

**A Toolkit to Assess the Consistency Between  
Real Sector and Financial Sector Forecasts**

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# TECHNICAL NOTES AND MANUALS

## A Toolkit to Assess the Consistency Between Real Sector and Financial Sector Forecasts<sup>1</sup>

Sophia Chen, Paola Ganum, and Pau Rabanal

### EXECUTIVE SUMMARY

We develop a toolkit to assess the consistency between real sector and financial sector forecasts. The toolkit draws upon empirical regularities on real sector and financial sector outcomes for 182 economies from 1980 to 2015. We show that credit growth is positively correlated with real sector performance, in particular when credit growth is unusually high or low. However, the relationship between credit growth and inflation is weak. These results hold for different country groups, including advanced economies, emerging markets and low-income countries. Combining credit growth with other variables such as house prices and the output gap helps to understand real sector outcomes. But including the financial account balance does not make a difference.

## I. Introduction

Much research has been devoted to improving the forecast accuracy of macroeconomic or financial market conditions. But much less attention has been focused on improving the consistency between the two. Recent research on credit and housing booms and busts provide ample evidence on how financial conditions influence macroeconomic outcomes and vice versa, yet analytical tools that allow for consistent joint forecasts are limited.<sup>2</sup> In the IMF's Financial Programming and Policies (FPP) framework, there are accounting links between the real, fiscal, external, and monetary sectors of the economy. These links discipline how outcomes in one sector respond to conditions in other sectors and ensures the consistency of forecasts across sectors. However, there are no direct links between these sectors and the financial sector. In other words, the financial sector can be formulated independently from other sectors in a macroeconomic scenario. Thus, forecasts of the real and financial sectors could be inconsistent.<sup>3</sup>

Our project fills this gap. We provide a toolkit that incorporates financial sector forecasts into the FPP framework and offers guidance on how to assess the consistency between real sector and financial sector forecasts. Our methodology is chosen to be deliberately simple to facilitate easy implementation in the FPP framework. The simplicity of the methodology makes it applicable to a

<sup>1</sup> IMF Research Department, Macro Financial Division. We are thankful to Giovanni Dell'Ariccia for guidance, and to Maria Soledad Martinez Peria and seminar participants at several IMF internal seminars for comments. We also thank Chengyu Huang and Huy Nguyen for excellent research assistance.

<sup>2</sup> See Claessens et al. (2012), Chen and Ranciere (2016), Gilchrist and Zakrajšek (2012), and Philippon (2009) for evidence of the relation between real and financial variables.

<sup>3</sup> The effects of macroeconomic conditions on the financial sector are typically studied in stress test exercises, but the inverse relationship receives much less attention.

large set of economies with minimum data requirements. Using cross-country historical data for 182 economies from 1980 to 2015, we estimate the distributions of real variables (e.g. GDP, consumption, investment, and employment growth, and inflation) conditional on the realizations of financial sector conditions (e.g. credit growth, housing prices, and capital flows) and economic cycles (e.g. the output gap). Using these estimations, the toolkit offers a way to compare a forecast scenario with historical norms. It also flags joint forecasts that are unlikely based on the empirical distribution of historical data.

Our results provide ample empirical evidence on the comovements between real and financial variables. For example, when credit growth is abnormally high, real activity growth is typically high. Conversely, when credit growth is abnormally low, real activity growth is typically low. These results can be informative in normal times or during economic booms and busts. If a country team believes that credit growth will be negative over a certain horizon, perhaps because of a need to deleverage, the team can use the tool to check whether real sector forecasts are consistent with historical patterns during a credit bust. The tool shows that extreme joint outcomes are possible, albeit unlikely. For instance, real activity growth can be high despite a large credit contraction. Although the specific economic circumstances under which extreme outcomes happened is not the focus of this project, it can be a fruitful topic for future research.

