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**Agustin Carstens**

Inflation is Back, Challenging Central Banks

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Lessons Learned on Normalizing Monetary Policy

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Defusing Debt Risks

**Joachim Wuermeling**

Regulating Innovation or Innovating Regulation? What it Takes to Make Digital Finance a Success

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# Special Column on Global Inflation and China's Measures to Stabilize Economy

## Inflation: A Look under the Hood

By BIS ANNUAL ECONOMIC REPORT

### Key takeaways

- To better understand inflation, it is key to go beyond aggregate analysis in order to separate relative from generalised price changes and examine their joint dynamics.
- Periods of high and low inflation are very different, notably with respect to their self-stabilising properties and how firms and workers respond to relative price shifts.
- Preserving a low inflation environment is paramount and requires ensuring that relative price changes do not translate into entrenched inflation. Transitions from low- to high-inflation regimes are especially challenging because they tend to be self-reinforcing.
- Monetary policy has an essential role to play in ensuring the durability of a low-inflation regime through the features of its operating framework as well as through flexible and timely adjustments in the policy stance.

### Introduction

The recent remarkable surge in inflation after its long quiescence has raised pressing questions about the dynamics of inflation more generally. In the process, it has put the spotlight on the importance of sector-specific developments including the persistent pandemic-induced shift from services to goods; sectoral bottlenecks in global value chains; and soaring food and energy prices (see Chapter I). An urgent question is whether higher inflation will become entrenched.

These developments have underscored the need to go beyond the aggregate dynamics of inflation in order to shed further light on how its engine works, ie to look “under the hood”.

What does this mean, concretely? Many workhorse models of inflation build on a Phillips curve relationship between inflation and economic activity. Taking this approach, inflation fluctuations reflect aggregate demand pressures on productive capacity, temporary supply shocks and changes in inflation expectations. Looking under the hood complements this perspective. It distinguishes clearly between a multitude of relative price changes and underlying inflation itself. It examines in detail how, and under which conditions, such relative price changes can morph into broader-based inflation. And it pays close attention to the wage-price formation process – the core of the inflation engine – illuminating how this depends on the rate of inflation itself and how it is linked to inflation perceptions and expectations. This also means going beyond the well known cyclical drivers of inflation to examine the structural influences on wage- and price-setting. These are often global in nature.

The distinction between relative price changes and underlying inflation is critical. Relative price changes reflect those in individual items, all else equal. This may or may not be related to

underlying inflation, ie a broader-based and largely synchronous increase in the prices of goods and services that erodes the value of money and devalues the “unit of account” over time.

Looking under the hood reveals some important features of the inflation process.

Low-inflation regimes turn out to be very different from high-inflation ones.<sup>1</sup> When inflation settles at a low level, it mainly reflects changes in sector-specific prices and exhibits certain self-equilibrating properties. Changes in inflation become less sensitive to relative price shocks, and wage and price dynamics are less closely linked. Moreover, there is evidence that the impact of changes in the monetary policy stance becomes less powerful.

Transitions from low- to high-inflation regimes tend to be self-reinforcing. As inflation rises, it naturally becomes more of a focal point for agents and induces behavioural changes that tend to entrench it, notably by influencing wage and price dynamics. This puts a premium on better understanding how transitions work in order to be able to identify them early enough as events unfold. The transition from a low- to a high-inflation regime in the late 1960s and early 1970s illustrates some of the possible forces at play. These include large and persistent relative price increases – notably oil – in a context of strong cyclical demand and in an environment structurally conducive to wage-price spirals, ie high pricing power of labour and firms coupled with the loss of the monetary anchor provided by the Bretton Woods system.

Monetary policy plays a key role in establishing and hardwiring a low-inflation regime and in avoiding transitions to a high-inflation one. Once a low-inflation regime is established, monetary policy can afford to be more flexible and tolerate more persistent, if moderate, deviations of inflation from targets. Having gained precious credibility, it can reap the benefits. At the same time, monetary policy must ensure that the regime is not jeopardised. It is one thing to tolerate moderate deviations from point targets; it is quite another to put the system’s self-equilibrating properties to the test. The costs of bringing inflation back under control can be very high. Calibrating policy to prevent transitions is especially challenging.

This chapter examines inflation in depth, from an under the hood perspective. It starts by defining inflation and characterising its behaviour as a function of its level, drawing on the disaggregated price data that underpin it. It then provides a systematic analysis of wage- and price-setting behaviour and of how changes in relative prices can give rise to inflation, facilitating transitions across regimes. Finally, it explores the key role of monetary policy in securing a low-inflation regime and preventing transitions to a high-inflation one.

## Inflation: stylised facts

Conceptually, the term “inflation” encapsulates the notion of an erosion of the purchasing power of money.<sup>2</sup> Inflation can be thought of as a change in the value of the numeraire vis-à-vis all goods and services. When looked at from this perspective, in its purest form, inflation would imply a proportional and synchronous change in all prices.<sup>3</sup> As such, it would leave the relative prices of all goods and services unchanged: only their prices expressed in terms of the numeraire would vary.

In practice, however, price changes are never perfectly synchronous. Different goods and services have different adjustment speeds. This is because the process of changing prices uses valuable firm resources and very frequent adjustments need not be optimal, especially in the presence of long-term relationships between buyers and sellers (“nominal rigidities”).<sup>4</sup> For example, the prices of commodities are much more variable than those of, say, manufactured goods and, even more so, of services.

Therefore, inflation, measured as the change in some general and comprehensive price index, will always reflect changes in relative prices in addition to underlying inflation. Some measures of inflation seek to partly disentangle the two, in a very rough fashion, most commonly by excluding the most volatile items. This, however, still misses the rich nature of granular price

changes, both transitory and long-lasting, if not permanent. Longer-lasting ones tend to be driven by structural “real” forces, such as changes in consumer preferences and relative productivity trends.

From a historical perspective, focusing on countries with a long history of price data, extended phases of high inflation have been relatively rare. The Great Inflation of the 1970s is the archetypal example. High rates of inflation have also typically followed wars. A look at cross-country historical data since 1870 (Graph 1.A) reveals that inflation was low, although volatile, over the years of the first globalisation era (1870–1914) but surged during World War I and World War II. In the aftermath of World War II, most belligerents experienced high inflation for some years (Graph 1.B). Again, the 1970s stand out for both the length and global reach of inflationary forces.

Extremely high-inflation episodes, or hyperinflations,<sup>5</sup> are even less frequent. These typically follow periods of major political upheavals and a generalised loss of confidence in institutions. The defining characteristics of hyperinflations are large budget deficits that are increasingly directly financed by central banks (often due to the inability to collect sufficient revenues via taxes). One consequence is spiralling exchange rate depreciations.<sup>6</sup> Telling examples include post-revolutionary France and the aftermath of World War I in the Soviet Union and Germany. More recently, some countries in Latin America experienced hyperinflation in the wake of the debt crisis of 1982, while Russia saw an inflation rate of around 2,500% in 1992 following the collapse of the Soviet Union.

The dynamics of inflation vary systematically with its level along a number of dimensions, pointing to important differences between low- and high-inflation regimes. In particular, it is well known that when inflation becomes durably low, its volatility tends to fall, as does its persistence.<sup>7</sup> However, looking under the hood at more granular price increases reveals several additional striking features.

### Inflation from a historical perspective<sup>1</sup>

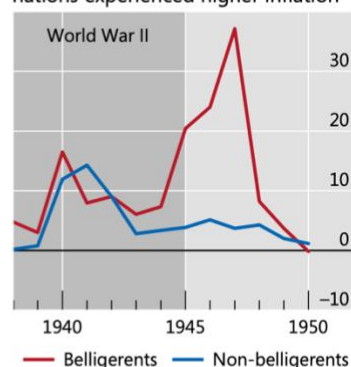
In per cent

Graph 1

A. Except for wartime and the 1970s, inflation tends to be low



B. Following World War II, belligerent nations experienced higher inflation



<sup>1</sup> See technical annex for details.

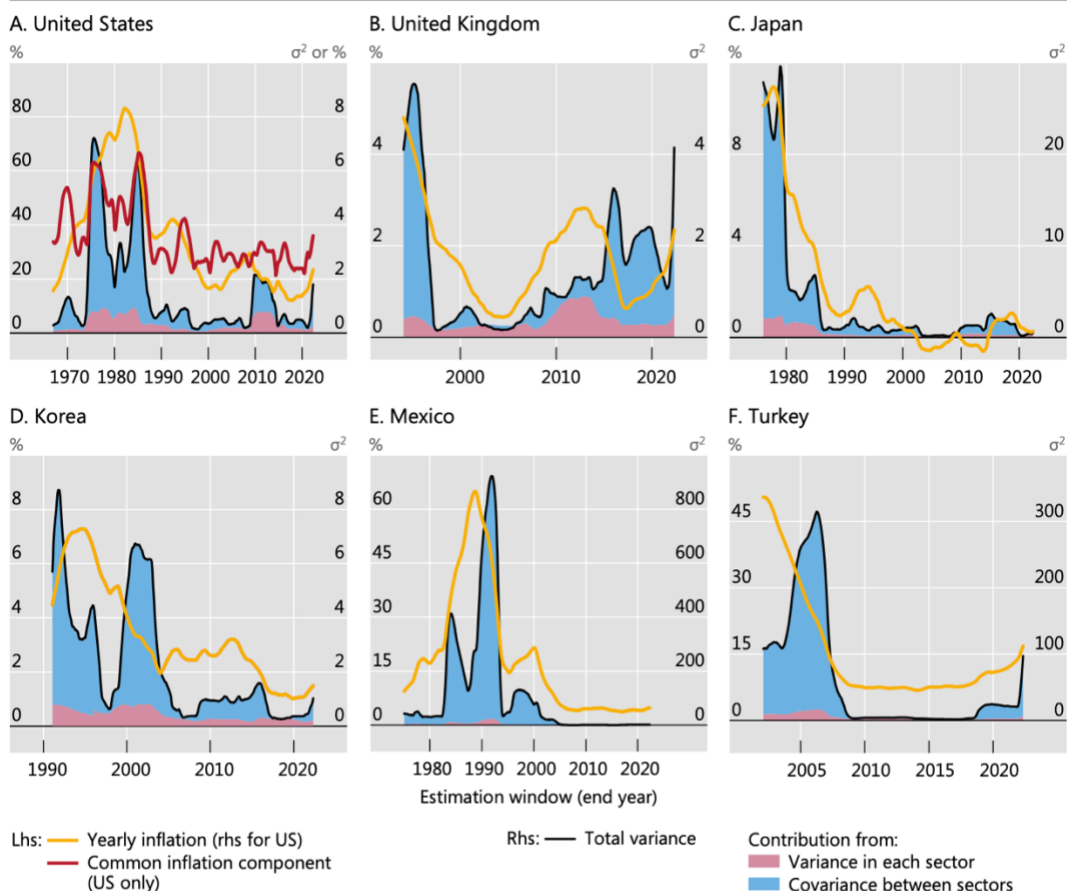
Sources: Global Financial Data; national data; BIS.

First, the reduction in inflation volatility at low levels of inflation is not due to a decline in the volatility of individual price changes but rather to the decline in the correlation between them. This bears a close analogy with the return on a portfolio of securities: the variance of the return is overwhelmingly determined not by the variance of the individual components, but by the correlation across them.

The mirror image of this stylised fact is that, once inflation is tamed, idiosyncratic relative price changes rather than price co-movements explain much of the change in the overall price index. Thus, the common component in the cross section of price changes declines. This is best illustrated with the personal consumer expenditure price index for the United States, for which a long time series of very granular data is available. The common component explains a large share of the total variance of inflation up until the mid-1980s, corresponding to the period when inflation was high, but little thereafter (Graph 2.A). This relationship also holds for other countries, for which the series are shorter (Graphs 2.B–2.F).

Volatility falls in low-inflation regimes as price co-movements drop<sup>1</sup>

Graph 2



<sup>1</sup> Consumer price inflation, except US (personal consumption expenditure deflator). Calculated using sector-level data over a five-year rolling window. See technical annex for details.

Sources: CEIC; national data; BIS.

Second, and closely related, the degree to which individual price changes spill over into inflation also declines as inflation becomes durably lower. For example, the pass-through of outside price changes to core inflation falls substantially (Graph 3.A). The same is true of the pass-through to inflation of changes in prices that are especially “salient”, either because of their pervasive role in production chains (eg oil; Graph 3.B) or because of their weight in consumption baskets (eg food, especially in EMEs). And the same holds for the exchange rate – the relative



price of two units of account – given its far-reaching impact on prices in the economy (Graph 3.C).<sup>8</sup>

Third, and consistent with the previous findings, the spillovers across all prices tend to decline in low-inflation regimes. This is illustrated in Box A and Graph 4.A, which documents the phenomenon for a group of advanced economies (AEs) and emerging market economies (EMEs). The transmission of disaggregated sectoral price changes to other sectors, measured by the share of the total variance that these account for, is much higher and more pervasive in high-inflation regimes.

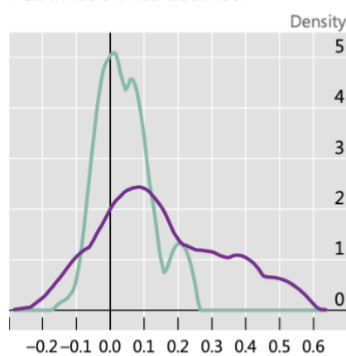
Finally, a more granular perspective sheds further light on the well documented decline in the persistence of aggregate inflation in low-inflation regimes.<sup>9</sup> It shows that this decline is not just a by-product of aggregation, but also reflects less persistent individual price changes. This is quite a general phenomenon, visible for most sectoral prices across a range of countries (Graph 4.B).

Overall, these findings highlight important differences between high- and low-inflation regimes. In a low-inflation regime, relative price changes, even the salient ones, tend to fade away without leaving a noticeable imprint on aggregate inflation. Hence, the regime is, to a certain extent, self-equilibrating. As such, it tends to become entrenched unless subjected to major shocks that are not met with a sufficient policy response. By contrast, a high-inflation regime does not have such desirable properties and inflation becomes increasingly sensitive to relative price shocks – including large exchange rate depreciations. It is therefore more likely to increase further (see also below).

In low-inflation regimes the pass-through of outside price changes, oil price increases and FX depreciations to aggregate prices is dampened

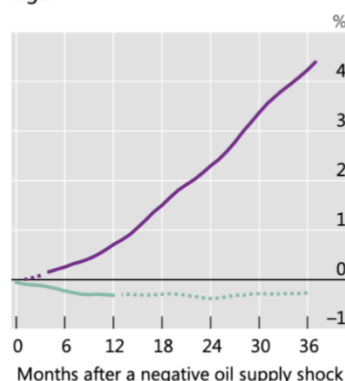
Graph 3

A. The pass-through of outside relative price increases to US core PCE inflation has declined<sup>1</sup>



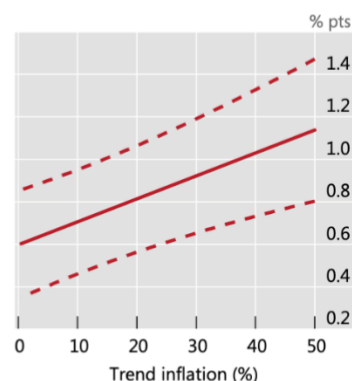
Sample period: — Jan 1960–Dec 1985  
— Jan 1986–Dec 2019

B. Oil price increases transmit to consumer prices when inflation is high<sup>2, 3</sup>



— High-inflation regime  
— Low-inflation regime

C. The exchange rate pass-through depends on the level of inflation<sup>3, 4</sup>



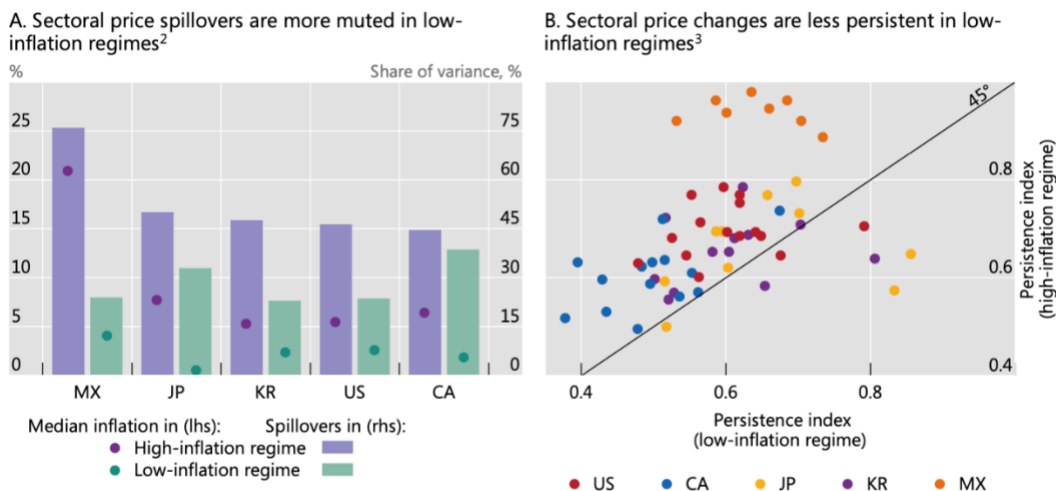
— Estimate  
- - - 90% confidence interval

<sup>1</sup> Distribution of the impact of large relative price increases on core inflation. See Borio et al (2021) for details. <sup>2</sup> The solid lines indicate portions of the response that are statistically significant at the 10% level. <sup>3</sup> See technical annex for details. <sup>4</sup> Effect on inflation from month t-1 to month t+2. For trend inflation, five-year moving average of annual headline inflation.

Sources: Baumeister and Hamilton (2019); Borio et al (2021); Federal Reserve Bank of St Louis, FRED; national data; BIS.

Inflation regimes affect the persistence and transmission of sectoral price changes<sup>1</sup>

Graph 4



<sup>1</sup> See technical annex for details, including regime dates. <sup>2</sup> Share of the variance of sectoral price changes explained by shocks to prices in other sectors over a horizon of one year. See Box A for details. <sup>3</sup> Persistence of one-month log price changes computed using sector-level data for the specified country.

Sources: Board of Governors of the Federal Reserve System; Federal Reserve Bank of St Louis, FRED; OECD; World Bank; CEIC; Datastream; national data; BIS.

What explains the inflation process?

What lies behind these stylised price dynamics? How do relative price changes translate into self-sustained increases in the aggregate price level? More generally, what explains the inflation process?

Sustained inflation ultimately involves a self-reinforcing feedback between price and wage increases – so-called wage-price spirals. Changes in individual prices can broaden into aggregate inflation. And they can also erode real wages and profit margins for very long spells. But, ultimately, they cannot be self-sustaining without feedback between prices and wages: profit margins and real wages cannot fall indefinitely. So, beyond the important impact of aggregate demand conditions on wage- and price-setting, a key question is how changes in relative prices that pass through to the aggregate price index (“first-round effects”) can trigger feedback between price and wage increases (“second-round effects”).

To unravel this process, we need to go beyond the canonical stylised Phillips curve. The Phillips curve provides a useful and relatively easy-to-grasp framework but has a number of features that limit its ability to shed light on the forces behind inflation dynamics (see Box B for a detailed discussion). First, by construction, and for simplicity, it focuses only on an aggregate price index and hence leaves out sectoral developments. While the framework can include some key relative prices, such as those of oil or the exchange rate, these have only a transitory impact on inflation.

Second, the Phillips curve focuses on aggregate cyclical factors as the key drivers of prices (and, implicitly, wages) and does not account for structural forces. Third, inflation expectations are assumed to affect inflation directly, rather than through their impact on individual pricing decisions.<sup>10</sup> Moreover, the various relationships are assumed to be invariant to the level of inflation. While this is a tenable assumption in a stable inflationary environment, it can be more problematic when inflation is liable to shifts across regimes.

### Wage and price formation

All this suggests that it is worth more closely examining the wage and price formation process. This can also more clearly bring out the role of inflation expectations of workers and firms.

There are many similarities in the way wages and prices adjust. First, both are sensitive to the same cyclical and structural forces. Second, their adjustment varies systematically with the level of inflation itself, helping to entrench the high- and low-inflation regimes. Finally, both are deeply influenced by inflation expectations.

These factors play somewhat different roles. Cyclical and structural forces shape the pricing power of workers and firms – in particular, firms' ability to raise prices when profit margins are squeezed and workers' ability to obtain higher wages when their purchasing power is eroded. Inflation expectations provide a key incentive to do so. And the level of inflation influences both their ability and incentives, not least because of its impact on structural features of contracting arrangements and on the sensitivity of expectations to relative price changes.

Let's consider in more detail the roles of pricing power and inflation in wage-price formation.

### Pricing power

The pricing power of economic agents is ultimately determined by perceptions of the consequences of charging a higher price or asking for a higher wage. How will customers and employers react? How will "competitors", be these other firms or workers, respond? Will firms see their profit margins or market shares squeezed? Will workers lose their jobs? Explaining pricing power means explaining how cyclical and structural forces exert their impact on wage and price dynamics.

### Cyclical forces

Cyclical forces are those that have generally attracted most attention. The main such force is aggregate demand pressures. When the economy is running hot, it is generally more likely for labour to have their wage demands accepted and for firms to have their customers tolerate higher prices.

That said, sectoral demand pressures, and differences across them, also matter. Whenever sectoral imbalances take centre stage, aggregate measures of slack are an insufficient indicator of the impact of cyclical factors on inflation. Given differences in the strength of sectoral forces and in the response of prices to those forces, a given measure of aggregate demand may be associated with quite different inflationary pressures.

Probably the most important distinction in this context is the one between tradeables and non-tradeables – one that has a long tradition in economics. Tradeable prices are more directly exposed to external factors, including international demand and supply imbalances and global financial conditions; non-tradeable prices are more sensitive to domestic conditions.<sup>11</sup> Of course, domestic demand conditions affect the exchange rate, and hence have an important indirect impact on the prices of tradeables.

The implication is that, as countries have become more open over time because of globalisation, one would expect their inflation rates to have become more sensitive to cyclical global factors as well.<sup>12</sup> For individual countries, these forces may show up as changes in relative prices, especially those of commodities. Since these are often treated as "supply shocks", there can be a tendency to underestimate the role of aggregate demand in inflation whenever these pressures affect several countries simultaneously.<sup>13</sup>

But the impact of the distinction between tradeables and non-tradeables goes further. Just as in the domestic context, supply chains can act as a transmission channel of global sectoral forces and facilitate their propagation. For instance, there is evidence that the exposure of countries to global value chains helps explain the relative importance of domestic and (suitably weighted) global measures of economic slack, both across countries and over time.<sup>14</sup>

Furthermore, sectoral factors, domestic and global, can interact. Their interaction has been very much in evidence in the unexpected recent flare-up in inflation (Chapter I). The pandemic has induced a surprisingly persistent rotation from services to goods, and the prices of many commodities have reflected global demand pressures and dislocations in global value chains (“bottlenecks”), which have made it harder for supply to keep up with the strong rebound in demand.

## Structural forces

Structural forces have a major influence on wage- and price-setting. The previous discussion highlights one channel through which they can influence the sensitivity of inflation to domestic demand pressures, ie the openness of the economy. But there are other examples, including structural features that may hinder the reallocation of labour across sectors (eg the design of the pension system or unemployment benefits).

The evolution of labour markets vividly illustrates how broad and deep the influence of structural forces can be. Labour markets have seen major structural changes since the Great Inflation of the 1970s. Their net effect has been to reduce the pricing power of labour. This secular decline reflects many factors, including a declining role of the public sector in setting wages; dwindling unionisation; a wave of labour market deregulation; the gradual opening of markets due to globalisation; and demographics. For instance, it is hard to imagine that the bargaining power of labour, especially in advanced economies, could have remained immune to the entry of large numbers of (predominantly low-wage) workers into the the global trading system. China and former members of the Soviet bloc are the most prominent examples. A quickening of technological change is yet another possible factor, in this case increasing the competition between labour and capital.

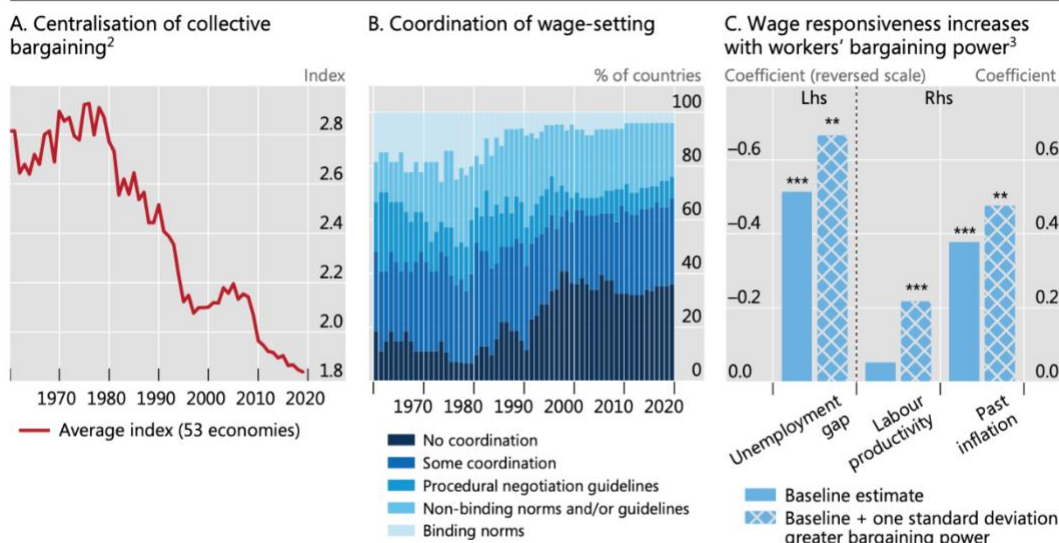
Measuring pricing power is not straightforward. For example, it may not be the actual entry of firms that determines their pricing power but the threat of entry (“contestability”). Similarly, the actual extent to which jobs are relocated to foreign countries may be less important than the threat thereof.

Again, labour markets can help illustrate the point. One possible, albeit imperfect, indicator of labour’s decreasing structural pricing power is the secular decline in the degree of centralisation of wage negotiations (Graph 5.A). Another is the reduction in the number of countries adopting binding norms in the coordination of wage-setting (Graph 5.B).

Based on these indicators, there is indeed evidence that workers’ bargaining power is important in shaping the response of wages to both prices and economic slack (Graph 5.C). When workers’ bargaining power is high, the cyclical sensitivity of inflation to the unemployment gap increases, reflecting greater pricing power for any given degree of tightness in labour markets.<sup>15</sup> Moreover, workers are better placed to successfully negotiate higher wages to reap the benefits of increases in labour productivity as well as to recoup losses in purchasing power due to past inflation.

Institutional features play a key role in the wage-setting process<sup>1</sup>

Graph 5



<sup>1</sup> See technical annex for details. <sup>2</sup> Higher values indicate higher degree of centralisation. <sup>3</sup> \*\*\*/\*\* indicates statistical significance at the 1%/5% level. For the cross-hatched bars, statistical significance refers to the incremental effect of a change in bargaining power.

Sources: OECD; OECD/AIAS ICTWSS database; BIS.

The inflation environment

In addition to cyclical and structural factors, the level of inflation itself can influence wage- and price-setting and hence the likelihood and intensity of wage-price spirals. In general, a high-inflation regime, if it persists, induces behavioural changes which raise the probability that it will become entrenched, not least by amplifying the impact of relative price increases. Several mechanisms are at work.

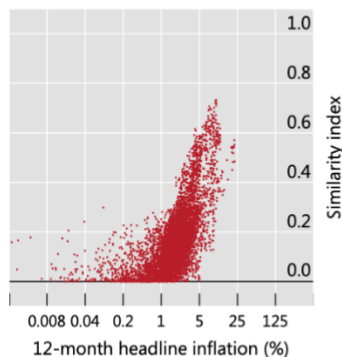
First and foremost, when inflation is very low, it may cease to be a significant factor influencing economic decisions. After all, agents' bandwidth is limited and acquiring information is costly - leading to so-called "rational inattention".<sup>16</sup> Indeed, this is the very definition that Paul Volcker, and later Alan Greenspan, gave of price stability: "a situation in which expectations of generally rising (or falling) prices over a considerable period are not a pervasive influence on economic and financial behavior."<sup>17</sup>

Second, and closely related, it stands to reason that the degree to which the general price level becomes relevant for individual decisions increases with the level of inflation. When inflation rises, price changes become more similar (Graphs 6.A and 6.B). As a result, differences in consumption patterns matter less. After all, wage earners do not care about the general price level per se, but only about their own cost of living. Similarly, firms care about the general price level only insofar as it carries information about how competitors might react or about their own costs. Since wages, in turn, are an essential component of costs, the stronger link of wages to general prices reinforces the relevance of inflation for firm decisions, and vice versa.

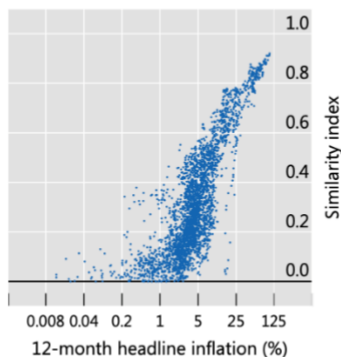
When inflation is high, it becomes a coordinating device in pricing decisions<sup>1</sup>

Graph 6

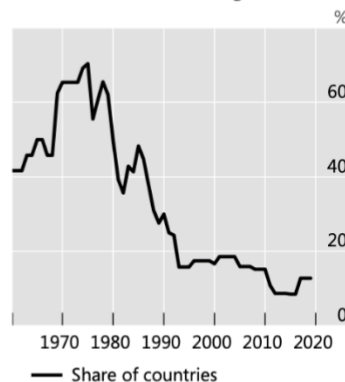
A. Similarity of price changes in AEs



B. Similarity of price changes in EMEs



C. Price indexation in wage contracts



<sup>1</sup> See technical annex for details.

Sources: OECD/AIAS ICTWSS database; CEIC; national data; BIS.

Third, the level of inflation is bound to influence the importance of inflation expectations. Once the general price level becomes a focus of attention, workers and firms will initially try to make up for the erosion of purchasing power or profit margins that they have already incurred. This, in and of itself, could trigger wage-price spirals if background conditions are sufficiently favourable. And, once inflation becomes sufficiently high and is expected to persist, they will also try to anticipate future changes in the general price level, as these will erode purchasing power and profit margins before contracts can be renegotiated.<sup>18</sup>

Fourth, if sufficiently high and persistent, inflation will influence the structural features of wage- and price-setting. The higher the inflation rate, the greater the incentive for workers to unionise, and for wage negotiations to be centralised, as the inflation rate acts as a stronger focal point.<sup>19</sup> And, the more persistent the inflation rate, the greater the incentive to index wages and, more generally, to reduce the length of contracts that are fixed in nominal terms.<sup>20</sup> These forces are amplified by the stylised fact that higher inflation rates tend to go hand in hand with higher volatility and hence uncertainty.

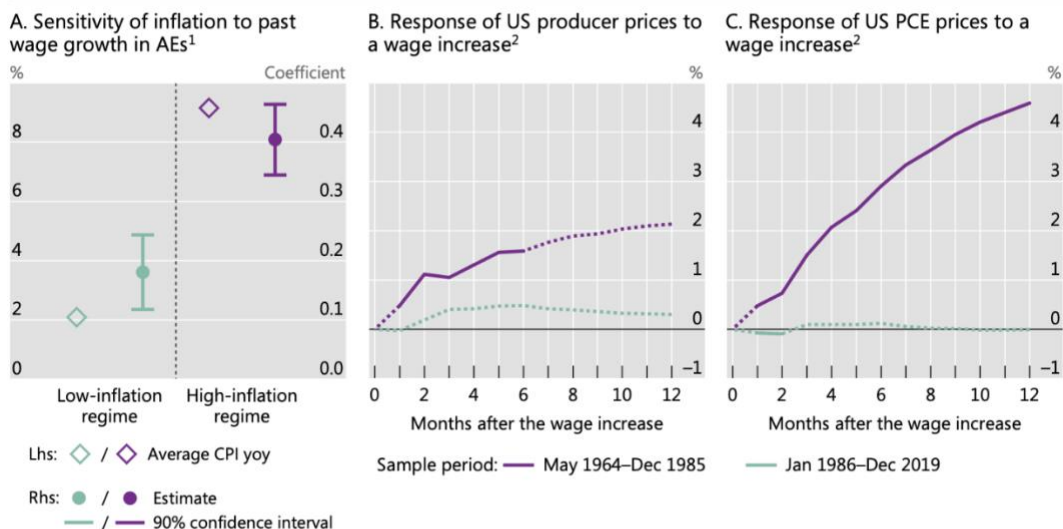
There is considerable evidence supporting the impact of the inflation regime on contractual arrangements.<sup>21</sup> For instance, indexation practices tend to be more prevalent in countries with a higher inflation history (eg in EMEs in Latin America relative to those in Asia). And reliance on indexation has declined along with the inflation rate (Graph 6.C).<sup>22</sup> In other words, since the 1980s, structural forces and a decline in inflation itself have arguably reinforced each other in reducing the bargaining power of labour.

It is not hard to find the footprint of inflation regimes on wage- and price- setting.

Consider price-setting first. As one example, across countries, the pass-through from wages to inflation becomes more muted at lower inflation rates (Graph 7.A). This finding is corroborated by US-specific evidence: unanticipated changes in wages estimated over a sample starting in 1986 transmit less to both the producer and consumer price indexes than they did in the preceding high-inflation regime (Graphs 7.B and 7.C).

The pass-through of wages to inflation is weaker in low-inflation regimes

Graph 7

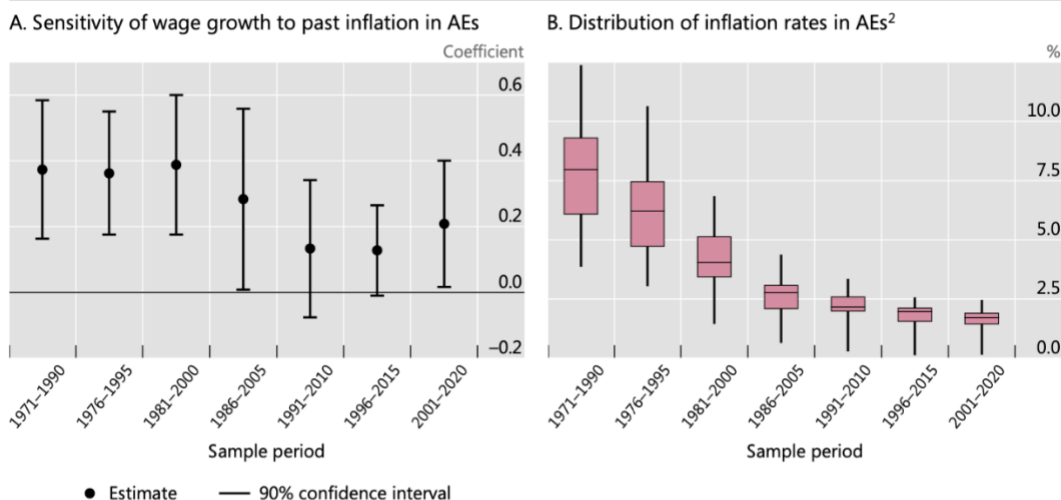


<sup>1</sup> See technical annex for details, including regime dates. <sup>2</sup> The estimated impact of a 5% unanticipated increase in nominal wages in month 0 on the specified US price index. The solid lines indicate portions of the response that are statistically significant at the 10% level.

Sources: Federal Reserve Bank of St Louis, FRED; OECD; Datastream; national data; BIS.

Wages have become less sensitive to inflation<sup>1</sup>

Graph 8



<sup>1</sup> See technical annex for details. <sup>2</sup> Box plots show median, minimum, maximum and interquartile range of year-on-year headline inflation.

Sources: OECD; national data; BIS.

Similarly, wages have become less responsive to inflation over time. For instance, corroborating evidence emerges from a simple empirical model in which wage growth is a function of past inflation, the unemployment gap and labour productivity growth estimated on a panel of advanced economies. Past inflation has become less reflected in wage gains (Graph 8.A) as its average level has declined over time (Graph 8.B).

Putting these various pieces of evidence together suggests that the link between wages and prices has become looser. A statistical exercise that captures their joint dynamics illustrates the point. When wages, say, fall behind their long-term relationship with prices, they tend to subsequently catch up, although more slowly in the low-inflation regime (Graph 9.A). The same holds for prices (Graph 9.B).

Taken together, all these findings may help explain why high- and low-inflation regimes are self-reinforcing. This is largely through their impact on wage and price adjustments and hence on the likelihood and intensity of wage-price spirals. In a low-inflation regime, both the inflation rate and individual price changes are less noticeable and the general price level is less representative of the prices that matter for individual agents. Further, inflation expectations play a smaller role, and inflation induces changes in structural features of wage- and price-setting that help keep it low. High-inflation regimes are the mirror image.

### Inflation expectations in financial markets

While the expectations of firms and households directly affect price- and wage-setting, those in financial markets play an important indirect role through a variety of channels.

First, they influence financial conditions and hence aggregate demand. A key factor behind any decision to borrow or save is the interest rate, ie the amount the borrower will need to pay to service their debt and the return to the saver for postponing consumption. Apart from the short-term policy rate, which is set by the central bank, the inflation expectations of market participants help determine nominal interest rates at longer maturities, as investors need to be compensated for the expected erosion of their purchasing power. In turn, expenditures are shaped partly by nominal rates, which have a first-order impact on cash flows, and by inflation-adjusted (“real”) interest rates, which reflect the real value of the resources transferred over time. Long-term mortgage rates are a good example.

Wage and price reactions to past shortfalls have become slower<sup>1</sup>

Graph 9



<sup>1</sup> The half-life is the time taken for half of the wage or price gap to have closed; see technical annex for further details. <sup>2</sup> Response of nominal wages when real wages fall in year zero. <sup>3</sup> Response of the price index when real wages rise in year zero.

Sources: OECD; national data; BIS.

Second, through their impact on interest rates, the inflation expectations embedded in financial markets have a major effect on the exchange rate – probably the most salient and important relative price for open economies. This is because they affect the returns across currencies, and hence the investment and borrowing decisions of market participants that have access to both domestic and

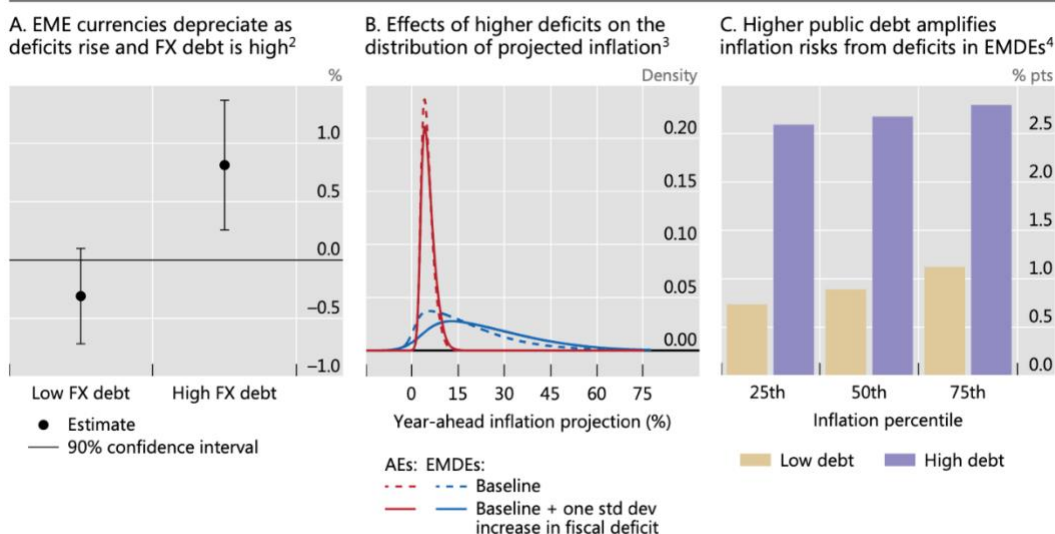


foreign funds. These decisions will, in turn, be an important driver of exchange rates, as sudden capital outflows can trigger large depreciations. Moreover, through exchange rates, inflation expectations also affect the value of both assets and debts denominated in foreign currencies. This is especially important in EMEs, where the use of a foreign currency to denominate contracts can be common and where currency mismatches – discrepancies between the currency denominations of assets and liabilities – can be widespread.<sup>23</sup>

The impact on the servicing costs and debt burden of the government is especially important. One possible mechanism is through financial market perceptions of the sustainability of fiscal positions. For instance, there is evidence from EMEs that when the share of public debt denominated in foreign currency is high, an increase in the fiscal deficit results in a depreciation of the currency (Graph 10.A). This depreciation is one reason why deficits, more generally, shift the whole distribution of future inflation outcomes, increasing the likelihood of higher inflation (Graph 10.B). This effect is stronger in EMEs, where debt sustainability tends to be more of a challenge and the exchange rate plays a bigger role. The effect of deficits on inflation is also bigger where debt levels are higher (Graph 10.C).

Higher fiscal deficits boost inflation risks in EMEs<sup>1</sup>

Graph 10



<sup>1</sup> See technical annex for details. <sup>2</sup> The effect of a 1 percentage point increase in the fiscal deficit on the depreciation of the EME currency against the US dollar in the following year. <sup>3</sup> Change in one-year-ahead conditional inflation forecast distribution (change from dashed to solid) when there is a one standard deviation increase in fiscal deficit. <sup>4</sup> The effect of a 1 percentage point increase in the fiscal deficit on annualised EMDE inflation over the next two years.

Sources: Banerjee et al (2020); BIS.

Third, financial markets’ inflation expectations are useful in and of themselves.

While they may not be a good proxy for the expectations of wage- and price-setters, they can help forecast inflation. After all, they aggregate the information of a myriad of investors, who “put their money where their mouths are”. Moreover, their timeliness can be of great value. And so is the fact that, through option prices, it is possible to tease out information about the perceived risks around the average or most likely future outcomes. To be sure, extracting inflation expectations from asset prices is not without pitfalls. Since expectations are not observable, some “model” is necessary to estimate them. Moreover, they are “contaminated” by the compensation investors require for bearing inflation risk as well as by market characteristics, including the underlying liquidity. Even so, at the end of the day, what matters is their predictive content.

The empirical evidence indicates that financial market measures of inflation expectations can indeed be valuable. While household expectations tend to be biased on the upside when compared with those made by professional forecasters (Graph 11.A), financial market expectations perform relatively well (Graph 11.B). They also have the advantage of timeliness: in contrast to surveys that generally take place regularly at fixed intervals, financial market expectations can be monitored in real time. As such, they may prove especially useful when economic conditions change rapidly.

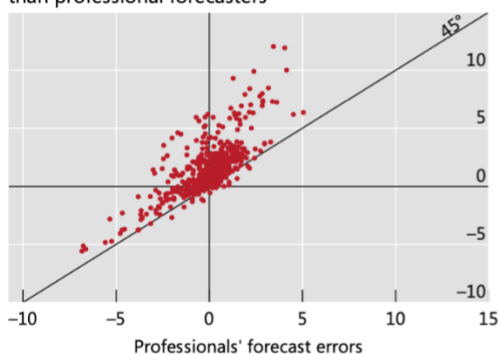
The timeliness of market-based inflation expectations is one reason why they are useful to central banks when setting monetary policy. As such, they serve not only as indicators of the future path of inflation, but also as real-time gauges of the credibility of the central bank's commitment to price stability. Their use in this context provides a valuable additional piece of information, although it needs to be managed properly (see below).

## Near-term inflation forecast performance<sup>1</sup>

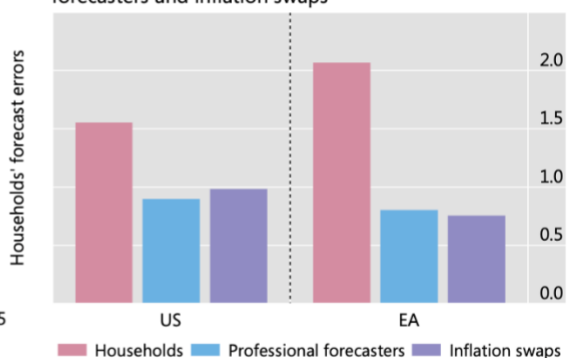
In percentage points

Graph 11

A. Households tend to overpredict inflation, more so than professional forecasters<sup>2</sup>



B. Forecast performance of households, professional forecasters and inflation swaps<sup>3</sup>



<sup>1</sup> See technical annex for details. <sup>2</sup> Difference between one-year-ahead inflation expectations of households or professional forecasters and realised inflation. <sup>3</sup> Root mean squared errors of one-year-ahead inflation forecasts.

Sources: Bloomberg; Consensus Economics; Datastream; national consumer surveys; national data; BIS.

## The role of monetary policy

The imprint of monetary policy on inflation can be easily traced through history. It can be found in the relative stability of the price level under the Gold Standard, the costly deflation of the Great Depression, the occasional hyperinflations, the Great Inflation of the 1970s under a fiat standard and the subsequent Great Disinflation from the 1990s. This phase ushered in a long period of low and stable inflation, as central banks gave clear priority to inflation control - the era of inflation targeting.

Monetary policy influences inflation in two ways.

First, through the policy regime, ie the rules of the game that define the monetary policy framework itself. These include the relative weight of different objectives; the core features of the systematic policy response to the evolution of the economy (the central bank's "reaction function"); the tools employed; transparency, accountability and, most importantly, the degree of autonomy ("independence") from the government, which offers insulation from short-term political pressures. These features ultimately determine the central bank's credibility and ability to deliver on its objectives. The conjunction of inflation targeting with central bank independence is

the most recent and widespread example of such a framework. It is the monetary policy framework that has the biggest influence on inflation expectations as well as on the features of wage and price formation.

Second, through changes in the monetary policy stance within a regime. These operate mainly through aggregate demand in the economy. It is through changes in the stance that the central bank calibrates the degree of accommodation or tightness to steer economic activity, and hence inflation. These adjustments help fine-tune the systematic policy response and its flexibility to evolving circumstances, sometimes requiring significant departures from the typical reaction function.

What light can the under the hood perspective shed on these issues? Consider, in turn, the operation of monetary policy in a low-inflation rate regime and transitions to a higher one.

#### Monetary policy in a low-inflation regime

The dynamics of prices in a low-inflation regime offer considerable flexibility to the central bank. In such a regime, inflation has valuable self-equilibrating properties. Its evolution largely reflects changes in sector-specific, relative prices that are, for the most part, transitory. Because of the lack of frequent and persistent salient price changes that could drive inflation durably higher, agents need not pay much attention to inflation. Partly as a result, wages and prices do not tend to chase each other higher. Flexibility in this context could mean greater tolerance for moderate, even if persistent, deviations of inflation from narrowly defined targets. It is as if, having succeeded in bringing inflation under control, the central bank can enjoy the fruits of its hard-earned credibility.

A low-inflation regime also confers flexibility regarding the specific measure of inflation that the central bank can target. In an environment in which relative price changes are dominant, and possibly disconnected from the dynamics of underlying inflation, there is a premium on measures that abstract, to the extent possible, from the most volatile relative price changes (see Box C for a detailed discussion).

There are good reasons for the central bank to make use of flexibility. For one, with inflation low, supply side forces driving price changes become relatively more important. These forces reflect natural adjustments in the economy that monetary policy should accommodate, unless they threaten the low-inflation regime itself. In addition, the evidence suggests that it becomes difficult for monetary policy to steer inflation precisely. This, in turn, increases the possible costs of trying.

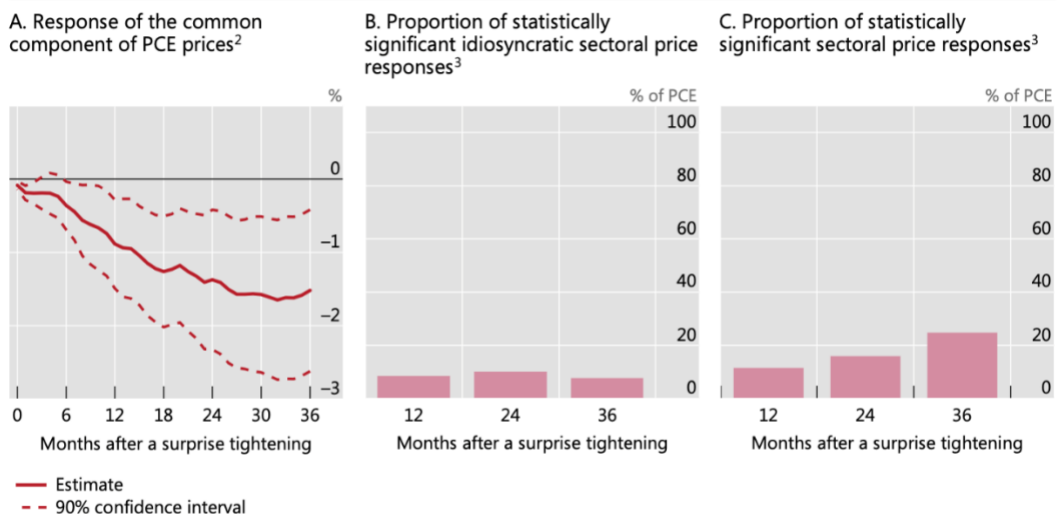
One reason behind the difficulties in steering inflation reflects the very nature of the price changes. One would expect monetary policy to operate through the common component of inflation, which tends to reflect the driver common to all price changes. Empirical evidence supports this conjecture. Changes in the policy stance have a persistent impact on the common component of price changes but have little impact on idiosyncratic elements in US data (Graphs 12.A and 12.B). Thus, as the common component declines relative to the sector-specific one when inflation settles at a low level, the traction of changes in the policy stance declines with it.

In addition, the evidence suggests that, at least when inflation is low, monetary policy operates through a rather narrow set of prices. The results of an exercise on US data indicate that its impact is statistically different from zero for only around one third of sectors, even after three years (Graph 12.C). Not surprisingly perhaps, the prices that exhibit a response are mainly in the cyclically sensitive services subsectors, which are more affected by domestic than foreign demand.<sup>24</sup>

Another piece of corroborating evidence is that monetary policy loses traction when nominal interest rates are very low.<sup>25</sup> Because nominal interest rates and inflation rates tend to move together, this implies more limited monetary policy traction in low-inflation regimes. This loss of traction holds even after filtering out the influence of other factors – the state of the economy, the level of debt and the apparent trend decline in “equilibrium” real interest rates. Moreover, the effect tends to intensify the longer interest rates remain low.<sup>26</sup>

The more limited traction of monetary policy at low levels of inflation means that bigger moves in the policy instrument are needed to produce the same inflationary effect, with larger side effects for the real economy. This has been in evidence in the post-Great Financial Crisis period, during which central banks have faced difficulties in lifting inflation back to target, partly owing to the structural disinflationary forces at play. Hence the need to keep an exceptionally easy policy stance for exceptionally long – the so-called low-for-long phenomenon. This has been one factor behind the build-up in risk-taking and financial vulnerabilities (Chapter I).

US monetary policy works mainly through the common component of inflation<sup>1</sup> Graph 12



<sup>1</sup> Responses to a surprise policy tightening of 25 basis points. See technical annex for details. <sup>2</sup> Including 131 narrowly defined personal consumption expenditure (PCE) sectors. <sup>3</sup> Significant at 10% level.

