

**EXECUTIVE
BOARD
MEETING**

EBS/22/82
Supplement 1

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September 27, 2022

To: Members of the Executive Board

From: The Secretary

Subject: **October 2022 World Economic Outlook—Executive Summary, Chapter 1, and Online Annex—Revised Box 1.3**

Board Action: Executive Directors' **consideration** (Formal)

Tentative Board Date: **Thursday, September 29, 2022**

Publication: Yes, it is intended that the full set of the World Economic Outlook documents will be released to the public at the time of the World Economic Outlook press conference, tentatively scheduled for **Tuesday, October 11, 2022.**

Additional Information: Box 1.3 of the October 2022 *World Economic Outlook—Executive Summary, Chapter 1, and Online Annex* (EBS/22/82, 9/16/22) has been revised to include a downside scenario describing how a plausible combination of shocks from various parts of the world economy could result in a very low global growth outcome for next year.

Questions: Mr. Leigh, RES (ext. 34747)
Mr. Portillo, RES (ext. 36021)

Box 1.3. Risk Assessment around the World Economic Outlook Baseline Projection

This box provides a quantitative assessment of the risks around the *World Economic Outlook's* (WEO's) current baseline projection through confidence bands and a downside scenario. Using the approach described below for deriving confidence bands, the risk of global growth next year falling below 2 percent—a low-growth outcome that has occurred only five other times since 1970—is currently estimated to be about 25 percent. The downside scenario illustrates how a plausible combination of shocks, coming from various parts of the world economy and amplified by a large tightening in global financial conditions, could push global growth down to as low as 1 percent.

Confidence Bands

The IMF's G20 model, presented in Andrie and others (2015), is used here to quantify the uncertainty around the baseline projection through confidence bands, drawing on historical data as well as explicit judgment about the likely recurrence of (variations of) historical episodes.¹ The approach should be thought of as complementary to the growth-at-risk framework presented in the *Global Financial Stability Report*, which links the probability distribution of growth projections to financial conditions.

Confidence bands around central projections are a well-known device for conveying forecast uncertainty, and they often reflect both statistical properties of the data and expert judgment. The benefit of using a structural, global model such as the G20 model for this exercise is the ability to analyze many individual countries jointly, consistently, and for multiple macroeconomic variables.

The model is first used to interpret the historical cross-country data on output, inflation for some countries, and oil prices, and to estimate the implied economic shocks—to aggregate demand and supply and oil supply. The economic shocks that are estimated this way are correlated across countries and through time, which helps address possible limitations in the propagation mechanisms in the model. Drawing all global and country-specific economic shocks for a given year jointly captures periods in which shocks are synchronized, such as 2020, and periods in which there is greater variation across countries, such as during the recovery from the global financial crisis. The resulting distribution of macroeconomic variables is shaped by the distribution of economic shocks, the properties of the model, and the initial conditions for the projection, including the effective lower bound on monetary policy rates (which is less relevant for the current outlook than it was in previous years).

Underlying the construction of the bands is the idea that, while history does not repeat itself, it rhymes, and so future shocks may partially resemble those in the past. The historical parallels can also be introduced explicitly through expert judgment. If there is a historical episode that shares some features with the current period, then shocks from that episode could be sampled more often when constructing the confidence bands. If no judgment is imposed, then historical shocks are sampled uniformly.

The authors of this box are by Michal Andrie, Jared Bebee, Allan Dizioli, Rafael Portillo, and Aneta Radzikowski.

¹ An early version of the approach is described in Andrie and Hunt (2020).

Figure 1.3.1 shows the distribution for global growth that results from this approach, with and without judgment, and under the assumption that the current WEO baseline projection is the mode of the distribution.² Each shade of blue represents a 5 percentage point interval, and so the entire band captures 90 percent of the distribution. Panel 1 shows the distribution when shocks are sampled uniformly; panel 2 shows the distribution when shocks from the year 1982 are considered to be 10 times more likely than those from other years. The year 1982 stands out as relevant because it was a time when the world economy was experiencing a slowdown in activity, reflecting contractionary monetary policy in advanced economies to address high inflation, most notably in the US.³ But there are limits to the historical parallel: while the current inflationary environment is reminiscent of the 1970s or early 1980s, the COVID shock is unprecedented, and policy frameworks today are very different. Nonetheless, drawing on events such as the 1982 episode can help illustrate the balance of risks to the current outlook.

