to metal coins in support of more than minor purchases is the inconvenience of lugging their weight around. A further problem is that coins lend themselves to debasement through shaving or clipping or sweating (shaking them in a bag to yield precious dust), or at the minting stage through the blending in of baser metals.

Paper money was a great innovation in overcoming these problems – notwithstanding the vulnerability of paper to debasement in its own right simply through excessive printing of notes, officially or in counterfeit. The advent of paper money dates to the turn of the 11th century in Song Dynasty China. Box 6.1 offers insight into why the innovation came about at the time and place that it did and how these paper notes later fell into dissolution.

Through much of the history of paper money, notes were redeemable for specie at a given rate. Paper money backed in this way by commodities is known as *representative or fiduciary money*. The global monetary system remained in principle on a fiduciary standard until 1971 when U.S. President Richard Nixon revoked the convertibility of the U.S. dollar into gold. In the wake of this break with gold, the world's currencies carried on as *fiat money* – meaning money because we say so, or by fiat. With no specie backing, fiat money rests on collective faith. We accept it in payment from others in the belief that others will in turn accept it from us.

Today's money consists largely of entries in electronic ledgers. We spend this money by writing checks, sliding debit cards, and submitting online payments. It passes from account to account without ever passing from hand to hand.

Function

Its form having proven so malleable, money is typically defined instead by its function. A list of three functions is consistently stated as follows:

- 1) medium of exchange;
- 2) unit of account;
- 3) store of value.

Most fundamental is the medium of exchange function. Without money, transactions would depend on barter. An exchange would require a match between two parties who could each offer items the other wished to acquire. Transactions would thus rest on a double coincidence of wants. Money allows for the act of offering to be divorced from the act of acquiring. This opens up tremendously the scope for economic activity.

Once the separation is drawn between offering and acquiring, the other two functions of money readily follow. Money provides a common unit of measurement on the basis of which to integrate distinct transactions into a coherent system. And money serving as a store of value allows selling and buying to be separated in time. Of course, if prices are rising significantly during this time lapse, the store of value function is compromised.

Box 6.1: The advent of paper money

Paper money got its start during China's Song Dynasty (960-1279) in the early 11th century. What turned mere slips of paper into money was their negotiability. Earlier, under the Tang Dynasty, paper remittances came into use, but these claims are not believed to have passed from hand to hand. A merchant from the provinces would sell his wares in the capital and be issued a note, known as *feiqian* (flying cash), to be redeemed in coin at his local bureau. The innovation under the Song was for a claim to pass from the original payee to any bearer. Initially the notes were issued by private merchants to be redeemed for bronze coin in variable amounts as stipulated on their faces. Later, government took over issuance, printing notes in standard denominations. For four centuries, paper currency circulated in China, finally meeting its demise under the Ming. At times over the course of this history, notes were redeemable in metal or in commodities monopolized by the state such as salt. At other times, though, notes circulated as fiat money, their value resting purely on state decree and the confidence of each in others to accept them in turn.

A number of factors contributed to paper money emerging at the time and place that it did. Technology played a part. More durable paper was fashioned from mulberry bark, and higher quality printing was achieved with metal plates. Further, China's traditional reliance on base metals for coinage lent itself to surrogates. The large masses of bronze and iron tokens needed to support purchases came to be represented by abbreviated strings hung together through holes in their centers. From this shorthand, representation by paper was a natural step. Ultimately, the backing of a strong state was essential to sustaining confidence in paper money as legal tender. Tax liabilities could be met with the paper currency while government payments were executed with it. The ruler's stamp itself conferred value absent any intrinsic worth to the medium.

That paper money was sustained for four centuries through a succession of dynasties is a wonder given paper's vulnerability to easy replication, both official and unofficial. A variety of safeguards kept counterfeiters at bay. Sophisticated production processes involving multiple printing plates in different colors impeded copying. Notes were stamped with official seals and identified with serial numbers. Beyond the technical barriers, forgery was subject to penalty of death, a warning to that effect being inscribed on some notes along with an offer of reward to informants. None of this, however, could prevent government profligacy. Lack of restraint in running the presses led to periods of inflation revealed through the ever larger denominations of notes. New issues sometimes replaced old ones at a fraction of their face value. But there were also remarkably long periods of restraint. Most of the 12th century was characterized by a stable currency despite the pure fiat nature of the notes.

Poor fiscal management under the waning Yuan (1272-1368) and the Ming (1368-1644) Dynasties brought the demise of paper money. Ming emperors undertook grandiose imperial projects, funded the seafaring expeditions of Zheng He, and bore the enormous cost of relocating the capital from Nanjing to Beijing, all by printing money. The paper became worthless and was ultimately supplanted in the marketplace by silver, infusions of which arrived from Japan and the Americas. Meanwhile, the Europeans finally caught on to the wonders of paper money along about the 1600s, even as China had given it up. Not until the 20th century did paper money finally return to Chinese hands.

Source: Goetzmann and Rouwenhorst (2005).



Song Dynasty currency plate.

Concept

At its essence, money is debt. The bearer is owed, and claims his due by making purchases. The instrument of debt is issued by the financial system, but conferred the status of legal tender, this instrument passes from one claimant to another with effect that society as a whole takes on the liability. There are many ways to obtain monetary claims on society: selling one's labor or capital services in exchange for them; accepting them in return for some other asset; borrowing them; or receiving them as gifts. To exercise these claims, one turns to society at large. Under a fiat money system, there is no other recourse.

How Money Is Created

Economist Milton Friedman famously explained the impact of a money supply increase by supposing that money were dropped from a helicopter. While an effective story telling device, this is not what really happens. And yet, what really happens is very much akin to money appearing out of thin air. For the creation of money, occurring as it does through expansion of the balance sheet of the banking system, is an ethereal process indeed.

In the Old Days

To get a grasp on the process, let us consider how money creation worked in an earlier era when money was backed by gold. Gold itself served as the unit of account, and to some extent a medium of exchange and a store of value. But gold presents a burden to carry around, to weigh and measure, to check for purity. So bankers found purpose in taking gold on deposit and issuing notes redeemable in gold by the bearer. As long as the holders of the notes believed they could redeem them in principle, there was no cause to actually exercise this prerogative. Only if a panic took hold that a bank was unsound would people run scurrying to collect their gold. Under normal circumstances, a banker could rest easy knowing his notes would circulate and the gold would sit idle in his vault.