Sources: Board of Governors of the Federal Reserve System; national data; BIS.

### Transitions across inflation regimes

What about transitions across regimes?

Bringing inflation under control has generally proven costly. And the higher and more entrenched the initial inflation rate, and hence the larger the required disinflation, the greater the cost is likely to be. As the previous analysis indicates, once wage-price spirals set in, they develop an inertia that is not easy to break. Expectations of persistent inflation become embedded in labour contracts and wage negotiations, requiring a larger reduction in aggregate demand, and hence higher unemployment, to break the back of persistent inflation. Monetary policy’s task becomes much harder. This is true not only from a technical standpoint, but also from a political one. A broad political consensus that inflation must be brought back under control would greatly help the central bank’s task. For example, it could be instrumental in inducing trade unions to accept the abandonment of indexation clauses, as it did in the 1980s.<sup>27</sup> But this consensus may take time to form and, in the meantime, central bank actions will inflict necessary near-term costs on the economy.

Thus, a key challenge for the central bank is to avoid transitions from low- to high-inflation regimes in the first place – to nip inflation in the bud. To be sure, a low-inflation regime has some self-equilibrating properties, which allow a credible central bank to enjoy a considerable degree of flexibility. But, if the system is subjected to too much pressure, those properties vanish. The Great Inflation of the 1970s is a case in point. This historical phase was preceded by several years

of moderately high inflation, which left the inflation regime vulnerable to the 1973 oil price shock.<sup>28</sup> Once the oil price soared, inflation accelerated and entrenched the transition.

A tough test central banks face in this context is how to identify transitions sufficiently promptly and reliably and then to calibrate policy accordingly. Both tasks are clouded in uncertainty. The under the hood perspective sheds light on these challenges and points to ways in which they may be addressed. Ultimately, though, central banks have little choice but to consider the broadest set of information possible, both hard and soft, and form a judgment about the risks ahead. The current environment helps illustrate some of these difficulties.<sup>29</sup>

A first warning indicator is large and persistent changes in salient relative prices, such as those of energy and food. Large exchange rate depreciations play a similar role. For instance, recently the war in Ukraine has triggered major increases in the prices of energy and food, adding to previous upward pressures, in part related to the broader rebound in global demand (Chapter I). To be sure, such price increases are neither necessary nor sufficient to trigger a transition. But they do test the self-equilibrating properties of the system and require special attention.

A common practice to deal with such price shifts is to exclude them from the measures of underlying or core inflation, because of their high volatility. The idea is to capture only the more long-lasting influence of the inflation path. One possible drawback, however, is that it may take time for their effect to filter through.

The under the hood perspective suggests another, complementary approach: looking more closely at the degree of commonality across all price changes. A simple such indicator is the degree of spillovers across sectors based on rolling windows. Adding just a few post-Covid observations to the long estimation period indicates that spillovers have increased in several countries in the sample (Graph 13.A). A more timely indicator, which does not require long estimation windows, is an index of similarity of price changes across sectors. This measure reinforces the previous message: monthly observations point to an increase in similarity since mid-2021 (Graph 13.B).

A limitation of all such indicators is that they cover only short horizons and that the underlying changes may not be long-lasting. A complementary approach, therefore, is to consider inflation expectations. These provide a better sense of the possible evolution of inflation at different horizons, at least as perceived by economic agents. That said, as noted earlier, these indicators are not foolproof either. Expectations of economic analysts may provide little information over and above central banks' own forecasts. Those of financial market participants may also be excessively influenced by the central bank's own assessments and credibility – in these cases, they could even lull the central bank into a false sense of security.<sup>30</sup> And those of households and firms tend to be very backward-looking. In the current context, these indicators point to significant risks (Chapter I).

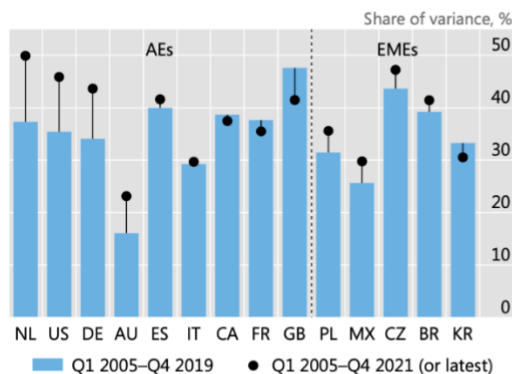
Econometric models, not least those based on stylised relationships like the standard Phillips curve, are the main tool to make longer-term forecasts, beyond one year. But they can only go so far. The reason is that they are less well equipped to address turning points (Box B). In part, this is because they tend to assume that relative price shocks, even if large, have only a temporary impact on inflation. Additionally, they may have been estimated over a long, low-inflation regime. More generally, it is because they have a hard time capturing the specific inflation dynamics during transitions, in which the level of inflation itself can alter well established relationships.

Ultimately, the most reliable warning indicator is signs of second-round effects, with wages responding to price pressures, and vice versa. These can be especially worrying if they go hand in hand with incipient changes in inflation psychology. Examples include demands for greater centralisation of wage negotiations or indexation clauses, or surveys indicating that firms have regained pricing power, as part of broader changes in the competitive environment, as observed in some countries recently (Chapter I).

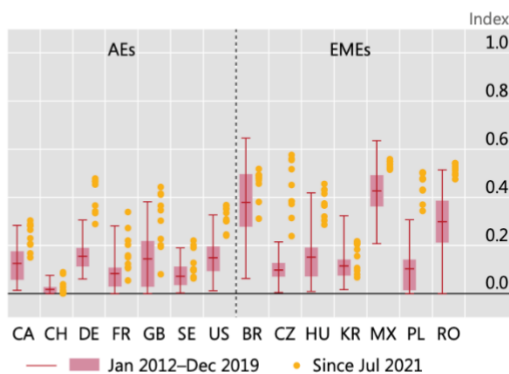
Signs of low-inflation regimes being tested

Graph 13

A. Sectoral price spillovers have generally increased...<sup>1</sup>



B. ...and sectoral price changes have become more similar<sup>2</sup>



<sup>1</sup> Share of the variance of sectoral price changes explained by shocks to prices in other sectors over a horizon of 12 months. See Box A for details. <sup>2</sup> Box plots show mean, minimum, maximum and interquartile range. See technical annex for details.

Sources: Board of Governors of the Federal Reserve System; Federal Reserve Bank of St Louis, FRED; OECD; World Bank; CEIC; Datastream; national data; BIS.

This gives rise to a dilemma. Central banks may wish to wait to obtain the most reliable signals and to avoid overreacting. But waiting until signals are unequivocal heightens the risk that inflation will become entrenched, and the system will reach a tipping point. This is particularly important given that monetary policy affects inflation only with a lag. Thus the risk of waiting too long should not be underestimated, especially after a prolonged period in a low-inflation regime. If the central bank has not had to tighten significantly for a long time, it will be more uncertain about the impact of the removal of accommodation. All the more so if, in the meantime, there have been signs of aggressive risk-taking and debt has built up, not least reflecting the very low interest rates that may go hand in hand with a low-inflation regime. These challenges loom large in the current environment.

In fact, transitions may be reliably identified only ex post. Central banks, however, have no such luxury. This puts a premium on flexibility and timeliness. When faced with high risks of a transition from a low- to a high-inflation regime, the costs of falling behind the curve are likely to be high.

In considering these risks, country-specific features and circumstances are important. For structural reasons, some countries are more vulnerable than others to drifting from a low- to a high-inflation regime. The previous analysis points to several relevant features. A large weighting of salient items in the consumption basket can make increases in the inflation rate more likely to stick. Weak public finances and large currency mismatches, especially in more open economies, can make the exchange rate more sensitive to deteriorating conditions and amplify the damage a depreciation can inflict. Formal or informal wage indexation practices, and centralized bargaining, can make it easier for wage increases to recoup losses in purchasing power. Above all, a history of high inflation could increase the likelihood that inflation expectations will become unanchored, inducing broader behavioural adjustments. The actions of those in financial markets could quickly push the system beyond the point of no return. This suggests that, in economies with such features, there is a premium on a prompt monetary policy response. EMEs are more likely to fall into this category. Not surprisingly, central banks in many EMEs have responded more promptly than their AE peers to rising inflation over the past year.

The prominent role of the history of inflation in influencing transitions highlights the importance of policy frameworks and institutions. They hold the key to the credibility of monetary policy. Credibility is essential to anchor expectations firmly and, more generally, to strengthen the resilience of the economy to inflationary shocks. In this context, central bank independence is critical. It reinforces the self-equilibrating properties of a low-inflation regime, thereby granting the central bank time to assess the situation more thoroughly. And, even more importantly, it shields the institution from political economy pressures that would delay, or even prevent, the necessary remedial policy response.

### Conclusion

Understanding the nature and the mechanics of the inflation process is fundamental to the conduct of monetary policy. Looking under the hood at disaggregated price developments and at wage-price formation in depth is particularly valuable. It sheds light on how waves of broad-based inflation can arise and propagate from sector-specific relative price shocks and on the relative roles of cyclical and structural forces in determining the likelihood and intensity of wage-price spirals.

The analysis highlights major differences between low- and high-inflation regimes and hence the criticality of transitions.

A low-inflation regime has significant self-stabilising properties. What is measured as inflation is, in large part, the reflection of relative or sector-specific price changes that tend to have a transitory impact on the inflation level. In such an environment, inflation has little effect on the wage and price formation as it loses significance as a factor influencing behaviour. Central bank credibility is instrumental in hardwiring the regime and increasing its robustness.

High-inflation regimes do not have such self-stabilising properties. Inflation becomes a focal point for agents' behaviour and wage-price formation becomes more sensitive to relative price shocks. Higher inflation, in turn, induces changes in more structural features of wage formation, such as indexation and centralised wage bargaining, which help entrench the regime. It also undermines central bank credibility, further unmooring the inflation process. The experience with the oil price shocks of the 1970s illustrates the mechanisms at work.

Because of the sensitivity of agents' behaviour to the level of inflation, transitions are self-reinforcing and hence challenging. They are challenging for the models typically used to explain and forecast inflation, which are ill-suited to capturing such behavioural changes. And they are especially challenging for policymakers, because of endemic uncertainty and the possibility of tipping points.

The under the hood perspective sheds light on how monetary policy can best secure a low-inflation regime. The perspective underscores the importance of navigating the transitions and the associated difficulties. Transitioning back from a high-inflation regime can be very costly once it becomes entrenched. All this puts a premium on a timely and firm response. Central banks fully understand that the long-term benefits far outweigh any short-term costs. And that credibility is too precious an asset to be put at risk.

### Endnotes

1 See Carstens (2022).

2 The word "inflation" emerged in the mid-19th century (see eg Bryan (1997)). At that time, it was used to denote changes in the volume of notes and deposits in circulation. Given the metallic standards of those days, the loss of purchasing power, and hence changes in the overall price level, were termed "depreciation". It was only considerably later that the term took on the current connotations of an increase in the general price of goods and services. In his Tract, Keynes (1924) defined inflation as "an expansion in the supply of money to spend relatively to the supply of

things to purchase”, while in *How to pay for the war?* he consistently refers to “price inflation” (Keynes (1940)).

3 For a detailed discussion, see Reis and Watson (2010).

4 See eg Eichenbaum et al (2011).

5 Hyperinflation is sometimes defined as an inflation rate exceeding 50% per month.

6 See Kiguel (1989).

7 See Benati (2008) and Kim and Lin (2012) for cross-country evidence.

8 Beginning with Taylor (2000), it has been recognised that a low-inflation environment contributes to reduced exchange rate pass-through.

9 See eg Altissimo et al (2009).

10 For a thought-provoking review of how inflation expectations have become so prominent in modern macroeconomics, see Rudd (2021).

11 See Gilchrist and Zakrajšek (2019).

12 See Forbes (2019).

13 See Filardo et al (2020).

14 See Auer et al (2017).

15 See also Box IV.A in BIS (2017), Lombardi et al (2020) and Ratner and Sim (2022).

16 See Sims (2010).

17 See Volcker (1983). The formulation of price stability used by Greenspan (1996) was similar: “That state in which expected changes in the general price level do not effectively alter business or household decisions”.

18 Plentiful evidence for this exists, especially from the 1970s and 1980s for the United States, where contracts often included automatic cost-of-living adjustments, and sometimes even promised large future wage increases, regardless of inflation outcomes. For example, a 40-month contract negotiated in May 1981 for US mine workers guaranteed average 11% annual wage increases over the life of the contract: see Taylor (1983).

19 High inflation also polarises the political debate, as the allocation of its costs becomes a relevant distributional issue (see also Chapter II in BIS (2021)). In that context, public policies (eg with respect to the minimum wage, or public sector wages) can often play an important role in amplifying, or short-circuiting, wage-price spirals. For example, wage moderation (achieved through consensus) was instrumental in several disinflation episodes throughout the 1980s – see Pereira da Silva and Mojon (2019).

20 This is most evident during hyperinflations. Paradoxically, extremely short contract lengths when inflation gets completely out of control allow hyperinflations to be brought to an abrupt end, since they contribute to lowering inflation persistence.

21 See eg Rich and Tracy (2004), Fregert and Jonung (2008) and Christofides and Peng (2006) for US, Swedish and Canadian evidence, respectively.

22 Note that indexation still plays an important role in the adjustment of pensions. While pensions do not directly contribute to inflation, since they do not reflect the cost of production, they contribute to demand and hence the inertia of price changes.

23 See eg Eichengreen and Hausmann (2010) and Carstens and Shin (2019).

24 Note that this is especially the case for large AEs. In smaller and more open EMEs, a stronger transmission of monetary policy through exchange rate fluctuations, and hence its direct effect on the prices of imported goods, will arguably lead to a broader inflationary response.

25 See Ahmed et al (2021).

26 There are many possible reasons for this loss of traction. Low nominal interest rates can harm bank profitability and hence banks’ lending capacity. When interest rates fall towards zero, market participants would see less potential for further cuts. Persistently low rates may create disincentives to address debt overhangs, undermining efficient resource allocation and



productivity as well as creating so-called zombie firms. Last but not least, the effects of real interest rates on consumption and investment could become weaker: low rates might encourage people to save more for their retirement to make up for lower expected returns and, at the margin, firms may not invest more once rates fall below hurdle rates.

27 See Pereira da Silva and Mojon (2019) and the references therein.

28 See Reis (2020).

29 See Carstens (2022).

30 This is a “hall of mirrors” effect as suggested by Morris and Shin (2002). Markets come to trust the central bank too much and the central bank, in turn, relies too much on market signals.

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## **Inflation is Back, Challenging Central Banks\***

*By* AGUSTÍN CARSTENS\*

Ladies and gentlemen,

Welcome to the presentation of our 92nd BIS Annual Economic Report. I am very glad that we can meet in person again after two years in a virtual format. The extraordinary times make it all the more important.

Why do I say extraordinary times? Well, let me take a moment to recap what has happened in the past few years.

Strongest global rebound in decades, surprising inflation

In my remarks at this event in 2019, I made several references to inflation and interest rates. At that time, the debate centred on how to bring inflation back up to target, and how to sustainably raise policy rates from very low levels to build buffers against the effective lower bound.

Since then, we have lived through the most severe global pandemic in a century, the largest economic contraction in 90 years and the strongest economic rebound in decades.

In the space of a few months, we went from fears of mass unemployment and a wave of business bankruptcies to a rapid, albeit uneven, recovery. Supply chains that had collapsed as firms cancelled orders were suddenly unable to meet demand. Bottlenecks emerged, particularly for durable goods. After breaching multi-decade lows, many commodity prices touched record highs. And concerns about deflation gave way to surprising inflation.

Amidst this already turbulent environment, the Russian invasion of Ukraine added to the inflationary pressures, particularly through its effects on food and energy markets. In much of the world, inflation is now at multi-decade highs. At the same time, growth projections, which were rosy just a few months ago, are quickly being downgraded.

The sudden shifts in economic momentum have naturally posed huge challenges for central banks and fiscal authorities. Policy settings designed to combat the sharp downturns of 2020 took time to unwind as conditions improved. In the meantime, they added impetus to the inflationary rise.

Most central banks have now firmly committed – through words and, increasingly, through actions – to bringing inflation back down to more acceptable levels. Thus, in 2022 we are still discussing inflation and interest rates. But in a very different sense and context than in 2019.

So where do we go from here?

The most urgent concern for central banks is the trajectory of inflation. The outlook is uncertain. But the most likely scenario is that inflation substantially overshoots most jurisdictions' targets for some time. The factors that raised inflation are still at work: the pass-through of higher commodity prices, strong goods demand and related strain on supply chains, sanctions and bottlenecks in key inputs, robust growth in many advanced economies supported by still negative real interest rates, and very tight labour markets. With the prospect of higher wages as workers look to make up for the purchasing power they lost, inflation could be high for long.

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\*This speech was given on the occasion of the Bank's Annual General Meeting in Basel on 26 June 2022

\*Agustín Carstens, General Manager, Bank for International Settlements

Of particular concern, persistently high inflation increases the risk of a shift from a low- to a high-inflation regime, as analysed in detail in Chapter II of the Report. Low-inflation regimes tend to have self-equilibrating properties. When inflation is low, price changes, including those of “salient” items such as energy, food and housing, tend to leave only a temporary imprint. Economy-wide inflation is less noticeable, but also less relevant. In contrast, in high-inflation regimes, households and firms pay more attention to individual price increases, especially of salient items. At the same time, the price changes of individual items become more representative of overall price pressures.

Importantly, transitions from low- to high-inflation regimes are self-reinforcing. As inflation rises, price increases come into sharper focus, and move out of the zone of “rational inattention”. Employees exert more effort to recoup lost purchasing power, both actual and prospective. And firms seek to protect themselves from profit squeezes. This combination can lead to wage-price spirals and make a transition to a high-inflation regime more likely.

Now the lights are flashing red. Wage growth is already on an upward trajectory in some countries. In many, the bulk of wage renegotiations are still to come. Demands for compensation for past losses, indexation and a return to centralised wage bargaining have already surfaced. Similarly, firms are finding it easier to translate higher wages into higher prices given how generalised price pressures are and how resilient economic activity has been.

Other, more structural, developments increase the risk of a regime switch. The pandemic and the war raise the prospect of new modes of operation, a reorganisation of global value chains and deglobalisation. This means less secular downward pressure on prices. Fiscal policy is still expected to cushion the impact of price shocks for essential items, at least in the short run. But in the process, the adjustment to higher prices is just postponed, and public finances are strained further. If growth slows, fiscal deficits will remain high, further increasing public debt, with associated risks of higher inflation down the road.

#### Central banks are awake to the risks

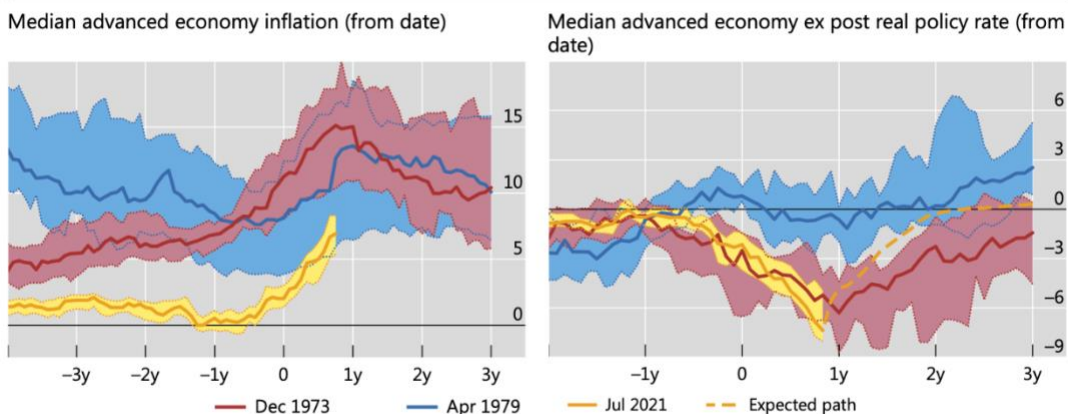
In emerging market economies, to stem inflation and limit currency depreciations, many central banks started raising policy rates last year. Advanced economies are quickly catching up. Eventually, tighter policy will reduce aggregate demand and slow economic growth, thereby easing price pressures. But time is of the essence. Inflation-adjusted (real) short-term interest rates are still falling as inflation has picked up more than policy rates.

To avoid entrenched high inflation, it will be important to heed the lessons of the 1970s. The aftermath of the oil crises of 1973 and 1979 saw persistently high inflation and low economic growth (Graph 1). Today, the oil price increase is relatively smaller and the energy intensity of GDP much less. At the same time, a much broader range of energy sources and agricultural commodities have seen sharp price increases. And supply disruptions for key products, such as fertilisers and metals, could lower future global output, adding to price pressures.

Heed the lessons from the 1970s and other periods<sup>1</sup>

In per cent

Graph 1



<sup>1</sup> Shaded areas indicate 20th–80th percentiles.

Sources: Bloomberg; Consensus Economics; Datastream; Global Financial Data; national data; BIS.

The key positive development since the 1970s is no doubt improved monetary policy frameworks. Monetary goals and instruments are now much better defined. Institutional setups are more robust. And credibility is stronger. To avoid the risk of a regime switch, central banks need to communicate clearly and well the final goal: to bring inflation quickly back to target. And needless to say, they have to act in consequence. Experience shows that shorter and front-loaded tightening cycles tend to make soft landings more likely than shallower, but more drawn out, tightenings.

Can the global economy achieve a soft landing?

The starting conditions are challenging. Inflation today is higher than at the start of most previous tightening cycles. Public debt is also at a historical high in many countries. This makes it harder to raise interest rates without triggering market dysfunction. House prices and household debt are generally elevated. Corporate exposures have grown in many economies too.

There is a path ahead, but it is narrow. In part, it depends on whether supply shocks dissipate quickly. Combined with a moderate monetary tightening, this could temper demand and lower inflation without a major economic contraction. However, if the adverse shocks persist and aggregate demand does not slow down enough to alleviate price pressures, more tightening will be necessary and added pain will be unavoidable.

The key balancing act in calibrating the policy response centres on the financial sector-real economy nexus, with debt and asset prices as crucial levers.

One risk for advanced economies is that large drops in asset prices could trigger a sharp recession and financial stresses. Related financial stability risks can manifest themselves in unexpected places, notably among non-banks and through hidden leverage and liquidity mismatches. Non-banks have grown fast. But they are much less transparent and less closely regulated than their banking counterparts.

Emerging markets may be especially at risk. They will face tighter global financial conditions against a backdrop of significant vulnerabilities. Should the dollar appreciate further, pressures will mount for many. Despite having moved earlier and being better placed than in past tightening

episodes, some emerging markets have no choice but to raise rates further, also as their real rates are still negative.

#### Tackling longer-term challenges

It is worth mentioning that over the past two years, both monetary and fiscal policies played a pivotal role in helping economies navigate through the unprecedented challenges that presented themselves. Even with debt at a historical peak, public debt servicing was easy, as real interest rates were generally negative and growth rates higher. But the support ran down the already limited policy space and added to concerns about fiscal sustainability.

In the short run, high inflation has lowered debt-to-GDP ratios.

But as monetary policy tightens, tensions with fiscal policy will emerge. As monetary normalisation gathers pace, growth rates will probably be closer to or even below interest rates. Consolidated fiscal balances will quickly deteriorate. Achieving fiscal sustainability is essential, not least to restore buffers in advance of future shocks and recessions. Maintaining central bank independence will also be critical, as many will make losses in the adjustment process, raising political economy concerns.

Boosting growth is critical to ameliorate these tensions. It calls for relying less on aggregate demand management and emphasising growth-friendly fiscal actions and broad structural reforms. Such measures have been absent for many years. But these are more important than ever, with fiscal and monetary policies having depleted much of their power to prop up GDP. Amid signs that globalisation may go into reverse, avoiding real and financial fragmentation is also essential. The active pursuit of shared sustainability goals could represent an important opportunity to reinvigorate growth.

#### Building the future monetary system

Let me now shift gears. Another major challenge that central banks have faced during recent years is the vigorous but chaotic eruption of cryptoassets, stablecoins and their evolution into decentralised finance (DeFi).

We meet at a time of turmoil for crypto. The recent Terra LUNA collapse is only the most spectacular one in the crypto world. Many lesser-known coins have seen price slumps of more than 90% from their peaks last year. However, focusing on prices alone would divert attention away from deeper lessons for the future monetary system.

There are many fundamental structural flaws with crypto. The prevalence of stablecoins indicates a pervasive need to piggyback on the credibility of fiat currencies. It also highlights crypto's lack of the nominal anchor that only central bank money can provide. Crypto has also quickly rediscovered a need for the unit of account function of central bank money. The proliferation of coins highlights the fragmentation of the crypto ecosystem, with many incompatible settlement layers jostling for a place in the limelight.

Nevertheless, we need to take note of the features of crypto that have captured the popular imagination. In spite of its fundamental flaws, crypto offers tantalising glimpses of potentially useful technical features. These could expand the capabilities of the current monetary system. The vision for the future monetary system laid out in Chapter III fuses these enhanced technical capabilities around the core of the trust provided by central bank money.

We lay out a metaphor for the future monetary system as a tree. Its solid trunk is the central bank. But it boasts a rich and vibrant ecosystem of private sector providers helping users to fulfil their economic needs. In this tree, the ecosystem is rooted, figuratively speaking, in the settlement on the central bank's balance sheet.

Some elements of the picture of the future monetary system entail a leap in terms of the institutions and arrangements that govern today's monetary system. Their use cases would need

to be tested against the current system. However, the path to the future monetary system is a long one. If we are to make progress, we need to take the first steps now.

So, while the sound and fury of collapsing crypto prices grabs all the attention, it is incumbent on us in the central bank community to look ahead to these longer-term goals.

### Conclusion

Let me conclude. There are not two ways about it. Today, tackling high inflation is the most urgent and important task for central banks. In some ways, monetary policy is in uncharted territory. Coming after a long period of low interest rates and out of the pandemic, households, firms and policymakers must relearn transmission channels and assess how the global economy adjusts to new demand configurations and supply shocks. While some economic slowdown is inevitable and indeed desirable, unexpectedly large spillbacks may follow from tighter global financial conditions.

Lacking clear vision about the future may counsel for caution and gradualism, as policy trade-offs are larger than in the past. But the premium is on timely and decisive, yet flexible, action. As the risk of a regime switch in inflation and related stagflation looms large, forceful action by central banks today is of the essence.

We should also accept the reality that if we want to have resilient, accelerated and sustainable economic growth in the future, with more opportunities for everyone, we need to depend less on the healing powers of fiscal and monetary policies. As fiscal and monetary policy space has been depleted, the baton needs to be passed to structural policies. These policies are harder to implement, both politically and technically. But the can should not be kicked forward forever.

Finally, it is up to central banks to play an active role in forging the future monetary system. This is especially so because it should have as key components central bank money and the institutional and operational infrastructure that central banks provide.

The fight against inflation and the forging of a future monetary system represent deeply intertwined challenges. Both issues address central banks' most fundamental function – to preserve the value of and trust in the unit of account. This is what central banks were set up to do, and this is what society expects from us. I am sure we will deliver.



## Global Inflation: The Fault of Central Banks?

By HERBERT POENISCH \*

In the decade after the global financial crisis (GFC) central banks struggled with avoiding falling prices, uncharted waters for central banks. As a result of policy measures taken such as quantitative easing and interest rates close to the zero bound the ghost of falling prices haunted central bankers. What would this do to economic growth, where the traditional textbook interest mechanism was put out of action? Benign inflation dominated central banker's concerns until the outbreak of the pandemic. All of a sudden demand dropped off a cliff, and authorities had to activate all policy levers to avoid a deep recession.

This article will follow the complexity of monetary policy decision making since the outbreak of the pandemic by extensively quoting the exact monetary policy decision as published by the BIS, the IMF as well as governors of the main central banks. Inflationary expectations had been anchored at low levels since the GFC. Once inflationary pressures resurfaced in selected sectors, such as in some services and commodity prices, these expectations were at risk of becoming unanchored by sudden reactions to events, which looked as temporary until the war in Ukraine broke out.

This article will address the monetary policy decisions taken during the pandemic, the resurgence of inflation during the pandemic, the supply disruptions and finally the contribution of the war in Ukraine. Surging inflation, a long forgotten phenomenon, engulfed advanced economies (AE) and emerging markets (EME) at the same time, although to a different degree. Was it the fault of central banks who expanded money supply too aggressively without realising the brewing inflationary storm as some pundits claim? Or was it the complexity of steering monetary policy during shifting tides? The complexity of inflation was analysed in depth in chapter II of the 2022 Annual Report of the BIS under the title: inflation: a look under the hood which is reproduced in this issue. The view here is what challenges central banks faced during the pandemic, documented by quotes from the BIS and the IMF documents.

### 1. The buildup of underlying inflation during the pandemic in 2020

The downturn triggered by the Covid19 pandemic has been different from past recessions. Service sectors reliant on face-to-face interactions have seen larger contractions than manufacturing. The drop in economic activity, in goods but mainly in services due to lockdown, together with the drop of inflation indicators into negative territory, consumer prices as well as core inflation, prompted the authorities to pull out all stops, fiscal and monetary to avoid total collapse. In terms of inflation, the effect of weak aggregate economic demand appeared to outweigh supply disruptions. Inflation in AE remained below pre-pandemic levels, in EME declined sharply in the initial stages of the pandemic.

As global economic and financial conditions deteriorated rapidly, central banks formed a critical line of defence. The massive policy support should avoid a further slide in economic activity. Fiscal discretionary revenue and spending measures amounted to close to 10% of GDP in AE with another 11% in various forms of liquidity support, including equity injections, asset purchases, loans and credit guarantees. The policy response was broad based, preventing a dysfunctioning of the financial system. Whereas fiscal measures were targeted at consumers and companies, monetary measures were targeted at supporting aggregate demand and financial intermediaries in their role as lender of last resort.

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Central banks found themselves facing the Herculean challenge of reconciling a real economy where the clock had stopped with a financial sector where it kept ticking. Central bank actions in AE involved more diverse, larger scales of asset purchases and relending facilities, supporting credit provision to a wide range of borrowers. Central banks in EME responded by interest rate cuts, new relending facilities and also asset purchases. These aggressive measures played a vital role in supporting sentiment and preventing further amplification of the Covid19 shock through the financial system.

There were four types of tools available which were widely used.

The first line of defence was cutting interest rates to the lower bound in order to sustain demand. They also sent a powerful signal, which could help to shore up confidence in times of stress. In EME this could not be followed as stabilising the exchange rate often required raising interest rates to stem capital flight.

The second set of tools was lending to financial institutions, the provision of liquidity to financial intermediaries to sustain their survival in times when borrowers faced repayment difficulties. This includes repurchase operations, as well as standing facilities and discount windows. Targeted lending operations can be tailored to support funding in specific market segments. Central banks relied heavily on targeted lending operations to banks at low funding costs. These operations required that banks onlend the funds to firms. Many central banks, such as of China, Brazil, Japan, Singapore, Sweden, Switzerland and the UK set up new facilities, mostly targeted at small and medium sized enterprises (SMEs). Similar programmes were launched by the ECB, FED and BoK.

The third tool is outright asset purchases and sales in order to prevent a collapse of asset prices. The assets involved range from government bonds to private sector securities, such as commercial paper, corporate bonds, equity and foreign exchange. This tool was widely used by the FED and the ECB, but also the BoJ and the BoE. The FED was particularly forceful, committing to purchasing unlimited amounts of US Treasuries and agency mortgage-backed securities, and subsequently breaking new ground by buying municipal debt. The BoJ also committed to unlimited government purchases. The ECB launched the Pandemic Emergency Purchase Programme (PEPP) to narrow bond spreads. The purchases helped stabilise bond markets despite sharp increases in issuance as governments fought the pandemic.

The fourth tool were easing regulatory and supervisory parameters which directly affected financial intermediaries and markets. These included reserve requirements, used by the PBoC, but also capital and liquidity requirements and even capital flow management measures and accounting standards. Authorities softened capital and short-term liquidity regulations in most countries and encouraged banks to make full use of existing buffers above regulatory minima.

The importance of the financial structure merits special attention. In the past emergency lending was credit provision to banks. As capital markets developed and the importance of market-based finance increased, the reach of emergency lending broadened. Early in the Covid19 crisis, money markets came under acute strain. Central banks provided liquidity to money market mutual funds through banks.

Asset purchases also helped a wide range of market segments. A striking example of how far a lender of last resort may need to go in a more market-based system was the dislocation in the US Treasury market in early 2020. Highly leveraged players had to unwind their long Treasury positions in face of large margin calls. As dealers had limited capacity to absorb the securities, the FED responded with massive purchases of Treasuries.

Given the importance of the USD in international financial markets, it is not uncommon for USD offshore markets to come under stress in times of market turbulence. Many non-US financial institutions and firms cannot draw on a USD deposit base or raise funds directly in the US money markets, and are so reliant on FX swaps. During the early Covid19 pandemic the imbalance

between demand and supply of USD widened significantly. In response, the FED acted swiftly. To ease USD funding, it utilised standing swap lines established during the GFC with five major AE central banks and reopened them for another nine.

As a result of adopting all these measures, balance sheets of central banks expanded markedly during the year, in the FED from 5% to 15% of GDP and the ECB from 4% to 8% of GDP, the BoJ from 5% to 12% and the BoE from close to 0 to 8%. The growth in monetary aggregates certainly by far outpaced the negative real growth rates, thus laying the ground work for future inflationary developments. Inflation, after all always is a monetary phenomenon. Was there a way of predicting this coming inflationary storm?

## 2. First signs of inflation in 2021

The key objective during the year was to assist firms and households affected by the pandemic. There were concerns about the lingering impact of insolvencies, persistent shifts in consumption patterns and shrinking global value chains. After acting decisively to pre-empt severe disruptions to credit intermediation and preserve market functioning at the onset of the pandemic, central banks provided further stimulus to aid the recovery. In AE they maintained asset purchase programmes and some, such as the FED made greater use of forward guidance. In EME the response varied according to economic forces. Some EME central banks lowered policy rates further. Others such as of Brazil and Turkey tightened in response to rising inflation. Several central banks also launched asset purchase programmes for the first time, generally to stabilise markets.

Banks globally weathered the recession surprisingly well. Most had entered the pandemic with relatively strong balance sheets after the regulatory reforms following the GFC. Bank capitalisation had increased in many countries in 2020, in part due to restrictions on shareholder payouts and greater flexibility in classifying loans and applying regulations.

The disinflationary effects of the pandemic continued through 2020. Lower aggregate demand, weaker labour markets and firm's cost cutting more than offset supply constraints. Low inflation in China also reverberated through other economies due to the country's large role in global trade.

In the course of 2021 supply pressures strengthened substantially and inflation picked up. After declining early in the pandemic, PPI inflation trended firmly upwards in several economies, most notably China, paralleling a steady recovery in commodity prices. Together with exchange rate depreciations, this led to higher inflation in a number of large EMEs. Inflation also rose in most AEs and in some cases exceeded central bank targets. As well as higher commodity prices, a rebound in other prices of some services, which had fallen sharply early in the pandemic, contributed to increased inflation in these countries.

As from early 2021, rapidly improving economic forecasts led to a sharp rise in sovereign yields in the AEs that then spilled over to EME yields. The steady increase in US bond yields reflected higher market-based inflation expectations. The brightening economic outlook, sustained by positive vaccine news, fiscal expansion and continued monetary accommodation, bolstered a 'reflation trade' in major AEs. China was an exception and saw financial conditions tightening noticeably, not least due to its domestic policy stance that aimed at containing credit growth.

One particular asset class, house prices soared in many countries during the period. Although a rise in house prices during a recession is not unprecedented, partly because of accommodative monetary policy meant to stimulate the economy also supports asset prices, increases during the period were unusually large.

In mid 2021 the BIS already envisaged a scenario of higher inflation and tighter financial conditions. They state that the impact on inflation was harder to assess. There are grounds to believe that any further increase would be limited and temporary. Central banks were not expected to react sharply to such a temporary spike in inflation. Headline inflation was projected to peak in the final months of 2021. The BIS cautions that given the strength of forces at play in the scenario, one could not rule out a larger and more sustained increase in inflation. Financial market measures

of inflation rose quickly in a number of countries. Rising corporate insolvencies would be magnified through their impact on banks and other financial institutions. Corporations would have to contend with increased repayment obligations due to the large rise in borrowing early in the pandemic.

In response, central banks would face a delicate communication challenge. On the one hand there was a need to provide sufficient reassurance to avoid a market-driven pre-emptive tightening of financial conditions. On the other had this reassurance posed the risk of constraining central banks, making them unable to adjust promptly if the inflation was more persistent. At that stage some central banks had little choice but to tighten, such as in Brazil, Turkey and Russia. Should commodity prices continue to rise or global bond yields resume their climb, other central banks could feel compelled to follow suit.

A sustained rise in inflation in AE leading to an unanticipated withdrawal of monetary accommodation could have disrupted financial markets. EME would be especially affected from the resulting spillover effects through capital outflows and exchange rate depreciation.

Inflation expectations and supply shocks are crucial to understanding the inflation process. A key concern was identifying the conditions that cause recent inflation spikes to persist, leading to unanchored expectations and self-fulfilling inflationary spirals. Policymakers worried that the unprecedented policy support in response to Covid19 crisis may have reduced the room for monetary policy to manoeuvre thereby denting the credibility of central banks and possibly de-anchoring of inflation expectations.

During 2021 it also became clear that higher commodity prices were not a temporary phenomenon but here to stay. The original price shocks were multiplied through the commodities futures markets where financial conditions played an important role. They affect macroeconomic conditions through several channels.

The first is through inflation. Some commodity prices such as oil and wheat are closely linked to the prices of consumer goods such as petrol and bread. Others such as metal are key production inputs. Higher and more persistent inflation could eventually prompt a monetary policy response that lowers growth.

A second channel is through changed production patters, such as substituting expensive inputs with other production inputs, such as less efficient energy. This could lower growth in the short run.

A third channel is through terms of trade effects. Higher commodity prices provide a real income boost for commodity producers and a real drag for commodity importers. These spillovers of inflation are typically larger for commodity importers, where core inflation will also rise.

There were already substantial commodity price increases in 2021 which were exacerbated by the war in Ukraine in early 2022, which triggered a surge in commodity prices, notably oil, gas, food and metals. Prices remain well above pre-pandemic levels and the outlook for commodity markets remain uncertain as the war continues.

### 3. Inflationary expectations become more entrenched in 2022

As the World Economic Outlook of the IMF put it, inflation is expected to remain elevated for longer than in the previous forecast, driven by war-induced commodity price increases and broadening price pressures. For 2022, inflation is projected at 5.7% in AE and 8.7% in EME, much higher by 1.8 to 2.8 percentage points than projected earlier. Although a gradual resolution of supply-demand imbalances and a modest pickup in labour supply are expected, easing price inflation eventually, uncertainty surrounds forecasts. Worsening supply-demand imbalances, including those stemming from the war, and further increases in commodity prices could lead to persistently higher inflation, rising inflationary expectations and stronger wage growth. If expected inflation will be higher over the medium term, central banks will be forced to react faster than currently anticipated.

Anchored inflationary expectations provide for monetary policy manoeuvre, but how strongly they remain in place will depend on central banks keeping inflation in line with their stated objectives. Broad progress in the anchoring of inflation expectations during the decade before Covid19 seems to be paying dividends in the post-pandemic landscape. Despite the sharp jump in recorded inflation over past 12 months until mid 2022, long-term expectations have remained flat for most of the economies in an analysis by the BIS. This policy space will depend on how far policymakers succeed in confronting rising inflation, hence locking in their pre-pandemic gains in anchoring expectations.

In a striking break with the recent past, global inflation climbed to multi-decade highs. By early 2022 it exceeded central bank targets in almost all AEs, and had risen above 5% in more than three quarters. The share of EMEs with inflation above 5% was almost as high. Higher inflation was less prevalent in Asia. But even there, it generally rose above target as the year progressed, with the notable exception of China.

The flare-up in inflation came as a surprise to most observers. While at the end of 2020, forecasts were generally projecting inflation at or below central bank targets. Even in mid-2021, by which time inflation had already started to rise, most forecasters underestimated the extent or persistence of the increase. Contributing to the miss, the increase was initially concentrated in a narrow set of items, such as durable goods, food and energy. These price increases were widely interpreted as one-off or transitory relative price adjustments to pandemic-induced shifts in supply and demand. But inflation progressively broadened. By early 2022, growth in service prices, which tends to be more persistent, exceeded its pre-pandemic level in much of the world.

Higher inflation was due to a number of factors.

First, the recovery from the Covid19 recession has been unusually rapid, particularly in AEs. As a result the relationship between income support early in the pandemic and economic activity in 2021 was much more evident for nominal GDP than real output.

Second, the pandemic-induced rotation of aggregate demand to goods from services, especially contact-intensive ones, proved surprisingly persistent. As a result, inflation rose even as output remained below its pre-pandemic trend and labour markets showed spare capacity.

Third, supply failed to keep up with the surging demand. In particular, global value chains came under pressure. Supply was especially tight in energy and other commodity markets, triggering major price increases and higher volatility. The war in Ukraine further disrupted the global supply of products such as wheat, oil, gas, nickel, palladium and fertilisers.

In some EMEs central banks responded quickly to rising inflation. By early 2022 most EME central banks had started to remove accommodation. The PBoC was an important exception: it eased monetary policy as the economy softened and inflation remained subdued.

In AEs, central banks responded more slowly. Initially, many attempted to 'look through' seemingly transitory higher inflation. As the current year progressed, central banks wound back their forward guidance, signalling an earlier start of policy normalisation. The concrete steps taken by major central banks follow in the section below.

Higher inflation and the outbreak of the war in Ukraine also left an imprint on financial markets. Financial conditions tightened sharply, particularly from the start of 2022, as asset prices responded to the prospect of rising inflation and the resulting anticipated monetary policy tightening.

#### 4. Policy reactions by main central banks, the FED, the ECB and PBoC

In his report to the US Congress in mid-2022 Chairman Powell stated that inflation remains well above the long-run target of 2 percent. Over the twelve months ending in April 2022, total personal consumption expenditure prices (PCE) rose by 6.3%. Even excluding the volatile food and energy categories, core PCE rose by 4.9%. Aggregate demand is strong and supply constraints have been larger and longer lasting than anticipated, and price pressures have spread to a broad range of goods and services.

With inflation well above the long-run goal of 2% and an extremely tight labour market, the FED raised the target range for federal funds rate at each meeting, resulting in a 1.5 percentage point increase in the target range so far. In addition to raising interest rates, the size of the FED balance sheet will be reduced by significantly reducing the holding of securities. Both these measures will lead to a significant tightening of financial conditions.

Similar to the FED, the European Central Bank (ECB) is facing headwinds from higher energy costs, the deterioration in terms of trade, greater uncertainty and the adverse impact of high inflation are expected to gradually fade. As a result, growth of 2.8% is projected in 2022 and 2.1% both in 2023 and 2024. Inflation has risen further, at 8.1% in May 2022. Energy prices were 39.2% higher than a year ago. Food prices rose 7.5% in May, in part reflecting the importance of Ukraine and Russia among the main global producers of agricultural goods. Prices have also gone up more strongly because of renewed supply bottlenecks amid recovering domestic demand. As a result, price rises are becoming more widespread across sectors and the underlying inflation has risen further.

As inflation is well above target, the ECB is committed to bring inflation back to its medium-term target of 2%. Monetary policy should normalise the previous extraordinary measures. First the asset purchase programme (APP) will end as of 1 July 2022. Secondly, interest rates will be raised by 25 basis points in July with another rise in September and beyond possible, if needed. Thirdly, the redemptions of the PEPP portfolio will be reinvested flexibly, depending on developments.

Differently from the US and the Eurozone, China has never used quantitative easing and recently reversed its tightening policy to stimulating monetary accommodation as there was downward pressure on growth.

In his speech to the Boao Forum in April 2022, Governor Yi Gang of the PBoC outlined China's monetary policy response. China's financial market is not immune to external shocks and the domestic Covid19 situation. China's accommodative monetary policy is stepping up support for the real economy. By end March 2022 M2 and social financing expanded by 9.7% and 10.6% respectively. The PBoC contributed profits of RMB 1trillion to the central government.

Structurally, the PBoC supports key areas and weak links of the economy through targeted facilities. Monetary policy is focusing on Green finance, and also on SMEs which were vulnerable to the pandemic. Consumer prices have stayed in a moderate range with CPI rising 1.1% in 1Q22 and PPI rising by 8.7% recently.

#### Conclusion

Central banks have done the utmost during the pandemic to avoid a total collapse. These measures have saved households, small and medium enterprises, as well as big enterprises and the financial intermediaries. Importance was attached to anchoring inflation and stabilising market expectations. In view of persistent inflation, broadening from commodities and some services to the whole economy, threatening to trigger the price-wage spiral, central banks reversed course in early 2022. As governors of major central banks communicated their shift in policy, fighting inflation has started in earnest. They can be blamed for delaying a sharp U-turn, but not for the support measures taken during the pandemic.

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## **Countries must be Prepared for the Spillover Effects from the Fed's Rate Hikes\***

*By* ZHANG MING\*

After the outbreak of the COVID-19 pandemic in early 2020, the United States adopted extremely loose monetary and fiscal policies to boost growth. The Federal Reserve lowered the federal funds target rate to the range of 0 to 0.25 percent in a short time, and implemented aggressive quantitative easing, expanding its balance sheet from \$4 trillion to \$9 trillion.

In terms of fiscal policy, the US federal deficit ballooned to 15 percent of GDP in 2020, mainly as a result of handing out cash directly to low- and middle-income households. Thanks to the stimulus measures, the US economy quickly recovered from the recession brought about by the pandemic.

The unemployment rate stood at 3.6 percent in May, approaching the lowest level in history. But in terms of inflation, the consumer price index reached 8.5 percent and core CPI growth was 6 percent in May, far exceeding the Fed's target level of about 2 percent.

There are several reasons behind the soaring inflation in the US.

Its fast economic growth has outpaced the potential growth rate, its consumption revival came earlier than the recovery of production, and the high tariffs imposed on some types of Chinese goods have also been a contributory domestic factor. As for external factors, the surging prices of global bulk commodities, such as food and grain, caused by the Russia-Ukraine conflict, have triggered imported inflation in the US.

Amid robust growth, a labor shortage and high inflation, the Fed was forced to quicken its pace of tightening its monetary policy. On March 16, it raised the benchmark interest rate by 25 basis points; on May 4, it lifted the interest rate by 50 basis points; and on June 15, the Fed increased the rate by 75 basis points, the steepest rise since 1994. In addition, the Fed started shrinking its balance sheet by \$47.5 billion per month in June, July and August.

Usually, when the Fed launches an interest rate hike cycle, it will trigger turbulence in the global financial market. Over the past more than half year, the long-term US interest rates have risen sharply, with the 10-year treasury yield approaching 3.5 percent. As the most important benchmark rate in the global financial market, the increase in the long-term US interest rate will push down the prices of global risk assets and safe-haven assets, and lead to the appreciation of the US dollar against other currencies. But sometimes the Fed's interest rate hike creates financial turbulence in emerging economies, and other times, it sparks turmoil in the US financial market.

In the last century, successive interest rate hikes by the Fed led to the debt crisis of Latin America in the 1980s, and the Asian financial crisis of 1997-98. That is because typically, when the Fed starts a rate-hike cycle, the interest-rate gap between the US and emerging economies will narrow, provoking an outflow of capital from emerging markets to the US.

Under such circumstances, emerging economies face slumping asset prices, currency depreciation and rising foreign currency debt. If dealt with improperly, that could spark a monetary crisis, debt crisis or a financial crisis, or even an economic crisis. For example, when the Fed

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announced its plan to end its loose monetary policy in 2003, some emerging markets were plunged into financial turmoil.

It is noticeable that the Japanese yen has tumbled against the greenback recently, with the exchange rate dropping to around 135 yen against the dollar. The sharp depreciation of the yen could cause negative impacts on export-oriented emerging economies which have a trade structure similar to that of Japan, and even lead to depreciation of the currencies of these economies against the US dollar.

At home, the US internet bubble in 2000 and the housing bubble in 2007 also burst after the Fed raised interest rates multiple times. The logic behind the collapse is that if the US capital market or housing market is overvalued, the Fed will launch a rate-hike cycle to increase lending costs, which will push down asset prices dramatically, thus triggering a financial crisis.

In addition to 2000 and 2007, the Fed's rate hikes from 2015 to 2017 wiped out about 20 percent in value from the US stock market in 2018. Since the beginning of this year, the three major US stock indexes have fallen by around 20 percent—the threshold of a bear market. And more turbulence in the stock market is expected for the remainder of this year, and the possibility of a slump cannot be excluded.

So, will this round of Fed's interest rate hike send shock waves to emerging economies or to the US financial market? The answer remains unclear. But the combination of the Russia-Ukraine conflict and the Fed's rate hikes may pose a severe challenge to the world economy, with the threat of stagflation looming large. The steep rise in the US interest rates will have enormous impacts on the financial markets of both emerging economies and the US.

How should emerging economies such as China respond to the challenge?

To weather growing external influences, emerging economies should first stabilize their economic fundamentals and maintain steady growth. It is also important for them to prevent their current account deficit from ballooning, which can put local currencies under huge depreciation pressure. Moreover, emerging economies should allow their currency's exchange rate against the US dollar to fluctuate within a reasonable range in order to resist and mitigate negative external influences.

Besides, emerging economies should properly control capital flows to prevent the vicious circle between massive capital outflows and currency depreciation expectation. Last, emerging economies should take precautions to better prepare for a possible crisis.

## **External Challenges and Policy Focus of China's Economy**

*By* E ZHIHUAN\*

China's economic growth has been facing multiple challenges since 2022. From external perspectives, the evolution of the pandemic and the divergence in epidemic prevention and control measures between countries and regions have continued to exacerbate the divergence of global economic growth. The high inflation has accelerated the pace of the United States' interest rate hikes and balance sheet reductions. The protracted Russia-Ukraine conflict has led to the cross-transmission of economic and financial risks. From the internal point of view, the epidemic outbreaks have reappeared among multiple cities and pressed the pause button of the economy, affecting the lives and consumption of residents. The 2022 Government Work Report proposes an annual economic growth target of 5.5%, reflecting the policy considerations of stabilizing growth and the employment priority principle. Facing internal and external difficulties, it is necessary to strengthen macro-policy support and enhance confidence and expectations on economic growth.

### **1. Global economic growth divergence intensifies cyclical differences**

Recently, some countries have tried to coexist with the virus. The real economy's sensitivity and panic to the epidemic have decreased. The output gap has gradually narrowed, and economic growth has normalized within a range higher than the long-term average. In general, the differences between countries in terms of economic structure, fiscal and monetary policy space, social development level, government governance capacity, and the pace of epidemic prevention and control have become increasingly prominent. Some advanced economies have recovered quickly, and the global recovery trend will be differentiated further.

Before the outbreak of the Russia-Ukraine conflict, the I M F lowered global economic growth from 5.9% in 2021 to 4.4% in 2022, the U.S. GDP growth rate from 5.6% to 4%, Eurozone economic growth from 5.2% to 3.9%. The divergence of major economies' growth momentum has intensified. The U.S. economic growth in 2022 is likely to be revised down to around 4%, but still above its average of the past decade and significantly above the trend growth rate.

