

# MONETARY AND EXCHANGE RATE POLICIES FOR SUSTAINED GROWTH IN ASIA

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# Monetary and Exchange Rate Policies for Sustained Growth in Asia

Joseph E. Gagnon and Philip Turner

## *Abstract*

The more advanced economies in Asia are experiencing slower growth rates. Structural reforms are the most important policies for keeping growth rates up, but this paper takes the growth slowdown as given and focuses on implications for monetary policy. The key policy implication is the importance of keeping core inflation at or above 2 percent to avoid prolonged periods of economic slack.

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# Monetary and Exchange Rate Policies for Sustained Growth in Asia

JOSEPH E. GAGNON AND PHILIP TURNER

The more advanced economies in Asia are experiencing slower growth rates. Structural reforms are the most important policies for keeping growth rates up, but this chapter takes the growth slowdown as given and focuses on implications for monetary policy. The key policy implication is the importance of keeping core inflation at or above 2 percent to avoid prolonged periods of economic slack.

Flexible inflation targeting has provided a successful and adaptable framework for monetary policy worldwide.<sup>1</sup> It is hard to overstate the importance for monetary policy of keeping inflation within the central bank's policy mandate. Such mandates typically specify some target for average inflation in the medium term, either a single number or some range. In our view, such a target should be no less than, and possibly greater than, 2 percent.

Forecasts at the time of writing (January 2018) suggest strong global growth in 2018. The threat of deflation has faded in most countries. But with inflation expectations still comparatively low, monetary policy should react promptly to any significant negative shocks to growth or to inter-

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1. Graeme Wheeler, "Reflections on 25 years of inflation targeting," speech at Reserve Bank of New Zealand and International Journal of Central Banking conference, Wellington, December 1, 2014.

national financial markets (e.g., a new taper tantrum). In Thailand, core inflation remains well below 2 percent and there is a case for additional monetary ease already.

Japan failed to keep inflation above zero after a severe financial crisis and suffered two decades of excess unemployment and forgone output. The longer inflation is allowed to remain below target, the harder it is to raise inflation to target. When inflation expectations settle at low levels, central banks have less scope to use conventional monetary policy to stabilize cyclical fluctuations. Central banks, however, can still expand their balance sheets (so-called unconventional policy) when the conventional policy rate is near zero.

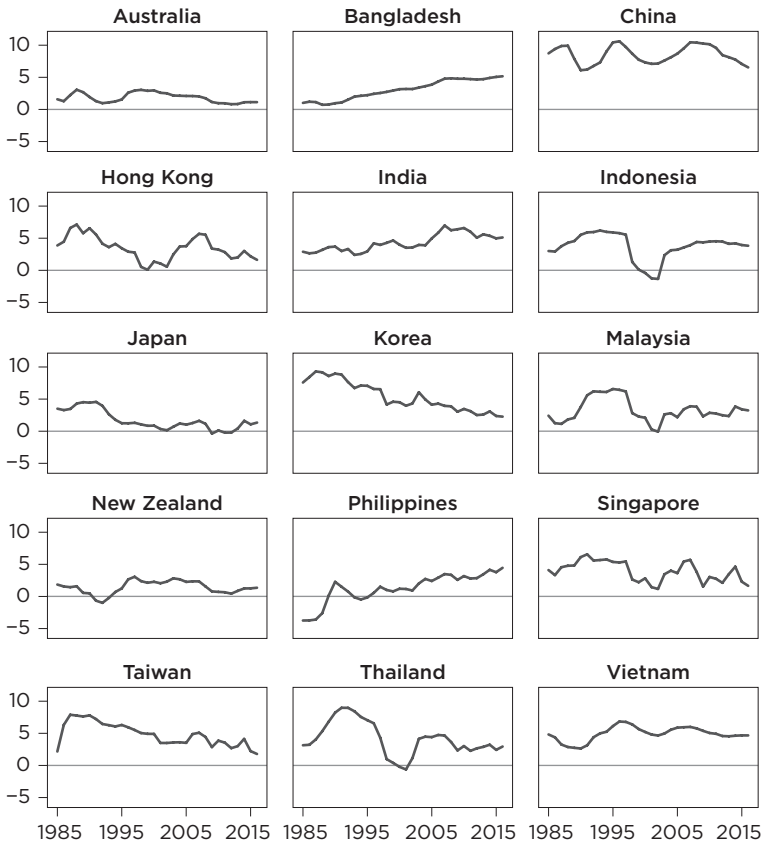
We rebut three possible criticisms of our advice.

First, it is argued that monetary policy has only a weak impact on inflation as reflected in declining estimates of the slope of the Phillips curve. We suggest that the Phillips curve slope is nonlinear in both the output gap and the level of inflation. When inflation is close to zero, a negative output gap has very little effect on inflation because of downward rigidities in nominal wages and prices. But a positive output gap is expected to have a significant effect, and this effect is likely to grow as the gap becomes larger.

Second, it is argued that central banks should stick to setting the overnight rate and should avoid the so-called unconventional balance sheet policies of the kind implemented by the Federal Reserve, European Central Bank (ECB), Bank of Japan (BOJ), and Bank of England. This view is unhistorical. Central banks have used their balance sheets to advance their objectives since their inception more than 300 years ago. In Asia, the accumulation of foreign exchange reserves and related policies to stabilize financial markets and control any excess liquidity in domestic banks were major planks of monetary policy in the years during and after the Asian financial crisis. What is new is that the substantial development of domestic financial markets in emerging-market economies has widened the possibilities for balance sheet policies. Because bond markets have become more important in monetary policy transmission in Asia, and because the liquidity of such bond markets can be especially fragile when global markets are disturbed, balance sheet policies should be on the policy agenda. This would be reinforced if weak growth and low inflation were to push the policy rate to zero.

Third, it is argued that easy monetary policy encourages risky behavior in financial markets. We argue that the evidence for such an effect is very weak. Moreover, ultra-low inflation and persistent negative output gaps themselves raise risks to financial stability. Prudential regulatory policies are far more potent at preserving financial stability than monetary policy. Regulatory policy includes tools such as bank capital and liquidity requirements; rules on currency and maturity mismatches in banks; limits to

**Figure 13.1 Growth rate of real per capita GDP, 1985–2016, five-year moving average (percent)**



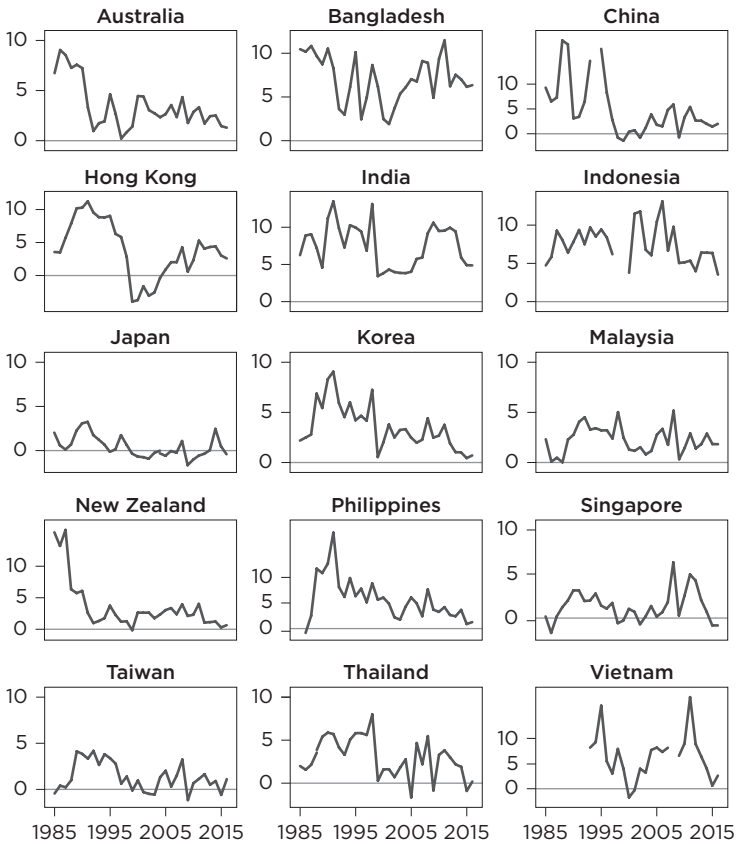
Source: IMF *World Economic Outlook* database.

interest rate exposures; and enhanced stress tests to make sure the balance sheets of financial intermediaries are resilient to any eventual tightening of monetary policy. New macroprudential policy tools (such as loan-to-value and debt-to-income ratios for house mortgages) give the central bank new ways of limiting risks to financial stability arising from low interest rates.