We offer flexibility in the toolkit to accommodate the fact that countries vary in data availability and economic conditions. For instance, users can check the consistency of real variable forecasts with one or two financial variables. Users can also choose from a variety of comparison groups based on income level (e.g. advanced economies, emerging markets, and low-income countries), region (e.g. Euro area, other advanced economies, Commonwealth of Independent States, emerging and developing Asia, emerging and developing Europe, Latin America and the Caribbean, Middle East and North Africa, and Sub-Saharan Africa), and by sources of export earnings (e.g. fuel, manufacturing, primary products, services, and diversified).<sup>4</sup>

Our toolkit complements the traditional model-based approach (e.g. using dynamic stochastic general equilibrium (DSGE) models) to assess the consistency between real and financial forecasts. The traditional approach has the advantage of providing a micro-founded narrative of real-financial linkages. But model-based forecasts suffer from the potential problem of misspecification. The problem is likely to be more severe if models designed to explain the behavior of advanced economies are applied to low-income countries or when the linearity assumed by a model fails to capture highly non-linear economic outcomes. The alternative approach we propose here is model-free. We discipline real sector and financial sector forecasts by exploiting the joint empirical distributions of real and financial outcomes across countries. The disadvantage of our approach is that it does not provide a narrative of real-financial linkages. To overcome this limitation, it is advisable that the toolkit be used in the context of country-specific economic analysis and that forecasts be built into the narratives of the overall macroeconomic framework.

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<sup>4</sup> We follow the regional and analytical groupings of the World Economic Outlook (WEO).

The rest of this note is organized as follows. Section II reviews related literature. Section III discusses data and methodology. Section IV presents empirical evidence. Section V concludes.

## II. Related Literature

In traditional macroeconomic models where financial frictions are absent, financial variables such as credit, asset prices, and the net worth of firms and households play no role. Macro-financial models, including well-known contributions such as Bernanke, Gertler, and Gilchrist (1999) and Kiyotaki and Moore (1997), have a corporate finance foundation and incorporate imperfections in the credit market. These imperfections can take the form of moral hazard, adverse selection or asymmetric information. In presence of these frictions, the financial positions of firms and households affect their access to external financing and therefore have real effects on investment, consumption and GDP. For example, asset price fluctuations affect the value of collateral that agents can use to access credit. Thus adverse shocks to the economy may be amplified by financial market conditions as conventionally referred to as a *financial accelerator* mechanism. In addition, shocks to the financial sector are an important source of business cycles, which leads to strong comovement between the real and financial sectors (Gilchrist and Zakrajsek, 2012). The empirical literature generally supports the financial accelerator mechanisms and provides evidence on the comovement between real and financial variables, as we briefly summarize in what follows.

Dell’Ariccia et al. (2012) examine the comovement between credit and macroeconomic variables in normal times and during credit booms for a sample of 170 countries during the 1970–2010 period.<sup>5</sup> Their analysis shows that when a country is in a credit boom, the credit-to-GDP ratio grows at an average rate of 16.8 percent compared to 1.6 percent in normal times. Countries in a credit boom also experience higher consumption and investment growth, and larger house and equity price appreciations. In particular, the growth rates of investment (10.3 percent versus 4.2 percent), house prices (9.5 percent versus 1.8 percent) and equity prices (11 percent versus 3.8 percent) are much larger during booms than during normal times. In addition, the current account deteriorates by about 1 percent of GDP if the country has a credit boom. However, inflation does not appear to have a different behavior between boom and non-boom years, with an average of 10.7 percent and 9.3 percent respectively. These results are broadly in line with other studies on credit booms (see, for instance, Gourinchas et al., 2008; Mendoza and Terrones, 2008).

Dell’Ariccia et al. (2012) also find that leverage is a key variable: when a credit boom is followed by a bust, the costs of the crisis are much larger if the country enters the recession with a high level of indebtedness. During the Global Financial Crisis, countries that had higher levels of the credit-to-GDP ratio in 2006 suffered larger losses in GDP after the crisis hit, during the 2007-2009 period.

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<sup>5</sup> Credit boom episodes are defined by comparing the credit-to-GDP ratio for a given year and country to a backward-looking, rolling, country-specific, cubic trend estimated over the preceding ten years. A credit boom occurs when either: (1) the deviation from trend is greater than 1.5 times its standard deviation and the annual growth rate of the credit-to-GDP ratio exceeds 10 percent; or (2) the annual growth rate of the credit-to-GDP ratio exceeds 20 percent.