China's economy has begun to decelerate since the second half of 2021, and it will continue to face downward pressure in 2022. The 5.5% annual economic growth target is close to the upper limit of market consensus, showing a certain degree of aggressiveness and continuity of the long-term goal of doubling GDP in 2035. The Chinese and U.S. economies are in different growth cycles and may present significant macro-policy differences, and the comprehensive impact needs to be assessed in details.

### **2. Major economies accelerate policy shifts, leading to new risks**

The divergence of economic growth increases the differences in the direction of macro-policy among countries. The U.S. labor market is moving toward full employment as jobs lost during the pandemic has gradually recovered. The service sector is recovering faster, supported by higher vaccination rates and progress in drug research and development. The supply chain bottleneck pressure caused by the epidemic has not been fundamentally relieved. Factors such as population aging and de-globalization trends have shown long-term impacts on inflation. In the following period of time, suppressing inflation is a significant challenge that needs to be addressed urgently. A monetary policy shift has become the primary choice to ease the upward pressure on prices.

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The Fed announced 25 basis points increase in the federal funds rate, which was limited, and real interest rates are still at historically low levels and will not have a severe impact on financial markets. At the same time, the global financial market has full expectations for the US Federal Reserve to raise interest rates. The Fed continues to convey to the market that the expansionary monetary policy is about to exit, to guide market expectations.

This rate hike is the beginning of a series of tightening actions for a more extended period, meaning a turning point in monetary policy. The Russia-Ukraine conflict intensified the rise in commodity prices. The epidemic and supply bottlenecks also led to persistently high inflation pressures, prompting the Fed to accelerate the pace of monetary policy normalization. The normalization sequence of US monetary policy is to slow the pace of asset purchases first, then stop asset purchases, raise interest rates moderately, and finally shrink the balance sheet. The Fed's latest dot-plot shows that the market generally expects more than seven interest rate hikes this year and may even raise interest rates by 0.50% at one time, thereby accelerating the pace of returning to long-term interest rates.

For a long time, the U.S. Fed's monetary policy orientation has mainly focused on domestic economic data without considering its international spillover effects. At present, the United States is facing severe inflationary pressure. The Personal Consumption Expenditures price index (PCE) has been raised to 4.3%. The inflation level will significantly exceed the target range in the next two years, and the core inflation rate will also show the same trend. Long-term upward inflation is an essential basis for raising interest rates. The market is also worried about the superposition of inflation and economic stagnation, leading to the stagflation risk. From the labor market perspective, the unemployment rate will reach 3.5% by the end of this year, close to the full employment, which may form a new cycle of rising wages and inflationary pressures. Therefore, both significant indicators of inflation and employment support the Fed to further accelerate the process of exiting the easing policy.

### **3. The Russia-Ukraine conflict increases the risk of international capital flows**

Judging by the current situation, the conflict between Russia and Ukraine first hit major European member states, leading to multiple difficulties and adverse challenges to the economic growth of the Eurozone. The Russia-Ukraine conflict affected the global supply chain and pushed up energy prices. The inflation in the Eurozone accelerated to a record high. According to Eurostat's latest data, the harmonized index of consumer prices (HICP) in the Eurozone rose by 7.5% in March. The core HICP rose by 3.0% year-on-year, up 160 and 30 basis points respectively from February. The continued rise in energy prices will affect the process of regional economic recovery, with rising pessimistic expectations of producers and consumers on the economic outlook, investment, and consumption. Eurozone manufacturing PMI in March was revised lower to 56.5, a drop of 1.7 from February, hitting a 14-month low, which means that the economic growth rate of the Eurozone may continue to decline.

The Russia-Ukraine conflict directly affects the trend of commodity prices and triggers risk aversion in the global financial market. International capital has fled to safe-haven assets such as the US dollar, US bonds, and gold, which intensified the volatility of the international financial market.

The Russia-Ukraine conflict has led to secondary disasters. The United States and European countries have imposed a new round of financial and economic sanctions on Russia, restricting Russia's use of foreign exchange reserves and excluding some Russian banks from the SWIFT system. In the past few years, Russia has gradually reduced its holdings of US treasuries in its foreign exchange reserves and implemented de-dollarization in the currency denomination of imported commodities. The denomination of export commodities is still mainly in US dollars to balance the demand for US dollars.

The US and European financial sanctions restrict Russia's foreign exchange reserves, which shakes the confidence of countries in the US dollar. This may provide a new opportunity for reforming the international monetary system and promoting the process of diversification of reserves.

#### **4. Fiscal policy will be more effective and proactive, and monetary policy will be more forward-looking and precise**

China's macro policy options are adjusted against global macro policy adjustments. In the short term, three external factors will pose challenges to China's economy and need to be cautiously and adequately addressed. From the perspective of the external environment, it is necessary to pay attention to the impact of the normalization of US monetary policy. From the internal point of view, the epidemic outbreaks have reappeared among multiple cities and pressed the pause button of the economy, affecting the lives and consumption of residents. Achieving the 5.5% growth target will be tough. The Chinese economy continued to decelerate in last year's third and fourth quarters. The trend of economic deceleration in the first quarter of this year has not been fundamentally reversed. To achieve the growth target, it is necessary to increase the coordination and support of macroeconomic policies for the whole year. China's economic growth rate is likely to show a trend of slowing down and then stabilizing this year.

First, the fiscal policy reflects the requirements of prioritizing stability while pursuing progress, emphasizing that reasonable efforts should be put forward. It is necessary to continue strengthening fiscal policy support for the real economy. Fiscal revenue continues to grow, coupled with the fact that certain state-owned financial and other institutions have turned over profits from recent years and transferred them into budget stabilization funds. The scale of expenditure will expand by more than 2 trillion yuan compared with 2021. The transfer payments from central to local will increase by about 1.5 trillion yuan, the most significant increase in years. Also, the government will seek to improve the effectiveness of the fiscal policy, further drive effective investment, and advance infrastructure investment to leverage private investment. Government investment funds will also further drive effective investment. The 3.65 trillion yuan of local government special bonds, coupled with the support of bond issuance funds later last year, is expected to be moderately advanced in infrastructure investment, to expand government investment and leverage the private sector. Infrastructure investment will become one of the critical pillars of stable growth.

Second, the monetary policy focuses on inter-cycle adjustment, emphasizing flexibility, precision, reasonableness, moderation, and self-centeredness. It grasps the strength and pace of the policy, handles the relationship between economic development and risk prevention, makes good use of the space for RRR cuts, maintains the overall financial stability, and enhances the resilience of economic growth.

Third, while increasing the intensity of the cross-cyclical approach, giving full play to the dual functions of aggregate and structure of monetary policy tools, and focusing on precise and advanced efforts to meet the real economy's practical and effective financing needs. Also, it is essential to comprehensively use monetary policy tools, such as medium-term lending facilities and open market operations, etc., and maintain reasonable and sufficient liquidity. In addition, it is necessary to focus on increasing financial support for critical and weak areas such as small and micro enterprises, technological innovation, and green development, etc.

Fourth, it is necessary to continue to improve the formation and transmission mechanism of market-oriented interest rates and promote the reduction of the comprehensive financing costs of small and micro enterprises. It is also essential to make good use of re-lending for rural and county entities and guide financial institutions to increase support for SMEs. The Two Sessions proposed implementing new tax and fee reduction and credit support policies, strengthening support for

SMEs and individual industrial and commercial businesses, providing more credit support for SMEs through inclusive loans, and guiding large platform companies to reduce fees to ease the burden on SMEs.

Fifth, the difference in economic cycles between China and the United States determines the differentiation of macro policy trends, reflected in the narrowing of the China-US interest rate spreads and changes in the USD Index (DXY). The DXY rose by 6.4% in 2021, and the increase was concentrated after June 2021. The interest rate hikes and the increased demand for safe-haven of the new variant virus will further push the dollar higher in 2022. For the RMB exchange rate trend, the RMB against the USD maintained a stable and moderate-to-strong trend in 2021, with a rise of 2.6% throughout the year, benefiting from the strong performance of China's foreign trade, the rollout of vaccination, and the cooling down of risk aversion, etc. Multiple factors will continue to support the performance of the RMB exchange rate in 2022, such as the potential in China's economic strength, the high level of current account surplus, the uncertainties of the global economic growth and the epidemic, the steady progress of the opening-up of the mainland's financial market, and the certain attractiveness of RMB-denominated financial assets to international investors, etc.

#### **5. Implementing structural policies that focus on balancing short-term impacts and expected shocks**

China's economy faces triple pressures of demand contraction, supply shocks, and weaker expectations. Among them, the adverse effects of weaker expectations cannot be ignored. As the internal and external environment becomes more complex, the promotion of structural reform policies should emphasize process management and secondary risk control to avoid adverse effects on expectations.

Long-term structural reform is the key to achieving high-quality economic development in China, and there will never be perfect timing. Therefore, in the current structural policy reform, we should pay special attention to the pace, control risks, and make it work as its intended function.

On the one hand, the management of relevant policy expectations should be strengthened. When functional departments launch structural policies, including the reform of the factor market, they should conduct scenario planning, fully consider the impact of industry-specific measures on the financial market, consider the different perspectives of the domestic market and the international market on policy interpretation, and fully communicate with market players.

On the other hand, the cooperation between relevant functional departments should be strengthened. For example, there is room for further improvement in the standardized management of some Internet platforms and the collaboration between financial management departments.

## Rate Alarms shouldn't Influence Monetary Moves<sup>\*</sup>

By ZHANG BIN<sup>\*</sup>

A worldwide trend of tightening monetary policy has been quite noticeable, which is best represented by the US Federal Reserve's latest moves. This will definitely affect global capital flows, risk appetite and asset pricing. China's economy and monetary policy thus face challenges.

There is solid evidence that the US-China interest rate difference is not the major element affecting China's cross-border capital flows. Even in an empirical regression model that includes external financial cyclical factors, an external financial cycle's impact on cross-border capital flows is less than expected.

This can be largely attributed to the unique environment, the nature of market participants and motives behind China's capital flow. China's capital account sees foreign companies and import-export firms, rather than residents or financial investors, exert a greater influence on short-term capital flows.

China's short-term capital flows are determined more by factors such as balance of payments, deposits of trading firms, loans, trade financing and financial leases. Changes in interest rate differences exert a limited impact, especially when compared to financial investors.

Empirical research shows that exchange rate expectations represent the predominant factor affecting China's short-term capital flows. The reason for this is the gradual reform in setting the renminbi's foreign exchange rate, under which the currency has maintained expectations of unilateral appreciation or depreciation for a long time.

The renminbi saw a gradual appreciation against the US dollar from 2005 to 2015, except for the re-peg to the greenback during the global financial crisis from late 2008 to early 2010. Expectations of the renminbi's unilateral appreciation existed in the foreign exchange market most of the time. The pressure on net capital inflows was relatively higher during the decade.

The renminbi experienced unilateral depreciation pressure between 2015 and 2017. The pressure on net capital outflows was higher.

The renminbi has become more flexible in terms of foreign exchange proceedings since 2017, which has resulted in weaker expectations in unilateral changes in the exchange rate and more balanced cross-border capital flows.

Chinese monetary regulators have not intervened in the foreign exchange reserve market since 2017, and they announced in 2020 a fadeout of the "counter-cyclical factor" used in the quotation model for the renminbi-US dollar parity rate. The renminbi's foreign exchange rate is more market-oriented, with supply and demand more balanced. Expectations of the renminbi's unilateral fluctuation have been lowered and cross-border capital flows thus stabilized.

The strength of the Chinese economy is another major factor influencing cross-border capital flows. When the economy outperforms, companies' robust capital demand will be translated into increased capital inflows. Short-term capital inflows decrease when the economy underperforms.

Differing from most developed countries where inflation is the biggest problem at present, China's major challenge at present is a low potential GDP growth rate and an underperforming economy.

China's potential GDP growth rate is mainly restricted in three aspects.

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<sup>\*</sup>This article first appeared on China Daily on April 25, 2022.

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First, the resurgence of COVID-19 places pressure on economic recovery, especially in the services industry and the job market.

Second, real estate is challenged by long-term adjustments and short-term liquidity shortages. Housing sales and investment will undoubtedly slow. The country's overall credit expansion will be affected.

Third, exports' contribution to economic growth has contracted, which is inevitable due to the slowdown of global economic growth and high base readings over the past few years.

Therefore, the focus should be diverted to avoid an excessive economic slowdown, which may result in the emergence of some potential risks in the short run. Structural problems will be more prominent and it will be more difficult to prevent and defuse major risks under such circumstances.

China should thus adopt a more powerful combination of macroeconomic policies to revitalize the economy. Instead of overly relying on local government financing platforms, there should be more extensive application of regulated interest rate policies, fiscal policies and policy-based financial tools so that China can realize economic growth while avoiding any rippling effect of inappropriate policies.

China's monetary policy should be centered on boosting domestic demand. There is no need to worry about the influence of the expanded China-US interest rate difference on capital flows.

China may face pressure from capital outflows and renminbi depreciation this year due to Fed rate hikes and China's economic downtrend. Past experience shows that capital flows tend to stabilize when there is little market intervention, as the country's foreign exchange formation mechanism is now more market-oriented.

Even if the renminbi depreciates to some degree this year, it is not totally negative, as it may help boost demand and, on the contrary, drive economic growth. China's stronger competitiveness in terms of exports will prevent the renminbi from further slides.

By sticking to the market-oriented foreign exchange formation mechanism, plans should be prepared for countercyclical cross-border capital flows under special scenarios to prevent speculative capital flows.

Monetary regulators should clarify interest rate adjustment trajectories so that the market can see the government's commitment to stabilizing growth. A possible solution is to lower the policy rate by 25 basis points under each phase and the lowering steps should not be held up until the growth target is realized.

The lowered policy rate can help expand credit by reducing the cost of debt, increasing asset valuation and strengthening the balance sheet. The debt of the Chinese government, companies and residents reached 73 trillion yuan (\$11 trillion), 171 trillion yuan (\$25.8 trillion) and 67 trillion yuan (\$10 trillion), respectively, in the first half of 2021. Lowering the policy rate by 100 basis points can reduce 3 trillion yuan in interest rate payments with regard to debts. This will play an important role in supporting investment and boosting consumption.

Meanwhile, policy rate adjustments can guide market expectations and help policies better function for market entities, creating stronger combined force to stabilize growth. More importantly, policy interest rates can be adjusted flexibly and in a timely fashion.

Monetary policy is effective only when financing costs are lowered. The phase of lowering interest rates should not be decided by other countries or based on past experience. The current economic situation is the only gauge needed. When companies are willing to spend and residents willing to borrow, monetary policy can be defined as effective.

China has ample room to make monetary policy adjustments. Monetary policies adopted by other countries after global financial crises showed that there was much bigger policy room than we had imagined. Chinese monetary authorities can develop more tools to lower financing costs for companies and residents to stimulate investment and consumption. The overall economy will be vitalized.

China's nominal interest rate is way above zero. Even for Japan and other European countries whose economic outlook is much weaker, they still have room to adjust their monetary policies. China should therefore not overly worry about the issue.



## Will Infrastructure Investment Become the Key Growth

### Stabilizer in 2022?\*

By DONG JINYUE AND XIA LE\*

#### Recent “Zero Covid” measures and economic slowdown have urged China’s policy turnaround from the “new” to “old” growth model

Recent Omicron outbreak and the lockdown measures in China significantly changed the previous soft-landing story of Chinese economy in 2022. In March and April, Shanghai and other mainland cities’ lockdown led to supply-side stagnancy and supply-chain disruptions. Coincidentally, the recent trending-up inflation, tumbling exports and RMB sharp depreciation etc. have shrink the authorities’ policy room for more aggressive easing measures.

Chinese authorities indeed face an “Impossible Trinity” in 2022 among “Zero Covid”, financial stability and 5.5% growth target. Given that the authorities still stick to “Zero Covid”, there are only two possible choices of the policy mix: (i) if the authorities want “Zero Covid” and 5.5% growth target together, they have to conduct aggressive easing monetary measures which are unsynchronized with the US FED, leading to financial instability such as capital flight and sharp RMB depreciation etc.; (ii) if they want “Zero Covid” and a synchronized monetary policy with the US FED to circumvent financial instability, they have to accept a lower growth rate than 5.5%. The authorities are probably trying to experiment (i) with aggressive easing measures at the current stage, although the real-world scenario might be (ii) ultimately.

Under this “trilemma” circumstance, Chinese authorities have already made some significant policy turnaround and reverted to “old growth model” in the recent months to stimulate growth. The so-called “old growth model” highly depends on real estate, exports and infrastructure investment to boost economy, the model that Chinese authorities have always implemented during the business cycle downturn in the past decades.

Some of the recent policy moves tilting towards infrastructure investment boost include but not confined with the following policy initiatives: In the State Council executive meeting in January 2022, the authorities prioritized the 102 infrastructure projects outlined in the 14th Five Year Plan, including new infrastructure projects, new urbanization projects, transportation and water conservancy projects, storage and postal facilities etc. In the Central Financial and Economic Committee Conference on April 26 2022, President Xi re-emphasized the importance of infrastructure investment to support growth in this year and clearly signaled that China’s infrastructure still has large potential to grow.

These high-level meetings also outlined the principles of infrastructure investment in 2022: (i) to construct the modern infrastructure system with the balance of development and security; (ii) to comprehensively consider the benefits of the economy, society, environment and security etc. when conducting the new infrastructure projects; (iii) to take the equal emphasize on the “old” and “new” infrastructure investment; and (iv) to expand financial channels and to include social capital into the infrastructure investment, such as PPP (public-private partnership).

In a bid to stimulate infrastructure investment, the authorities also recently promulgated a series of monetary and fiscal easing measures. Regarding fiscal stimulus, the pace of special local government bond issuance reached historical high in Q1, indicating the authorities have strained every nerve to stimulate infrastructure investment. In particular, the new increase issuance in Q1

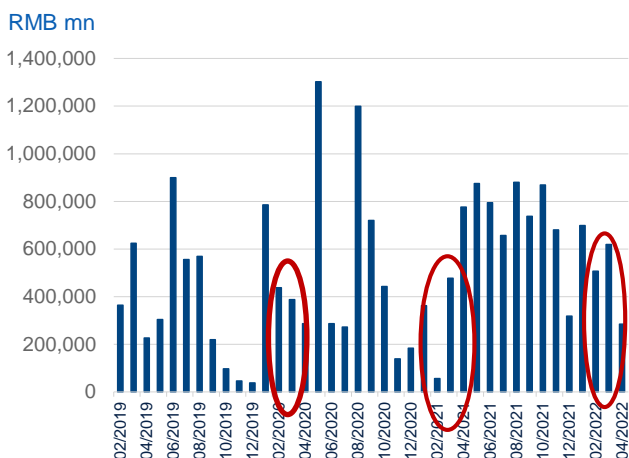
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\*This article first appeared in BBVA Research on July 5, 2022.

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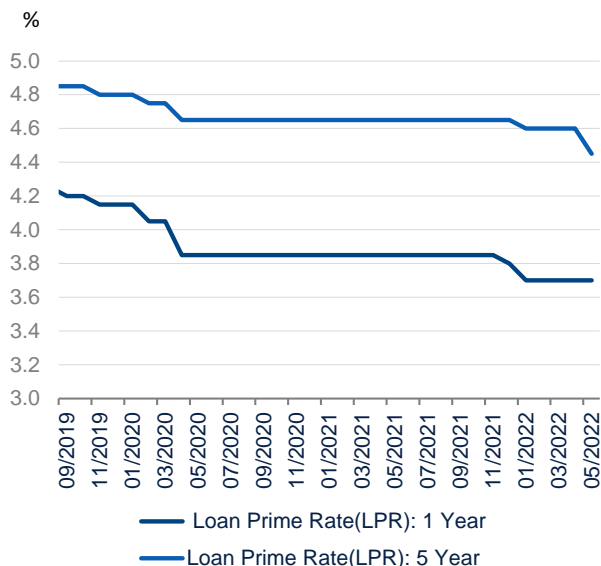
reached 36% of full-year budget of local government bond issuance (RMB 3.65 trillion) and 89% of quota for the early issuance (RMB 1.46 trillion). The Q1 issuance level is significantly higher than that of the same period of 2021 and 2020. (Figure 1) On the front of monetary policy easing, the PBoC recently cut the 5-year LPR from 4.6% to 4.45%, the largest cut since the LPR reform in August 2019, suggesting the expansionary stance of monetary policy to support infrastructure long-term investment financing. (Figure 2)

Figure 1. THE AUTHORITIES SPEEDED UP LOCAL GOVERNMENT BOND ISSUANCE IN Q1, WITH ITS LEVEL HIGHER THAN THE SAME PERIOD OF 2021 AND 2020



Source: CEIC and BBVA Research

Figure 2. THE PBOC CUT 5-YEAR LPR BY 15 BPS, THE LARGEST CUT SINCE 2019 LPR REFORM TO SUPPORT LONG-TERM INFRASTRUCTURE FINANCING

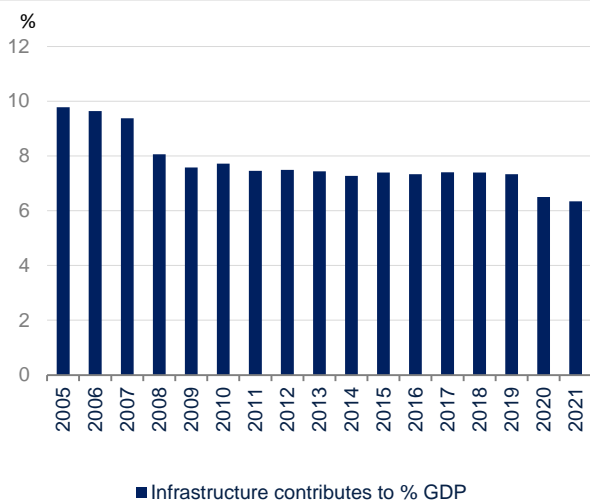


Source: CEIC and BBVA Research

**Infrastructure investment has always been an important counter-cyclical measure for China in the past decades**

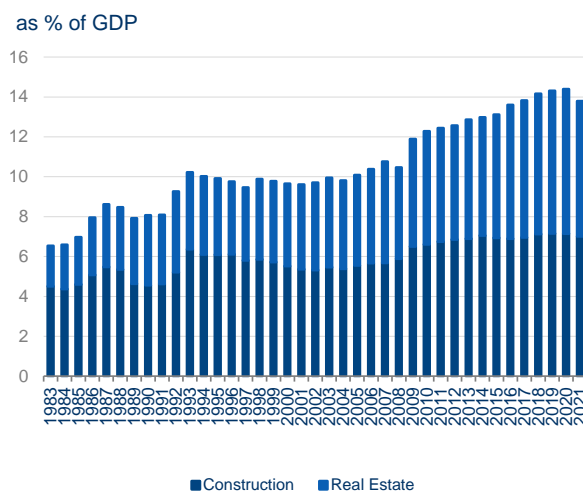
Infrastructure investment constitutes a large ratio of Chinese total GDP and has been the main growth engine for Chinese economy in the past decades. It contributes around 6.5% of the total GDP in 2021. (Figure 3 and 4) However, these figures only consider the direct effect while ignore the indirect effect. Infrastructure investment, whether they are “new” or “old”, has large externalities to other sectors. For example, a better infrastructure may benefit a province or a region’s tourism, FDI, real estate investment, etc. If we consider its strong linkages to its upstream and downstream sectors, such as construction, architecture raw materials, etc., as well as its extremities to tourism, industrial investment, real estate and FDI etc., infrastructure is estimated to contribute around 20% of GDP for Chinese economy for the past decades.

Figure 3. **INFRASTRUCTURE CONTRIBUTES TO AROUND 6.5% OF GDP IF ONLY DIRECT EFFECT IS CONSIDERED**



Source: CEIC and BBVA Research

Figure 4. **REAL ESTATE AND CONSTRUCTION SECTOR COMBINED CONTRIBUTE AROUND 14% OF CHINA'S TOTAL GDP**



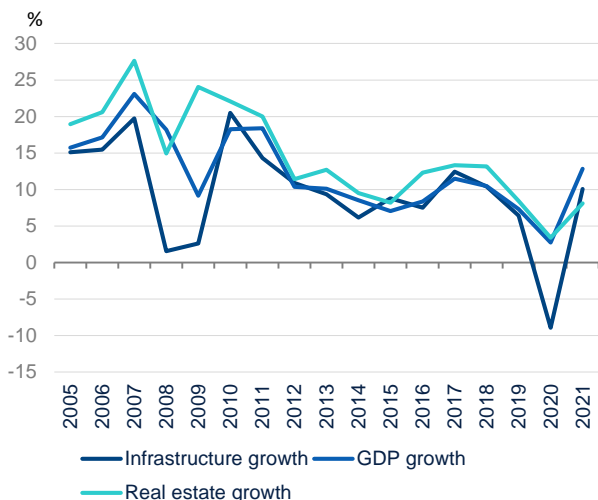
Source: CEIC and BBVA Research

In the past two decades, infrastructure has always been the stabilizer and the main counter-cyclical measure to stimulate growth amid business cycle downturns. Through fiscal expansionary measures particularly the issuance of local government bond, infrastructure investment has always been the main pillar to smooth the business cycle. During 2007-2016, infrastructure investment has remained double-digit growth in China and it is not difficult to understand that Chinese business cycle has always been deemed to be “infrastructure cycle” in the past decades. (Figure 5)

Take 2008-2009 Global Financial Crisis as an example, Chinese authorities injected RMB 4 trillion into the economy, most of them went to the infrastructure investment, which successfully secured a soft-landing of the economy when other countries went into recession. (Figure 6) Including the Global Financial Crisis period, historically, there were three times of expansionary infrastructure investment policy in China, in 2008-09, 2012 and 2016, respectively. Every time, infrastructure investment expansion played a counter-cyclical role and successfully pulled the economy out of the mud.

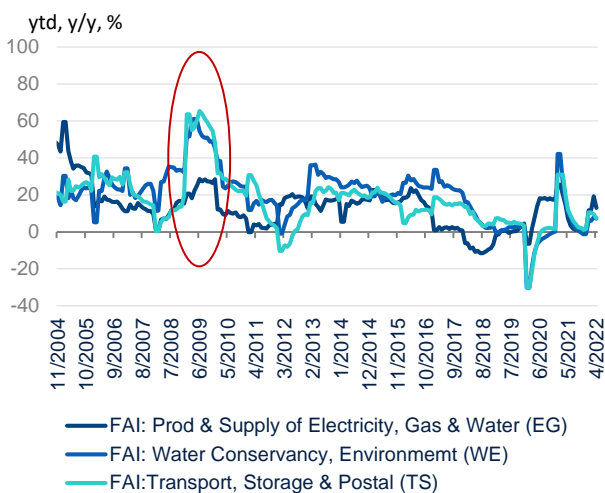
However, the “golden time” of China’s infrastructure investment gave way to the deleveraging campaign and supply-side reform since 2018. Due to the tightening regulation on local government debt and the stricter scrutiny process of infrastructure projects in a bid to fulfill the deleveraging targets, the infrastructure investment growth has gradually dipped from 2018 to 2020. Worse still, during 2021, the post-pandemic time, due to the early exit of fiscal policy stimulus as China “first-in, first-out” of the pandemic, infrastructure investment even plunged to as low as an average growth of 0.4% in 2021.

Figure 5. THE MARKET ALWAYS BELIEVES CHINA'S BUSINESS CYCLE IS EQUIVALENT TO REAL ESTATE CYCLE AND INFRASTRUCTURE CYCLE



Source: CEIC and BBVA Research

Figure 6. RMB 4 TRILLION STIMULUS PLAN ON INFRASTRUCTURE SUCCESSFULLY SECURED A SOFT-LANDING IN 2008-09



Source: CEIC and BBVA Research

However, history always repeats. The recent growth headwinds stemmed from Omicron outbreak and lockdown measures again brings infrastructure investment from back to the front. Why infrastructure investment becomes important again? Here are some important factors which determine its counter-cyclical role during the pandemic time:

First, among the traditional “Troika” of China’s growth engine, namely exports, infrastructure investment and consumption, infrastructure is the most controllable by the authorities. Through issuing local government bond, it is the most efficient way which could be fully controlled by the authorities to stimulate growth during the business cycles downturns in the past decades, while the other two engines are much more ambiguous. For instance, consumption bears the most severe economic blow by the “zero-Covid” policy while exports are external-demand determined which is going to experience a significant slowdown as the US and Europe is entering into recession due to the aggressive central bank interest rate hike this year.

Second, among the three categories of the fixed asset investment (FAI), namely housing, infrastructure and manufacturing, only the former two are domestic determined while manufacturing investment heavily depends on the external demand due to the dominant position of China’s processing trade in the manufacturing sector. In addition, due to the regulatory storms and housing market crackdown in 2021, it is very difficult to stimulate growth through real estate this year, as it is difficult to alter people’s expectation on the housing price slowdown once it was formed.

Third, infrastructure investment still has a large room to grow in China. In particular, China’s infrastructure stock per capita is only around 20-30% of that of the developed countries. As the urbanization progresses in China, together with the national strategy of developing the western and middle region of China, infrastructure investment has large potential to grow. In addition, the authority’s priority to develop “new infrastructure” such as artificial intelligence, block chain, cloud computing, big data and 5G etc. also brings about many new opportunities to infrastructure investment.

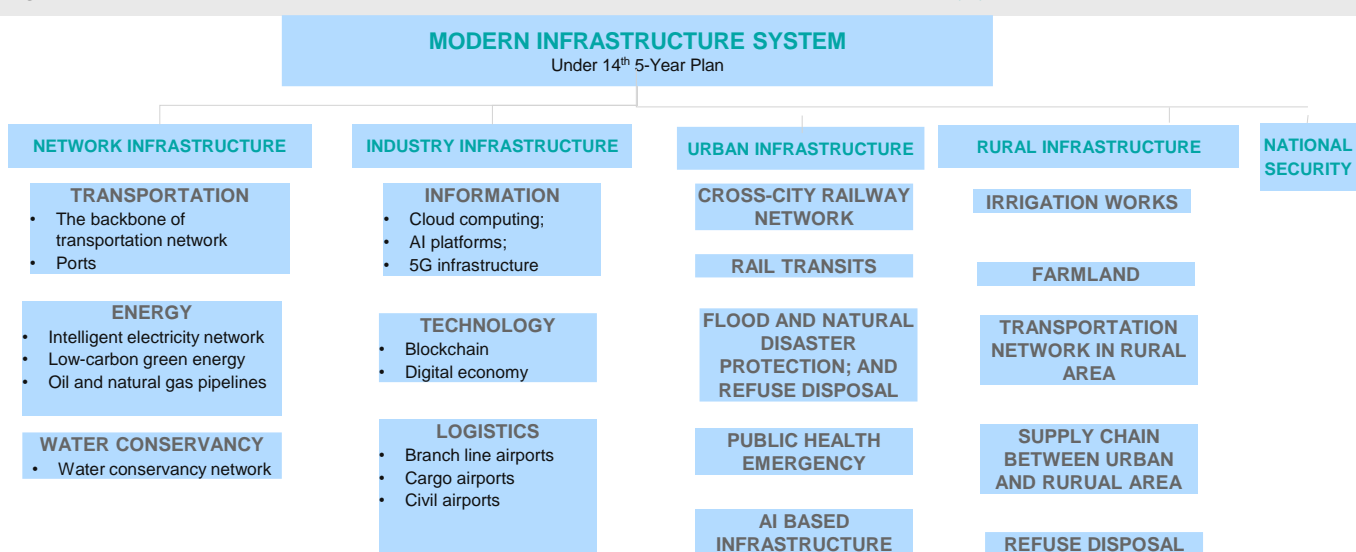
Finally, “new infrastructure” investment is in line with China’s “new growth model” which is underpinned by common prosperity, high-tech self-sufficiency and green economy (see our recent Economic Watch: China | Understanding China’s New Growth Model) In particular, high-tech

self-sufficiency requires a large-scale “new infrastructure” investment and China’s carbon neutrality target in 2060 also prospers green economy infrastructure investment, such as photovoltaic infrastructure, hydroelectricity, wind power infrastructure etc.

**The authorities promulgated a series of projects to construct a modern infrastructure system under the 14th Five-Year Plan**

In this section, we summarize the infrastructure projects that the recent State Council and Central Financial and Economic Conference wanted to prioritize in a bid to construct the modern infrastructure system. These projects are in line with the 102 strategic infrastructure projects in the 14th Five Year Plan. They are divided to four sections of infrastructure investment: network infrastructure, industry infrastructure, urban infrastructure, rural infrastructure and national security related infrastructure. (Figure 7) And we believe these pipeline projects will provide a large amount of infrastructure investment projects in 2022.

Figure 7. **INFRASTRUCTURE INVESTMENT TO CONSTRUCT MODERN INFRASTRUCTURE SYSTEM (%)**



Source: BBVA Research and Xinhua News Agency

**The role of New and Old Infrastructure investment**

We normally categorize China’s infrastructure investment into “new infrastructure” and “old infrastructure”. Old infrastructure means traditional investment in airplane, high-speed road, train trail and public facilities such as water conservancy projects, etc. New infrastructure includes but not confined with “ABCDG”, namely Artificial Intelligence (AI), Blockchain, Cloud computing, Big data center and 5G infrastructure etc. In a more generalized sense, new infrastructure investment also indicates the digital and intelligent transformation of the traditional infrastructure such as energy, transportation, urban, water conservancy, agricultural infrastructure, etc.

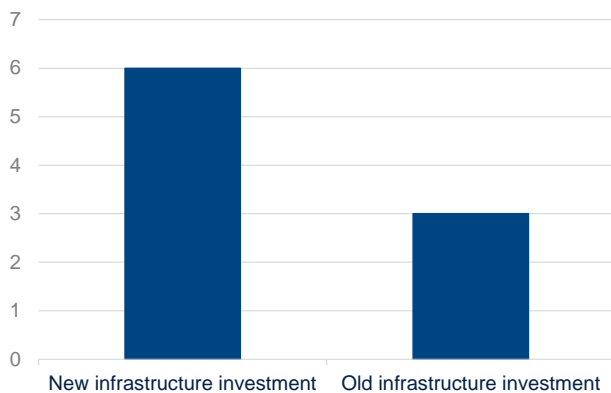
Some statistics and estimations from Cyberspace Administration of China show that new infrastructure investment has a much higher multiplier effect than that of old infrastructure investment. For instance, the multiplier of high-speed railway is estimated by this institute to be around 3, while the multiplier of 5G, AI, industrial internet etc. is estimated as high as 6. Some other research such as Wang (2020) in a working paper of China Academy of Social Sciences also has similar result in which they estimated the multiplier for traditional infrastructure investment is 1.7 in the long term and could reach 3.65 with a higher public goods spillover effect. (Figure 8)

Although the New Infrastructure investment will have a long-term positive spill-over effect to the economy and support China’s technology advancement, its total scale, at least at the current stage, remains much lower than the Old Infrastructure investment. For instance, in 2021, the scale of new infrastructure investment reached RMB 1.16 trillion, only around 7.7% of total infrastructure investment. Although this ratio is expected to rise to 15-20% in 2025, it could not wobble the role of the old infrastructure to stimulate the growth.

Regarding the capability to drive GDP growth, at the current stage, old infrastructure also has larger direct effect. Take 2019 and 2020 as an example, based on the GDP expenditure method, old infrastructure could drive GDP growth by 0.4% and 1.2% respectively, while new infrastructure investment could drive around 0.2% and 0.8% respectively. (Figure 9)

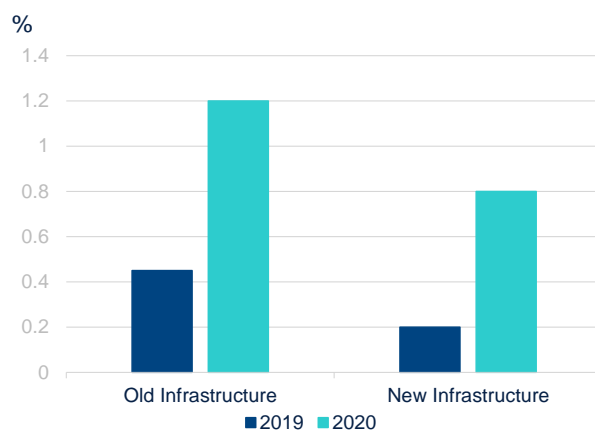
Given that the new infrastructure investment has a higher multiplier effect but old infrastructure has a larger total scale at the current stage, fiscal expansion in 2022 needs to synergize both old and new infrastructure investment. In addition, “new infrastructure” such as infrastructure of digitalization, AI and big data etc. could significantly increase efficiency of “old infrastructure”, indicating a necessity of synergizing the two.

Figure 8. **THE ESTIMATED MULTIPLIERS OF NEW INFRASTRUCTURE INVESTMENT IS AROUND TWO TIMES LARGER THAN THAT OF OLD INFRASTRUCTURE**



Source: Cyberspace Administration of China’s Estimation and BBVA Research

Figure 9. **AT THE CURRENT STAGE, OLD INFRASTRUCTURE DRIVES GDP GROWTH TO A LARGER EXTENT THAN THAT OF NEW INFRASTRUCTURE**



Source: Zhongtai Securities Research report (2020) and BBVA Research

### How to finance 2022 infrastructure investment?

The market has started to worry about fiscal burden of this year particularly at the local government level. Thus, how to finance 2022 infrastructure investment becomes an impending issue.

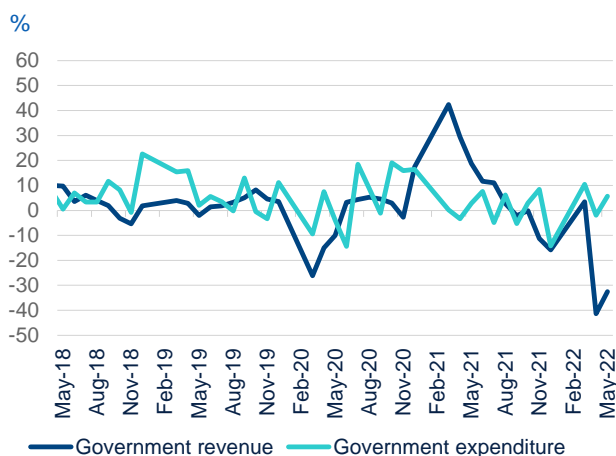
These worries come from a significant dip of fiscal revenue in April (-41.3% y/y) when lockdown measures imposed in Shanghai and other pandemic affected cities, while fiscal expenditure keeps rising, not only for large-scale infrastructure investment but also for ever-increasing universal and regular Covid-19 PCR tests etc. (Figure 10) The worries are also from the expansionary fiscal measures on tax cuts and fee reductions which significantly shrinks fiscal revenue. In addition, land sales revenue amid a downward housing cycle which used to be the main pillar of local government fiscal income also tumbled by -34.4% y/y in April and -26% ytd y/y accumulatively for Jan-May. Combined together, the fiscal revenue for Jan-May dipped by 10% y/y, while fiscal expenditure increased by 6% y/y for Jan-May, leading the augmented fiscal deficit in January-May 2022 reached RMB 3 trillion.

Under this circumstance, the market estimates the fiscal expenditure-revenue gap will be around RMB 1-2.8 trillion in 2022, given the assumption that Q3 and Q4 GDP will bounce back to 5-6%. That means, it is probably difficult to strike a fiscal balance this year with a shrinking fiscal revenue and an expansionary fiscal expenditure. If the authorities do not want to break the fiscal budget of 2.8% which was set in the 2022 “two sessions”, the authorities have to reduce the fiscal stimulus in 2H 2022 particularly on the infrastructure investment, which may deteriorate economic recovery; or if the authorities want to maintain the ongoing fiscal support, more policy-oriented bond or Covid bond needs to be issued and more unutilized fiscal budget in 2021 should be transferred to this year. (Figure 11)

There are several options to finance infrastructure investment this year amid an expansionary fiscal gap and dipping fiscal revenue:

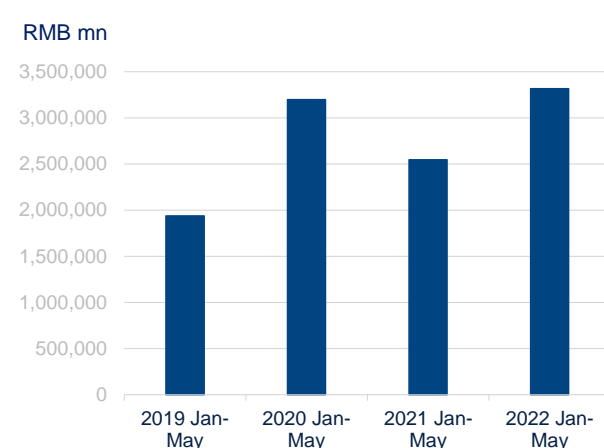
First, to transfer payments of the profits gained by the PBoC and the SOEs at the central government level to Ministry of Finance to fill in the fiscal gap. Indeed, the profits transferred from the PBoC and large SOEs to Ministry of Finance is a usual way in China to finance the fiscal expenditure in the past decades. On March 8 2022, the PBoC transferred RMB 1 trillion accumulated by foreign reserve management gains to Ministry of Finance to support fiscal transferring to local government and the fiscal stimulus measures such as tax cuts and fee reduction etc. The SOEs at the central government level, such as China Investment Corporation (CIC), China Tobacco etc., have also submitted their revenues to Ministry of Finance to support fiscal expansion.

Figure 10. **FISCAL REVENUE DIPPED SIGNIFICANTLY DURING LOCKDOWN PERIOD BUT FISCAL EXPENDITURE KEPT RISING**



Source: CEIC and BBVA Research

Figure 11. **LOCAL GOVERNMENT BOND ISSUANCE IN JAN-MAY 2022 HAS ALREADY SURPASSED THE LEVEL OF THE SAME PERIOD OF 2020 WHEN COVID STARTED IN CHINA**



Source: CEIC and BBVA Research

Second, to issue special government bond to support infrastructure investment is also an option. Although the “two sessions” in March just promulgated the fiscal budget this year to 2.8%, issuing new special government bond at the current stage might have some procedure challenge, the market still calls for the new issuance of special sovereign bond to fill in the fiscal gap and to break the pre-set fiscal budget amid “zero Covid” policy and economic slowdown as the March “two session” did not anticipate the a sudden change of pandemic circumstances in China as well as Shanghai lockdown in end-March.

Third, the transfer from 2021’s residual fiscal budget to 2022 could also help to make up for the fiscal gap of this year. As the authorities conducted an early fiscal policy normalization in the past year, the actual utilized fiscal budget was lower than the fiscal budget set in 2021’s “two sessions”. The amount of residual budget in 2021 was amounted to RMB 2.5 trillion, among which, only

half of it (around RMB 1.25 trillion) was transferred into the 2022 fiscal budget while the other half could still be utilized to make up for the fiscal gap in 2022 to support infrastructure investment and other fiscal expenditure.

## **2022 Infrastructure investment growth prediction and the economic growth outlook**

Chinese authorities have already pressed ahead at least three directions of policy initiatives to stimulate infrastructure growth in 2022, which could be summarized below:

(i) There are abundant infrastructure investment projects outlined in the recent high-level State Council and Central Government meetings in a bid to construct modern infrastructure system, in line with the 102 projects raised in the 14th Five-Year Plan.

(ii) The authorities have pushed forward a series of monetary and fiscal easing measures to stimulate infrastructure growth, such as the recent 5-year LPR cut, three RRR cuts, the early release of local government bond quota to stimulate infrastructure investment in 1H 2022, etc.

(iii) The motivation of the local government officials to push forward infrastructure investment is much larger than that of 2021. As the 5.5% growth target for 2022 amid Covid-19 flare-ups and lockdown measures is quite challenging, while local government officials at the beginning of the year even set higher growth target than the nationwide target, it is challenging for them to achieve the goals thus they are much more motivated to take use of available sources to press ahead local infrastructure investment.

Under all of these pro-infrastructure investment measures, for this year, infrastructure investment growth is predicted to be 10-13% based on the expansion of the local government bond issuance (RMB 4.73 trillion) and the fiscal surplus transferred from 2021 to 2022 (around RMB 1.5-2 trillion). Given that infrastructure investment is around 15% of China's total GDP on average in the past 10 years, it is estimated that infrastructure investment will contribute to around 1.5-2% of total real GDP growth. And it will lead the total fixed asset investment to reach 6.5% in 2022 (manufacturing investment estimation: 7%; housing investment estimation: 0.6%).

However, we have to at the same time realize that larger-scale infrastructure investment cannot sufficiently offset the consumption and exports plunge as well as a downward real estate cycle in 2022. The tumbling economic activity figures particularly in March and April reflected that the authorities' lockdown measures under "zero tolerance" strategy significantly weighed on growth. Given that Chinese authorities will continue to stick on "zero Covid" policy in the rest of the year, there will be "impossible trinity" for China's policy setting in 2022: either China needs to give up synchronized monetary policy with the US FED to continue aggressive easing in order to achieve 5.5% growth target which might lead to financial instability, or, the authorities have to give up 5.5% growth target to accept a lower growth in a bid not to conduct aggressive easing measures to circumvent capital flights and sharp currency depreciation.

Under the current situation, we predict the real-world case would be the latter one, as the policy room of aggressive easing has been shrinking significantly amid a trending-up inflation, sharp RMB depreciation and capital outflows. Look ahead, we predict GDP growth in the second half of the year will gradually recovered from the Q2 downturn caused by the Covid flare-ups and resultant lockdowns. For 2022 as a whole, growth will reach 4.5%, lower than the authorities' 5.5% growth target.



# Global Inflation and China's Measures to Stabilize the Economy

By PETER KOENIG\*

Under normal circumstances inflation occurs, when too many monetary units (US-dollars, Euros, Chinese Yuan) chase too few goods. But we are not living in normal times. To the contrary. We are living in an increasingly divided world, not only in political terms – West vs. East / Global North vs. Global South – but also in monetary terms.

The gradual but ever faster faltering of the US-dollar hegemony, followed by related so-called hard currencies, like the Euro, the British Pound, the Japanese Yen, as well as the Australian and Canadian dollars – is giving eastern currencies, especially the Chinese Yuan and to some extent also the Russian Ruble a thrive towards stability.

Why is that? – For a number of reasons. First, the Chinese Yuan and the Russian Ruble, as well as many other eastern currencies, are backed by their economies and in both cases also by gold. For that reason alone, they have an inherent stability, western fiat currencies – which are based on nothing – do not have.

A new and coming eastern currency stability mechanism may soon be a basket of some twenty commodities that are widely and universally used, in addition to the strength of the local economy.

This idea is not new, but has recently been reintroduced by Russia's Sergei Glazyev. As of 2021, he is the Commissioner for Integration and Macroeconomics within the Eurasian Economic Commission, the executive body of the Eurasian Economic Union. Sergei Glazyev is also President Putin's economic advisor.

It is a clear distinction from western fiat currencies which are based on no solid substance, other than debt creation. In other words, western dollar-based currencies – beginning with the US-dollar itself – are unsustainable pyramid schemes which sooner or later are bound to implode, or at best gradually collapse.

What we are witnessing today, is a steady decay of western currencies which are currently been artificially propped up by manipulation of interest rates, as well as artificially caused inflation, based on artificially created shortages of food, energy and other commodities. The pretext used for such shortages – totally false indeed – is the Russian-Ukraine war.

Such shortages, especially food shortages and resulting mass famine, had been planned for over ten years and were already reflected in the 2010 Rockefeller Report. They are being carried out now.

In today's (western) world, inflation and monetary (in)stability are manufactured or manipulated. They are being used like "cold war" weapons by the west internally, initiated by the US, to play western currencies against each other and to assure dollar hegemony will continue. To the extent possible and especially through the east-west trade-related interdependency, mostly through the powerhouse China, the west is hoping to also destabilize the economies of the Shanghai Cooperation Organization (SCO) members, especially China.

China's western currency reserves amounted in May 2022 to some US\$ 3.12 trillion equivalent, at least two thirds of which are in US-dollar denominated assets. Given the Chinese – US, as well as western economies' trading interrelation, dedollarization remains a challenge for China.

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\* Peter Koenig, Research Associate of the Centre for Research on Globalization (CRG), former Senior Economist of the World Bank

### **The Federal Reserve - FED**

Despite forecasters' expectations of a half percentage point increase, under the pretext of fighting inflation, the FED announced on June 15 the largest interest rate hike in 28 years, namely an increase of three-quarters of a percentage point — the biggest hike since 1994. That follows a quarter-point increase in March and a half-point jump in May. On July 5, 2022, the FED's base rate was between 1.5% and 1.75%.

This, the FED said, was a move towards regaining control over soaring consumer prices.

However, consumer prices were up 8.6% from a year ago. In other words, the FED pretends to fight an 8.6% annual inflation with an interest rate hike of less than 2%. This is unrealistic.

The real reason for these sudden interest rate increases is to be sought elsewhere. Namely, the gradual but steady loss of the US-dollar's value in the global monetary market. This has to do with a number of factors, among them, the steadily faltering trust in the US economy, but predominantly with Washington's dollar-based worldwide "sanctioning" of countries that do not conform to US policies, but instead want to preserve their political and economic sovereignty.

Increasing interest rates is expected to draw investors to dollar denominated assets – at least temporarily; thereby "postponing" the collapse of the US-dollar hegemony.

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The global flow of US-dollars accounts today for between 50% and 60% of all trading currencies in the world. With this quantitative supremacy. Plus, interest rates increases, the US-dollar may be able to extend its currency domination provisionally – but the fall of the dollar and dollar-related and dependent currencies will undoubtedly follow.

The result of this FED interest hike can already be seen, in as much as the exchange rate US dollar and Euro is almost 1 : 1, and the dollar is moving in the same direction vis-à-vis the British Pound.

The inflation-driven price increases reflect not only rising costs for gasoline and groceries, but also for rent and airfares and a wide range of services.

Overall, however, the FEDs interest hike, even at a record-level over the past almost 30 years, does not stop or even brake inflation – which is expected to soon enter the two-digit dimension. The gap between base-interest and inflation is too wide. But it may bring temporarily more stability to the US-dollar.

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What is China doing for their currency's - the Yuan's – stability?

In addition to having already a real economy-based currency, and the prospect of moving towards commodity-based and backed currency, the State Council of China issued at the end of May 2022 a policy package, including 33 measures covering fiscal and financial policies, as well as policies on investment, consumption, food and energy security, industrial and supply chains and people's livelihoods. These are some highlights of the package:

— **In finance**, China will further enhance value-added tax credit refund policies and quicken its fiscal spending schedule. Local government special bonds issuance and utilization will be accelerated with a service extension. Government financing guarantee policies will be activated and social security premiums deferral and employment support policies will be enhanced;

— **In terms of monetary and financial policies**, China encourages delayed repayment of capital and interests on loans for small and medium-sized enterprises, self-employed individuals, truck drivers, and personal housing and consumption loans affected by COVID-19. Inclusive loans to micro and small businesses will be expanded. Real lending rates will be stable with a slight decline, and improvements will be made to the financing efficiency of capital markets;

— **In stabilizing investment and promoting consumption**, China will accelerate some approved water conservancy projects and speed up investment on transportation infrastructure, continue to build urban underground pipelines, stabilize and expand private investment, promote

the healthy and standardized development of the platform economy, and stimulate purchases of cars and home appliances;

— **Regarding food and energy security**, policies on grains profit guarantee for farmers will be intensified. Quality coal will be produced while ensuring safety, environment-friendliness and efficient utilization. In addition, some major [alternative] energy projects will be launched;

— **To stabilize industrial and supply chains**, China will reduce utility costs for market entities, gradually reduce and exempt their rent, and help ease the burden on sectors and companies severely affected by the pandemic. Enterprises' work resumption, and smooth transportation and logistics policies will be optimized. More support will be provided to logistics hubs and enterprises. Major foreign-funded projects will be prioritized to attract foreign investments; and

— **As for policies concerning people's livelihoods**, China will implement support policies for housing provident funds, bolster the employment and entrepreneurship of rural migrant population and rural labor, and enhance social security guarantee measures.