## Macroeconomic Developments in Asia

Figure 13.1 displays five-year moving averages of the growth rate of real per capita GDP for the 15 largest economies (based on 2016 GDP at market exchange rates) in the Asia-Pacific region. Many economies appear to be growing more slowly over time. However, for some economies there is no clear trend in the growth rate, and for a few economies growth seems to be increasing.

**Figure 13.2 CPI inflation rates in Asia, 1985–2016**  
(percent per year)



CPI = consumer price index

Note: Observations above 20 percent have been dropped.

Source: IMF, *World Economic Outlook* database.

The main policy option to raise an economy's growth rate regardless of its relative income level is structural reform that opens up protected sectors to competition and encourages investments in human and physical capital and research and development (R&D). However, structural reform is the topic of other chapters in this volume. This chapter focuses on implications for monetary policy, which can help to avoid prolonged underemployment of resources and to sustain investment. Monetary policy can thus help an economy achieve its long-run potential growth rate.

Figure 13.2 displays inflation rates in the Asia-15 economies. In every case, inflation in 2016 was below its historic average, often by a considerable amount. In 2016, inflation was below 5 percent in 14 of the 15 econo-

mies; below 3 percent in 12 economies; below 2 percent in 8 economies; below 1 percent in 5 economies; and below 0 percent in 2 economies.

In most of the economies with inflation below 1 percent in 2016—Singapore, Japan, Thailand, New Zealand, and Korea—GDP growth slowed markedly over time. In these economies, there was probably a gap between actual and potential GDP growth at some point either before or when inflation was declining. As we discuss in the next section, a key priority for monetary policy in Asia should be keeping inflation from falling persistently below 2 percent and possibly even targeting a rate slightly higher than 2 percent.

## **Dangers of Ultra-Low Inflation**

It is a widely acknowledged human failing that we learn more readily from our own mistakes than from the mistakes of others. A similar truth holds at the level of national economic policies. The United States and the euro area did not fully absorb the lessons of real estate bubbles and banking crises in the Nordic countries, the United Kingdom, and Japan in the early 1990s and in developing Asia in the late 1990s. This failure doomed them to suffer their own crises in 2008.

In our view, many Asian policymakers are not sufficiently concerned about the likely persistence and economic costs of ultra-low inflation. All their lives, inflation has been a problem only when it was too high, and they take satisfaction in having conquered it. Yet both economic research and the experiences of some advanced economies suggest that inflation can get stuck below target for extended periods and that allowing ultra-low inflation to persist has serious costs.

## **Lessons from Japan**

The bursting of the equity and real estate price bubbles in 1990–91 devastated the Japanese financial system but it was not until 2000 that the authorities developed systematic policies to deal with insolvent banks.<sup>2</sup> Since 1993, nominal GDP growth and core consumer price index (CPI) inflation in Japan have fluctuated around zero<sup>3</sup> (see figure 13.3). Real GDP growth slowed after 1993. The severe impairment of financial inter-

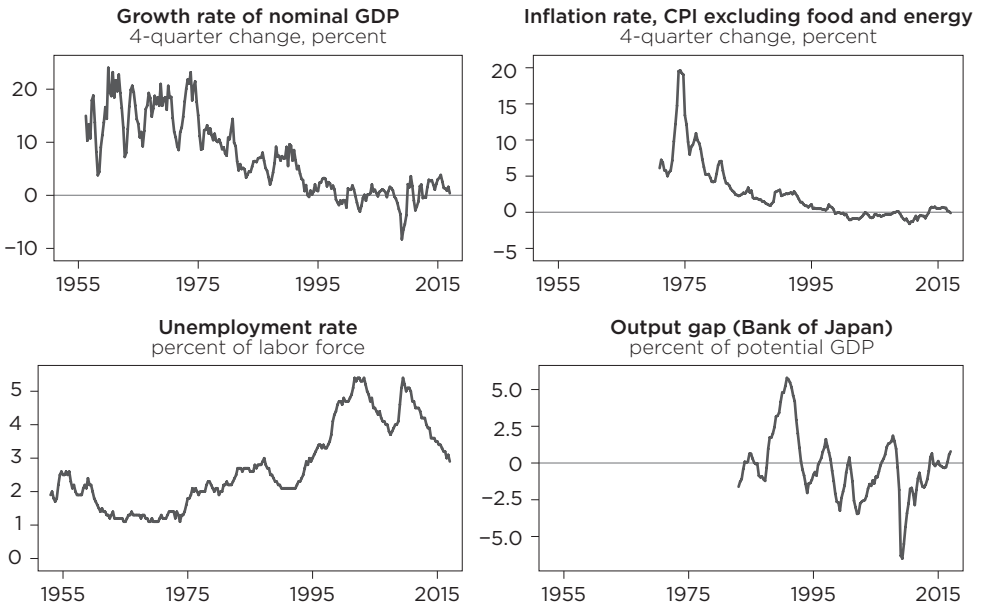
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2. Nakaso (2001) provides an authoritative account of how it took years for the authorities in Japan to develop policies to deal with this financial crisis.

3. In the four quarters following each increase in the consumption tax, the inflation rate shown in figure 13.3 was adjusted downward by the change in inflation in the first quarter minus the change in inflation in the fifth quarter divided by two. The consumption tax was increased in 1997Q2 and 2014Q2.



**Figure 13.3 Macroeconomic developments in Japan, 1954Q1–2017Q1**



CPI = consumer price index

Note: Inflation has been adjusted to remove the effects of increases in the consumption tax.

Sources: Bank of Japan, Haver Analytics, and authors' calculations.

mediation during much of the 1990s, slower growth of the working-age population, and convergence toward per capita income levels of the most advanced economies would have slowed real growth regardless of monetary policy or inflation.

However, ultra-low inflation makes it harder to reduce the real value of debts, and banks find it difficult to improve their balance sheets when nominal GDP is stagnant. In any event, the level of output does appear to have been below potential on average since the advent of ultra-low inflation. The BOJ's estimate of the output gap has fallen from an average of 1.7 percent before 1993 to -1.0 percent since 1993 (see figure 13.3). This estimate probably understates the economy's true underperformance. The unemployment rate has risen from an average of 1.9 percent before 1993 to 4.1 percent since then. Even if the natural rate of unemployment is now close to 3 percent, as appears likely, Okun's law suggests that an average excess unemployment rate of 1 percent implies a shortfall in GDP of 2 percent.<sup>4</sup> Cumulated over more than 20 years, this shortfall represents an

4. Note that the BOJ estimates that output is slightly above potential in 2017 with an unemployment rate slightly below 3 percent.

enormous loss of goods and services that could have been consumed or invested in Japan.

In 1993—well after the bubbles had burst—the BOJ’s policy interest rate was above 3 percent. Adam Posen (1998) provided one of the earliest critiques of Japanese macroeconomic policy after the bubbles. He argued for coordinated monetary and fiscal expansion to return output to potential and avoid deflation. Soon thereafter, the BOJ began to take more aggressive monetary policy measures (the zero interest rate policy in 1999 and quantitative targeting in 2001) but it reversed direction before deflation was fully conquered. A faster, stronger, and more sustained response to deflation in the early 1990s would have been warranted and might have maintained inflation near 2 percent in the subsequent decades (Ahearne et al. 2002). Twenty years of zero inflation, however, have changed the expectations of firms and workers in Japan. Raising inflation back to 2 percent is much harder now, as evidenced by the limited success of the BOJ’s massive quantitative easing policy since 2013 (Ball et al. 2016, 48–50). Surveys of professional forecasters reveal that long-term inflation expectations in Japan were very slow to decline and remained above actual inflation for most of the 1990s and 2000s.<sup>5</sup> Getting expectations to rise will also take time and is likely to require a sustained increase in actual inflation. A key lesson for Asian economies is not to allow inflation and inflation expectations to become entrenched below 2 percent.

