



GROUP OF TWENTY

G-20 REPORT ON STRONG, SUSTAINABLE, AND BALANCED GROWTH

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I N T E R N A T I O N A L M O N E T A R Y F U N D
with inputs from the OECD*

*Does not necessarily reflect the views of the IMF Executive Board.

EXECUTIVE SUMMARY

The G-20 has come a long way towards its goal of strong, sustainable, and balanced growth, but more remains to be done. At the G-20's request, this report offers diagnostics and policy recommendations for further action.

- *Growth is stronger, but there remain pockets of concern.* After a slow recovery, growth has strengthened and output gaps are expected to close in about half of the G-20 by 2018. However, there are still symptoms of insufficient demand in many advanced economies, with inflation below target; and several emerging economies are facing challenges from low commodity prices or domestic problems.
- *The sustainability of growth is not assured.* The cyclical recovery has firmed, but productivity growth remains low, with more than half of G-20 economies' potential growth rates currently estimated at around 2 percent or lower, with the lowest rates in advanced economies. Imbalances (see below) are posing sustainability risks going forward.
- *Progress toward balanced growth remains incomplete.* While much reduced since the crisis, external imbalances remain excessive, and are concentrated among advanced economies. Debt levels are substantially higher than before the crisis, particularly public debt in advanced economies and private debt in some emerging economies.

Policymakers should focus on rebalancing and ensuring the sustainability of growth, while fine-tuning the macroeconomic policy mix. The following policies—based on IMF Article IV recommendations, with input from the OECD on structural reforms—would help bringing the G-20 closer to its objectives:

- *Macroeconomic policy should adjust to changing circumstances.* Monetary policy remains appropriately accommodative in advanced economies. In some countries more available fiscal space should be deployed to help close output gaps (e.g., *Korea*) or raise public investment (e.g., *Germany*). Elsewhere, deficits should be reduced further to rebuild buffers now (e.g., *Turkey, Indonesia, India, Brazil*).
- *Internal imbalances need attention.* Where public debt is high (e.g., *Italy, Japan, United States*), medium-term consolidation plans should be more ambitious to reduce vulnerabilities. *China* should build on recent efforts to reduce financial vulnerabilities in the private sector.
- *External adjustment must continue.* The adjustment of the policy mix discussed above would help reduce excess surpluses and deficits in advanced economies (e.g., *Germany, United States*). In *China*, enhancing social safety nets and reducing import barriers would further help its external rebalancing.
- *Sustaining long-term growth requires ambitious structural reforms,* in addition to implementing still in-progress G-20 growth strategies. The needs differ across countries, but there is substantial scope to raise potential growth in most.

Joint action promises significant gains along all G-20 goals. Simulating the implementation of these recommendations with the help of the IMF's G-20 model suggests:

- *Slightly higher GDP in the short term.* By 2018, G-20 output is about 0.3 percent higher than expected under the baseline, but it reflects a more balanced composition of demand, with additional support in excess surplus advanced economies offsetting the effects of lower fiscal deficits in excess deficit countries and China's welcome rebalancing policies.
- *Strong output gains in the medium and long term.* Output continues to rise due to the implementation of recommended additional structural reforms, with the level of G-20 GDP estimated to exceed the baseline by about 3.5 percent in 2028. A more ambitious reform agenda would yield even higher gains.
- *The G-20 economy also becomes more balanced.* Changes in the current accounts of advanced surplus and deficit economies go in the right direction, while public debt of high-debt countries drops.

Acting together yields benefits significantly beyond what countries would reap by acting alone. In the short term, the GDP gains across the membership from implementing the recommended policies more than double due to spillovers from other countries' actions. In the long run, positive productivity spillovers operating through the trade channel amount to 15 percent of total output gains. Joint G-20 action would also be critical to react to common shocks, such as a sudden drop in confidence that would threaten the current momentum, and to protect the open multilateral trade system from protectionist policies.

INTRODUCTION: G-20 OBJECTIVES

After the global financial crisis, the G-20 set a comprehensive goal of achieving strong, sustainable, and balanced growth. Following a request of the G-20, this report will assess progress toward this goal and provide advice for further improvements.

1. **The G-20 is aiming for strong, sustainable, and balanced growth (SSBG).** The G-20's ambition for the global economy goes beyond the need to keep growth strong in the short term: it also aims for a sustainable expansion that remains balanced by avoiding domestic and external vulnerabilities. More recently, inclusiveness has been highlighted as an important dimension, which also contributes to the sustainability of growth.¹ Climate change is another critical challenge to sustainable growth deserving attention at the global level.

2. **The comprehensiveness of the G-20's goal reflects the insight that all aspects of growth are interrelated.** As the global financial crisis and its aftermath demonstrated, a deep shock can have lasting effects, as depressed investment and hysteresis effects from protracted unemployment reduce potential growth. Moreover, high private and sovereign debt and excessive current account imbalances make crises more likely and costlier. This means that all aspects of the G-20's SSBG goal have to be considered together.

3. **Another lesson of the crisis is that joint action yields better results.** In a deeply integrated global economy, national developments and policies are quickly spilling over from one country to another. Financial and real shocks travel from advanced economies to emerging economies and, increasingly, also from emerging economies to advanced economies; and the effects of domestic policies can be felt globally. This also means that coordinated G-20 policy action has become more important and, at the same time, more powerful, with the potential to benefit all.

4. **Against this background, the report takes stock of the G-20's progress and points out the scope for further policy action.** To gauge how far the G-20 has come in its SSBG ambition, the report provides a broad set of diagnostics of economic developments and policy settings across the G-20 membership, taking into account all aspects of growth and their interlinkages. These diagnostics provide the background for a discussion of policy recommendations. The report offers policy advice based on the IMF's Article IV consultations, with OECD input on structural reforms, and compares it with projected policy settings. Finally, using model-based simulations, it illustrates how a simultaneous implementation of the policy advice by all G-20 countries would impact the G-20's SSBG goal relative to the baseline provided by the July World Economic Outlook (WEO) update. Additional scenarios illustrate how joint action by the G-20 is key to address common risks and shocks.

¹ See, for example, IMF, 2017, [Fostering Inclusive Growth](#), Paper prepared for the G-20 Leaders' Summit; OECD and World Bank, 2017, [A Policy Framework to Help Guide the G20 in its Development of Policy Options to Foster More Inclusive Growth](#), July 2017, Note to the G-20 Hamburg Summit; and IMF, October 2017, Fiscal Monitor, "Tackling Inequality," forthcoming.

5. **The current growth momentum is an opportunity to implement these policies and sustain the recovery.** Without the right macroeconomic policies and structural reforms, along with measures to make growth more inclusive, there is a risk that growth will again disappoint, leading to inward-looking policies that favor protectionism and reject the benefits of global integration. This could lower global output and, by making tradable consumer goods more expensive, would harm those with low incomes the most. But with the cyclical recovery now firmly in place, structural reforms will be particularly effective and the political climate for reforms should improve. These efforts should be enhanced by securing and building on improvements in financial stability, including by addressing financial sector vulnerabilities and avoiding any broad rollback of financial regulations. Leaders can point to the large gains from joint action and to the fact that implementing the right policies now would go a long way to securing higher future growth.

DIAGNOSTICS: WHERE ARE WE NOW?

The G-20 has taken strong action, helping the global economy recover from the crisis and achieving significant progress towards its SSBG goal. However, there is scope for much additional gain across the membership, especially to ensure that growth becomes more balanced and sustainable.

THE G-20 HAS COME A LONG WAY...

6. **The G-20 took strong action during the crisis.** The coordinated fiscal stimulus—a historic first— and strong monetary support helped soften the impact of the global financial crisis; and the impact from the policy response was magnified by positive spillovers from joint action. When potential growth weakened, the Brisbane “2-in-5” ambition promised additional structural reforms and higher infrastructure investment concretized in countries’ growth strategies.² The G-20 also played a major role in strengthening the world’s financial regulatory framework and safeguarding global trade integration.

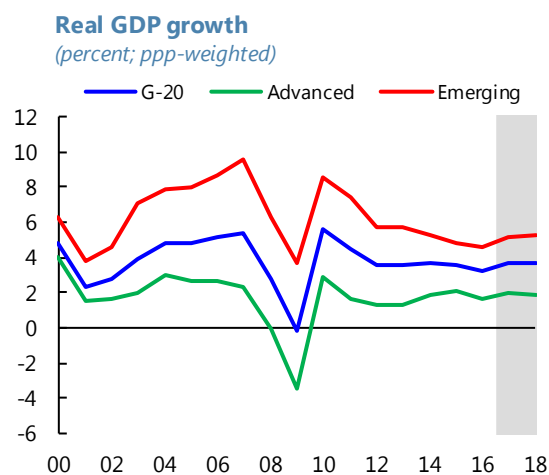
7. **These policies have helped the global economy regain its footing.** While the depth of the global financial crisis meant the recovery took time and its speed varied across G-20 members, progress was made along all dimensions. (Box 1 lists the indicators used to assess progress toward SSBG, and a comprehensive set of diagnostic charts is provided in Annex I.)³ In a nutshell:

- *The cyclical recovery continues.* In advanced economies, output gaps have decreased substantially since the global financial crisis and are expected to shrink further, and deflationary pressures have receded. While the assessment of labor market performance can be complicated by demographic

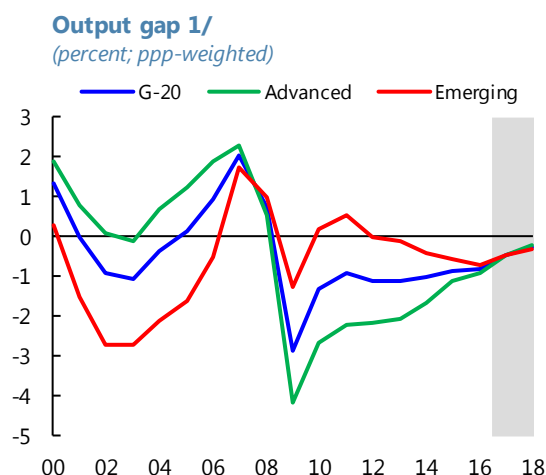
² In 2013 at the [Brisbane Summit](#), G-20 Leaders formulated the ambition to raise their collective GDP by 2 percent above baseline by 2018.

³ For all charts in this report, “other EU” refers to all member countries of the European Union (EU) excluding France, Italy, Germany, and the United Kingdom, who are individual G-20 members. Aggregates of G-20 and advanced economies include “other EU” where data is available and Spain otherwise. Where shown, “euro area” includes all euro area member countries. Country labels in the charts use International Organization for Standardization (ISO) country codes.

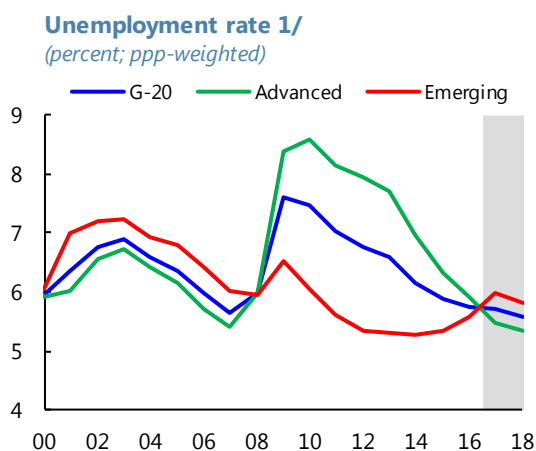
shifts and other factors impacting participation, employment has been growing and measured unemployment rates have dropped notably. Emerging economies experienced a relatively fast rebound from the crisis; however, in recent years some countries have seen their output gaps widen again on the back of commodity price and country-specific shocks. By 2018, GDP is expected to be approximately at or even above potential output in about half of the G-20 countries (see Figure A1.2 in Annex I).



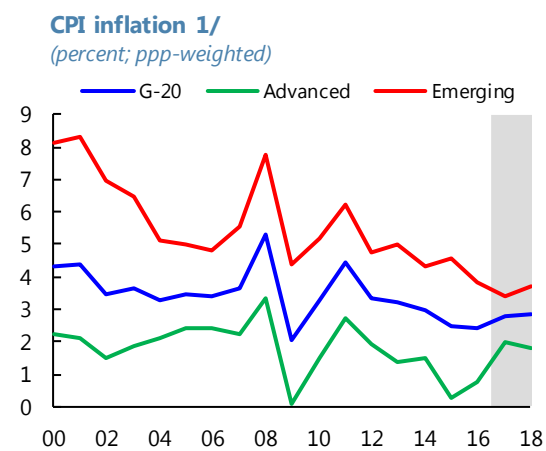
Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.



Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ SAU is not included due to data limitations.



Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ IND and SAU are not included due to data limitations.



Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ ARG is not included due to data limitations.

- *Potential growth has stabilized* as well, following a gradual but substantial decline since the early 2000s in advanced economies and a more rapid post-crisis decline in emerging economies, albeit from a high level. Especially in emerging economies, reflecting relatively strong investment growth in some economies, the decline in labor productivity has been less steep than the decline in total factor productivity growth (see Figures A2.6-A2.7).

- *Excess global imbalances have moderated since the crisis.* Much of the adjustment took place in the years immediately following the global financial crisis, reflecting a correction of pre-crisis financial excesses, demand rebalancing in *China*, and demand compression in advanced economies (e.g., *France, Italy, Spain, the United Kingdom, and the United States*). Since 2013, the sharp fall in commodity prices brought about an adjustment of the current account surpluses of oil exporters, while other emerging economies saw improvements in their current accounts, including from a tightening of financing conditions. As discussed below, imbalances have become concentrated among advanced economies more recently.⁴

Box 1. Strong, Sustainable, and Balanced Growth: Concepts and Measurement

The elements of SSBG are broadly operationalized as described below. There are, however, important areas of overlap between the individual aspects of growth. For example, the sustainability of growth will ultimately require that growth is also balanced, and vice versa. The main text provides some discussion how the different aspects of SSBG interact.

- *Strong growth.* The term refers to short-term, cyclical growth. It is measured by the GDP growth rate and the output gap. Inflation (in level and in deviation from the inflation target, if applicable) is another relevant indicator.
- *Sustainable growth.* This term refers to long-term growth, measured by the rate of potential growth, total factor productivity growth, and labor productivity growth. Another dimension of sustainability is balanced growth (see below). The pilot report does not cover other aspects of sustainability, such as the inclusiveness of growth and the repercussions of climate change.
- *Balanced growth.* This term refers to the composition of growth (domestic demand vs. external demand) and avoidance of build-up of external and domestic imbalances. *External imbalances* may be reflected in current account balances, the IMF's External Sector Report estimates of current account (which focus on excess imbalances beyond what would be warranted by fundamentals and desired policies), and the net international investment positions; indicators of *domestic private imbalances* include (non-financial) private sector debt, the debt service ratio for the private non-financial sector, and asset quality ratios; while *domestic public imbalances* can be measured by general government gross debt.¹

¹ Additional information is provided by the G-20's "Indicative Guidelines," a specific methodology assessing a set of indicators mechanically, without normative implications, against reference values to identify members with large imbalances that would have called for additional analysis under the sustainability updates. (See Annex II).

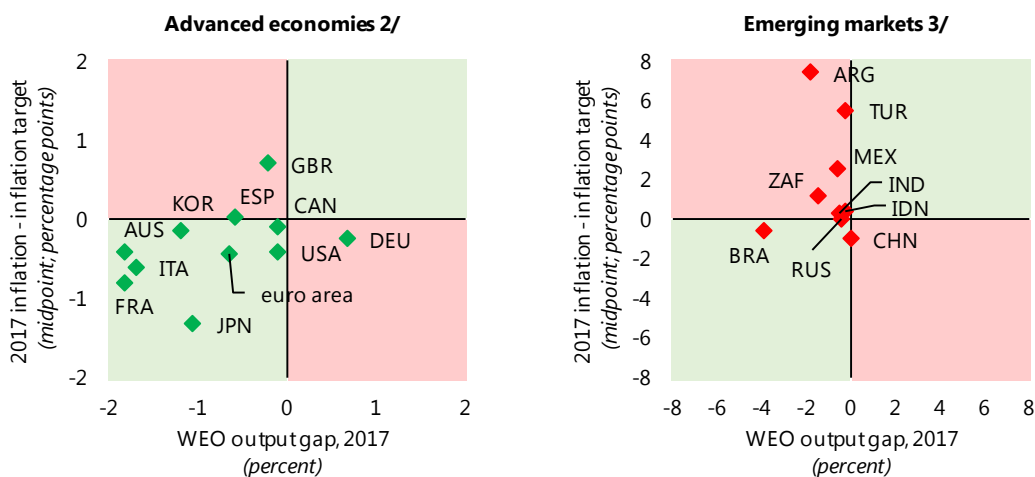
⁴ [IMF 2017 External Sector Report](#).

...BUT PROBLEMS PERSIST AND NEW CHALLENGES DEMAND ATTENTION

8. **While global growth momentum has picked up, in the short term, output gaps are expected to remain negative and inflation away from targets in a number of economies.** Indeed, based on the July World Economic Outlook, no G-20 economy is expected to have a positive output gap along with above-target inflation in 2017. More specifically:

- *Symptoms of negative output gaps remain in advanced economies.* Many G-20 advanced economies, including *Japan, Korea, Australia* and some euro area countries (*France and Italy*) are still projected to have negative output gaps in 2017 and 2018—a diagnosis that is robust across different measurement approaches (Figures A1.2–A1.6). Similarly, inflation remains persistently below target in *Italy, France, and Japan*, also pointing to insufficient aggregate demand in these economies (Figure A1.8).
- *Among G-20 emerging economies, new shocks have created unforeseen challenges.* A sharp and protracted fall in commodity prices has triggered a difficult adjustment for commodity exporters, which in some cases experienced a decline in growth and a reversal of their current account surpluses. Others (for example, *Argentina and Brazil*) faced domestic problems which complicated the post-crisis recovery. As a result, several G-20 emerging economies are still experiencing negative output gaps, including *Argentina, Brazil, Saudi Arabia, South Africa*, and to a lesser extent *Mexico and Turkey* (Figure A1.2). While inflation has declined in many emerging economies, macroeconomic management is complicated in several countries by the coincidence of negative output gaps and persistent above-target inflation.

WEO output gap and deviation from inflation target, 2017 1/



Sources: IMF, *World Economic Outlook*, July 2017; National Central Banks; and IMF staff calculations.

1/ PCE inflation projections have been used for USA; end-of-period CPI inflation for ARG, TUR, RUS; period-average CPI for all other countries.

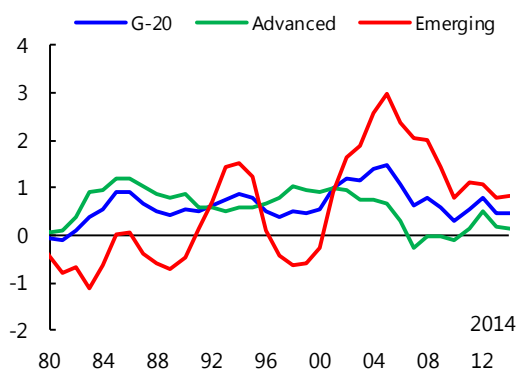
2/ The European Central Bank uses the Harmonized Index of Consumer Prices as a target. ESP is a permanent invitee.

3/ SAU does not have an inflation target.

9. The sustainability of higher growth is still in doubt due to the slow expansion of potential output and stalling productivity growth.

These headwinds will constrain the recovery going forward, as output gaps close and the pace of GDP growth converges to its sluggish potential rate. Potential and total factor productivity growth remain low and below pre-crisis levels, especially in advanced economies (Figures A2.1–A2.7). This reflects the scarring from the long recession and adverse long-term trends, including the waning ICT boom, aging workforce, slower human capital accumulation and slowing global trade integration. In emerging economies, notwithstanding high potential growth rates in some countries (including *India* and *Indonesia*), many countries have estimated long-term growth rates at 2 percent and lower, which suggest they might not achieve income convergence with advanced economies once the cyclical recovery runs its course. In addition, while the G-20’s Brisbane ambition has brought significant additional structural reform efforts, the implementation of the G-20 growth strategies has been slower than hoped.⁵

Total factor productivity growth 1/
(ppp-weighted; 5-year moving average)



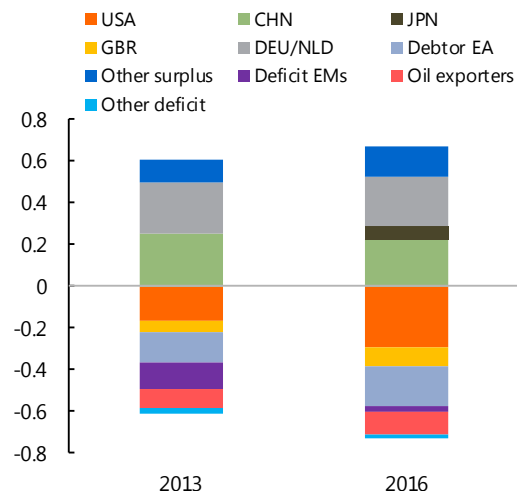
Sources: IMF, *World Economic Outlook*, July 2017; Penn World Tables (PWT); and IMF staff calculations. 1/ SAU and RUS are not included due to data limitations.

10. Progress toward balanced growth also remains incomplete, as external rebalancing has recently stalled and debt levels—private and public—are higher than before the crisis.

An update of the G-20 Indicative Guidelines identifies the same nine G-20 members as having large imbalances as in the last sustainability updates, indicating that progress toward addressing external and domestic imbalances has been limited (Annex II). A closer look at indicators of balanced growth suggests that:

- Overall excess current account imbalances have remained broadly unchanged since 2013, although increasingly concentrated in advanced economies where progress has recently reversed (Figures A3.1–A3.3).⁶ According to the IMF 2017 External Sector

Global excess imbalances
(percent of world GDP)

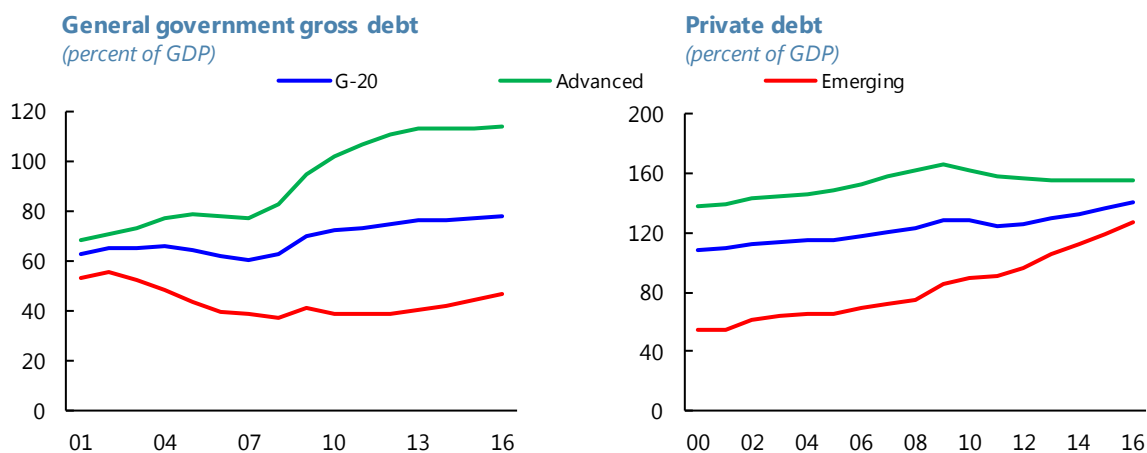


Sources: IMF 2017 External Sector Report; and IMF staff calculations. Note: Other surplus: CHE, HKG, KOR, MYS, SGP, SWE, THA. Debtor EA: BEL, ESP, FRA, ITA. Deficit EMs: BRA, IDN, IND, MEX, TUR, ZAF. Oil exporters: CAN, RUS, SAU. Others deficit: AUS, POL.

⁵ See the G-20 [Hamburg Accountability Assessment](#).