Now, a banker could not make money simply by taking in gold and issuing equivalent notes to depositors. Profits were to be had in lending at interest against the gold on deposit. Provided redemption of notes was a rare occurrence, notes could be issued in multiple against the gold on deposit with the banker still safely able to make good on any claims that might be presented. This is how a given amount of base money embodied in gold could support a much larger amount of bank money conveyed in paper.

The bank balance sheet showed gold and loans outstanding on the asset side against bank notes issued on the liability side. A balance sheet of this form could expand through the making of additional loans and the corresponding issuance of bank notes subject only to the limits of public faith in the bank to redeem its notes on demand. The system would remain viable as long as the public believed in it, and the public would believe in it as long as it appeared viable – as it would right up until the moment some confidence shattering incident caused the whole thing to collapse.

The world monetary system no longer rests on precious metals and private bank notes. For more on those days and how confusing things sometimes got, see Box 6.2. Under the modern system, central bank liabilities take the place of gold, and deposits at commercial banks take the place of private bank notes. But the principle of an expansion in the balance sheet of the banking system acting to increase the money supply applies just the same.

Box 6.2: Before there were central banks

Nowadays, we take for granted a system of national currencies based on notes issued by government central banks. But it wasn't always so. Before there were central banks, all manner of coins comingled while currencies were spawned by a plethora of banks and other sundry agents. Monetary systems could be quite chaotic.

The economy of colonial Southeast Asia rested on a profusion of foreign and domestic coins. Dutch guilders, British trade dollars minted in India, silver dollars from the Americas, coins struck by trading companies, and later on Japanese silver yen and U.S. trade dollars, all vied for use. Private tokens and counterfeit coins flowed in from China. A number of banks chartered by the British, including Hong Kong and Shanghai Bank, Oriental Bank, and Mercantile Bank, issued notes that gained regional circulation. But much tender remained localized.

In China by the early 20th century, the Nationalist government had granted an ostensible monopoly on national currency issuance to the mixed state/private Bank of China. But the similarly mixed state/private Bank of Communications nevertheless continued to issue money as well. Further complicating matters, both banks issued notes by province even as provincial banks were issuing their own notes. Over-issue of national bank notes in Beijing to fund government spending led to their debasement and a preference within the capital for notes from other provinces or from foreign countries.

As chaotic as the East Asian milieu of yore may seem, worse existed across the seas in the U.S. According to John Kenneth Galbraith, "by the time of the Civil War, the American monetary system was, without rival, the most confusing in the long history of commerce and associated cupidity." Some 1600 different banks, many defunct, had put into circulation roughly 7000 different notes of varying denominations. Counterfeiting thrived, as did periodicals that reported status updates on currency trading values.

The breakthrough was forged with the Bank of England becoming the prototype for modern central banking. Established with a large loan to the government in 1694, it proceeded over the next century to finance wars, first against the revolting American colonies and then against an expanding Napoleonic empire. Not until 1844, however, was the Bank of England granted a monopoly over currency issuance. On this foundation, it consolidated central bank functions of taking deposits from and making loans to other commercial banks, manipulating interest rates through the trading of securities, and acting as lender of last resort to banks temporarily unable to meet depositor demands for withdrawals.

Central bank monopoly over currency issue arrived in the U.S. in 1914. In China, a unified and stable currency was achieved in 1949 with the founding of the People's Bank. Following Indonesia's independence, the Dutch-chartered Java Bank was reconstituted in 1953 as a central bank under the moniker Bank Indonesia. Bank Negara Malaysia was established as a central bank in 1959, although currency issue was left to Singapore's Currency Board until 1967. The Currency Board in Singapore dated to 1897, with the Monetary Authority of Singapore being established as a de facto central bank in 1971.

In Modern Times

Under a modern fiat money system, the gold of olden times is replaced by claims against the central bank. The central bank issues these liabilities against itself in the form of currency notes or deposits credited to commercial banks in exchange for the purchase of assets. Let us consider this process with reference to the Central Bank of Myanmar. The balance sheet for the Central Bank of Myanmar for 2017, in kyats, is shown in Table 6.1. The exchange rate in 2017 was about 1200 kyats per U.S. dollar.

On the asset side of the balance sheet the first item is foreign assets net of foreign liabilities. As recently as 2011, this entry had a negative sign for the Central Bank of Myanmar, showing it to be a net debtor internationally. In the intervening years, the Central Bank of Myanmar managed to accumulate US\$5.5 billion in net foreign assets. It did this by entering into the foreign exchange market to sell kyats of its own issuance and buy foreign currency, which it then used either to pay down foreign debt or to invest in foreign securities.

Table 6.1: Balance Sheet of the Central Bank of Myanmar, 2017

in kyats billion

Assets		Liabilities	
Net Foreign Assets	6,616	Currency In Circulation	12,669
Claims on Commercial Banks	777	Deposits of Commercial Banks	4,213
Net Claims on Central Government	13,674	Other (Net)	4,185
TOTAL	21,067	TOTAL	21,067

The second item under assets is claims on commercial banks, which refers to central bank loans to commercial banks. A central bank lends to commercial banks by creating deposits for them that appear as liabilities on its own account. Claims on commercial banks represent a relatively small portion of the balance sheet of the Central Bank of Myanmar.

The third item, claims on the central government, accounts for the bulk of assets held by the Central Bank of Myanmar. These claims arise from the purchase of government debt instruments. Put simply, the central bank has printed money to pay for government expenditures.

On the liabilities side, the first and largest item is currency in circulation. This refers to notes issued by the Central Bank of Myanmar for use as legal tender. These notes are printed by the central bank for the purpose of purchasing assets.