### **Economic Costs of Ultra-low Inflation**

One important cost of ultra-low inflation is that relative prices become more difficult to change. When inflation is positive and prices and wages are rising on average, firms can adjust relative prices in response to shifts in tastes, technology, and competitive conditions by increasing some prices at a faster rate and others at a slower rate. When overall inflation is zero, adjustments in relative prices require firms to reduce some prices in nominal terms. If there is resistance to cutting prices, the economy needs to run below its full-employment level to force some wages and prices down to keep the average inflation rate near zero (Akerlof, Dickens, and Perry 1996; Benigno and Ricci 2011). Studies find evidence of such downward rigidities in wages in many countries (Dickens et al. 2007; Fallick, Lettau, and Wascher 2016). Once nominal wages begin to decline, the fear of a deflationary spiral can lead households and firms to cut spending, adding further downward pressure to an already weak economy.

Akerlof, Dickens, and Perry estimated that an overall inflation rate of

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5. *Consensus Forecasts*, various issues.

at least 2 percent is needed to avoid the bulk of the economic cost of downward nominal wage rigidity.<sup>6</sup> In comments published with the Akerlof, Dickens, and Perry paper, Robert Gordon and Greg Mankiw suggested that downward nominal wage rigidity might become less apparent as people become used to low inflation or in the event of severe economic distress. However, Fallick, Lettau, and Wascher show that these conjectures did not prove correct in the aftermath of the Great Recession in the United States.

Another reason to prefer a positive inflation rate is that price indexes do not fully control for quality improvements and the welfare benefits of new goods. These omissions bias published inflation measures up by as much as 1 percent per year, so that a reported inflation rate of 1 percent may reflect constant true prices (Bank of Canada 2013).

### **Ultra-low Inflation, Interest Rates, and Monetary Policy**

Because economic equilibrium depends on the real rate of interest over both short and long horizons, an environment of low expected inflation must be accompanied by low nominal rates of interest. Moreover, recent studies document a decline in the equilibrium real rate of interest in many advanced economies (Holston, Laubach, and Williams 2016; Williams 2017). Figure 13.4 shows that the real short-term interest rate has trended down in many of the Asia-15 economies. In 2016 it was below its historical average in these economies except India and Vietnam.

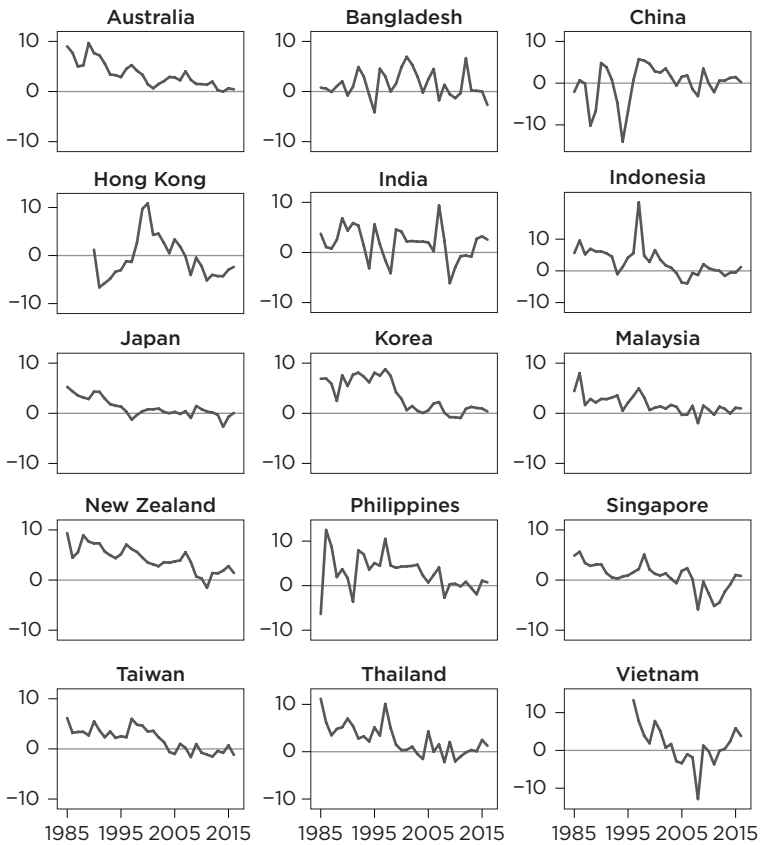
In most economies in the Asia-Pacific region with active and open bond markets, long-term interest rates have declined since 2000, a period in which long-term inflation expectations are likely to have been fairly stable. As figure 13.5 shows, this has mirrored the movement in average long-term rates in advanced economies. Since the mid-2000s local-currency bond markets of many Asian emerging-market economies have thus become part of this expanding global market (Obstfeld 2015). But note that the long-term rates of emerging Asian economies on average rose more sharply than rates in advanced economies in the two periods of bond market turbulence—in 2008 and during and after the 2013 taper tantrum.

As King and Low (2014) have concluded, given the high correlation between bond yields of different countries (emerging as well as advanced economies), “it therefore is quite reasonable to talk about a ‘world’ interest rate.” The real long-term rate has been declining for about 30 years. Observations for the most recent years using a principal-components estimate based on 10-year government bonds of three major markets show that the world real long-term interest rate has been hovering around zero

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6. Wyplosz (2001) also argues for optimal rates of inflation above 2 percent in major European economies.

**Figure 13.4 Real short-term interest rates in Asia, 1985–2016**  
(percent)



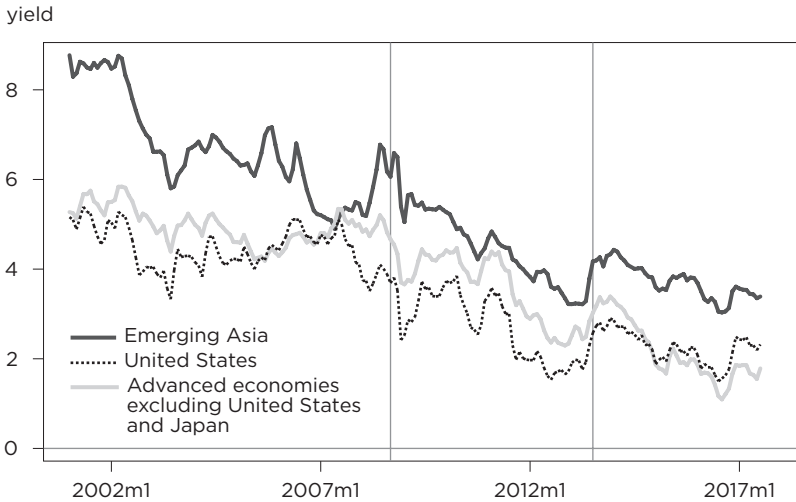
Note: Real interest rate is three-month Treasury bill rate (or closest equivalent) minus current consumer price index (CPI) inflation rate.

Sources: Haver Analytics and IMF *International Financial Statistics* and *World Economic Outlook* databases.

since mid-2011 (graph 2 in Hördahl, Sobrun, and Turner 2016). Rachel and Smith (2015) attribute about two-thirds of the long-run decline to secular factors shaping desired saving and investment rates in the global economy. They argue that the likely persistence of these factors suggests that the underlying global neutral real rate will settle at around 1 percent in the medium to long run.<sup>7</sup> If this prognosis is correct, central banks will again grapple with the zero lower bound for the policy rate.

7. Laubach and Williams (2015) also estimate a long-run equilibrium real rate of around 1 percent for the United States. They attribute the decline in the long-run equilibrium real rate mainly to the decline in the growth rate of potential output.

**Figure 13.5 Long-term bond yields: Emerging Asia and selected advanced economies, January 2001 through July 2017**



Note: Vertical lines denote the collapse of Lehman Brothers in September 2008 and the taper tantrum in July 2013. Emerging Asia is the unweighted average of Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand. Advanced economies are the unweighted average of Australia, Canada, euro area, New Zealand, Sweden, and United Kingdom.

Sources: Bank for International Settlements and Haver Analytics.

The decline in equilibrium rates of interest took both markets and central banks by surprise. Because policy rates have lagged the equilibrium rate in coming down, there has been a secular downward pressure on inflation. To some degree this downward trend in inflation has been welcome. However, in a few economies it has gone too far. Asian economies with slowing trend growth rates are at risk of getting trapped in harmful deflation, as in the case of Japan since the early 1990s.

With a low inflation rate and a low equilibrium real interest rate, the nominal policy interest rate will be close to zero in the future. The difficulty of setting the policy rate much below zero greatly reduces the scope for countercyclical monetary policy, at least using the conventional policy tool. Ball et al. (2016) show for the United States that the zero bound is likely to constrain conventional monetary policy in all but the mildest of recessions as long as inflation and inflation expectations remain near 2 percent. Although fiscal policy can, in principle, play an important role in macroeconomic stabilization when monetary policy faces the zero bound, the experience of the major advanced economies in the aftermath of the global financial crisis demonstrates that political and institutional barriers to effective fiscal policy can be substantial.