⁶ See [IMF 2017 External Sector Report](#). The country groups reflect the assessment of the presence of current account balances in excess of what is warranted by fundamentals and desired policies in the year 2016. “Excess surplus” refers to countries where the current account balance is stronger than the IMF-estimated norm, while “excess deficit” refers to countries where it is weaker than the IMF-estimated norm (even though the current account balance could itself be in deficit or surplus, respectively). For the G-20 economies, advanced excess surplus countries include Germany, Japan, and Korea; advanced excess deficit countries include Australia, Canada, France, Italy, Spain, (continued)

Report, excess imbalances have increased in advanced economies, where large and persistent excess surpluses in *Germany* and *Korea* (and, to a smaller degree, *Japan*) are partly matched by equally persistent deficits in the *United States* and the *United Kingdom*. The persistence of excess imbalances in advanced economies—including, of large excess current account surpluses—suggests that automatic adjustment mechanisms are weak. In contrast, excess imbalances have narrowed in emerging economies, driven by a smaller excess surplus in *China* and smaller excess deficits in others (*Brazil*, *Indonesia*, *South Africa*, and *Turkey*). While deficit-financing risks may be small in the short term for the *United States* and the *United Kingdom*, the persistent deficits nevertheless pose risks as they could trigger disruptive trade policy actions and lead to abrupt adjustments as the net international investment position of these countries grows more negative down the road (Figures A3.4–A3.6).



Sources: BIS; Haver Analytics; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

Note: Private debt refers to credit to private non-financial sector, which includes borrowing by non-financial corporations and households and reflects lending by domestic and foreign banks, as well as holdings of debt securities. For SAU, data on private debt is expressed in percent of non-oil GDP. For CHN, private debt includes LGFV (local government financing vehicles) debt.

- *Sovereign and private debt levels have risen considerably compared to pre-crisis levels.* This creates vulnerabilities, including in the context of a normalization of still very low interest rates. Sovereign debt has increased—most notably in advanced economies—driven by the output collapse, countercyclical fiscal stimulus, and banking sector support in the post-crisis years. While sovereign debt levels have now broadly stabilized, little progress has been achieved in bringing them down (Figures A3.11–A3.12). Some emerging economies (including *Brazil*, *Mexico*, and *South Africa*) also experienced a notable increase in sovereign debt, though debt ratios to GDP remain generally lower than in advanced economies. In many countries, private debt and debt-service ratios also remain higher than before the crisis as the long period of relatively accommodative financing conditions has contributed to a rapid increase in corporate leverage (Figures A3.7–A3.9), most notably in emerging economies. In advanced economies, there has been some progress in private-sector deleveraging and reducing banks’ non-performing loans; but private debt levels remain generally high, and non-performing loans are still elevated in the euro area (Figure A3.10).

the United Kingdom, and the United States; emerging excess surplus countries consist of China; emerging excess deficit countries include Russia, Saudi Arabia, South Africa, and Turkey; and emerging balanced countries include Brazil, India, Indonesia, and Mexico. For brevity, figures making use of these groupings omit the term “excess.”

POLICY SETTINGS AND RECOMMENDATIONS

While macroeconomic policy settings are broadly in line with countries' short-term needs, IMF policy advice points to areas for improvement in the policy mix across the G-20 membership. On the one hand, in some advanced economies additional fiscal support would be helpful to help close output gaps further, raise potential growth, and advance external rebalancing. On the other hand, medium-term fiscal consolidation should be more ambitious in many countries with high public debt. Structural adjustment should continue in emerging markets, including many commodity exporters. In most G-20 countries, there is a need for ambitious additional structural reforms to sustain growth in the medium term.

11. **The G-20 have shown that they have the determination and policy tools to work toward stronger, more sustainable, and more balanced growth.** The key to success is to continue tackling all dimensions simultaneously to maximize synergies from joint action. To see where additional policy measures promise the largest impact, members' current macroeconomic policy stances and structural reform strategies are compared with policy recommendations based on the IMF's Article IV surveillance, with input from the OECD on structural reforms. The recommendations are summarized in Tables 1 to 3. (Box 2 provides policy definitions and metrics.)

Box 2. Policies: Definitions and Measurement

Depending on the policy area, different indicators are used to approximate the current stance and measure recommended policy efforts.

- *Fiscal policy.* Fiscal policy is described as the change in the cyclically adjusted primary balance (CAPB) as a percent of potential GDP (Figures A4.2-A4.4). Policy recommendations are expressed as deviations from the expected path of the change in the CAPB in the WEO baseline.
- *Monetary policy.* Monetary policy is described as the difference between the real policy interest rate and approximations/estimates of the (unobservable) real natural interest rate. (See Figure A4.1 and Annex III, which discusses various approaches to estimate this interest rate gap, along with a discussion of their caveats.) Given the uncertainty surrounding these measures, the expected baseline path is based on IMF desks' assessments and policy recommendations are expressed as deviations from this path.
- *Structural reforms.* The policy areas considered are those for which there are quantifiable indicators of structural reform, namely product market regulation, trade liberalization, employment protection legislation, tax structure reform (direct vs. indirect taxes), R&D spending, labor tax wedge, childcare spending (or other reforms to increase female labor force participation), active labor market policies, and unemployment benefit replacement rates. While this set of indicators captures key structural reform needs, it does not necessarily provide a complete description of the structural reform agenda for every country. Policy recommendations are expressed in terms of reform priorities.

Table 1. Monetary policy recommendations

Advanced economies			Difference between recommended and projected monetary stance	
Projected monetary stance	2017		2018	2018
	euro area			
FRA				
DEU				
ITA				
ESP				
AUS				
CAN				
GBR				
USA				
JPN				
KOR				

Sources: Based on IMF staff estimates and Article IV recommendations.
 Note: ESP is a permanent invitee. For JPN, while no changes to the quantitative or interest rate targets are recommended at this point, improvements in the monetary policy communication framework could help lift inflation expectations, and thus widen the gap between the natural and actual real interest rate.

Key (stance)	
Neutral	
Moderately expansionary	
Substantially expansionary	
Moderately contractionary	
Substantially contractionary	

Emerging markets				
Projected monetary stance	2017		2018	2018
	CHN			
TUR				
IND				
IDN				
MEX				
ZAF				
ARG				
BRA				
RUS				
SAU				

Sources: Based on IMF staff estimates and Article IV recommendations.
 Note: IND does not project monetary stance. SAU has a fixed exchange rate.

Key (difference)	
	Unchanged: $\Delta i \approx 0$ (approximately)
	Moderately more expansionary: -100 basis points $\leq \Delta i < 0$
	Substantially more expansionary: $\Delta i < -100$ basis points
	Moderately more contractionary: $0 < \Delta i \leq 100$ basis points
	Substantially more contractionary: $\Delta i > 100$ basis points

Table 2. Fiscal policy recommendations

	Advanced economies				
	Projected change in CAPB (in ppt)			Difference between recommended and projected change in CAPB	
	2017	2018	2019-22 avg.	2017	2018
CAN	Green	Yellow	Orange		
DEU	Green	Light Green	Orange	Green	Orange
ITA	Light Green	Red	Orange		Orange
USA	Light Green	Orange	Yellow		
KOR	Yellow	Orange	Orange	Green	
JPN	Orange	Red	Orange	Light Green	Orange
FRA	Yellow	Orange	Orange		Orange
AUS	Orange	Orange	Orange		
GBR	Orange	Red	Orange		
ESP	Orange	Yellow	Yellow		Orange

Sources: Based on IMF staff estimates and Article IV recommendations.
Note: CAPB = cyclically adjusted primary balance. ESP is a permanent invitee.

	Emerging markets				
	Projected change in CAPB (in ppt)			Difference between recommended and projected change in CAPB	
	2017	2018	2019-22 avg.	2017	2018
TUR	Green	Red	Orange	Orange	Orange
IDN	Yellow	Yellow	Yellow	Orange	Orange
ZAF	Yellow	Orange	Orange		
CHN	Yellow	Yellow	Yellow		Green
IND	Orange	Orange	Yellow	Orange	Orange
BRA	Orange	Yellow	Orange	Orange	Red
ARG	Orange	Red	Orange		Orange
RUS	Red	Red	Red		
MEX	Red	Orange	Yellow		
SAU	Red	Red	Red	Light Green	Green

Sources: Based on IMF staff estimates and Article IV recommendations.
Note: CAPB = cyclically adjusted primary balance. For RUS, non-oil cyclically adjusted structural primary balance in percent of potential GDP is used. For SAU, non-oil primary balance in percent of non-oil GDP is used (not cyclically adjusted).

Key (stance)	
Neutral	Yellow
Moderately expansionary	Light Green
Substantially expansionary	Green
Moderately contractionary	Orange
Substantially contractionary	Red

Key (difference)	
Unchanged: $-0.1 \leq \Delta d(\text{CAPB}) \leq 0.1$ ppt. of potential GDP	
Moderately more expansionary: $-0.5 \leq \Delta d(\text{CAPB}) < -0.1$ ppt. of potential	Light Green
Substantially more expansionary: $\Delta d(\text{CAPB}) < -0.5$ ppt. of potential GDP	Green
Moderately more contractionary: $0.1 < \Delta d(\text{CAPB}) \leq 0.5$ ppt. of potential	Orange
Substantially more contractionary: $\Delta d(\text{CAPB}) > 0.5$ ppt. of potential GDP	Red

Table 3.1 Structural reform recommendations: Advanced economies
(Degree of priority according to consensus rating, beyond commitments in 2017 growth strategy)

	AUS	CAN	other EU	FRA	DEU	ITA	JPN	KOR	ESP	GBR	USA
Easing product market regulations	Low	High	High	High	Medium	High	Medium	High	High		Low
Trade liberalization/facilitation			High				Low				
Easing employment protection legislation				High			Medium	High	High		
Tax structure reform (increase share of consumption and property taxes in total tax revenues)	High	High		Medium		Medium		Medium	High		High
Research and Development	High	High	Medium	Medium						High	
Reducing labor tax wedge				High	High						
Childcare spending or other reforms to increase female labor force participation	Low	Low			Medium	Medium	Medium	High			High
Active labor market policies		Low	Low	Low		High		Low	Medium	High	Medium
Reducing unemployment benefit replacement rate											

Sources: Based on a consensus assessment by IMF and OECD.

Note: ESP is a permanent invitee. Other EU indicates European Union excluding FRA, DEU, ITA, and GBR.

Key	
High	Dark Green
Medium	Light Green
Low	Very Light Green

Table 3.2 Structural reform recommendations: Emerging markets
(Degree of priority according to consensus rating, beyond commitments in 2017 growth strategy)

	ARG	BRA	CHN	IND	IDN	MEX	RUS	SAU	ZAF	TUR
Easing product market regulations	High	Low	High	High	High	High	High	Low	High	Low
Trade liberalization/facilitation	Medium	High	Medium	Low	Low	Low	Medium	Low	Medium	Low
Easing employment protection legislation	High	Low	Low	High	High	High	High	Low	High	High
Tax structure reform (increase share of consumption and property taxes in total tax revenues)	High	Low	Low	High	High	Medium	High	High	Low	Low
Research and Development	Low	Low	Low	Low	Low	High	Medium	Low	Low	Low
Reducing labor tax wedge	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Low
Childcare spending or other reforms to increase female labor force participation	Low	Low	Low	High	Low	Low	Low	High	Low	Low
Active labor market policies	Low	Medium	Medium	Low	Low	Low	High	High	Low	High
Reducing unemployment benefit replacement rate	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Sources: Based on a consensus assessment by IMF and OECD.

Note: For SAU, IMF rating is taken as the consensus rating. For CHN, corporate restructuring is also added as part of structural reforms.

Key	
High	Dark Green
Medium	Light Green
Low	White

MACROECONOMIC POLICIES AND RECOMMENDATIONS

Safeguarding the growth momentum

12. **To safeguard the current growth momentum, the macroeconomic policy mix should be adjusted to changing circumstances.** Following the IMF's Article IV policy advice, countries with negative output gaps which have fiscal space should support growth with all available tools, while those with closed output gaps should withdraw short-term fiscal stimulus and calibrate monetary policy to inflation developments.⁷ In some advanced economies that have fiscal space and are operating at or close to capacity, additional spending could boost potential growth and create positive transitional spillovers for others.⁸ Where fiscal space is a constraint—for example because of particularly high levels of public debt or other concerns—consolidation efforts should be gradual and as growth-friendly as possible. Many countries would benefit from a more growth-friendly budget composition. In countries facing too-low growth and too-high inflation, macroeconomic policies will have to weigh possible trade-offs. Emerging economies still adjusting to the lower commodity price environment should avoid expansionary fiscal policies and focus on fostering longer-term adjustment instead.

13. **Monetary policy stances are generally aligned with IMF recommendations.** In most advanced economies, monetary policy is expected to remain appropriately accommodative, while the pace of normalization in the *United States*—which is reaching full employment—should continue to be gradual and data-dependent, alongside well communicated plans for the Federal Reserve's balance sheet. By contrast, most emerging economies are projected to maintain neutral or somewhat contractionary monetary stances, suitably contributing to bring or keep inflation in line with central bank targets.

14. **Fiscal policy in advanced economies remains broadly in line with countries' short-term needs, but additional support would be helpful in some countries.** For example, in *Korea*, where cyclical shortfalls remain, there is still a case for larger-than-planned fiscal support. *Japan*, should avoid a premature drop in the level of fiscal support. There is scope for additional fiscal support in *Germany*, including by means of higher public investment: the latter would not only raise the country's potential output, but also contribute to lower the excess current account surplus and help lift growth in other euro area countries, notably where economic slack persists and fiscal policy is constrained. In economies with smaller or already closed output gaps and an increased focus on fiscal sustainability, fiscal support is, accordingly, expected to be withdrawn sooner (for example, in the *United States* and the *United Kingdom*). In the medium term, most countries will appropriately turn to consolidation, given elevated public debt levels (see also the discussion in the section below).

⁷ See IMF, 2016, [Assessing Fiscal Space – An Initial Consistent Set of Considerations](#). Figures A4.2–A4.4 provide further details, including on the impact of measurement uncertainty on the assessment of the policy stance.

⁸ For a general discussion of fiscal spillovers and the role of economic conditions in the cross-border transmission of fiscal policy shocks, see IMF, October 2017 [World Economic Outlook, “Cross-Border Impacts of Fiscal Policy: Still Relevant?”](#).

15. **In emerging economies, fiscal policy is, in general, appropriately focused on consolidation, but the speed of adjustment could helpfully be fine-tuned in some cases.** Commodity exporters and countries facing economic stress should focus on rebuilding fiscal space through growth-friendly consolidation, with some need to accelerate the pace of adjustment in *Brazil* and *Turkey*. An acceleration of fiscal consolidation would also be desirable in *India* and *Indonesia* to increase fiscal space. In *Saudi Arabia*, some of the projected substantial budgetary retrenchment could be postponed to the medium-term to smooth economic activity, given the availability of fiscal space. *China* could use some of its fiscal space to smooth the impact of the needed corporate restructuring, through extending temporary transfers to affected workers.

Promoting more balanced and more sustainable growth

16. **By further reducing external imbalances and bringing down debt levels, macroeconomic policies could contribute more to advancing balanced growth in the medium term.**

- *External rebalancing should continue.* While macroeconomic policies are but one determinant of the current account, they have contributed to maintain excess imbalances, which illustrates the benefits of recalibrating the policy mix across both surplus and deficit countries (see IMF 2017 External Sector Report). With monetary policy set to remain appropriately supportive, this will be helped by the recommended use of fiscal space—for example, to raise potential growth or reduce still-open output gaps—in G-20 excess surplus economies (such as *Germany* and *Korea*) and gradual fiscal consolidation in excess deficit countries (*United Kingdom*, *United States*).
- *Public debt burdens need to fall in the medium term.* Beyond the short term, most countries are appropriately set for fiscal consolidation. However, current plans for medium-term consolidation could be more ambitious across many advanced G-20 economies with uncomfortably high public debt levels (for example, *Italy*, *Japan*, *Spain*, and *United States*) as well as in some emerging economies (for example, *Brazil*).
- *Private debt and financial vulnerabilities require attention.* Addressing corporate and bank vulnerabilities is a priority in many G-20 countries, including in several emerging economies and the euro area, where the structural overcapacity of the financial sector elevates operation costs and reduces profitability. This task requires a faster recognition of non-performing assets, stronger bank capital buffers, and better corporate debt restructuring mechanisms. *China* should build on recent efforts to address financial vulnerabilities by continuing regulatory/supervisory tightening, greater recognition of bad assets, more market-based credit allocation, and gradually reducing monetary policy accommodation if core inflation picks up. In many countries, macroprudential policies should be used to address corporate and bank vulnerabilities by reducing the buildup of leverage or strengthening buffers.

17. **Implementing the proposed adjustments to the policy mix would also contribute to more sustainable growth.** At least three effects are at work. First, where fiscal policy directly supports infrastructure investment (for example, *Germany*), it will raise productivity and the growth potential in the future, enhancing sustainability. Second, additional short-term demand support from fiscal policies where output gaps are negative can accelerate the benefits of certain structural reforms, such as

measures that raise labor supply, which are particularly relevant for European G-20 members but also several emerging economies (see next section). Finally, to the extent that fiscal and monetary policies are adjusted to make growth more balanced and reduce vulnerabilities, they will also decrease the risk of crisis, and thereby, make growth more lasting and sustainable.

STRUCTURAL REFORM COMMITMENTS AND FURTHER REFORM NEEDS

18. **The G-20's Brisbane ambition is expected to contribute to global growth in the medium term.** However, the pace of implementation has been slower than anticipated, suggesting that the original ambition to raise G-20 GDP by an additional 2 percent will be reached later. As of July 2017, the already implemented structural reform and infrastructure spending commitments made at the Brisbane, Antalya, Hangzhou, and Hamburg summits are estimated to raise the level of G-20 GDP by about 1.2 percent by 2018.⁹

19. **Given the disappointing medium-term outlook, however, further ambitious action is needed, especially in advanced economies.** Structural reforms prepare the ground for faster global growth going forward. They are often politically difficult and can take time to implement, however, so improvement requires determination and early action. The assessment of structural reform needs, performed jointly by the IMF and OECD, suggest that although precise priorities for structural reforms differ across countries, most have significant room for improvement.¹⁰

- *In advanced economies, the priority is to raise productivity and increase employment.* Suitable policies include easing product market regulation, reducing direct taxes (offset by an increase in indirect taxation), and more R&D support. Many economies will also continue to benefit from measures that boost employment—for example by raising female participation (*Germany, Japan, and Korea*) or the use of active labor market policies (for example, *Spain, United Kingdom, and United States*).
- *Emerging economies also will profit from productivity-enhancing reforms*—in particular, easing product market regulation, further liberalizing trade, and tax structure reform. In addition, adjustment to persistent shocks and longer-term structural change needs to continue. For example, *China* should continue increasing the role of market forces to improve resource allocation, strengthen social safety nets, and reduce import barriers. *India* needs to address long-standing supply bottlenecks, streamline labor market regulations, and improve its business climate. Commodity exporters should continue diversifying their economies to enhance resilience as they adjust to lower commodity prices.

⁹ [G-20 Hamburg Action Plan](#) and [Hamburg Accountability Assessment](#).

¹⁰ IMF assessment is based on Article IV Consultations Staff Reports and OECD assessment draws on [Economic Policy Reforms 2017: Going for Growth](#) and OECD Economic Surveys of specific countries.

20. **Additional structural reforms will also enhance short-term growth momentum and aid the external rebalancing.**

- *Some structural measures also have the potential to boost demand in the short term—for example, easing product market regulations that impede the easy entry of new firms.¹¹ Structural reforms with positive short-term growth impact can help countries facing output and price stability trade-offs. In addition, structural policies that entail a fiscal stimulus (such as reducing the labor tax wedge, increasing childcare spending, or more active labor market policies) will also support short-term demand, while contributing to higher potential output.*
- *Structural reforms can also help reduce global external imbalances, but the effects are complex.¹² For instance, reducing barriers to foreign competition and to domestic investment in services will tend to reduce excess surpluses. Reforms that reduce unit labor costs, improve the business environment, and encourage innovation will also increase external competitiveness and reduce excess deficits. That said, current account balances depend on cross-country differences, so the ultimate effect of structural reforms on a country's current account depends on the intensity and composition of a country's reforms relative to those of its trading partners. Certainly, though, the added growth generated by structural reforms can help reduce public and private debt burdens, mitigating domestic imbalances.*

21. **Climate change is another aspect of sustainable growth that deserves attention at the global level.** It is set to have significant economic impact, with a large number of lower-income countries being particularly at risk.¹³ This requires adjustment of economic policies to accommodate the adverse consequences of weather shocks, including through building buffers and upgrading infrastructure. But many low-income and small island economies have limited ability to cope with the risks of global warming, so that continued international cooperation will be needed to support vulnerable countries. At the same time, stemming man-made causes of climate change will require a radical transformation of the global energy system, including through the use of fiscal instruments to better reflect environmental costs in energy prices and promote cleaner technologies.

¹¹ IMF, April 2016 [World Economic Outlook, "Time for a Supply-Side Boost? Macroeconomic Effects of Labor and Product Market Reforms in Advanced Economies;"](#) and Bouis, R., O. Causa, L. Demmou, R. Duval, and A. Zdzienicka, 2012, "The Short-Term Effects of Structural Reforms: An Empirical Analysis," OECD Economics Department Working Papers, No. 949 (OECD Publishing, Paris).

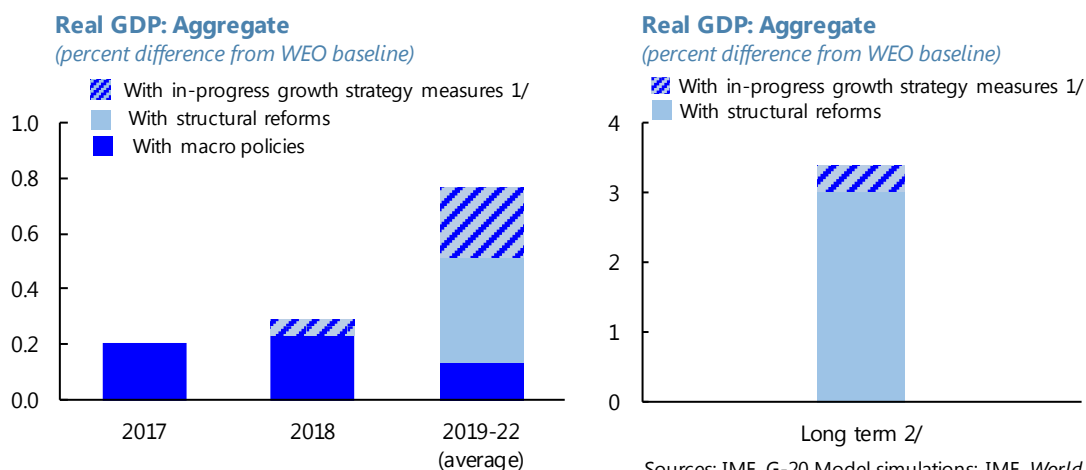
¹² IMF [2017 External Sector Report](#).

¹³ IMF, October 2017 [World Economic Outlook, "The Effects of Weather Shocks on Economic Activity: How Low-Income Countries Can Cope,"](#).

BENEFITS OF JOINT ACTION

Joint G-20 action based on the policy recommendations just discussed promises sizable gains along most dimensions of the SSBG goal. Growth would be stronger in the short term, helping reduce output gaps; and it would be more sustained in the long run, reflecting structural reforms. It would also be more balanced, as external imbalances moderate, especially in advanced economies; as China's output composition shifts toward consumption; and as public debt burdens decline in countries with currently limited fiscal space.