### **From a Uni-Polar to a Multi-Polar World**

The future points clearly away from a western-dominated unipolar world – or On World Order (OWO) to a multi-polar world, that may be based on some strong economic “hubs”, while preserving individual countries' sovereignty.

The above policies are to strengthen and stabilize in the long-term the Chinese economy – which will be further enhanced by trade and political association with other related regional economies, like those of the - Eurasia Economic Union (EAEU), the SCO, as well as further down the road the BRICS+ countries.

Among the particular socioeconomic achievements that will keep China's and associated currencies and financial systems stable and apart from the western shortage and inflation-driven economies, is the ASEAN-plus Five world's largest and most comprehensive free-trade agreement, the Regional Comprehensive Economic Partnership (RCEP).

The RCEP is a free trade agreement among the Asia-Pacific ASEAN nations of, Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. The trade deal also includes five non-ASEAN signatories, Australia, New Zealand, Japan, South Korea and China.

The RCEP is the world's largest free trade agreement. It was negotiated during eight years and entered into effect on 1 January 2022. According to a recent UN Conference on Trade and Development (UNCTAD) study, it represents 30.5% of the world's GDP. The only other blocs coming close to that are the US-Mexico-Canada agreement - NAFTA (28%) and the EU (17.9%).

The RCEP is expected to expand quickly, as the 15 countries will likely generate world-embracing dynamics, while at the same time, remaining self-contained as a sovereign bloc, meaning trading within and protected from western influences.

The bloc's trading currencies will be predominantly the Yuan (a digital yuan primarily for international trade is expected to be rolled out possibly as early as later this year or early 2023), but also local currencies – but not the US-dollar and other western currencies under the dollar hegemony.

Another element for enhancing eastern financial stability, is the BRICS bloc (Brazil, Russia, India, China, South Africa). Earlier this year, Iran applied for BRICS membership. Iran is already a member of the SCO.

At present, the BRICS represent 40 percent of world population, 25 percent of the global economy, 18 percent of world trade. The BRICS are the fastest growing bloc of countries, contributing some 50% to world economic growth.

Finally – but not least – are the interrelated Belt and Road Initiative (BRI), initiated by President Xi Jinping in 2013. The BRI is also called the New Silk Road, inspired by the concept of the Silk

Road established during the Han Dynasty over 2,000 years ago – an ancient network of trade routes that connected China to the Mediterranean via Eurasia for centuries.

In March 2022, the number of countries that have joined the BRI by signing a Memorandum of Understanding (MoU) with China is 146, plus 32 international organizations. The countries of the BRI are spread across all continents: 43 countries are in Sub-Saharan Africa.

The BRI has several trading routes, including maritime routes, connecting countries with transport and other infrastructure links, as well as joint ventures for energy exploitation or industrial production processes, cultural and educational exchanges – and many more country and regional links. It is “Globalization” with Chinese characteristics, where individual autonomies are respected.

This initiative goes hand in hand with another one, the Global Development Initiative (GDI), announced by President Xi Jinping at the UN General Assembly in 2021.

GDI complements BRI as a support and cooperation mechanism for large international financial and development bodies, such as the South-South Cooperation Fund, the International Development Association (IDA is part of the World Bank Group), the Asian Development Fund (ADF), and the Global Environment Facility (GEF).

This eastern, China-based network of mutually enhancing financial institutions, trade agreements, economic policy think tanks – and much more – shield against western attempts to interfere with and destabilize these eastern bloc financial, economic and monetary mechanisms.

These networks also represent a stronghold for a sound future for an eastern-led socioeconomic development framework – a solid base for a common future in PEACE for mankind.

# Monetary Policy

## Lessons Learned on Normalizing Monetary Policy\*

By CHRISTOPHER WALLER\*

Thank you, Meredith and Cullum and thank you to the Society for the invitation to speak to you today. This week, the Federal Open Market Committee (FOMC) took another significant step toward achieving our inflation objective by raising the Federal Funds rate target by 75 basis points. In my view, and I speak only for myself, if the data comes in as I expect I will support a similar-sized move at our July meeting. The Fed is "all in" on re-establishing price stability, and part of that effort involves understanding the forces that have boosted inflation and also examining how policymakers responded. Today, I intend to look back on monetary policy in 2020 and 2021, as I have before in recent speeches, but go a bit further and try to discern some lessons learned.<sup>1</sup>

In addition to the Federal Reserve's emergency lending programs, the monetary policy actions taken during this time were deemed extraordinary. We swiftly lowered the target range for the federal funds rate to close to zero—the effective lower bound—and made an open-ended commitment to purchasing securities. It was only the second time that the Fed had taken such dramatic steps. But the first time for these actions was scarcely a decade ago, and there is good reason to think such a response may not be extraordinary anymore. Structural changes in the economy have tended to lower interest rates and limit the room that the Federal Reserve will have to cut rates during a slowdown.<sup>2</sup> I hope we never have another two years like 2020 and 2021, but because of the low-interest-rate environment we now face, I believe that even in a typical recession there is a decent chance that we will be considering policy decisions in the future similar to those we made over the past two years. Because of that likelihood, it is especially useful to consider the lessons learned.

Let's start at the beginning, when the United States was faced with the economic shock from COVID-19. Over several weeks starting in early March 2020, the FOMC lowered the target range for the federal funds rate to the effective lower bound and began purchasing Treasuries and agency mortgage-backed securities (MBS). Meanwhile, the Fed established numerous liquidity and credit market facilities.<sup>3</sup> All these actions were taken to support liquidity in the financial system and keep credit flowing to households, businesses and state and local governments. Asset purchases were undertaken in response to disruptions in financial markets, particularly in the normally stable U.S. Treasury market. Besides supporting smooth market functioning, asset purchases also aided in the transmission of monetary policy to broader financial conditions.

Financial markets stabilized relatively quickly. Over the course of 2020, the Fed's liquidity and credit facilities saw reduced demand and most of the emergency programs were decommissioned around year end. Perhaps the most straightforward takeaway for monetary policy is that in times of severe stress, lending facilities, along with sharp cuts to the federal funds rate and the introduction of large-scale asset purchases, are very effective in reviving the economy.

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\*This speech was given at a panel discussion hosted by the Dallas Society for Computational Economics, Dallas, Texas, 18 June 2022.

<sup>1</sup>Christopher J. Waller, Member of the Board of Governors of the Federal Reserve System

There are some other lessons, I think, from the experience of tightening monetary policy, a process which was put in motion by the guidance that the FOMC issued in 2020 about how long it would keep the federal funds rate at the effective lower bound and continue asset purchases. In September and December of 2020, the FOMC provided criteria or conditions in the meeting statement that would need to be met before the FOMC would consider raising interest rates and begin to reduce asset purchases, respectively. These conditions were, in effect, the FOMC's plan for starting the process of tightening policy. This guidance was short term, specific to the task of when to tighten policy in this current cycle, and focused on specific tools.

Let me make an important distinction here. A bit earlier, in August 2020, the Committee completed a multi-year review of our overall strategy for achieving and sustaining our economic goals. The strategy statement is very different than the tightening guidance-it is about longer-run goals, not specific actions related to the current circumstances. The goals in the strategy statement apply in all economic circumstances and don't include any details on the settings of policy tools. I mention this distinction because some have argued that the FOMC's new strategy was a factor that led the Committee to wait too long to begin tightening monetary policy. A bit later, I will explain why I do not believe this is the case, and I will explain how the guidance for tightening policy, laid out in the FOMC's post-meeting statements, was the basis for our decisions.

So, let's think about how the economy evolved and how the criteria for that guidance steered the path of policy. In early 2021, the Committee began noting whether the economy was making progress toward our employment and inflation goals, and thus getting closer to decisions on unwinding our highly accommodative policy. Based on our positive experience with unwinding after the Global Financial Crisis (GFC), we thought it would be appropriate to use the same sequence of steps: taper asset purchases until they ceased, then lift rates off the effective lower bound, then gradually and passively reduce our balance sheet by redeeming maturing securities. Most importantly, through various communications, we made it clear that tapering of asset purchases would have to be completed before rate liftoff to avoid the conflict that would occur by easing via continuing asset purchases versus tightening through rate hikes.

In the previous episode of tightening policy after extraordinary accommodation, this process was very gradual. Tapering of asset purchases took 11 months, and then the first rate hike did not occur until more than a year after purchases ended. Balance sheet reduction began more than a year and half after that. This gradualism worked well then, and it surely influenced the Committee's approach this time.

Implementing this approach required two pieces of guidance: first, criteria for beginning the tapering process, and, second, criteria to begin raising the policy rate from the effective lower bound. Through explicit language in FOMC statements, we told the public the necessary conditions that needed to be met before we would adjust these two policies.

For asset purchases, the Committee declared that tapering would wait "until substantial further progress has been made toward the Committee's maximum employment and price stability goals."<sup>4</sup> Meanwhile, the FOMC said that it would keep rates near zero until our employment goal had been reached and until inflation had reached 2 percent and was "on track to moderately exceed 2 percent for some time."<sup>5</sup>

A fair question is: what did these words mean? And, in particular, what did the phrases "substantial further progress" for tapering and "for some time" for liftoff mean? In large part the interpretation hinged on how the Committee viewed the economy would recover from the pandemic. Looking across forecasts at the time by Committee participants and the private sector, no one expected substantial progress toward both our goals to happen very soon. The economy had begun the recover, but at the end of 2020 COVID was bad and getting worse and vaccines were just arriving, so we didn't know how soon schools would reopen and people would get back to work. In November and December 2020, the unemployment rate was 6.7 percent and inflation

seemed to be in check: 12-month personal consumption expenditures inflation was declining, and core inflation, which excludes volatile energy and food prices, was more or less steady at 1.5 percent. The Summary of Economic Projections by FOMC participants in December 2020 had the unemployment rate moving down to 4.2 percent at the end of 2022 and inflation moving up to 2 percent only in 2023. Only one participant had liftoff occurring by the end of 2022.

Based on this SEP, the Committee did not expect the economy to recover quickly. And, looking at the Federal Reserve Bank of New York's Survey of Primary Dealers back in January of 2021, the median respondent thought tapering would start in the first quarter of 2022 and liftoff wouldn't be until the end of 2023 or later.

To move forward, policymakers had to evaluate "substantial further progress" and "for some time." The phrases, admittedly, are not concrete in their meaning. Inflation averaging doesn't define how much above 2 percent is moderate and how long some value of elevated inflation should be tolerated. In addition, for assessing progress on the health of the labor market, different policymakers will prefer different measures that may not provide the exact same signal. On top of this, the data used to measure progress in the labor market can revise substantially and reshape the evaluation of the strength of this market quite quickly. For example, a key input-payroll data-in the latter half of 2021 painted a picture of a slowing labor market. But revised data over several subsequent months revealed that the slowdown never happened. Instead, job gains were quite robust. In particular, initial reports of job creation between August and December were a cumulative 1.4 million, but by February of this year that number was revised up to nearly 2.9 million.

Overall, the economy evolved rapidly in 2021. I won't get into the month-by-month details, as I have in recent speeches, but by October and November, policymakers thought the economy had improved enough to meet the criteria to start tapering at the early November meeting. Then, later that month, data indicated inflation was accelerating, so the Committee hastened the pace of tapering at the December meeting, making a plan to wind down purchases by early March. Between December and March of this year inflation data came in very elevated, and at that point there was no question that inflation had been above 2 percent for "some time." Given continued improvement in the labor market and the high inflation readings, the Committee began raising interest rates in March, as soon as asset purchases were completed.

With these actions in the rearview mirror, we can now ask: knowing what we know now, should we have done anything differently? To be clear, by asking this question my intent is not to criticize the decisions of the Committee. Rather, it is to assess our policy strategies should we be confronted with another crisis in the future.

One question to ask is whether the guidance we issued was too "restrictive"; in other words, did it allow enough flexibility for the FOMC to begin raising the policy rate when it was appropriate to? Recall, we had decided that raising the policy rate would not occur until the tapering of asset purchases had finished. But to finish, tapering must start-for a given pace of tapering, the longer it takes to start tapering, the longer it will be before the policy rate can be raised. Of course, one can keep the liftoff date fixed and simply taper at a much faster rate, including the possibility of a hard stop of asset purchases. But concerns about financial market functioning, including the ability of markets to absorb the purchases the Fed stops making, typically limits how fast the tapering can be, particularly given the amount of asset purchases we were making at the time (\$120 billion per month).

Given the tapering criteria and subsequent data, we ultimately had to pivot hard to accelerate the tapering pace and, in fact, completed the tapering of purchases just a few days before we lifted off. Unlike the normalization timeline after the financial crisis, we did not have flexibility to raise the target range sooner. However, if we had less restrictive tapering criteria and had started tapering sooner, the Committee could have had more flexibility on when to begin raising rates.<sup>6</sup> So, by requiring substantial further progress toward maximum employment to even begin the

process of tightening policy, one might argue that it locked the Committee into holding the policy rate at the zero lower bound longer than was optimal.

My takeaway is that a less restrictive tapering criteria would have allowed more flexibility to taper "sooner and gradually," as opposed to the relatively "later and faster" approach that occurred. Experience has shown that markets need time to adjust to a turn from accommodation to tightening, and that surely was a factor for FOMC statements over the years in framing criteria for key policy actions during the recovery from the GFC and the pandemic. So, I'm supportive of issuing such criteria but we need to be careful to use language that allows the Committee the flexibility it needs to respond to changing economic and financial conditions.

Now let's turn to the liftoff criteria. It was also quite restrictive. The liftoff criteria required the economy to be in a situation where our dual mandate had been achieved. It can be argued that this meant getting the economy back to its 2019 state with very low unemployment and inflation near 2 percent. But the policy rate in 2019 was well above zero and close to its neutral value. Consequently, if the state of the economy is telling you to be at neutral and you are at zero, then any Taylor rule would say the policy rate needs to rise much faster than was typically done in the past.

So, it should not have been a surprise that the policy rate would rise fast in 2022. Rate hikes would need to be larger and more frequent, relative to the 2015-2018 tightening pace, to get back to neutral. Looking back, should the Committee have signaled a steeper rate path once the liftoff criteria had been met? Perhaps another lesson is that giving forward guidance about liftoff should also include forward guidance about the possible path of the policy rate after liftoff.

In closing, I hope that our country is not faced with another crisis as severe as the one precipitated by COVID, and that the Fed is not faced with the challenges of setting monetary policy under such conditions. But if we again face those challenges, we now have the additional insight that only experience can bring. I hope that this latest experience will help us approach the future with a more complete understanding of the policy choices and tradeoffs.

1. See Christopher J. Waller (2022), "Reflections on Monetary Policy in 2021," speech delivered at the 2022 Hoover Institution Monetary Conference, Stanford, California, May 6; and Christopher J. Waller (2021), "A Hopeless and Imperative Endeavor: Lessons from the Pandemic for Economic Forecasters," speech delivered at the Forecasters Club of New York, New York, December 17. These remarks represent my own views and not any position of the Federal Reserve Board or the Federal Open Market Committee.

2. Research has suggested a large number of developments may have contributed to a decline in the equilibrium real interest rate, focusing on factors that may have shifted aggregate savings and/or investment in a manner that depresses the real interest rate required to equilibrate savings and investment. For example, lower trend economic growth likely lowers aggregate investment, while demographic factors such as an increase in life expectancy may increase savings. Other research has emphasized an increase in demand for safe assets among emerging market economies, which depresses interest rates in advanced economies. For a review and references, see Michael Kiley (2020), "The Global Equilibrium Real Interest Rate: Concepts, Estimates, and Challenges," *Annual Review of Financial Economics*, vol. 12 (1), pp. 305–26.

3. Supported by funds provided by the CARES Act, the Federal Reserve created, with the authorization of the U.S. Treasury Department, a number of emergency lending facilities. The extraordinary 'dash for cash' early in the pandemic threatened the orderly functioning of money markets as well as the flow of credit to employers. The Board responded with a set of emergency lending facilities that, collectively supported the flow of credit throughout the economy both by providing backstops and, in some cases, by more directly supplying funding. Future downturns are unlikely to see the same global, sharp, and intense demand for liquidity, and thus not warrant



the same kind of emergency lending. For more details on the Fed's facilities to support households, businesses, and municipalities during the COVID crisis see the November 2020 Financial Stability Report.

4. See Board of Governors of the Federal Reserve System (2021), "Federal Reserve Issues FOMC Statement," press release, June 16

5. This phrase echoed a new detail in our monetary policy strategy that recognized the 12 years that inflation had run persistently below 2 percent and noted that as a result, "appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time." See Board of Governors of the Federal Reserve System (2020), "2020 Statement on Longer-Run Goals and Monetary Policy Strategy," policy statement, August 27.

6. There are a couple of reasons why a less restrictive tapering criteria can create more policy space. First, a less restrictive tapering criteria allows policymakers to reduce the amount of purchases, perhaps more than once or even potentially end purchases, all while a more restrictive criteria may not even be triggered. Second, if policymakers believe that market functioning considerations constrain the dollar amount that Fed purchases can be reduced in a given month, then a policy with less restrictive criteria that has started tapering may be able to end purchases before one with a more restrictive criteria.

## **The Outlook for Inflation and Monetary Policy\***

*By* MICHELLE W. BOWMAN\*

I will touch on some of the banking issues I expect are on your minds, but one of the biggest issues for everyone right now is inflation, what the Fed is doing to get inflation under control, and the implications for your businesses, your customers, and your communities.

Inflation is the highest we have seen in the United States in 40 years and so far it shows little sign of moderating. At the same time, the economy is growing at a moderate pace, and the labor market is extremely tight, as indicated by a variety of measures including reports of many employers unable to find workers despite significantly raising wages. That tightness is contributing to inflation, because labor is the largest input cost for producing goods and providing services. Inflation is a significant challenge for everyone, but it hits lower- and moderate-income people the hardest, since they spend a larger share of their incomes on necessities and often have less savings to fall back on. Inflation is also a burden for businesses that must somehow balance unpredictable costs while setting prices that aren't so high that they discourage customers from purchasing. Inflation that continues at these levels is a threat to sustained employment growth and to the overall health of the economy.

The inflation data show that, after moderating slightly for a short time, price increases for motor vehicles have picked up again, energy prices rose sharply in May, and prices for food have risen more than 10 percent from a year ago. The inflationary effect from the invasion of Ukraine has proven to be lasting for both energy and food commodity prices, with little prospect of the conflict or those price pressures abating very soon. More broadly, global supply chain issues continue, in part because of the effect of ongoing COVID-19 lockdown policies in China that have slowed production and shipping.

One important factor that we often point to in driving today's spending decisions and inflation outlook are expectations of future inflation. Near-term expectations tend to rise as current inflation increases, but when inflation expectations over the longer-term—the next 5 to 10 years—begin to rise, it may indicate that consumers and businesses have less confidence in the Fed's ability to address higher inflation and return it to the Federal Open Market Committee's (FOMC) goal of 2 percent. If expectations move significantly above our 2 percent goal, it would make it more difficult to change people's perceptions about the duration of high inflation and potentially more difficult to get inflation under control. As we see surveys like the Michigan survey report higher longer-term inflation expectations, we need to pay close attention and continue to use our tools to address inflation before these indicators rise further or expectations of higher inflation become entrenched.

As I mentioned earlier, one force driving inflation is the extremely tight labor market. The benefits from a tight labor market are easy to see—the U.S. economy continued to add jobs at a pace of 400,000 per month for the past three months, which is remarkable considering the low number of people looking for work. Today, most people who want to work can find a job, and wages and salaries have risen faster than they have in decades. Even with these gains, wages have not kept pace with inflation, which has made it much more difficult for many workers to make ends meet in the face of soaring housing, energy, and food costs.

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\*This speech was given at Executive Officers Conference, Massachusetts Bankers Association, Harwich, Massachusetts on June 23, 2022.

\* Michelle W. Bowman, member of the Board of Governors of the Federal Reserve System

Job creation signals strong labor market demand, particularly in the current environment, with a large number of available jobs and fewer job seekers. In addition, the tightness of the labor market is exacerbated by a labor force participation rate that remains far below the pre-pandemic benchmark, representing millions of workers sitting on the sidelines. Many of these are early retirees, some incentivized to retire during the pandemic, and those with family caregiving challenges including very high costs for childcare. While the strong job market has brought some of these workers back into the workforce, it seems that many are still waiting or may not return, meaning that labor shortages will likely persist in many sectors of the economy.

I've laid out many of the challenges, so now let me talk about what the Federal Reserve is doing to get inflation under control. In the face of inflation that continues to be much too high and in light of the recent high readings, the FOMC raised the federal funds rate by 75 basis points at our most recent meeting last week. That increase followed two rate hikes totaling 75 basis points earlier this year, and we indicated that further increases will likely be appropriate in the months ahead. On June 1, the Fed took a separate step to tighten monetary policy by beginning to reduce its large balance sheet of securities holdings.

I strongly supported the FOMC's decision last week, and I expect to support additional rate increases until we see significant progress toward bringing inflation down. Based on current inflation readings, I expect that an additional rate increase of 75 basis points will be appropriate at our next meeting as well as increases of at least 50 basis points in the next few subsequent meetings, as long as the incoming data support them. Depending on how the economy evolves, further increases in the target range for the federal funds rate may be needed after that. The case for further rate hikes is made stronger by the current level of the "real" federal funds rate, which is the difference between the nominal rate and near-term inflation expectations. With inflation much higher than the federal funds rate, the real federal funds rate is negative, even after our rate increases this year. Since inflation is unacceptably high, it doesn't make sense to have the nominal federal funds rate below near-term inflation expectations. I am therefore committed to a policy that will bring the real federal funds rate back into positive territory.

While I expect that the labor market will remain strong as the FOMC continues to tighten monetary policy, these actions do not come without risk. But in my view, our number one responsibility is to reduce inflation. Maintaining our commitment to restore price stability is the best course to support a sustainably strong labor market. The Fed's credibility, earned over decades of low inflation, is a powerful policy tool that is critical to our long-term success. If that credibility erodes, it must be re-earned.

As a step toward that goal, I also supported the Committee's action to begin reducing the Fed's balance sheet, which is providing unneeded economic stimulus making inflation worse. The current balance sheet is composed of Treasury securities and a significant amount of agency mortgage-backed securities (MBS). Since the longer-term goal of the balance sheet reduction plan includes a Treasuries-only balance sheet, it would make sense to eventually incorporate MBS sales into the plan so that reaching this goal does not take too long. My longer-term goal would be to get the Fed out of the business of indirectly intervening in the real estate market.

In closing, I know that inflation, and our efforts to lower it, may present challenges for banks. The first session on your agenda this morning discussed interest rate risk, and I would be interested to learn how you are managing this risk so far and what you expect as the year progresses. Many of your sessions and speakers overlap with the Fed's work in supervision and much of what I'm focused on, including innovation and how best to use technology like AI and fintech to level the playing field for banks. Attracting and retaining talent, along with succession planning, are absolutely critical for long-term sustainability. One other matter is the recently issued Community Reinvestment Act (CRA) proposed rule that would significantly change supervisory implementation and qualifying activities. I strongly encourage you to review this proposal and

comment so that banks subject to the CRA understand the changes and will be able to continue to effectively serve their customers and communities.

## Policy-makers should Shift Focus to Economic Resilience<sup>\*</sup>

By TAMIN BAYOUMI<sup>\*</sup>

The last decade-and-a-half has been hectic for economic policy-makers. They have had to cope with a global financial crisis, a worldwide pandemic and now a generalised burst of inflation combined with a European war. The response to the first two of these shocks was highly activist. Monetary policy-makers put the pedal to the metal, often cutting rates to (or below) zero and buying up swathes of bonds to provide a further boost through lower long-term interest rates. Fiscal policy also played its part in supporting activity. Since 2008 government debt as a ratio of gross domestic product has risen by a half in advanced countries and doubled in emerging markets.

This vigorous response has demonstrated impressive versatility. But, in retrospect, was it wise? The answer largely depends on your assessment of the future. If the global financial crisis and the pandemic were black swan shocks that are unlikely to be repeated, as most of us assessed them to be at the time, then responding with massive stimulus made sense. Any distortions caused by such an all-out approach could be resolved once the immediate problem was over and the world had returned to its previous stability. The economic firefighters can go back to the station and relax, looking back on a job well done.

But what if these events were not black swans but rather a new normal? While throwing everything at a single event is appropriate, it is not a sensible response to serial instability because it gradually limits the ability to counter future shocks. In such a world it is better to respond in a more conservative manner and retain future flexibility. Triage becomes a better option than largess.

There is growing evidence that economic instability is the new normal. Take a basic measure of economic instability — the volatility of growth. In the US, the standard deviation of four-quarter growth from 1948-84 was 2.7%. From 1985-2007 it was just 1.3%. After 1985 growth became more predictable.

Taking the post-1985 performance as the norm, it made sense to provide an all-out policy response to the 2008 financial crisis. And the subsequent recovery suggested that the financial crisis might indeed have been a black swan. After a major contraction in late 2008 and early 2009, the economy seemed to be returning to its previous predictability. By the end of 2019, output volatility since 2008 was not much higher than between 1985-2007. A robust response to the Covid-19 pandemic again seemed reasonable.

But from the perspective of early 2022, the notion that the economy is returning to the enviable stability of 1985-2007 seems increasingly threadbare. Looking back at the entire period since 2008, the standard deviation of growth has been 2.8% — over double the 1985-2007 value and a smidge above the earlier postwar number. And this sharp leap in instability is a global phenomenon. Using International Monetary Fund data, the volatility of global growth since 2008 is more than double that of 1985-2007.

These backward-looking calculations obviously reflect the impact of the 2008 financial crisis and the Covid-19 pandemic. But looking forward, policy-makers are facing a host of uncertainties that have no real parallels during 1985-2007. In a matter of months, the abrupt rise in inflation has upended assumptions about the monetary policy trajectory worldwide. The war in Ukraine and renewed superpower rivalries have put the future of globalisation into increasing doubt and made the international economic solidarity mustered by the G20 after the 2008 crisis seem like a distant memory. Climate change is destined to lead to more natural disasters. The Covid-19 pandemic appears more resilient than had been hoped in the wake of the rapid development of vaccines.

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<sup>\*</sup>This article first appeared in OMFIF Commentary on May 6, 2022.

<sup>\*</sup> Tamim Bayoumi is Visiting Senior Research Fellow at King's College London and former Deputy Director, International Monetary Fund.

Rising populism and increasing numbers of autocratic regimes are adding to political uncertainties that cascade into economic instability. Long-term scarring from earlier shocks, especially Covid-19, add further question marks to this already muddy picture.

By responding sequentially, policy-makers risk missing the forest for the trees. A gestalt switch is needed that recognises that the evidence points to a major rise in instability and accepts three important implications for macroeconomic policies. First, the return to a neutral policy stance should be accelerated. Second, the neutral stance itself should be more conservative so as to rebuild depleted policy buffers given the need for future policy flexibility. And finally, responses to future negative shocks should be more circumscribed.

Restraint may not be a welcome message in a world with so many unknown unknowns. But facing entrenched economic instability, and following over a decade of highly expansionary policies, it just may be the correct one.

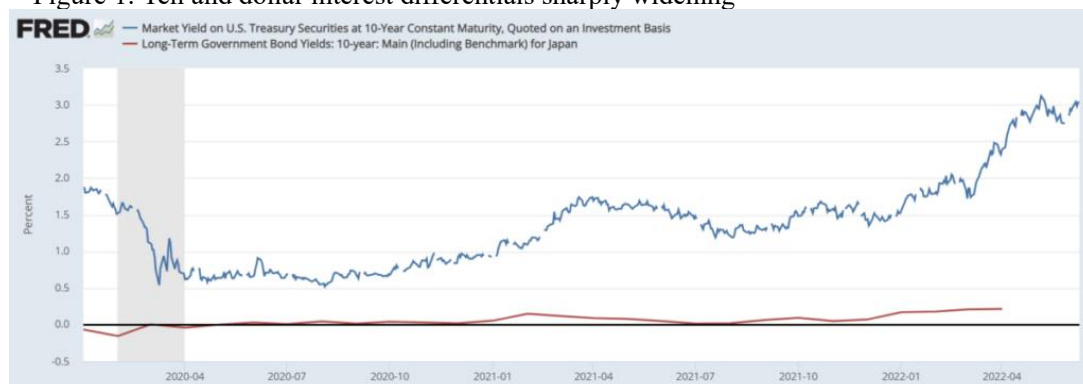
## Japan should not Intervene to Slow the Yen's Decline\*

By MARK SOBEL\*

The Japanese yen has fallen sharply against the dollar this year. Its roughly 15% decline is twice that of the euro. Markets are abuzz. Should Japan intervene to staunch the yen's decline? No. Will Japan intervene? I'm sceptical for now.

The yen is falling for obvious reasons. The Federal Reserve is tightening while Japan is not changing the stance of its highly accommodative monetary policy. Interest differentials favouring dollar placements against the yen are sharply widening. Japan is highly dependent on foreign energy but the US is self-sufficient.

Figure 1. Yen and dollar interest differentials sharply widening



Source: FRED

Notwithstanding, there is a hue and cry from the Japanese public about the weakening yen. It isn't keen about surging energy prices and is focused in part on yen weakness, even if not the root of the issue. With Upper House elections in July, the government is keenly sensitive to public concerns.

While the Ministry of Finance is responsible for exchange rate policy, the Bank of Japan is independent, in charge of monetary policy. Haruhiko Kuroda, the BOJ's governor since 2013 (and former Mr Yen vice minister of finance), remains staunchly committed to accommodative monetary policy and yield curve control, aimed at holding the 10-year bond rate to no more than 25 basis points.

Japan has long been mired in near deflation and unable to come close to hitting its 2% inflation target. Kuroda might welcome that Japanese inflation is now coming close to 2%, but knows it is being driven by higher energy/food costs over which the BOJ has little sway. Japan shows few signs of any wage/price spiral. With Kuroda's term ending early next year, the bar for him to change YCC – a hallmark of his tenure – is high.

When officials are confronted with a problem, the instinct is to do something. Japan has a long history of jawboning foreign exchange markets, ratcheting up rhetoric as concerns mount – generally to keep the yen down, but rarely from falling too quickly as is now happening. Usually, concerns are framed in terms of excessive volatility in the yen, rather than the yen's level. The

\*This article first appeared on OMFIF Commentary on June 13, 2022.

\* Mark Sobel is US Chair of OMFIF.

MoF has repeatedly expressed concerns over yen weakness/volatility and was just joined by the BoJ in a highly unusual statement.

Although words are cheap, in this case Kuroda may have sought to help deflect political heat on Japanese monetary policy by signing on. Jawboning may briefly instill caution, but unless backed by more meaningful action it is unlikely to persuade market participants.

FX market intervention – in this case buying yen and selling dollars – would be a more meaningful act. But would it be wise and succeed? For major currency markets – dollar, euro, yen – intervention in and of itself is not regarded as a generally effective tool unless it signals, or is associated with, a fundamental change in policy – and particularly monetary policy. Financial authorities usually assess the need for FX intervention in terms of levels/misalignments and volatility/disorder.

With the yen sinking due to US/Japanese monetary policy divergence, it's hard to argue FX markets aren't broadly reflecting fundamentals. Regardless, the way to tackle misalignments – to the extent they can be gauged – is through fundamental policy change.

FX markets are not showing signs of disorder. While the yen is lower, bid/offer spreads are reasonable and FX business is getting done.

In the 1990s and early 2000s, Japanese intervention was commonplace. But Japanese attitudes have changed. The MOF focuses much less on the yen exchange rate and last intervened in 2011 as part of a concerted G7 operation in the wake of the Fukushima disaster.

Intervention would raise other nettlesome issues. Would it be a concerted G7 operation as was the case in 2011, or with the euro in 2000? In all likelihood, the G7 would be unwilling to stage a concerted operation. They know the yen's weakening is fundamentally related and that the MOF and BOJ are seemingly at odds. However, if the G7 went along for the club's sake, they might put their credibility on the line. Indelicate market questions would be raised: will they sustain such operations? How much firepower would they bring? And will they undertake policy changes?

But if Japan intervened alone, market participants would question where the G7 was and whether the absence implies dissension in the ranks. That could exacerbate instability – precisely what the operation seeks to avoid.

As for reversing the yen's weakness, if the market's assessment of the trajectory of Fed rate hikes softened, that could support the yen. But that is not now on the cards if US inflation prints remain very high. Similarly, Kuroda's recent statements show little inclination to tighten Japanese monetary policy or deviate from YCC, even raising the threshold, for example, from 25 to 35 bps.

In the final analysis, Japan shouldn't intervene. It is not likely to be effective without a change in monetary policy, which does not now seem expected. Sporadic jawboning may continue. But beware of authorities needing to be seen as doing something.



# Global Economy

## Why We must Resist Geoeconomic Fragmentation

### —And How<sup>\*</sup>

By KRISTALINA GEORGIEVA, GITA GOPINATH AND CEYLA PAZARBASIOGLU<sup>\*</sup>

*Only international cooperation can address urgent global issues such as fixing shortages of food and other products, eliminating barriers to growth, and saving our climate.*

As policymakers and business leaders head to Davos, the global economy faces perhaps its biggest test since the Second World War.

Russia's invasion of Ukraine has compounded the Covid-19 pandemic—a crisis upon a crisis—devastating lives, dragging down growth, and pushing up inflation. High food and energy prices are weighing heavily on households around the world. Tightening financial conditions are putting further pressure on highly indebted nations, companies, and families. And countries and companies are re-evaluating global supply chains amid persistent disruptions.

Add to this sharply increased volatility in financial markets and the continuing threat of climate change, and we face a potential confluence of calamities.

Yet our ability to respond is hampered by another consequence of the war in Ukraine—the sharply increased risk of geoeconomic fragmentation.

How did we get here? Over the past three decades, flows of capital, goods, services, and people have transformed our world, helped by the spread of new technologies and ideas. These forces of integration have boosted productivity and living standards, tripling the size of the global economy and lifting 1.3 billion people out of extreme poverty.

But the successes of integration have also brought complacency. Inequalities of income, wealth, and opportunity have continued to worsen within too many countries for a long time—and across countries in recent years. People have been left behind as industries have changed amid global competition. And governments have struggled to help them.

Tensions over trade, technology standards, and security have been growing for many years, undermining growth—and trust in the current global economic system. Uncertainty around trade policies alone reduced global gross domestic product in 2019 by nearly 1 percent, according to IMF research. And since the war in Ukraine started, our monitoring indicates that around 30 countries have restricted trade in food, energy, and other key commodities.

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<sup>\*</sup>This article was published on IMF Blog on May 22, 2022.

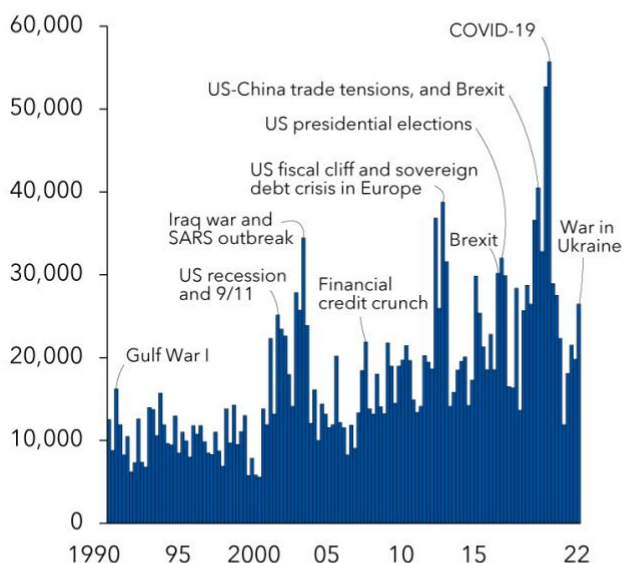
<sup>\*</sup> Kristalina Georgieva, Managing Director of the IMF; Gita Gopinath, First Deputy Managing Director of the IMF; Ceyla Pazarbasioglu, Director of the Strategy, Policy, and Review Department (SPR) of the IMF.

## Fog of war

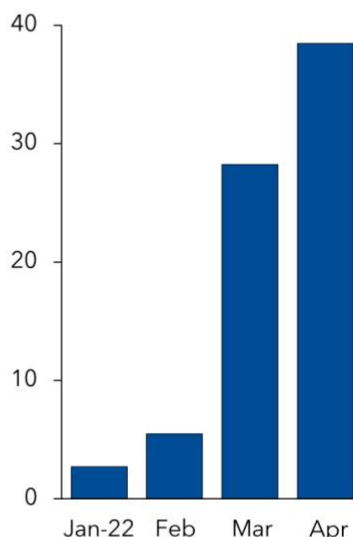
The World Uncertainty Index is climbing again as the invasion of Ukraine clouds the economic outlook.

### Overall uncertainty

(Index, GDP weighted average)



### Uncertainty related to the war in Ukraine as a share of overall uncertainty



Source: Ahir, Bloom, and Furceri (2022).

Note: The left chart is computed by counting the percent of the word “uncertain” (or its variant) in the Economist Intelligence Unit country reports. The index is rescaled by multiplying by 1,000,000. A higher number means higher uncertainty and vice versa. The right chart is computed by counting the percent of the word “uncertain” (or its variant) that appear near a word related to the war in Ukraine in the Economist Intelligence Unit country reports and is calculated as a percentage of overall uncertainty.



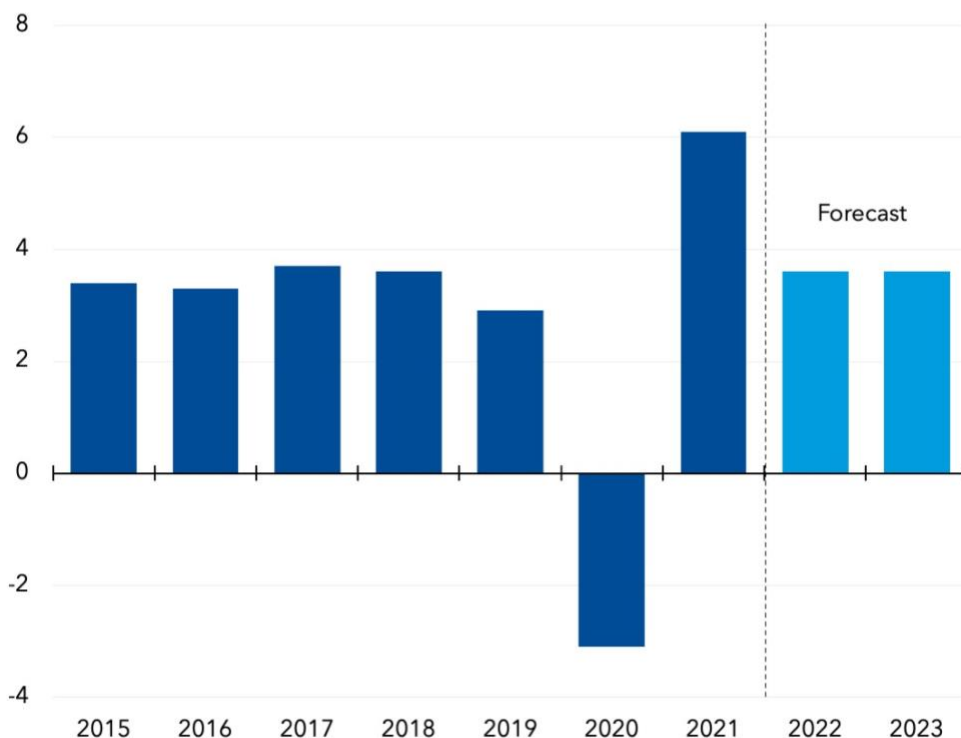
The costs of further disintegration would be enormous across countries. And people at every income level would be hurt—from highly-paid professionals and middle-income factory workers who export, to low-paid workers who depend on food imports to survive. More people will embark on perilous journeys to seek opportunity elsewhere.

Think of the impacts of reconfigured supply chains and higher barriers to investment. They could make it more difficult for developing nations to sell to the rich world, gain know-how, and build wealth. Advanced economies would also have to pay more for the same products, stoking inflation. And productivity would suffer as they lost partners who currently co-innovate with them. IMF research estimates technological fragmentation alone can lead to losses of 5 percent of GDP for many countries.

## Dimming outlook

War is weighing on the global economy, underscoring the need for cooperation that can help eliminate barriers to growth.

(real GDP growth, annual percent change)



Source: IMF, *World Economic Outlook*.

**IMF**

Or think of the new transaction costs on people and businesses if countries develop parallel, disconnected payment systems to mitigate the risk of potential economic sanctions.

So, we have a choice: Surrender to the forces of geoeconomic fragmentation that will make our world poorer and more dangerous. Or reshape how we cooperate—to make progress on addressing collective challenges.

### Restoring Trust in the Global System—Four Priorities

To restore trust that the rules-based global system can work well for all countries, we must weave our economic fabric in new and better ways. If we can start by focusing on urgent issues where progress will clearly benefit everyone, we can build the trust needed to cooperate in other areas where there is disagreement.

Here are four priorities that can only be advanced by working together.

First, strengthen trade to increase resilience.

We can start now by lowering trade barriers to alleviate shortages and lower the prices of food and other products.

Not only countries but also companies need to diversify imports—to secure supply chains and preserve the tremendous benefits to business of global integration. While geostrategic

considerations will drive some sourcing decisions, this need not lead to disintegration. Business leaders have an important role to play in this regard.

New IMF research shows that diversification can cut potential GDP losses from supply disruptions in half. Auto manufacturers and others have found that designing products that can use substitutable or more widely available parts can reduce losses by 80 percent.

Diversifying exports can also increase economic resilience. Policies that help include: enhancing infrastructure to help businesses shorten supply chains, increasing broadband access, and improving the business environment. The WTO can also help with its overall support for more predictable, transparent trade policies.

Second, step up joint efforts to deal with debt.

With roughly 60 percent of low-income countries with significant debt vulnerabilities, some will need debt restructuring. Without decisive cooperation to ease their burdens, both they and their creditors will be worse off. But a return to debt sustainability will draw new investment and spur inclusive growth.

That is why the Group of Twenty's Common Framework for Debt Treatment must be improved without delay. This means putting in place clear procedures and timelines for debtors and creditors—and making the framework available to other highly-indebted vulnerable countries.

Third, modernize cross-border payments .

Inefficient payment systems are another barrier to inclusive growth. Take remittances: the average cost of an international transfer is 6.3 percent. This means some \$45 billion per year are diverted into the hands of intermediaries—and away from millions of lower-income households.

A possible solution? Countries could work together to develop a global public digital platform—a new piece of payment infrastructure with clear rules—so that everyone can send money at minimal cost and maximum speed and safety. It could also connect various forms of money, including central bank digital currencies.

Fourth, confront climate change: the existential challenge that looms above everything .

During the COP26 climate conference, 130 countries, representing over 80 percent of global emissions, committed to achieve net-zero carbon by around mid-century.

But we urgently need to close the gap between ambition and policy. To accelerate the green transition, the IMF has argued for a comprehensive approach that combines carbon pricing and investment in renewables, and compensation for those adversely affected.

Progress for People

The hard fact is that we have all been too slow to act as our economic fabric started to fray. But if countries can find ways now to come together around these urgent issues that transcend national borders and impact us all, we can begin to mitigate fragmentation and bolster cooperation. There are some hopeful signs.

When the pandemic hit, governments took coordinated monetary and fiscal measures to prevent another Great Depression. International cooperation was essential to developing vaccines in record time. On global corporate taxation, 137 countries agreed on reforms to ensure that multinational enterprises pay their fair share wherever they operate.

Last year, the IMF's membership supported a historic \$650 billion allocation of the Fund's Special Drawing Rights to strengthen countries' reserves. Even more recently, our members agreed to create the Resilience and Sustainability Trust—which provides longer-term affordable financing to help our more vulnerable members address climate change and future pandemics.

In the pursuit of further progress, we must all adhere to a simple guiding principle: policies are for people. Instead of globalizing profits, we should act to localize the benefits of a connected world.

Start with the communities in every country that lost out in the “old globalization,” and were set back further by the pandemic: Invest in their health and education. Help displaced workers learn

in-demand skills and transition to careers in expanding industries. For example, firms that export pay higher salaries on average—as do greener jobs.

Multilateral institutions can also play a key role in reshaping global cooperation and resisting fragmentation, including by further strengthening their governance to ensure they reflect changing global economic dynamics—the upcoming IMF review of capital and voting shares will provide such an opportunity. They can also leverage their convening power, and maximize use of their diversified toolkits. The IMF can help, for example, with its range of financial instruments, bilateral and global surveillance, and even-handed approach across our membership.

There is no silver bullet to address the most destructive forms of fragmentation. But by working with all stakeholders on urgent common concerns, we can begin to weave a stronger, more inclusive global economy.

## Speech at the Beijing Launch Meeting of IMF World

### Economic Outlook

*By WEI BENHUA\**

Good evening to Steve and others who are participating this discussion in U.S. and good morning to the participants in China.

Thank you for your excellent presentation of the latest issue of the World Economic Outlook which was published just a few days ago. We do share with you your views on the world economic prospects and policies. I'd like to make two major comments on your presentation: The first is regarding the issues facing the global economy, the second regarding the Chinese economy.

On the global economic prospects, we recognize that the global economy is faced with downside risks coming from two directions. One is the uncertainty due to the continuing severe developments of the covid-19 pandemic. The Omicron virus is spreading much faster than the previous ones, though at a less lethal rate. Many emerging markets and developing countries are still being disturbed by the Omicron virus. Even advanced economies are still being besieged by the still rising cases. In fact, as pointed out in the WEO, more than 100 countries will not be able to achieve the goal of 70% vaccination rate in the middle of this year.

For EMDS, while the supply of vaccine has improved somewhat, the implementation of vaccination in many of them is far from adequate. How to address these issues, we are glad to learn from your presentation, 216 billion dollars have been approved for 92 member countries. Since the outbreak of the injection, is there an evaluation of the effectiveness of these lending programs? We do think advanced countries are obliged to provide more grants or concessional loans to help them. In this respect, it is noted in the last communique of the IMFC, IMFC Governors appeal to the international community "We will intensify our joint efforts to boost equitable access to a comprehensive covid-19 toolkit, including vaccines, tests, treatments, and enhanced in-country delivery in developing countries, and remove relevant supply and financing constraints to overcome the pandemic, including by boosting local protection of vaccines". We are sure with IMF taking the lead in providing financial assistance in this respect, with the co-operation with other international institutions, it has played an important role in helping EMDCs fighting against covid-19, I am wondering whether we are making good progress in the above areas.

Back to this issue for China, I noticed that staff is paying a lot of attention to the "Zero-Covid-19" policy in China and are worried about the economic effects of implementing such a policy. I can assure you that as China has accumulated much experiences in dealing with the pandemic, plus with the help of high tech like big data, we will be able to solve the recently arising cases in Shanghai or in Beijing. In fact, situations in these two largest cities in China are under control and have improved significantly. We will see a zero-covid-19 in not distant future.

For the global economy, another key issue discussed in your presentation is inflation. In my views, why U.S has the highest inflation over the past years, the answer is that it has conducted an unlimited quantitative monetary policy for many years. And also the government has had expansionary fiscal policy for so many years that resulted in a huge amount of fiscal deficits which, more worse has been absorbed by relying on the Fed to print dollar notes. In Chinese proverb is to quench a throat with poison. The consequence of such policies will inevitably be inflation.

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\* Wei Benhua, Member of IMI Academic Committee, Former Deputy Administrator-in-bureau of SAFE, Former Executive Director of IMF for China

Now the Fed has to raise interest rate to curb inflation. As in the past, whenever the Fed raises interest rate it will have spillover effects on the rest of the world, in particular on the EMDCs. Capital will flow out from them, their currencies will be under pressure and there will be even disruption in their financial markets.

Of course we recognize the global market, especially the commodity market has been under huge pressure due to the Russia-Ukraine conflict. The prices of oil, food and some metals have gone up tremendously. This factor has attributed to the global inflation. Unfortunately, the IMF staff forecasting that the inflation will be expected to persist longer though we wish it be shorter.

Now, I'd like to shift to the second part of my comment focusing on the Chinese economy. We are aware that the current WEO reduced the China's GDP growth of 2022 to 4.4% from the January Issue of WEO by 0.4 percent given the global economic slowdown and the uncertainty arising from the new pandemic cases. However, we are more optimistic that China will be able to achieve the 5.5% target in the NPC session that March. I have many reasons to support such optimistic view. Let me just mention some of them.

1. On the policy for China fighting against the Covid-19 pandemic, I have given my views earlier, I'd like to add one more point that China is the largest populous country with 1.4 billion population in the world. We don't have the luxury to experiment with Herd Immunity. We could not afford to fail as the cost of the experiment is human life. Now that China could succeed in tackling the worst situation in 2020 we are confident we will win this round, probably with some economic cost that is understandable.

2. As is well known, the economic growth model of China is transitioning to a quality focused growth from a quantity one in the past. And we have been successful in such a transitioning. Nowadays many people of different industries could work at home through Internet. That is why the economic cost is becoming smaller than before when the city is implementing a zero-covid-19 policy.

3. One point I should not miss is that the advanced technology and good communication are contributing tremendously to the success of a zero-covid-19 policy.

Having said the above, we have ample rooms to maneuver in fiscal and monetary policy to support the economy.

For fiscal policy, the planned fiscal deficit is 2.8% of GDP for this year, comparing 3.1% for 2021 and 3.7% for 2020. Naturally the relatively low deficit for this year is helpful for maintaining a sustainable fiscal policy in long run. Premier Li Keqiang stated during the NPC and CPPCC session that the total reduction of tax and fees will be 2.5 trillion yuan for 2022. And the tax reduction of 1.5 trillion yuan will be refunded to enterprises directly which will produce better result. Moreover, the fiscal transfer from the central to local government will increase 18% reaching 9.8 trillion yuan. Such huge amount of fiscal assistance could make substantial effects to the growth of local economy.

For monetary policy, the staff recommended to the Chinese authorities at the end of Article IV consultation:

1. Macroeconomic policy should adjust to support the stable development of the real economy given that the economy is facing the slowdown risk.

2. To shift to supporting consumption from supporting investment in the process of restructuring the economic structure.

3. Accelerating the reform of real economy to create an equal platform for state-owned enterprises and private enterprises.

Here, please allow me to introduce what Mr. Chen Yulu, vice-governor of the People's Bank of China said when he was interviewed by the Xinhua Agency last Saturday.

He says China will step up use of structural monetary tools to help out suffering market player and cushion economic headwinds in a targeted manner. The central bank will put stabilizing economic growth in a more prominent position and better employ the role of monetary policy in

leafing up support for the real economy. Specifically rolling out a relending facility with a quota of 100 trillion yuan as soon as possible to support transportation and warehousing companies.