Claessens, Kose, and Terrones (2012) examine the interaction between financial cycles and business cycles.<sup>6</sup> They find that financial cycles increase the volatility of business cycles. For instance, recessions that coincide with credit crunches are twice as costly as recessions without a credit crunch (measured by the cumulative loss in real GDP). The same happens when a recession coincides with a house price bust. However, recessions that coincide with equity price busts are not different from recessions without equity price busts.<sup>7</sup> Interestingly, similar results also hold during expansions. Real GDP grows faster when an expansion coincides with either a credit or housing boom, with a cumulative gain that is twice as large as an expansion without a credit or housing boom. An expansion that coincides with an equity price boom is not different from one without. Using a different approach based on dynamic generalized factor model, Igan et al. (2009) also find a high degree of synchronization between housing, credit and real GDP cycles. Based on these results, our toolkit includes credit and house price in the set of financial variables, but excludes equity prices.

The literature also suggests a strong relationship between credit and real activities after a financial crisis or a credit bust. Financial crises are likely to have a long-lasting and sometimes permanent effect on the level of real GDP (see, for instance, Cerra and Saxena, 2008; and IMF, 2009). Abiad et al. (2011) examine the joint behavior of real GDP and credit after a recession, and focus on the case of “creditless recoveries”, defined as episodes with negative real credit growth but positive real GDP growth in the first three years following a recession. These episodes are more likely after a financial crisis: if the downturn was preceded by a banking crisis and a credit boom, the subsequent recovery would almost certainly be creditless. Abiad et al. (2011) find that when the recovery is creditless, real GDP growth is lower than when the recovery is accompanied by a pick-up in credit (3.8 percent in the creditless case versus 6.3 percent otherwise). In addition, real GDP is less likely to return to its pre-recession trend level when the recovery is creditless (45 percent in the creditless case versus 65 percent otherwise). To capture the different relationship between credit and real activities between normal times and times of crisis, we include the output gap as a second conditioning variable in the toolkit because crises are usually accompanied by large negative output gaps.<sup>8</sup>

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<sup>6</sup> They identify financial and business cycles using a Harding-Pagan algorithm to date peaks and troughs in real GDP, credit, house prices and equity prices.

<sup>7</sup> These results are similar to those reported in Kannan et al. (2011) and Crowe et al. (2011).

<sup>8</sup> We use the output gap instead of a crisis indicator for the simplicity of implementation. Users can input the output gap forecast from the macro scenario and do not need to rely on the judgement that the country is in a crisis. In a large crisis, the output gap is likely to be a large and negative number.

### III. Data and Methodology

We collect macroeconomic and financial variables for 182 economies over the period 1980-2015. Our data sources for macroeconomic variables are the IMF's International Financial Statistics (IFS) database and the IMF's World Economic Outlook (WEO) database, when data is unavailable in the IFS. We include GDP, private consumption, private investment, employment, and CPI inflation. We use the annual time series in constant prices after deflating the nominal series by the GDP deflator.<sup>9</sup> To exclude extreme values, we winsorize all macroeconomic and financial variables at the 2 percent and 98 percent levels.

The financial variables we consider are credit, house prices, and the financial account balance. Credit series are taken from the IFS and are defined as “claims on the private sector by deposit money banks”<sup>10</sup>. We convert credit series into real terms using the GDP deflator and calculate its annual growth rate. House prices are obtained from the OECD, the Bank of International Settlements (BIS), and the IMF's Real Estate Module based on data from the Global Property Guide.<sup>11 12</sup> The financial account series are obtained from the IFS and are defined as the net acquisition of financial assets (or net incurrence of liabilities). The financial account balance shows aggregate national borrowing and lending. It captures how a country is receiving financing from international resources. The rationale for including the financial account balance is that financing from abroad (such as foreign direct investment and portfolio investments) might affect investment and GDP, but such financing is not reflected in domestic credit statistics. We normalize the financial account balance by current year GDP in US dollars (from the WEO dataset).

We use the output gap as a measure for country-specific economic cycles. The output gap is defined as the percentage deviation of real GDP from its potential. To compute the trend in real GDP, we linearly interpolate missing values. We then estimate potential output using a Hodrick-Prescott (HP) filter with a smoothing factor of 6.25 consistent with annual data.