Next under liabilities is deposits of commercial banks held at the central bank. As explained above, these liabilities may be created in connection with loans extended to commercial banks. For the most part though, they are created when the central bank purchases an asset either directly from a commercial bank (say, a government bond that the bank holds) or indirectly from a customer of the commercial bank who then deposits payment in an account at that bank. In most countries, commercial banks are required to maintain deposits with the central

bank as reserves according to some ratio relative to the deposits they in turn hold of the banking public. But even where reserves are not required (the United Kingdom, for example), commercial banks must as a practical matter maintain a prudent level of working balances with the central bank for clearing purposes. A given commercial bank may, after all, find that on any particular day its own depositors draw on their funds to make payments to the depositors of other banks that exceed the payments received by the bank's own depositors from outside the bank. As a consequence, the bank will be obliged to transfer reserves from its own account at the central bank to the accounts of its counterparts to make up the difference.

Finally under liabilities, items of lesser importance are subsumed in the residual "other".

The central bank balance sheet is contrived for making money, not just in the literal sense already outlined of issuing currency notes and creating commercial bank deposits, but in the colloquial sense of making a profit. On the asset side, all claims yield interest while on the liabilities side no interest is paid on currency and little if any (depending on the economy) on commercial bank deposits that it holds. To be sure, costs are incurred in the physical printing of money and the general conduct of central bank operations. Nevertheless, central banking is a highly lucrative endeavor, with the benefits redounding ultimately to government. For the very revenues central banks collect from the government in debt service in large part revert back to it in central bank profits. Government debt is thus, in effect, wiped out when it is converted to money. One form of government liability embodied in a bond that commands interest and must be repaid is transformed into another form as currency notes that bear no interest and need never be repaid.

The returns derived from printing money are known as *seigniorage*. Governments benefit from the power of seigniorage. But it is all too tempting to over-exercise this power. We will examine the consequences of excessive money creation in the next section of this chapter.

The central bank balance sheet points to the channels for central bank money creation. The liabilities the central bank issues against itself as currency and commercial bank deposits constitute central bank money. This money goes by a variety of names, all referring to precisely the same thing:

- base money (or monetary base);
- reserve money;
- high-powered money;
- outside money;
- central bank money;
- M0.

The central bank issues base money when it purchases assets from among the three classes specified in the balance sheet of Table 6.1. Hence a change in the monetary base (M0) is equal to the sum of changes in net foreign assets (FA), loans to banks (LB), and loans to government (LG). Letting Δ represent the change operator we have:

$$\Delta M0 = \Delta FA + \Delta LB + \Delta LG. \quad (6.1)$$

This equation makes clear that the central bank may take action that expands the monetary base on one front – for example buying foreign currency in the foreign exchange

market – and offset this with action that contracts the monetary base on another – for example, selling government bonds. In the situation just described, the central bank is said to have *sterilized* its foreign exchange market intervention. No net increase in the monetary base has ultimately taken place. This process will come under further discussion in our analysis of monetary policy in Chapter 11.

An increase in the monetary base precipitates expansion in the money supply on a broader scale via the commercial banking system. Under a fiat money system, an increase in base money plays the same role that an increase in gold played under the system of private bank note issuance described in the preceding sub-section. Under the gold-based system, commercial banks issued notes at a multiple of the gold reserves held in their vaults. In an analogous process, under a fiat money system, commercial banks issue customer deposits at a multiple of their combined central bank reserves plus vault currency. Modern commercial banks must be prepared to meet the demand of depositors for currency or payments to customers of other banks in the same way that commercial banks in days of yore had to be prepared to meet the demand of their note holders for gold.

The Money Multiplier

A money multiplier captures the effect of an increase in the monetary base, represented by M_0 , on some broader money aggregate. Money aggregates are specified according to their degree of liquidity. The most liquid form, M_1 , is currency in circulation (i.e., outside bank vaults) plus demand (checking) deposits. M_2 , also known as “broad money”, adds time (savings) deposits to M_1 . M_3 is more expansive still, bringing in less liquid assets such as commercial paper and shares in mutual funds.

These categories used to be well delineated, but technological advance has now blurred the lines. With online banking and ubiquitous ATM machines, funds may be moved easily and instantaneously from one type of account to another such that liquidity does not vary much along the spectrum. Indeed, classification standards differ across economies such that comparing the size of monetary aggregates among them is not very meaningful. For a given economy over time, however, we can still glean important relationships between money and the economy.

Money multipliers for a particular economy over a given period of time are calculated as the ratio of the change in a monetary aggregate to a change in the monetary base. The central bank can directly initiate an increase in the monetary base by purchasing assets and issuing liabilities against itself. What happens from there is up to commercial banks and the banking public. At the core of their business model, commercial banks create deposit money in association with making loans. Regulatory provisions particular to each economy constrain this lending and deposit creation process, as does the tolerance of economic agents for risk and their desire for liquidity.

Formally, the size of the multiplier depends on two ratios: (i) how much the public holds in currency (as opposed to deposits) against an increase in base money, call it c ; and (ii) how much commercial banks hold in reserves (as opposed to making loans) against an increase in deposit money, call it r . Letting C represent currency in circulation, R commercial bank reserves with the central bank, and D broad deposit money (demand plus savings deposits), the key ratios are expressed as follows:

$$c = \Delta C / \Delta M0; \quad (6.2)$$

$$r = \Delta R / \Delta D. \quad (6.3)$$

To compute the M2 multiplier, given as $\Delta M2 / \Delta M0$, we start from definitions:

$$\Delta M0 = \Delta C + \Delta R; \quad (6.4)$$

$$\Delta M2 = \Delta C + \Delta D. \quad (6.5)$$

By substitution, and rearranging terms:

$$\begin{aligned} \Delta M2 &= c\Delta M0 + (1/r)\Delta R \\ &= c\Delta M0 + (1/r)(\Delta M0 - c\Delta M0) \\ &= [c + (1/r)(1-c)]\Delta M0. \end{aligned} \quad (6.6)$$

The M2 multiplier is then the expression in square brackets. The bounds on c , as the share of an increase in base money held in currency, are zero at the minimum and one at the maximum. If c is one, the multiplier is also one because any increase in base money is fully absorbed in currency with no increase in deposit money. The commercial banking system simply has no role to play in money creation. This represents a lower bound on the multiplier. At the opposite extreme, if c is zero, the full increase in base money is deposited by the public in commercial banks and the multiplier then depends on r .