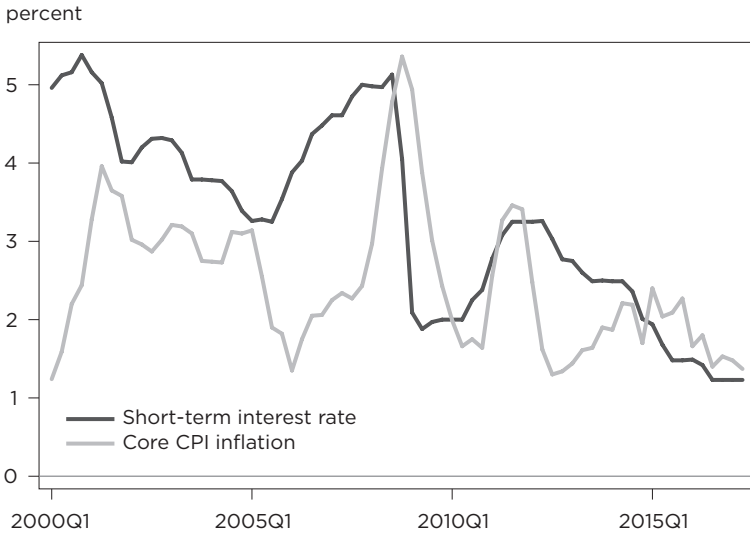
The case of Korea is instructive (see figure 13.6). From 2000 through 2008, Korea's short-term interest rate averaged 4.3 percent and core inflation averaged 2.8 percent, implying a real interest rate of 1.5 percent. To stabilize the Korean economy during the global financial crisis, the Bank of Korea cut short-term interest rates by more than 3 percentage points.

Since 2009, the short-term interest rate has averaged 2.2 percent and the core inflation rate also averaged 2.2 percent, implying a real interest rate of 0.0 percent. Currently, core inflation is 1.4 percent. If inflation were to settle in at 1 percent and the equilibrium real interest rate is now 0 percent, then the "new normal" policy rate would be 1 percent. In the event of a negative shock to the Korean economy, the Bank of Korea would not be able to lower the policy rate by as much as it did in 2009. Without the help of fiscal policy or unconventional monetary policy (discussed below) Korea would be subject to longer recessions and slower recoveries. To reduce this risk, the Bank of Korea should set its policy stance to ensure that inflation returns at least to its target rate of 2 percent and seriously consider a slightly higher target, say 3 percent, which had been the target only two years ago.

Figure 13.7 shows that Thailand is at risk of falling into sustained deflation. With the policy rate at 1.5 percent, the Bank of Thailand would not be able to deliver the 2 percentage point easing of conventional policy that it did during the global financial crisis. Moreover, policy seems to be too tight as the real interest rate is higher than in Korea and core inflation is falling further below target. In the latest Article IV consultation, IMF staff recommended further monetary ease. Thai authorities preferred to preserve space for future policy action, arguing that inflation expectations are well anchored and lower interest rates could raise risks to financial stability. However, as seen in Japan in the 1990s, measures of expectations typically lag rather than lead actual inflation trends. In addition, research suggests that preserving policy space is the wrong strategy for an economy at risk of deflation. In such circumstances, an inflation surprise to the downside is harder to deal with than a surprise to the upside. Therefore, a central bank should be more aggressive than otherwise in easing policy as it approaches the zero lower bound to avoid the danger of the liquidity trap (Reifschneider and Williams 2000).

We also note that Singapore and Taiwan are currently at the zero lower bound. Any additional monetary ease in these economies must come in the form of unconventional monetary policies, which we discuss in the next section.

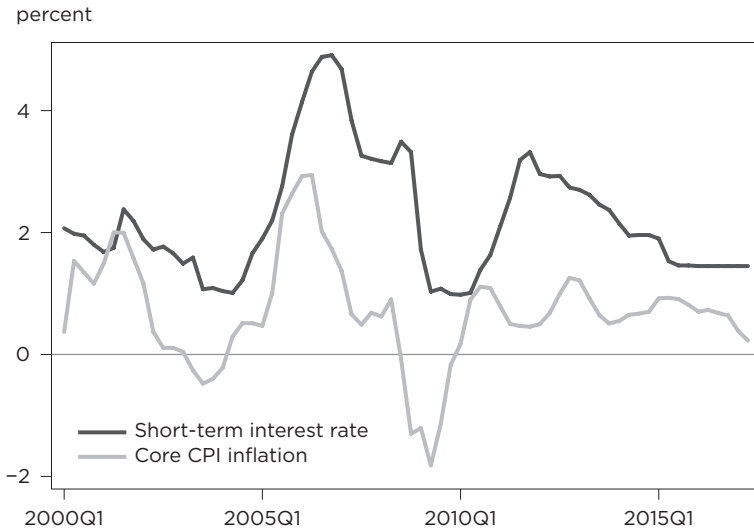
**Figure 13.6 Korean monetary policy since the Asian financial crisis, 2000Q1-2017Q2**



CPI = consumer price index

Source: Haver Analytics. Interest rate is the call money rate. Inflation is the four-quarter change in the CPI excluding agriculture and oil.

**Figure 13.7 Thai monetary policy since the Asian financial crisis, 2000Q1-2017Q2**



CPI = consumer price index

Source: Haver Analytics. Interest rate is the call money rate. Inflation is the four-quarter change in the CPI excluding food and energy.

## Risks from Global Bond Markets: The “Taper Tantrum”

Central banks in Asia facing subpar growth and below-target inflation are vulnerable to shocks from global bond markets that could suddenly tighten domestic financing conditions. The increased importance of domestic bond markets in monetary policy transmission (Mohanty 2014) means that central banks in Asia may have to make greater use of their balance sheets than when credit was supplied exclusively by banks at rates linked to the short-term interest rate set by the central bank.

Central banks need to be ready for external shocks to the world real interest rate. As described above, there are sound reasons to believe that the equilibrium real interest rate has declined secularly. Yet part of the decline observed since 2011 is cyclical and reflects central bank purchase of bonds. The unexpected depth and length of the recession in advanced economies after the global financial crisis (and the associated pessimism about the future) has depressed the world long-term rate. If growth-friendly policies succeed in closing the global output gap and end the trend decline in inflation, investment rates would probably rise and precautionary savings fall. We cannot know how suddenly global long-term rates would rise. The taper tantrum of 2013 showed that expectations of monetary policy tightening in the United States could have a large effect on Asian bond markets even when domestic conditions in Asia do not change (see figure 13.5).

The taper tantrum demonstrated how externally driven swings in local bond market liquidity in emerging markets can affect local financial conditions in a dramatic way. Monetary policy, notably central bank balance sheet policies, may need to offset these shocks. During the taper tantrum, the average of yields on local-currency government bonds in the more open Asian markets rose sharply—from 3.2 percent in April 2013 to 4.4 percent by January 2014—and market volatility spiked higher. In some emerging markets, currencies fell sharply just as bond prices declined, although exchange rate movements in the Asia-15 economies were mixed and mostly rather small.

The bond markets in most emerging markets are of recent birth, and market liquidity is vulnerable to swings in foreign investor sentiment. In many countries, the domestic investor base is narrow, dominated by banks or state-run pension funds. Because the intrinsic liquidity of the markets for government bonds in many emerging markets is still comparatively low, some foreign investors tend to rely on intermediary instruments (bond funds, synthetic exchange traded funds [ETFs], etc.) that promise daily liquidity. When market sentiment changes, this liquidity illusion can be shattered, leading to very heavy sales: Shek, Shim, and Shin (2015) have shown that investor flows into and out of emerging-market funds tend to cluster much more than for advanced-economy bond flows.



As discussed further later in the chapter, the central bank can use its balance sheet to keep the markets for local financial assets operating in the face of a market liquidity shock. This can forestall any self-feeding price movements that could produce a sharp and unwarranted tightening of financial conditions. A particularly bold policy move along these lines was the decision of the Hong Kong Monetary Authority in 1998 to buy 7 percent of domestic equities to thwart a joint speculative attack on its currency peg and stock market (Bayoumi and Gagnon 2018). This policy worked because of the credibility of the central bank's commitment to free financial markets in normal times. In the aftermath of the global financial crisis, several central banks in the emerging markets undertook to lend against (or even buy) financial assets, private as well as public (BIS 2009). Some offered to indemnify asset holders for any eventual losses from continuing to hold government bonds or other paper. Such policies aimed at countering temporary bouts of extreme market illiquidity.