22. **The IMF's G-20 model is used to evaluate the impact of policy recommendations on the SSBG objective.** To that end, the recommendations laid out in Tables 1–3 are translated into changes of countries' monetary and fiscal stances and structural policy reform plans vis-à-vis the projected baseline for the global economy under the WEO. The approach is based on broad categories of action. For example, a recommendation anchored in the IMF's Article IV advice to steer fiscal or monetary policy in a moderately/substantially more expansionary/contractionary direction is modeled as a change in the cyclically adjusted primary balance or the nominal policy rate, respectively; and these changes are assumed to be of the same magnitude for any country in this category. Similarly, the structural reform priorities agreed by the IMF and OECD are modeled as improvements in quantifiable indicators of structural reform, based on historical magnitudes of reforms. (Box 3 provides further details, including on the different layers of structural reform.)



Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

1/ Supply effects only. Demand effects of growth strategies' infrastructure investment commitments are included in the fiscal part of the macro policy layer.

Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

1/ Supply effects only. Demand effects of growth strategies' infrastructure investment commitments are included in the fiscal part of the macro policy layer.

2/ Measured as of 2028.

23. **The results suggest that the G-20 stands to gain along most dimensions of its goal for stronger, more sustainable and more balanced growth.** The level of G-20 GDP is higher at all horizons, with larger gains in the medium and long term. In the short run, output gains mostly reflect the effect of changes to the macroeconomic policy stance; in the medium term, both macroeconomic policies and structural reforms interact to shape outcomes; the long run is mostly determined by

structural reforms. Overall, growth is not only stronger and more sustained—as evidenced by the positive long-run effects—but, importantly, it also becomes more balanced (as discussed below). Detailed simulation results by country groups are available in Annex I (Figures A5.1–A5.12).¹⁴

Box 3. Simulations of Policy Advice

The impact of policy action along the recommendations summarized in the previous section (see Tables 1–3) on the G-20 SSBG goal is illustrated using the IMF’s G-20 model.¹ The model evaluates the economic impact of a change in policies relative to those projected under the current WEO baseline forecast in a dynamic general equilibrium setting. The specific policies are quantified as follows:

- *Fiscal policy.* A moderately more contractionary (expansionary) fiscal policy corresponds to a positive (negative) difference between the recommended and baseline change in the CAPB of about $\frac{1}{4}$ percentage point of GDP; a substantially more contractionary (expansionary) fiscal policy is modelled as a positive (negative) difference of about $\frac{3}{4}$ percentage point of GDP.
- *Monetary policy.* A moderately more contractionary (expansionary) monetary stance is assumed to correspond to a 75-basis point increase (decline) in the policy rate relative to the baseline; substantially more contractionary (expansionary) is assumed to correspond to a 150-basis point increase (decline).
- *Structural reforms.* While reforms already undertaken as part of growth strategy commitments are reflected in the baseline scenario, the recommendations for additional structural reforms considered here include still in-progress growth strategy measures (assumed to be implemented over the next 5 years) and additional recommendations (beyond authorities’ reform plans) reflecting the consensus assessment of the IMF and the OECD (“structural reforms,” gradually implemented over 10 years starting in 2019).² For the latter, the magnitude of changes in the structural reform indicators is based on historical episodes of major reforms, with the speed of implementation more closely aligned with behavior exhibited by G-20 countries in the implementation of their growth strategies so far. Specifically, “high” priority reforms are implemented as $\frac{3}{4}$ of the historical magnitude of major reforms, “medium” priority reforms as $\frac{1}{2}$ of the historical magnitude, and “low” priority reforms as $\frac{1}{3}$ of the historical magnitude. The quantitative evaluation of the impact of structural reforms on productivity and labor markets is based on a series of OECD analytical papers.³

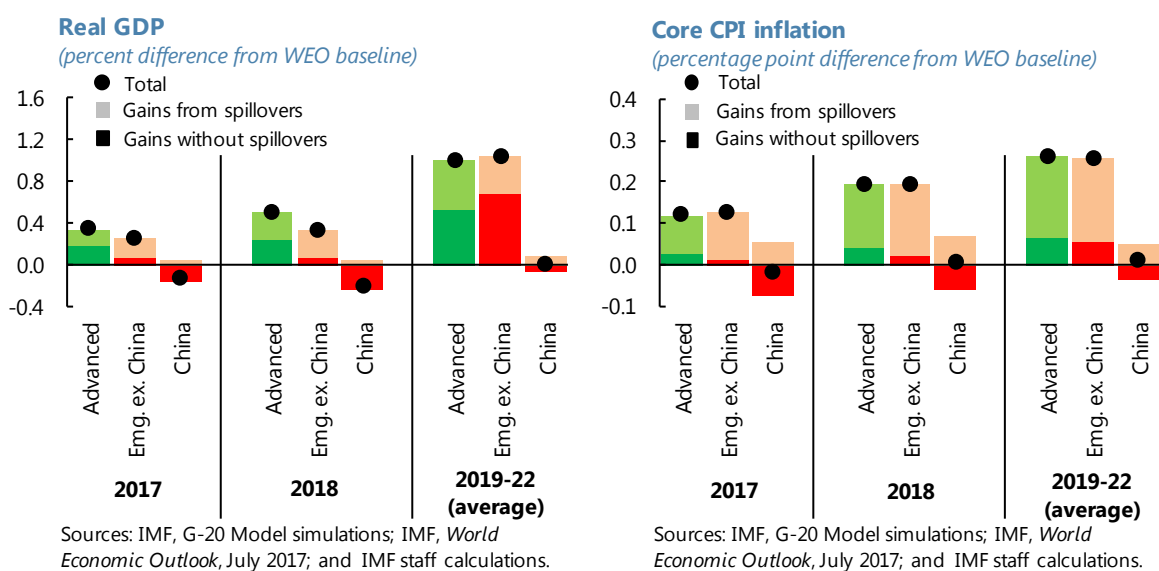
¹ Andrle, M., P. Blagrove, P. Espailat, K. Honjo, B. Hunt, M. Kortelainen, R. Lalonde, D. Laxton, E. Mavroeidi, D. Muir, S. Mursula, and S. Snudden, 2015, “The Flexible System of Global Models – FSGM,” [IMF Working Paper 15/64](#) (International Monetary Fund, Washington D.C.).

² The in-progress growth strategy measures include both structural reforms and supply-side effects of infrastructure investments included in the growth strategies, while additional structural reform recommendations of the IMF and OECD only encompass structural reforms. IMF and OECD recommendations are based on priority levels for additional reforms (relative to reforms already incorporated in the baseline), aggregated based on a simple rule—for example, a “high” priority rating required that both IMF and OECD desks found reforms in a certain area to be very urgent. In a few cases, desks engaged in a direct exchange to ensure both institutions were in agreement with the final priority rating.

³ For example: Egert, B. and P. Gal, 2017, “The Quantification of Structural Reforms in OECD Countries: A New Framework,” OECD Economics Department Working Paper No. 1354 (OECD Publishing, Paris); Bouis, R. and R. Duval, 2011, “Raising Potential Growth After the Crisis: A Quantitative Assessment of the Potential Gains from Various Structural Reforms in the OECD Area and Beyond,” OECD Economics Department Working Papers, No. 835 (OECD Publishing, Paris).

¹⁴ Results for China are shown separately to facilitate the exposition. China’s ongoing rebalancing implies a different trajectory from other G-20 emerging markets, and the IMF 2017 External Sector Report classifies China as the only emerging market surplus economy.

24. **In the short run, additional demand support, especially by advanced economies, increases global output moderately.** Stronger near-term fiscal support in advanced economies increases output and inflation in these countries but also, through spillovers—primarily via trade—helps reduce output gaps in advanced deficit economies. Output also expands in most emerging G-20 economies, albeit at the cost of slightly higher inflation, reflecting mostly positive growth spillovers. In *China*, on the other hand, rebalancing policies—including recommended monetary policy tightening and corporate restructuring—lead to a decline in both actual and potential output relative to the WEO baseline. The overall effect contributes to a net output gain for the global economy of about 0.3 percent of GDP relative to the WEO baseline by 2018.¹⁵

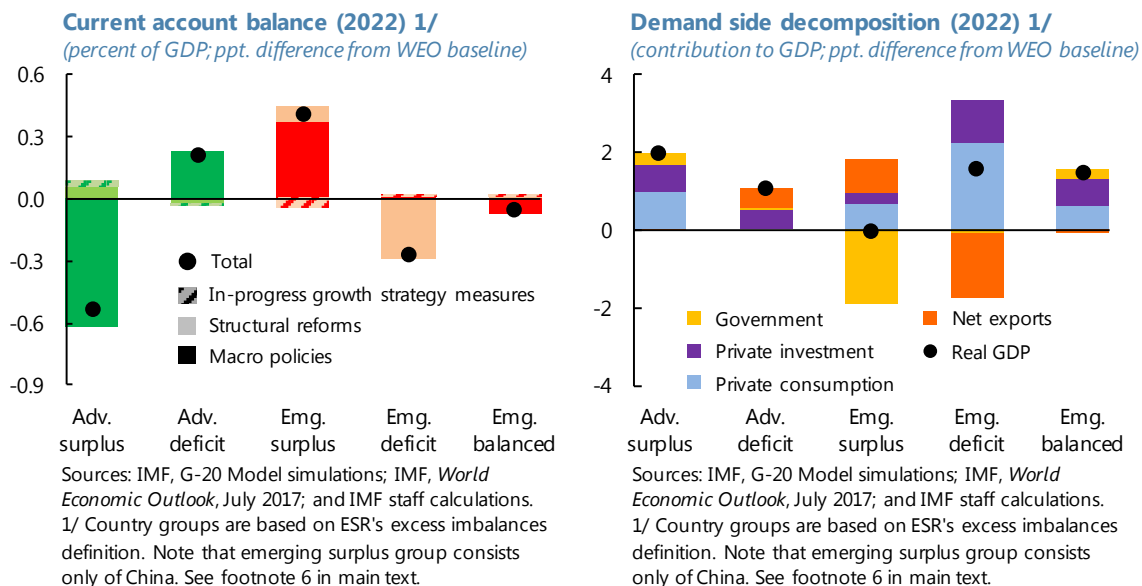


25. **Over the medium and longer term, growth is supported by additional structural reforms.** Where additional fiscal consolidation is recommended, it tends to depress the level of output relative to the baseline; yet, this is more than offset by additional structural reform efforts, contributing to further output gains in the medium term (Figures A5.5–A5.12). Some gains come from the implementation of in-progress G-20 growth strategy measures (see Box 3), but exploiting the considerable remaining scope for additional structural reforms indicated above provides even stronger growth support. The main benefits are from reforms that ease product market regulations, followed by tax structure reforms, and reforms to boost labor supply. In *China*, structural reforms and efficiency gains from corporate restructuring (which reallocates resources from the overcapacity manufacturing sector to the services sector) help to offset the negative effects of the policy tightening and rebalancing.

26. **There are significant positive spillovers from acting together.** For example, over the short and medium term, about half of the increase in the level of GDP generated in advanced economies stems from the fact that all countries are implementing the recommended policies simultaneously,

¹⁵ For illustrative purposes, the simulations assume that policy recommendations will impact the annual outcome in 2017 in full.

which benefits global trade.¹⁶ For most emerging markets, the spillover effects tend to be even larger in the short term. As oil prices and other commodity prices are increasing along with global output, inflation spillovers are also large. For energy importing countries, higher energy prices mitigate the positive external demand effects from higher GDP levels elsewhere.



27. **Importantly, the policy advice yields more balanced growth in the medium term.**

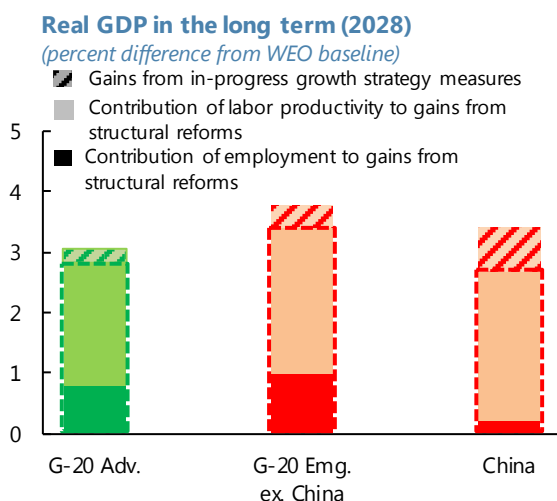
Specifically:

- *External rebalancing progresses further*, especially in advanced economies. The recommended macroeconomic policy stance reduces current accounts in advanced economies with current account balances larger than suggested by fundamentals and desired policies as defined in the IMF 2017 External Sector Report, and increases them in advanced economies where current accounts deficits are below this benchmark. In *China*—which has a current account surplus in excess of the benchmark—the current account surplus increases further, reflecting the recommendation for a moderately more contractionary fiscal stance in the medium term. A reduction of the excess current account balance will require additional structural reforms, in particular in the fiscal area, that are difficult to quantify and, therefore, not fully captured in these simulations (see Boxes 2 and 3).¹⁷ Emerging countries with current account deficits larger than the benchmark see their deficits become larger, but this comes largely as a reaction to changing economic conditions. For example, the decline in the current account balance of *Russia* and *Saudi Arabia* reflects an additional boost to investment related to commodity price increases, as global growth strengthens.

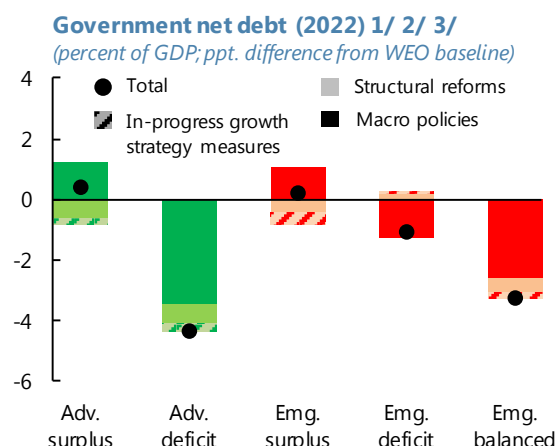
¹⁶ Spillovers are defined as the difference between the sum of individual countries' outcomes when each country acts alone and the sum of the individual country outcomes when all countries act together.

¹⁷ For example, the scenarios do not necessarily capture all policy measures that affect private saving rates. See [IMF 2017 External Sector Report](#) and [IMF 2017 Staff Report for the People's Republic of China](#).

- *The composition of activity becomes more balanced, especially in China, as the composition of output shifts more towards private consumption. In advanced surplus economies, output gains reflect stronger domestic demand, and deficit countries benefit from improved net exports and private investment.*
- *Public debt burdens decline relative to the WEO baseline in countries with high debt levels, reflecting the recommendation for more ambitious medium-term fiscal consolidation and higher GDP levels. In contrast, public debt increases moderately and temporarily in advanced surplus economies and in China, reflecting their use of fiscal space in the near term.*¹⁸



Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.



Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
 1/ Country groups are based on ESR's excess imbalances definition. Note that emerging surplus group consists only of China. See footnote 6 in main text.
 2/ For most countries, a decrease in government net debt corresponds to a reduction in gross debt; for some, it corresponds to an increase in government assets.
 3/ The simulations assume that the impact from structural reforms works mostly through the denominator of the government debt-to-GDP ratio by increasing the GDP level.

28. Growth also becomes more sustainable, as structural reforms permanently raise output over the longer term, through substantially higher productivity, investment, and employment.

In the main policy scenario, the output gain from structural reforms would exceed 3 percent after 10 years at the G-20 level—a sizable increase. While spillovers play a somewhat smaller role in the longer term when structural reforms tend to increase supply along with demand, the simulation suggests that positive productivity spillovers operating through the trade channel amount to about 15 percent of these gains. Of course, a more ambitious reform agenda—if feasible—would yield even higher rewards.¹⁹

¹⁸ The simulation assumes unchanged fiscal strategies. The reduction in debt-to-GDP ratios would be larger, if countries were to save the additional fiscal net revenue associated with the increase in output.

¹⁹ The policy scenario assumes that the additional structural reform effort is slightly lower than typical reform efforts in the past (see Box 3). However, a larger effort would also promise larger effects. For example, if G-20 countries were to pursue reforms with a higher intensity that would see high-priority reforms implemented fully in line with past efforts (with lower-priority reform efforts scaled up accordingly), output could be about 4½ percent higher after 10 years.

GOING FORWARD

Implementing the recommended macro and structural policies would help the G-20 make substantial additional progress toward its goal of SSBG. Joint action clearly matters, as growth spillovers are large. Going forward, joint action will also be key in successfully tackling new shocks affecting the global economy and preserving the benefits from global trade integration.

29. **Executing on short- and long-term policies together will deliver balanced and sustainable growth.** With recovery from the global financial crisis now well underway, the strength of short-term growth is less of a concern. But to sustain the current growth rates in a balanced way going forward, it will be important to adjust the policy mix. This adjustment entails some additional demand support in some advanced economies and more ambitious medium-term fiscal consolidation in countries with currently limited fiscal space. It also involves an acceleration of rebalancing and continued adjustment in some emerging markets, possibly with temporary support from fiscal policy. In all countries, more ambitious structural reforms are necessary to lift growth potential.

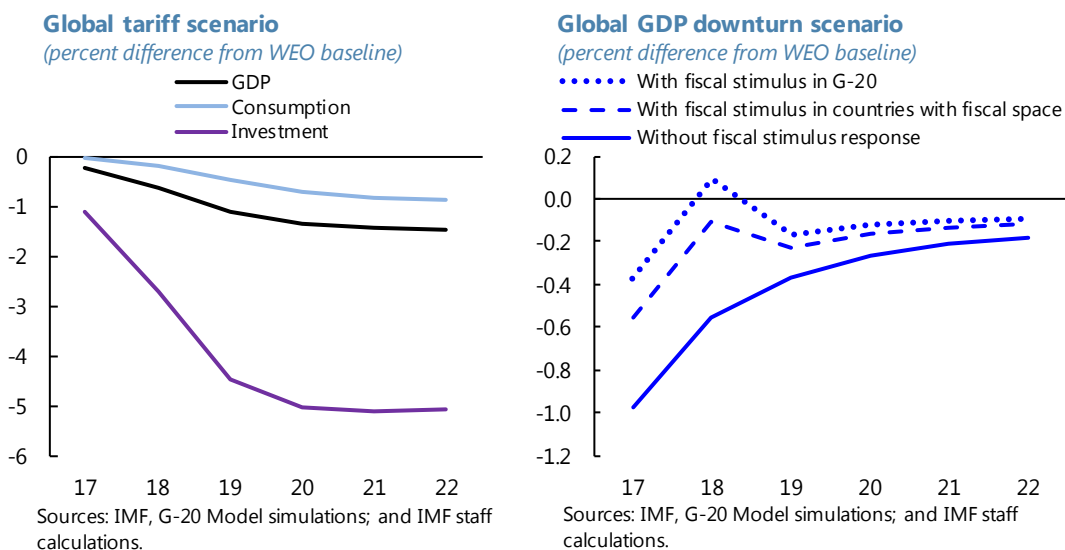
30. **Joint action matters to advance the G-20's SSBG goal.** Rebalancing global growth while maintaining the current growth momentum requires action on the part of both advanced and emerging economies. *China's* desirable domestic rebalancing would result in more sustainable but slower growth, while added demand support in advanced surplus countries would provide offsetting momentum for the global economy. In addition to the own-country effects, growth spillovers on other economies are sizable, including in the longer term as productivity spillovers of structural reforms support global growth. A key assumption for these positive spillovers to occur is, however, that the global economy continues to operate smoothly within the existing multilaterally cooperative trade framework. Progress on strengthening financial regulation has been impressive, but completion and implementation of the global regulatory reform agenda is vital. Dilution of financial regulations—or a loss of cooperation—could undermine hard-won financial stability gains.

31. **Going forward, acting together will remain vital to address unforeseen shocks that could affect the global economy.** The G-20 has shown it can provide global leadership in times of crisis. Given the risks surrounding the current recovery, joint G-20 action may again be needed in the future.²⁰ Should global demand fall substantially—for example, reflecting sudden loss in confidence—coordinated demand support could prevent a sharp slowdown of the current cyclical upswing. In such a scenario, a coordinated fiscal stimulus of ½ percentage point of baseline GDP for two years by countries that have fiscal space (12 of the G-20 countries) would substantially smooth the shock to global output. If all countries implement a ½ percentage point fiscal stimulus irrespective of the initial availability of fiscal space, some additional smoothing would result. Moreover, the ratio of debt to GDP in the countries lacking fiscal space improves further when they also participate in the stimulus.

32. **Global leadership means protecting the benefits from global trade integration by avoiding policy mistakes.** A global surge in protectionism, triggered by beggar-thy-neighbor

²⁰ See [G-20 Leaders' 2017 Summit IMF Note on Global Prospects and Policy Challenges](#).

policies, would impose large costs on the global economy without much change to global imbalances, as real exchange rates would adjust to offset the effect of trade restrictions.²¹ In an illustrative scenario in which all tariffs increase gradually such that all import prices rise by 10 percent, the higher cost of traded goods lowers global output by about 1.5 percent after five years. Both consumption and investment decline, and the drop in global trade is even more severe. The negative impact could even be larger, as global uncertainty and financial volatility would likely have additional material effects on global investment, beyond the channels captured in the model. Determined G-20 action is thus also key to forestall the large global costs of a surge in protectionism.



33. **The current global upswing is an opportunity for G-20 leaders for joint action that will sustain the recovery for the benefit of all.** Since the crisis, advanced economy growth has been slow and bypassed many, causing some to question the advantages of multilateralism and turn to nationalistic policies. Emerging market growth has generally been higher, but failure to sustain it could lead to a backlash against openness and further reform. This makes it critical that leaders make use of the current momentum to pursue the right policies. The potential for better outcomes is significant, especially when acting together and reaping the substantial positive spillovers from joint action.

²¹ See [IMF 2017 External Sector Report](#).

Annex I: Diagnostic Charts

The Annex presents comprehensive statistics on (i) the strength of growth (GDP growth; output gap; inflation), (ii) the sustainability of growth (potential output growth; productivity growth), and (iii) balanced growth (external balance; private and public debt). In addition, it provides information on (iv) macroeconomic policy stances and (v) detailed information on the outcome of model simulations of the joint implementation of policy advice. The main data source is the WEO database, complemented with other sources where needed, as specified in footnotes to the charts.

Qualification of size of gaps and stances. The charts provide some sense of the size of the output/inflation gaps and fiscal policy stance by showing the standard deviation of historical realizations across G-20 member countries, differentiated by advanced economies/emerging economies where helpful. Shadings in the charts indicate the following ranges: within $\frac{1}{2}$ standard deviation from 0; within $\frac{1}{2}$ and 1 standard deviation from 0; and outside the 1 standard deviation interval.

Illustration of measurement uncertainty. For potential output, the output gap and change in CAPB, the main WEO measure is complemented with two alternative estimates to illustrate measurement uncertainty: one measure where potential output is derived from a simple HP filter; and another measure based on consensus forecasts estimates of 1-, 2- and 5-year ahead growth rates. In turn, the alternative potential output and output gaps imply a different estimate of the change in the CAPB. For the monetary policy stance, given that the natural rate is not observable, it is approximated by three alternative measures of steady-state real interest rates as well as by estimates from a semi-structural model. In addition, for countries where the policy rate is at the effective-lower-bound, two sets of measures are calculated, one set which uses the actual policy rate and another which uses shadow rate estimates, which seek to take into account the effect of unconventional measures (see Annex III).