Given that commercial banks are in the business of lending money, the ratio of their reserves with the central bank to customer deposits, r , must be less than one, and hence $1/r$ is greater than one. The smaller the value of r , the more deposit money is created from given reserves and the larger is the multiplier. As r approaches zero, the multiplier approaches infinity. The banking system becomes more unstable the lower the value of r since meeting the demands of deposit holders to convert their deposits to cash rests more precariously on a smaller reserve base.

For Myanmar, the M2 multiplier during recent years has taken a value close to 4. This is in line with other economies at its stage of development which remain largely cash based. More advanced economies in the region, such as Korea, Malaysia, and Thailand, have M2 multipliers in the range of 8-10.

The money multiplier is a critical magnitude for the conduct of monetary policy. Why this is so will become clear as we turn our attention to the relationship between money and the economy.

Money and the Economy: Theory

A connection between rapid money supply growth and rising prices was easily recognized at least as far back as the decline of the Roman empire. The connection was similarly obvious with the fall of every dynasty in China from the Song to the Yuan to the Ming (recall

Box 6.1). Under stress of survival, Roman emperors debased the coin of the realm by thinning down its silver content while Chinese rulers printed notes without restraint. The result was “too much money chasing too few goods” as the adage goes. Rampant inflation accompanied the end of empire, from one continent to another.

In this section we formalize the relationship between money and prices. The upshot is that while major episodes of inflation are invariably rooted in excessive money creation, the short term effects of modest increases in money are more complicated.

The Equation of Exchange

The amount of money in an economy is related to the nominal value of output produced over a period of time through the *velocity* of circulation, or the number of times a unit of money is spent on final goods and services during the period. This is purely definitional: velocity is defined as nominal output divided by the money supply. Rearranging terms yields the *Equation of Exchange*:

$$MV = PQ \tag{6.7}$$

where M is the money supply, V is the velocity of money circulation, P is the price level, and Q is real GDP. The Equation of Exchange says that spending on output is equal to the value of output, or nominal GDP.

The Equation of Exchange is a tautology and as such engenders no controversy among economists. To develop a theory of money and the economy, however, we need to posit a story of how velocity is influenced by economic phenomena and how equilibrium is re-established following disruptions to an economic system. Such a modeling exercise rests on the specification of a variety of different types of relationships. These are outlined in Box 6.3. Imbuing the Equation of Exchange with theories of human behavior and equilibration processes has involved much controversy indeed.

Box 6.3: Equation forms for macro modeling

Three types of equations are used to construct macroeconomic models. They are characterized as follows:

1) Accounting Identities

These hold precisely and without exception by virtue of the way variables are defined. They are tautologies. The Equation of Exchange is an example:

$$MV = PQ$$

where M is the money supply, V is velocity of money circulation, P is the price level, and Q is aggregate real output. Velocity is herein **defined** as the value of output (PQ) divided by the money supply. V captures how many times each unit of money changes hands for a given total volume of transactions. The equality cannot but hold.

2) Behavioral Expressions

These hold as approximations subject to a margin of error. They focus attention on key behavioral patterns suppressing less important or less relevant considerations. An example is the consumption function (foreshadowed in Chapter 4 and studied in Chapter 9):

$$C = C_0 + \beta \cdot Y$$

where C is consumption, Y is income, and C_0 and β are parameters. Income is highlighted here as a determinant of consumption although certainly a plethora of other factors must have an influence as well. The consumption function abstracts from all such noise to isolate a core feature of behavior for a particular analytical purpose. Deviations around this core behavior are to be expected.

3) Equilibrium Conditions

These hold as theoretical tendencies given the passage of sufficient time for all adjustments to given circumstances to be completed. An example is the equating of aggregate demand (AD) and aggregate supply (AS) (concepts foreshadowed in Chapter 3 and elaborated in Chapter 9):

$$AD = AS$$

where AD and AS are respectively demands and supplies across all markets for final goods and services. Of course, the circumstances to which markets respond come under a constant barrage of changing forces, and that puts the target equilibrium in a constant state of flux. Equilibrium is thus more theoretical construct than observable outcome.

The Quantity Theory of Money

Any theory must be informed by empirical observation. With respect to the variables that enter the Equation of Exchange, certain long-run patterns are well-established empirically. In general, real output has shown a gradual secular increase and velocity a gradual secular decrease over time, regardless of what may have been happening with money and prices. The increase in real output has been attributed to growth in factor inputs and advances in technology (discussed in Chapter 1). The decline in velocity means people hold rising money balances relative to income, and for that a variety of explanations may be postulated. Economic development involves specialization and the division of labor, subsistence thereby giving way to exchange. As the supply chain lengthens, given output is undergirded by an expanding web of transactions

which must be supported by money. Development also involves a faster rise in wealth broadly speaking than in income, with money being one form that wealth takes. Finally, advances in finance have blurred the distinction between money and other assets, in particular offering up interest-bearing demand deposits that have raised the appeal of holding deposit money as opposed to bonds or stocks.

Taking long-run trends in real output and velocity as exogenous leaves the remaining variables of money and the price level to be co-determined within the Equation of Exchange. The record shows they tend to move together: both may increase steeply; both may hold fairly stable; both may even decline. Nowhere in the realm of experience, however, do we find protracted divergence between money and prices. Sustained increases in the price level are invariably linked to growth in the money supply. In the oft-quoted words of Milton Friedman, “Inflation is always and everywhere a monetary phenomenon.”

This quote conveys the thrust of the *Quantity Theory of Money*. The theory says in essence that the value of money – in other words, its purchasing power – depends on its quantity. The Quantity Theory was quintessentially articulated in 1911 by Irving Fisher, although the precept was by that time well ensconced in economic thinking. The theory came under disparagement in the 1930s, however, eclipsed by Keynesianism with its shift in attention to shorter term variations in the money/price relationship. Milton Friedman then led a comeback in the 1950s and remained a staunch defender of the faith throughout his long lifetime which extended into the next century.

To a large extent, the two sides actually agree on the basics. Keynes accepts, however grudgingly, that “the total quantity of money remains, if not an overruling factor [in price fluctuations], at least in the long run a dominant one – and of exceptional practical significance because it is the most *controllable* factor.” But Keynes’s most famous line may well be: “In the long run we are all dead.” A time frame of less than the long run thus commanded his attention. For their part, Fisher and Friedman recognized that in the short run velocity could be volatile, with the connection between money and prices therefore unstable. Despite this scope for agreement, the two schools arrive at sharply opposing positions on government policy.