## **Is Low Inflation beyond the Control of Central Banks?**

### **The Phillips Curve Is Dormant, Not Dead**

Many observers have noted that very large increases in unemployment rates during the Great Recession had only small effects on inflation in advanced economies. However, it does not follow that inflation is beyond the control of central banks. Rather, the very low trend rates of inflation coupled with downward nominal wage and price rigidity have put economies in a region where the Phillips curve is flat. But the slope is likely to increase as economies exceed potential by a significant amount. And the slope is likely to be higher in general when inflation is significantly above zero.

This subsection examines the evidence on inflation and the output gap in the United States, which has the longest available series of these data. The first column in table 13.1 presents an estimate of an expectations-augmented Phillips curve (equation 13.1). The dependent variable is the four-quarter percent change in the GDP deflator minus the value of inflation that had been predicted eight quarters ago for the following four quarters.<sup>8</sup> The gap is the difference between the Congressional Budget Office's estimate of the natural rate and the actual unemployment rate. The infla-

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8. The predicted value is from a survey of professional economic forecasters and is provided by Haver Analytics. The inflation forecast of four quarters earlier should have incorporated the effects of the gap of four quarters earlier, leaving no systematic prediction error if forecasters are efficient. An alternative specification based on the contemporaneous output gap and forecasted inflation with a four-quarter lag had a lower  $R^2$  (0.12) and a much smaller coefficient on the gap of 0.46.

**Table 13.1 Phillips curves regressions on US GDP deflator**Inflation – Expected Inflation =  $\alpha + \beta \text{ Gap} + \gamma \text{ Gap}^*(\text{Inflation Dummy})$ 

Expectations measure	Survey	Survey	Lag	Lag	Lag
Emp Gap	1.16*** (0.25)		1.00*** (0.12)	1.15*** (0.13)	
Cap Util Gap		0.53*** (0.08)			0.45*** (0.05)
Emp Gap (Inf<3)	-0.96*** (0.22)		-0.98*** (0.16)	-1.01*** (0.14)	
Cap Util Gap (Inf<3)		-0.56*** (0.09)			-0.45*** (0.07)
Constant	0.32 (0.29)	-0.38** (0.17)	-0.02 (0.17)	0.16 (0.17)	-0.41*** (0.14)
R-squared	0.58	0.58	0.47	0.56	0.60
Observations	182	182	271	199	199
Sample	1972Q2– 2017Q3	1972Q2– 2017Q3	1950Q1– 2017Q3	1968Q1– 2017Q3	1968Q1– 2017Q3

Note: \*\*\*, \*\*, and \* denote 1, 5, and 10 percent significance levels, respectively. Newey-West standard errors with three lags are in parentheses.

Sources: Haver Analytics and authors' calculations. See text for description of variables.

tion dummy equals zero when inflation is above 3 percent and one when inflation is below 3 percent.

$$\text{Inflation}(t) - \text{Expected Inflation}(t-8) = \alpha + \beta \text{ Gap}(t-4) + \gamma \text{ Gap}(t-4)^*(\text{Inflation Dummy}(t-4)) \quad (13.1)$$

The results show that the gap has a large and strongly significant effect when inflation is above 3 percent, but the effect largely disappears when inflation is below 3 percent. This simple model can explain nearly 60 percent of the overall variance of inflation, as shown by the  $R^2$  statistic. The second column displays results using an alternative measure of the output gap: the Federal Reserve's index of capacity utilization in manufacturing, mining, and utilities minus its average value since 1967. The effect on inflation of a 1 percentage point gap in capacity utilization is about half as large as that of a 1 percentage point employment gap, but the explanatory power is essentially identical. As with the employment gap, the effect of the capacity utilization gap declines sharply when inflation is very low.

The remaining columns of table 13.1 display results using a lagged three-year moving average of inflation as a measure of inflation expectations (equation 13.2). The regression shown in column 3 has a much longer sample, back to 1950, and a somewhat lower  $R^2$  than column 1. But the coefficients on the employment gap are reasonably close to those in column

1. Column 4 displays the same regression starting in 1968. The coefficients are almost identical to those in column 1. The final column displays a regression using lagged inflation and capacity utilization. It obtains results similar to those of column 2.

$$\text{Inflation}(t) - 3\text{-year Ave. Inflation}(t-4) = \alpha + \beta \text{ Gap}(t-4) + \gamma \text{ Gap}(t-4) * (\text{Inflation Dummy}(t-4)) \quad (13.2)$$

To check whether the Phillips curve slope may have changed over time, we also ran the regressions of table 13.1 starting in 1992Q1, just after US inflation fell below 3 percent on a sustained basis. There are only nine quarters with inflation above 3 percent in this subsample (2004Q4–2006Q3 and 2007Q1), yet we obtain estimates of the gap coefficients that are almost identical to those shown in columns 1 and 2 and moderately smaller than those in columns 3 to 5.

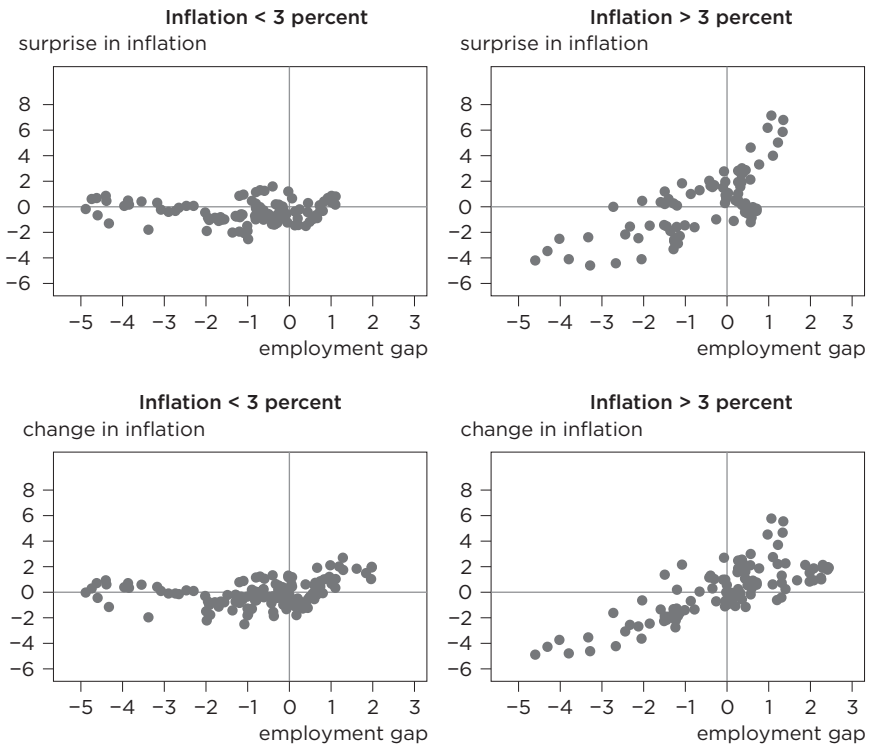
Figure 13.8 displays the inflation surprises (left-hand sides of equations 13.1 and 13.2) and employment gaps (right-hand sides of both equations), where the sample is split between lagged inflation above and below 3 percent. Similar results (not shown) are obtained using capacity utilization. The greater slope in the high inflation regime is apparent for both measures of expectations. It also appears that the slope may steepen for the most positive values of the output gap. However, adding the interacted value of the output gap and a dummy when the output gap is above its mean value yields a significant coefficient (at the 10 percent level) in only the first of the five regressions shown in table 13.1.

### Scope for Unconventional Monetary Policy

Central banks can ease policy and achieve their objectives even at the zero bound. It would be absurd to assume that—irrespective of circumstances—the only legitimate policy tool for a central bank is the overnight rate in interbank markets. The analysis by Reddy (2017) supports this policy conclusion. The following paragraphs suggest some possibilities. What would work best will depend on country circumstances (including political constraints) and on macroeconomic conditions.

To a small extent, central banks can reduce policy rates below zero. Switzerland has pushed short-term interest rates more deeply negative than any other economy, at  $-0.75$  percent. It may be possible to go more negative, but there is a risk that at some point banks and firms might begin to store large volumes of paper currency. In addition, banks in any economy with negative policy rates have not passed the negative rates through to household deposits. This lack of pass-through to household deposits limits the effectiveness of negative policy rates and hurts bank profitability.