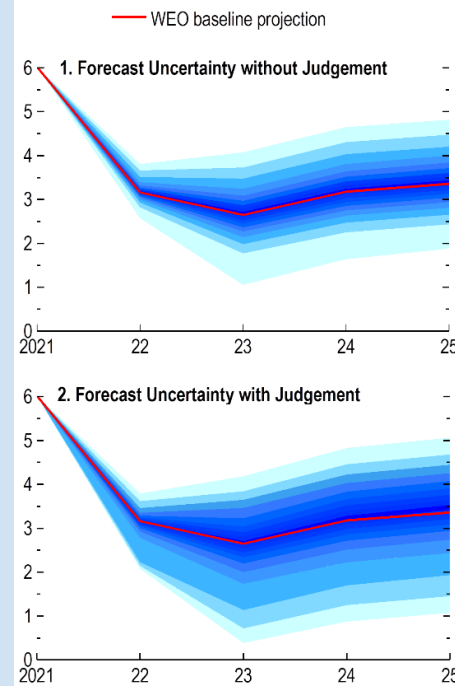
Without judgment, very low growth outcomes are already somewhat likely because global growth is unusually low under the baseline (the mode of the distribution). With the judgment added, however, the distribution skews further down, increasing the probability of historically low outcomes such as 2 percent or even 1 percent global growth.

Downside Scenario

The IMF’s G20 model is also used to quantify several specific risks to the outlook. The shocks come from various parts of the world economy, underscoring the many sources of uncertainty currently prevailing. Their joint effect would be amplified by a large tightening in global financial conditions. If the downside scenario materializes the level of global activity will be 1.5 percentage points lower in 2023 and 1.6 percentage points lower in 2024, relative to the current baseline.

The downside scenario consists of the following layers:

Figure 1.3.1. Distribution of World GDP Growth Forecast (Percent)



Source: IMF staff calculations.
 Note: Each shade of blue represents a five percentage point interval. Shocks are sampled uniformly in panel 1 while shocks from 1982 are considered to be 10 times more likely than other years in panel 2. WEO = World Economic Outlook.

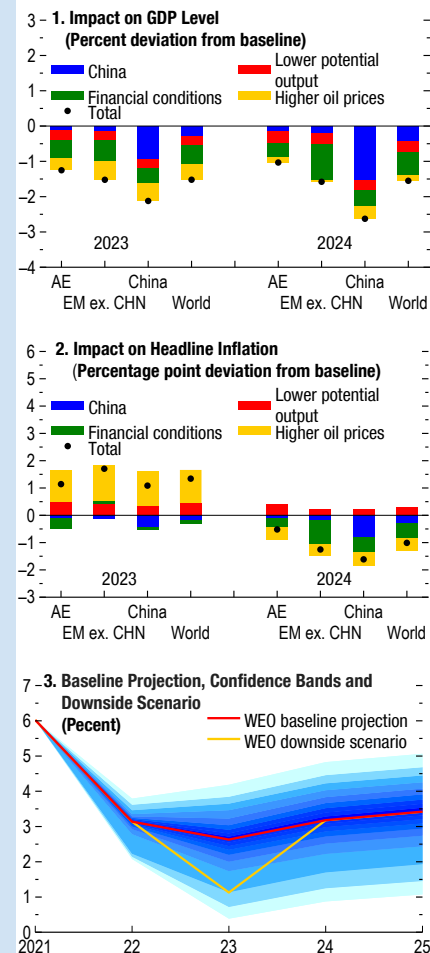
² Shocks to demand and supply and global oil shocks were estimated using the entire WEO sample starting in 1960; shocks to demand were estimated for all G20 countries, whereas shocks to supply were estimated only for the US. Future work will expand the estimation to include supply shocks for all G20 countries, which will allow for a richer assessment of uncertainty around inflation projections.

³ While there are other episodes in the 1970s and 1980s that share similarities with the current period, 1982 stands out for its impact on global growth