We are interested in studying the relationship between real sector and financial sector outcomes. We approach this by characterizing the empirical distributions of real variables conditional on financial

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<sup>9</sup> There is a special consideration for nominal series obtained from IFS. Statistics from IFS are provided in a Non-Standardized Report Format, which has better time coverage before 2001 as well as in Standardized Report Format, which provides coverage afterwards. We use both of these series to extend our sample over time. Nominal series from IFS are expressed in national currency. However, for member countries that have adopted the euro, the series are denominated in euros after joining. Therefore, we adjust the series to be expressed in national currency for the entire period by using the last valuation of their former national currency's exchange rate from the European Commission's Eurostat database.

<sup>10</sup> Information beyond aggregate credit measures (e.g. by borrower type and maturity) or beyond claims by depository institutions (e.g. by shadow banks) would greatly enrich the analysis. Unfortunately, this is extremely difficult, if not impossible, in the context of our large cross-country analysis.

<sup>11</sup> The house price data are typically obtained from national authorities and are comparable across countries. Most series reflect nationwide trends but some are based on major cities. These data are not of the Case-Shiller type (i.e. corrected for quality and repeated sales). Where available, we use data from OECD as the first source and BIS as the second source. When multiple series are available for the same countries, we use the one with the longest time coverage. When house price series are available in quarterly frequency, we use year-end values.

<sup>12</sup> The IMF's Real Estate Module is developed and maintained by the Macro Financial division in the Research Department. It estimates price misalignments in the housing market and uses house price data based on OECD and Global Property Guide. House price series are provided in real terms and in quarterly frequency. We keep year-end values.

variables (credit, house prices, and the financial account balance) and the output gap. We start by estimating the inverse cumulative distribution function (CDF) for each conditioning variable at each quintile. Then, we estimate the CDF of real variables conditional on a conditioning variable being in each quintile. We proceed in two steps. First, we estimate the CDF conditional on a single variable: credit, the financial account balance, house prices, or the output gap. Second, we estimate the CDF based on three types of double conditioning: credit and financial account balance, credit and house prices, and credit and the output gap. The toolkit presents four threshold values (10th, 25th, 75th, and 90th percentile) for each conditional CDF. These threshold values are intended to signal values that are relatively far away from historical norms. Based on these threshold values and user-input forecasts for real and financial variables, the toolkit flags real variable forecasts that are outside the threshold values.<sup>13</sup> The result obtained in the toolkit interface shall be informative to the user as to the consistency of their forecasts in comparison with the historical norms but should not substitute for the user's judgement based on their assessment in the context of their macroeconomic framework. For example, a country might have relatively high investment growth despite weak credit conditions if corporates have large retained earnings to fund investment. Narratives on particular circumstances as such can be used to explain why investment forecasts might be abnormally high given credit growth forecasts.

#### IV. Empirical Evidence

In this section, we discuss empirical regularities in the data. We focus on results based on all countries or by country groups.<sup>14</sup> We group countries by income level, region, and source of export earnings according to the IMF World Economic Outlook (WEO) definition. Details on the sources, definitions of all variables and country coverage are presented in the Appendix. The most important reason for using cross-country data rather than individual country data is data availability. Many countries in our sample only have a few observations for some time series, which makes country-specific statistical inference uninformative, if not impossible. Using cross-country data also has the advantage of minimizing the impact of structural breaks in time series. For example, a country that has experienced substantial financial development or undergone major structural changes is likely to have very different real-financial relationships from its own past.

We present summary statistics for macro and financial variables in our sample in Table 1. The mean GDP growth rate for all countries is 3.5 percent, similarly for consumption and investment growth (3.4 percent and 3.6 percent respectively). The mean and median inflation rate are 9.1 percent and 5.1 percent respectively. The distribution of inflation is skewed to the right due to episodes of hyperinflation in some countries. On average, credit grows faster than GDP, reflecting financial

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<sup>13</sup> Values that are below the 10th percentile or above the 90th percentile trigger a red flag. Values that are between the 10th and 25th percentile, or between the 75th and 90th percentile trigger a yellow flag in the toolkit.