**Figure 13.8 US Phillips curves for GDP inflation and employment gap, 1955Q1-2017Q1**



Source: Haver Analytics and authors' calculations.

Another channel for easing policy at the zero bound is to provide forward guidance to markets that the policy rate will remain near zero for several years. The credibility of such a commitment almost surely declines with the horizon of the commitment, as central bank governors and policy board members cannot legally restrict their own future actions, let alone those of their successors. But forward guidance does appear to have worked over horizons of two to three years (Campbell et al. 2012).

Probably the most general avenue for easing policy at the zero bound is the active use of the central bank's own balance sheet. Table 13.2 represents a stylized central bank balance sheet to show just how many tools a central bank has at its disposal. In almost all emerging-market economies in Asia, the central bank balance sheet is very large. A major driver of this expansion was the huge accumulation of foreign exchange reserves after the Asian financial crisis (discussed in the next section). One consequence of foreign exchange accumulation for the domestic financial system was an

**Table 13.2 A central bank balance sheet**

<b>Assets</b>	<b>Liabilities</b>
Foreign assets	Cash
Government bills	Required bank reserves
Government bonds	Excess bank reserves
Loans to domestic banks	Government deposits
Other local financial assets	Equity

increase in local bank deposits, usually raising commercial bank reserves held with the central bank. When the central bank wanted to prevent this accumulation leading to an increase in bank lending, it typically raised required reserve ratios. For much of this period, however, central banks welcomed the stimulus from bank lending expansion that foreign reserve accumulation supported. Buying domestic financial assets or lending to domestic banks would similarly stimulate aggregate demand even if policy interest rates do not change.

Historically, central banks in the advanced economies have used their balance sheets extensively for macroeconomic purposes. Tobin's (1969) classic work on portfolio rebalancing mechanisms in the transmission of monetary policy (changes in the term premium and other risk spreads) found a recent echo in Gertler and Karadi (2013). Ben Friedman (2014) has argued that the central bank's balance sheet is likely to become a part of the standard toolkit of monetary policy in the years ahead. Farmer (2017) shows how official purchases of equities can counter too-pessimistic animal spirits in markets, and so sustain business investment.

Table 13.3 shows the scope for quantitative easing (QE) in the Asia-15 economies. Among these economies, only Japan is currently engaged in QE, as reflected in the very large size of the BOJ's balance sheet. Many other Asian economies have large central bank balance sheets, primarily reflecting large stockpiles of foreign exchange reserves. We discuss exchange rate and intervention policy in the final section below.

All of these economies have at least some scope for central banks to conduct QE through purchases of government bonds. Three advanced economies (the euro area, Japan, and the United Kingdom) have also subsidized lending to the banking system. The Bank of England estimates that its Funding for Lending scheme has had a macroeconomic impact equivalent to a reduction in the policy rate of 0.75 to 1.50 percent (Bank of England 2014). The column labeled broad money in table 13.3 gives an approximate size of the domestic banking system through which subsidized central bank credit could operate.

**Table 13.3 Scope for quantitative easing, December 2016** (percent of 2016Q4 GDP, seasonally adjusted annual rate)

Country	Central bank liabilities	General government gross debt	Broad money <sup>a</sup>	Equity market capitalization
Australia	10	41	112	100
Bangladesh <sup>b</sup>	n.a.	33	55	16
China	45	44	202	66
Hong Kong <sup>c</sup>	60	0	232	560
India <sup>d</sup>	21	70	82	69
Indonesia	8	28	38	45
Japan	88	239	236	104
Korea	28	38	201	92
Malaysia	35	56	128	131
New Zealand <sup>e</sup>	10	29	99	n.a.
Philippines	30	35	62	80
Singapore	37	112	137	221
Taiwan	87	36	238	157
Thailand	46	42	124	103
Vietnam <sup>b</sup>	n.a.	61	n.a.	3

n.a. = not available

a. M3 where available, otherwise M2.

b. Based on 2016 annual GDP.

c. Data exclude assets denominated in foreign currency and shares of mainland companies.

d. Broad money based on April 2017 to avoid effects of demonetization in late 2016.

e. Central government debt.

Sources: Haver Analytics, Hong Kong Monetary Authority, and International Monetary Fund *World Economic Outlook* database.

Perhaps the most untapped channel for QE is equity purchases. The BOJ is buying about 1 percent of domestic equities per year, but this pace could be increased considerably. In some economies, equities represent a much larger potential market for central banks than government bonds.

A vast literature documents the powerful effects of QE on long-term bond yields in the euro area, Japan, the United Kingdom, and the United States (Gagnon 2016). Though more difficult to prove, there is evidence that QE has stimulated economic activity and inflation. The Federal Reserve purchased long-term bonds equivalent to nearly 25 percent of GDP in successive rounds from 2008 through 2014. Staff estimate that these purchases had a macroeconomic effect roughly equal to that of a 250 basis point cut in the federal funds rate (Engen, Laubach, and Reifschneider 2015). Wu and Xia (2015) estimate a shadow federal funds rate to capture the macroeconomic impact of QE. They find that as of 2014, QE had reduced the

shadow federal funds rate by 200 to 300 basis points. A similar estimate by Lombardi and Zhu (2014) places more weight on the Federal Reserve's balance sheet and implies a shadow federal funds rate of minus 400 basis points by 2011.

In some circumstances, however, governance considerations may in practice limit the large-scale use of the central bank's balance sheet. This can be the case in jurisdictions where full instrument independence of the central bank is not securely established. Central banks must avoid the traps of fiscal and financial dominance; they need to be sure they are free to decide to sell the assets they have purchased if monetary policy so requires. Governments with large debts to refinance may resist higher bond yields. While no central bank will want to provoke financial market volatility, worries about destabilizing bond or equity markets should not prevent central banks from gradually tightening monetary policy when inflation is expected to remain above their targets. The warning of Shirakawa (2015) that markets must not be misled into believing the policy regime has become a "put-option type of monetary policy" is well taken.

### **Should Risks to Financial Stability Constrain Monetary Policy?<sup>9</sup>**

Some central banks feel in a quandary. They worry that a prolonged period of very low interest rates could create risks for financial stability—a reasonable worry since monetary policy works in part by changing financial risk exposures. Lower interest rates reduce the debt service burdens of borrowers and may help keep them solvent. And lower rates typically increase asset prices, raising the value of collateral held by firms and households, thus making them seem better credit risks in the eyes of potential lenders. Debt-to-income ratios can be expected to rise if the decline in interest rates persists, as some recent research suggests (Laubach and Williams 2015, Rachel and Smith 2015). Higher debt and asset prices can be regarded as natural equilibrating mechanisms to a move to a low interest rate environment. Yet it is possible to overshoot the new equilibrium, and any sudden correction would be disruptive. Because no one can know how such worries might materialize, regulatory policy needs to be prepared.

Keeping policy interest rates higher than warranted by macroeconomic conditions would not solve this quandary. This is because a prolonged period of subpar growth and high unemployment also creates financial stability risks. Such risks would be all the greater if prices are falling. The question whether a central bank should keep the policy rate higher than

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9. This section draws on Turner (2017), which provides fuller details and references.

that needed on macroeconomic grounds to counter financial stability risks is not new. Dennis Robertson (1928/1966) answered this question with a clear “no” when he took the (young) Federal Reserve to task in 1928 for focusing its interest rate policy on limiting speculative lending of commercial banks. At that time, the Federal Reserve was guided by what it called the Principle of Productive Credit. Underlining the danger at that time of an undesirable fall in the general level of prices, Robertson proposed instead what he termed the Principle of Price Stabilization, “the stabilization of the price level as the sole and sufficient objective of (central) banking policy.” The subsequent history surely vindicated his view. The Federal Reserve’s acquiescence in the massive collapse of the money supply and a 25 percent decline in the price level after the 1929 crash turned an ordinary recession into the Great Depression.

As the head of economic research at the Reserve Bank of Australia (RBA) has documented, there is little historical evidence that low interest rate environments are inherently unstable—either in creating macroeconomic instability or in destabilizing the financial system (Simon 2015). The main common sense argument for not allowing financial stability worries to override the macroeconomic considerations driving monetary policy is that interest rates high enough to counter some potential financial threat would cripple the rest of the economy. In addition, expectations that determine asset prices or lending expansions are not as stable or predictable functions of policy variables as are macroeconomic variables (BIS 1998). The most general analysis of the issue to date shows that the marginal cost of keeping the policy rate high and accepting higher unemployment outweighs the marginal benefit from the lower probability of a crisis under a wide range of assumptions about the economy (Svensson 2016).