- **Higher oil prices.** Oil prices are pushed up 30 percent, on average, for 2023 relative to the current baseline because of a combination of (i) ongoing efforts to reduce Russia’s oil export revenues, and (ii) retaliation from Russia in the form of a 25 percent decrease in overall oil exports. Oil prices start to decline in 2024 but stay 15 percent higher than baseline. The shock fades in 2025 as global supply and demand for oil adjust.
- **China’s real estate sector.** Issues in the real estate sector lead to further decreases in real estate investment over the next two years. The level of total fixed investment falls by as much as 9 percent by 2024, relative to the baseline projection.
- **Lower potential output from persistent disruptions in labor markets.** Labor markets show clear signs of overheating, especially in several advanced economies, despite activity remaining below pre-COVID trends. Two labor market developments help account for the disconnect: lower labor force participation and shifts in the Beveridge curve that point to worsened efficiency in matching workers and jobs. In the downside scenario these two features are more persistent than expected, leading to lower equilibrium employment than in the baseline and higher equilibrium unemployment. Underlying potential output is lower as a result, implying less slack and more inflation, and requiring a larger monetary policy response than currently envisaged. The layer differentiates across countries depending on how they fare in the two labor indicators relative to pre-COVID levels: lower labor force participation is more important for some advanced economies and emerging markets, while shifts in the Beveridge curve are more visible in advanced economies such as the US and some European countries (data on vacancies is limited for most emerging markets).
- **Tighter global financial conditions.** The combination of the first three shocks leads to a large tightening in global financial conditions. Emerging market currencies experience a sizable depreciation vis-à-vis the US dollar: 10 percent in emerging markets outside Asia and 5 percent in Asian emerging markets, including China, on average in 2023. Relatedly, emerging markets (this time excluding China) see an average increase in sovereign premia of over 200 basis points in 2023, and an additional increase in corporate premia of around 80 basis points. Advanced economies experience an increase in corporate premia of around 100 basis points and are also negatively affected by the large depreciation of emerging market currencies.

The simulations assume monetary policy responds endogenously to movements in inflation. Fiscal policy responds through automatic stabilizers but no additional fiscal measure is assumed.

Figure 1.3.2. Impact of Downside Scenario on GDP and Inflation



Source: IMF staff calculations.
 Note: Each shade of blue in panel 3 represents a 5 percentage point interval. Shocks from 1982 are considered to be 10 times more likely than in other years. AE = advanced economies; EM ex. CHN = emerging markets excluding China. WEO = World Economic Outlook.

Figures 1.3.2 (panel 1 and 2) present the effects from all four layers on the level of GDP and headline inflation, respectively, for 2023 and 2024. Results are presented as percent deviations from baseline, and grouped into three regions (advanced economies, emerging markets excluding China, and China) and the world. Each region-year is shown as a column, with the contribution from each shock shown in stacked form.

As Figures 1.3.1 shows, each of these risks has sizable negative effects on global activity, especially in 2023, with the magnitude of the effects across regions depending on the shock:

- All three regions are affected by higher oil prices, which reduce the level of global GDP by about -0.5 percentage points in 2023, relative to baseline. The effect on the level of global output in 2024 is smaller from this layer as the shock dissipates.
- Issues in China's real estate sector reduce global output by -0.3 percentage points in 2023. The effects amplify over time as China's investment continues to decline relative to baseline in 2024.
- Advanced economies are especially affected by the disruptions in labor markets, both through lower potential and the tightening in monetary policy required to bring down inflation. Emerging markets excluding China are also affected, while the effect on China is smaller and operating through international spillovers. Global output is lower by -0.3 percentage points from this layer in 2023; the effect persists into 2024 and beyond, consistent with the protracted effect on potential output.
- Tighter financial conditions take a large toll on global activity (-0.5 percentage points in 2023). The effect amplifies over time as global investment gradually responds to the shock. The impact is most notable in emerging markets, but spillovers to other regions are large.
- The impact from the last three layers continues to build over time but there is no further deterioration in global activity in 2024 relative to baseline. The decline in oil prices envisaged in the scenario provides some offset, by reducing the impact of the other layers on global purchasing power. As a result, while the level of activity remains well below baseline there is no impact on global growth in 2024.

While the effects on GDP are uniformly negative, the effects on inflation vary depending on the shock (see Figure 1.3.2, panel 2):

- Higher oil prices contribute around 1.1–1.3 percentage points to headline inflation across regions in 2023, before turning disinflationary in 2024.
- The lower potential output layer is also inflationary. The effects are concentrated in advanced economies, and emerging markets excluding China, and are also quite persistent.
- Tighter financial conditions and the slowdown in China are instead disinflationary.
- Adding all the layers, global inflation is around 1.3 percentage point higher than baseline in 2023 and 1 percentage point lower in 2024.

Figure 1.3.2 (panel 3) superposes the resulting global growth in the downside scenario on the confidence bands presented above (with judgment). The downside scenario would imply global growth of 1.1 percent in 2023, which is in the 15th percentile of the distribution.