He also says the PBOC will strengthen support for banks to issue perpetual bonds that will enhance their lending capacity and promote fee reductions by financial institutions to alleviate burdens on enterprises and individuals.

In fact, PBOC adopted preemptive measure of reducing RRR by 0.5 percent by the end of that year and cut again by 0.25 percent earlier. These measures provided significant support to the real economy.

On RMB exchange rate, it has been stable and will continue to be stable as the exchange rate is radically decided by the market mechanism.

I'd like to end my comments by quoting another matter in the IMFC Communique "We remain committed to revisiting the adequacy of quotas and will continue the process of IMF governance reform under the 16th general Review of Quota, including a new quota formula as a guide by December 15, 2023.

We always call that the voice and representation of EMDCs should be rightly reflected in the IMF quota.



## Opening Remarks during the Launch of the June 2022

### Global Economic Prospects Report\*

By DAVID MALPASS\*

I want to highlight a few messages from our latest Global Economic Prospects report and take questions. At the outset, let me thank Ayhan Kose and his team for all their work on this.

The new GEP cuts forecasts for the global economy and emerging markets. Global economic activity is expected to slow to 2.9 percent in 2022 amid surging inflation, rising interest rates, and the war in Ukraine. This forecast is close to one-third lower than the January forecast of 4.1 percent.

Several years of above-average inflation and below-average growth now seem likely. The path will depend heavily on supply decisions taken now, especially for energy; and on central bank policies to encourage business investment as interest rates normalize.

The growth forecast for emerging market and developing economies (EMDEs) this year has been lowered to 3.4 percent (from 4.6 percent expected in January 2022). In this latest GEP, forecasts for 2022 growth have been revised down in nearly 70 percent of EMDEs compared to the January release.

The risk from stagflation is considerable, with potentially destabilizing consequences for low- and middle-income economies. In 2022, the level of EMDE per capita income will be nearly 5 percent below its pre-pandemic trend. Subdued growth will likely persist throughout the decade because of weak investment in most of the world. GEP has a special focus note on the risks of stagflation, including comparisons to the 1970s.

For many countries, recession will be hard to avoid. With the supply of natural gas constrained in poorer countries for use in fertilizer, farming, and electricity grids, announcements of major production increases will be essential for restoring non-inflationary growth. The GEP presents downside risks. If they materialize, we could even see global growth fall to 2.1 percent in 2022 and 1.5 percent in 2023. If so, on a per capita basis, growth would fall close to zero.

In this extraordinary era of overlapping global crises, policymakers need to focus their efforts in five key areas to respond to the crises and improve the outlook for developing countries:

- First, limit the harm to people directly affected by the war in Ukraine.
- Second, actively counter the spike in oil and food prices. As Europe realigns its energy supply away from Russia and absorbs new resources from around the world, it reduces the availability of energy, electricity, and food elsewhere. This makes new energy and food production an imperative for both Europe and the world. Markets are responsive to supply, and they look forward, so increases in estimates of future supply would help reduce current prices and inflation expectations.
- It's also crucial to avoid export and import restrictions and subsidies that magnify the rise in prices and distort markets. In the poorest nations – those at greatest risk from shortages of fertilizer and food – targeted social safety nets and cash transfers need to be buttressed. This supports the vulnerable and helps countries avoid more costly subsidies and price controls.
- Third, step up debt-relief efforts. Debt vulnerabilities were acute for low-income countries even before the pandemic. As debt distress spreads to middle-income countries, the danger is growing. Debt relief needs to be rapid, comprehensive, and sizable in order to avoid deeper crises and allow recovery.

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\*This speech was first published by World Bank Group.

\* David Malpass, World Bank Group President.

- Fourth, strengthen health preparedness and efforts to contain COVID-19. Expanding immunization efforts in low-income countries, including COVID-19 vaccinations, must be a high global priority.

- Fifth and final, among these overlapping crises and policy priorities, we need to effectively address climate change as a continuing challenge. It requires massive investments in cleaner energy, energy efficiency, and electricity grids and transmission. Gas flaring, methane leakage, and the operation of antiquated coal-fired power plants, with severe health and environmental impacts, continue with little abatement.

I'll leave you with two sobering points. First, the energy tradeoffs made in Europe will have major consequences for developing countries. Already, the high price of liquified natural gas (LNG) is causing reduced crop yields and an increased use of coal, diesel, and heavy fuel oil. Investments need to be made now to stop this shift into more carbon-intensive fuels.

Second, many developing countries are facing instability and severe shortages of capital. They've been left behind by COVID-19, the global response to the pandemic, inflation, and now by the policy response to inflation. As policy accommodation is removed in the advanced economies, inequality is deepening rapidly. The GEP outlook is for these global divides to persist.

# Debt Risk

## Defusing Debt Risks<sup>\*</sup>

By XIONG AIZONG<sup>\*</sup>

Asian developing countries are faced with a severe debt situation. The current debt-to-GDP ratio of the developing countries in Asia is much higher than the international redline for developing countries of 60 percent. According to the International Monetary Fund, the general government debt-to-GDP ratio of emerging and developing economies in Asia was 71.8 percent in 2021, a level which is second only to that of Latin America and the Caribbean.

And, in 2021, the external debt of emerging and developing economies in Asia increased by 20.7 percent compared with the level of 2019, the fastest growth rate among all emerging markets and developing economy regions.

There are mainly three factors driving the debt risks.

First, the COVID-19 pandemic has pushed up the debt levels of some countries. The pandemic has caused a substantial increase in government public spending, while slowing or even shrinking fiscal revenue growth, leading to a sharp rise in government deficits. The pandemic has also caused a decline in the income of some countries from overseas remittance. These factors have exacerbated the difficulties of some countries in repaying their foreign debts.

Second, the tightening of monetary policy by the United States is increasing the debt burden of Asian countries. The bond yields in Asian economies have been pushed up, chafing debt risks. Meanwhile, with the tightening of the Fed's monetary policy, the US dollar has entered an appreciation cycle, and the currencies of some Asian economies have depreciated sharply against the US dollar, increasing their burden from debts on US dollar terms.

Third, the Russia-Ukraine conflict has further aggravated the debt difficulties of Asian countries. The escalation of the crisis in Ukraine has led to soaring prices of commodities such as energy and food, which has brought about serious debt payment difficulties to developing countries dependant on commodity imports. In Sri Lanka, for example, rising global food and oil prices have hit its balance of payments and brought about a severe shortage in its foreign exchange reserves, forcing the country to suspend its foreign debt repayments. Financial tensions brought about by the Russia-Ukraine conflict have also pushed up financing costs for developing countries.

But despite being confronted with relatively large debt pressures, the debt risks of Asian countries are generally under control. Asia still maintains a relatively high economic growth rate, and the international reserves of Asian economies are relatively sufficient. But active policies are still needed to defuse the debt risks.

First, it is important to balance short-term economic stimulus and medium-term fiscal consolidation. At present, some Asian countries are facing the dual pressure of slowing economic growth and rising inflation. Against the backdrop of successive interest rate hikes by the Fed, most Asian countries have also begun to tighten their monetary policy, and relied on their fiscal policies to stimulate the economy, which may lead to a further rise in government debt. To this end, once

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<sup>\*</sup>This article first appeared China Daily Global on June 15, 2022.

<sup>\*</sup>Xiong Aizong is an associate researcher with the Institute of World Economics and Politics at the Chinese Academy of Social Sciences.

the economic performance improves in the future, policymakers should conduct fiscal consolidation in a timely manner to avoid long-term fiscal deficits and ensure the sustainability of public debt.

Second, it is important to strengthen regional financial cooperation to ensure financial stability in Asia. The development of local currency bond markets in Asia should be further promoted. In doing so, Asian countries can reduce their over-reliance on external financing, cut the risk from currency mismatches, and alleviate the debt burden caused by the appreciation of the US dollar. It is important to accelerate the development of the Asian credit rating system, improve the pro-cyclical rating methods for rating agencies, and prevent rating agencies from amplifying debt risks and exacerbating cyclical fluctuations in the macro economy. The role of Asian regional financial arrangements must be further enhanced so as to enhance their capabilities in economic surveillance, crisis prevention, and crisis resolution and maintain financial stability in Asia.

Third, Asian economies must work with the international community to resolve the debt problem. The solution to debt issues has always been an important part of the G20 agenda. Indonesia holds the rotating presidency of the G20 this year. Asian countries should actively participate in multilateral debt coordination with other countries, and urge all parties to implement the G20 Common Framework for Debt Treatments beyond the Debt Service Suspension Initiative. International and regional financial institutions, such as the IMF and the World Bank, should also increase financing support for relevant countries and actively ease the debt burden of developing countries.

China has been striving to help developing countries deal with their debt problems. The country initiated and took an active part in the G20 Debt Service Suspension Initiative, offering the largest amount of debt suspension among the G20 members. Meanwhile, relevant non-official financial institutions in China have also taken debt suspension actions with reference to the terms of the debt service suspension initiative. In addition, China has waived the interest-free loans of several least-developed countries in a successive manner.

Going forward, China and Asian countries can strengthen their cooperation in the following aspects to jointly resolve the debt problem. The first aspect is to establish bilateral currency swap lines with countries in need to increase their foreign exchange reserves and prevent their sovereign credit ratings from being lowered in a continuous manner, and to help them stabilize their economies and financial situations. The second aspect is to provide assistance and loan support for relevant countries and help them solve their balance of payments problems. The third aspect is to continue strengthening cooperation with Asian countries under the Belt and Road Initiative to spur stable and sustained economic growth in the Asian region, which is the key to resolving debt problems in the long run.

## Borrowers' Blues<sup>\*</sup>

By XIONG WANTING AND XU QIYUAN<sup>\*</sup>

Monetary policy tightening in the US and EU is becoming a nightmare for high-debt developing countries.

Over the past decade, the debt burden of emerging and developing countries has risen significantly.

This year, with the Russia-Ukraine conflict and the US monetary policy tightening, many developing countries are driven to the edge of debt crisis and some of them have already fallen off the cliff. In early April, Lebanon and Sri Lanka announced that they were in debt distress. According to the International Monetary Fund and the World Bank, 38 of the 69 low-income countries are already in or at high risk of debt distress. It is also warned that the number of countries in crisis is very much likely to rise in the near future.

Three groups of countries deserve close attention. The first group is emerging market economies with a high dependence on external debt, a poor historical record of sovereign credit and weak economic recoveries, such as Argentina, Turkey, Brazil, and Mexico. Since the beginning of 2022, these countries have experienced severe inflation and currency depreciation. To cope with these problems, their central banks have already raised the policy interest rate. However, even if their central banks tighten the monetary policy more aggressively, the pressures of capital outflows and currency depreciation are still high, because of their weak fundamentals and poor sovereign credibility. In general, these countries struggle with the dilemma that there are few appropriate policy tools and inadequate space for both policy expansion and tightening.

The second group is the high-debt countries that have been hit hard by the Russia-Ukraine conflict. On the one hand, some Russian and Ukrainian entities have defaulted on their debts due to the conflict and sanctions, causing asset losses to financial institutions that hold their debts, especially those in Europe. On the other hand, rises in commodity prices and refugee problems caused by the conflict have added to the fiscal burdens of many governments neighboring to Russia and Ukraine or having close economic and trade ties with them. European countries including Hungary, Moldova, Romania and Slovakia, and Asian countries, including Mongolia, Tajikistan and Kazakhstan, fit into this category.

The third group is countries with severe debt and poverty problems and strong dependency on food imports, such as Lebanon, Yemen and Syria. These countries may experience multiple crises such as capital outflows, food crises and political unrest. Since the outburst of the Russia-Ukraine conflict, global food prices have risen sharply and many countries have announced restrictions or bans on food exports. The UN has warned that 325 million people worldwide are currently suffering from food shortages, and about 43 countries are expecting famine to knock at their doors.

At the global governance level, the top priority is further expanding and improving debt restructuring and relief programs under multilateral mechanisms. As a first step in tackling the debt crisis, the G20 has postponed debt repayments for 73 poorest countries through the Debt Service Suspension Initiative. The bloc also rolled out a Common Framework aiming to promote wide-ranging, quick and orderly debt restructuring. However, the influence of the DSSI and the CF is still relatively limited. Among the countries eligible for application, many countries choose to continue borrowing from the private sector at high interest rates rather than participating in debt restructuring at an early date, because the DSSI and the CF provide insufficient discounts, but are

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<sup>\*</sup>This article first appeared on China Daily Global on June 8, 2022.

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expected to require lengthy negotiation and induce downgrades of sovereign credit ratings. Such a slow response to debt crisis will eventually lead to the snowballing of debt problems and higher debt relief costs in the future.

In order to prevent a debt spiral, it is necessary to develop a multilateral consensus with long-lasting and broad influences. The key to achieve this goal is to create more incentives for borrowers and creditors to participate in debt resolution as soon as possible. It is especially important to provide more incentives, pressure and platforms for the private sector to participate in debt relief. For example, eligible debtor countries can be encouraged to combine debt resolution with other sustainable development goals, through the use of debt-for-nature swaps, debt-for-climate swaps, and other sustainable financing tools. These instruments are able to hit two birds in one shot: reduce debt burden and channel funds to support sustainable development.

The combination of debt resolution with sustainable development goals like climate mitigation can help attract funds from NGOs, international organizations and ESG investors. Through its cooperation with The Nature Conservancy, a non-profit organization, Seychelles not only completed a debt restructuring of \$21.6 million, but also established 410,000 square kilometers of ocean protection area. In 2021, Belize also secured a debt restructuring of \$364 million and finance the protection of 30 percent of its waters through a similar debt swap program.

As an emerging creditor, China should also be prepared for the upcoming wave of debt crises in developing countries. It should further improve its external lending standards and debt management institutions, and provide more diversified debt resolution options for debtor countries, especially market-based debt restructuring options. For example, more swaps from loan to bonds can be encouraged. These loan-for-bond swaps can largely increase debt transparency, because the information disclosure requirements of bonds are much more stringent than loans. Meanwhile, it is also important for China to adhere to multilateral frameworks and strengthen its coordination and cooperation with other creditors. For example, China can better monitor the debt sustainability of relevant countries by cooperating with the IMF and the World Bank. In-depth cooperation among all parties will help formulate more influential and more efficient international rules for debt governance, laying a better global foundation for the prevention of future crises.

# Digital Economy

## CBDCs for the People\*

By AGUSTIN CARSTENS AND H.M. QUEEN MÁXIMA OF THE NETHERLANDS\*

THE HAGUE and BASEL – Central banks around the world are considering whether to issue their own digital currencies. While financial inclusion is often cited as a key motivation, this is not automatic. Precisely how can central bank digital currencies (CBDCs) be designed and implemented to ensure that "unbanked" people have access to essential financial services?

According to the World Bank, 1.7 billion adults worldwide are unbanked. With no access to services from the formal financial sector, they are forced to resort to alternatives, often at significant cost or risk. Such financial exclusion entrenches poverty, limits opportunity and prevents people from protecting themselves against hardship. It stifles hope for a better future.

Financial inclusion starts, but does not end, with the ability to make and receive payments. People need a fast, secure, and cheap way to transfer money. To date, central banks have largely met this need by providing the most inclusive form of money we currently have: cash. However, using cash exclusively leaves the unbanked outside the formal financial system and without the data and transaction trail needed to readily access financial services. This can make it much more difficult for small businesses to build savings and gain access to credit.

But due to the widespread adoption of digital and mobile technologies, the payments landscape is changing. Cash transactions are declining, and there is a shift toward digital activity – a trend accelerated by the COVID-19 pandemic, when online transactions surged. Given these broad developments, it is imperative that we work to close the widening digital divide. Central banks and policymakers now have an opportunity to explore reforms, including the issuance of digital central bank money for all.

CBDCs could offer an opportunity to overcome some barriers facing the unbanked. Traditional services have potentially prohibitive costs and requirements such as transaction fees, minimum account balances, or formal proof of identification. Additional obstacles include the low level of trust in digital payments and the lack of smartphones among some groups.

While CBDCs are not the only way to overcome these barriers, they could be part of the inclusion toolkit. Central banks are already coordinating further improvements to retail payments by adopting fast payment systems, and CBDCs represent a natural extension of this continuum. Both fast payment systems and CBDCs can spur competing providers to offer new services, lower costs, and, ultimately, broaden access. A further benefit of CBDCs is that, by their very nature, they will incorporate the unique advantages of central-bank money – safety, finality, liquidity, and integrity.

CBDCs could bypass many of the vested commercial interests that have cropped up around payment systems and contributed to inefficiencies and costs for users. They could also lower costs by removing the credit and liquidity risks inherent in other forms of digital money. A CBDC has

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\*This op-ed was published by Project Syndicate on 18 April 2022.

\* Agustín Carstens, General Manager of the BIS. H.M. Queen Máxima of the Netherlands, the United Nations Secretary-General's Special Advocate for Inclusive Finance for Development.

the potential to upgrade and connect payment systems – both domestically and across borders. It could spur countries with limited financial infrastructure to leapfrog directly to a CBDC arrangement, creating an opportunity to connect to an inclusive, safe, and efficient payments system.

There are also benefits for social policies. For example, governments could use CBDCs to channel financial support to low-income households, which would deepen longer-term inclusion and act as another gateway to other financial services.

To realize these benefits, any CBDC rollout must be accompanied by policy reforms and safeguards to address potential difficulties and risks, such as low levels of financial and digital literacy, and operational challenges, including cybersecurity. Policy reforms also should prevent disintermediation: the danger that money will be held in large amounts in CBDC wallets, rather than as deposits in commercial banks, making it unavailable for lending (such as mortgages) and other productive purposes.

Central banks also should consider designing CBDCs to level the playing field. Give people control over their transaction data and the ability to share it with a wider set of financial service providers. Growing concerns about data privacy could be addressed by hardwiring personal data protections into the structure of a CBDC.

Central banks exploring CBDCs will have many design choices to make to balance privacy protection and transparency, and to ensure both financial inclusion and financial integrity. They will need to consider whether to grant direct access to consumers or to use a purely intermediated model that offers CBDC digital wallets through banks or nonbank financial service providers. More dialogue, research, and trials will be needed to show how CBDCs can best become engines of financial inclusion.

Central bankers and other public-sector representatives have a duty to ensure the financial system is inclusive, open, competitive, and responsive to the needs and interests of all groups. If designed properly, CBDCs hold great promise to help support a digital financial system that works for everyone.



## Remarks at the Seminar “Central Bank Digital Currency and Crypto Assets”\*

By LI BO\*

I am delighted to join you today to celebrate the 20th anniversary of AFRITAC East and welcome you to this virtual conference, organized jointly by the IMF and the Bank of Tanzania.

To begin with, let me congratulate AFRITAC East for reaching this notable milestone and thank all of the member countries, which have achieved so much in building their institutions over the past twenty years. A special vote of thanks goes to the Tanzanian authorities for hosting the center and to our donor partners for their generous support.

AFRITAC East was the first of what are now six IMF regional capacity development centers in Africa. This was a major innovation in the way we participated in capacity building, and I think all stakeholders agree that it has paid handsome dividends. The center’s location in the region facilitates the provision of prompt, tailored, and sustained hands-on support. Through its workshops and peer-to-peer visit programs, the center promotes mutual learning as well as regional harmonization and integration. The center’s inclusive governance structure makes member countries a key part of the venture. And the close coordination with development partners helps to minimize duplicative CD efforts.

AFRITAC East has been able to adapt quickly to countries’ evolving needs, as has been demonstrated amply during the COVID-19 pandemic. But to remain relevant, the center must continue to be agile, assisting its members with the realities they face. That is why the center has been collaborating with IMF headquarters to step up its support on key emerging issues, including: building resilience to climate change; promoting inclusive growth; and leveraging fintech and digital transformation.

This brings me naturally to the topic of this conference—namely, crypto assets and central bank digital currencies, or CBDCs.

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Crypto assets, as you know, are privately issued digital tokens that use cryptographic techniques. Bitcoin is perhaps the most famous example.

This asset class has grown rapidly. Market capitalization reached US\$2.3 trillion by end-2021, and we’ve seen substantial action right here in the region, in such countries as Kenya, Nigeria, South Africa, Ghana, and Tanzania.

But there are risks. Insofar as their movements are correlated with those of other financial instruments, crypto assets could lead to the amplification of shocks. They could, in some circumstances, replace local currency as a medium of exchange, a store of value, and a unit of account—a risk which has been dubbed as “cryptoization.” And they can be misused for money laundering, terrorist financing, and other illegal activities.

Countries have taken different regulatory approaches to address possible financial stability threats—some completely hands-off, others with licensing regimes of various restrictiveness, and yet others banning these assets outright. There is an active debate going on worldwide regarding the right regulatory and supervisory options to employ. The IMF has made a strong call for a

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\*This speech was given at the seminar “Central Bank Digital Currency and Crypto Assets” in celebration of the 20-year Anniversary of the African Regional Technical Assistance Centre (AFRITAC) East.

\* Li Bo, IMF Deputy Managing Director.

comprehensive, consistent, and coordinated global regulatory framework for crypto assets. It will be good to hear your perspectives on this during the conference.

Now let me turn to CBDCs.

Unlike crypto assets, CBDCs are issued by central banks and recorded as a liability of the central bank.

Central banks around the world are exploring the potential benefits and risks of CBDCs from various angles, including how a CBDC could improve the efficiency and safety of payments systems. If designed prudently, CBDC could reduce incentives for adopting crypto assets, and at the same time support public policy objectives such as efficiency and stability of the payment systems in the digital age.

The IMF recently did a stocktaking of six countries with advanced CBDC pilots, and three broad themes emerged.

First, objectives and needs for CBDC may vary across jurisdictions.

In some countries, CBDC is all about financial inclusion—consider, for example, island nations where a digital means of payment is needed given the cost and difficulty of getting cash to citizens spread across many islands. In other places, CBDC is about enhancing resilience—becoming an essential backup if private sector solutions fail. And in other countries with dominant private sector service providers, CBDC is also about promoting market competition.

Thus, central banks should tailor the design of CBDCs to meet their specific objectives and needs, reflecting country circumstances. There is no “one size fits all” approach.

Second, financial stability and privacy considerations are paramount for the design of CBDCs.

Central banks are committed to minimizing the impact of CBDC on financial stability, including the risk of banking disintermediation. The countries we studied offer CBDCs that are not interest-bearing—which makes CBDC useful, but not as attractive for savings as traditional bank deposits. We also saw limits on holdings across active CBDC projects—again, to prevent sudden outflows of bank deposits into CBDC.

Separately, privacy issues need to be considered carefully. One of the core features of cash is the relative privacy of cash transactions, and to be attractive, CBDCs also need to offer some privacy. But too much privacy can facilitate illicit financial flows. One way to balance these concerns is via a “tiered wallet” CBDC design, which would offer greater anonymity at lower levels of CBDC holdings. Such a design may also help promote financial inclusion, since customer onboarding and documentation requirements could be kept simpler at lower thresholds.

So, it’s vital that policymakers get the mix right between protecting privacy, promoting financial inclusion, and ensuring financial integrity.

Third, introducing a CBDC is a complex process requiring appropriate resources and capacity. Areas for further efforts may include new legal frameworks, new regulation, and public-private partnerships to ensure successful adoption, or the building of additional features.

This conference provides an opportunity to share country experiences and understanding about what might work and what pitfalls to avoid in regulating crypto assets and designing CBDCs. International coordination and collaboration remain vital in these rapidly evolving areas.

The IMF is playing its part in international efforts to develop appropriate policies, regulations, and standards, and we are gearing up to provide capacity development support to our members.

I wish you all a successful conference, and I look forward to the next twenty years of AFRITAC East’s journey!

## Regulating Innovation or Innovating Regulation?

### What it Takes to Make Digital Finance a Success\*

By JOACHIM WUERMELING\*

#### Introduction

Ladies and gentlemen, innovation drives us forward. Without innovation, we would still be living in caves, hunting with wooden spears – maybe not even that – and dying of "old age" in our 30s. So overall, innovation is a good thing.

But sometimes, it can go awry. Has anyone ever heard of Thomas Midgley? Thomas Midgley is often described as the most disastrous human who ever lived. Alas, he was not a mad dictator, a crazy warlord or a terrible tyrant; he was an engineer at General Motors.

What made him so dangerous was his drive to innovate. In 1921, he invented tetraethyl lead. This particular kind of lead could be added to petrol in order to improve car engine performance. What looked like a good thing in 1921, though, contaminated the soil, poisoned the water and polluted the air. It led to countless premature deaths and harmed the development of just as many children. It wasn't until the 1970s that policymakers began to phase out leaded petrol.

But Thomas Midgley had more ideas up his sleeve. In 1928, he came up with chlorofluorocarbons, or CFCs for short. CFCs could help cool refrigerators, for instance. You might have guessed it: this is the very same stuff that put a hole in the earth's ozone layer. According to historian J. R. McNeill, Midgley "had more impact on the atmosphere than any other single organism in earth's history" – and it was not a positive impact.

Midgley had some help, though. Even back in 1921, people knew that leaded petrol was not very healthy, to put it mildly. At least five workers at the original factory had died; others had fallen ill. Still, light-touch regulators approved Midgley's invention and thus paved the way for much more harm to be done.

This brings us to the often unloved but inevitable twin of innovation: regulation. Let's take a closer look at their relationship.

#### Innovation and regulation – a happy relationship?

Innovators tend to focus on the benefits of their ideas and inventions; and who can blame them? Also, the benefits are often immediate and easy to see, while risks might take years to build up and affect the innovators themselves less than others. Thus, risks are easy to ignore – at first.

Meanwhile, it is the job of regulators to take the long-term view, to focus on risks and potential side effects. They are supposed to try to put in place a set of rules which mitigate relevant risks right from the start. This is easier said than done, though. First, innovation goes hand in hand with uncertainty, and long-term risks are hard to gauge. Second, it requires a certain boldness to point out risks and impose rules while everyone else is still marvelling at the beauty of an innovation. And third, regulators run the risk of inadvertently stifling progress. These are the challenges, but none of them should serve as an excuse for doing nothing.

The important part of the acronym CBDC is not the "D" for "digital". Nowadays, nearly everyone has access to digital payments. Whenever you or I pay using a bank debit card or use a banking app on our mobile phone, the payment is made digitally and often instantly.

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\*This speech was given at Bitkom Digital Finance Conference 2022 at Berlin on 2 June 2022.

\* Joachim Wuermeling, Member of the Executive Board of the Deutsche Bundesbank.

Regulators have to act, of course; they must act decisively and carefully at the same time. Their ultimate goal should be to strike a balance between enabling innovation and protecting society from potential risks.

With a view to digital innovation in the financial sector, this is exactly what we try to do. And we try to do it as carefully and comprehensively as possible. For us, the core principle is "same business, same risks, same rules". We take a close look at all the technologies as they evolve, and we work on rules to mitigate any risks without putting a brake on innovation. In other words, we are risk-oriented and technology-neutral.

Let's take a tour through the engine room of digital innovation and see what is going on before we talk about risks and rules.

## Technology-driven innovation in the financial sector

To cut a long story short: there is a lot going on. Digital innovation is moving very fast, and it spits out a number of tools that quickly find their way into finance. To my mind, the four most important things are:

(1) Cloud computing, which allows banks to outsource data and processes in order to reduce costs;

(2) Artificial intelligence, or AI for short, which helps banks to improve decision-making in general and risk management in particular;

(3) Blockchains, which can improve the speed and efficiency of finance – and, according to some, may open the doors to an entirely new financial system;

(4) Quantum computing, which still seems to be a bit further down the road but could prove to be a game changer for any process that needs computing power.

How will all this change finance? Well, that is anyone's guess, including mine. So I will not make any specific predictions, which would only turn out to be wrong anyway. Instead, let's consider a few scenarios. And to stake out the territory, I will lay out two extreme scenarios. Scenario one: nothing will change. Scenario two: the financial system as we know it will cease to exist. Instead, we will have an entirely new one, built on blockchains and run by artificial intelligence and extremely powerful computers.

I think it is already obvious that the first scenario is not going to happen. Things have already started to change and will not revert back. Likewise, I would rule out the second scenario – at least for as far as I dare look into the future. There are still too many hurdles to be cleared before decentralised finance could become mainstream.

Thus, the future lies somewhere in between these two extreme scenarios. I admit that this does not help very much because there is indeed a lot of space between them. There is a lot of space, and it is by no means certain that every country or even every part of a country's financial system will end up in the same spot.

First, the impact of new technologies depends on how developed the financial sector is. Take Africa as an example. Over there, financial infrastructure was still a bit patchy when digitalisation hit. The result: many African countries still lag behind when it comes to the number of bank branches or ATMs. But when it comes to electronic money, they are far ahead of the curve. New technologies arrived in time to fill gaps and thus quickly took hold. Here in Germany, we do have a well-developed financial sector; thus, there is less room to leapfrog ahead, and there are more well-established structures that innovation needs to clear.

The next question is how traditional institutions deal with new technologies. A few years ago, many observers saw traditional banks as an almost extinct species – the dinosaurs of finance. They reckoned that new, tech-heavy companies would quickly replace banks. As of today, banks are still alive and well. Some of them apply new technologies for their own benefit; others happily

work together with fintech firms. As long as traditional banks manage to adapt, they apparently do have a future.

Third, the impact of digitalisation depends on how policymakers react to it. If they are too lenient when it comes to regulating things, we might see an explosion of new business before it all blows up in a crisis. If they are too strict, innovation might cease and we will stay where we are forever.

To sum up: it is very hard to gauge what the financial sector might look like in the future – that is, two or three decades from now. Nevertheless, I will venture to make three predictions.

First, the value chain of banking will disintegrate further but not entirely. From a technical point of view, it might be possible to atomise it completely. But there is also the economic angle. Bundling activities within a single entity does offer benefits; and while digitalisation might shift the boundaries, it does not render bundling completely irrelevant.

Second, finance will become more efficient. New technologies will help to speed up transactions and lower their costs. They will help to streamline processes and improve how banks interact with their customers. And they might lessen the burden of regulation. We could, for instance, turn regulation into code that computers could read. Banks could integrate this code into their own systems, automate compliance and save quite a bit of money.

Third, the financial system will become more resilient. Just think of how AI can help banks to improve their risk management. At the same time, supervisors can use the very same technologies to spot risks early and mitigate them effectively. At the Bundesbank, we are making intense efforts to integrate these new technologies into our work.

To sum up: I do believe that digital finance can be a success story. But real success is determined over the long run. What looks good today might prove a disaster tomorrow – think of Thomas Midgley's botched inventions. It is the job of regulators to look out for disaster, set up safeguards and thus stop the disaster from happening. So how should we approach this task?

#### Regulating digital finance

First of all, it is quite hard to pin down digitalisation; it's not a single new financial instrument, for instance, or a single new business model we are talking about. We're talking about many new technologies that enable many new business models that push many new players into the market, breaking up the value chain and shifting the boundaries of finance. It's a very broad and diffuse development we are looking at – a development that spans countries and sectors and makes it hard to see the forest for all the trees.

Thus, we might need to adapt the rulebook in some places to cater for all the dimensions of digitalisation. Towards this end, the principle of "same risks, same rules" helps a lot. Any entity that starts to take deposits or grant credit automatically counts as a credit institution and has to follow the relevant rules. It does not matter whether it is a fintech or a bigtech firm or any other new player. And it does not matter which technology is used. Thus, existing rules should be flexible enough to cover at least part of the digital finance landscape.

What makes things a bit tricky, though, is the fact that the value chain of banking is breaking up. As a result, some of its parts might move out of the regulatory perimeter. Think of cloud computing. Cloud providers certainly do not count as credit institutions. Yet, they now are a key part of the value chain and might be a source of risk for banks. Thus, here in Europe, we came up with the Digital Operational Resilience Act, or DORA for short. It is meant to improve banks' resilience vis-à-vis third-party providers. Likewise, here in Germany, we have also strengthened the supervision of outsourcing arrangements.

And then there are entirely new things such as blockchains and crypto assets. As such, they require new rules, which are being written as I speak. At the global level, for instance, we are working on standards for handling crypto assets on banks' balance sheets. At the European level, we are drafting rules to govern providers of crypto-related services and issuers of stablecoins. In Germany, new rules on crypto custody services have already entered into force.

But while we deal with crypto assets, we do not deal with the world they are helping to create: decentralised finance, or DeFi for short. The basic idea of DeFi is to build a financial system based on blockchains and crypto assets, which would render intermediaries such as banks redundant. So far, DeFi is a small and mostly self-referential world. To me, DeFi seems more like a casino for tech-savvy speculators, to be honest. Yet it is growing quickly and so might its ties to the rest of finance and the economy. Thus, we need to be discussing regulatory options now. But then again, whom should we regulate? DeFi is supposed to be decentralised by design. Thus it is not straightforward to determine who should be regulated in the first place. When it comes to DeFi, this question is the elephant in the room.

Yet, there are even bigger elephants in the room that we still need to take care of: bigtech firms. These companies are poised to enter finance big time. They control vast platforms, which allow them to embed finance into commerce, collect huge amounts of data and turn them into money. Bigtech players are the one example where the boundaries of finance are most obviously shifting and no longer overlap with the regulatory perimeter. Thus, we have to better understand what bigtech firms mean for finance and how we can regulate them. So far, it is clear that we need to cooperate across sectors and engage with competition authorities, for instance. Otherwise, we might end up with a patchwork of rules where no two parts fit together properly.

To sum up: regulators are adapting the rulebook to account for digitalisation. We have to be quick, though. Writing new rules takes time, while innovation happens fast. Thus, there is the risk that everything will have changed again by the time we are done. There are two potential fixes to this problem. First, we could take an even more principles-based approach, which would make it easier to cover new products and business models. Second, we can review and potentially adapt our regulation on a regular basis to account for new developments.

## Conclusion

Let us return to Thomas Midgley. In 1940, he fell ill with polio, which left him severely disabled. Just 10 years later, the first vaccines for polio were developed, and today most of us do not have to worry too much about contracting polio. Thomas Midgley and innovation – a tragic couple in every respect.

At the moment, these settlement accounts, shown in the second column of the table, are the only form of CBDC. Only commercial banks have access to them. The debate is whether to widen access to CBDC beyond the current circle of commercial banks.

This is the power of innovation; it can make the world a better place. The financial world is no exception: digitalisation can make the financial system more efficient and more stable. Still, we regulators have to look out for potential new risks and rein them in. This is our job, and we do it in the interest of society and innovators alike.

Digitalisation knows no borders. That is why we have to coordinate across national borders when we design regulation. Personally, I could imagine having a global forum akin to the Basel Committee on Banking Supervision, the BCBS for short, that could set global ground rules for digital innovation – a "digital BCBS".

To sum up: innovation without regulation is not what we should aspire to. After all, most innovators are not keen on seeing their ideas harm other people, and this is exactly what regulators try to prevent. By doing so, they help to increase trust in innovations. So yes, the relationship between innovators and regulators can indeed be a happy one, and it should start early. Regulators should accompany the process of innovation from an early stage instead of trying to catch up with the outcome; they should take a precautionary approach. In finance, this is what we do.

# New Framework for the Digital Economy\*

By TOBIAS ADRIAN\*

It is my pleasure to be with you today for a discussion on the new digital economy and the future of money. My remarks today will focus on the current and future landscape of digital currencies, in particular, central bank digital currencies, or CBDCs, as well as crypto assets including stablecoins.

I will also touch on some of the opportunities that exist for global standards and coordination to narrow some of the current regulatory gaps, so that these new instruments can better support a growing digital economy.

## **The changing nature of money—CBDCs**

Digitalization is changing our understanding of what “money” is and how it operates. On the public-sector side, we now see a movement toward Central Bank Digital Currencies, or “CBDC.”

Currently, only two countries have officially launched CBDCs: the Bahamas and Nigeria. But many more are actively running trials, including China and the countries of the Eastern Caribbean Currency Union. More than 100 countries are exploring the idea. In the United States, the Federal Reserve issued a paper in January on the pros and cons of CBDCs as a first step of a public discussion among stakeholders.

Naturally, approaches differ according to each country’s particular circumstances. Some are still cautiously analyzing the policy motive for issuance, while a few are actively prototyping various options in safe “sandbox” environments or launching live pilot programs.

There is so much interest in CBDCs because they offer so many potential benefits. Just to name a few of these:

- CBDCs could enhance payment systems, making them more cost-effective due to the digital nature; more competitive by disciplining often highly concentrated payment markets; and more resilient with an alternative decentralized platform.
- CBDCs could help increase financial inclusion. Access to payments is often the first step toward greater participation in the financial system, and the digital availability of micro-payment data could lead to access to credit and other financial services for people who currently lack access.
- CBDCs can be used to improve cross-border payments. Currently, these are often slow, costly, opaque, and not easily accessible. By sharing common technical standards and data and compliance requirements, CBDCs could allow for cross-border trading between intermediaries or end-users directly.

Notwithstanding these benefits, it’s important that we recognize likely risks and consider how they can be reduced. Here, I’d like to highlight three in particular:

- Banking-sector disintermediation. If people decide to hold a CBDC in significant volume, it could lead to a compression of bank margins or to an increase in lending rates, resulting in contraction in credit to the economy.
- Reputational risks for central banks. If problems occur—whether it is due to technological glitches, cyber-attacks, or simply human error—it could undermine public faith in the central bank’s operations.
- Macrofinancial risks. With the cross-border use of CBDCs, countries with weak institutions, high inflation, and volatile exchange rates could see an increase in currency substitution (so-called “dollarization”).

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\*This speech was given at IIF Digital Bretton Woods Forum with London Stock Exchange Group.

\* Tobias Adrian, Financial Counsellor and Director of the Monetary and Capital Markets Department, IMF

These risks can be mitigated through appropriate design. For instance, offering a lower interest rate on CBDC holdings, or distributing CBDC through existing financial institutions.

Cooperation among central banks will also be pivotal in building CBDCs with features that help contain spillovers and help facilitate backstops. For example:

- To curb currency substitution, countries could explore the option of limiting transactions and holdings for foreigners. Or, they could allow foreign countries to introduce such limits on their own territory.

- Capital-flow-management measures, which might involve restrictions on certain cross-border transactions, could be built directly into the CBDC specification.

- The programmability of CBDC could also be used to facilitate a more efficient exchange of currencies across borders.

### **Alternative forms of digital assets—cryptoassets including stablecoins**

So where do the private-sector-led innovations of cryptoassets including stablecoins fit in?

Recent years have seen a boom in cryptoassets like Bitcoin. These are privately issued and secured by cryptography—a decentralized asset that allows peer-to-peer transactions without an intermediary like a bank. Since Bitcoin’s launch in 2009, over 14,000 different types of cryptoassets have been issued, holding an estimated market value of US\$2.6 trillion at the end of 2021. They are highly volatile, infrequently accepted, and carry a high transaction cost.

The huge volatility of unbacked crypto has created interest in stablecoins, which attempt to offer price stability by linking their value to a fixed asset such as US dollars or gold. Still, there are many stablecoins with various shades of stability. Unlike unbacked cryptoassets, stablecoins have the potential to become global payments instruments.

Along with CBDCs, both unbacked crypto and stablecoins are eventually likely to come to exist side-by-side on a new continuum, competing with today’s two most common forms of money, namely cash and bank deposits.

Unbacked crypto and stablecoin use is still relatively small, but both are growing rapidly and could soon start having significant implications for the international monetary system.

If they become widely adopted, they could introduce a wide range of concerns. Let me highlight some of these:

- Widespread currency substitution, or what we have called “cryptoization,” could potentially undermine governments’ control of monetary policy and have an impact on domestic financial conditions.

- Capital flow measures could be more easily circumvented and independent exchange-rate regimes could be harder to maintain.

- Capital-flow volatility could increase, as could gross foreign-asset positions, potentially triggering balance-of-payments problems.

- Global stablecoins in their own denomination raise significant new risks, including the lack of available safe assets and a credible safety net.

- Finally, there is risk of fragmentation of payment systems, and of global “digital divide”—stemming from differences in countries’ access to new payment technologies and their capacity to regulate and regulate it.

Such risks underscore why we now need comprehensive international standards that more fully address risks to the financial system from crypto assets, their associated ecosystem, and their related transactions, while allowing for an enabling environment for useful crypto asset products and applications.



### **Closing the regulatory gaps**

How could monetary and regulatory authorities approach different types of crypto including stablecoins to ensure that the international monetary system remains stable and efficient?

Policymakers struggle to monitor risks from this evolving sector, in which many activities are unregulated. In fact, we think these financial stability risks could soon become systemic in some countries.

Crypto's cross-sector and cross-border remit limits the effectiveness of national approaches. Countries are taking very different strategies, and existing laws and regulations may not allow for national approaches that comprehensively cover all elements of these assets. Importantly, many crypto service providers operate across borders, making the task for supervision and enforcement more difficult. Uncoordinated regulatory measures may facilitate potentially destabilizing capital flows.

Let us remember that most of the money that we use today is issued by the private sector—in the form of commercial bank deposits. It is safe, because issuers are very closely supervised; they benefit from government backstops; and they are required to adhere to clear legal and regulatory frameworks.

Those same factors must also hold firm for private issuers of digital money such as certain types of stablecoins. Clear regulations must be enacted so these forms of money fully address risks to financial stability, financial integrity, consumer protection, and market contestability. Clear legal frameworks must be developed to determine whether these stablecoins are (for example) deposits, securities or commodities. More broadly, entities that carry out core functions across the crypto asset ecosystem such as wallets and exchanges should be authorized and licensed. Where regulated institutions like banks are exposed to crypto assets, there should be appropriate prudential treatment of those exposures. Regulation should be globally comprehensive, consistent, and coordinated.

Stablecoins have the potential to change the international monetary and financial system in profound ways. It is important that digital money like CBDC and certain types of stablecoins are designed and provided so that countries maintain control over monetary policy, financial conditions, capital-account openness, and foreign-exchange regimes. The IMF has developed a strategy in order to continue to deliver on its mandate in the digital age. The Fund will work closely with the Financial Stability Board and other members of the international regulatory community to develop an effective regulatory approach to crypto assets.

We're at an exciting moment in the evolution of currencies—and indeed, in the evolution of our very concept of what “money” is, and what benefits “money” should deliver. If we design digital currencies with caution and with precision, and if we frame their adoption within legal and regulatory systems that maximize their benefits and minimize their risks—then we could be on the verge of an era that fulfills the promise of transformation.

## Green Finance

### Interview with Governor Yi Gang on Financial System

#### Supporting Green Transition\*

By YI GANG\*

CGTN: Green transition requires massive capital, and the financial system can play an important role in this process. In recent years, what measures has the PBOC taken to encourage financial institutions to support green transition?

Yi Gang: Central banks can play a very important and positive role in green transition. The international community has reached a consensus about this.

As far as monetary policy is concerned, the first and the most important mandate for central banks is to maintain price stability. Having said that, some central banks still have room to pay attention to structural issues to facilitate green transition, where structural monetary policy could play a role.

To facilitate green transition, the People's Bank of China has done a lot. The People's Bank of China included high-quality green bonds and loans as qualified collateral to the Medium-term Lending Facility in 2018. Last year, we launched two new monetary policy instruments, namely carbon emission reduction facility and special central bank lending facility for green and efficient use of coal, both of which provide funds to qualified commercial banks at a low interest rate of 1.75%.

As of the end of May, the People's Bank of China has provided over 210 billion yuan through the two facilities to financial institutions, which reduced emission by over 60 million metric tonnes of carbon dioxide equivalents, accounting for about 0.6% of China's annual carbon emission.

Moreover, the People's Bank of China issued Green Finance Evaluation Guidance in May 2021, incorporating green loans and green bonds into financial institutions' performance rating, providing the right incentives.

These incentives have helped accelerate green financing. As of March 2022, outstanding green loans in China exceeded 18 trillion yuan, posting a rapid increase. Outstanding green bonds reached about 1.3 trillion yuan, one of the largest in the world.

In conclusion, central banks can do something to help in green transition. It is important to make the whole society aware of the benefits of green transition.

CGTN: What has the PBOC done to improve climate information disclosure and prevent fake reporting? What are some achievements?

Yi Gang: This is very important. The disclosure is important and key issue in green transition. For fair and efficient implementation of green monetary policy tools, we should guard against different kinds of moral hazards, such as green-washing, low-cost fund arbitrage, and green project

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\* Recently, Governor Yi Gang of the People's Bank of China (PBOC) was interviewed by China Global Television Network (CGTN) on issues related to mobilizing the financial system to support green transition, climate information disclosure, international cooperation in green finance and monetary policy.

\* Yi Gang, Governor of the People's Bank of China.

fraud. Therefore, information disclosure and strict supervision are needed when we design and implement green monetary policy tools. For example, the carbon emission reduction facility requires banks to disclose information on their websites on a quarterly basis about loan amount, interest rate, number of supported projects, and especially, quantity of carbon reduction. The People's Bank of China will verify the information together with other ministries and independent third-party institutions. It is also important for the general public to know this and help to watch.

To promote better management of climate risk, the People's Bank of China conducted the first climate risk stress testing last year, where the biggest challenge was insufficient information disclosure.

To promote climate information disclosure, the PBOC released the Guideline on Environmental Information Disclosure for Financial Institutions last year, defining requirements on the form, frequency, qualitative and quantitative information of the disclosure, and has guided over 200 financial institutions to prepare environmental information disclosure reports, including procedures to identify and assess, manage and control environmental risks, issuance of green loans and reduced emissions, as verified by third-party agencies. Going forward, we plan to expand the pilot program nationwide.

CGTN: The PBOC has been actively advancing international cooperation in green finance through multilateral and bilateral platforms. What role has the PBOC played in developing global green finance?

Yi Gang: At the global level, the People's Bank of China has worked with all parties to mobilize social capital to address climate change.

First, China co-chaired the G20 Sustainable Finance Working Group. Last year, the G20 resumed the Sustainable Finance Working Group, co-chaired by the People's Bank of China and the US Treasury. The working group has completed the G20 Sustainable Finance Roadmap as an important global guidance for mobilizing social capital to address climate change. This year, our priority is to develop the framework for transition finance, to guide social capital to support low-carbon transition of high-emission sectors.

Second, we have made progress in harmonizing taxonomies with our European counterparts. The People's Bank of China and the European Commission have been comparing green finance taxonomies since 2020. In November last year, we published the Common Ground Taxonomy, proposing 55 mutually recognized economic activities that could mitigate climate change. We have just upgraded the Common Ground Taxonomy on June 3rd this year, adding another 17 economic activities. The groundbreaking work could facilitate cross border green capital flows. To date, the China Construction Bank and the Industrial Bank have issued green bonds under Common Ground Taxonomy. Some emerging market economies also refer to this taxonomy.

Third, we have leveraged green finance to build a green "Belt and Road". In 2019, the People's Bank of China offered guidance in launching the Green Investment Principles (GIP) for the Belt and Road, outlining seven principles for green investment. As of May 2022, the GIP membership have expanded to 41 signatories and 14 supporters.

The People's Bank of China is also working with the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), the FSB and the BCBS on various fronts, including regulatory standards for green finance.

Going forward, the PBOC will continue to strengthen international cooperation on green finance through multilateral and bilateral platforms to create an enabling environment for China to achieve the target of carbon peaking and neutrality.

CGTN: The Chinese economy has been facing some downward pressures, and the RMB exchange rate has depreciated recently. What is the current stance of China's monetary policy and how would it support economic recovery?

Yi Gang: China's monetary policy is accommodative in supporting the real economy. Growth of broad money M2 and total social finance is in line with the nominal GDP growth rate, and

provide ample liquidity and support to small- and medium-sized enterprises with the purpose of maximizing employment.

The market interest rate has been stable and trending downward in the past 10 years. The natural interest rate is mainly determined by the marginal productivity of capital and long-term demographic trend.

In China, interest rates are determined by market supply and demand, and the central bank guides market interest rates with monetary policy instruments. Currently, the time deposit rate is 1-2%, and bank loan rate is about 4-5%, and the bond market and the equity market function well. After taking into account of inflation, you can see the real interest rate is pretty low. The financial market makes an efficient allocation of resources.

We have a flexible and market-determined exchange rate system using a basket of currencies as reference. Compared to 20 years ago, RMB has appreciated against the USD by 25%, and appreciated against a basket of currencies by about 30% in nominal terms. The appreciation in real terms is even more.

Inflation outlook is stable in China. Right now, consumer price index is 2.1% and producer price index is about 6.4% on the year-on-year basis. Maintaining price stability and maximizing employment are our high priorities.

This year, we face some downward pressures of growth due to COVID-19 and external shocks, and the monetary policy will continue to be accommodative to support economic recovery in aggregate sense. At the same time, we also emphasize structural policies such as supporting small- and medium-sized enterprises and green transition.

# Propelling a Graceful Transition: The Role of the Financial System<sup>\*</sup>

By KLAAS KNOT<sup>\*</sup>

It is a pleasure to be here today – appropriately on screen and not on-site, thus leaving a smaller carbon footprint.

The offices of De Nederlandsche Bank, where I usually work, have a view over the Amstel River. When looking out of my window, I regularly see swans on the river.

It has a calming effect on me - seeing them gliding on the glittering water. They make it all look so effortless, graceful, smooth. There never seems to be anything urgent about their movements. But, such grace above the water conceals the effort of their feet just below the surface.

This conference is about the role of finance in the transition to net-zero. Similar to the effort required for the swans to propel themselves, if the financial system is to play its part in a smooth and graceful transition, swift action is required. Climate risk must be incorporated into all financial decisions. This is a goal which will require significant changes to business practices and to policy.

I want to join others at this conference in stressing the increasing urgency of such action. And I want to underscore the role that the FSB will play in supporting it.

Russia's invasion of Ukraine has demonstrated the reality of transition risk, and its relevance even over a short time horizon. It has triggered an intense debate about governments' current and future energy policies, as it has profoundly changed the global economic and financial market backdrop. Public authorities are still overcoming residual challenges of the pandemic and are now faced with rising commodity prices and inflation. Unsurprisingly, this has created pressure to deprioritize energy transition plans. In some cases, public and private-sector players are taking actions that are inconsistent with their stated net-zero ambitions. The gap between commitment and action is growing ever wider.

At the same time, risks from climate change keep rising. In February, the Intergovernmental Panel on Climate Change (IPCC) published its Sixth Assessment Report. It paints an alarming picture of the physical risks of climate change. The report warns of more frequent and intense extreme weather and climate events. It warns of unavoidable climate hazards over the next two decades even with global warming of the targeted 1.5 degrees. The consequences of exceeding that target are even more dire.

Together, these developments should reinforce, rather than deflect from international sustainability ambitions.

As I mentioned at the start, the financial sector must play its part, both to help meet net zero targets and to manage the financial risks from climate change. The two goals are closely connected. If the transition to a low carbon economy is delayed or disorderly, the global economy and financial system will face significant risks. This was the conclusion of recent climate scenario analysis and stress tests conducted by financial authorities across various jurisdictions. By further deepening our understanding of these financial risks, we can not only protect the financial system, but help to give greater impetus to a timely and orderly transition. The FSB Roadmap for addressing climate-related financial risks has been developed to coordinate ambitious actions to assess and address these risks.

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<sup>\*</sup>This speech was given at the Green Swan Conference.

<sup>\*</sup> Klaas Knot, Chair, Financial Stability Board and President, De Nederlandsche Bank.

Since the launch of the roadmap in July last year, progress has been made across all four of its building blocks: disclosures, data, vulnerabilities analysis, and regulatory and supervisory practices and tools. Allow me to briefly elaborate on these four building blocks, stressing their interdependencies.