Recent history fully supports this conclusion. From mid-2004 to mid-2006, a substantial rise in policy rates worldwide, which bond markets expected to be sustained, went together with increased risk-taking in the global financial system on all the standard metrics (Turner 2017). In his press conferences as chairman of the bimonthly global economy meetings of central bank governors at the Bank for International Settlements (BIS), Jean-Claude Trichet repeatedly during 2006 and early 2007 underlined the concerns of the governors about overextended financial markets. He explained that central banks had prepared the ground by raising interest rates substantially as economies neared full employment and that the financial industry should prepare for a significant correction. But banks and markets remained entirely complacent.

One telling international comparison between the Bank of England and the Bank of Canada throws some useful light on what would have happened



had short-term rates been kept higher before 2004. The Bank of England, worried about strong domestic demand as well as continued rises in house prices and expecting a return of core inflation to around 2 percent from a lower level, did not follow the sharp cuts in the US federal funds rate in 2001. By mid-2004, the bank rate had been raised to 4¾ percent—even though core inflation was below 1½ percent during almost all of 2003 and 2004. The bank was concerned about “financial imbalances creating problems beyond the two-year horizon of our inflation target.” Yet tighter monetary policy did not prevent the buildup of financial imbalances in the United Kingdom. And this policy did contribute to an overvalued currency, which created its own financial risks.

The Bank of Canada, by contrast, cut interest rates aggressively. But lower rates did not induce Canadian banks to become overextended because of much stricter regulation (notably the existence of a leverage ratio and limits to banks’ off-balance sheet exposures to securitized products) and because a less contestable domestic banking market allowed fatter margins. The major policy shortcomings that aggravated the 2008–09 financial crisis were not related to monetary policy. They were rather the failures of domestic supervisors to address the new risks that innovation in the financial industry had created (Ramaswamy 2017).

The BIS has challenged the Svensson (2016) analysis. In its *2016 Annual Report*, the BIS put forward an alternative path for the federal funds rate from 2002 (BIS 2016). The new policy rule guiding this path was a Taylor rule augmented by a financial cycle proxy. Had the Federal Reserve followed this rule, the BIS argues, the financial crisis would have been avoided and there would have been a gain of about 1 percent a year in real US GDP over a decade or so, or 12 percent cumulatively.

As Turner (2017) documents, however, the methodology underlying this calculation raises many questions. The federal funds rate implied by the financial cycle-augmented Taylor rule rises earlier but by much less than the actual funds rate over the 2003–06 period. As noted above, substantial rises in the Bank of England’s policy rate and in the federal funds rate to over 5 percent failed to curb financial market risk-taking—much to the chagrin of Trichet and the other governors. Why then would a more modest rise started a little earlier have worked? It is implausible that a new monetary policy rule would have significantly reined in the housing bubble and added so much to US GDP. We are skeptical that a Taylor rule augmented by any financial cycle proxy would be a useful guide to policy. As Federal Reserve chair Janet Yellen put it shortly after the publication of the 2014 BIS *Annual Report*, which had urged central banks to more quickly return interest rates to normal levels because of financial stability worries, “there

is no simple rule that can prescribe, even in a general sense, how monetary policy should adjust to shifts in the outlook for financial stability.”<sup>10</sup>

The implication from this new rule for monetary policy that was underlined by the BIS in June 2017 was that central banks “may have to tolerate longer periods of inflation below target, and tighten monetary policy if demand is strong, even if inflation is weak, so as not to fall behind the curve with respect to the financial cycle.”<sup>11</sup> Certainly, strong demand growth especially when the economy is near full employment justifies a tightening in monetary policy. But we would not agree that central banks should keep interest rates up in the face of prolonged periods of inflation below their targets. Such a policy would run counter to the inflation targeting mandates of many central banks and aggravate the risks of recession.

Almost everywhere, the postcrisis policy response focused primarily on tightening regulation and developing new macroprudential tools. Monetary policy was progressively eased to counter a deep and prolonged weakness in aggregate demand. Although such a recession was perhaps inevitable given the severity of the global financial crisis, its persistence was a surprise. Few (if any) expected interest rates to remain low for so long. The United States both tightened regulations (notably forcing the banks to recapitalize) more rigorously and uniformly and eased monetary policy more promptly than was the case in the euro area. This difference, as well as the fragmented policy response to the euro area’s existential crisis, likely explains why the United States was more successful in ending its recession.

The implications of unusually low interest rates globally for the balance sheets of households, companies, and financial institutions are going to be much larger than in the past because rates have been low for so long (Hannoun and Dittus 2017). Those responsible for prudential regulation need to pay particular attention to two important classes of risk. The first is the risk associated with borrowers becoming more highly leveraged. The second is the interest rate risks on the balance sheets of financial intermediaries. Near-zero or negative interest rates on shorter maturities have induced banks and other investors to seek yield by lengthening the maturity of the bonds they hold as assets. The profitability of interest rate carry-trades for many years has led many financial firms to lengthen the maturity of their debt instruments, which has lowered long-term rates. Falling long-term interest rates for some years have given large capital gains to financial firms holding bonds on the asset side of their balance sheets.

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10. Janet Yellen, “Monetary policy and financial stability,” 2014 Michel Camdessus Central Banking Lecture, International Monetary Fund, Washington, DC, July 2, 2014.

11. “Central banks warned on inflation risk: BIS annual report focuses on danger of interest rates staying low for too long,” *Financial Times*, June 26, 2017.

At the same time, this lengthening in duration has made the market value of portfolios of debt securities more sensitive to changes in benchmark long-term rates. Interest rate risk exposures have therefore risen. Even in normal times, regulatory and accounting rules do not treat interest rate risk well. Some recent regulations (e.g., the international banking rules of Basel 3 and the Solvency 2 regulations for European insurance companies) have inadvertently magnified interest rate exposures. When global interest rates are lower and more stable than they have been historically, those supervising banks and institutional investors need to look especially hard at how their current rules encourage greater interest rate risk exposures. And they need to redouble efforts to better manage such exposures.

Interest rate developments should also influence the design of macroprudential instruments. Consider the evolution of rules on household property mortgages. One way of protecting households from borrowing too much when interest rates are unusually low is to impose debt-to-income ratios. After successfully using loan-to-value (LTV) ratios, for example, the Reserve Bank of New Zealand (RBNZ) recently proposed that it be given powers to use debt-to-income ratios. It argues that such ratios would help to constrain the credit/asset price cycle in a manner most other macroprudential ratios would not (Reserve Bank of New Zealand 2017).

To those who argue that macroprudential tools are not perfect and occasionally may need to be reinforced by monetary policy, we counter that all policy tools are imperfect. It is better to develop new macroprudential tools—or improved techniques for existing tools—than to sacrifice the important objectives of monetary policy for a goal that it is ill suited to achieve. In many cases, the financial risks that cause most concern are sector-specific (e.g., increased mortgage debt in many Asian countries) and require a tailored policy response. A recent speech by the vice president of the ECB exemplified the approach we support.<sup>12</sup> QE has produced stronger growth, which has helped make banks in the euro area stronger. But he also reported ECB data on how very low interest rates were creating larger maturity mismatch risks in nonbank financial institutions and then explained the need to expand the macroprudential toolkit to address these new risks.

So our answer to the question of this section is: No, financial stability considerations should not in general constrain monetary policy. But prudential policies may need to be adapted to curb risks created by higher levels of debt and by the maturity mismatches/interest rate exposures associated with a long period of very low rates. A possible rejoinder is that this answer amounts to advocating that one arm of policy (regulation) undo

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12. Vítor Constâncio, “The evolving risk landscape in the euro area,” speech at a Banco do Portugal conference on financial stability, October 17, 2017.

the inevitable consequences of another arm of policy (monetary expansion). This rejoinder is not convincing. Expansionary monetary policy in a depressed economy can also improve financial stability (higher incomes from stronger growth lower debt-to-income ratios of many borrowers, lower interest charges help liquidity-constrained but viable debtors avoid default, encouraging investors to buy risky assets that are typically undervalued in a recession, and so on). It deserves emphasis that there is no logical presumption that monetary tightening needs to complement macroprudential tightening measures.