1. STRONG GROWTH

Growth and Output Gap

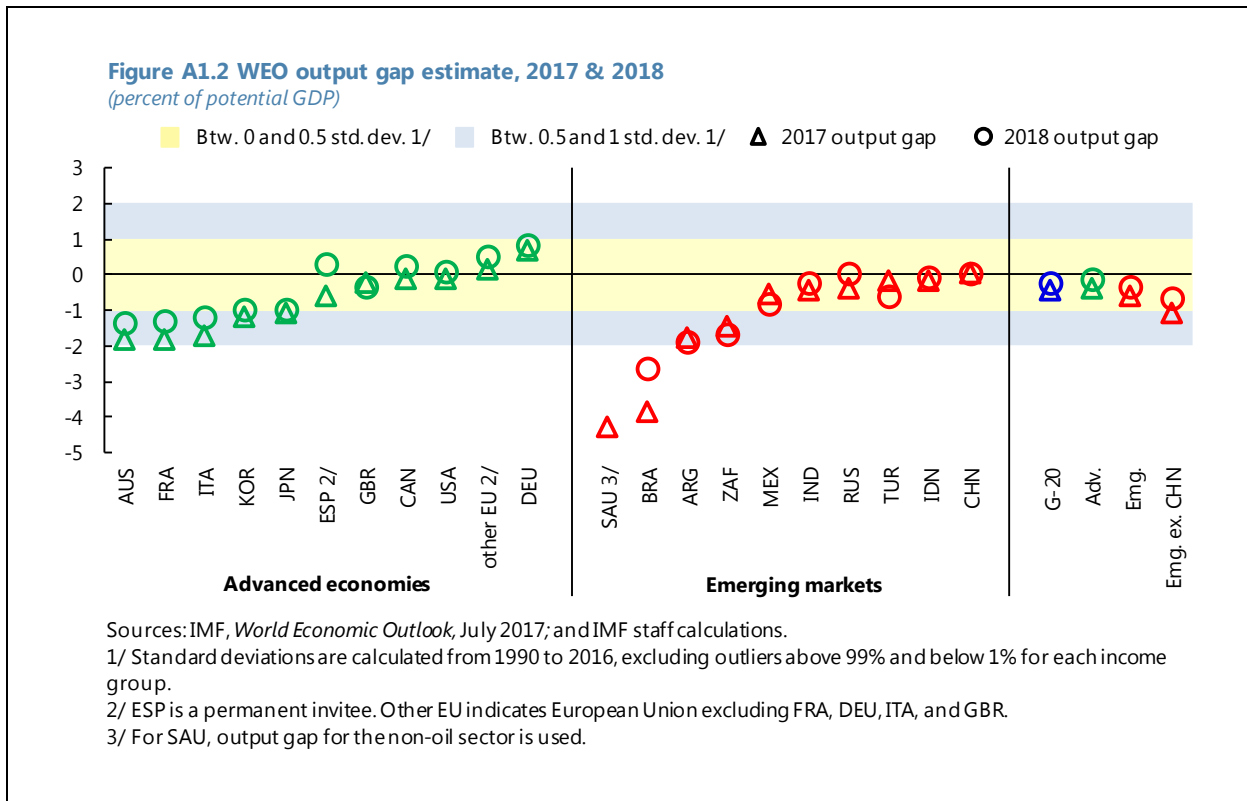
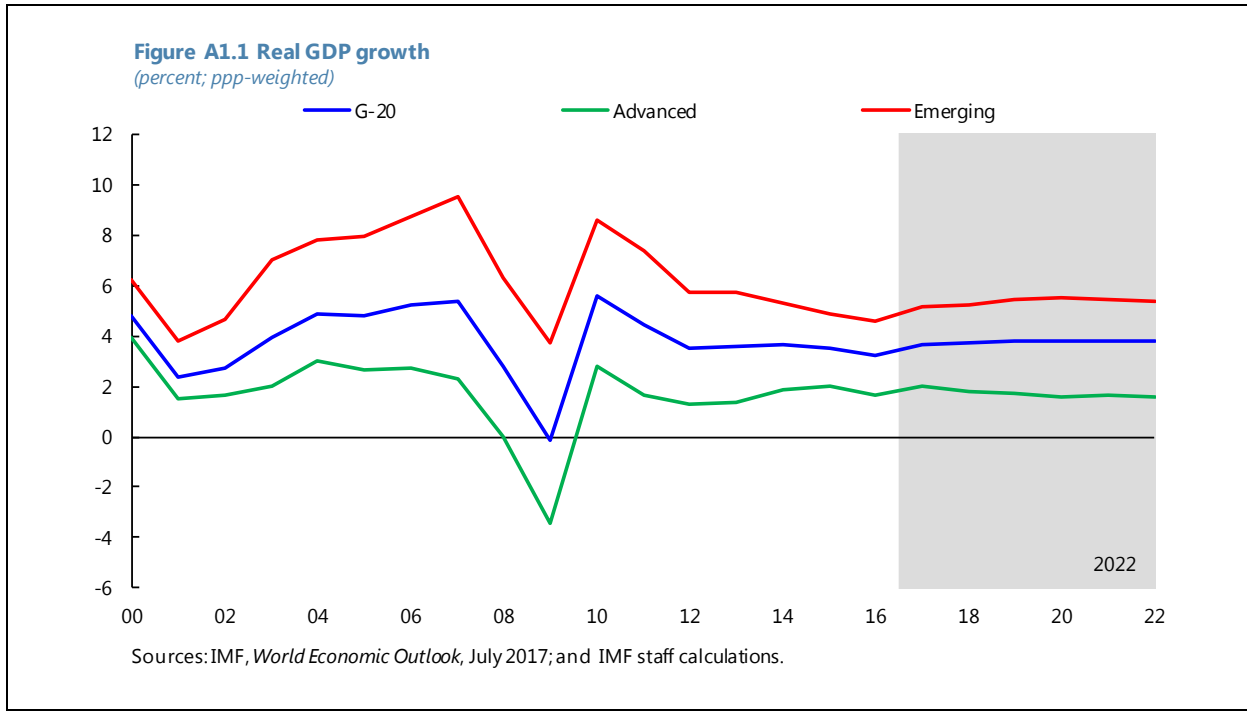
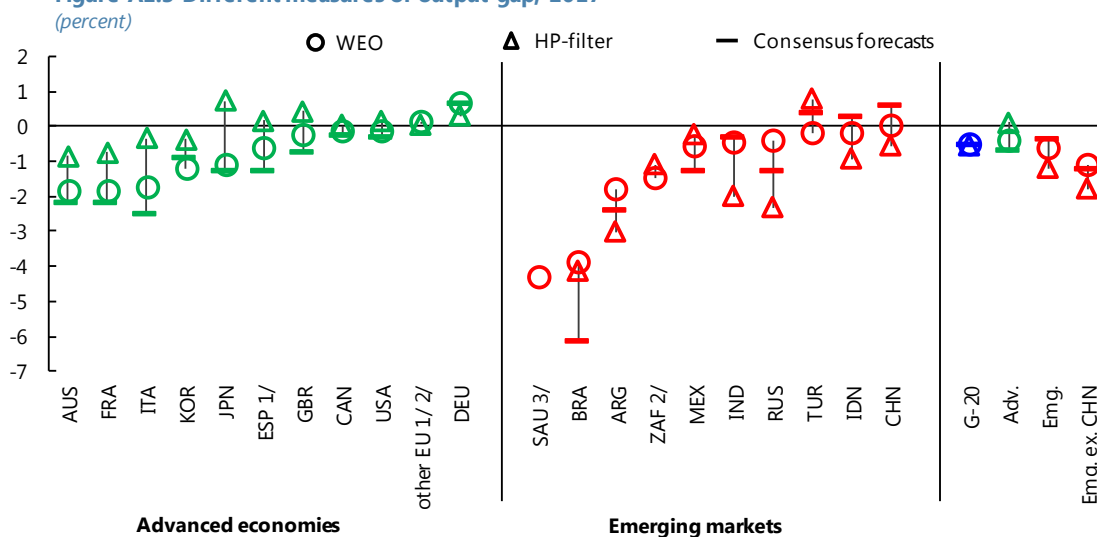
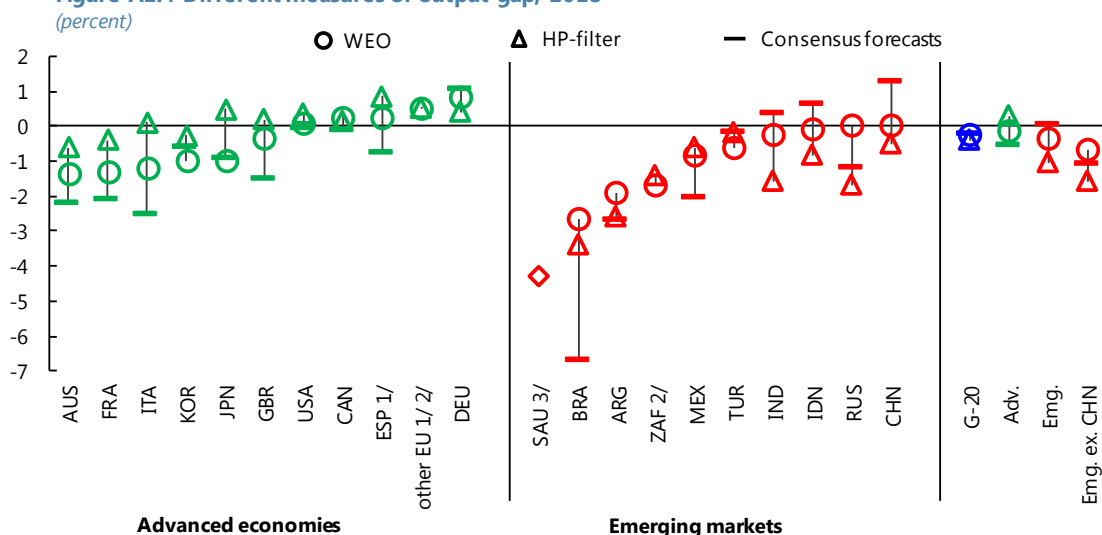


Figure A1.3 Different measures of output gap, 2017



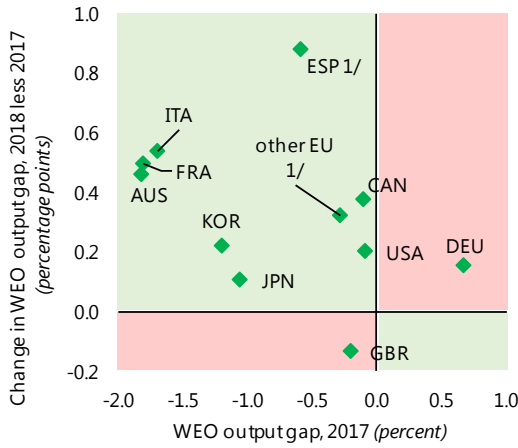
Sources: IMF, *World Economic Outlook*, July 2017; Consensus Forecasts; and IMF staff calculations.
 Note: Output gap estimate based on Consensus forecasts uses real GDP and potential GDP levels, projected based on 1, 2 and 5-year ahead growth rates from Consensus Economics.
 1/ ESP is a permanent invitee. Other EU indicates European Union excluding FRA, DEU, ITA, and GBR.
 2/ 5-year ahead Consensus data are unavailable to calculate output gap estimates based on Consensus forecasts. For other EU, data are unavailable for about 40 percent of the countries.
 3/ For SAU, output gap for the non-oil sector is used; HP-filter estimate and 5-year ahead Consensus Forecast data are not available.

Figure A1.4 Different measures of output gap, 2018



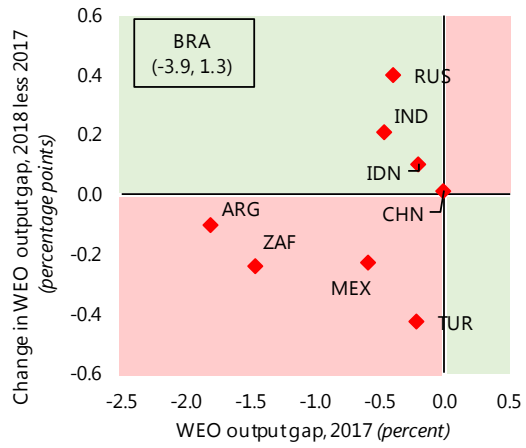
Sources: IMF, *World Economic Outlook*, July 2017; Consensus Forecasts; and IMF staff calculations.
 Note: Output gap estimate based on Consensus forecasts uses real GDP and potential GDP levels, projected based on 1, 2 and 5-year ahead growth rates from Consensus Economics.
 1/ ESP is a permanent invitee. Other EU indicates European Union excluding FRA, DEU, ITA, and GBR.
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 3/ For SAU, 2017 output gap for the non-oil sector is used; WEO and HP-filter estimates for 2018 and 5-year ahead Consensus Forecast data are not available.

Figure A1.5 Output gap and change in output gap: Advanced economies



Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ ESP is a permanent invitee. Other EU indicates European Union excluding FRA, DEU, ITA, and GBR.

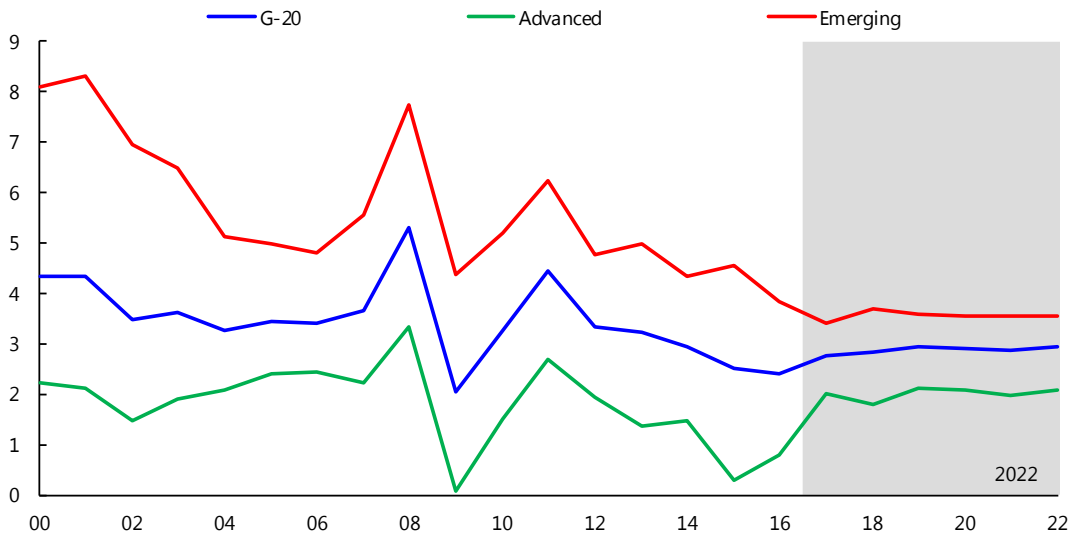
Figure A1.6 Output gap and change in output gap: Emerging markets 1/



Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ Output gap for SAU for 2018 is unavailable.

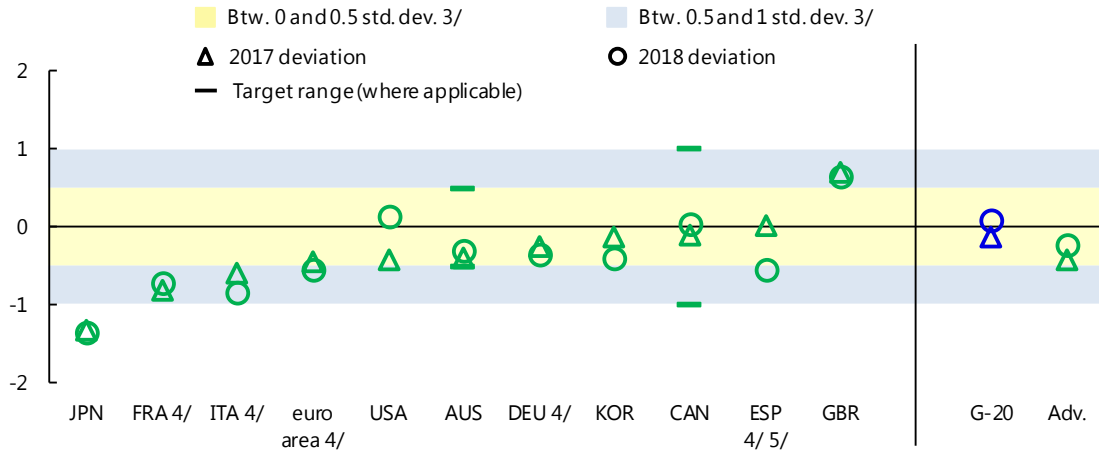
Inflation

Figure A1.7 CPI inflation 1/
(percent; ppp-weighted)



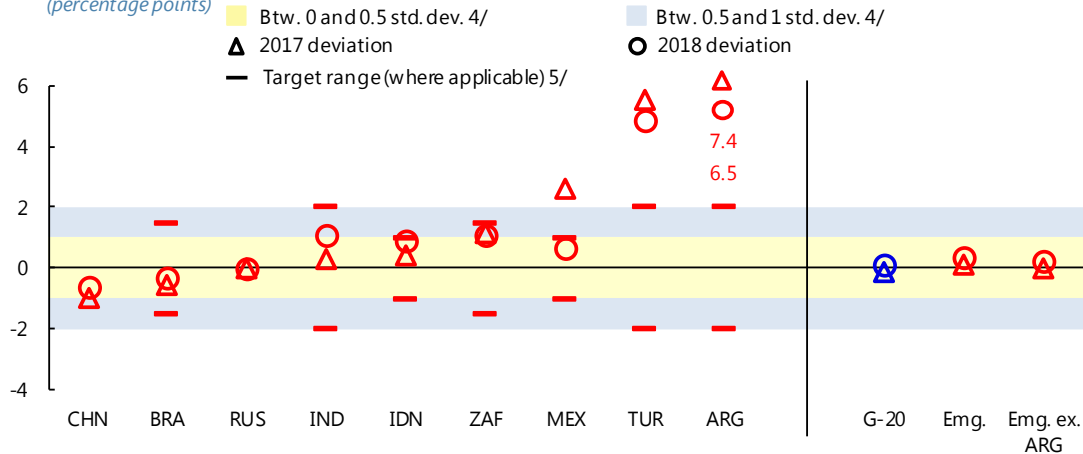
Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ ARG is not included due to data limitations.

Figure A1.8 Deviation from inflation target: Advanced economies 1/ 2/
(percentage points)



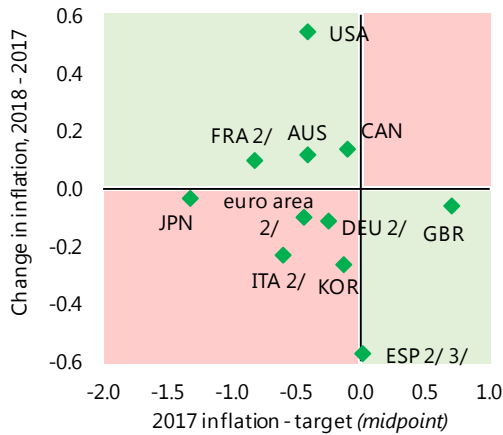
Sources: IMF, *World Economic Outlook*, July 2017; National Central Banks; and IMF staff calculations.
 1/ Inflation and target range are in deviations from the mid-point for countries that have a target range.
 2/ For calculating deviations, PCE inflation projections have been used for USA and period-average CPI inflation for all other countries.
 3/ Standard deviations are calculated from 2007 to 2016, excluding outliers above 95% and below 5% for each income group.
 4/ The European Central Bank uses the Harmonized Index of Consumer Prices as a target.
 5/ ESP is a permanent invitee.

Figure A1.9 Deviation from inflation target: Emerging markets 1/ 2/ 3/
(percentage points)



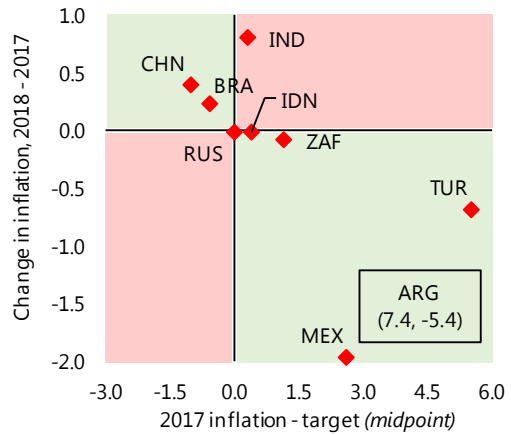
Sources: IMF, *World Economic Outlook*, July 2017; National Central Banks; and IMF staff calculations.
 1/ Inflation and target range are in deviations from the mid-point for countries that have a target range.
 2/ For calculating deviations, end-of-period CPI inflation has been used for ARG, TUR, RUS, and period-average CPI inflation for all other countries.
 3/ SAU does not have an inflation target. SAU's CPI inflation is projected to be 1.7 in 2017 and 5 in 2018.
 4/ Standard deviations are calculated from 2007 to 2016, excluding outliers above 95% and below 5% for each income group.
 5/ Target range stays same for all countries between 2017 and 2018 except ARG. For ARG, 2018 target range is reported.

Figure A1.10 Change in annual inflation and deviation from inflation target: Advanced 1/
(percentage points)



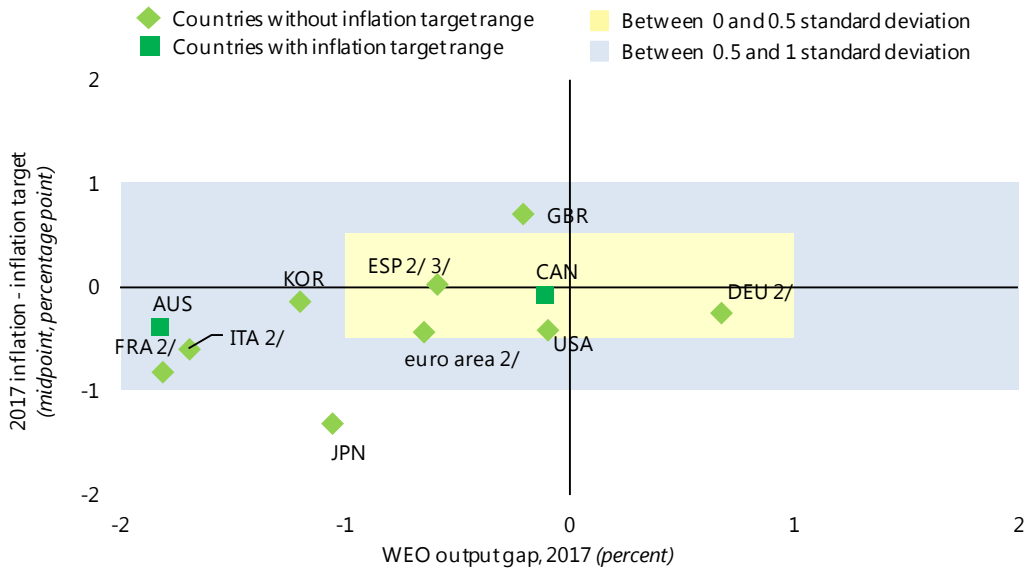
Sources: IMF, *World Economic Outlook*, July 2017; National Central Banks; and IMF staff calculations.
1/ PCE inflation projections have been used for USA and period-average CPI for all other countries.
2/ The European Central Bank uses the Harmonized Index of Consumer Prices as a target.
3/ ESP is a permanent invitee.

Figure A1.11 Change in annual inflation and deviation from inflation target: Emerging 1/ 2/
(percentage points)



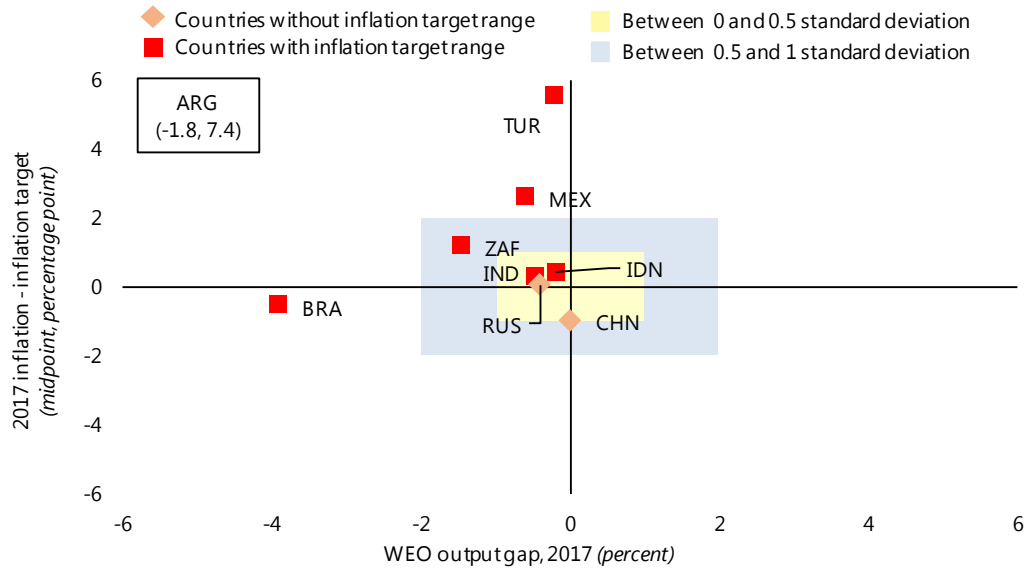
Sources: IMF, *World Economic Outlook*, July 2017; National Central Banks; and IMF staff calculations.
1/ End-of-period CPI inflation has been used for ARG, TUR, RUS, and period-average CPI for all other countries.
2/ SAU does not have an inflation target. SAU's CPI inflation is projected to be 1.7 in 2017 and 5 in 2018.