We take up the policy discussion later in the chapter; first, we must flesh out the theory. Friedman is on record that “In the short run, which may be as long as three to ten years, monetary changes affect primarily output” while “Over decades, on the other hand, the rate of monetary growth affects primarily prices.” The dynamics work through the interest rate. Faster growth in the money supply drives an easing of credit that initially depresses the interest rate. Real output expands as a result, led by strong investment demand and associated job growth. But as bottlenecks in supply develop and labor markets tighten, prices begin to rise. Over time, expectations of continued inflation take hold. Nominal interest rates must rise to preserve the real rate of return on lending. With that, investment is discouraged, employment slackens, and real output growth eventually returns to its trend path.

A remnant of the elevated rate of money supply growth remains, however. Once inflationary expectations have been established, higher interest rates persist. This means the initial increase in the rate of growth of the money supply must be maintained if real output is to stay at trend. Inflation is locked in. The only way to quell it is to slow money growth. But this would mean tightening credit and pushing the interest rate even higher than its already inflation adjusted level. With that, output growth would drop below trend and inflation would gradually

subside. Eventually, expectations of continued price increases would fade, and the nominal interest rate would drop back to its non-inflationary baseline. Output growth would ultimately recover to its trend path.

Velocity is not presumed by quantity theorists to remain constant over the course of this cycle. On the contrary, there is good reason for velocity to increase as inflation heats up. The increase follows from a desire on the part of wealth holders to shift out of money balances and into assets that will hold their value or generate a return to offset the impact of inflation on money's purchasing power. But the very process of the broad public seeking to spend away its money balances only adds to inflationary pressure. Thus the initial impetus to inflation from an increase in money supply growth is accentuated by a feedback loop that involves rising velocity. Changes in velocity can thus introduce considerable variability into the relationship between money and prices in the short-run .

As Friedman sums up the Quantity Theory: "Money matters." It matters for prices in the long run, but also for real output in the short run. Too much money ultimately results in inflation, and inflationary episodes are difficult and costly to unwind. But too little money can be harmful as well. In Friedman's assessment: "There is strong evidence that a monetary crisis involving a substantial decline in the quantity of money is a necessary and sufficient condition for a major depression." Why money matters is discernible from the Equation of Exchange. The scope for variation in velocity is limited. That means M feeds through systematically to PQ .

The Keynesian Challenge

Keynes discounts the long run heavily since none of us now incarnate will be there to see it. Within the more immediate time horizon of his concern, the main drivers of economic activity are other than money. Money may or may not matter in the Keynesian context as a countervailing policy instrument.

While concurring with the quantity theorists on the long-run relationship between money and prices, Keynes maintained that in the short run the price level and real output depend primarily on aggregate demand. The argument hinges on the relationship between saving and investment. Income not spent on consumption is saved. In order to keep an economy operating at its potential, this saving must be channeled into investment. If desired investment spending does not materialize to absorb available saving, aggregate demand comes up short of aggregate supply and output prices weaken. Businesses find they are unable to cover costs and so they cut back on production. The economy goes into a downturn.

The decision to invest is the key to the Keynesian business cycle. Investment involves a commitment to the future, and that makes it vulnerable to the vagaries of expectations. Sentiment carries the day. When investors are bullish, spending is strong, prices rise, and output expands. When investors turn bearish, the opposite sequence of events transpires. Once the economy falls into a slump, there is no automatic tendency for it to recover in any timely fashion. Pessimism is self-reinforcing, and the economy can remain mired in it for a long while. A detailed exposition of the Keynesian model must wait until Chapter 9. In the present context we turn our focus to the monetary implications.

Money's impact on the economy is dubious under the Keynesian view. Fisher took velocity to be quite rigid so that an increase in the money supply was transmitted directly to nominal output. Friedman allowed for greater variability in velocity, but in a systematic way

based on identifiable factors. The transmission mechanism between money and nominal output worked, if not as mechanistically as Fisher believed. By contrast, Keynes saw velocity as very pliant. Money balances, in Keynes's framework, are held not just for the purpose of supporting transactions, but with an eye to managing an asset portfolio. If wealth holders expect bond prices to fall, they will absorb expanding money balances until investment prospects improve. Conversely, if they expect bond prices to rise, they will shift their portfolios out of cash and into bonds. In Keynes's world of fickle human sentiment and malleable expectations, the willingness to hold money balances can be quite elastic.

Moreover, money as a policy instrument is beset by a further problem for Keynes, and that is that money supply is endogenous. The monetary authorities have limited influence over money creation. Their command is confined to the monetary base. Commercial bankers then determine the degree to which they will extend loans and expand deposit money. In boom times, bankers will be eager to fuel economic expansion with credit while in hard times they will be reticent to do so. The money multiplier can drop so low as to make monetary policy ineffectual. Rather than serving as a lever of policy to actively manage the economy then, money becomes endogenous to the business cycle and accentuates it. The money supply contracts when times are bad, and expands when times are good. The central bank will be hard pressed to override this tendency which is inherent in the commercial bank incentive structure.