Let me start with disclosures. Work to strengthen the quality and consistency of climate-related financial disclosures has been moving forward rapidly. The International Sustainability Standards Board (ISSB) has made very encouraging progress, building on the Task Force on Climate-Related Financial Disclosures' (TCFD) Recommendations. The ISSB's two exposure drafts set out baseline standards for both general sustainability-related, and more specific climate-related disclosures. This marks a key milestone in the move towards establishing globally consistent, comparable and decision-useful disclosures. The ISSB is taking a building-block approach. This allows countries to use its common global baseline – and also be able to build on that baseline to develop national approaches to suit individual circumstances and priorities. This will provide jurisdictions with the flexibility to be more ambitious and go further or faster if they wish. At the same time, the common baseline will allow interoperability of approaches.

Disclosures are important for investors' financial decision-making but have wider importance too. They will provide necessary information on the progress being made by firms towards the transition, which is important to investors, but also to a wider set of stakeholders. Such disclosures must provide the information needed to assess the credibility of private sector commitment and action.

The second building block is data. Firm-level disclosures are essential, but are not the only data we need. We also need macro-level data to help us determine which sectors of the economy are most at risk. We need government data. For example, on the policy plans to curb emissions and their effects. We need data on underlying climate risks, for instance on the frequency and severity of extreme weather events. Finally, to fully understand the systemic perspective, we will also need data to assess the degree to which climate-related risks might be transferred, amplified or mitigated by different financial sectors.

Such data provide the raw material for the third building block of the FSB roadmap – vulnerabilities analysis.

To examine vulnerabilities from a long-term, forward-looking perspective, it is critical to further develop scenario analysis, making use of the common NGFS climate scenarios. At the same time, we need to devise simpler indicators that can help identify the build-up of vulnerabilities. This is a key part of the FSB's work on integrating climate-related risks into its broader financial stability surveillance framework.

Improving our vulnerabilities analysis, in turn, forms the basis for the final block of our roadmap – regulatory and supervisory practices and tools. Sectoral standard-setters are doing important work already, by developing tools in their individual sectors. The FSB's contribution is to help bind this work together by promoting consistency and effectiveness of approaches across sectors and countries. In April, we issued a consultation report on Supervisory and regulatory approaches to climate-related risks. This report takes a cross-sector, cross-border perspective.

It sets out high level recommendations on regulatory and supervisory data. Here the ISSB's firm-level disclosures provide a good starting point that provide the basis that supervisors and regulators can build upon for the development of standardized regulatory reporting requirements. A concern we often hear from financial institutions – with good reason I would say – is to ask authorities in different jurisdictions to standardise reporting where possible. As we put in place these new reporting requirements, we have an opportunity to ensure that they are well standardised from the start. Let's take this opportunity.

Scenario analyses are currently one of the most effective supervisory tools. They promote a more sophisticated understanding of risks by financial institutions, and how these risks connect

with transition scenarios. Our consultation report encourages the expanded use of climate scenario analysis and stress tests to incorporate system-wide aspects of climate-related risks such as indirect exposures, risk transfers, spillovers and feedback loops.

Our report also introduces some early thoughts on the use of macroprudential tools, which is still at a nascent stage. It highlights the early work of jurisdictions to develop macroprudential approaches and calls for further research to be undertaken to assist as we continue our journey to develop our macroprudential policy toolbox.

Our public consultation closes at the end of June, and we would welcome your feedback by then. The final report will be published in October.

It is almost a year now since we published our roadmap with its wide-ranging set of actions. To be more precise, coordinated actions by both public and private-sector players, to address climate-related financial risks. To emphasise that point: the roadmap is deliberately designed as a joint endeavour. We need to combine our efforts for an efficient and comprehensive response to climate risk in the financial system.

The FSB's upcoming progress report, which will be submitted to the G20 in July, will provide a stocktake of how far we have come and what the next steps should be.

Let me wrap up.

The swans I see on the Amstel River, the ones that have a calming, mesmerizing effect on me are, of course, not the green swans this conference refers to. Nevertheless, they have some important commonalities.

The gracefulness of a swan obscures what happens beneath the water's surface. It conceals what it takes to propel action. It makes the hard look easy.

In the same way, a graceful climate transition requires urgent action under the surface. As policy makers, we must ensure that the move to net zero is underpinned by a resilient financial system. One which can manage the challenges associated with climate change. And one which can propel the green transition forward. Members of the public may only see the outcome of such propulsion, just as I only see the swan above the surface. But, those who regulate, and operate within, the financial system know that the status quo will not suffice. Significant work is required. I look forward to doing that work together, so that we can make the graceful transition a reality.

## **Climate Finance and Financial Stability: Some Areas for**

### **Further Work\***

*By* TOBIAS ADRIAN\*

Climate change has become an utmost priority. While it has several dimensions, our focus today is on those aspects of climate change that could disrupt macroeconomic and financial stability.

Recent global stress episodes remind us of the importance of crisis preparedness and resilience building. The COVID-19 crisis demonstrated how "tail events" can cause extensive disruption of economic activity. And the repercussions of the war in Ukraine have made evident the urgency to cut dependency on carbon-intensive energy and accelerate the transition to renewables.

Tackling climate change is critical to ensuring a healthy planet, but it also makes good economic sense. Studies have shown that the social gains far outweigh the costs of climate financing. There is now a sizeable and growing body of literature providing quantitative estimates on the "social cost of carbon." This measures the incremental harm from climate change caused by additional carbon emissions. And evidence now shows that avoiding emissions and moving to renewables would result in significant social benefits and an overall net gain for society.

Potential risks to energy transition could amplify risks to the financial system. Risks to energy transition could arise if the perception of the trade-off between energy security and transition changes rapidly and net-zero transition becomes costly, complex, and disorderly. Given Russia's large share in global commodity production beyond oil and gas, commodity prices, including those used as raw materials for renewables—such as aluminum, copper, and nickel—have risen sharply. The energy-related repercussions from the war in Ukraine may also alter the speed of phasing out fossil fuel subsidies in emerging markets and developing economies.

A delayed or disorderly climate transition could magnify the risks to the financial system. Therefore, at the IMF, we have prioritized gaining a more holistic understanding of the implications of climate change for the global financial system and financial stability.

Let me lay out seven areas of climate finance and financial stability that needs more vigorous attention by central banks and financial regulators. I hope these will help in the policy dialogue over the next two days.

First, policymakers need advice on climate-related macro-financial policies. These policies have a crucial role to play because of two main factors. The first is the magnitude and global nature of the potential economic and financial stability risks. The second is the strong positive relationship between climate protection on the one hand and macroeconomic performance and financial stability on the other.

Last year, we published a climate strategy that recognized a more systematic and strategic integration of climate change into the IMF's activities. Growing demand from our member countries to assess macroeconomic and financial implications of climate change demonstrated the need to step up our climate-related work. Our bilateral and multilateral surveillance is giving more significant focus to climate-related issues, and we are increasing climate-related capacity development.

Second is the urgent need for structural reforms to minimize the impact of climate change on the financial system. One of the reasons this has been stalled in the developing markets is the lack

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\* Opening remarks at the IMF Policy Dialogue on Climate-Related Financial Risks and Green Finance in Asia and the Pacific

\* Tobias Adrian, Financial Counsellor and Director of the Monetary and Capital Markets Department, IMF



of proper financing to affect structural changes. The IMF is stepping up to help provide affordable financing to support countries in tackling structural challenges, including climate change. The new Resilience and Sustainability Trust, approved recently by the IMF Executive Board, will channel SDRs and address these macro-critical longer-term challenges that pose significant macroeconomic risks to member countries. But more is needed in this area.

Third, central banks and financial regulators must systematically integrate climate risk assessments into their financial stability frameworks. When climate risks are deemed material and systemic importance exists, special attention will be needed to ensure the evaluation of how climate risks amplify and transmit risks to the financial sector.

The fourth relates to the regulation and supervision of climate-related financial risks. Preserving financial stability is the core mandate of financial supervisory authorities, who should therefore ensure that climate-related risks are adequately captured in their supervisory processes. Where these risks are assessed as being material and likely to threaten financial stability, supervisors should then be able to intervene early. We are all learning by doing but building capacity in this area is important.

The fifth relates to central banks' mandates and balance sheets. Thanks to the NGFS, a lot of good technical work is coming about, but, again, more analytical work is required to assess the impact of climate change on central bank operations, governance framework, policy-setting framework, and financial stability. We need to evaluate—within the mandate of central banks—how environmental sustainability objectives should influence central bank operations and the use of monetary policy tools, and to integrate sustainability considerations into central banks' balance sheets.

The sixth issue relates to the strengthening of climate information architecture. Assessing climate risks, allowing accurate market pricing, and enabling informed investment decisions require a robust information architecture around climate risks. The information architecture consists of three components: first, reliable and high-quality data; second, a harmonized and consistent set of climate disclosure standards; and third, principles to align investments to sustainability goals. Implementing a global climate information architecture may also serve as the foundation to develop sustainable finance markets in emerging and developing economies. In this regard, current standard-setting work should fully take into consideration the difficulties in data collection in emerging markets, while ensuring that company-level disclosures are mainstreamed across these economies. We have Ravi Menon, Sarah Breedon, and Fabio Natalucci, who are taking forward—via the NGFS—the work on improving climate architecture.

The seventh and final area that needs action is ways to mobilize both public and private finance, while keeping the balance with other economic needs of the country. We need to understand the potential avenues to scale up private financing to mitigate climate risks, which is required to develop sustainable finance markets. Access to finance continues to be a barrier in many economies. In some economies, climate finance flows need to increase by 4 to 8 times until 2030, according to the latest estimates from the Intergovernmental Panel on Climate Change.

Momentum is continuing to build on climate financing and other initiatives, but we need to act now to ensure the necessary frameworks are in place in the years ahead. As the Managing Director mentioned in her welcome remarks, carbon pricing should be at the center of efforts to reduce emissions. Everyone must play a role in scaling up work and effort on climate-related financial stability and climate finance.

Through this regional policy dialogue, I sincerely hope that we will benefit from a frank exchange of challenges countries face and what must be assigned as our collective immediate vs. medium-term priorities.

## High Inflation Challenges Central Banks' Green Push\*

By MIROSLAV SINGER\*

Some risks of fighting the last war are less obvious than others. Such risks do not only consist of actions, but the tools considered. The willingness of European Central Bank President Christine Lagarde to consider using institutional lending facilities to encourage the transition to a carbon neutral economy may exemplify that. Lagarde has commented about the possibility of a 'green' discount rate, 50 basis points lower than the standard, at the Green Swan Conference hosted by the Bank for International Settlements on 1 June. 'I know it's not squarely in the mandate and it is not necessarily what we consider as the prime objective, but you know, if we don't try, then we have no chance of succeeding. So, count on me.'

Green lending to larger companies will be powered by environmental finance rules that have been rolled out by European Union regulators already. If such programmes, propelled by cheap green goal-oriented facilities provided to commercial banks by central banks, are to have greater value, they should be focused primarily on small- and medium-sized enterprises.

SMEs find it relatively more difficult to comply with regulations and rules, including green ones, as well as to secure lending in general. The marginal benefit of an ECB programme would be clearly greater if it was aimed towards them.

Designers of cheaper green lending programmes may find it worthwhile to consider examples of similar facilities aimed primarily at SMEs. There are two European examples, though they are managed by central banks not in the euro area.

Both the Bank of England and Magyar Nemzeti Bank have been running such programmes. Both have been motivated by acknowledging that in times of financial stress, different segments of the financial market fragment and transmission mechanisms work imperfectly. Simple rate cuts may not work efficiently to take care of the needs of all borrowers, particularly SMEs. Both the BoE and MNB have gathered a wealth of experience with these programmes. Both are also leaders of green transition thinking.

The flexibility of a potential ECB programme, perhaps named the Green Climate Assistance, Security and Help Facility (or Green Cash for short), would ensure additional capacity to access liquidity for green goods and services provided by SMEs. Such a programme is a natural extension of central banks using monetary policy to fight climate change.

However, a problem persists. We are no longer living with deflationary risks. With inflation in the euro area at multiples of the target, central banks need to manage inflation with firm and credible control, as well as the inflationary expectations of economic agents and corporations. The consequences of additional lending in times of hot demand and temporarily constrained supply chains are inflationary.

Some observers may find additional lending programmes, including green ones, not so much outside of the mandates of central banks, as squarely running contrary to them. There is a clear need to give thorough consideration to that in our current time of inflationary risks.

Central bankers have demonstrated in the past that they can tame inflation. Doing so while attempting to ease the transition to a net zero economy is more challenging.

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\* This article first appeared on OMFIF Commentary on June 14, 2022.

\* Miroslav Singer is Director of Institutional Affairs and Chief Economist at Generali Group and former Governor of the Czech National Bank.

# Working Paper

## Openness, Rural-Urban Inequality, and Happiness in China<sup>\*</sup>

By MA YONG AND CHEN DIANDIAN<sup>\*</sup>

**Abstract:** *Although the relationship between income inequality and subjective wellbeing has been extensively discussed in the literature, relatively little is known about the effects of openness on subjective wellbeing and how rural-urban inequality may influence these effects. This article attempts to address this issue by using the dataset of China General Social Survey (CGSS). We find that the effect of trade openness on happiness is inverted U-shaped, whereas that of financial openness is U-shaped. We also find that rural-urban inequality exerts a dampening effect on happiness, and this effect is strengthened by trade openness but weakened by financial openness. These findings extend the previous studies on the determinants of happiness by highlighting the different effects associated with trade openness and financial openness and how such effects may interact with rural-urban inequality.*

JEL Classification: I31, O15, D63

**Keywords:** Rural-Urban Inequality; Trade Openness; Financial Openness; Happiness

### 1. Introduction

Since the end of World War II, globalization is arguably one of the most prominent trends across the world. In this backdrop, Asian countries have adopted economic and financial opening policies to promote economic growth and people's welfare. Theoretically, the welfare effect of trade opening lies in that increased imports help to alleviate income inequality. Researchers find that tradable commodities account for a high proportion of low-income household expenditures. The implementation of trade opening has lowered the prices of these commodities, thereby reducing the expenditures and increasing the welfare of low-income families (Carroll and Hur, 2020). Also, trade opening increased employment opportunities in the export sector, resulting in the rise of labor force participation rates (Madanizadeh and Pilvar, 2019).

As for the welfare effects associated with financial opening, there are studies arguing that backward areas can narrow urban-rural income gap by making use of FDI to develop tourism and other characteristic industries for poverty alleviation (Kim and Kang, 2020). It also generates welfare gains in the sense that advanced technologies brought by foreign investments would have spillover effects, fostering the economic development of developing countries (Ma et al., 2019). Moreover, opening domestic trade and financial markets can enrich the choices of commodities and lifestyles as cross-border flows of goods, services, and finance become increasingly

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convenient. All these improvements in economic freedom and efficiency would contribute to improving individual welfare (Rahman and Veenhoven, 2018).

From an empirical perspective, there are evidences showing that openness has a positive effect on subjective wellbeing. For example, Khun et al. (2015) find that people in countries with less trade restrictions report higher degrees of life satisfaction. Tsai (2009) provides evidence that subjective wellbeing improves during the transition from a closed economy to an open one. However, there are also studies suggesting that openness may not necessarily enhance happiness. For example, despite overwhelming studies arguing that openness promotes economic growth (e.g., Chang et al., 2009; Darku and Yeboah, 2018), it remains largely inconclusive whether economic growth would enhance people's subjective wellbeing. According to the classic Easterlin paradox, although economic growth and increased income can boost up happiness to some extent, the effects typically dilute across nations and periods (Easterlin, 1974). As documented by Bartolini and Sarracino (2015), in the ten years around 2000, despite substantial growth in the economy, China reports a decline in subjective wellbeing. Such frustration is contrary to the intuition that increased absolute income would bring happiness. In this regard, the so-called "China puzzle" is supportive of the Easterlin paradox. To account for the "China puzzle", Knight et al. (2009) turn to focus on the role of income inequality instead of absolute income and propose that relative deprivation caused by income gap, rather than poverty, capture the variations of happiness within a country.

In fact, the effects of openness on poverty and inequality are highly controversial. Opening policies that lower consumer and investment tariffs would produce a redistributive effect of income (Turnovsky and Rojas-Vallejos, 2018), which will aggravate job polarization (Lee, 2020). In particular, financial openness usually leads to reductions in costs of financing activities, from which the upper-income group would actually gain more benefits (Erauskin and Turnovsky, 2019). This is because financing activities such as overseas investment and borrowing are more connected to the life of the rich people. Nonetheless, meta-analysis indicates that the previous literature generally supports a small negative correlation between financial openness and income inequality (Ni and Liu, 2019).

In recent years, the explosive growth of data has enriched the studies on Chinese happiness. For example, Wen et al. (2019) notice that in the family of the rural-to-urban migrant workers, grandparents have to raise grandchildren in rural areas. They investigated whether living in such a skipped-generation family dampens the happiness of the elder people and provided inconclusive evidences. Morgan and Wang (2018) use a modified Oaxaca decomposition method and find that improving labor market conditions are the main contributor to life satisfactions of the urban Chinese over the period of 2002-2012. In the study of Han and Gao (2019), participation in welfare programs such as the lowest insurance in rural areas can improve the life satisfaction of recipients. Other determinants of subjective wellbeing in China include quality of government, distributive justice beliefs as well as societal values (Huang, 2019; Lim et al., 2020; Liu et al., 2020)

It is worth noting that, despite the vast literature on happiness, very little is known about how openness may affect happiness, because the opening policy is typically not regarded as a direct cause of happiness traditionally. However, as China is more deeply integrated into globalization, the Chinese people become wealthier, and materialism gets popular (Bartolini and Sarracino, 2015). In this backdrop, the economic results of the opening policy tend to play an important role in determining happiness. Moreover, it is observed that the incomes of different social classes are widely divided in the process of economic development, which suggests that the "inequality channel" is very likely to exist. Taken together, as openness can affect happiness through both the wealth channel and the inequality channel, how these two channels may interact with others becomes an interesting question that needs to be studied.

Another issue that is not adequately addressed in the previous literature is the distinction between different dimensions of openness and its implications for the openness-happiness nexus. Recent studies suggest that economic (trade) openness and financial openness may have different effects on the economy and society. For example, economic (trade) openness can stimulate the massive production of domestic products and thereby promote economic growth (Ma et al., 2014), especially in developing countries (Semančíková, 2016; Tahir and Azid, 2015). But this conclusion does not necessarily hold for the effects of financial openness. Indeed, financial openness is found to be associated with higher financial risks (Ashraf, 2017), which are harmful to financial development and may result in a negative impact on economic growth (Bremus and Buch, 2016; Guillen, 2016). In this regard, another focus of this paper is to investigate the potentially different effects that are associated with different dimensions of openness. To be specific, we distinguish between two important aspects of openness (i.e., economic openness and financial openness) in this paper and discuss the potential differences that exist in their relationships with happiness.

To sum up, although there is an extensive literature on the various determinants of people's subjective wellbeing, little is known about how financial and trade openness may affect people's subjective wellbeing. In this paper, we attempt to address this inadequacy, although tentatively, using data from a national survey in China. We find interesting and enlightening results, which are not well understood in the previous literature and will be discussed in detail in the main text. Also, to the best of our knowledge, this is the first paper to study how financial and trade openness may affect people's subjective wellbeing in China. Therefore, the analysis of the paper also complements the emerging literature on the various determinants of subjective wellbeing in China.

The rest of the paper is organized as follows. Section 2 presents the data and methodology. Section 3 reports baseline empirical results and discusses their implications. Section 4 extends the analysis by examining cohort differences. Section 5 concludes the paper.

## 2. Data and Empirical Strategy

### 2.1 Data and variables

The raw data in this paper are collected from multiple data sources. The dataset of China General Social Survey (CGSS) is used as the source of individual information. Starting in 2003, CGSS is conducted annually (or bi-annually) by Renmin University of China and Hong Kong University of Science and Technology, and has been widely used in many fields of social studies. In order to maintain consistency, we use the last four waves of the CGSS data (because the sampling approach for the previous waves of the survey is different). We then obtain a sample of 51,574 respondents aged over 17 years, from 31 provinces (Hong Kong, Macao and Taiwan are not included due to data availability). The proportion of urban and rural samples is approximately 6:4. After dropping 6843 missing values, the final sample for empirical analysis has 44,731 observations. Table 1 presents the year-wise sample distribution. To ensure that there is no bias from abandoned observations, Table 2 exhibits the distributions of happiness. Trivial statistical differences exist between the full sample and the final sample, indicating little danger from sample bias.

**Table 1** Year-wise sample distribution

Year	2010	2011	2012	2013	2015	Total
Number of respondents	10,216	4,871	10,250	9,734	9,660	44,731
Average happiness	3.77	3.91	3.83	3.77	3.88	3.82

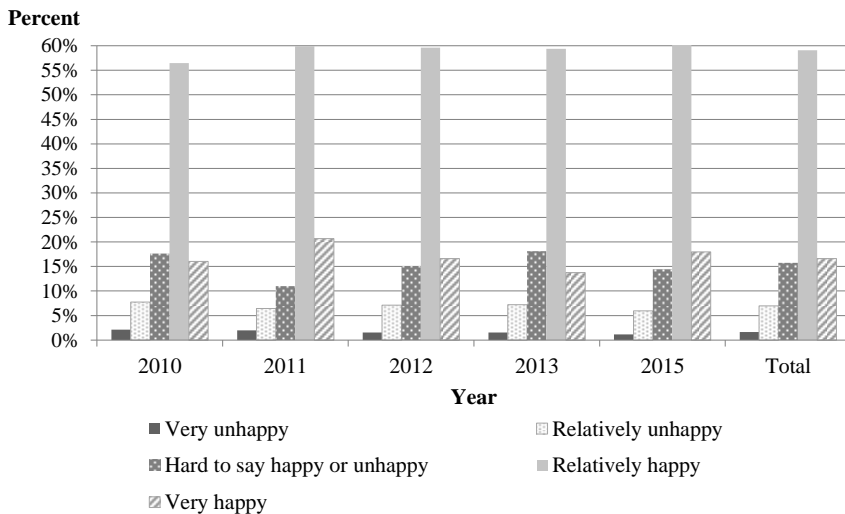
**Table 2** Distribution of happiness in the full sample and the final sample

Happiness	Full sample		Final sample	
	Frequency	Percent (%)	Frequency	Percent (%)
Very unhappy	857	1.66	728	1.63
Relatively unhappy	3,677	7.13	3,108	6.95
Neither unhappy nor happy	8,322	16.14	7,039	15.74
Relatively happy	30,158	58.48	26,429	59.08
Very happy	8,424	16.33	7,427	16.60
Missing	136	0.26	-	-
Total	51,574	100	44,731	100

The data for provincial variables, including GDP, per capita disposable income, export, import and foreign direct investment (FDI), which are used to construct proxy variables for trade openness, financial openness, and rural-urban inequality, are obtained from the National Bureau Statistics of China and Provincial Statistical Yearbooks. Data for the various regional control variables such as CPI, industrial production, and government expenditure are also extracted from the same source.

*2.1.1 Measure of happiness*

In line with the previous studies, happiness in this paper is measured by interviewees’ answers to the following multiple-choice question: “Generally speaking, how do you think about your life?” Except for cases of inapplicability, inability to answer and refusal to answer, options are set in a Likert-scale type, i.e., “very unhappy”, “relatively unhappy”, “neither unhappy nor happy”, “relatively happy” and “very happy”. For our analysis, we code the responses from 1 to 5 in order, where 1 represents “very unhappy” and 5 stands for “very happy”. As suggested by Ferrer-i-Carbonell and Ramos (2014), this measure of subjective wellbeing is of the most common usage and of sufficient reliability. The average happiness of interviewees in the final sample scores 3.821 out of 5, situated between “neither unhappy nor happy” and “relatively happy”. Figure 1 displays the year-wise sample distribution of happiness of the final sample in percentage. The distribution shows a consistent pattern with the previous literature (e.g., Jiang et al., 2012; Knight and Guantilaka, 2010), which further confirms the validity of data.



**Fig. 1** Distribution of happiness in China: 2010-2015

### *2.1.2 Measures of openness and rural-urban Inequality*

The core explanatory variables used in this paper include openness and inequality as well as their square terms and interaction terms. The square terms are included to investigate the potential non-linear relationships while the interaction terms are included to examine whether there are strengthening or weakening effects of openness on inequality.

As explained earlier, in order to detect the potentially different effects associated with different dimensions of openness, we use two measures of openness: trade openness and financial openness. Consistent with prior literature (e.g., Zhang et al., 2015), we measure trade openness (TO) by calculating the total trade volume of import and export as a fraction of GDP in the region<sup>1</sup>. In order to measure financial openness (FO) more accurately, several measures are considered here. Lane and Milesi-Ferretti (2007) recommend using the de facto measure, which defines financial openness as a fraction of total capital flow to GDP. Alternatively, Chinn and Ito (2006) propose the de jure measure, which quantifies financial openness as a dummy indicating limitations on cross-border financial activities. Although the de jure measure has a solid theoretical basis, the de facto measure has a better econometric property. To avoid endogeneity, and also because of data availability, we use the de facto measure, i.e., financial openness in this paper is measured by the proportion of foreign direct investment (FDI) in GDP for each region.

Besides methodology and data issues, a political issue on the measure is whether provincial governments in China are authorized to make regional trade and financial policies. Generally, foreign trade and investment policies are formulated by the central government in China. Nonetheless, local governments still have certain administrative powers in deciding trade and financial opening policies. For example, local governments may, in respective of the actual situations in the region, draft local laws and regulations, and organize their implementation. In deciding openness, local governments are responsible for the management of licenses and quotas for import and export commodities, as well as approvals (with limited authorities) and filings for the establishment of foreign-invested enterprises. Furthermore, supporting measures for funds and services, such as loans to foreign-invested enterprises, environmental standards for production, and convenience of export rebates, are all under local jurisdiction. Hence, local governments can influence the degree of openness by changing regional policies as well as the related administrative procedures. For example, in response to the economic impact of COVID-19, the Shanghai Municipal Commission of Commerce issued 11 policies to support foreign trade, including the exemption of tariffs for epidemic prevention and control materials, reduction of guarantee fees for financing, among other measures.

Following the literature on income inequality (e.g., Lu and Chen, 2006; Morgan and Wang, 2018), we adopt the income ratio of urban residents to that of rural residents as the measure of rural-urban inequality. The ratio is calculated as the per capita disposable income of urban residents divided by the per capita disposable income of rural residents. According to the location where the respondents dwelled, we group individuals within the same province to generate the inequality indicators. Due to data availability, we employ indicators estimated at the provincial level rather than at a lower level. Alternative measures will be discussed in the robustness analysis. As mentioned earlier, we also include the interaction terms between measures of inequality and openness to investigate whether there is a channel that openness can have an additional impact on the effect of inequality on happiness.

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<sup>1</sup> Dollar-denominated foreign trade volumes and foreign direct investment amounts are converted into Renminbi at the prevailing exchange rate that year.

2.1.3 Other control variables

Besides the main variables of interest mentioned above, in line with the previous literature (e.g., Han and Gao, 2019; Huang, 2019; Morgan and Wang, 2018; Tran et al., 2018; Wen et al., 2019; Yang et al., 2019; Zhang and Churchill, 2020), we also include a set of individual characteristics that may affect happiness. Specifically, we control for age, income level, gender, ethnicity, education, political status, religious belief, marital status, health, and social status in our regressions. In addition, it is worth noting that the measure of openness might be biased by other provincial variables. For instance, higher trade to GDP ratio may be due to that some Chinese provinces are industrial hubs. If so, the cross-province comparison would be misleading. There is also a possibility that average area-level income helps mitigate the negative relationship between inequality and subjective welfare (Tran et al., 2018). To address these concerns, we also control for various province-level variables, including GDP per capita, provincial GDP as a percentage of total national GDP, industrial production, CPI, and government expenditure. Year dummies are included in regressions to capture time effects. Detailed definitions of the variables are presented in Table 3. Table 4 reports descriptive statistics of the data.

**Table 3** Definitions of variables

Variable	Description
<i>Happiness</i>	Self-reported happiness level. Very happy=5; relatively happy=4; neither unhappy nor happy=3; relatively unhappy=2; very unhappy=1
<i>Trade openness</i>	Total volume of foreign trade in the province/Provincial GDP
<i>Financial openness</i>	Foreign direct investment (FDI) in the province/Provincial GDP (in %)
<i>Inequality</i>	Per capita disposable income of urban residents/per capita disposable income of rural residents in the province where the respondent is interviewed
<i>Age</i>	Age of the respondent (in years)
<i>Income</i>	Natural logarithm of the respondent's household income in the previous year of being investigated
<i>Gender</i>	Gender of the respondent. If male, then Gender=1; if female, then Gender=0
<i>Ethnicity</i>	Ethnicity of the respondent. If Han, then Ethnicity=1; if minority, then Ethnicity=0
<i>Education</i>	Educational background of the respondent. Bachelor degree and above=5; post-secondary education=4; senior middle school or secondary vocational school education=3; junior high school education=2; primary education=1; no formal education=0
<i>Political status</i>	Political status of the respondent. If member of Chinese Communist Party (CCP), then Political status=1; otherwise Political status=0 (including member of Communist Youth League, member of democratic parties, and none)
<i>Religion</i>	Religious affiliation of the respondent. If religion follower, then Religion=1; if no religious affiliation, then Religion=0
<i>Divorced</i>	Marital status of the respondent. If divorced or separated, then Divorced=1; otherwise Divorced=0
<i>Married</i>	Marital status of the respondent. If married, then Married=1; otherwise Married=0



<i>Health</i>	Physical condition of the respondent. In good health=5; relatively healthy=4; so-so=3; relatively unhealthy=2; in poor health=1
<i>Status change</i>	Socioeconomic status change compared with previous period. Higher=2; unchanged=1; lower=0
<i>GDP per capita</i>	Natural logarithm of real GDP per capita in the province where the respondent is interviewed (in yuan)
<i>GDP proportion</i>	Provincial GDP as a proportion of total national GDP
<i>CPI</i>	The rate of change in Consumer price index in the province where the respondent is interviewed (in %)
<i>Industrial production</i>	Natural logarithm of industrial added value in the province where the respondent is interviewed (in 100 million yuan)
<i>Government expenditure</i>	Provincial government expenditure as a fraction of provincial GDP

**Table 4** Descriptive statistics of the data (N=44,731)

Variable	Mean or %	Std. Dev.	Minimum	Maximum
<i>Dependent variable</i>				
Happiness	3.821	0.846	1	5
Very happy	1.6			
Relatively happy	6.9			
Neither unhappy nor happy	15.7			
Relatively unhappy	59.1			
Very unhappy	16.6			
<i>Explanatory variables</i>				
Trade openness	0.303	0.326	0.015	1.457
Financial openness	2.428	1.679	0.068	7.961
Inequality	2.703	0.481	1.845	4.073
<i>Individual characteristics</i>				
Age	48.772	15.908	17	97
Income	10.311	1.091	4.605	13.816
Gender	0.495	0.5	0	1
Ethnicity	0.919	0.273	0	1
Education	2.064	1.348	0	5
No formal education	12.6			
Primary education	23.6			
Junior high school education	29.7			
Senior middle school or secondary vocational school education	18.8			
Post-secondary education	9.8			
Bachelor degree and above	5.6			
Political status	0.116	0.321	0	1

Religion	0.119	0.324	0	1
Divorced	0.021	0.143	0	1
Married	0.806	0.396	0	1
Health	3.536	1.127	1	5
In poor health	4.2			
Relatively unhealthy	16.8			
So-so	22.1			
Relatively healthy	35.3			
In good health	21.7			
Status change	1.384	0.678	0	2
Lower	11.2			
Unchanged	39.2			
Higher	49.6			
<i>Regional variables</i>				
GDP per capita	10.590	0.460	9.482	11.590
GDP proportion	0.037	0.026	0.001	0.112
CPI	0.031	0.013	0.006	0.061
Industrial production	8.687	0.973	3.682	10.318
Government expenditure	0.236	0.124	0.106	1.086

## 2.2 Estimation methodology

Following recent studies on happiness (e.g. Tran et al., 2018; Wen et al., 2019), we specify the following regression model to estimate the effects of trade openness, financial openness, and rural-urban income inequality on happiness:

$$\begin{aligned}
 Happiness_{ij} = & \alpha + \beta_1 TO_j + \beta_2 TO_j^2 + \beta_3 FO_j + \beta_4 FO_j^2 + \beta_5 Ineq_j \\
 & + \beta_6 Ineq_j \times TO_j + \beta_7 Ineq_j \times FO_j + \beta_8 X_{ij} + \varepsilon_{ij}
 \end{aligned} \tag{1}$$

where  $i$  and  $j$  denote subscripts for individuals and provinces, respectively.  $Happiness_{ij}$  denotes the self-reported happiness;  $TO_j$  and  $FO_j$  denote trade openness and financial openness, respectively.  $Ineq_j$  denotes the rural-urban income gap.  $X_{ij}$  is the vector of control variables and year dummies.  $\varepsilon_{ij}$  is the error term.

Concerning the estimation method, conventional econometrics treats the dependent variable  $Happiness$  as an ordinal variable and thus uses ordered response models. However, Ferrer-i-Carbonell and Frijters (2004) argue that it does not matter to the result whether happiness is treated as cardinal or ordinal. In line with the standard practice in the literature (e.g., Jiang et al., 2012; Yang et al., 2019), we use the ordered probit (Oprobit) model in the main analysis. Additionally, the results of ordered logit (Ologit) model and OLS are also reported in the robustness checks.

### 3. Empirical Results

#### 3.1 Baseline results

Table 5 reports the estimation results of Equation (1). From the results in Table 5, we can see that for all model specifications and estimation methods, the coefficient on the level term of happiness is significantly positive while that on the square term is significantly negative, suggesting that there is an inverted U-shaped relationship between trade openness and happiness. Taking the results estimated by the Oprobit model for illustration, the threshold value of trade openness occurs approximately at 2 in the regression without control variables and at 1.67 in the regression with full control variables, *ceteris paribus*. This means that living in a region with increasing trade openness can improve the happiness of dwellers until trade openness reaches a specific threshold value, which locates between 1.67 and 2 for our sample. After that, life satisfaction will decrease as the degree of trade openness further increases. However, no region has a trade openness higher than 1.46 in the sample. Thus, people in almost all regions in China can still gain more happiness by promoting the trade openness of the regions where they live.

In contrast to the inverted U-shaped relationship between trade openness and happiness, the impact of financial openness on happiness forms a U-shaped pattern, as suggested by the negatively significant coefficient on the level term of financial openness and the positively significant coefficient on its square term. In other words, the effect of financial openness on happiness is negative before financial openness reaches a critical threshold value and then becomes positive after the threshold value. As far as our sample is concerned, the associated threshold value of financial openness occurs approximately at 10.68% in the regression without controls and 11.2% in the regression with full controls. After that, people's happiness will improve as the degree of financial openness increases. However, none of the sample regions have reached a degree of financial openness higher than 7.96%, indicating that China is now still in a stage that financial opening has a dampening effect on people's happiness.

As for the effect of rural-urban inequality on happiness, consistent with the previous literature (e.g., Huang et al., 2016; Jiang et al., 2012), the coefficient on inequality is negative and statistically significant, suggesting that people's happiness would decrease as income disparity increases. Meanwhile, the coefficient on the interaction term between inequality and trade openness ( $\beta_6$ ) is estimated to be significantly negative, implying an exacerbating effect of trade openness on the negative effect of inequality on happiness. To be more specific, in a region with a higher degree of trade openness, relative deprivation from rural-urban inequality tends to be more substantial, resulting in a lower level of happiness for people in these regions. In other words, although trade openness itself can raise happiness, its positive effect would be discounted by decreasing the slope of inequality and happiness. This is also consistent with the results in Yang and Greaney (2016), who find that trade openness alleviated inequality in the US and Japan but worsened inequality in China. By comparison, the coefficient on the interaction term between the rural-urban gap and financial openness ( $\beta_7$ ) is estimated to be significantly positive, suggesting that financial openness can moderate the negative impact of inequality on happiness. The implication is that in a region with higher financial openness, the feeling of relative deprivation is weaker and people tend to be happier because of less aversion to income inequality.

Overall, the results obtained with different estimation methods are highly consistent, which confirms the validity of our main findings. Trivial differences are found in the magnitude of the estimates: of the three models, Ologit generates the largest values, followed by Oprobit, and OLS the smallest. As for model specification, it can be easily seen that, the estimates without control variables are slightly overestimated, implying necessity for inclusion of the control variables.

**Table 5** Baseline results

Dependent variable: Happiness	Model 1 Oprobit without control variables	Model 2 Ologit without control variables	Model 3 OLS without control variables	Model 4 Oprobit with control variables	Model 5 Ologit with control variables	Model 6 OLS with control variables
Trade openness	2.028*** (0.18)	3.651*** (0.31)	1.449*** (0.14)	0.607*** (0.22)	1.000*** (0.38)	0.396*** (0.15)
Trade openness squared	- 0.506*** (0.04)	- 0.880*** (0.08)	- 0.382*** (0.03)	- 0.182*** (0.06)	- 0.317*** (0.11)	- -0.114** (0.05)
Financial openness	- 0.363*** (0.04)	- 0.651*** (0.07)	- 0.250*** (0.03)	- 0.336*** (0.04)	- 0.607*** (0.07)	- 0.221*** (0.03)
Financial openness squared	- 0.017*** (0.00)	- 0.031*** (0.00)	- 0.011*** (0.00)	- 0.015*** (0.00)	- 0.027*** (0.00)	- 0.010*** (0.00)
Inequality	- 0.118*** (0.02)	- 0.203*** (0.04)	- 0.093*** (0.02)	- 0.102*** (0.03)	- 0.190*** (0.05)	- 0.069*** (0.02)
Inequality × Trade openness	- 0.482*** (0.06)	- 0.894*** (0.11)	- 0.333*** (0.05)	- 0.223*** (0.07)	- 0.386*** (0.13)	- 0.151*** (0.05)
Inequality × Financial openness	- 0.077*** (6.54)	- 0.133*** (6.37)	- 0.056*** (6.13)	- 0.068*** (5.54)	- 0.123*** (5.64)	- 0.047*** (5.32)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
LR statistic	540.75** *	569.90** *		5082.72* **	5168.87* **	
Pseudo R-squared	0.01	0.01		0.06	0.06	
Number of observations	44731	44731	44731	44731	44731	44731

Notes: (1) Robust standard errors are in parentheses; (2) \*, \*\*, \*\*\* indicate statistically significant at the 10%, 5% and 1% level respectively.

Regarding the effects of control variables, almost all of them are estimated to be statistically significant. This means that our selection of controls is generally valid. For better interpretation, Table 6 quantifies the baseline results by reporting the average marginal effect of explanatory variables.<sup>2</sup> Because the dependent variable takes all levels of happiness into account, the average marginal effect estimations yield five sets of results accordingly. As the predicted outcome shifts from unhappiness to happiness, the effects of the variables of being male, not minority, and

<sup>2</sup> Due to the existence of the square term and interaction term, the marginal effects of core variables are hardly distinguishable from the change of themselves. Hence, we leave the discussion on the marginal effect of openness and inequality to the next section and simply focus on the control variables here.

divorced shift from positive to negative. In contrast, the marginal effects of the variables of higher income, higher education, being a CCP member, having religious belief, being married, in good health status, and higher social status, shifts the other way around.

As for the specific effects associated with the controls, our results are generally consistent with the prior studies (e.g., Han and Gao, 2019; Huang, 2019; Morgan and Wang, 2018; Tran et al., 2018; Yang et al., 2019; Zhang and Churchill, 2020). For example, the result supports a U-shaped age-happiness curve with the lowest point at about 40 years old, for middle-aged people suffer from economic pressure and career ceilings. A 1% increase in average income may increase the marginal probability of happiness by 0.033. It is also suggested that females are more likely to be happy than males (with a higher marginal probability of 0.024). Not surprisingly, minorities enjoy more happiness because of the preferential ethnic policies. Enhancement in happiness can also be achieved by receiving a higher level of education, being a member of the China Communist Party, or a nonbeliever. Marital, health and social status turn out to be the first three critical determinants of happiness among all the individual control variables, which can raise the marginal probability of happiness by 0.050, 0.047, and 0.034, respectively. Concerning the provincial variables, positive coefficients of GDP per capita, industrial production, and government expenditure indicate that improvement in the economic conditions of the province in which respondents live can improve individual wellbeing. Nonetheless, GDP proportion generates a negative impact on happiness when controlling for absolute GDP, indicating that dwellers in highly developed provinces may suffer from high pressures in life while enjoying better economic conditions. Finally, the marginal probability of CPI amounts to -1.438, suggesting that inflation exerts a strong negative influence on happiness, as was evidenced by Tsai (2009).

**Table 6** Average marginal effects

Dependent variable: Happiness	(1) Opro bit	(2) ME (Happiness =1)	(3) ME (Happiness =2)	(4) ME (Happiness =3)	(5) ME (Happiness =4)	(6) ME (Happines s=5)
<i>Impacts of openness and inequality</i>						
Trade openness	0.607*** (0.22)	0.004 (0.00)	0.013 (0.01)	0.018 (0.01)	-0.013 (0.01)	-0.021 (0.01)
Trade openness squared	-0.182** (0.06)					
Financial openness	0.336*** (0.04)	0.003*** (0.00)	0.010*** (0.00)	0.013*** (0.00)	-0.010*** (0.00)	-0.016*** (0.00)
Financial openness squared	0.015***					

	(0.00)					
	)					
Inequality	-					
	0.10	0.000	0.001	0.001	-0.001	-0.001
	2***					
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	)					
Inequality	-					
	0.223**					
	*					
× Trade	(0.07)					
openness	)					
Inequality	0.06					
	8***					
× Financial	(0.01)					
openness	)					
<i>Individual characteristics</i>						
	-					
Age	0.03	-0.003***	-0.011***	-0.015***	0.012***	0.018***
	6***					
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	)					
Age	0.04					
squared/100	6***					
	(0.00)					
	)					
Income	0.16	-0.006***	-0.020***	-0.028***	0.021***	0.033***
	3***					
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	)					

**Table 6 (Continued)**

Dependent variable: Happiness	(1)	(2)	(3)	(4)	(5)	(6)
	Oprobit	ME (Happiness =1)	ME (Happiness =2)	ME (Happiness =3)	ME (Happiness =4)	ME (Happiness =5)
	-					
Gender	0.117***	0.004***	0.014***	0.020***	-0.015***	-0.024***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	-					
Ethnicity	0.081***	0.003***	0.010***	0.014***	-0.010***	-0.016***
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education	0.024***	-0.001***	-0.003***	-0.004***	0.003***	0.005***

	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Political status	0.148***	-0.005***	-0.018***	-0.025***	0.019***	0.030***
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Religion	0.113***	-0.004***	-0.014***	-0.019***	0.014***	0.023***
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Divorced	-0.221***	0.008***	0.027***	0.038***	-0.028***	-0.044***
	(0.04)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Married	0.249***	-0.009***	-0.031***	-0.042***	0.032***	0.050***
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Health	0.234***	-0.008***	-0.029***	-0.040***	0.030***	0.047***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Status	0.167***	-0.006***	-0.021***	-0.029***	0.021***	0.034***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
<i>Regional controls</i>						
GDP per capita	0.249***	-0.009***	-0.031***	-0.042***	0.032***	0.050***
	(0.04)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)

**Table 6 (Continued)**

Dependent variable: Happiness	(1) Oprobit	(2) ME (Happiness =1)	(3) ME (Happiness =2)	(4) ME (Happiness =3)	(5) ME (Happiness =4)	(6) ME (Happiness =5)
GDP proportion	-1.402*	0.048**	0.173**	0.239*	-0.179**	-0.281*
	(0.72)	(0.02)	(0.09)	(0.12)	(0.09)	(0.15)
CPI	-7.169***	0.247***	0.885***	1.222***	-0.917***	-1.438***
	(1.58)	(0.05)	(0.19)	(0.27)	(0.20)	(0.32)
Industrial production	0.123***	-0.004***	-0.015***	-0.021***	0.016***	0.025***
	(0.03)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
Government expenditure	1.140***	-0.039***	-0.141***	-0.194***	0.146***	0.229***
	(0.23)	(0.01)	(0.03)	(0.04)	(0.03)	(0.05)

Year	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	4473	44731	44731	44731	44731	44731
	1					

Notes: (1) Robust standard errors are in parentheses; (2) \*, \*\*, \*\*\* indicate statistically significant at the 10%, 5% and 1% level respectively.

### 3.2 Marginal analysis

In order to intuitively illustrate the interplay of openness and inequality on residents' wellbeing, we adopt a graphical approach by following Ashraf et al. (2020) for further marginal analysis. To this end, we convert the continuous variables into discrete ones. Specifically, to distinguish between regions with high and low financial openness, we introduce a dummy variable  $TOdum$ , which takes the value of one if trade openness is greater than the sample mean and zero otherwise. Similarly, the dummy  $FOdum$  distinguishes regions with high and low financial openness, and  $Ineqdum$  distinguishes regions with high and low rural-urban inequality. Then Equation (1) becomes:

$$\begin{aligned}
 Happiness_{ij} = & \alpha + \beta_1 TOdum_j + \beta_3 FOdum_j + \beta_5 Ineqdum_j \\
 & + \beta_6 Ineqdum_j \times TOdum_j + \beta_7 Ineqdum_j \times FOdum_j + \beta_9 X_{ij} + \varepsilon_{ij}
 \end{aligned}
 \tag{2}$$

The marginal effects of trade and financial openness are respectively given by:

$$\frac{\partial Happiness_{ij}}{\partial TOdum_j} = \beta_1 + \beta_6 Ineqdum_j, \quad \frac{\partial Happiness_{ij}}{\partial FOdum_j} = \beta_3 + \beta_7 Ineqdum_j$$

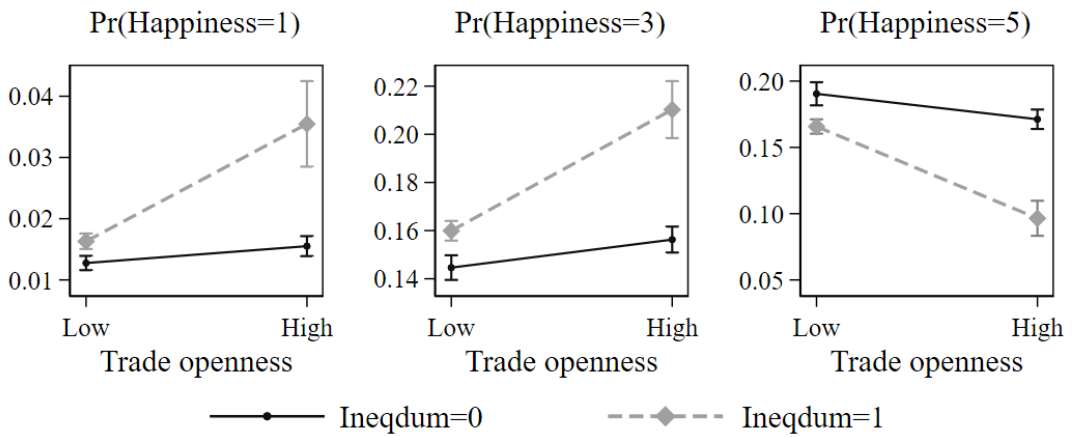
It is obvious that inequality affects the impact of trade and financial openness by  $\beta_6$  and  $\beta_7$  respectively. Meanwhile, the marginal effect of inequality is also affected by trade and financial openness:

$$\frac{\partial Happiness_{ij}}{\partial Ineqdum_j} = \beta_5 + \beta_6 TOdum_j + \beta_7 FOdum_j$$

Based on the estimation results for Equation (2), Figures 2 and 3 display the marginal effects of different levels of openness on the wellbeing of residents living in areas with low (i.e.,  $Ineqdum = 0$ ) and high (i.e.,  $Ineqdum = 1$ ) inequality respectively. According to horizontal comparison of Figure 2, the marginal probability of happiness is higher in regions with higher degrees of trade openness than that with lower degrees of trade openness. This suggests that trade openness has an affirmative impact on happiness, as estimated before. By vertical comparison, the marginal effect of trade openness is more pronounced in regions with higher inequality than those in regions with lower inequality, indicating that inequality strengthens the positive impact of trade openness. In addition, this strengthening effect becomes stronger as the degree of trade openness increases, as shown by the enlarging gap between two lines.

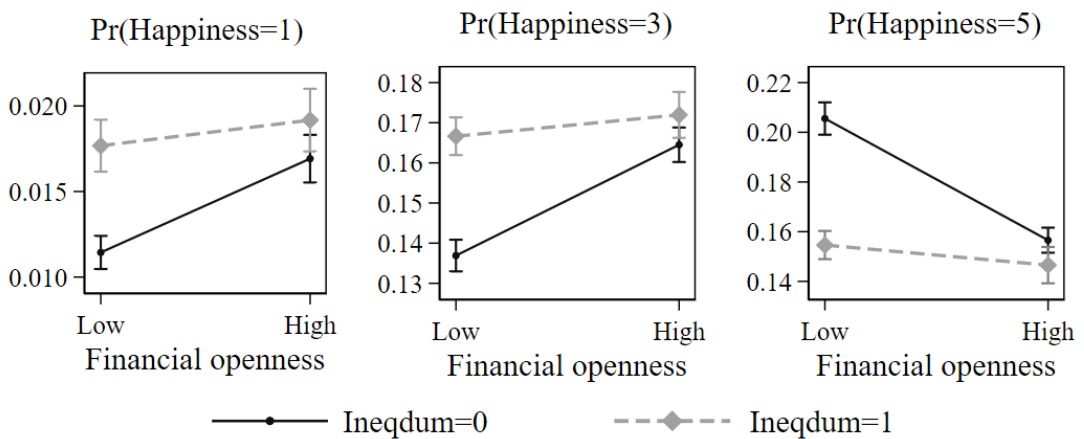
As for financial openness (see Figure 3), people in regions with a higher degree of financial openness tend to have a lower marginal probability of happiness, which again confirms the previous baseline results. By within-group comparison, highly unequal regions show greater marginal effects of financial openness than regions with lower inequalities, implying a moderation effect of inequality that weakens the negative impact of financial openness. Additionally, this moderation effect is attenuated given a rise to financial openness, as shown by the decreasing disparity between lines.





**Fig. 2** Marginal effects of trade openness

*Notes:* The marginal effects on “Relatively unhappy” (Happiness=2) are similar to the marginal effects on “Very unhappy” (Happiness=1). The marginal effects on “Relatively happy” (Happiness=4) are similar to “Very happy” (Happiness=5). All the figures do not report the predicted outcomes of “Relatively unhappy” and “Relatively happy” to save space (these results are available upon request).



**Fig. 3** Marginal effects of financial openness

Figures 4 and 5 depict the marginal effects of inequality at different levels of happiness. It appears that inequality dampens happiness, as shown by the downward slope of the line standing for the impact of inequality on happiness in the third subgraph. Alternatively, in the first subgraph, the line representing the impact on unhappiness has an upward slope. Taken together, these two figures reveal that the marginal probability of unhappiness for residents in areas with higher inequality is greater than those with low inequality, which is consistent with our previous results.