Figure A1.12 WEO output gap and deviation from inflation target: Advanced economies 1/



Sources: IMF, *World Economic Outlook*, July 2017; National Central Banks; and IMF staff calculations.
1/ PCE inflation projection has been used for USA and period-average CPI for all other countries.
2/ The European Central Bank uses the Harmonized Index of Consumer Prices as a target.
3/ ESP is a permanent invitee.

Figure A1.13 WEO output gap and deviation from inflation target: Emerging markets 1/ 2/



Sources: IMF, *World Economic Outlook*, July 2017; National Central Banks; and IMF staff calculations.
 1/ End-of-period CPI inflation has been used for ARG, TUR, RUS, and period-average CPI for all other countries.
 2/ SAU does not have an inflation target.

2. SUSTAINABLE GROWTH

Potential Growth

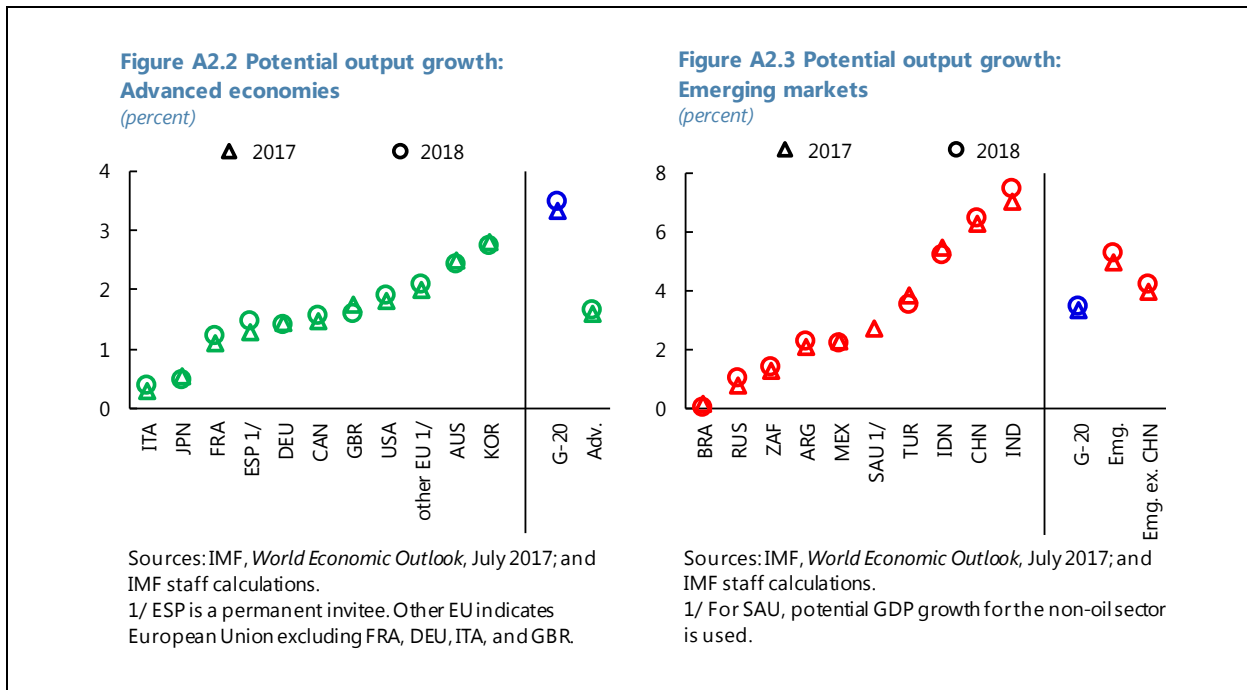
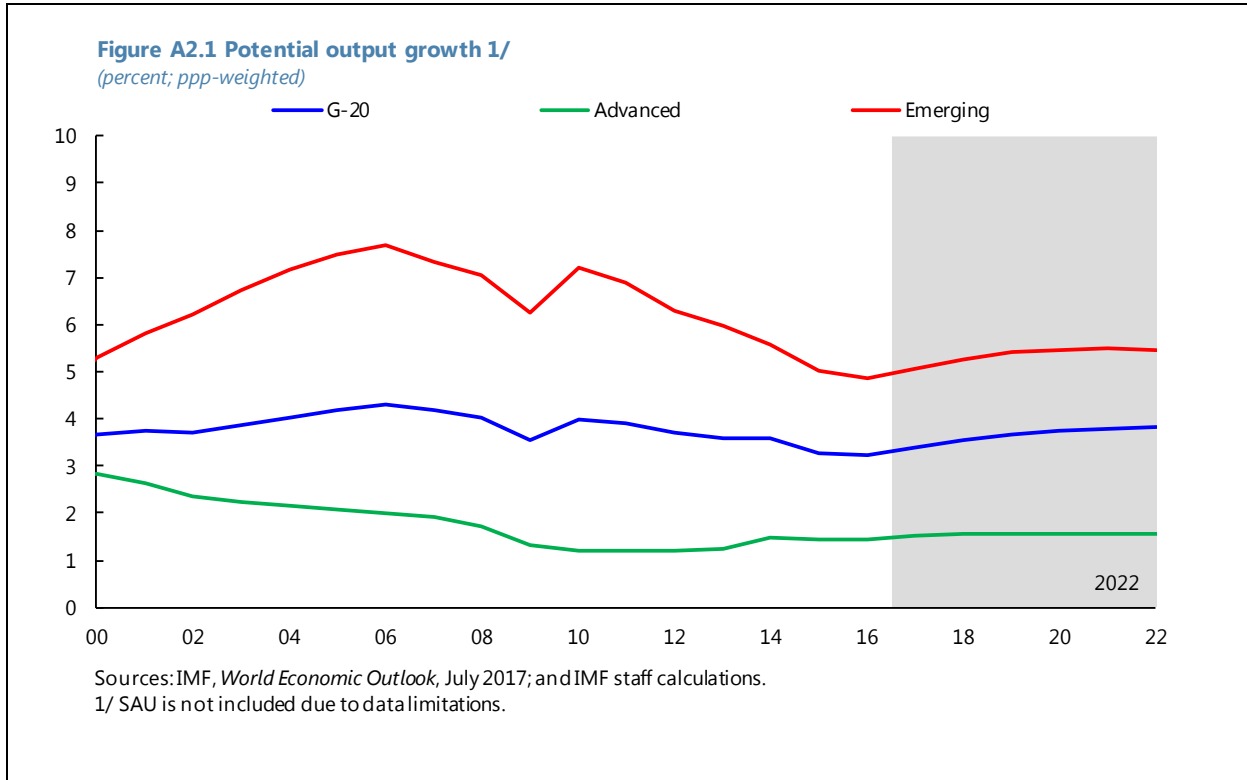
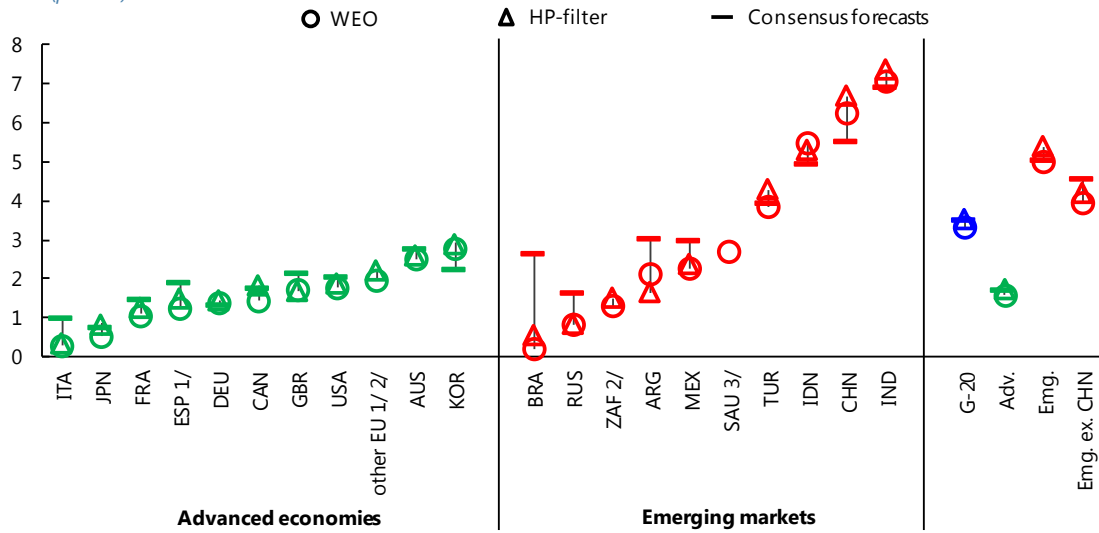
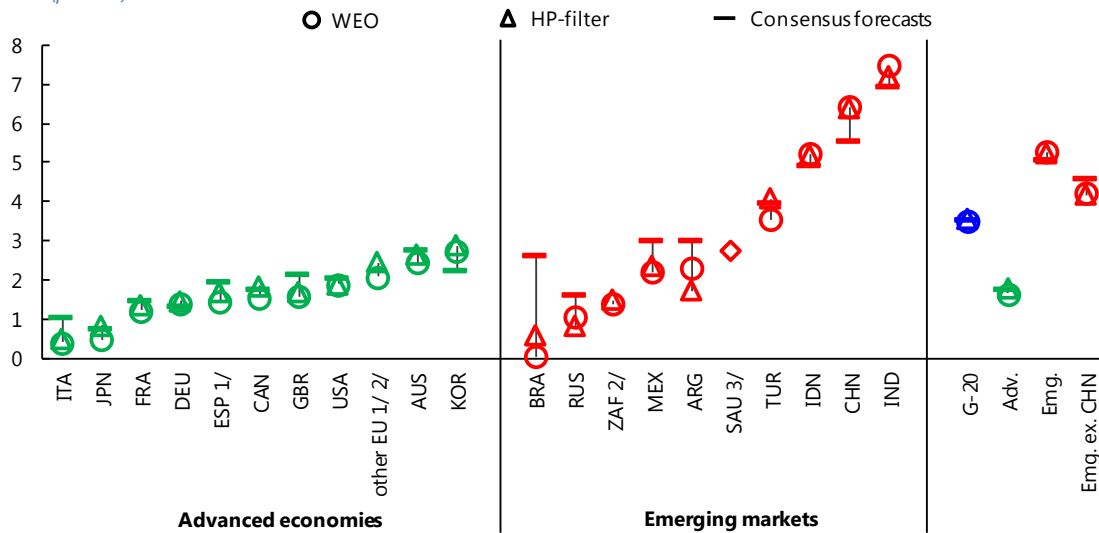


Figure A2.4 Different measures of potential output growth, 2017
(percent)



Sources: IMF, *World Economic Outlook*, July 2017; Consensus Economics; and IMF staff calculations.
 1/ ESP is a permanent invitee. Other EU indicates European Union excluding FRA, DEU, ITA, and GBR.
 2/ 5-year ahead Consensus data are unavailable to calculate output gap estimates based on Consensus forecasts. For other EU, data are unavailable for about 40 percent of the countries.
 3/ For SAU, 2017 potential output growth for the non-oil sector is used; HP-filter estimate and 5-year ahead Consensus Forecast data are not available.

Figure A2.5 Different measures of potential output growth, 2018
(percent)

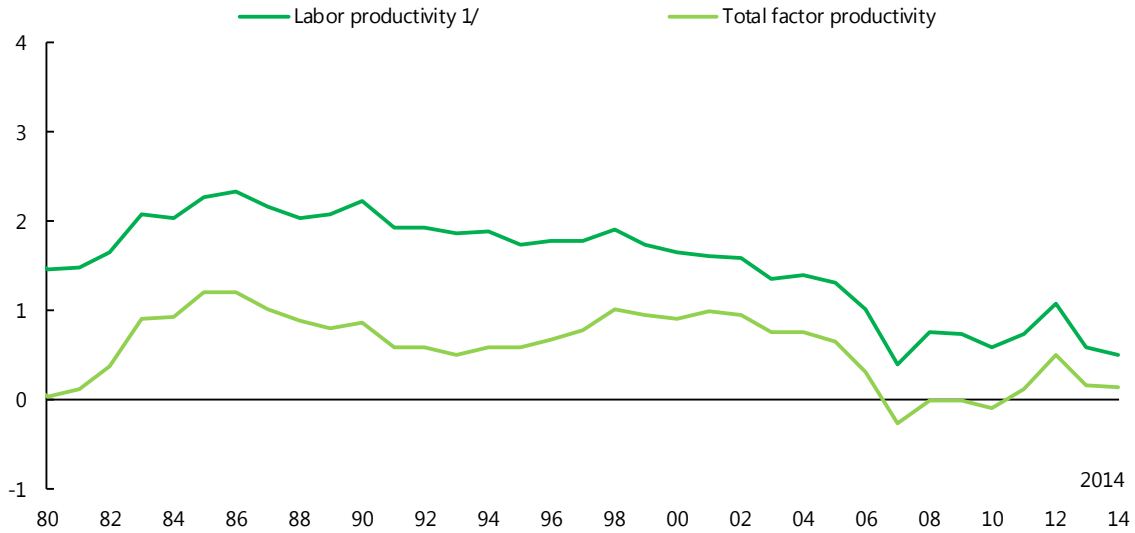


Sources: IMF, *World Economic Outlook*, July 2017; Consensus Economics; and IMF staff calculations.
 1/ ESP is a permanent invitee. Other EU indicates European Union excluding FRA, DEU, ITA, and GBR.
 2/ 5-year ahead Consensus data are unavailable to calculate output gap estimates based on Consensus forecasts. For other EU, data are unavailable for about 40 percent of the countries.
 3/ For SAU, 2017 potential output growth for the non-oil sector is used; WEO and HP-filter estimates for 2018 and 5-year ahead Consensus Forecast data are not available.

Productivity Growth

Figure A2.6 Productivity growth: Advanced economies

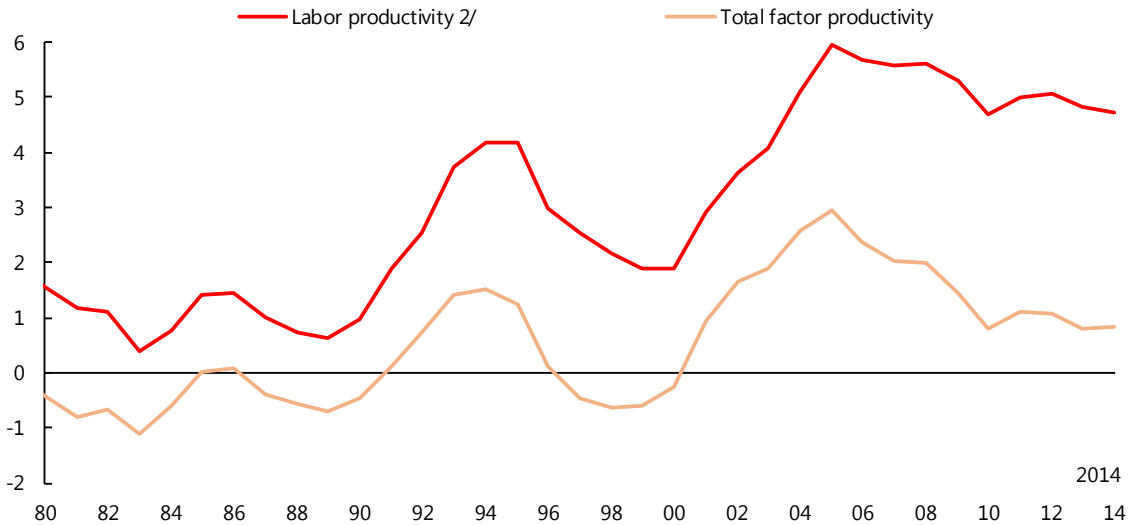
(ppp-weighted; 5-yr moving average)



Sources: IMF, *World Economic Outlook*, July 2017; Penn World Tables (PWT); and IMF staff calculations.
 1/ Labor productivity is calculated as real GDP per person employed.

Figure A2.7 Productivity growth: Emerging markets 1/

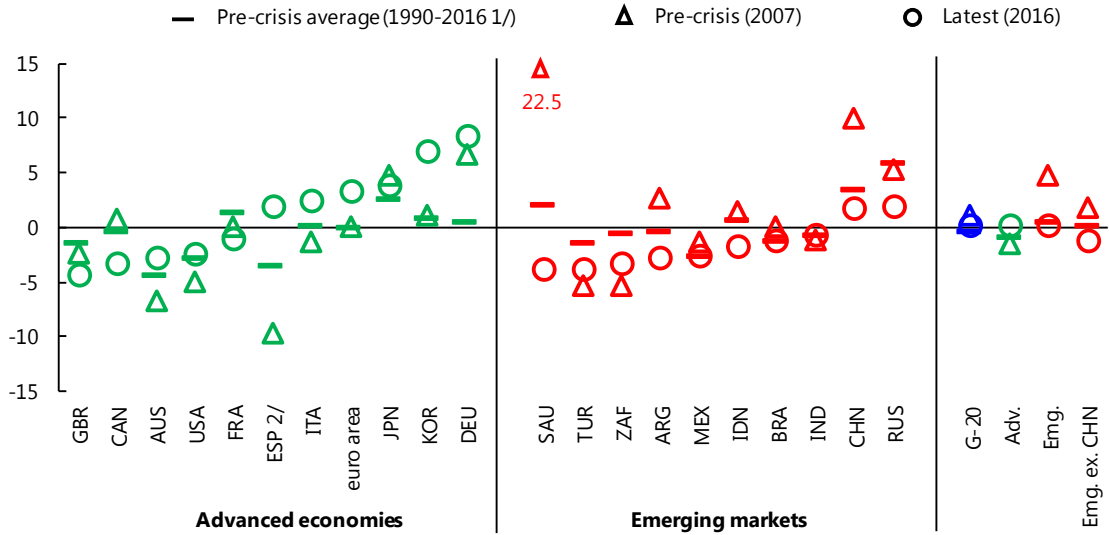
(ppp-weighted; 5-yr moving average)



Sources: IMF, *World Economic Outlook*, July 2017; Penn World Tables (PWT); and IMF staff calculations.
 1/ SAU and RUS are excluded from the aggregates due to data limitations.
 2/ Labor productivity is calculated as real GDP per person employed.

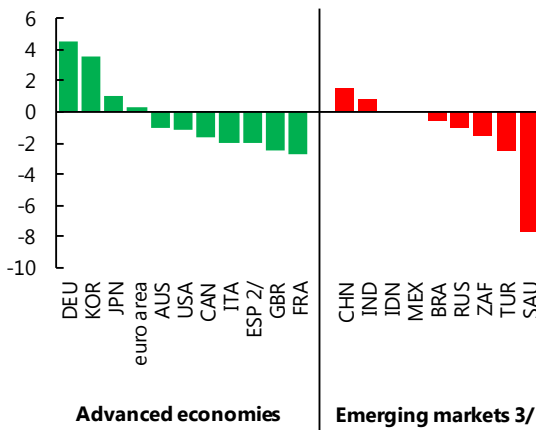
3. BALANCED GROWTH

Figure A3.1 Current account balance
(percent of GDP)



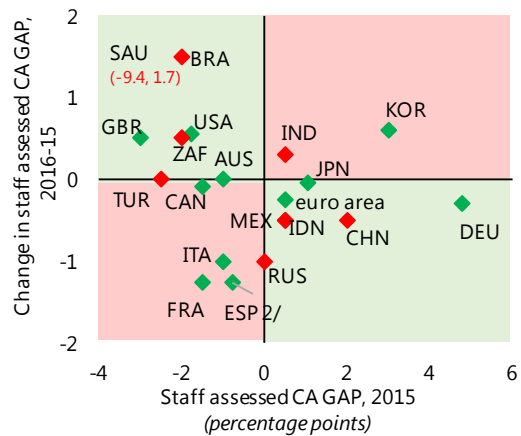
Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ Earliest data for RUS is from 1992 and CHN and euro area from 1997.
2/ ESP is a permanent invitee.

Figure A3.2 Current account gap 1/
(2016, based on ESR)



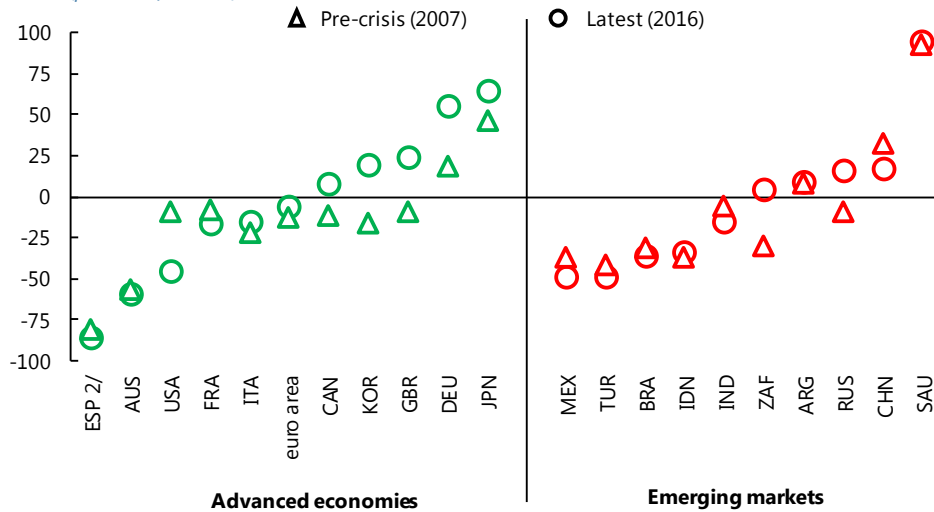
Source: IMF, *External Sector Report*, 2017.
1/ Gaps relative to staff assessed current account norms.
2/ ESP is a permanent invitee.
3/ ARG is not shown due to data limitations.

Figure A3.3 Current account gap assessment 1/
(2016, 2015, based on ESR)



Source: IMF, *External Sector Report*, 2017.
1/ Gaps relative to staff assessed current account norms. ARG is not shown due to data limitations.
2/ ESP is a permanent invitee.

Figure A3.4 Net international investment position (NIIP)
(percent of GDP 1/)

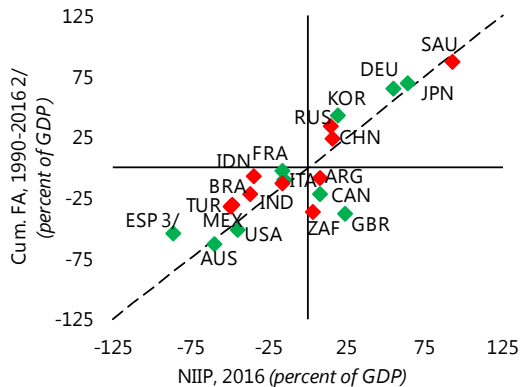


Sources: IMF, *Balance of Payments Statistics*; and IMF staff calculations.

1/ NIIP has been shown as a share of each country's GDP for the corresponding year, both in local currency.

2/ ESP is a permanent invitee.