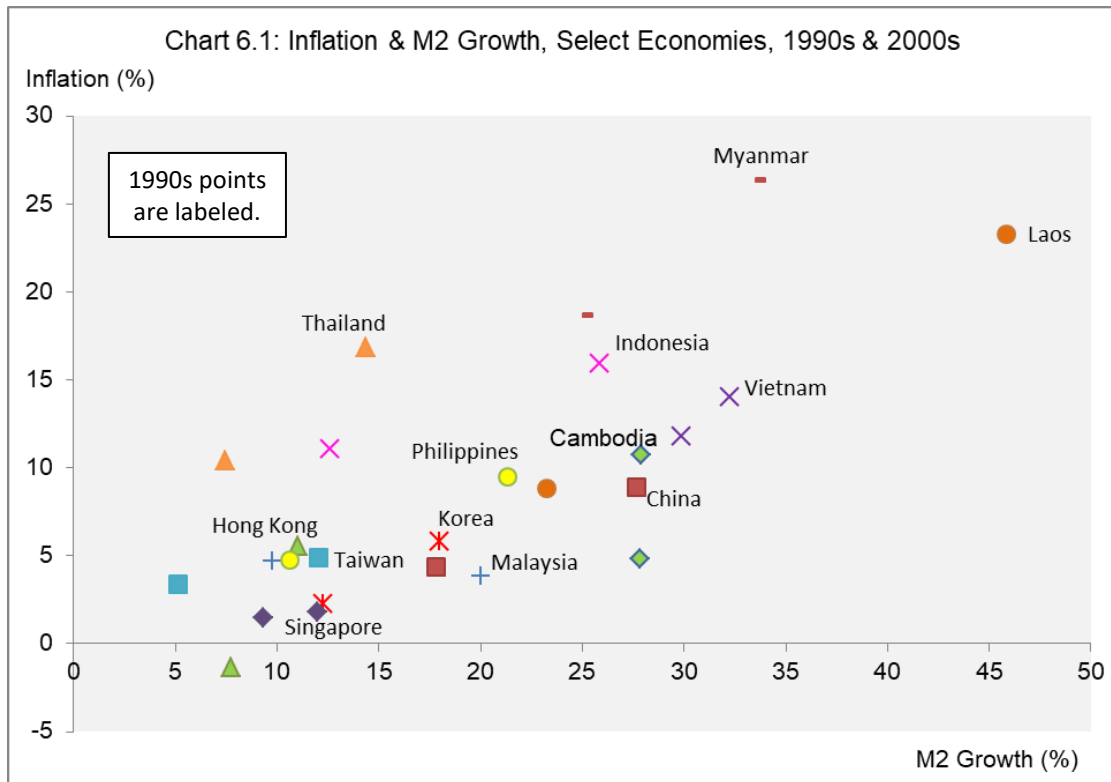
Their differing interpretations of how the economy works lead quantity theorists and Keynesians to opposing views on policy. Before we take up the policy debate, however, let us examine the empirical record on money and the economy for Emerging East Asia.

Money and the Economy: Empirics

Empirical validation of the positive relationship between money and prices is to be found both in cross-section analysis of the economies of Emerging East Asia and in movement over time with respect to our featured economy for this chapter, Myanmar, where fluctuations have been quite dramatic.

Cross-Economy Comparisons

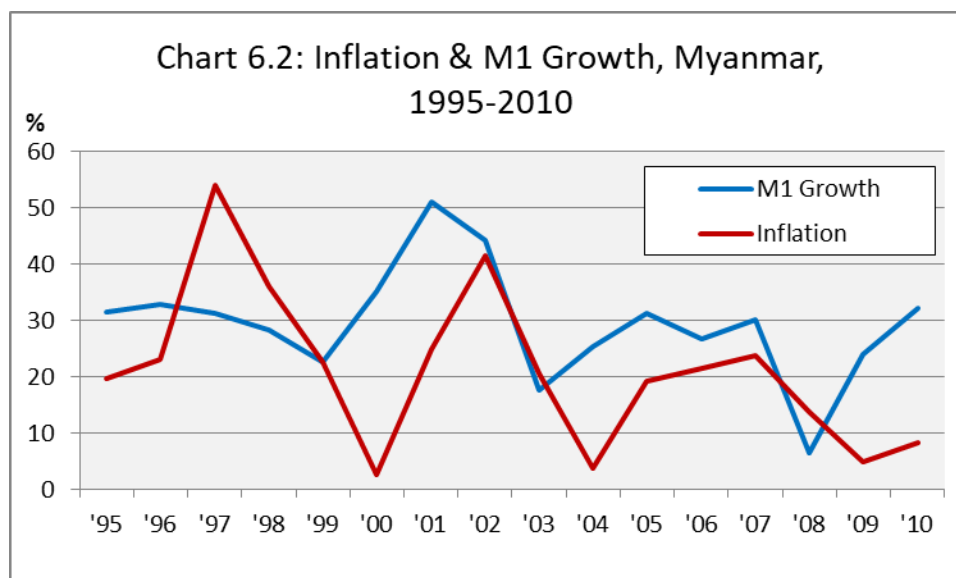
Chart 6.1 plots money growth versus inflation for our sample of economies measured during two different decades. Economy labels are attached to the 1990s data point with the matching symbol by economy representing the 2000s data point. A general positive relationship is visible such that higher money growth is associated with higher inflation. At the high extreme, Myanmar and Laos both had inflation rates above 20 percent during the 1990s with money growth rates above 30 percent. At the low extreme, Hong Kong experienced deflation in the 2000s and low money growth at about 8 percent. The 1990s was in general a much higher inflation era than the 2000s. Economies that endured very high inflation in the 1990s all saw the rates come down in conjunction with slowing their rates of money growth. Vivid examples are to be seen in Laos, Myanmar, Thailand, and Indonesia. Economies with more moderate inflation in the 1990s, such as the Philippines, China, and Korea, achieved reductions according to the same principle applied on a more modest scale. By the 2010s, low inflation had become such the norm throughout the region that graphing it holds no interest. All points are clustered at the lower left. The lessons of money growth and inflation thus seem to have been well learned and taken to heart.



While a general pattern exists between money growth and inflation, significant variation around this pattern is nevertheless apparent. Some economies managed to combine fairly rapid money growth with moderate to low inflation – China, Cambodia, and Malaysia being cases in point. Certainly, other factors enter into the nexus. Importantly, higher rates of money growth can be absorbed with less inflationary pressure in environments of rapid real growth in output and in the monetization of productive activity that accompanies economic development. Leaning in the opposite direction, Thailand in the 1990s experienced high inflation even with modest money growth. We note that Thailand went through a crisis in the 1990s that was disruptive to normal economic outcomes in many ways.

The Case of Myanmar

Chart 6.2 tracks inflation and money growth for Myanmar for the period 1995-2010. Extremely sharp movements in both indicators bring the connection into stark relief. Peaks and troughs in money growth were followed regularly at a one year lag by peaks and troughs in inflation. Money growth spiked to as high as 51 percent in 2001, with inflation following suit to hit more than 40 percent a year later. Money growth then plummeted to 17.4 percent and inflation dropped to 3.5 percent. Up again, down again, the pattern repeated until finally the decade ended with a spurt in money growth, leaving inflation seemingly poised for yet another take-off.