Note also that there are two lines in each subgraph. The gray line stands for the marginal effect of inequality on the wellbeing of residents living in areas with lower openness, while the black line stands for that in areas with higher openness. Looking closely at Figure 4, in areas with high

trade openness, the marginal effect of inequality on unhappiness is higher than that in areas with low trade openness. Hence, Figure 4 reflects that trade openness strengthens the negative effect of inequality on happiness. Such moderating effect diminishes as inequality increases, as implied by the narrowing gap between the two lines in the first subgraph. Rather, Figure 5 shows that in regions with high financial openness, the marginal effect of inequality on unhappiness is less than that in regions with low financial openness, suggesting that financial openness weakens the negative effect of inequality on happiness. This adjustment effect, as shown in the first subgraph, also shrinks when inequality increases.

To sum up, rural-urban inequality has a moderation effect on the impact of openness on happiness: it strengthens the positive impact of trade openness and weakens the negative impact of financial openness. In turn, the negative impact that inequality exerts on happiness is exacerbated by trade openness and impaired by financial openness.

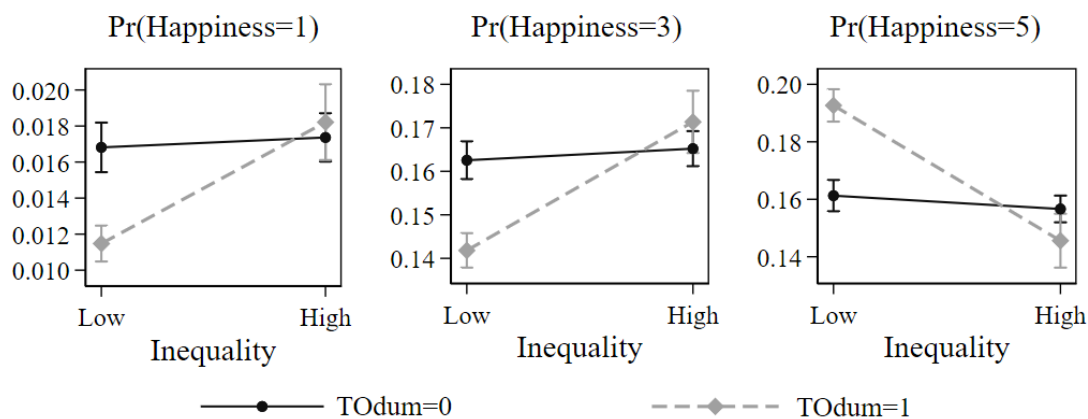


Fig. 4 Interaction of inequality and trade openness

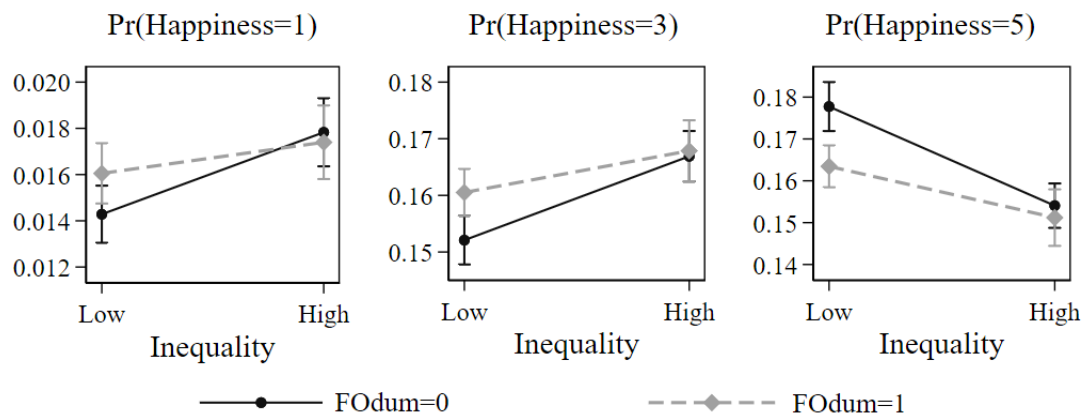


Fig. 5 Interaction of inequality and financial openness

### 3.3 Robustness check

Considering that individuals are more aware of and affected by what happens in their surroundings, an alternative and perhaps better measure of inequality might be estimated at a lower level of areas, such as counties (Xian) or districts (Qu). Previous literature (e.g., Tran et al., 2018) uses a small estimation method to estimate inequality indicators at the community level. However,

due to privacy policy, the CGSS does not release the information for the location of the sample below the provincial level. Thus, we could not match the CGSS data with other databases below the provincial level. A workaround is to use CGSS data directly for calculations. In doing so, considering that the survey did not cover every county (some counties have only urban samples with few rural samples, or the other way around), we excluded counties with proportion of rural sample below 10% or above 90% to avoid sample bias. The remaining sample size is 9626, covering 167 county-years.

The results are reported in Table 7. We first replace the inequality indicator with the county-level urban-rural income ratio, which is the ratio of the average income of urban residents to the average income of rural residents in the county for each year. The second alternative is the between-group component of the Gini coefficient, which is obtained by decomposing the county's Gini coefficient according to the sample type for each year.

From the results in Table 7 we can see that, the coefficients on trade and financial openness preserve the same signs and significances as before. This confirms that the inverted U-shaped relationship between trade openness and happiness and the U-shaped relationship between financial openness and happiness still holds for different measures of inequality. Moreover, the threshold of turning point is 0.21 for trade openness and 2 for financial openness, situated between the minimum and the mean value. However, it turns out that the county-level inequality indicator and happiness are positively correlated. This result is consistent with Kelly and Evans (2017), suggesting that the Kuznets curve may indeed exist: in the early stage of economic development, unequal income growth may enhance happiness. In this case, trade openness would depress the marginal impact of inequality, as indicated by the significantly negative coefficients on the interaction terms for trade openness and inequality. Likewise, financial openness tends to reduce the marginal impact of inequality and thus depresses happiness, although the related coefficients are not statistically significant.

**Table 7** Robustness to county level measures of inequality

Dependent variable: Happiness	(1)	(2)
	Income ratio	Between-group Gini
Trade openness	1.054*** (0.41)	0.940** (0.39)
Trade openness squared	-2.494*** (0.49)	-2.609*** (0.49)
Financial openness	-0.196*** (0.07)	-0.188*** (0.06)
Financial openness squared	0.049*** (0.01)	0.051*** (0.01)
Inequality	0.043 (0.03)	1.032*** (0.35)
Inequality $\times$ Trade openness	-0.162* (0.08)	-1.297 (0.93)
Inequality $\times$ Financial openness	-0.004 (0.02)	-0.235 (0.19)
Controls	Yes	Yes

Year	Yes	Yes
LR statistic	1095.13***	1103.15***
Pseudo R-squared	0.06	0.06
Number of observations	9626	9626

*Notes:* (1) Robust standard errors are in parentheses; (2) \*, \*\*, \*\*\* indicate statistically significant at the 10%, 5% and 1% level respectively; (3) All regressions include full controls but not reported in the table to save space (these results are available upon request).

#### 4. Further discussion: cohort differences

In the previous two subsections, we have analyzed the effects of trade openness, financial openness, and rural-urban income inequality on happiness in China and tested the robustness of the results. Considering the variety of social classes and the enlarging gap between urban and rural areas in recent years, both of which may lead to notable differences among different cohorts, in this subsection we proceed to explore the following question: Are there any differences in the effects of openness and rural-urban income inequality on happiness among different cohorts in China? To answer this question, we divide the entire sample into corresponding subsamples and redo the regressions in a similar fashion as before.

First, we examine whether our main results are robust to different income groups and residential status. As is conventional in the literature, we classify the sample into three categories based on the household income of the respondents. As shown in Table 8, the numbers of households in each group are roughly equal. Then we repeated the regression analysis for each sub-sample, with the results presented in Table 9. It is evident from Table 9 that the main results generally holds for all income groups, despite some differences in statistical insignificance. Notably, the high-income households are the only group sensitive to the inverted U-shaped relationship between trade openness and happiness, yet insensitive to the negative impact of inequality. This is understandable because high-income households may benefit from trade openness (Turnovsky and Rojas-Vallejos, 2018), and rural-urban inequality further enhances the benefits from trade openness, as we analyzed above. Meanwhile, trade openness strengthens the negative impact of inequality on happiness. Consequently, the subjective wellbeing of middle- and low-income households are hardly enhanced by trade openness but significantly impaired by inequality, implying that the gains of the rich from trade openness and inequality are at the cost of the low and middle classes.

Columns (4) and (5) report the results for the urban group and the rural group respectively, from which we can see that, again, our main results remain robust for both groups. Exceptions are that the coefficients on the level term and the interaction term of trade openness for rural residents are different from the baseline results, although statistically insignificant. One possible explanation is that for foreign trade, cities are more attractive than rural areas. While urban areas enjoy the convenience and prosperity brought by trade openness, rural areas may suffer from labor outflows, aging population, abandoned farmlands, as well as other social costs. In addition, taking into account that the income of rural residents (with an average of 39266 in the sample) is much lower than that of urban residents (with an average income of 69003), this result is also consistent with those presented in Columns (1) and (2): trade openness and inequality tends to hurt the subjective wellbeing of the poorer group. Overall, the results in Table 9 further confirm the robustness of our main results.

**Table 8** The classification of household income over the sample period (Unit: RMB)

Year	Income classification	Low-income households	Middle-income households	High-income households
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2010	Income range	≤17130	17130-38000	>38000
	Observations	3,406	3,431	3,379
2011	Income range	≤20000	20000-40000	>40000
	Observations	2,014	1,369	1,488
2012	Income range	≤20000	20000-50000	>50000
	Observations	3,460	3,793	2,997
2013	Income range	≤30000	30000-60000	>60000
	Observations	3,996	2,914	2,824
2015	Income range	≤30000	30000-60000	>60000
	Observations	3,986	2,707	2,967
Total		16,862	14,214	13,655

Notes: (1) The entire sample is divided into three subsamples roughly equal in household numbers each year; (2) Each interval includes the upper boundary and excludes the lower boundary.

**Table 9** Robustness to different income groups and residential status

Dependent variable: Happiness	Household income class			Residential status	
	Low-income (1)	Middle-income (2)	High-income (3)	Urban subsample (4)	Rural subsample (5)
Trade openness	0.225 (0.53)	0.067 (0.41)	0.892*** (0.34)	0.853** (0.35)	-0.225 (0.31)
Trade openness squared	-0.096 (0.14)	-0.167 (0.12)	-0.194* (0.11)	-0.220** (0.10)	-0.333*** (0.10)
Financial openness	0.280*** (0.08)	-0.227*** (0.07)	0.428*** (0.07)	-0.296*** (0.06)	-0.234*** (0.07)
Financial openness squared	0.016*** (0.00)	0.011*** (0.00)	0.014*** (0.00)	0.007** (0.00)	0.019*** (0.00)
Inequality	-0.104** (0.04)	-0.107** (0.04)	-0.044 (0.05)	-0.092** (0.04)	-0.114*** (0.04)
Inequality × Trade openness	-0.100 (0.19)	-0.020 (0.14)	0.373*** (0.11)	-0.307** (0.12)	0.111 (0.11)
Inequality × Financial openness	0.046* (0.02)	0.034 (0.02)	0.113*** (0.02)	0.080*** (0.02)	0.021 (0.02)
Controls	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
LR statistic	1912.68* **	1210.66** *	1037.57* **	2211.65***	2947.66***
Pseudo R-squared	0.05	0.04	0.04	0.06	0.06

Number of observations                      16862              14214              13655              18391              26339

Notes: (1) Robust standard errors are in parentheses; (2) \*, \*\*, \*\*\* indicate statistically significant at the 10%, 5% and 1% level respectively; (3) All regressions include full controls but not reported in the table to save space (these results are available upon request).

Second, considering the diversity of individual characteristics, it is also worthwhile to assess whether there are differences in the effects of openness and rural-urban inequality on happiness across different groups of people with different genders, different ethnicities, and different religious beliefs. According to the results in Table 10, we can see that the coefficients for financial openness remain largely stable across all groups, but the coefficients for trade openness exhibit differences in statistical significance. This indicates that the two aspects of openness might influence subjective wellbeing through different mechanisms, which further confirms our previous hypothesis that the modeling of openness by classifying into two dimensions is of necessity to reveal the potential differences.

Interestingly, even after controlling for income, the regression results for the wealthier group under each division remain supportive for the baseline results, but there are minor differences that exist in the inferior groups: the coefficients on trade openness are less significant. In other words, trade openness mainly benefits rich people and thus enhances their happiness. Besides income differences, another underlying reason is that males are the primary labor force in China<sup>1</sup>, thereby females, especially housewives, are less likely to be affected by trade openness.

**Table 10** Robustness to different genders, different ethnicities and different religious beliefs

Dependent variable: Happiness	Gender		Ethnicity		Religious belief	
	Male	Female	Han	Minority	Believer	Nonbeliever
Trade openness	0.844** *	0.378	0.405*	1.761	0.571	0.423*
	(0.31)	(0.30)	(0.22)	(1.37)	(0.54)	(0.24)
Trade openness squared	- 0.215**	-0.143	- 0.197** *	-0.617*	-0.141	- 0.183** *
	(0.09)	(0.09)	(0.07)	(0.36)	(0.15)	(0.07)
Financial openness	- 0.335** *	- 0.332** *	- 0.287** *	- 0.878* **	- 0.437* **	- 0.280** *
	(0.06)	(0.06)	(0.04)	(0.17)	(0.13)	(0.04)
Financial openness squared	0.015** *	0.015** *	0.014** *	0.018* *	0.022* **	0.013** *
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
Inequality	- 0.088**	- 0.112** *	- 0.130** *	-0.164*	-0.097	- 0.097** *
	(0.04)	(0.04)	(0.03)	(0.09)	(0.07)	(0.03)

<sup>1</sup> According to China Labour Statistical Yearbook, total employments in 2018 amount to 111,711 thousand people, among which 37,687 thousand people are female.

Inequality × Trade openness	- 0.309** *	-0.143	- 0.150**	-0.369	-0.217	-0.155*
	(0.11)	(0.10)	(0.08)	(0.49)	(0.18)	(0.08)
Inequality × Financial openness	0.069** *	0.066** *	0.052** *	0.268* **	0.082* *	0.054** *
	(0.02)	(0.02)	(0.01)	(0.05)	(2.07)	(4.13)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
LR statistic	2703.98 ***	2423.41 ***	4769.28 ***	524.90 ***	694.45 ***	4477.78 ***
Pseudo R-squared	0.06	0.05	0.06	0.07	0.06	0.06
Number of observations	22131	22600	41096	3635	5323	39408
Mean income	53583.0 8	49459.2 8	52375.5 9	41595. 50	50666. 48	51612.0 9

Notes: (1) Robust standard errors are in parentheses; (2) \*, \*\*, \*\*\* indicate statistically significant at the 10%, 5% and 1% level respectively; (3) All regressions include full controls but not reported in the table to save space (these results are available upon request).

## 5. Concluding Remarks

Despite the vast literature on the various determinants of happiness, very little is known about how openness may affect people's happiness in the current literature. In this paper, we attempt to fill this gap, albeit partially, through an empirical analysis of the CGSS data from China. Several results seem particularly interesting. First, we find that both trade openness and financial openness have a statistically significant impact on happiness, but their effects seem to be going in opposite directions. Specifically, the effect of trade openness on happiness is inverted U-shaped, whereas that of financial openness turns out to be U-shaped. Second, we find that rural-urban income inequality has a significantly negative effect on happiness, which is highly consistent with the previous studies. Third, we find that the negative effect of rural-urban income inequality on happiness would be strengthened by an increase in trade openness but weakened by an increase in financial openness. These results are proved to be robust to different estimation strategies and a variety of sensitivity checks.

This paper contributes to the existing literature in three folds. First, our results not only identify openness as an essential determinant of happiness but also highlight the different effects that are associated with different dimensions of openness (i.e., financial openness and trade openness). Second, our paper extends the literature on inequality-happiness nexus by showing that the effect of rural-urban inequality on happiness also depends on trade and financial openness. And the favorable adjustment effects of openness seem to spread unevenly across cohorts. Third, the main findings of this paper also complement the studies on the determinants of the subjective wellbeing in an emerging market economy like China, where economic and financial opening policies may face some contradictions between opening up the market and maintaining individual happiness.

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# The Role of Investment Bankers in M&As: New Evidence on Acquirers' Financial Conditions\*

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**Abstract:** *This paper investigates whether top-tier M&A (mergers and acquisitions) investment bankers (financial advisors) create value for acquirers with different financial conditions in both the short- and long-term by analyzing 3,420 US deals during 1990-2012. In this paper, deals are divided into three groups based on acquirer financial constraints – acquisitions by constrained, neutral and unconstrained firms. We find that the effects of top-tier bankers are dependent on acquirer financial conditions. Specifically, top-tier advisors improve performance for constrained acquirers rather than neutral and unconstrained acquirers. Our results show that top-tier investment bankers improve constrained acquirers' short- (five days) and long-term (36 months) performance by 1.45% and 24.27% respectively, after controlling for firm, deal and market characteristics. For deals with investment banker involvement, constrained acquirers advised by top-tier advisors have the lowest deal completion rate, and pay the lowest bid premiums; while unconstrained acquirers that retain top-tier investment bankers have the highest deal completion rate, and pay relatively high bid premiums. Our findings imply that constrained acquirers tend to retain top-tier investment bankers to gain superior synergy, while unconstrained acquirers appear to retain top-tier investment bankers to ensure deal completion.*

**Keywords:** Mergers and acquisitions; Investment banker; Financial constraint; Acquirer performance

**JEL Classification:** G14; G34.

## 1. Introduction

In this paper, we investigate whether the effects of investment banker reputation on acquirer performance vary according to acquirer financial conditions. Mergers and acquisitions (M&As) are one of the most influential investment projects for companies; the majority of acquirers and targets will retain investment bankers as their financial advisors. For acquisitions with advisors' involvement, about 50% of the deals are advised by top-tier investment bankers.<sup>4</sup> The effects of bank reputation on acquirer performance have been highlighted by an increasing number of researchers.

Top-tier investment bankers charge much higher advisory fees and are supposed to provide their clients with superior service (Golubov et al., 2012); however, the empirical evidence on this reputation–quality mechanism remains inconclusive. Some studies find that acquirers advised by top-tier advisors do not outperform those advised by non-top-tier advisors and may even obtain negative abnormal returns (e.g. Hunter and Jagtiani, 2003; Ismail, 2010; Michel et al., 1991; Rau, 2000; Servaes and Zenner, 1996).

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<sup>4</sup> Source: Thomson One Banker.

For example, Michel et al. (1991) find that Drexel Burnham Lambert, a less prestigious bank, helps its clients earn the highest announcement abnormal returns, while First Boston, Bulge Bracket, achieves the poorest performance. In other words, bank reputation does not relate to better takeover performance. Servaes and Zenner (1996) show that acquirer announcement returns do not differ across in-house deals and deals advised by investment banks. The differences in announcement returns between acquirers advised by top-tier and non-top-tier advisors are also insignificant. Rau (2000) finds that acquirers advised by top-tier investment banks obtain higher announcement abnormal returns in tender offers but lower announcement abnormal returns in mergers compared to acquirers advised by lower-tier investment banks. Furthermore, in both mergers and tender offers advised by top-tier investment banks, the completion rate of value-increasing transactions measured by announcement cumulative abnormal returns (CARs) is not significantly higher than that of value-decreasing transactions. In contrast, compared to the proportion of tender offers with negative announcement CARs, second-tier banks help acquirers complete a significantly higher proportion of tender offers with positive announcement CARs. Hunter and Jagtiani (2003) use a unique method, employing the difference between the transaction values at the announcement date and the effective date as a proxy for acquisition gains, and find that acquisition gains are inversely associated with the retention of top-tier investment bankers. Furthermore, Ismail (2010) reports that acquirers advised by first-tier banks obtain negative announcement returns, whereas second-tier banks help their clients gain positive returns around announcements.

In contrast, several researchers argue that top-tier advisors have superior abilities to identify synergistic targets and secure a larger proportion of synergy for their clients. Therefore, top-tier advisors are capable of improving acquirer performance (Golubov et al., 2012). Additionally, a higher reputation is associated with a higher market share. To maintain this market share, top-tier advisors must therefore maintain their reputation, which is achieved by providing superior service.

Specifically, Boone and Mulherin (2008) find that acquirer announcement returns are positively related to top-tier advisors retained by acquirers but negatively related to top-tier advisors retained by targets. Therefore, top-tier advisors help their acquirer clients improve acquisition performance, and help their target clients gain high-premium offers. In other words, the retention of top-tier advisors is in the interest of employers. In addition, Golubov et al. (2012) argue that acquirers advised by top-tier advisors outperform acquirers advised by non-top-tier advisors in public acquisitions. They find that the retention of top-tier advisors led to \$65.83 million shareholder gains for acquirers, on average, in public acquisitions during 1996-2009. More importantly, their results suggest that the improvement in performance can be attributed to top-tier advisors' skills in identifying synergistic targets and negotiating higher shares of synergies for acquirers.

The previous literature examines the effects of investment bankers' reputation on acquirer performance. However, a firm's decision to conduct acquisitions and to retain top-tier advisors can be influenced by firm characteristics, such as firms' financial conditions. Acquirers with sufficient internal funds are more likely to conduct mergers, while they tend to forgo them if they are financially constrained (Harford, 1999; Jensen, 1986). At the same time, cash-rich acquirers are more likely to retain top-tier advisors (Golubov et al., 2012).

Jensen (1986) introduces the free cash flow hypothesis and argues that firms with excess cash reserves tend to make value-decreasing takeover deals. Similarly, Smith and Kim (1994) investigate the influence of free cash flow and financial slack on announcement abnormal returns. Their study shows that acquirers with high free cash flow obtain significantly negative announcement abnormal returns, whereas slack-poor acquirers gain significantly positive announcement abnormal returns. The returns to acquirers are highest in the acquisition of high free cash flow targets by slack-poor acquirers. In addition, Harford (1999) examines whether excess cash holdings stimulate top management to conduct takeover transactions and whether such

deals (made by cash-rich acquirers) tend to destroy value. Harford finds that cash richness is positively related to the probability of being an acquirer, but negatively related to acquirer announcement returns. Additionally, the post-merger long-term abnormal operating performance of both cash-rich and cash-poor acquirers is significantly negative and insignificant, respectively. In other words, cash-rich companies tend to conduct value-destroying takeovers. Furthermore, Malmendier and Tate (2005, 2008) find that financially unconstrained firms are more likely to exhibit overconfidence and overconfident CEOs tend to conduct value-destroying acquisitions, while firms with financial constraints are reluctant to raise external capital and forgo mergers if external finance is required.

The above-mentioned studies suggest that acquirers with different financial conditions exhibit different behaviors, which may help to explain the inconclusive evidence on the role of top-tier investment bankers in M&A deals. Specifically, acquirers with abundant cash flows tend to overestimate their ability to generate excess returns (Crocchi et al., 2010; Doukas and Petmezas, 2007; Malmendier and Tate, 2008; Roll, 1986). Thus, it is highly possible that they do not rely on investment bankers to identify synergistic targets, and employ top-tier advisors solely to complete their intended M&A deals. In contrast, acquirers with financial constraints do not have sufficient internal funds to finance M&A deals, and high financing costs force constrained firms to make acquisition decisions rationally and carefully. Consequently, constrained acquirers are likely to retain top-tier advisors to obtain acquisition synergy. However, there is no empirical research that has directly examined if the effects of top-tier investment bankers differ across acquirers with different financial conditions. This paper, therefore, aims to fill this void in the literature. Specifically, we examine acquirer short- and long-term performance and, more importantly, investigate whether the effects of top-tier advisors are dependent on acquirer financial conditions.

Therefore, we analyze a large sample of US M&As over the 1990-2012 period, and divide the deals into three groups – acquisitions by constrained, neutral, and unconstrained acquirers. Specifically, we use KZ (Kaplan-Zingales) index to classify acquirer financial constraints. The lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers.<sup>5</sup> We use a market share-based league table to measure investment banker reputation. Specifically, top-10 investment banks in the league table are defined as top-tier advisors, while others are defined as non-top-tier advisors.<sup>6</sup> We show that top-tier investment bankers help financially constrained acquirers improve performance in both the short- and long-term. In contrast, the effects of top-tier investment bankers are insignificant for unconstrained and neutral acquirers, which is consistent with most of the previous literature.<sup>7</sup> For deals with investment banker involvement, constrained acquirers advised by top-tier advisors gain the highest short- and long-term abnormal returns, and pay the lowest bid premiums, while unconstrained acquirers advised by top-tier advisors have the highest deal completion rate. These results suggest that constrained acquirers retain top-tier advisors to improve takeover performance and bargaining power, while unconstrained acquirers advised by top-tier advisors give priority to deal completion. In other words, the effects of top-tier advisors are dependent on acquirer financial conditions.

This research contributes to the M&A literature in the following two aspects. First, this paper sheds new light on puzzling empirical evidence on the effects of top-tier investment bankers. We highlight that the effects of top-tier advisors are sensitive to acquirer financial conditions. By examining abnormal returns to acquirers in different advisor-constrained groups, we provide novel evidence on the impact of top-tier advisors on acquirer performance. In particular, we find

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<sup>5</sup> We also use the SA Index to measure acquirer financial constraint as a robustness check. Acquirers with a higher SA Index are more constrained. Robustness tests are discussed in Section 4.

<sup>6</sup> Investment bank league tables are acquired from Thomson One Banker. We also use other classifications to define top-tier advisors. Robustness tests are discussed in Section 4.

<sup>7</sup> See Hunter and Jagtiani (2003); Ismail (2010); Michel et al. (1991); Rau (2000); Servaes and Zenner (1996).

that top-tier advisors create value for their clients, but only if their clients are financially constrained acquirers.

Second, this paper emphasizes the importance of the long-term effects of financial advisors. Most studies<sup>8</sup> only focus on investment bankers' effects on acquirer performance in the short-term; however, financial advisors engage not only in deal negotiation but also post-deal integration. If the synergies identified and secured by top-tier advisors exist, then it will take time to transfer them into improved performance through post-deal integration and to demonstrate them to the market. To fill this void in the research, this paper investigates the effects of advisors on acquirer performance in both the short- and long-term.

Our findings also have important strategic implications for practitioners. Prestigious investment bankers have superior abilities to improve their clients' bargaining power and takeover performance. They also have stronger skills in deal completion. However, our research asks whether top-tier bankers can fulfill their potential is determined by clients' aims. We emphasize that the positive effects of top-tier investment bankers can be offset by acquirers' overconfidence. Stock markets reward acquirers who make acquisition decisions rationally and elaborately.

The remainder of this paper is organized as follows. Section 2 presents the data selection procedure and methodology. Section 3 discusses the empirical results. Robustness tests are carried out in Section 4. Section 5 concludes this paper.

## **2. Data and methodology**

### ***2.1. Sample selection***

This paper analyzes a sample of US domestic M&As announced from 1<sup>st</sup> January 1990 – 31<sup>st</sup> December 2012. Initially, we acquire a sample of 28,220 deals from Thomson One Banker.<sup>9</sup> Since this paper focuses on the effects of investment bankers, acquirers are required to have their advisor information recorded by Thomson One Banker, yielding 6,782 deals. To control for deal characteristics, observations are required to report transaction value and payment method information to Thomson One Banker, which leaves a sample of 5,910 deals. To calculate short- and long-term abnormal returns, acquirers are also required to file sufficient stock price data with the Center for Research in Security Prices (CRSP) database, which leaves a sample of 5,505 deals.<sup>10</sup> To measure financial constraints and other firm characteristics, acquirers are further required to have sufficient accounting data in the Compustat database, yielding a final sample of 3,420 deals.<sup>11</sup> In the final sample, 3,323 transactions are advised by investment banks, and 97 transactions are in-house deals.

### ***2.2. Methodology***

#### ***Measure of advisor reputation***

Following the method of Golubov et al. (2012), this research uses a binary classification to distinguish between top-tier and non-top-tier advisors. Specifically, the top 10 banks measured by transaction value are classified as top-tier advisors and the others are classified as non-top-tier advisors.<sup>12</sup> Since the eighth and tenth advisors are very similar in transaction values and market shares, this paper uses the top 10 as the cut-off point, unlike the top-8 classification of Golubov et al. (2012).

<sup>8</sup> See Bao and Edmans (2011); Bowers and Miller (1990); da Silva Rosa et al. (2004); Golubov et al. (2012); Ismail (2010); Kale et al. (2003); McLaughlin (1992); Michel et al. (1991); Schiereck et al. (2009); Servaes and Zenner (1996); Walter et al. (2008).

<sup>9</sup> The original sample includes 203,415 deals. Acquirers are required to be public and targets are required to be public, private, or subsidiaries. Using these criteria yields a sample of 105,565 deals. Takeover transaction values are required to be greater than or equal to \$1 million, yielding a sample of 58,742 deals. Regulated industries such as financial and utility firms (Standard Industrial Classification codes 6000–6999 and 4900–4999, respectively) are excluded, yielding a sample of 41,396 deals. Bankruptcy acquisitions, going-private transactions, leveraged buyouts, liquidations, repurchases, restructurings, reverse takeovers, and privatizations are excluded from the sample, leaving a sample of 28,220 observations.

<sup>10</sup> Calculating size-adjusted BHARs also requires data on the book value of equity from the Compustat database.

<sup>11</sup> This paper uses the KZ index to measure financial constraints. To calculate the KZ index, Compustat items 1, 6, 8, 9, 14, 18, 19, 21, 24, 25, 34, 60, 74, and 216 are required.

<sup>12</sup> Appendix 1 shows the top 25 investment banks ranked by transaction value. Financial advisor league tables were downloaded from Thomson One Banker.

To prevent misclassification, this paper also pays attention to takeovers among investment banks. For instance, Lehman Brothers declared bankruptcy in 2008 and was acquired by Barclays Capital the same year. Therefore, deals advised by Barclays Capital before the acquisition of Lehman Brothers (top-tier) are classified as being advised by a non-top-tier investment bank, whereas deals advised by Barclays Capital after the acquisition are classified as advised by a top-tier bank. Similarly, First Boston (top-tier) was acquired by Credit Suisse in 1990. Travelers Group acquired Salomon Brothers (top-tier) in 1998 and subsequently merged with Citicorp the same year, establishing Citigroup.

### ***Measure of financial constraint***

This paper uses the Kaplan-Zingales (KZ) index to measure acquirer financial constraints. Using a sample of 49 low-dividend firms from 1970 to 1984, Kaplan and Zingales (1997) investigate the proper measure of firms' financial constraints. Specifically, they identify constrained and unconstrained firms by analyzing annual reports and management discussions. Subsequently, they consider firm characteristics (ratio of cash flow to capital, Tobin's Q, leverage, ratio of dividends to capital, and ratio of cash to capital) that relate to financing constraints, to estimate an ordered logit regression. The parameters of the regression are used to formulate the KZ index, thereby measuring a firm's level of financial constraint (Lamont et al., 2001). A higher KZ index indicates a higher level of financial constraint. The KZ index is widely used in research to measure firm financial constraints (e.g. Baker et al., 2003; Guariglia and Yang, 2016; Li, 2011; Malmendier and Tate, 2005, 2008).

Following the afore mentioned research, we calculate the KZ index using the following formula:

$$KZ_{it} = -1.001909 \times \frac{CF_{it}}{K_{it-1}} + 0.2826389 \times Q_{it} + 3.139193 \times Leverage_{it} \\ - 39.3678 \times \frac{Dividend_{it}}{K_{it-1}} - 1.314759 \times \frac{C_{it}}{K_{it-1}}$$

where  $CF_{it}/K_{it-1}$  is cash flow (Compustat item IB+DP) over lagged capital (Compustat item PPENT),  $Q_{it}$  is Tobin's Q ratio (Compustat item (AT+PRCC×CSHO-CEQ-TXDB)/AT),  $Leverage_{it}$  is the leverage ratio (Compustat item (DLTT+DLC)/(DLTT+DLC+SEQ));  $Dividend_{it}/K_{it-1}$  is dividends (Compustat item DVC+DVP) over lagged capital (Compustat item PPENT), and  $C_{it}/K_{it-1}$  is cash (Compustat item CHE) over lagged capital (Compustat item PPENT).

We divide acquirers into three groups based on their KZ index. Specifically, the lowest (highest) third of acquirers ranked by KZ index is defined as unconstrained (constrained). The middle third of acquirers is classified as the neutral group.<sup>13</sup>

### ***Short-term performance***

Bouwman et al. (2009) argue that the presence of serial bidders implies that multiple takeovers may be announced during the estimation period for the market model, and therefore the parameter estimates will be biased. In line with these authors, this paper uses market-adjusted CARs to measure acquirer short-term performance. Market-adjusted abnormal returns are defined as

$$AR_{it} = R_{it} - R_{mt}$$

where  $R_{it}$  is the daily stock return for firm  $i$  on date  $t$  and  $R_{mt}$  is the daily return for the value-weighted CRSP index on date  $t$ .

Subsequently, market-adjusted CARs are calculated over a [-2, 2] window around announcements (CAR [-2, 2]), as follows:

$$CAR_{i,T_1,T_2} = \sum_{t=T_1}^{T_2} AR_{it}.$$

### ***Long-term performance***

This paper uses buy-and-hold abnormal returns to measure acquirer long-term performance in completed deals. Test statistics of long-term market-adjusted abnormal returns are misspecified

<sup>13</sup> Additional results obtained using an alternative methodology of constrained acquirers are discussed in Section 4.

due to rebalancing bias, new-listing bias, and skewness bias (Barber and Lyon, 1997; Lyon et al., 1999). To address these problems, Lyon et al. (1999) and Bouwman et al. (2009) use size-adjusted buy-and-hold abnormal returns (BHARs) to measure long-term stock performance. Therefore, this paper calculates post-merger 36-month size-adjusted BHARs (BHAR36). Specifically, size-adjusted BHARs are calculated as follows:

$$BHAR_{i,T_1,T_2} = \prod_{t=T_1}^{T_2} (1 + R_{it}) - \prod_{t=T_1}^{T_2} (1 + R_{pt})$$

where  $R_{it}$  is the monthly stock return for firm  $i$  in month  $t$  and  $R_{pt}$  is the monthly return for reference portfolio in month  $t$ , calculated as

$$R_{pt} = \frac{1}{N} \sum_{j=1}^N R_{jt}$$

where  $R_{jt}$  is the monthly stock return for firm  $j$  in month  $t$  and  $N$  the number of firms.

In each year, we construct 50 reference portfolios based on size and market-to-book. The reference portfolios are created in two stages, following Bouwman et al. (2009). First, from 1990 to 2009, all NYSE firms are sorted into deciles on the basis of their market value, calculated as the stock price multiplied by the number of common shares outstanding in June of year  $t$ . Second, within each size decile, firms are sorted into quintiles based on their market-to-book ratios, calculated as the market value of equity in June of year  $t$  divided by the book value of equity in fiscal year  $t - 1$ . After all NYSE firms have been categorized into 50 groups, AMEX and NASDAQ firms are placed in their appropriate reference portfolios based on market value and market-to-book ratios. Additionally, firms that conducted acquisitions in year  $t$  are excluded from the reference portfolios.

### **Multivariate analysis**

The variation in acquirer abnormal returns can be explained by multiple variables. Multivariate regressions are conducted to examine the effects of top-tier investment banks.<sup>14</sup> The following equation is employed to examine the relation between acquirer performance and the retention of top-tier investment banks:

$$\begin{aligned} Performance_i = & \alpha_0 + \alpha_1 TopTier_i + \alpha_2 TopTier_i \times Constrained_i \\ & + \alpha_3 TopTier_i \times Unconstrained_i + \alpha_4 Constrained_i + \alpha_5 Unconstrained_i \\ & + \alpha_6 Firm_i + \alpha_7 Deal_i + \alpha_8 Market_i + f_t + f_{ind} \\ & + \varepsilon_i \end{aligned} \quad (1)$$

where  $Performance_i$  is the performance of acquirer  $i$ , and it can be either short-term or long-term.  $TopTier_i$  is the key explanatory variable in this research and equals one if acquirer  $i$  retains a top-tier advisor for the deal.  $Constrained_i$  ( $Unconstrained_i$ ) is a dummy that equals one if acquirer  $i$  is financially constrained (unconstrained).  $TopTier_i \times Constrained_i$  ( $TopTier_i \times Unconstrained_i$ ) is the interaction variable that interacts the  $TopTier_i$  dummy and  $Constrained_i$  ( $Unconstrained_i$ ) dummy.  $Firm_i$  represents the firm characteristics of acquirer  $i$  at the end of the fiscal year prior to the announcement, including size ( $LN(MV)$ ), market-to-book ratio ( $M/B$ ), leverage ( $Leverage$ ), cash flows-to-equity ratio ( $Cash\ flows/Equity$ ), pre-deal stock performance ( $RUNUP$ ), risk of stock ( $Sigma$ ), acquirer takeover experience ( $Experienced Bidder$ ), and whether the acquirer is a serial bidder ( $Serial Bidder$ ).  $Deal_i$  represents the deal characteristics for acquirer  $i$ , including relative transaction values ( $Relative Size$ ), target public status ( $Public$ ), payment method ( $Cash/Stock$ ), deal attitude ( $Hostile$ ), bid competition ( $Competing Bid$ ), tender offers ( $Tender Offer$ ), and diversifying deals ( $Diversification$ ).  $Market_i$  represents market

<sup>14</sup> All the control variables mentioned in this section are described in Appendix 2.



characteristics for acquirer  $i$ , including M&A market heat (*M&A Heat Degree*) and stock market valuation (*High/Low Valuation Market*).

We also control for year fixed effects ( $f_i$ ) and industry fixed effects ( $f_{ind.}$ ). To minimize the influence of outliers, all quantitative variables are winsorized at 1% and 99%.<sup>15</sup>

### 2.3. Summary statistics

Table 1 exhibits summary statistics for the entire sample.<sup>16</sup> In our sample, 48.16% and 49.01% of deals are advised by top-tier and non-top-tier advisors, respectively. In-house deals account for only 2.84% of the sample.

**Table 1: Summary Statistics**

This table presents summary statistics for the full sample of M&A Deals, stratified by the retention of financial advisors. The top-tier, non-top-tier and in-house subsamples contain deals advised by top-tier advisors, deals advised by non-top-tier advisors and in-house deals, respectively. Panels A, B, C and D report acquirer short- and long-term abnormal returns, acquirer firm characteristics, deal characteristics, and market characteristics, respectively. All variables are defined in Section 3.2 and Appendix B. Bid Premiums are winsorized if values are beyond the range of [0, 2]. Other quantitative variables are winsorized at the 1% and 99% levels. T-test and the Wilcoxon rank-sum test are used to test the difference in mean and median, respectively.

	All (A)			Top-Tier (T)			Non-Top-Tier (N)			In-House (I)			Difference (T) – (N)	
	Mean	Standard Deviation	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	P-Value Mean	P-Value Median
<b>Panel A: Acquirer Short- and Long-Term Abnormal Returns</b>														
CAR [-2, 2]	1.08%	0.10	3,420	0.57%	0.48%	1647	1.51%	0.99%	1676	2.42%	0.68%	97	0.003	0.019
BHAR36	-37.25%	0.84	3,216	-29.68%	-35.69%	1572	-44.86%	-54.79%	1551	-38.46%	-45.98%	93	0.000	0.000
<b>Panel B: Acquirer Firm Characteristics</b>														
KZ Index	-14.61	52.37	3,420	-11.67	-2.25	1647	-18.12	-2.75	1676	-3.83	-1.28	97	0.000	0.010
MV (\$ mil)	8239.88	23159.14	3,420	12944.36	2496.40	1647	2425.14	388.54	1676	28829.64	1602.12	97	0.000	0.000
M/B	4.84	6.80	3,420	4.86	3.02	1647	4.64	2.76	1676	7.97	5.00	97	0.181	0.004
Leverage	0.28	0.26	3,420	0.31	0.30	1647	0.24	0.15	1676	0.25	0.24	97	0.000	0.000
Cash Flows/Equity	0.04	0.13	3,420	0.06	0.06	1647	0.03	0.05	1676	0.04	0.05	97	0.000	0.000
RUNUP	0.17	0.49	3,420	0.15	0.10	1647	0.20	0.11	1676	0.15	0.12	97	0.005	0.093
Sigma	0.03	0.02	3,420	0.03	0.02	1647	0.04	0.03	1676	0.03	0.03	97	0.000	0.000
Past Experience	6.94	8.53	3,420	8.57	6.00	1647	4.90	3.00	1676	14.67	8.00	97	0.000	0.000
Serial Bidder	28.74%	0.45	3,420	37.40%	–	1647	18.79%	–	1676	53.61%	–	97	0.000	–
<b>Panel C: Deal Characteristics</b>														
Transaction Value (\$ mil.)	728.25	1823.83	3,420	1207.49	365.35	1647	275.16	69.69	1676	419.63	101.13	97	0.000	0.000
Relative Size	0.34	0.45	3,420	0.33	0.17	1647	0.36	0.19	1676	0.10	0.05	97	0.037	0.001
Public	46.20%	0.50	3,420	53.79%	–	1647	36.63%	–	1676	82.47%	–	97	0.000	–
All Stock Deals	25.50%	0.44	3,420	20.40%	–	1647	29.18%	–	1676	48.45%	–	97	0.000	–
All Cash Deals	37.08%	0.48	3,420	42.38%	–	1647	32.10%	–	1676	32.99%	–	97	0.000	–
Mixed Deals	37.43%	0.48	3,420	37.22%	–	1647	38.72%	–	1676	18.56%	–	97	0.186	–
Hostile	2.63%	0.16	3,420	3.89%	–	1647	1.55%	–	1676	0.00%	–	97	0.000	–
Competing Bid	3.19%	0.18	3,420	4.31%	–	1647	2.15%	–	1676	2.06%	–	97	0.000	–
Tender Offer	16.20%	0.37	3,420	19.73%	–	1647	12.47%	–	1676	20.62%	–	97	0.000	–
Diversification	34.82%	0.48	3,420	34.43%	–	1647	34.90%	–	1676	40.21%	–	97	0.386	–
Completed Deals	92.98%	0.26	3,420	92.53%	–	1647	93.38%	–	1676	93.81%	–	97	0.171	–
Time to Resolution	86.02	78.92	3,386	95.23	73.00	1635	75.51	54.00	1658	111.39	98.00	93	0.000	0.000
Bid Premiums	42.61%	0.38	1,456	40.62%	33.33%	839	43.84%	35.04%	546	56.76%	45.45%	71	0.061	0.295
Advisory Fees (\$ mil)	3.89	6.45	537	6.21	3.23	256	1.77	0.75	281	–	–	–	0.000	0.000
Relative Advisory Fees	0.85%	0.85%	537	0.69%	0.51%	256	0.99%	0.75%	281	–	–	–	0.000	0.000
<b>Panel D: Market Characteristics</b>														
Heat Degree	1.45	0.34	3,420	1.40	1.36	1647	1.47	1.44	1676	1.82	1.85	97	0.000	0.000
High Valuation Market	44.06%	0.50	3,420	39.28%	–	1647	46.00%	–	1676	91.75%	–	97	0.000	–
Neutral Valuation Market	38.77%	0.49	3,420	41.23%	–	1647	38.37%	–	1676	4.12%	–	97	0.046	–
Low Valuation Market	17.16%	0.38	3,420	19.49%	–	1647	15.63%	–	1676	4.12%	–	97	0.002	–

Panel A of Table 1 shows both short- and long-term abnormal returns for acquirers. For the full sample, acquirers' CAR [-2, 2] and BHAR36 average 1.08% and -37.25%, respectively. Deals advised by top-tier advisors generate significantly lower short-term returns but significantly higher long-term returns for acquirers than deals advised by non-top-tier advisors.

<sup>15</sup> Results hold when the variables are winsorized at different levels, such as 2% and 98%, 3% and 97%, and 5% and 95%.

<sup>16</sup> All the variables mentioned in this section are described in Appendix 2, where Panels A to D present acquirer short- and long-term abnormal returns, acquirer firm characteristics, deal characteristics, and market characteristics, respectively.

Panel B of Table 1 presents statistics for firm characteristics. The KZ index for acquirers averages -14.61 over the sample period (1990-2012). Additionally, acquirers that retain top-tier advisors have a higher KZ index than acquirers that retain non-top-tier advisors (-11.67 versus -18.12), indicating that relatively more constrained acquirers tend to choose top-tier advisors.

Furthermore, compared to acquirers advised by non-top-tier advisors, acquirers that retain top-tier advisors tend to be larger firms, glamour firms, firms with higher leverage, firms with higher cash flows-to-equity ratio, firms with lower stock performance and lower risk, firms with more takeover experienced, and serial bidders.

Panel C shows the deal characteristics. Top-tier advisors are more likely to be retained in acquisitions with a higher transaction value but lower relative size, public acquisitions, all-cash deals, hostile deals, competing bids, and tender offers. In addition, top-tier advisors take more time to complete deals and help their clients pay lower bid premiums. Top-tier advisors charge higher advisory fees; however, when the deal value is taken into consideration, acquirers pay lower relative advisory fees in deals advised by top-tier advisors.

Panel D presents the market characteristics. M&A Heat Degree is significantly negatively related to the retention of top-tier advisors, indicating that acquirers in a relatively cold M&A market tend to choose top-tier advisors. In addition, acquirers are more likely to choose top-tier advisors when stock market valuations are low or neutral.

The correlation matrix of variables used in regression analyses is shown in Table 2. The results show relatively low correlation between most independent variables. In particular, the correlation between *TopTier* dummy and other variables, and the correlations between *KZ Index* and other variables are low, suggesting that these are unlikely to cause any concern regarding multicollinearity in regression analyses.

**Table 2: Correlation Matrix**

This table presents pairwise correlations of the variables. Variables are abbreviated as follows: CAR – CAR [-2, 2]; BHAR – BHAR36; Top – Top-Tier Advisor; KZ – KZ Index; MV – Market Value; MB – M/B; LEV – Leverage; CFE – Cash Flows/Equity; RUN – RUNUP; SIG – Sigma; PE – Past Experience; SB – Serial Bidder; RS – Relative Size; PUB – Public; STO – Stock; CAS – Cash; HOS – Hostile; CB – Competing Bid; TO – Tender Offer; DIV – Diversification; HD – Heat Degree; HVM – High Valuation Market; LVM – Low Valuation Market. All variables are defined in Section 3.2 and Appendix B. Bid Premiums are winsorized if values are beyond the range of [0, 2]. Other quantitative variables are winsorized at the 1% and 99% levels.

	CAR	BHAR	TOP	KZ	MV	MB	LEV	CFE	RUN	SIG	PE	SB	RS	PUB	STO	CAS	HOS	CB	TO	DIV	HD	HVM	LVM
CAR	1.00																						
BHAR	-0.01	1.00																					
TOP	-0.05	0.09	1.00																				
KZ	0.01	0.06	0.05	1.00																			
MV	-0.07	0.01	0.19	0.04	1.00																		
MB	-0.03	-0.16	0.00	-0.18	0.18	1.00																	
LEV	0.05	0.09	0.13	0.19	0.03	-0.06	1.00																
CFE	0.07	0.11	0.11	0.29	0.03	-0.11	0.16	1.00															
RUN	-0.02	-0.13	-0.04	-0.07	0.01	0.46	-0.08	-0.04	1.00														
SIG	0.00	-0.15	-0.28	-0.29	-0.22	0.24	-0.19	-0.35	0.32	1.00													
PE	-0.07	0.03	0.18	0.11	0.56	0.01	0.13	0.07	-0.06	-0.25	1.00												
SB	-0.05	0.03	0.18	0.11	0.33	-0.02	0.11	0.08	-0.08	-0.27	0.67	1.00											
RS	0.07	0.08	-0.02	0.04	-0.18	-0.14	0.19	0.05	-0.06	0.11	-0.15	-0.15	1.00										
PUB	-0.14	0.03	0.14	0.07	0.17	-0.02	0.06	0.02	-0.04	-0.13	0.17	0.14	0.08	1.00									
STO	-0.09	-0.14	-0.12	-0.09	0.00	0.27	-0.13	-0.18	0.22	0.32	-0.02	-0.04	-0.05	0.14	1.00								
CAS	0.09	0.10	0.10	0.07	0.08	-0.15	0.03	0.15	-0.16	-0.30	0.12	0.13	-0.18	0.02	-0.44	1.00							
HOS	-0.06	0.04	0.08	0.03	0.03	-0.02	0.07	0.05	-0.01	-0.06	0.07	0.05	0.12	0.16	-0.05	0.01	1.00						
CB	-0.07	0.02	0.06	0.01	0.03	-0.02	0.04	0.04	-0.03	-0.06	0.02	0.04	0.12	0.16	-0.04	0.00	0.31	1.00					
TO	0.05	0.05	0.10	0.06	0.05	-0.10	0.04	0.08	-0.11	-0.14	0.09	0.09	-0.04	0.46	-0.20	0.33	0.16	0.14	1.00				
DIV	-0.03	-0.04	-0.01	-0.01	0.10	0.01	0.03	0.02	0.00	-0.06	0.10	0.07	-0.09	-0.06	0.01	-0.01	0.00	-0.04	-0.06	1.00			
HD	0.02	-0.09	-0.12	-0.01	-0.03	0.14	0.04	0.05	0.01	0.07	0.04	0.03	0.06	0.10	0.25	-0.17	0.01	0.02	0.05	0.04	1.00		
HVM	0.03	-0.10	-0.09	-0.05	0.00	0.17	0.01	0.02	0.11	0.22	0.04	0.02	0.04	0.04	0.23	-0.17	-0.01	0.00	0.02	0.04	0.60	1.00	
LVM	-0.03	0.09	0.06	0.02	0.03	-0.09	0.05	0.01	-0.10	-0.19	0.01	0.02	-0.04	-0.03	-0.13	0.12	0.01	-0.02	-0.01	-0.01	-0.29	-0.40	1.00

### 3. Empirical results

#### 3.1. Univariate analysis

##### *Short-term performance*

Table 3 reports the short-term performance (CAR [-2, 2]) for different advisor–constraint groups and their univariate comparison.