Figure A3.5 Net international investment position (NIIP) and cumulative financial account (FA), historical 1/



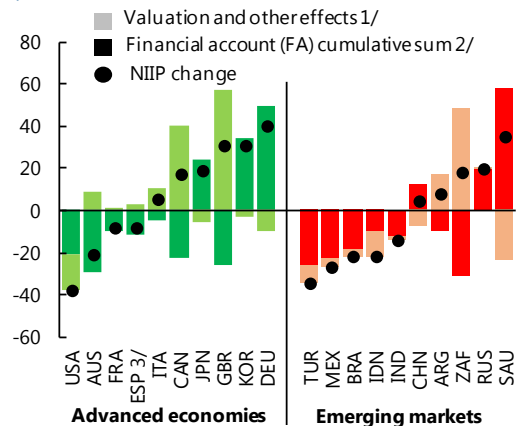
Sources: IMF, *Balance of Payments Statistics*; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

1/ FA is sum of current account balance, capital account balance and net errors and omissions. For more information, please refer to Chapter 4, *World Economic Outlook*; October 2014. Cumulative FA and NIIP are shown as share of each country's GDP in 2016; all in local currency.

2/ Earliest data for RUS is from 1992 and for CHN and from 1997.

3/ ESP is a permanent invitee.

Figure A3.6 2007-16 Net international investment position (NIIP) changes
(percent of 2016 GDP)



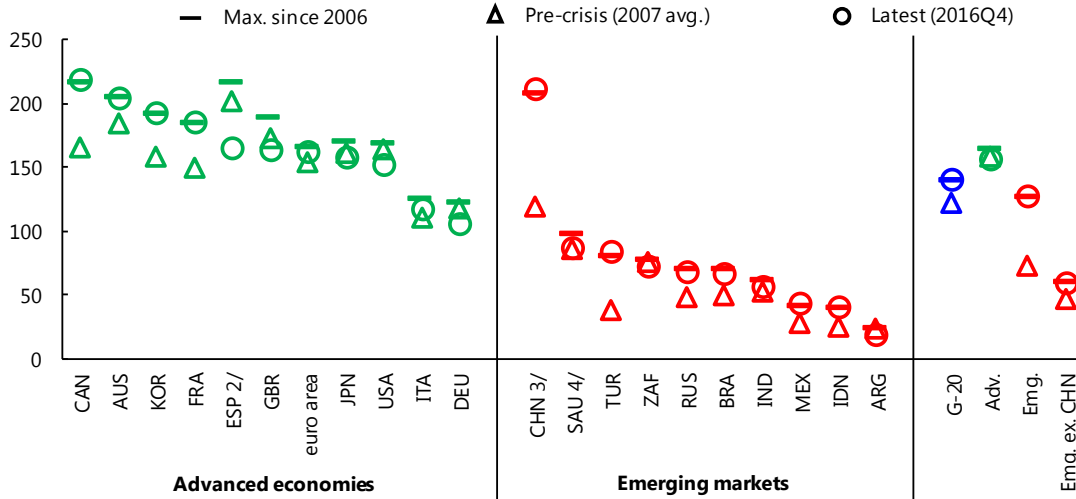
Sources: IMF, *Balance of Payments Statistics*; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

1/ Valuation effects from currency and asset price shifts and other effects.

2/ FA is sum of current account balance, capital account balance and net errors and omissions. For more information, please refer to Chapter 4, *World Economic Outlook*; October 2014. Cumulative FA and NIIP are shown as share of each country's GDP in 2016; all in local currency.

3/ ESP is a permanent invitee.

Figure A3.7 Private debt 1/
(percent of GDP)



Sources: BIS; Haver Analytics; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

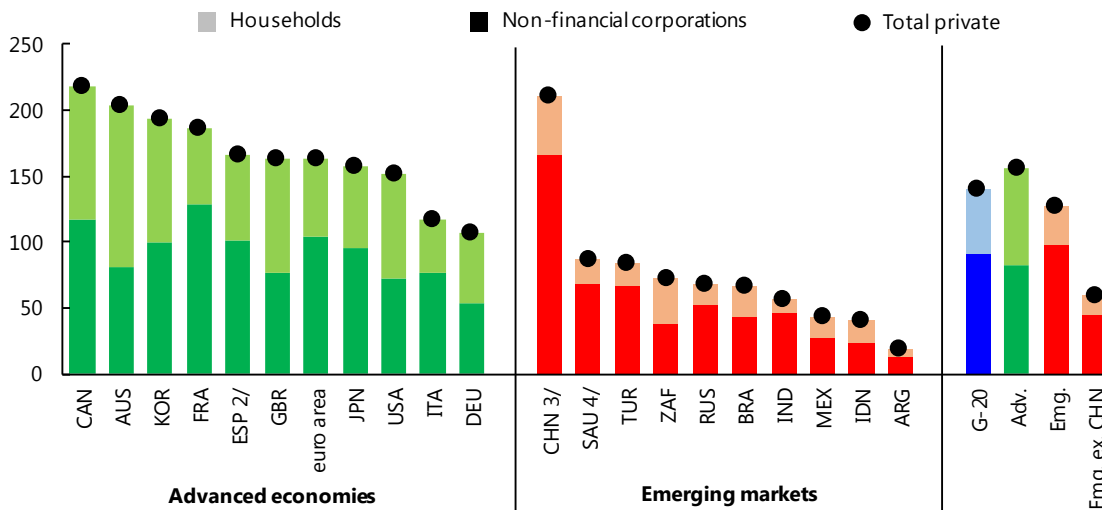
1/ Credit to private non-financial sector, which includes borrowing by non-financial corporations and households and reflects lending by domestic and foreign banks, as well as holdings of debt securities.

2/ ESP is a permanent invitee.

3/ For CHN, private debt includes LGFV (local government financing vehicles) debt.

4/ SAU data is expressed in percent of non-oil GDP.

Figure A3.8 Private debt by sector 1/
(2016Q4; percent of GDP)



Sources: BIS; Haver Analytics; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

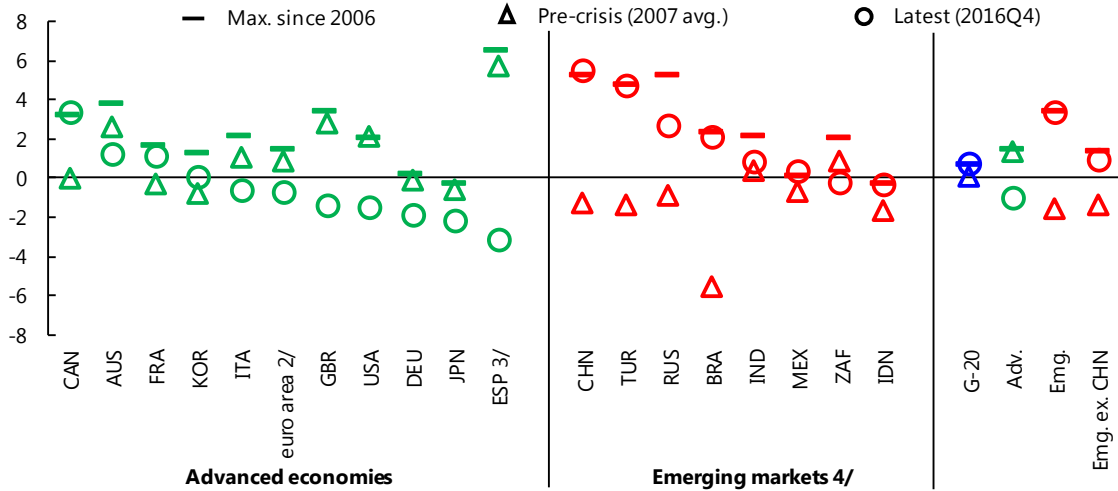
1/ Credit to private non-financial sector, which includes borrowing by non-financial corporations and households and reflects lending by domestic and foreign banks, as well as holdings of debt securities.

2/ ESP is a permanent invitee.

3/ For CHN, private debt includes LGFV (local government financing vehicles) debt.

4/ SAU data is expressed in percent of non-oil GDP.

Figure A3.9 Debt service ratio for private non-financial sector, difference from 1999-2016 average 1/
(percentage point deviation)



Sources: BIS; Haver Analytics; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

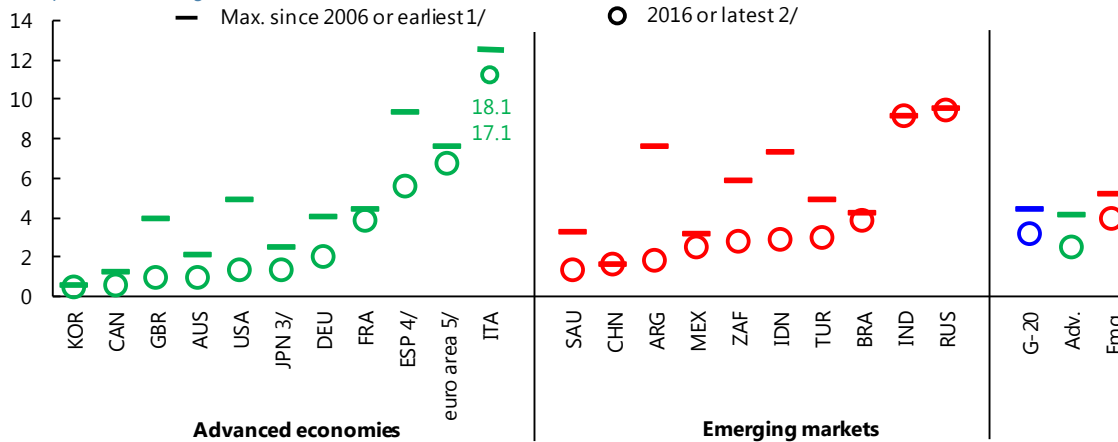
1/ The ratio is interest payments plus amortizations to income. 1999-2016 average calculated for each country separately; for Turkey, the sample period is 2002-2016.

2/ Debt service data is available for 40 percent of euro area countries, covering about 90 percent of euro area GDP.

3/ ESP is a permanent invitee.

4/ ARG & SAU are excluded due to data limitations.

Figure A3.10 Non-performing loans
(percent of total gross loans)



Source: Haver Analytics; IMF, *Financial Soundness Indicators*; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

1/ Data for GBR, IND, KOR, ZAF is available from 2008; JPN and USA in 2009; and CHN in 2010.

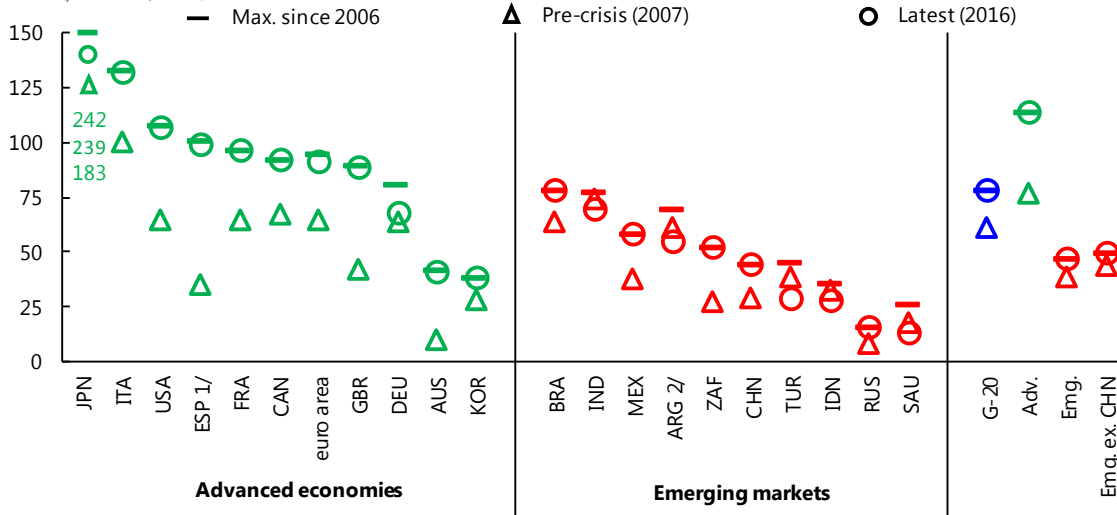
2/ Data for CHN, DEU, MEX, and TUR is from 2015, and KOR is from 2014.

3/ JPN numbers correspond to Q3 data for every year as annual data is not available.

4/ ESP is a permanent invitee.

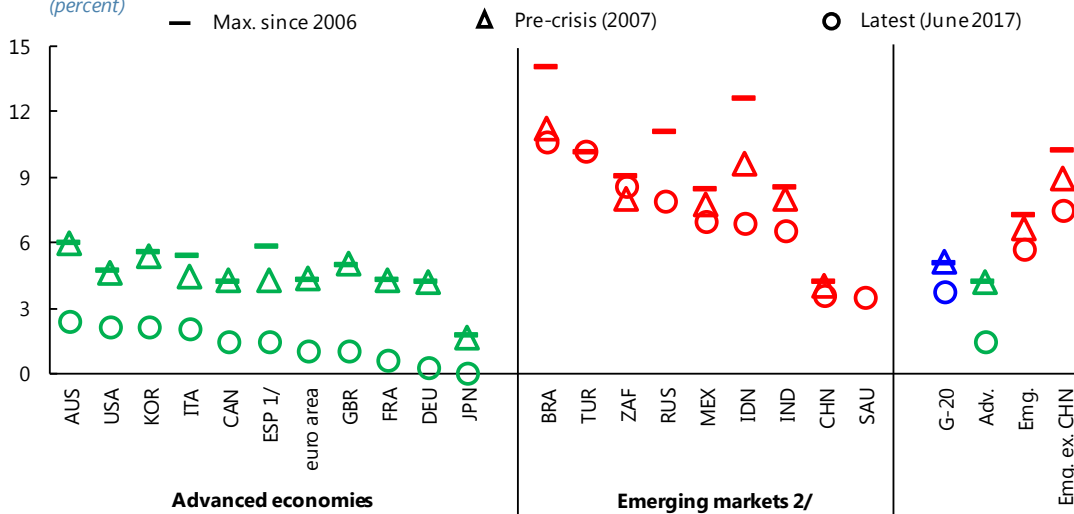
5/ Represents the weighted average of NPLs of 19 countries that constitute the euro area. FIN and LUX are excluded due to data limitations. Data for BEL, CYP, DNK, IRL, LTU and PRT is from 2015. Data for PRT is available from 2007; EST, GRC, LTU, LVA, NLD, SVK, SVN from 2008; and CYP from 2009.

Figure A3.11 General government gross debt
(percent of GDP)



Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ ESP is a permanent invitee.
2/ For ARG, data reflects federal government gross debt in percent of GDP.

Figure A3.12 10Y sovereign bond yield
(percent)

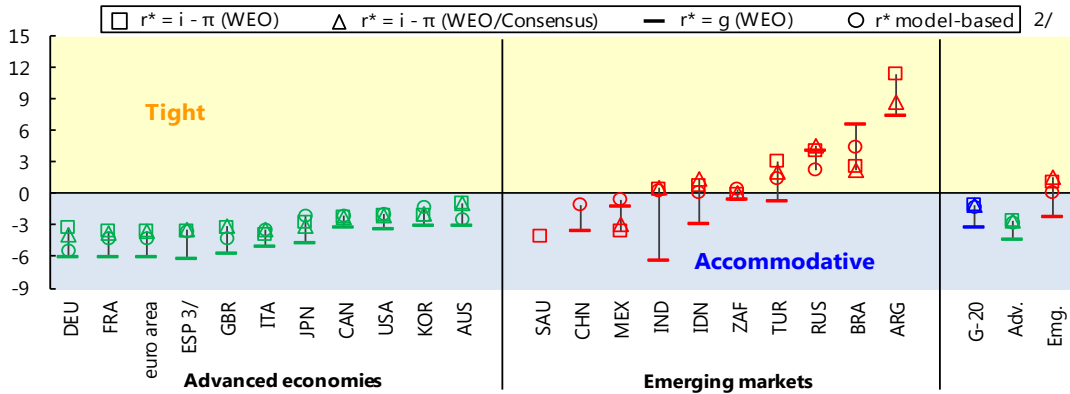


Sources: Bloomberg L.P.; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
1/ ESP is a permanent invitee
2/ ARG is excluded due to data limitations. For RUS and TUR, data starts from 2010. For BRA, data is available for 2007 and from 2010 onwards. For SAU, data starts from Oct. 2016.

4. MACROECONOMIC POLICIES

Monetary Policy

Figure A4.1 Real interest rate gap 1/
(percentage points)



Sources: CEIC database; Consensus Economics; Haver Analytics; IMF, *Global Assumptions Statistics*, *World Economic Outlook*; and IMF staff calculations.

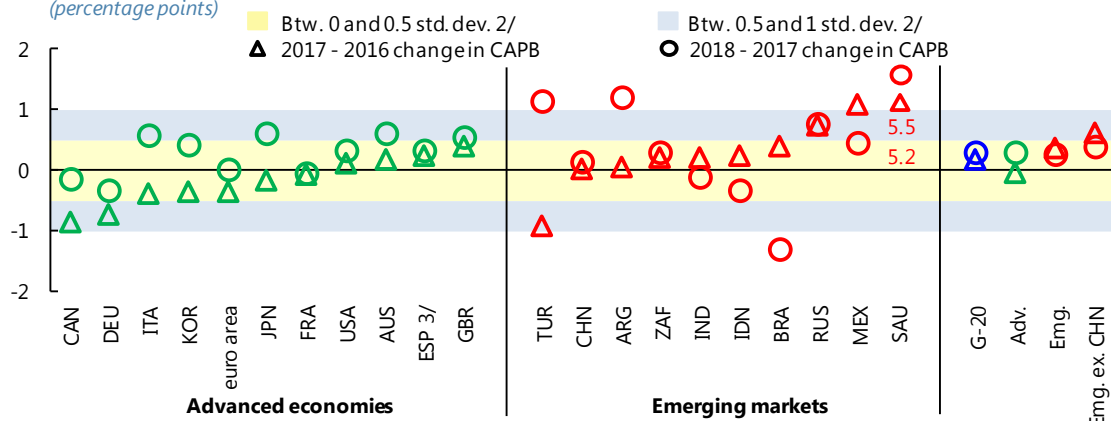
1/ The real interest rate gaps are for the 2017Q1 period and are constructed with data available as of the end of the second quarter of 2017. See Annex III for further details and discussion.

2/ The gap is the difference between the real interest rate (r) and the real natural rate (r^*). Monetary policy is tight (accommodative), when the real interest rate is above (below) its natural level. The natural rate is approximated by means of 5-year ahead forecasts of the real short-term rate using IMF staff projections and Consensus Economics data, 5-year ahead IMF staff projections of potential growth, and model-based estimates. For the countries that are still operating at the effective lower bound (Euro area, DEU, FRA, ITA, ESP, JPN, and GBR), these estimates represent the average between the stance based on the observed interest rate and the stance that considers the effect of unconventional measures by means of a shadow interest rate estimate. For ZAF, data on 5-year ahead inflation expectation is from the South African Bureau of Economic Research for the 2017Q1 period as corresponding data is not available from Consensus Economics.

3/ ESP is a permanent invitee.

Fiscal Policy

Figure A4.2 Change in cyclically adjusted primary balance, 2017 1/
(percentage points)



Sources: IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

1/ For RUS, non-oil cyclically-adjusted structural primary balance in percent of potential GDP is used. For SAU, non-oil primary balance in percent of non-oil GDP is used.

2/ Standard deviations are calculated from 1990 to 2016, excluding outliers above 99% and below 1% for each income group.

3/ ESP is a permanent invitee.

Figure A4.3 Different measures of change in cyclically adjusted primary balance, 2017 1/
(percentage points)



Sources: IMF, *World Economic Outlook*, July 2017; Consensus Economics; and IMF staff calculations.

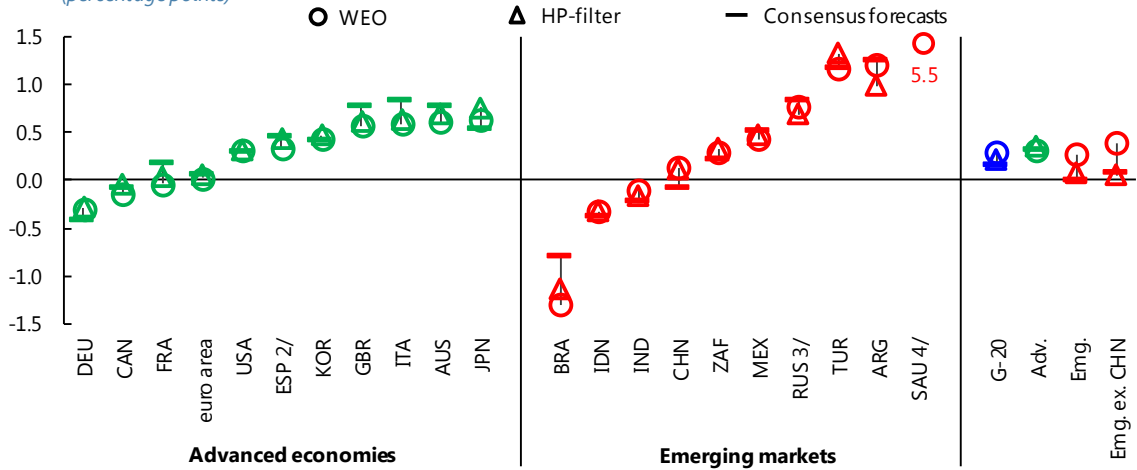
1/ All approaches use WEO fiscal projections, but the three different measures reflect different cyclical adjustments, based respectively on the desk's method for cyclical adjustment and potential output estimate, consensus forecasts of potential and actual growth, and potential output estimated using an HP-filter.

2/ ESP is a permanent invitee.

3/ For RUS, non-oil cyclically-adjusted structural primary balance in percent of potential GDP is used.

4/ For SAU, non-oil primary balance in percent of non-oil GDP is used as the WEO measure; HP-filter estimate and 5-year ahead Consensus Forecast data are not available.

Figure A4.4 Different measures of change in cyclically adjusted primary balance, 2018 1/
(percentage points)



Sources: IMF, *World Economic Outlook*, July 2017; Consensus Economics; and IMF staff calculations.

1/ All approaches use WEO fiscal projections, but the three different measures reflect different cyclical adjustments, based respectively on the desk's method for cyclical adjustment and potential output estimate, consensus forecasts of potential and actual growth, and potential output estimated using an HP-filter.

2/ ESP is a permanent invitee.

3/ For RUS, non-oil cyclically-adjusted structural primary balance in percent of potential GDP is used.

4/ For SAU, non-oil primary balance in percent of non-oil GDP is used as the WEO measure; HP-filter estimate and 5-year ahead Consensus Forecast data are not available.