Such extreme gyrations beg an explanation. An IMF review of 2012 noted that the Central Bank of Myanmar was subordinate to the Finance Ministry and took as its primary function the monetization of fiscal deficits. The government, rather than issuing debt to borrow in financial markets, enlisted the central bank to simply print money in support of public expenditures. Under such easy spending terms, discipline tends to lapse. Fortunately, as of the IMF's 2017 review, this financing arrangement was being phased out, aided by decent progress in fiscal deficit reduction. The government is increasingly turning to bond financing to cover its deficits, which requires development of financial markets from a nascent state. With continued progress in this direction, the central bank should be able to gain independence in managing the money supply.

Movements in M1 involve commercial bank deposit-money creation as well as central bank manipulation of base money. The sharp tightening of money growth in 2003 is an episode of particular note in this connection. Commercial banking in Myanmar is dominated by four state-owned banks, with private banks having been allowed to operate only since 1992. In 2003 a collapse in confidence set off a massive run on private banks following the failure of a number of their corporate borrowing clients. A severe liquidity shortage developed as lending froze up. Deposit money growth fell dramatically, and so too did the rate of inflation. Recovery from the crisis was fairly quick as the central bank stepped in to provide loans to the troubled banks and restore depositor confidence.

The Myanmar case illustrates a clear short-run relationship between money and inflation under circumstances of pronounced fluctuation in money growth. The more subdued money growth patterns exhibited by other economies in our sample would not tend to yield such an obvious short-run connection, other factors taking on greater relative importance. Overall then, the empirical picture from our sample of Emerging East Asian economies is one of a generally supported relationship between money growth and inflation in the long run with money growth having the potential to take on decisive influence over the price level even in the short run if the growth is turbulent enough.

Money As a Policy Target

Historically, debate raged over the role the quantity of money should play in policy formulation. Quantity theorists believe in a direct relationship between money and prices. As articulated by Friedman, the theory takes velocity as subject to identifiable and contained influences, if not treating it as strictly fixed. Keynes, on the other hand, regarded the link between money and prices as more tenuous and the behavior of velocity as less coherent. The Keynesian view lends itself to a more activist approach to money management even as it implies reservations about the potential effectiveness of monetary policy. Quantity theorists by contrast advocate steady growth in the money supply as a means of achieving steady growth in the real economy at stable prices. This policy school is known as *Monetarism*.

Monetarists emphasize the pernicious effects of excessive price increases and advocate monetary restraint to prevent inflation from getting out of hand. When inflation catches people off-guard, its disruptive consequences can discourage risk taking for years to come. Lenders find the purchasing power of their repayments undermined. For retirees who depend on investment income and see their life savings effectively dissipated, this may be particularly unsettling. Workers also suffer as their wages lag the increase in prices of the things they buy. Borrowers, on the other hand, receive a windfall. The lesson taken by savers may be that it is safer to hold wealth in gold or real property than in the financial assets that fund business investment.

When inflation becomes established and people anticipate it, some of the costs can be mitigated. Nominal interest rates rise to compensate for inflation and preserve real rates of return, while cost of living adjustments are built into employment contracts and pension agreements. Yet unavoidable costs remain. Inflation acts as a tax on cash balances and thus distorts the decision to hold cash as opposed to other assets at a sacrifice of convenience. Because price adjustments as a practical matter occur in lurches at discrete intervals, distortions ripple through the economy. Business planning is subject to greater uncertainty, and cost management commands more effort. The communication of price changes to customers also takes effort, as summed up in the term “menu costs”.

Keynesians for their part emphasize the hardship of recession and see monetary stimulus as a potential, if not unattenuated, remedy. High unemployment in the here and now is felt to impose far greater personal and social cost than vaguely possible inflation in the unknowable future. Any emergence of inflationary tendencies can be monitored and addressed in a timely fashion. For Keynes, the principal source of economic malaise was inadequate investment demand. Expansionary monetary policy through its impact on interest rates addresses this investment reticence directly. The key in Keynes’s view was to use monetary policy assiduously to maintain the balance between saving and investment.

The Keynesians and the Monetarists are diametrically opposed in their views on the conduct of monetary policy. Keynesians see a critical role for active intervention, the authorities stimulating the economy or reigning it in as warranted to counter the vicissitudes of public sentiment. Monetarists believe such intervention does more to destabilize than to stabilize. They oppose the use of discretion, preferring a rules based system that targets a steady course for money supply growth. Discretionary policy, in their view, introduces one more element of uncertainty into economic life, compounding the difficulty of businesses and households to form valid expectations on the basis of which to make sound decisions.

Historically, money supply targeting of the sort favored by Monetarists has been implemented in both Germany and the U.S. Germany's Bundesbank initiated money targeting in 1974 and kept inflation in check under this *modus operandi* for more than two decades until transition to the euro intervened. In the U.S., the impetus for money targeting was the escalation of inflation in the 1970s. U.S. central bank chairman Paul Volcker committed to conquering inflation by strictly restraining money growth and succeeded, seeing his mission through despite the hardship imposed by soaring interest rates as credit tightened. In the present day, however, most developed market economies have adopted approaches to monetary policy that give little or no attention to the monetary aggregates.

Similarly, the economies of Emerging East Asia for the most part focus on targets other than the money supply in the conduct of monetary policy. For China, though, references to M2 and other quantitative measures of money and credit figure prominently in the quarterly policy reports of the central bank. This approach to policy is rooted in the legacy of a planned economy and a banking system that continues to be dominated by state-owned banks. Market based targets for policy such as interest rates or exchange rates are less amenable to use in manipulating the economy. So for China, while the target for M2 growth is not hard and fast, nor is it the sole indicator used in steering policy, it nevertheless remains important.

In a broader sense, the distinction between Monetarists and Keynesians turns on the preference for a rule to determine policy versus discretion. For the most part, monetary authorities in Emerging East Asia have opted for discretion. But here too there is an exception. Hong Kong has adopted a hard exchange rate peg to the U.S. dollar to serve as the anchor for monetary policy, with this peg having been sustained since 1983. Advocates for a rule based system argue that by taking discretion out of the mix, one important source of economic uncertainty is eliminated. In Hong Kong's case, that argument has been compelling. More on the choices involved in setting a monetary policy regime will have to wait until Chapter 11.