In many circumstances the central bank will want to ease monetary policy but tighten macroprudential policies. The recent policies of the RBNZ illustrate this well. As the governor noted, the introduction of macroprudential speed limits on high loan-to-value lending for mortgages “moderated excesses in the housing market, thereby enabling the Bank to delay the tightening of interest rates, and reducing the incentive for further capital inflows into the New Zealand dollar.”<sup>13</sup>

## Exchange Rate Policy

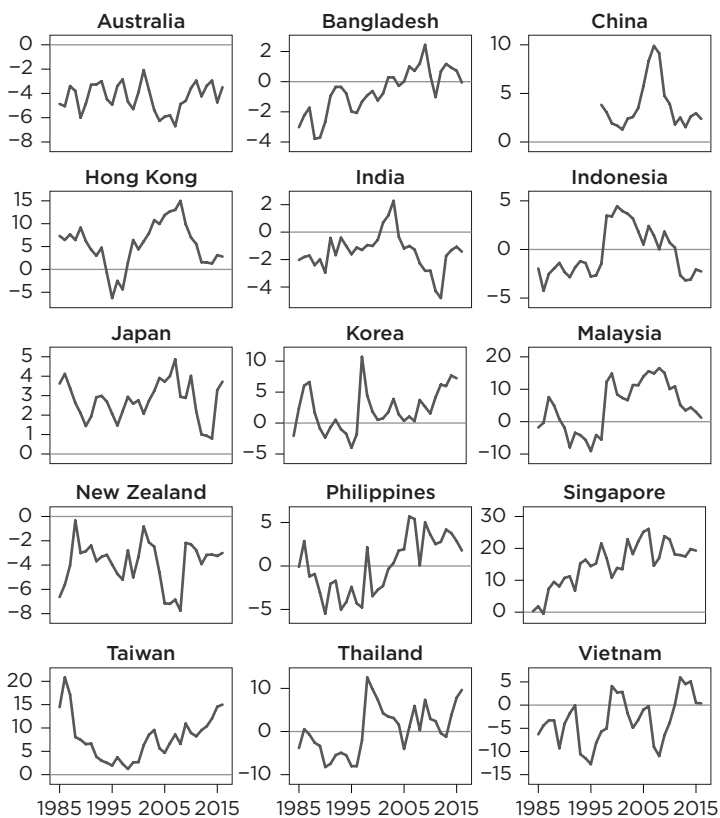
If Asian economies were suffering a loss of external demand, it might be argued that officials should seek a more competitive exchange rate by selling domestic currency for foreign currencies. However, in economies where the growth slowdown is most pronounced (Korea, Japan, Thailand, Hong Kong, Singapore, and Taiwan) the cause is domestic not external. These economies have current account surpluses, and in all but Hong Kong, these surpluses have been rising in recent years (see figure 13.9). Thus, the external sector has on net been supporting growth in most of the Asian economies experiencing slower growth. Among the large emerging Asian economies, only India and Indonesia have current account deficits, which in both cases are quite modest at around 2 percent of GDP.

Figure 13.10 shows that many Asian economies have piled up unprecedented levels of foreign exchange reserves and paid down official external debts in some cases. In many cases, official foreign assets far exceed reasonable precautionary needs (Bergsten and Gagnon 2017). Moreover, combatting currency mismatches in the private sector is much more important than accumulating reserves for preserving financial stability and preventing future balance of payments crises (Gagnon 2013). For instance, the currency mismatch data reported in Chui, Kuruc, and Turner (2016) show that foreign-currency debts in the corporate sector in some Asian economies grew too rapidly because foreign lenders took too much comfort from

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13. Wheeler, “Reflections on 25 years of inflation targeting.”

**Figure 13.9 Current account balances in Asia, 1985–2016**  
(percent of GDP)

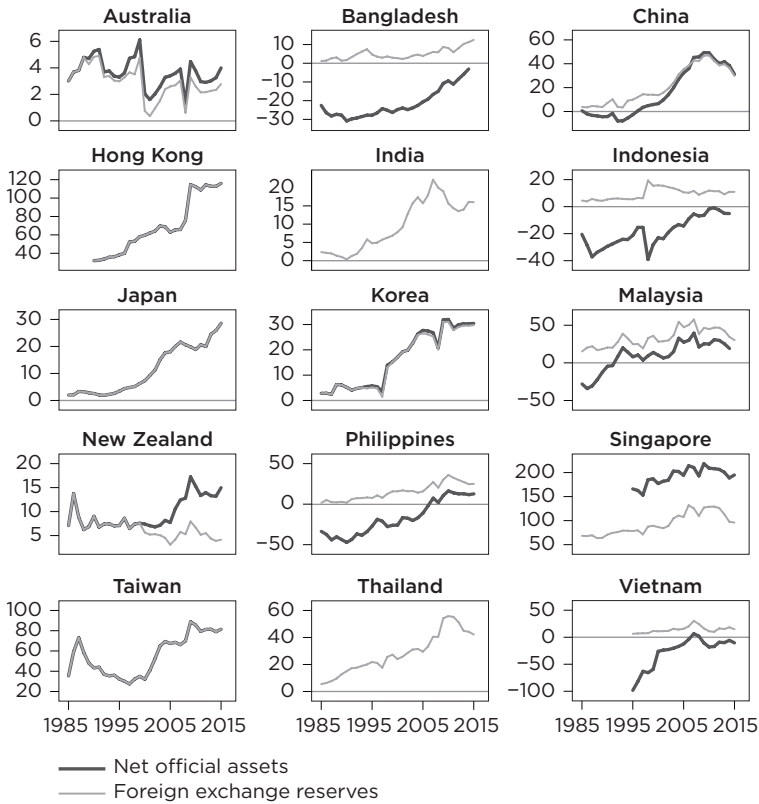


Source: IMF *World Economic Outlook* database.

very high levels of official foreign exchange reserves. In some cases, quasi-fixed exchange rate regimes encourage foreign-currency borrowing. Neither macroeconomic nor precautionary needs justify continued accumulation of foreign exchange reserves by most large Asian economies. The IMF estimates that the aggregate savings ratio of developing Asia has exceeded 40 percent of GDP for many years—far above that prevailing elsewhere. In such circumstances, and given the chronic shortfall of aggregate demand at the global level since the global financial crisis, excess reserve accumulation that supports a current account surplus exerts a powerful negative externality on the rest of the world.

In some cases, the stock of foreign exchange reserves may fall as officials seek to prevent unwanted currency depreciation. For example, China's reserves fell by roughly \$1 trillion over the past three years. The central bank

**Figure 13.10 Foreign exchange reserves and net official assets in Asia, 1985–2016** (percent of GDP)



Note: Net official assets are foreign exchange reserves plus other official assets (including sovereign wealth funds) minus official borrowing in foreign currencies.

Source: Bergsten and Gagnon (2017).

may want to prevent a credit-depressing shrinkage of its balance sheet. In the case of China, a rise in loans to domestic banks offsets the decline in foreign-currency assets on the central bank's balance sheet.

## Conclusion

Growth in several Asian economies remains disappointing, and there are downside risks. With inflation declining to very low levels, central banks in Asia should be ready to use the policy tools at their disposal to sustain aggregate demand to meet medium-term inflation targets. Indeed, for Thailand at least, conditions already support further monetary ease.

Financial stability worries do not in general justify keeping the policy rate higher than warranted by macroeconomic conditions. Indeed, such a policy would be fraught with risks: For instance, when discussing the Swedish Riksbank's decision to raise rates in 2010 to counter a property price bubble, Brunnermeier and Schnabel (2016) pointed out that increasing rates when banks are vulnerable and leverage in the economy high might not be the best option. At the top of the policy agenda should be measures to adapt both regulatory and macroprudential policies and the focus of supervision should be on the new (or accentuated) financial risks created by a very long period of exceptionally low interest rates, long as well as short.

Although globalization has weakened some of the channels of monetary policy transmission, Asian central banks have not lost their monetary autonomy.<sup>14</sup> The volatility of capital flows and vulnerability of domestic financial conditions to sudden shifts in investor risk preferences create difficult monetary policy dilemmas. As Obstfeld (2015) put it, "financial globalization has worsened the trade-offs monetary policy faces in navigating between multiple domestic objectives." The most reliable compass remains flexible inflation targeting. Even if the policy rate gets stuck at the zero lower bound, central banks still have tools to keep inflation within their policy mandate. In particular, they have the scope to expand their holdings of domestic assets (financial securities and loans to banks).

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