5. SIMULATION OUTCOMES

Short-Term Effects

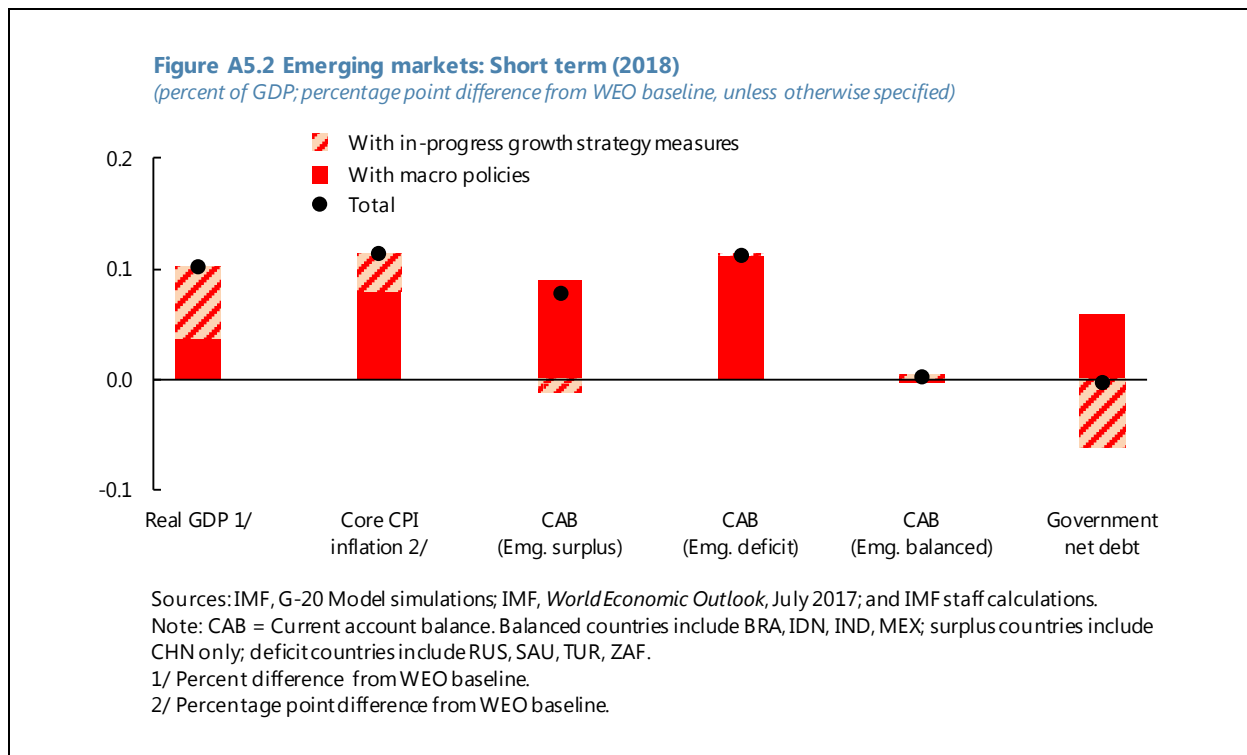
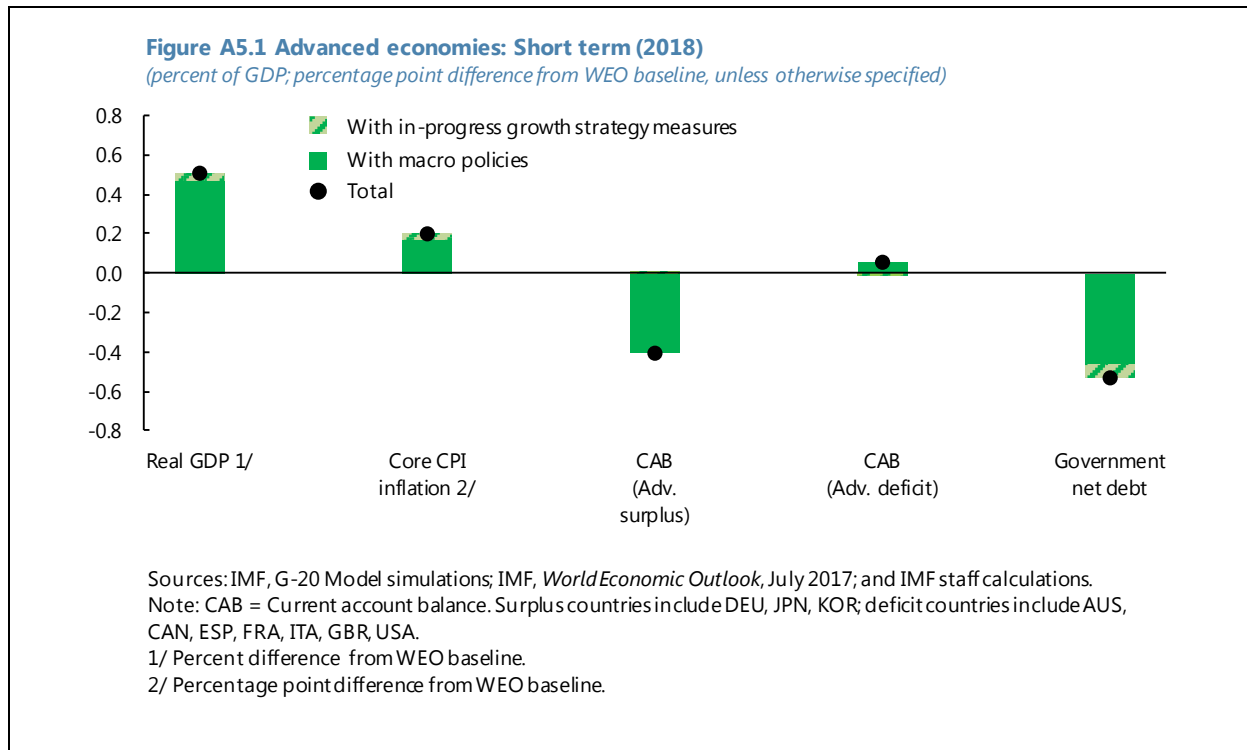
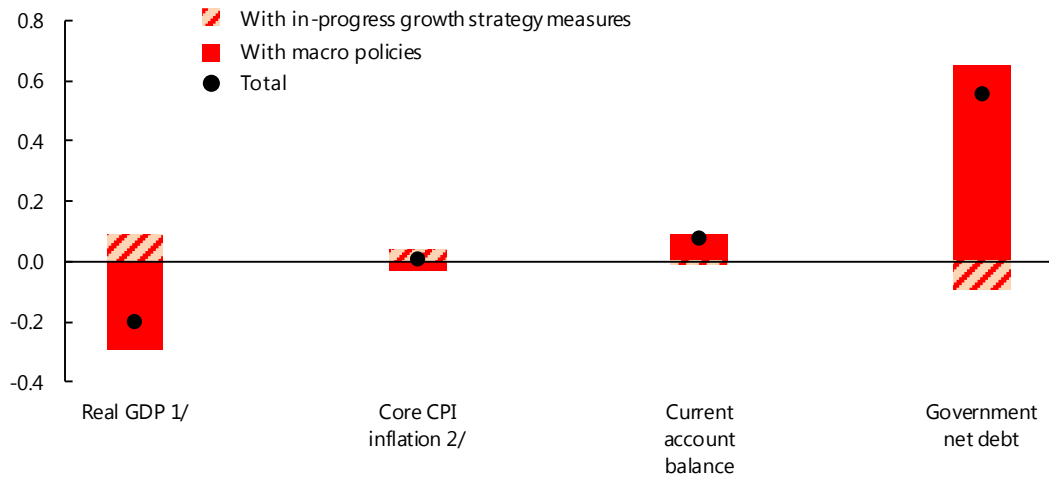


Figure A5.3 China: Short term (2018)

(percent of GDP; percentage point difference from WEO baseline, unless otherwise specified)



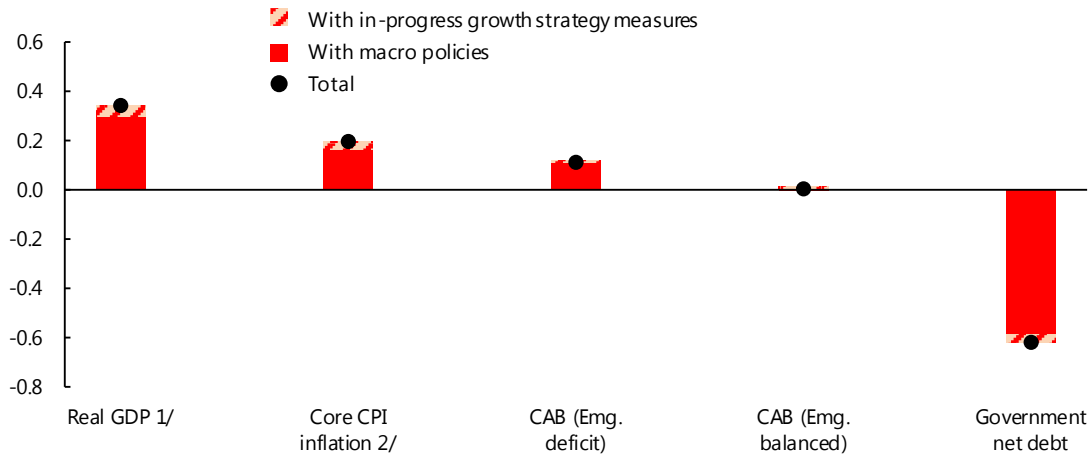
Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

1/ Percent difference from WEO baseline.

2/ Percentage point difference from WEO baseline.

Figure A5.4 Emerging markets excluding China: Short term (2018)

(percent of GDP; percentage point difference from WEO baseline, unless otherwise specified)



Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

Note: CAB = Current account balance. Balanced countries include BRA, IDN, IND, MEX; deficit countries include RUS, SAU, TUR, ZAF.

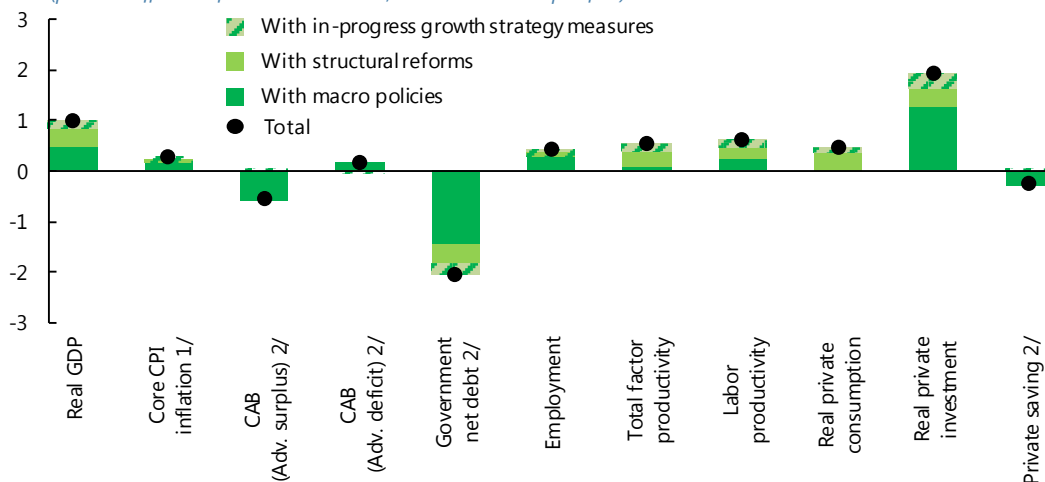
1/ Percent difference from WEO baseline.

2/ Percentage point difference from WEO baseline.

Medium-Term Effects

Figure A5.5 Advanced economies: Medium term (2019-22 average)

(percent difference from WEO baseline, unless otherwise specified)



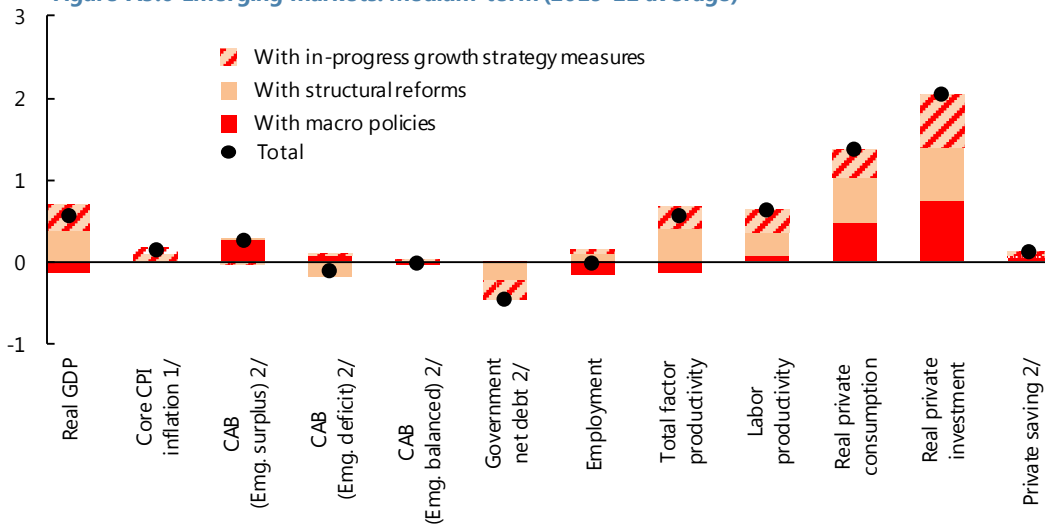
Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

Note: CAB = Current account balance. Surplus countries include DEU, JPN, KOR; deficit countries include AUS, CAN, ESP, FRA, ITA, GBR, USA.

1/ Percentage point difference from WEO baseline.

2/ Percent of GDP; percentage point difference from WEO baseline.

Figure A5.6 Emerging markets: Medium term (2019-22 average)



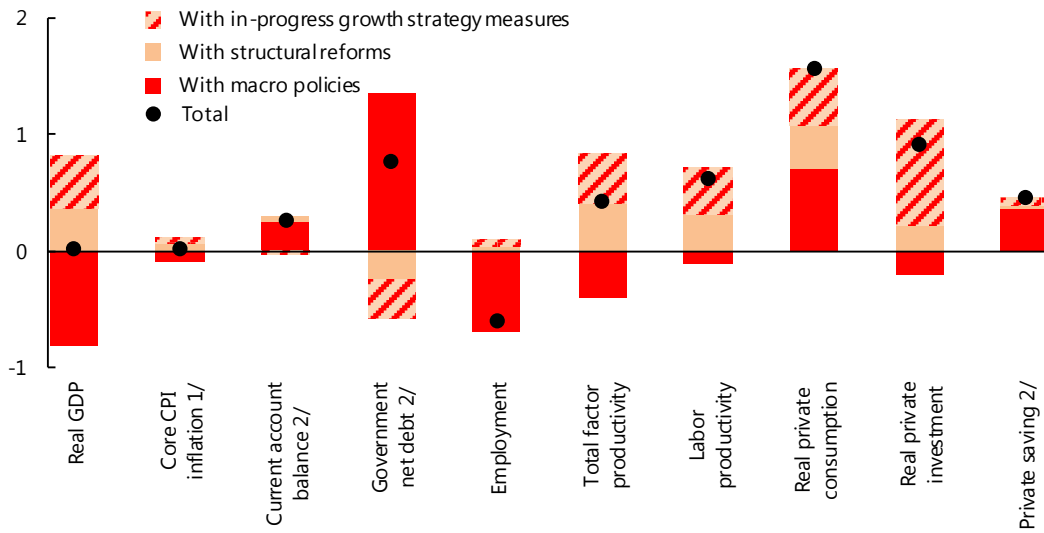
Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.

Note: CAB = Current account balance. Balanced countries include BRA, IDN, IND, MEX; surplus countries include CHN only; deficit countries include RUS, SAU, TUR, ZAF.

1/ Percentage point difference from WEO baseline.

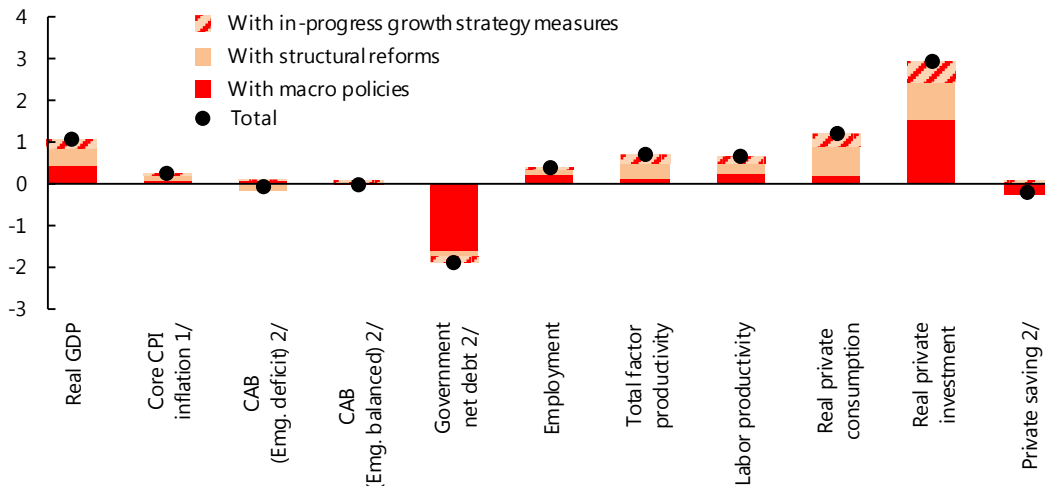
2/ Percent of GDP; percentage point difference from WEO baseline.

Figure A5.7 China: Medium term (2019-22 average)



Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
 1/ Percentage point difference from WEO baseline.
 2/ Percent of GDP; percentage point difference from WEO baseline.

Figure A5.8 Emerging markets excluding China: Medium term (2019-22 average)
(percent difference from WEO baseline, unless otherwise specified)



Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
 Note: CAB = Current account balance. Balanced countries include BRA, IDN, IND, MEX; deficit countries include RUS, SAU, TUR, ZAF.
 1/ Percentage point difference from WEO baseline.
 2/ Percent of GDP; percentage point difference from WEO baseline.

Long-Term Effects

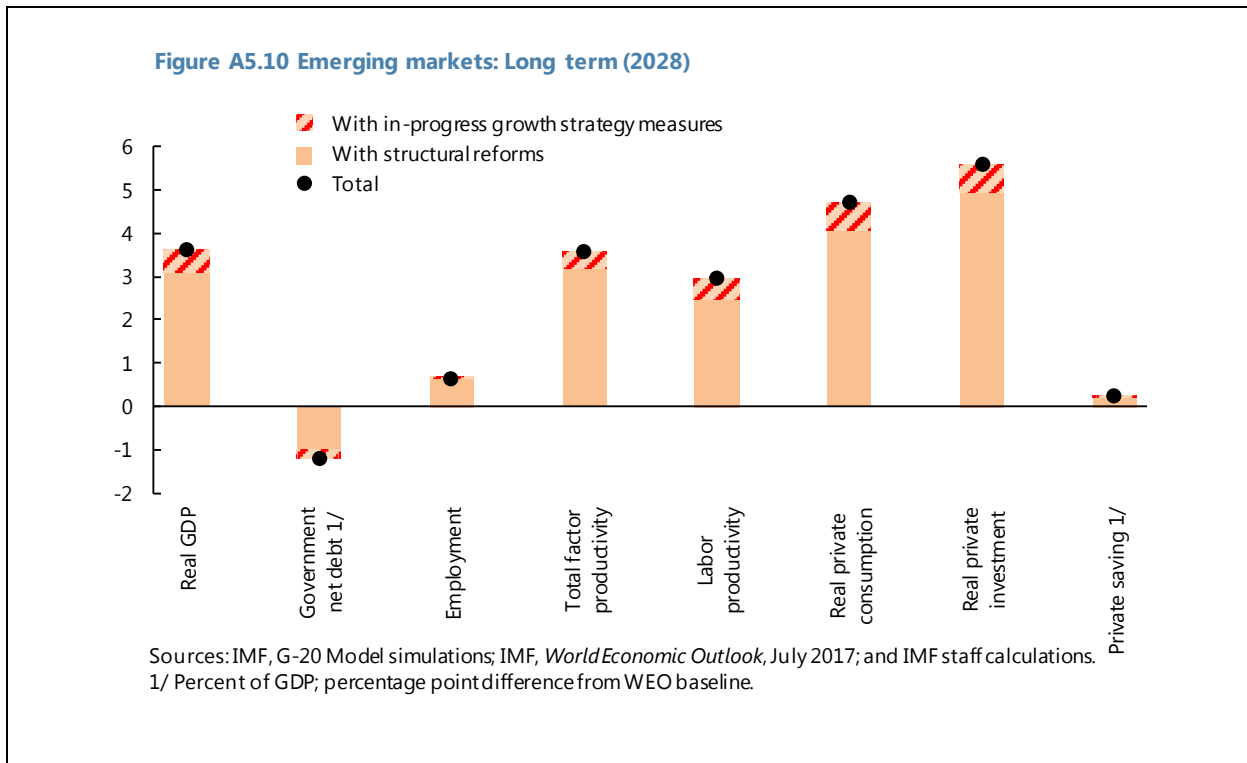
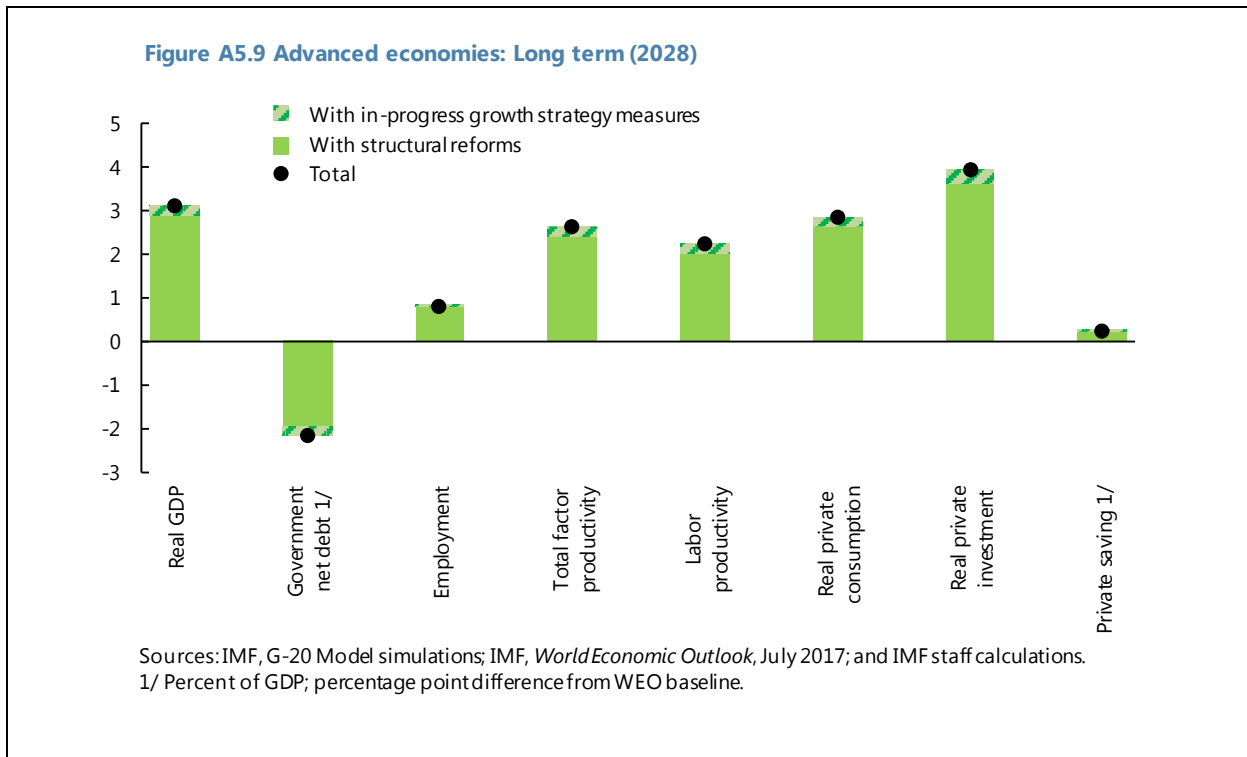
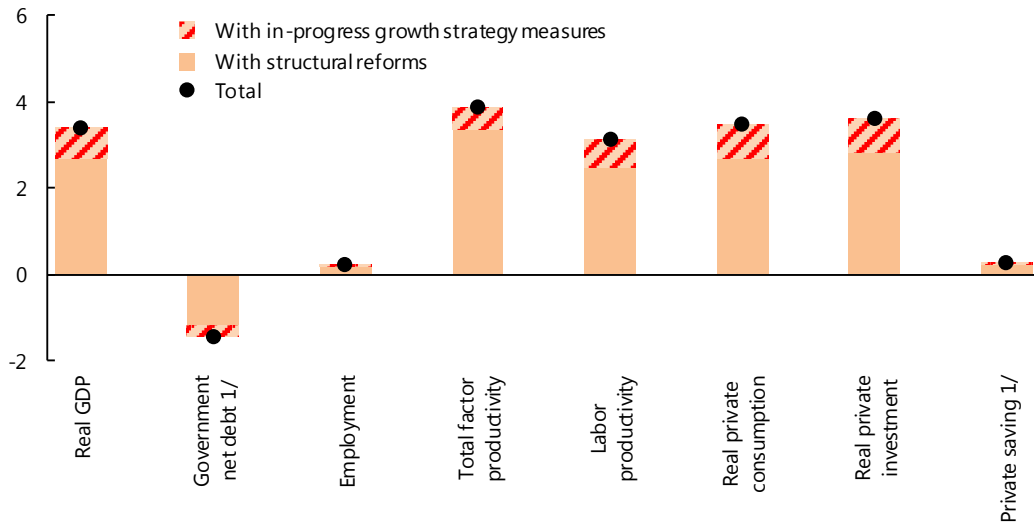
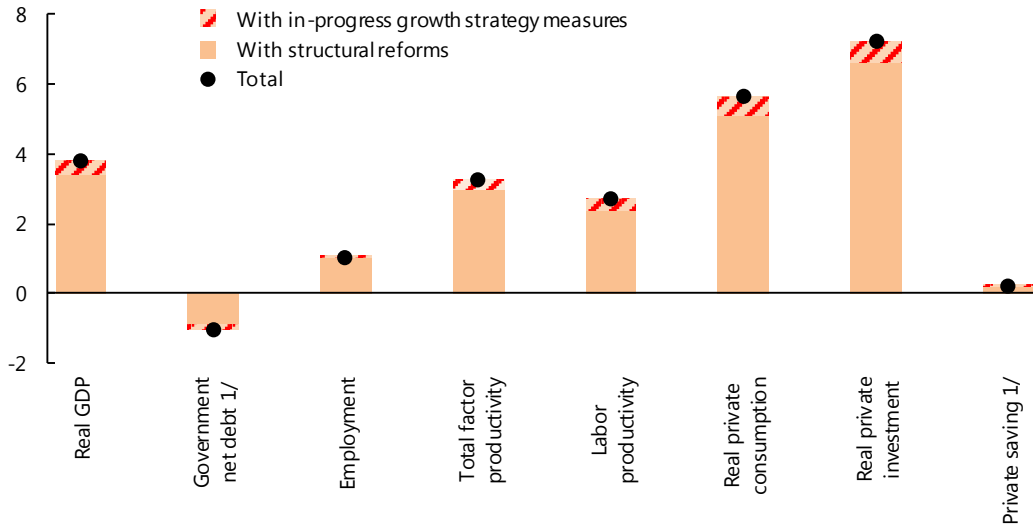


Figure A5.11 China: Long term (2028)



Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
 1/ Percent of GDP; percentage point difference from WEO baseline.