Summary and Linkage to Finance

In a modern economy, money takes the form of currency and deposits in commercial banks. Currency notes are issued as liabilities of the central bank in exchange for the purchase of assets such as domestic government securities or foreign exchange. Deposit money is issued as the liabilities of commercial banks against loans made to the public. Deposit money can be converted into currency at any commercial bank conditional on the demand for conversion remaining circumscribed in the aggregate. But under a modern fiat money system, that currency cannot in turn be converted into anything at the central bank. Currency does not take its value from being backed by precious metal or any other commodity of intrinsic worth. It takes its value by functioning as a claim on the economy at large. Claims on the central bank in effect become claims on the economic system.

Commercial banks are limited in their deposit money creation by the need to convert deposits to currency on demand. In readiness, they hold reserves in the form of vault cash and deposits with the central bank. Regulatory requirements on the ratio of commercial bank reserves to customer deposits are generally imposed by governments. By controlling the level of reserves, the central bank is then able to indirectly influence deposit money creation.

Central bank manipulation of commercial bank reserves is at the foundation of monetary policy. Central banks generally exercise discretion over how monetary policy is conducted,

though not always. In some cases, Hong Kong being an example, discretion is eliminated under a rules-based system that automates money supply growth. In other cases, as with Myanmar, the central bank becomes an arm of the finance ministry, printing money perforce to fund government deficits. More typically though, monetary policy is undertaken deliberately with the aim of managing economic growth and inflation. When growth slips below its potential, a monetary stimulus is mobilized. Conversely, when growth goes into overdrive and inflation rears up, monetary restraint is imposed.

The conduct of monetary policy has been described by former U.S. central bank chairman Alan Greenspan as “more art than science.” We will elaborate on that assessment in later chapters. One of the extenuating factors, to be examined in the next chapter, is that much credit creation takes place outside the confines of the commercial bank deposit-money realm. For example, a bank or other financial intermediary may sell a security to investors and lend the proceeds to a real estate developer. That allows the real estate developer to make purchases. At the same time, if the security can be easily liquidated, the bearers of this asset retain ready command over purchasing power as well. What’s more, the security itself may serve as a negotiable instrument used to support expenditures and discharge debt. Indeed, any promise to pay may in principle function as money if others are willing to accept it in payment. Financial innovation is often a force behind the credit proliferation that generally accompanies economic booms. Conventional monetary policy holds little sway over such credit expansion. And the problem with booms is that they tend to be followed by busts.

Data Note

Central bank balance sheet data for Myanmar in Table 6.1 are from the IMF International Financial Statistics online database as are data used to calculate money multipliers. The 1990-2005 time series data on money and inflation for Myanmar in Chart 6.2 are also from this source. These early data for Myanmar must be regarded as subject to a high margin of error, and this example should thus be taken as merely illustrative.

For the cross-economy comparisons of Chart 6.1, the data are from the World Bank World Development Indicators online database and in addition for Taiwan, from the Republic of China (Taiwan) Statistical Bureau. Growth rates are derived from regression estimation of exponential curves based on annual magnitudes. This approach avoids undue influence of any endpoint outliers.

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Milton Friedman's helicopter story of money creation is recounted in the 1994 volume *Money Mischief* (Chapter 2). For invoking this story in a speech in 2002, U.S. central bank chairman Ben Bernanke gained the nickname "Helicopter Ben".

Perhaps the most quoted statement in all of economics is Friedman's "Inflation is always and everywhere a monetary phenomenon." Friedman uttered these words in a lecture given in India in 1963, which was then published as a slim volume that might otherwise have passed into obscurity. The volume is *Inflation: Causes and Consequences*, the passage appearing on page 17.

The seminal work on the Quantity Theory of Money is due to Irving Fisher. Fisher's 1911 *Purchasing Power of Money* was the jumping off point for Friedman's "Restatement" of 1956. Both authors convey a strong sense of the adversarial nature of their positions.

The opposing view is due to John Maynard Keynes. Keynes's *Treatise on Money* published in 1930 anticipates the Great Depression in describing how excessive saving relative to investment demand can cause an economy to underperform. As an antidote, Keynes supported an activist monetary policy. His concession on the long-run inflationary tendencies of money growth is articulated in the *Treatise on Money* (Volume II, p. 49). His famous dismissal of the long run is from the *Tract on Monetary Reform* (p. 80), and reads in full:

But this *long run* is a misleading guide to current affairs. *In the long run* we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is long past the ocean is flat again.

Friedman, for his part, concurs that money affects primarily output in the short run and primarily prices in the long run, the quote coming from *Money Mischief* (p. 48). The same source provides the quote on a substantial decline in the quantity of money being necessary and sufficient for a depression. Friedman's last word on the subject of money was published posthumously in 2006 in the *Wall Street Journal* under the fitting title "Why Money Matters".

The examination of money and inflation for Myanmar draws on two sources. The first is Article IV consultations of the International Monetary Fund for 2011 and 2017. Article IV refers to an item under the IMF founding agreement that authorizes surveillance over the exchange rate policies of member countries. This surveillance broadly encompasses member obligations to direct their “economic and financial policies toward the objective of fostering orderly economic growth with reasonable price stability.” Article IV consultations generally take place once a year. IMF economists meet with government officials and other stakeholders, then prepare a staff report to be published conditional on member approval. About four out of five countries agree to publication of their Article IV staff reports.

The second source on Myanmar is a report published by the South East Asian Central Banks (SEACEN) Research and Training Centre (<http://www.seacen.org>). Established in 1982 in Kuala Lumpur, this organization has grown to 20 members from the Asia-Pacific region as of 2018. Its purpose is to foster learning, research, networking, and capacity building within the region and to represent regional interests within the multilateral institutions. The report consulted is a multi-country study of monetary policy led by Nephil Matangi Maskay, the chapter on Myanmar having been contributed by Tin Maung Htike, Research Officer of the Central Bank of Myanmar.

Analysis of China’s monetary policy with evidence on the ineffectiveness of the interest rate as a policy instrument and the need to emphasize quantitative targets may be found in Berkelmans, et al.

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