**Table 3: Acquirer Short-Term Performance**

This table reports acquirer short-term 5-day market-adjusted CARs around the announcement for the full sample. The variable is defined in Section 3.2 and Appendix B. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers. Panel A relates to all deals in the sample. Panel B relates to deals advised by top-tier advisors. Panel C relates to deals advised by non-top-tier advisors. Panel D relates to in-house deals. Panel E relates to the difference in acquirer performance between deals advised by top-tier and non-top-tier advisors. The variable (CAR [-2, 2]) is winsorized at the 1% and 99% levels. T-test is used to test the significance of the mean, and the difference in the means. Wilcoxon signed-rank test and Wilcoxon rank-sum test are used to test the significance of median and the difference in medians, respectively. P-Values are shown in parentheses. Statistical significance at the 1% level, 5% level and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	All (A)	Constrained (C)	Neutral (N)	Unconstrained (U)	Difference (C) – (U)
<b>Panel A: All</b>					
<b>Mean</b>	1.08%*** (0.000)	1.94%*** (0.000)	0.90%*** (0.001)	0.41% (0.196)	1.53%*** (0.000)
<b>Median</b>	0.64%*** (0.000)	1.41%*** (0.000)	0.54%*** (0.003)	0.17% (0.310)	1.24%*** (0.000)
<b>N</b>	3,420	1,140	1,140	1,140	
<b>Panel B: Top-Tier</b>					
<b>Mean</b>	0.57%*** (0.008)	2.31%*** (0.000)	0.18% (0.549)	-0.88%** (0.042)	3.19%*** (0.000)
<b>Median</b>	0.48%*** (0.003)	1.82%*** (0.000)	0.21% (0.529)	-0.24%** (0.049)	2.06%*** (0.000)
<b>N</b>	1,647	545	603	499	
<b>Panel C: Non-Top-Tier</b>					
<b>Mean</b>	1.51%*** (0.000)	1.49%*** (0.001)	1.61%*** (0.000)	1.45%*** (0.002)	0.04% (0.474)
<b>Median</b>	0.99%*** (0.000)	1.28%*** (0.001)	0.91%*** (0.002)	0.69%*** (0.003)	0.59% (0.830)
<b>N</b>	1,676	553	505	618	
<b>Panel D: In-House</b>					
<b>Mean</b>	2.42%*** (0.003)	3.08%** (0.039)	2.98%** (0.012)	0.45% (0.748)	2.63%* (0.096)
<b>Median</b>	0.68%** (0.033)	-0.05% (0.167)	2.34%** (0.014)	-0.45% (0.670)	0.40% (0.476)
<b>N</b>	97	42	32	23	

Panel E: Difference (Panel B – Panel C)				
<b>Mean</b>	-0.94%*** (0.003)	0.83%* (0.073)	-1.43%*** (0.004)	-2.33%*** (0.000)
<b>Median</b>	-0.51%** (0.019)	0.54% (0.125)	-0.70%** (0.029)	-0.93%*** (0.000)

Panel A of Table 2 shows the announcement abnormal returns for the full sample. On average, constrained acquirers significantly outperform unconstrained acquirers by 1.53% ( $p = 0.000$ ). This result is consistent with the free cash flow hypothesis that cash-rich acquirers tend to conduct value-destroying takeovers.

Panel B of Table 2 shows that deals advised by top-tier advisors generate significantly positive announcement abnormal returns for constrained acquirers, but significantly negative abnormal returns for unconstrained acquirers. For deals advised by top-tier advisors, constrained acquirers significantly outperform unconstrained acquirers by 3.19% ( $p = 0.000$ ) on average, while median constrained acquirers outperform median unconstrained acquirers by 2.06% ( $p = 0.000$ ).

Panel C of Table 2 represents the announcement abnormal returns for acquirers advised by non-top-tier advisors. The results suggest there is no significant difference in abnormal returns between constrained and unconstrained acquirers. These results indicate that constrained acquirers do not outperform unconstrained acquirers without the services of top-tier advisors. In other words, if the free cash flow hypothesis can explain all the variation in acquirer short-term performance, constrained acquirers should also outperform unconstrained acquirers in deals advised by non-top-tier advisors. Our results suggest that top-tier advisors play a pivotal role in helping constrained acquirers gain superior performance.

Panel D of Table 2 represents the announcement abnormal returns for acquirers in in-house deals. The results show a marginally significant difference in mean return, but an insignificant difference in median return, between constrained and unconstrained acquirers. The small sample size of in-house deals leads to inconsistent results.

Panel E shows the differences in acquirer announcement abnormal returns between deals advised by top-tier and non-top-tier advisors. For the full sample, acquirers advised by top-tier advisors underperform non-top-tier advisors by 0.94% ( $p = 0.003$ ) on average. This result is attributed to unconstrained and neutral acquirers. On average, unconstrained acquirers advised by top-tier advisors significantly underperform unconstrained acquirers advised by non-top-tier advisors by 2.33% ( $p = 0.000$ ), while neutral acquirers advised by top-tier advisors significantly underperform neutral acquirers advised by non-top-tier advisors by 1.43% ( $p = 0.004$ ). In contrast, constrained acquirers advised by top-tier advisors significantly outperform constrained acquirers advised by non-top-tier advisors by 0.83% ( $p = 0.073$ ). For deals advised by investment banks, constrained acquirers advised by top-tier advisors gain the highest short-term abnormal returns (2.31%,  $p = 0.000$ ), whereas unconstrained acquirers advised by top-tier advisors gain the lowest abnormal returns (-0.88%,  $p = 0.042$ ). These results suggest that constrained acquirers retain top-tier advisors to chase performance, whereas unconstrained acquirers that retain top-tier advisors do not give priority to takeover gains.

#### *Long-term performance*

Table 4 reports the long-term performance (BHAR36) for different constraint–advisor groups and their univariate comparison.<sup>17</sup> Long-term abnormal returns are significantly negative for each constraint–advisor group (except for the neutral in-house group, where mean BHAR36 is insignificantly negative), which is consistent with previous research (Bouwman et al., 2009). However, Shleifer and Vishny (2003) suggest overvalued acquirers gain profits through the

<sup>17</sup> This paper only measures acquirer long-term performance for completed deals.

acquisition of undervalued targets, although long-term abnormal returns are negative, since acquirers will gain more negative returns without acquisitions.

**Table 4: Acquirer Long-Term Performance**

This table reports the acquirer long-term 36-month size-adjusted buy-and-hold abnormal returns from the announcement for the sample of completed deals. The variable is defined in Section 3.2 and Appendix B. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers. Panel A relates to all deals in the sample. Panel B relates to deals advised by top-tier advisors. Panel C relates to deals advised by non-top-tier advisors. Panel D relates to in-house deals. Panel E relates to the difference in acquirer performance between deals advised by top-tier and non-top-tier advisors. The variable (BHAR36) is winsorized at the 1% and 99% levels. The bootstrapped skewness-adjusted t-statistic is used to test the significance of the mean. T-test is used to test the significance of the difference in the means. Wilcoxon signed-rank test and Wilcoxon rank-sum test are used to test the significance of median and the difference in medians, respectively. P-Values are shown in parentheses. Statistical significance at the 1% level, 5% level and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	All (A)	Constrained (C)	Neutral (N)	Unconstrained (U)	Difference (C) - (U)
<b>Panel A: All</b>					
<b>Mean</b>	-37.11%*** (0.000)	-30.02%*** (0.000)	-38.37%*** (0.000)	-42.69%*** (0.000)	12.67%*** (0.001)
<b>Median</b>	-44.80%*** (0.000)	-39.96%*** (0.000)	-41.87%*** (0.000)	-53.07%*** (0.000)	13.10%*** (0.000)
<b>N</b>	3,007	978	1,012	1,017	
<b>Panel B: Top-Tier</b>					
<b>Mean</b>	-29.35%*** (0.000)	-16.69%*** (0.000)	-36.31%*** (0.000)	-33.82%*** (0.000)	17.12%*** (0.001)
<b>Median</b>	-35.69%*** (0.000)	-29.65%*** (0.000)	-34.75%*** (0.000)	-45.84%*** (0.000)	16.19%*** (0.001)
<b>N</b>	1,464	461	543	460	
<b>Panel C: Non-Top-Tier</b>					
<b>Mean</b>	-45.08%*** (0.000)	-42.75%*** (0.000)	-41.91%*** (0.000)	-49.77%*** (0.000)	7.02% (0.106)
<b>Median</b>	-55.00%*** (0.000)	-55.29%*** (0.000)	-49.42%*** (0.000)	-60.19%*** (0.000)	4.91%* (0.064)
<b>N</b>	1,456	479	440	537	
<b>Panel D: In-House</b>					
<b>Mean</b>	-34.33%*** (0.002)	-31.19%** (0.039)	-23.14% (0.272)	-56.51%** (0.013)	25.32% (0.119)
<b>Median</b>	-41.35%*** (0.000)	-48.20%** (0.011)	-30.26%* (0.074)	-61.67%*** (0.004)	13.47% (0.556)
<b>N</b>	87	38	29	20	

<b>Panel E: Difference (Panel B – Panel C)</b>				
<b>Mean</b>	15.73%*** (0.000)	26.05%*** (0.000)	5.60% (0.127)	15.95%*** (0.002)
<b>Median</b>	19.31%*** (0.000)	25.63%*** (0.000)	14.67%*** (0.006)	14.35%*** (0.000)

Panels A to D represent acquirer long-term size-adjusted BHARs for the full sample, deals advised by top-tier advisors, deals advised by non-top-tier advisors, and in-house deals, respectively. For the full sample, constrained acquirers significantly outperform unconstrained acquirers by 12.67% ( $p = 0.001$ ) on average. Similarly, for deals advised by top-tier advisors, constrained acquirers significantly outperform unconstrained acquirers by 17.12% ( $p = 0.001$ ) on average. For deals advised by non-top-tier advisors, median constrained acquirers outperform median unconstrained acquirers by 4.91% ( $p = 0.064$ ). The results concur with the free cash flow hypothesis. However, for in-house deals, the performance differences between constrained and unconstrained acquirers are insignificant.

Panel E shows the differences in long-term performance between deals advised by top-tier and non-top-tier advisors. For the full sample, acquirers advised by top-tier advisors outperform acquirers advised by non-top-tier advisors by 15.73% ( $p = 0.000$ ) on average, while median acquirers advised by top-tier advisors outperform median acquirers advised by non-top-tier advisors by 19.31% ( $p = 0.000$ ). In addition, the outperformance of acquirers advised by top-tier advisors is also shown in constrained, neutral, and unconstrained acquirer subsamples. The results suggest that top-tier advisors can help their clients improve performance in the long-term, regardless of the acquirer's financial condition. However, constrained acquirers advised by top-tier advisors have the best long-term performance.

***Deal completion rate, time to resolution, bid premiums, and advisory fees***

Table 5 reports the deal completion rate for different constraint–advisor groups and their univariate comparison. Regardless of financial conditions and advisor retention status, deal completion rates are above 90%. For the full sample, the deal completion rate for constrained acquirers is 4.65% ( $p = 0.000$ ), lower than that for unconstrained acquirers. Similarly, for deals advised by top-tier and non-top-tier advisors, constrained acquirers have significantly lower deal completion rates, compared to unconstrained acquirers. However, for in-house deals, there is no significant difference in deal completion rate between constrained and unconstrained acquirers. In addition, the results suggest top-tier advisors do not help acquirers to improve the deal completion rate. For constrained and neutral acquirers, deals advised by top-tier advisors even have lower deal completion rates, although the results are insignificant. If top-tier advisors have superior skills, they should have a stronger ability to complete deals; however, acquirers advised by top-tier advisors do not have higher completion rates. One possible explanation is that top-tier advisors pay more attention to deal quality rather than deal completion, and therefore deter value-destroying deals. For deals with investment banks' advisory service, constrained acquirers advised by top-tier advisors have the lowest deal completion rate, whereas unconstrained acquirers advised by non-top-tier advisors have the highest deal completion rate. These results suggest unconstrained acquirers retain top-tier advisors to pursue deal completion.

**Table 5: Deal Completion Rate**

This table reports the deal completion rate for the full sample. The variable is defined in Section 3.2 and Appendix B. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as

neutral acquirers. Panel A relates to all deals in the sample. Panel B relates to deals advised by top-tier advisors. Panel C relates to deals advised by non-top-tier advisors. Panel D relates to in-house deals. Panel E relates to the difference in acquirer performance between deals advised by top-tier and non-top-tier advisors. T-test is used to test the significance of the mean, and the difference in the means. P-Values are shown in parentheses. Statistical significance at the 1% level, 5% level and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	All (A)	Constrained (C)	Neutral (N)	Unconstrained (U)	Difference (C) - (U)
<b>Panel A: All</b>					
<b>Mean</b>	92.98%	90.53%	93.25%	95.18%	-4.65%*** (0.000)
<b>N</b>	3,420	1,140	1,140	1,140	
<b>Panel B: Top-Tier</b>					
<b>Mean</b>	92.53%	90.09%	92.54%	95.19%	-5.10%*** (0.001)
<b>N</b>	1,647	545	603	499	
<b>Panel C: Non-Top-Tier</b>					
<b>Mean</b>	93.38%	90.60%	94.26%	95.15%	-4.55%*** (0.001)
<b>N</b>	1,676	553	505	618	
<b>Panel D: In-House</b>					
<b>Mean</b>	93.81%	95.24%	90.63%	95.65%	-0.41% (0.470)
<b>N</b>	97	42	32	23	
<b>Panel E: Difference (Panel B – Panel C)</b>					
<b>Mean</b>	-0.85% (0.171)	-0.51% (0.389)	-1.72% (0.124)	0.04% (0.486)	

Table 6 reports the time to resolution for different constraint–advisor groups and their univariate comparison. Time to resolution is measured as the number of days between the announcement and effective dates. Compared to unconstrained acquirers, constrained acquirers use 30.84 ( $p = 0.000$ ) more days to complete deals on average. In addition, in deals advised by top-tier advisors and deals advised by non-top-tier advisors, the time to resolution is significantly longer for constrained acquirers than unconstrained acquirers. These results suggest that constrained acquirers are more careful in conducting takeovers. However, for in-house deals, the differences between constrained and unconstrained acquirers are insignificant. It is not surprising that in-house acquirers without professional advisors' help use the longest time to negotiate an agreement for deals. Furthermore, acquirers advised by top-tier advisors take 19.72 ( $p = 0.000$ ) more days to complete deals than acquirers advised by non-top-tier advisors. For all three different constraint groups, time to resolution is significantly higher for acquirers advised by top-tier advisors. If top-tier advisors have superior skills, they can take less time to complete deals. On the one hand, it is possible that top-tier advisors are retained in more complex deals, and therefore they take a longer time to complete deals. On the other hand, the results may suggest top-tier advisors work diligently.

**Table 6: Time to Resolution**

This table reports time to resolution for the full sample. The variable is defined in Section 3.2 and Appendix B. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers. Panel A relates to all deals in the sample. Panel B relates to deals advised by top-tier advisors. Panel C relates to deals advised by non-top-tier advisors. Panel D relates to in-house deals. Panel E relates to the difference in acquirer performance between deals advised by top-tier and non-top-tier advisors. The variable (Time to Resolution) is winsorized at the 1% and 99% levels. T-test is used to test the significance of the mean, and the difference in the means. Wilcoxon signed-rank test and Wilcoxon rank-sum test are used to test the significance of median and the difference in medians, respectively. P-Values are shown in parentheses. Statistical significance at the 1% level, 5% level and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	All (A)	Constrained (C)	Neutral (N)	Unconstrained (U)	Difference (C) - (U)
<b>Panel A: All</b>					
Mean	86.02	101.68	85.60	70.84	30.84*** (0.000)
Median	66.00	79.00	64.00	52.00	27.00*** (0.000)
N	3,386	1,125	1,132	1,129	
<b>Panel B: Top-Tier</b>					
Mean	95.23	108.08	95.95	80.43	27.65*** (0.000)
Median	73.00	83.00	73.00	63.00	20.00*** (0.000)
N	1,635	538	601	496	
<b>Panel C: Non-Top-Tier</b>					
Mean	75.51	94.12	72.55	61.29	32.83*** (0.000)
Median	54.00	73.00	49.00	42.00	31.00*** (0.000)
N	1,658	546	502	610	
<b>Panel D: In-House</b>					
Mean	111.39	118.37	96.97	117.13	1.24 (0.477)
Median	98.00	102.00	79.00	97.00	5.00 (0.585)
N	93	41	29	23	
<b>Panel E: Difference (Panel B – Panel C)</b>					
Mean	19.72*** (0.000)	13.96*** (0.003)	23.40*** (0.000)	19.14*** (0.000)	
Median	19.00*** (0.000)	10.00*** (0.003)	24.00*** (0.000)	21.00*** (0.000)	

Table 7 shows the bid premiums for different constraint–advisor groups and their univariate comparison. Bid premiums, obtained from Thomson One Banker, are calculated as the difference



between the deal price and the target's stock price four weeks prior to the announcement divided by the latter term. Following Golubov et al. (2012) and Officer (2003), we winsorize the variable if values are beyond the range of [0, 2]. If acquirers have a higher bargaining power, they will pay lower bid premiums. For the full sample, constrained acquirers pay significantly lower premiums than unconstrained acquirers, indicating that constrained acquirers care more about takeover performance than unconstrained acquirers do. Without a professional advisory service, in-house acquirers pay the highest bid premiums, compared to acquirers advised by top-tier and non-top-tier advisors. On average, acquirers advised by top-tier advisors pay significantly lower bid premiums than acquirers advised by non-top-tier advisors do, which suggests that top-tier advisors help their clients to gain stronger bargaining power in the negotiation process and therefore secure more shares of synergy. On average, constrained acquirers advised by top-tier advisors pay the lowest bid premium (38.21%).

**Table 7: Bid Premium**

This table reports the bid premium for the public deals. The variable is defined in Section 3.2 and Appendix B. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers. Panel A relates to all deals in the sample. Panel B relates to deals advised by top-tier advisors. Panel C relates to deals advised by non-top-tier advisors. Panel D relates to in-house deals. Panel E relates to the difference in acquirer performance between deals advised by top-tier and non-top-tier advisors. The variable (Bid Premium) is winsorized if values are beyond the range of [0, 2]. T-test is used to test the significance of the mean, and the difference in the means. Wilcoxon signed-rank test and Wilcoxon rank-sum test are used to test the significance of median and the difference in medians, respectively. P-Values are shown in parentheses. Statistical significance at the 1% level, 5% level and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	All (A)	Constrained (C)	Neutral (N)	Unconstrained (U)	Difference (C) - (U)
<b>Panel A: All</b>					
<b>Mean</b>	42.61%	40.34%	42.29%	46.03%	-5.69%** (0.013)
<b>Median</b>	34.31%	33.50%	33.33%	37.26%	-3.76%* (0.064)
<b>N</b>	1,456	529	524	403	
<b>Panel B: Top-Tier</b>					
<b>Mean</b>	40.62%	38.21%	38.46%	46.58%	-8.37%*** (0.005)
<b>Median</b>	33.33%	32.40%	31.29%	38.10%	-5.70%** (0.018)
<b>N</b>	839	283	324	232	
<b>Panel C: Non-Top-Tier</b>					
<b>Mean</b>	43.84%	41.54%	46.76%	43.71%	-2.17% (0.299)
<b>Median</b>	35.05%	35.28%	35.42%	34.45%	0.83% (0.961)
<b>N</b>	546	216	177	153	

<b>Panel D: In-House</b>					
<b>Mean</b>	56.76%	51.81%	61.75%	58.65%	-6.84% (0.318)
<b>Median</b>	45.45%	39.40%	47.40%	46.49%	-7.09% (0.624)
<b>N</b>	71	30	23	18	
<b>Panel E: Difference (Panel B – Panel C)</b>					
<b>Mean</b>	-3.22%* (0.061)	-3.33% (0.141)	-8.31%** (0.012)	2.87% (0.249)	
<b>Median</b>	-1.72% (0.295)	-2.88% (0.359)	-4.13%* (0.065)	3.65% (0.282)	

Table 8 shows the acquirer relative advisory fees for different constraint–advisor groups and their univariate comparison. Relative advisory fees are measured as acquirer total advisory fees divided by takeover transaction value. It has been shown in the summary statistics that top-tier advisors charge premium advisory fees. However, if top-tier advisors are retained in complex deals, it is reasonable that they charge higher advisory fees for deals with a higher transaction value. Therefore, it is necessary to examine relative advisory fees. The results suggest top-tier advisors charge significantly lower relative advisory fees than non-top-tier advisors, which is consistent with the univariate test results in Golubov et al. (2012). In other words, acquirers do not overpay top-tier advisors. In addition, it is not surprising that constrained acquirers pay significantly lower relative advisory fees than unconstrained acquirers do; however, the result is driven by the subsample of deals advised by top-tier advisors. For deals advised by non-top-tier advisors, there is no significant difference between constrained and unconstrained acquirers.

**Table 8: Acquirer Relative Advisory Fees**

This table reports the acquirer relative advisory fees for deals advised by investment banks. The variable is defined in Section 3.2 and Appendix B. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers. Panel A relates to all deals in the sample. Panel B relates to deals advised by top-tier advisors. Panel C relates to deals advised by non-top-tier advisors. Panel D relates to the difference in acquirer performance between deals advised by top-tier and non-top-tier advisors. The variable (Acquirer Relative Advisory Fees) is winsorized at the 1% and 99% levels. T-test is used to test the significance of the mean, and the difference in the means. Wilcoxon signed-rank test and Wilcoxon rank-sum test are used to test the significance of median and the difference in medians, respectively. P-Values are shown in parentheses. Statistical significance at the 1% level, 5% level and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	<b>All (A)</b>	<b>Constrained (C)</b>	<b>Neutral (N)</b>	<b>Unconstrained (U)</b>	<b>Difference (C) - (U)</b>
<b>Panel A: All</b>					
<b>Mean</b>	0.85%	0.77%	0.90%	0.91%	-0.14%* (0.068)
<b>Median</b>	0.61%	0.53%	0.69%	0.64%	-0.11%** (0.031)
<b>N</b>	537	224	180	133	

<b>Panel B: Top-Tier</b>					
<b>Mean</b>	0.69%	0.62%	0.72%	0.77%	-0.15%* (0.089)
<b>Median</b>	0.51%	0.43%	0.56%	0.54%	-0.12% (0.109)
<b>N</b>	256	104	95	57	
<b>Panel C: Non-Top-Tier</b>					
<b>Mean</b>	0.99%	0.89%	1.09%	1.01%	-0.12% (0.205)
<b>Median</b>	0.75%	0.63%	0.87%	0.70%	-0.06% (0.221)
<b>N</b>	281	120	85	76	
<b>Panel D: Difference (Panel B – Panel C)</b>					
<b>Mean</b>	-0.30%*** (0.000)	-0.28%*** (0.006)	-0.37%*** (0.002)	-0.24%* (0.051)	
<b>Median</b>	-0.23%*** (0.000)	-0.21%** (0.028)	-0.31%*** (0.001)	-0.15% (0.187)	

Overall, for deals using investment banks' advisory services, constrained acquirers advised by top-tier advisors gain highest short- and long-term performance, pay the lowest bid premiums and relative advisory fees, and have the lowest deal completion rate. In contrast, unconstrained acquirers advised by top-tier advisors have the highest deal completion rate, but gain the lowest announcement returns. They also gain lower long-term returns, and pay higher bid premiums and relative advisory fees. These results suggest constrained and unconstrained acquirers advised by top-tier advisors give priority to takeover performance and deal completion, respectively. In other words, constrained acquirers retain top-tier advisors to chase performance, whereas unconstrained acquirers retain top-tier advisors to complete their intended deals.

### **3.2. Multivariate analysis**

We conduct multivariate regressions to further address the research question. Specifically, we conduct regressions of short- and long-term abnormal returns on top-tier advisors for deals advised by investment banks.

#### **Short-term performance**

Table 9 shows the results of the short-term multivariate analysis for deals advised by investment banks. Specifications 1 and 2 represent the regressions of CAR [-2, 2] on top-tier advisors for all acquirers. Specifications 3, 4, and 5 represent the regressions for constrained, neutral, and unconstrained acquirers, respectively.

**Table 9: Regression of Short-Term Performance**

This table presents the results of the OLS regression of short-term performance for the sample of completed deals advised by investment banks. In these models acquirer CAR [-2, 2] is regressed against a vector of explanatory variables. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers. Specifications 1 and 2 report the results for all acquirers. Specifications 3, 4 and 5 report the results for constrained, neutral and unconstrained acquirers, respectively. All variables are defined in Section 3.2 and Appendix B. In all models, industry fixed effects and year fixed effects are controlled for. For brevity, their coefficients are not reported in the table. All quantitative variables are winsorized at the 1% and 99% levels. P-Values shown in parentheses

are adjusted for heteroskedasticity and acquirer clustering. Statistical significance at the 1%, 5% and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	(1) All	(2) All	(3) Constrained	(4) Neutral	(5) Unconstrained
TopTier	0.0004 (0.910)	-0.0033 (0.565)	0.0145** (0.024)	-0.0043 (0.464)	-0.0125 (0.118)
TopTier×Constrained		0.0180** (0.022)			
TopTier×Unconstrained		-0.0077 (0.369)			
Constrained		-0.0061 (0.325)			
Unconstrained		0.0032 (0.637)			
Ln(MV)	-0.0054*** (0.000)	-0.0051*** (0.001)	-0.0092*** (0.000)	-0.0035 (0.131)	-0.0048 (0.108)
M/B	0.0004 (0.385)	0.0004 (0.314)	-0.0004 (0.479)	0.0002 (0.829)	0.0011 (0.173)
Leverage	0.0050 (0.495)	0.0039 (0.619)	0.0067 (0.576)	-0.0046 (0.735)	0.0050 (0.753)
Cash Flows/Equity	0.0411** (0.013)	0.0390** (0.019)	0.0536** (0.015)	0.0043 (0.934)	0.0305 (0.301)
RUNUP	0.0015 (0.755)	0.0014 (0.762)	0.0015 (0.849)	0.0060 (0.528)	-0.0062 (0.447)
Sigma	0.0301 (0.870)	0.0303 (0.869)	-0.2624 (0.356)	-0.0720 (0.856)	0.0520 (0.873)
Past Experience	-0.0000 (0.962)	0.0000 (0.989)	-0.0002 (0.807)	-0.0003 (0.406)	0.0006 (0.282)
Serial Bidder	0.0015 (0.755)	0.0017 (0.732)	0.0018 (0.849)	-0.0003 (0.969)	0.0031 (0.727)
Relative Size	0.0110* (0.055)	0.0112* (0.052)	0.0094 (0.222)	0.0051 (0.647)	0.0180 (0.180)
Public	-0.0322*** (0.000)	-0.0322*** (0.000)	-0.0234*** (0.001)	-0.0306*** (0.000)	-0.0424*** (0.000)
Cash	0.0155*** (0.000)	0.0155*** (0.000)	0.0166*** (0.008)	0.0133** (0.042)	0.0156** (0.040)
Stock	-0.0031 (0.553)	-0.0028 (0.591)	-0.0059 (0.516)	0.0071 (0.399)	-0.0092 (0.355)
Hostile	-0.0211** (0.015)	-0.0232*** (0.008)	-0.0225* (0.089)	-0.0176 (0.234)	-0.0187 (0.209)
Competing Bid	-0.0293*** (0.001)	-0.0291*** (0.001)	-0.0419*** (0.005)	-0.0248** (0.026)	-0.0036 (0.802)
Tender Offer	0.0299*** (0.000)	0.0303*** (0.000)	0.0220*** (0.006)	0.0333*** (0.000)	0.0378*** (0.000)
Diversification	-0.0070* (0.056)	-0.0063* (0.084)	-0.0126* (0.069)	-0.0023 (0.662)	-0.0062 (0.395)
M&A Heat Degree	-0.0317 (0.349)	-0.0299 (0.375)	-0.0760 (0.203)	0.0181 (0.749)	-0.0392 (0.532)

High Valuation Market	-0.0001 (0.988)	-0.0003 (0.971)	0.0136 (0.322)	-0.0113 (0.291)	-0.0061 (0.712)
Low Valuation Market	-0.0113** (0.043)	-0.0111** (0.047)	-0.0173* (0.087)	-0.0064 (0.478)	-0.0089 (0.392)
Constant	0.0840** (0.028)	0.0803** (0.037)	0.1953*** (0.005)	0.0429 (0.500)	0.0581 (0.404)
N	3323	3323	1098	1108	1117
R <sup>2</sup>	0.087	0.090	0.144	0.087	0.097
adj. R <sup>2</sup>	0.072	0.074	0.101	0.042	0.053

The *TopTier* dummy, the key explanatory variable of this paper, is insignificant in specification 1, suggesting that top-tier advisors do not help acquirers to improve announcement performance. However, the univariate tests in section 4.1 suggest the positive effects of top-tier advisors are only shown in the subsample of constrained acquirers, and the acquirers advised by top-tier advisors gain highest announcement returns. In other words, constrained acquirers retain top-tier advisors to chase performance. To examine this proposition, we add two dummy variables for constrained and unconstrained acquirers (*Constrained* dummy and *Unconstrained* dummy) and interact them with the *TopTier* dummy in Specification 2. As a consequence, we find that the interaction between *TopTier* dummy and *Constrained* dummy is significantly positive, whereas the coefficient on the interaction between *TopTier* dummy and *Unconstrained* is insignificant. The results suggest that the effects of top-tier advisors depend on acquirers' financial condition. More specifically, top-tier advisors improve their clients' announcement performance, but only for constrained acquirers. The coefficients on *Constrained* and *Unconstrained* dummies are insignificant in specification 2, suggesting financial constraint is not a determinant of acquirer announcement performance when firm, deal and market characteristics are controlled for. In addition, the coefficient on *TopTier* dummy is significantly positive in the regression of the constrained acquirer subsample (Specification 3), but insignificant in the regressions of neutral and unconstrained acquirer subsamples (Specifications 4 and 5), which is consistent with the results of specification 2. For constrained acquirers, top-tier advisors can help their clients improve announcement abnormal returns by 1.45%; however, for unconstrained and neutral acquirers, the retention of top-tier advisors does not enhance announcement performance.

Furthermore, the coefficient of *LN(MV)* is significantly negative in specifications 1 to 3, suggesting that larger firms tend to gain lower announcement returns. The coefficient of *Cash Flows/Equity* is significantly positive in specifications 1 to 3, indicating that acquirers with higher cash flows-to-equity ratio have better short-term performance. The coefficient of *Experienced Bidder* dummy is significantly negative in specification 2, suggesting that the more experienced acquirers gain lower announcement returns. The coefficient of *Relative Size* is significantly positive in specifications 1 and 2, indicating that deals with larger relative size create more announcement returns for acquirers. The coefficient of *Public* dummy is significantly negative in all specifications, implying that acquirers underperform in public acquisitions. The coefficient of *Cash* dummy is significantly positive in all specifications, suggesting that cash deals have better announcement performance. The coefficient of *Competing Bid* dummy is significantly negative in specifications 1 to 4, indicating that takeover contests have a detrimental influence on acquirer announcement returns. The coefficient of *Tender Offer* dummy is significantly positive in all specifications, implying that acquirers gain higher announcement returns in tender offers. The coefficient of *Diversification* dummy is significantly negative in specifications 1 to 3, suggesting that diversifying deals destroy value for acquirers. The coefficient of *Low Valuation Market* dummy is significantly negative in specifications 1 to 3, indicating that acquirers underperform around announcement, when the deals are conducted during a bear market.

*Long-term performance*

Table 10 shows the results of the long-term multivariate analysis for deals using investment banks' advisory services. Specifications 1 and 2 represent the regressions of BHAR36 on top-tier advisors for all acquirers. Specifications 3, 4, and 5 represent the regressions for constrained, neutral, and unconstrained acquirers, respectively.

**Table 10: Regression of Long-Term Performance**

This table presents the results of the OLS regression of long-term performance for the sample of completed deals advised by investment banks. In these models acquirer BHAR36 is regressed against a vector of explanatory variables. Acquirers are divided into three groups based on the KZ Index. Specifically, the lowest (highest) one third of acquirers ranked by their KZ Index are defined as unconstrained (constrained) acquirers. The middle one third of acquirers are classified as neutral acquirers. Specifications 1 and 2 report the results for all acquirers. Specifications 3, 4 and 5 report the results for constrained, neutral and unconstrained acquirers, respectively. All variables are defined in Section 3.2 and Appendix B. In all models, industry fixed effects and year fixed effects are controlled for. For brevity, their coefficients are not reported in the table. All quantitative variables are winsorized at the 1% and 99% levels. P-Values shown in parentheses are adjusted for heteroskedasticity and acquirer clustering. Statistical significance at the 1%, 5% and 10% levels are denoted as \*\*\*, \*\* and \* respectively.

	(1) All	(2) All	(3) Constrained	(4) Neutral	(5) Unconstrained
TopTier	0.1285*** (0.002)	0.0550 (0.327)	0.2427*** (0.001)	0.0476 (0.413)	0.0856 (0.258)
TopTier×Constrained		0.1434* (0.068)			
TopTier×Unconstrained		0.0773 (0.390)			
Constrained		-0.0385 (0.516)			
Unconstrained		-0.0075 (0.907)			
Ln(MV)	-0.0422*** (0.009)	-0.0410** (0.011)	-0.0730** (0.024)	-0.0387 (0.109)	-0.0138 (0.650)
M/B	-0.0089** (0.011)	-0.0089** (0.011)	-0.0134** (0.012)	-0.0131*** (0.008)	-0.0023 (0.690)
Leverage	0.1359* (0.097)	0.1314 (0.119)	0.2677** (0.050)	0.0239 (0.860)	0.1452 (0.310)
Cash Flows/Equity	0.3955** (0.018)	0.3828** (0.023)	0.2071 (0.367)	1.0459** (0.017)	0.1198 (0.712)
RUNUP	-0.0799* (0.090)	-0.0799* (0.093)	-0.1492* (0.069)	-0.1410* (0.074)	0.0269 (0.762)
Sigma	-3.2933* (0.087)	-3.3351* (0.083)	-4.5580 (0.176)	-3.9383 (0.223)	-2.2789 (0.945)
Past Experience	0.0048 (0.145)	0.0049 (0.140)	0.0011 (0.846)	0.0034 (0.390)	0.0067 (0.334)
Serial Bidder	-0.0168 (0.752)	-0.0128 (0.808)	-0.0891 (0.295)	0.0112 (0.874)	0.0877 (0.405)

Relative Size	0.0716 (0.170)	0.0698 (0.181)	-0.0512 (0.508)	0.0234 (0.788)	0.4169*** (0.001)
Public	0.0063 (0.871)	0.0074 (0.850)	0.0923 (0.205)	-0.0653 (0.259)	-0.0514 (0.454)
Cash	0.0551 (0.124)	0.0543 (0.132)	0.0430 (0.533)	-0.0434 (0.436)	0.1827*** (0.004)
Stock	-0.0512 (0.336)	-0.0527 (0.322)	-0.0763 (0.387)	-0.0763 (0.319)	-0.0497 (0.648)
Hostile	0.3791** (0.031)	0.3680** (0.034)	0.3799* (0.081)	0.1494 (0.618)	0.4690 (0.298)
Competing Bid	-0.0585 (0.587)	-0.0538 (0.621)	-0.0710 (0.746)	-0.0144 (0.932)	0.0256 (0.904)
Tender Offer	0.0139 (0.783)	0.0145 (0.774)	0.0410 (0.661)	0.0095 (0.901)	0.0111 (0.908)
Diversification	-0.0510 (0.165)	-0.0459 (0.214)	0.0086 (0.902)	-0.0279 (0.585)	-0.0751 (0.219)
M&A Heat Degree	0.0414 (0.889)	0.0506 (0.865)	-0.2902 (0.602)	0.0558 (0.917)	0.1705 (0.732)
High Valuation Market	-0.0388 (0.561)	-0.0358 (0.590)	0.0491 (0.663)	-0.0451 (0.660)	-0.1333 (0.340)
Low Valuation Market	0.0534 (0.313)	0.0547 (0.301)	0.0835 (0.478)	0.0362 (0.666)	0.0459 (0.533)
Constant	-0.1033 (0.772)	-0.1025 (0.775)	0.5316 (0.478)	-0.0316 (0.960)	-0.7544 (0.144)
N	2920	2920	940	983	997
R <sup>2</sup>	0.091	0.093	0.146	0.139	0.133
adj. R <sup>2</sup>	0.074	0.074	0.095	0.090	0.086

The coefficient of the *TopTier* dummy is positive for specification 1 (regression for the full sample). This result is driven by the constrained acquirer sub-sample. More specifically, the *TopTier* dummy loses its significance in specification 2, when the interactions between top-tier status and financial constraint are added in the regression. In particular, the coefficient of *TopTier*×*Unconstrained* is insignificant, whereas that of *TopTier*×*Constrained* is significantly positive, suggesting that top-tier advisors improve their clients' long-term performance for constrained acquirers rather than unconstrained acquirers. In addition, the coefficient S of *Constrained* and *Unconstrained* dummies are insignificant in specification 2, suggesting financial constraint has no significant influence on acquirer long-term performance when firm, deal and market characteristics are controlled for. Furthermore, the results of subsample regressions are consistent with specification 2. Specifically, the coefficient of *Top-Tier* dummy is significantly positive in specification 3 (constrained acquirers) but insignificant for specifications 4 (neutral acquirers) and 5 (unconstrained acquirers). In other words, top-tier advisors help constrained acquirers gain significantly higher long-term abnormal returns, but do not improve performance for unconstrained and neutral acquirers. For constrained firms, acquirers advised by top-tier advisors outperform acquirers advised by non-top-tier advisors by 24.27% in the long-term.

Additionally, the coefficient of *LN(MV)* is significantly negative in specifications 1 to 3, indicating that larger acquirers underperform in the long-term. The coefficient of *M/B* is significantly negative in specifications 1 to 4, suggesting that glamour acquirers underperform in the long-term. The coefficient of *Leverage* is significantly positive in specifications 1 and 3, implying that acquirers with a higher leverage ratio gain better long-term performance. The

coefficient of *Cash Flows/Equity* is significantly positive in specifications 1, 2 and 4, indicating that acquirers who have a better operating performance before acquisitions tend to gain higher long-term returns. The coefficient of *RUNUP* is significantly negative in specifications 1 to 4, indicating that firms with better stock performance prior to announcements do not maintain their performance during the post-merger period. The coefficient of *Sigma* is significantly negative in specifications 1 and 2, suggesting that acquirers with higher risk of stocks underperform in the long-term. The coefficient of *Relative Size* is significantly positive in specification 5, suggesting that acquisitions of relatively larger targets generate higher long-term returns for acquirers. The coefficient of *Cash* dummy is significantly positive in specification 5, suggesting that acquirers outperform in cash deals. The coefficient of *Hostile* is significantly positive in specifications 1 to 3, indicating that acquirers gain higher long-term returns in hostile deals.

#### **4. Robustness test**

This section addresses the robustness of our results.<sup>18</sup>

##### ***Financial advisor classification***

We first evaluate whether our results are sensitive to different financial advisor classifications. Specifically, we follow the method of Golubov et al. (2012), using the top-eight cut-off point. In addition, since the investment bank league table is market share-based, we also use different thresholds (e.g. 8% and 10%) of market share to define top-tier advisors. Furthermore, since the sample period of this research is longer than two decades, we also measure bank ranking separately over the 1990s and post-2000 periods. To examine whether the league table is sensitive to the time intervals, we also examine the bank ranking over each three-year period. By using different definitions of top-tier advisors, our results are not qualitatively changed.

##### ***Measure of financial constraint***

To examine whether our results are sensitive to the measure of financial constraint, we also use the SA index (Hadlock and Pierce, 2010) to classify the financial constraints of firms. Hadlock and Pierce (2010) argue that firm size and age are the reliable indicators of financial constraints and introduce the SA index; following Hadlock and Pierce (2010), we calculate the SA index using the following formula:

$$SA = (-0.737 \times \text{Size}) + (0.043 \times \text{Size}^2) - (0.040 \times \text{Age})$$

where *Size* is the natural logarithm of total assets (inflation adjusted to 2004), and *Age* is the number of years the firm is listed on Compustat. When the SA index is calculated, *Size* is winsorized at (the log of) \$4.5 billion, and *Age* is winsorized at 37 years.

Companies with a higher SA index, lower age, and larger size are more financially constrained. By using the SA index, age and size to measure financial constraint, our results are qualitatively similar.

##### ***Short-term performance***

We use alternative event windows and valuation models to measure acquirer short-term performance. Specifically, we calculate CARs over the [-1, 1] and [-5, 5] windows. In addition, we apply the market model, the Fama-French three-factor model, and the Fama-French-momentum four-factor model to compute announcement abnormal returns. The results are not sensitive to these variations.

##### ***Long-term performance***

We also use alternative event windows and valuation models to measure acquirer long-term performance. Specifically, we calculate BHARs over 12-month and 24-month windows. In addition, we calculate market-adjusted BHARs. For size-adjusted BHARs, we also use the following alternative formula:

<sup>18</sup> For reasons of brevity, this paper does not tabulate the robustness results; however, they are available upon request.



$$BHAR_{i,T_1,T_2} = \prod_{t=T_1}^{T_2} (1 + R_{it}) - 1 - R_{pt}$$

where  $R_{it}$  is the monthly stock return for firm  $i$  in month  $t$  and  $R_{pt}$  is the monthly buy-and-hold return for the reference portfolio in month  $t$ , calculated as

$$R_{pt} = \sum_{j=1}^n \frac{\prod_{t=T_1}^{T_2} (1 + R_{jt}) - 1}{n}$$

with  $R_{jt}$  the monthly stock return for firm  $j$  in month  $t$  and  $n$  the number of firms.

The results are robust to these variations.

#### **Other issues**

To control for the influence of outliers, we also winsorize all the quantitative variables at different levels, such as 2% and 98%, 3% and 97%, and 5% and 95%. In addition, bid premium is measured as the difference between offer price and target price four weeks prior to the announcement divided by the latter term. To calculate bid premiums, we also measure target prices one week and one day before the announcement; however, the results are not sensitive to the above variations.

### **5. Conclusions**

This paper examines whether top-tier investment bankers can help acquirers gain superior takeover performance in both the short- and long-term and, more importantly, whether the effects of top-tier advisors are dependent on acquirer financial constraints. In line with Malmendier and Tate (2008) that financially unconstrained acquirers tend to be overconfident and therefore make value-decreasing takeovers, this paper shows that the retention of top-tier advisors improves acquirer performance, but only for constrained acquirers. Specifically, in the short-term, retaining top-tier advisors can help constrained acquirers improve announcement abnormal returns by 1.45%, after controlling for firm, deal and market characteristics. However, the retention of top-tier advisors does not improve short-term performance for unconstrained and neutral acquirers. In the long-term, the retention of top-tier advisors is positively related to acquirer performance. The result is driven by the sub-sample of constrained acquirers. For constrained acquirers, the retention of top-tier advisors improves long-term performance by 24.27%, after firm, deal and market characteristics are controlled for. In contrast, the effects of top-tier advisors are insignificant for unconstrained and neutral acquirers. Therefore, the results indicate that the effects of top-tier advisors on acquirer performance differ across acquirers with different levels of financial constraints. The retention of top-tier advisors creates value for relatively constrained acquirers in both the short- and long-term.

Acquirers choose appropriate investment bankers to conduct M&A deals. Correspondingly, financial advisors also have rights and opportunities to determine whether they accept the offers. Since top-tier advisors tend to be in high demand, there is concern that they select their acquirer clients to maintain their reputation. In other words, it is possible that top-tier advisors cherry-pick acquirer clients with given characteristics to generate excess returns; however, empirical evidence suggests this concern is not necessary. Firstly, acquirer firm characteristics are not the only determinant to gain superior performance. To create synergy, it is essential to choose appropriate targets. Golubov et al. (2012) have highlighted the top-tier advisors' abilities to identify synergistic targets and to secure more shares of synergy for their clients. Secondly, our results suggest that financial constraint is not a significant determinant for acquirer performance, when firm, deal and market characteristics are controlled for. Acquirers advised by non-top-tier advisors are more constrained than acquirers advised by top-tier advisors. In other words, top-tier advisors tend to be retained by unconstrained acquirers. If top-tier advisors cherry-pick acquirer clients to gain

superior performance and maintain their reputation, it cannot explain the fact that top-tier advisors improve performance for constrained acquirers, but not for unconstrained acquirers.

In addition, the results for deal completion rate, bid premiums, and acquirer relative advisory fees can help explain the variation in acquirer performance. In general, deal completion is independent of bank reputation. Top-tier advisors should have a stronger ability to complete deals. It is possible that top-tier advisors emphasize deal quality, and deter value-destroying deals for their clients. However, for deals with investment bank involvement, constrained acquirers advised by top-tier advisors have the lowest deal completion rate, whereas unconstrained acquirers with top-tier advisors have the highest completion rate. Furthermore, constrained acquirers advised by top-tier advisors also pay the lowest bid premiums and relative advisory fees. In contrast, unconstrained acquirers advised by top-tier advisors pay higher advisory fees. If unconstrained acquirers chase performance, they should expect to gain higher bargaining power and therefore pay lower bid premiums; however, the highest advisory fees do not translate into greater bargaining power in the negotiation process. Unconstrained acquirers advised by top-tier advisors pay higher bid premiums. These results suggest that unconstrained acquirers care less about overpayment and takeover performance, and give priority to deal completion.

Overall, our results suggest that different acquirers have different aims. Constrained acquirers retain top-tier advisors to gain superior performance, while unconstrained acquirers retain top-tier advisors to complete their intended deals.

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**Appendix 1: Top 25 U.S. Financial Advisor Ranking Based on Transaction Value**

The table presents the ranking of the top-25 investment bankers based on the transaction value for acquisitions of U.S. targets over the period January 1990 to December 31, 2012 obtained from Thomson One Banker. Transaction value is shown in U.S. million dollars.

<b>Rank</b>	<b>Financial Advisor</b>	<b>Deal Value (\$ Mil)</b>	<b>Market Share<sup>19</sup></b>	<b>Number of Deals</b>
<b>Top-Tier</b>				
1	Goldman Sachs & Co	7,703,438.25	36.7	4,172
2	Morgan Stanley	5,939,139.94	28.3	3,328
3	Bank of America Merrill Lynch	5,606,400.70	26.7	4,967
4	JP Morgan	5,548,980.32	26.4	4,278
5	Citi/Salomon Smith Barney/Salomon Brothers	4,549,572.86	21.6	3,782
6	Credit Suisse/First Boston	4,178,196.93	19.9	4,454
7	Barclays/Lehman Brothers	3,509,500.37	16.7	2,418
8	UBS	2,266,358.97	10.8	2,424
9	Lazard	2,170,142.34	10.3	1,887
10	Deutsche Bank	1,697,296.66	8.1	1,927
<b>Non-Top-Tier</b>				
11	Evercore Partners	1,072,961.26	5.1	363
12	Commerzbank AG	595,289.46	2.8	503
13	Houlihan Lokey	579,540.88	2.8	2,289
14	PJT Partners LP	531,198.92	2.5	404
15	Wells Fargo & Co	530,559.69	2.5	935
16	Rothschild & Co	478,220.18	2.3	485
17	Greenhill & Co, LLC	461,694.01	2.2	240
18	Jefferies LLC	395,867.31	1.9	1,755
19	Stifel/KBW	371,546.54	1.8	1,535
20	Allen & Co Inc	306,787.79	1.5	158
21	Centerview Partners LLC	286,985.04	1.4	80
22	RBC Capital Markets	263,252.55	1.3	1,496
23	Moelis & Co	252,028.19	1.2	277
24	Gleacher & Co Inc	243,717.81	1.2	169
25	BNP Paribas SA	218,766.09	1.0	78

**Appendix 2: Definitions of Variables**

This table describes variables in this paper. Panels A, B, C and D present acquirer performance, firm characteristics, deal characteristics and market characteristics, respectively.

<b>Variable</b>	<b>Definition</b>
<b>Panel A: Acquirer Short- and Long-Term Abnormal Returns</b>	
<b>CAR [-2, 2]</b>	5-day market-adjusted cumulative abnormal return around announcement.
<b>BHAR36</b>	Post-merger 36-month size-adjusted buy-and-hold abnormal return.

<sup>19</sup> Sum of market share is higher than 100%, which is due to the allocation method used in the Thomson One M&A database. The default allocation method is full credit to each eligible advisor, meaning if multiple advisors work on a deal, all of them will receive league table credit for the given transaction.

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**Panel B: Acquirer Firm Characteristics**

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<b>KZ Index</b>	Kaplan–Zingales Index.
<b>MV</b>	Market value of equity measured 4 weeks before the announcement (CRSP item $PRC \times SHROUT$ ).
<b>Ln(MV)</b>	The logarithm of the market value of equity measured 4 weeks before the announcement.
<b>M/B</b>	Market-to-book ratio measured as market value of equity 4 weeks before the announcement (CRSP item $PRC \times SHROUT$ ) divided by book value of equity at the fiscal year end before the announcement (Compustat item CEQ).
<b>Leverage</b>	Total debt over total capital at the fiscal year end before the announcement (Compustat item $(DTLL+DLC)/(DLTT+DLC+SEQ)$ ).
<b>Cash Flows/Equity</b>	Cash flows-to-equity ratio measured as cash flows at the fiscal year end before the announcement (Compustat item $IB+DP-DVP-DVC$ ) divided by market value of equity 4 weeks before the announcement (CRSP item $PRC \times SHROUT$ ).
<b>RUNUP</b>	Acquirer market-adjusted CARs over the pre-announcement [-365, -28] window.
<b>Sigma</b>	Standard deviation of a firm’s market-adjusted daily abnormal returns over the pre-announcement [-365, -28] window.
<b>Past Experience</b>	Number of M&A deals made by an acquirer over the five-year period prior to the acquisition in question.
<b>Serial Bidder</b>	Dummy variable equals one if the acquirer has conducted 5 or more M&A deals over the three-year period before the acquisition in question.

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**Panel C: Deal Characteristics**

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<b>Transaction Value</b>	Transaction value of the M&A deal (from Thomson One Banker).
<b>Relative Size</b>	Transaction value divided by the acquirer market value of equity 4 weeks before the announcement.
<b>Public</b>	Dummy variable equals one if the target is a publicly listed firm.
<b>Stock</b>	Dummy variable equals one if the deal is 100% paid by stock.
<b>Cash</b>	Dummy variable equals one if the deal is 100% paid by cash.
<b>Mixed</b>	Dummy variable equals one if the deals is
<b>Hostile</b>	Dummy variable equals one if the deal attitude is identified as hostile or unsolicited by Thomson One Banker.
<b>Competing Bid</b>	Dummy variable equals one if there is more than one bidding firm reported by Thomson One Banker.
<b>Tender Offer</b>	Dummy variable equals one if the deal is identified as a tender offer by Thomson One Banker.
<b>Diversification</b>	Dummy variable equals one if the acquirer and the target have different first two-digits of the primary SIC code.
<b>Completed Deals</b>	Dummy variable equals one if the deal is successfully completed.
<b>Time to Resolution</b>	Number of days between announcement date and resolution date (effective or withdrawn).
<b>Bid Premiums</b>	Difference between the offer price and the target stock price 4 weeks before the announcement divided by the latter (from Thomson One Banker).
<b>Advisory Fees</b>	Acquirer total advisory fees (from Thomson One Banker).
<b>Relative Advisory Fees</b>	Acquirer total advisory fees divided by the transaction value.

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**Panel D: Market Characteristics**

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<b>M&amp;A Heat Degree</b>	The moving average of the number of M&A deals in each quarter divided by the historical average of the number of M&A deals in all previous quarters going back to 1985.
<b>High Valuation Market</b>	Dummy equals one if a deal is conducted in a high valuation month. To measure stock market valuation, this paper follows the method of Bouwman et al. (2009). Specifically, this paper initially detrends the monthly P/E ratios of the S&P 500 from 1985 to 2009. Subsequently, each month is classified as below or above average, based on whether the detrended P/E ratio of the month is lower or higher than the past five-year average. Finally, the lowest 50% of below average months is identified as “Low Valuation Market”, while the highest 50% of above average months is identified as “High Valuation Market”. Other months are defined as “Neutral Valuation Market”. The monthly P/E ratios of the S&P 500 are acquired from Datastream.
<b>Neutral Valuation Market</b>	Dummy equals one if a deal is conducted in a neutral valuation month.
<b>Low Valuation Market</b>	Dummy equals one if a deal is conducted in a low valuation month.

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