Figure A5.12 Emerging markets excluding China: Long term (2028)



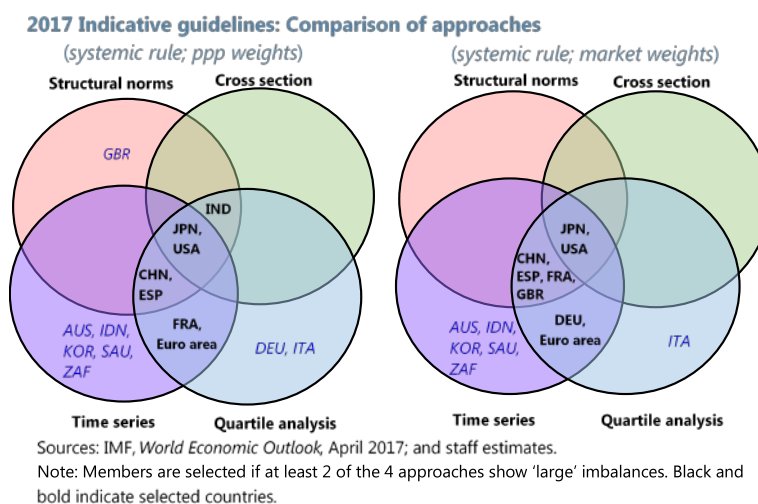
Sources: IMF, G-20 Model simulations; IMF, *World Economic Outlook*, July 2017; and IMF staff calculations.
 1/ Percent of GDP; percentage point difference from WEO baseline.

Annex II. Update of G-20 Indicative Guideline¹

This Annex presents the 2017 biennial update of G-20 Indicative Guidelines following the methodology agreed by the G-20 in April 2011. The G-20 methodology consists in assessing a set of indicators mechanically, without normative implications, against reference values to identify members with large imbalances that would require further analysis, under the sustainability updates of the G20 Mutual Assessment Process (MAP).

Indicators to evaluate imbalances: They include (i) public debt and fiscal deficits; (ii) private saving and private debt; and (iii) the external position, comprising trade balance, net investment income flows, and transfers. The indicators are based on average projected values for 2019–2021 from the IMF’s April 2017 *World Economic Outlook*, except for private debt where the latest available data is used.

Reference points: Reference values against which the indicators are compared, are derived from the following four approaches: (i) a structural approach based on economic frameworks to calculate “norms” (for the external position, the norm is based on staff’s ESR methodology); (ii) a time series approach to provide historical trends; (iii) a cross-section approach to identify benchmarks based on averages of countries at similar development stages; and (iv) quartile analysis to provide median values for the full G-20 distribution.



Selection criteria: Members are selected if at least 2 of the 4 approaches above show “large” imbalances (i.e., significant deviations of indicators from their reference values) in 2 or 3 sectors (external, fiscal, and private). For “systemic” members (i.e., whose share in the G-20 GDP is 5 percent or more), a “moderate” imbalance is used for selection to account for their systemically important roles.

Results: The updated G-20 Indicative Guidelines identify the same 9 members as in the 2015 exercise as having relatively large imbalances that would have warranted in-depth analysis under the G20 MAP sustainability updates. Specifically, the main sources of imbalances are the following: *China*: external, fiscal, and private imbalance; *Euro area*: external surplus and public sector debt; *India*: fiscal and private imbalances; *Japan*: high external imbalance, high public sector debt, and private saving; *United Kingdom*: external, public debt, and private imbalance; *United States*: external and fiscal imbalances; *France*: external imbalance, high public sector debt, private imbalances; *Germany*: high external surplus; and *Spain*: external imbalance, high public sector debt, and private imbalances.

¹ Prepared by Eric Bang. Note that the approach and the indicators used are specific to the Indicative Guidelines methodology and not necessarily the same as those used elsewhere in the G-20 Report on SSBG.

Annex III. Approaches for Estimating the Monetary Stance¹

This note discusses different approaches for estimating the monetary stance for the G-20, used in the report. The stance of monetary policy is measured by the gap between the real policy rate (r) and the natural rate (r^), which is the real short-term rate consistent with a closed output gap and constant inflation. For countries that are operating at the effective lower bound, the effects of unconventional monetary policies on short-term interest rates are considered by means of shadow rate estimates. Natural real rates are not observable, so estimates are subject to considerable uncertainty; we construct measures of steady-state real interest rates and estimate a semi-structural model to approximate real natural rates.*

Monetary policy stance

The analysis assumes monetary policy operates by changing the short-term nominal interest rate (i). The nominal policy rate in isolation is not a good measure for the stance monetary policy, however, as it only matters to the extent that it affects the real rate—which is the rate determining economic agents' savings and investment decisions. We compute the real short-term rate as follows:

$$r_t = i_t - \pi_{t+1}^e \quad (1)$$

i denotes the nominal short-term interest rate, π^e denotes short-term inflation expectations measured by the 1-year ahead expectations from Consensus Economics, and r is the real short-term rate. The stance of monetary policy is gauged by the level of the real interest rate relative to its natural value (r^*), which is the real interest rate that would equate savings and investment, when output is at potential and inflation is constant. Monetary policy is tight (accommodative), when central bank actions push the real interest rate above (below) its natural level.

It should be noted that for countries in the euro area, we provide individual country assessments despite their common monetary policy, as the crisis demonstrated that economic and financial forces—such as differences in the short- and medium-term growth path, output gap, and financial conjuncture (for example, sovereign and private debt overhangs and private sector balance sheet problems)—may have affected natural rates differently across euro area members.

Accounting for unconventional monetary policies through shadow rate estimates

Since the crisis, nominal interest rates have approached the effective-lower bound and unconventional monetary policies—asset purchases and forward guidance—have been deployed in several advanced economies: the United States, the United Kingdom, the euro area, and Japan. To capture the potential effect of these policies on the monetary stance, an alternative assessment is provided for these countries based on shadow nominal interest rate estimates. These estimates attempt to calculate an interest rate compatible with the policy rate in normal times, in order to represent the monetary stance in the presence of unconventional monetary policies at the effective lower bound. Several approaches have been put forward to estimate shadow interest rates, including yield curve-based models,

¹ Prepared by Carolina Osorio Buitron.

principal component analysis, estimates based on the impact of unconventional policies on long-term rates that take account of financial market frictions—such as imperfect asset substitutability— and estimates based on fitted Taylor rules. We use yield-curve-based estimates from Krippner (2017), as time series shadow rate estimates are available for all countries at the effective lower bound, and we discuss selective alternative results (see the discussion).²

Approximating the natural real rate

Since the real natural rate is unobservable, there is significant uncertainty and imprecision around its estimates. We therefore use a number of approaches to approximate the real natural rate.

A number of approaches is used to approximate the real natural rate.

Empirical indicators

1. $r_t^* = i_{t+5}^f - \pi_{t+5}^f$: 5-year ahead forecasts of the short-term nominal rate less 5-year ahead forecasts of inflation, both based on IMF staff projections.
2. $r_t^* = i_{t+5}^f - \pi_{t+5}^e$: 5-year ahead IMF staff forecasts for the short-term nominal rate less 5-year ahead inflation expectations from Consensus Economics.
3. $r_t^* = g_{t+5}^f$: 5-year ahead potential growth IMF staff projections. This indicator assumes that movements in the natural rate are governed by the economy’s potential trend growth rate. This is consistent with standard growth economic theory, which predicts that the natural rate of interest varies over time in response to shifts in population growth, preferences and technological progress.

Model-based estimates

An alternative approach is to estimate a simple semi-structural model—an approach used widely in the literature—following the application by Pescatori and Turunen (*forthcoming*). The authors estimate potential output (and hence the output gap) as well as the natural interest rate for the United States, by combining the Kalman filtering technique developed by Laubach and Williams (2003) and Bayesian methods to characterize the posterior distribution of structural parameters.

The core system of equations in each country model includes:

- An IS-curve relating the output gap to the stance of monetary policy;

$$\tilde{y}_t = \alpha_1 \tilde{y}_{t-1} + \alpha_2 \tilde{y}_{t-2} - \frac{\alpha_r}{2} \sum_{j=1}^2 (r_{t-j} - r_{t-j}^*) + \varepsilon_t^{IS} \quad (2)$$

where \tilde{y}_t is the output gap and ε_t^{IS} is an iid shock with standard deviation σ^{IS} . The output gap is equal to the log-difference between output (y_t) and potential (y_t^N):

$$\tilde{y}_t = y_t - y_t^N \quad (3)$$

² Krippner’s model assumes two-state variables or factors—the yield curve level and slope—and an effective lower bound of 12.5 basis points imposed through a call option mechanism, whereby shadow bonds with yields below this threshold are constrained to the lower bound.

Potential output growth is assumed to be driven by trend growth g and noise ε_t^N , which has a standard deviation σ^n .

$$y_t^N = y_{t-1}^N + g_t + \varepsilon_t^N \quad (4)$$

$$g_t = g_{t-1} + \varepsilon_t^g \quad (5)$$

with ε_t^N representing a transitory shock to potential output, while ε_t^g is a persistent shock.

- An open-economy backward looking Phillips curve relating core inflation (π_t) to the output gap and the gap between (domestic-currency) import price inflation and core inflation (π_t^m)³;

$$\begin{aligned} \pi_t = & \beta_1 \pi_{t-1} + \frac{\beta_2}{3} (\pi_{t-2} + \pi_{t-3} + \pi_{t-4}) + \frac{1 - \beta_1 - \beta_2 - \beta_0}{4} \pi_{t-5} \\ & + \frac{1 - \beta_1 - \beta_2}{4} (\pi_{t-6} + \pi_{t-7} + \pi_{t-8}) + \beta_y \tilde{y}_{t-1} + \beta_m \pi_{t-1}^m + \varepsilon_t^{PC} \end{aligned} \quad (6)$$

where core and import price inflation are measured by quarter-on-quarter annualized percent changes; and ε_t^{PC} is an iid shock with standard deviation σ^{PC} .

- An equation that links the natural rate of interest to its determinants; trend growth (g_t) and an exogenous process (z_t).

$$r_t^* = c g_t + z_t \quad (7)$$

where c is a positive constant and z_t is meant to capture possible determinants of the natural rate other than trend growth. While some of these factors are not observable (e.g., changes in time preferences and financial frictions), others are. For all countries with the exception of the U.S., we assume that the following factors influence the exogenous process: the country-specific news-based index of economic policy uncertainty (p_t)⁴ by Bloom et. al., an indicator of financial risk (f_t)⁵ which measures country-risk, and the U.S. 10-year real sovereign yield (e_t).

$$z_t = \delta_1 z_{t-1} + \delta_2 z_{t-2} + \delta_f \Delta f_t + \delta_p \Delta p_t + \delta_e \Delta e_t + \varepsilon_t^z \quad (8.A)$$

For the United States, the exogenous process is assumed to be influenced by economic policy uncertainty (p_t^{US}) from Bloom et. al. and the equity premium (e_t^{US}) from Duarte and Rosa (2015), both capturing investor preferences for safe assets.

$$z_t = \delta_1 z_{t-1} + \delta_2 z_{t-2} + \delta_p \Delta p_t^{US} + \delta_e \Delta e_t^{US} + \varepsilon_t^z \quad (8.B)$$

These assumptions imply that the United States is treated mostly as a closed economy, while all other countries are assumed to be open economies, whose natural rates can be influenced by United States interest rates.

³ Headline inflation is used for India and Mexico.

⁴ For countries where the policy uncertainty is not available (Mexico, Turkey, Indonesia and South Africa), we use the global index or the index of a close trade partner.

⁵ We use the EMBI spread for all emerging economies except India, and the 10-year sovereign spread relative to the U.S. for India and advanced economies.

- Output gap estimates from WEO are assumed to provide a noisy signal for the output gap, which helps anchor the filter.

$$\tilde{y}_t^{WEO} = \tilde{y}_t + \mu_t + \varepsilon_t^m \quad (9)$$

$$\mu_t = \rho_m \mu_{t-1} + \varepsilon_t^u \quad (10)$$

where ε_t^m represents temporary noise and ε_t^u is a persistent reduction in the quality of the signal. The parameter ρ_m and the standard deviations of errors ε_t^m and ε_t^u (σ^m and σ^u , respectively), determine the relationship between signal (\tilde{y}_t^{WEO}) and noise ($\mu_t + \varepsilon_t^m$).

- The real interest rate and import price inflation are taken as exogenous.

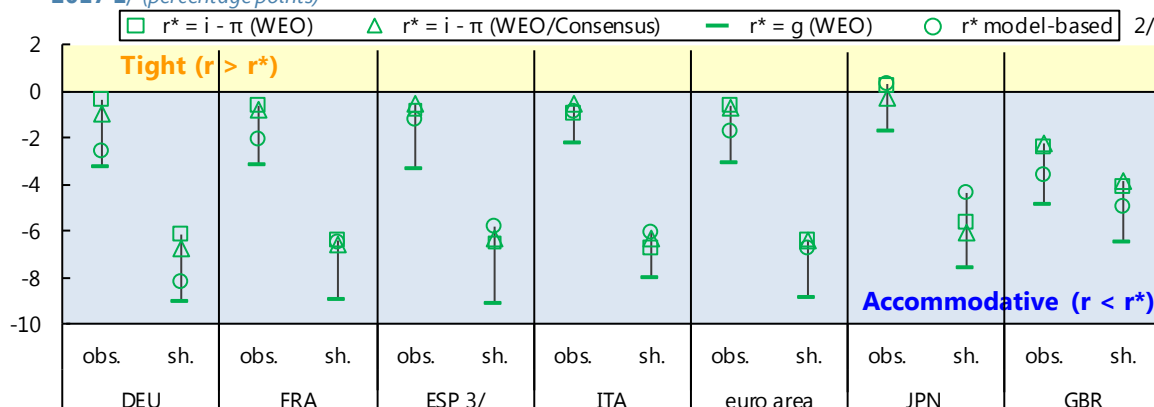
The sample period varies by country, but in all the models 2017Q2–2018Q4 forecasts are included to mitigate the end-point problem of the filter.⁶

In general, the Bayesian priors are set using single-equation regression analysis as well as information from Pescatori and Turunen (forthcoming). Priors are tight for the standard deviation of c (which helps solve the weak identification of this parameter), as well as for the output gap persistence ($\alpha_1 + \alpha_2$) and the persistence of the exogenous process z , ($\delta_1 + \delta_2$). In contrast, the priors for the trend growth and potential output (λ_g) and the ratio of the standard deviations of the error of the z -process and IS curve (λ_z) are wider, and the priors for the determinants of z ($\delta_c, \delta_e, \delta_p$) are relatively loose, putting fewer restrictions on the data. The priors for all standard deviations are inverse gamma and distributed in line with Bayesian DSGE literature.

Figure A4.1 shows the stance of monetary policy for 2017Q1 based on the semi-structural model and the simple empirical approximations introduced earlier, using data as of the end of the second quarter 2017. For the countries that are still at the effective lower bound, these estimates represent the average between the stance based on the observed interest rate and the stance that considers the effect of unconventional measures by means of the shadow interest rate estimate. The figure below shows these estimates separately.

⁶ While it has been argued that state-space models, such as the Kalman filter, do not suffer from an end-point problem (e.g. Proietti and Musso; 2012), more recent theoretical and applied research (Andrieu; 2013 and Blagrove et. al. 2015) show that it does. The Kalman filter also has starting-point problems, but these are likely to be small given the length of our sample period.

Real interest rate gap for countries at the effective lower bound: observed vs. shadow policy rate, 2017 1/ (percentage points)



Sources: CEIC database; Consensus Economics; IMF, *Global Assumptions Statistics*, *World Economic Outlook*; and IMF staff calculations.

1/ The real interest rate gaps are for the 2017Q1 period and are constructed with data available as of the end of the second quarter of 2017.

2/ The gap is the difference between the real interest rate (r) and the real natural rate (r^*). Monetary policy is tight (accommodative), when the real interest rate is above (below) its natural level. The natural rate is approximated by means of 5-year ahead forecasts of the real short-term rate using IMF staff projections and Consensus Economics data, 5-year ahead IMF staff projections of potential growth, and model-based estimates. Obs. denotes the monetary stance based on the observed policy rate, and sh. denotes the stance based on the shadow policy rate.

3/ ESP is a permanent invitee.

Discussion

A number of caveats are worthwhile noting:

- *It is difficult to capture all country circumstances in a common approach.* To provide a coherent set of diagnostics of the monetary stance across G-20 countries, the approaches used are the same across all countries. For example, while the interest rate based approximations reflect, in principle, the domestic economy's growth prospects relative to others—along with additional factors, such as financial frictions and changes in time preferences—the approximation of the real natural rate by potential growth focuses on domestic growth prospects alone, a simplification which is most limiting for very open economies. The model-based estimates offer some flexibility to capture country idiosyncrasies, ultimately there are limits to using a single model for a heterogenous set countries that includes advanced and emerging economies, as well as commodity exporters. In some cases, taking full account of these country characteristics could alter the results.
- *There is significant uncertainty around the estimates.* First, estimates obviously change across the various approaches considered, and judgment is needed when interpreting the outcomes. Second, the confidence bands around the model-based estimates are large in some cases and, as with any such exercise, the estimates remain sensitive to the assumptions made about priors.
- *Unconventional policies present a challenge to the assessment of the monetary stance.* The use of shadow rates, while generally not changing the qualitative assessment of the monetary stance,

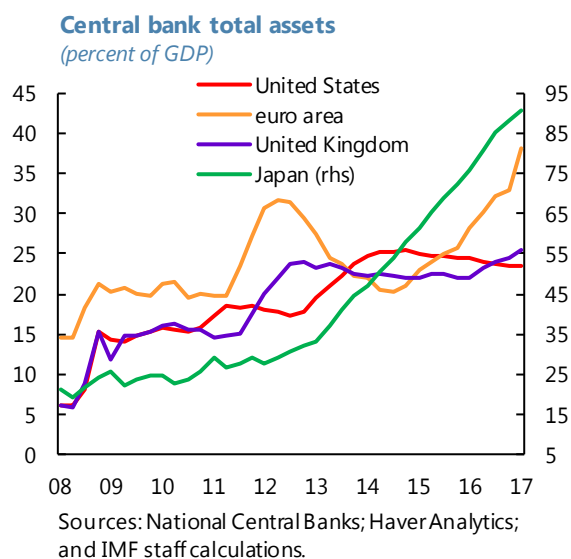
provides a first cut at the problem. There are, however, a number of important limitations to consider. These include:

- *Negative values of the shadow rate do not represent interest rates at which economic agents can transact.* Therefore, changes in shadow rates should not be expected to influence the economy in the same way as *conventional* policy rates changes, because negative interest rate gaps when real shadow rates are negative may entail a different degree of accommodation than when the shadow rate is positive. As such, our assessment of more accommodation based on shadow rate estimates is simply qualitative.
- *Yield-curve based shadow rates may not capture all the channels through which unconventional policies operate, which can bias the estimated degree of accommodation.* Unconventional monetary policy stimulates the economy through at least three channels: (i) signaling—conveying information about future short-term rates; (ii) confidence—reducing market volatility or uncertainty about the economic outlook; (iii) and portfolio rebalancing—inducing investors to switch into higher-risk assets. The last channel is specific to central bank asset purchases and, due to market frictions, may entail persistent effects on (long-term) interest rates that are not captured well by yield-curve based shadow rate approaches. Specifically, due to imperfect asset substitutability—arising from a preference of certain bond holders for particular maturities—quantitative easing (QE) operations create a shortage of the assets purchased by the central bank. The resulting price effect has a persistent component, as the announced path of central bank holdings perpetuates the shortage of the purchased assets, making bond yields sensitive to the expected evolution of both the size and composition of the central bank balance sheet. This contrasts with the shadow rate estimates used in our analysis, which rely on an arbitrage-free term-structure model, according to which changes in the supply of assets to the private sector ensuing from QE represent one-period shocks that do not affect bond prices beyond the purchase date (Ihrig et. al. 2012). This is evident in the case of the United States, where shadow rate estimates currently coincide with the policy rate, as the latter has lifted-off the effective lower bound and the Federal Reserve is no longer conducting asset purchases. Estimates by Bonis et. al. (2017), which take account of the supply effects of QE under imperfect asset substitutability, suggest that the Federal Reserve's asset holdings continue to put considerable downward pressure on longer-term interest rates with a median impact of 100 bps as of 2017Q1. The latter would be equivalent to a reduction in the fed-funds rate of about 325 bps and, therefore, a degree of accommodation of about 4 percentage points.⁷ As the average maturity of the Federal Reserve's balance sheet falls, the degree of accommodation is expected to gradually decline, with the downward pressure on the 10-year yield falling to about 85 bps by the end of 2017. While similar estimates are not available for other countries operating at the effective lower bound, there are studies considering the supply effects arising from imperfect asset substitutability.⁸ Simple back-of-the-envelope calculations based on the median of these estimates would suggest that the

⁷ This estimate is based on Yellen (2017), where a 15 basis points increase in the 10-year bond yield is estimated to be equivalent to an increase in the fed-funds rate of 50 basis points.

⁸ Altavilla et. al. (2015), Andrade et. al. (2016) and De Santis (2016) for the euro area, Joyce et. al. (2011, 2012) and Meaning and Warren (2015) for the U.K., and Bank of Japan (2016).

degree of monetary accommodation in the United Kingdom and euro area is broadly similar to that of the United States, while the degree of accommodation in Japan is likely smaller, at around 2 percentage points.



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