<sup>14</sup> Consistent with the IFS and WEO databases, the terms “country” and “entity” used in this note refer to a territorial entity that is a state as understood by internal law and practice in all cases. As used here, the term also covers some territorial entities that are not states but for which statistical data are maintained on a separate and independent basis.

deepening and credit booms experienced by many countries during the sample period. The mean credit growth rate is 6.1 percent. The mean house price growth rate is relatively lower at 2.5 percent.

Not surprisingly, we observe substantial variation in both real and financial sector variables because our sample includes a large set of countries and spans a time period with several business cycles and crises. Overall, real variables have larger variance in low-income countries and emerging markets than in advanced economies. Among real variables, investment growth has the largest variance in all country groups. Credit growth in low-income countries and emerging markets is typically higher and has larger variance than in advanced economies. The financial account balance also has larger variance in low-income countries and emerging markets than in advanced economies. The average financial account balance is positive for advanced economies and negative for emerging markets and low-income countries.

We are interested in how real sector outcomes vary with financial conditions. We compare the unconditional distributions of real variables and their distributions conditional on financial conditions. Figure 1 shows the unconditional distribution of GDP growth and the distribution conditional on a country experiencing high or low credit growth in a given year, where we define credit growth as high (low) if credit growth is within the fifth (first) quintile of the sample. For ease of illustration, we show the threshold values of these distributions at the 10th, 25th, 75th, and 90th percentile. We present results for all countries (Panel A), advanced economies (Panel B), emerging market (Panel C), and low-income countries (Panels D). Two patterns emerge. First, the distribution of GDP growth is more disperse in emerging markets and low-income countries than in advanced economies. The interquartile range in the unconditional distribution is 4.6 percent in emerging markets and 5.4 percent in low-income countries, which is higher than the 3.1 percent in advanced economies. This result holds in the conditional distribution as well. Second, GDP growth is typically higher when credit growth is higher. For example, in the sample including all countries, the 25th and 75th threshold values of GDP growth are -1.4 percent and 4.3 percent respectively conditional on low credit, and 3.6 percent and 8.1 percent respectively conditional on high credit. This result holds for other country samples.

Figures 2 and 3 similarly show the unconditional and conditional distributions of real investment growth and real private consumption growth respectively. In all country groups illustrated, the distribution of investment and private consumption growth vary with credit conditions. Investment and consumption growth are typically higher when credit growth is high. We also note that the dispersion of the distribution is much higher for emerging markets and low-income countries than for advanced economies. Figure 4 shows that similar pattern also holds for employment growth. However, the results are not as strong, especially for emerging markets and low-income countries.

Figure 5 shows the unconditional and conditional distributions of inflation. Interestingly, the lower decile (i.e. 10<sup>th</sup> percentile) and lower quantile (i.e. 25<sup>th</sup> percentile) of inflation do not vary much with credit conditions, especially among emerging markets and low-income countries. However, the upper decile (i.e. 90<sup>th</sup> percentile) and upper quantile (i.e. 75<sup>th</sup> percentile) of inflation with low credit

growth are higher than with those with high credit growth, especially among emerging markets. For example, Panel C shows that for the sample of emerging markets, the upper decile and upper quantile when credit growth is low are 61.9 percent and 26.3 percent respectively, compared to 19.4 percent and 10.6 percent respectively when credit growth is high. Overall, our results appear to confirm the informal narrative prior to the Global Financial Crisis, which suggests that monetary policy in advanced economies remained accommodative despite high credit growth because inflation remained at or below target. Our result for emerging markets might be pointing to the fact that when countries suffer a credit bust, the exchange rate depreciates and feeds into inflation.

To summarize the results we presented so far, we find evidence that credit conditions typically correlate with macroeconomic outcomes. The evidence is strong during extreme cases with unusually rapid or sluggish credit growth. Our finding is consistent with previous empirical evidence that credit conditions are neutral for macroeconomic activities in normal times but may have strong impacts during booms and busts. Moreover, the sensitivity of macroeconomic indicators to credit conditions also varies. Investment and consumption growth tend to be more sensitive to credit growth than GDP growth and employment. There is less of a clear relationship between credit growth and inflation.

The differential effects of credit conditions on macroeconomic indicators may arise for several reasons. First, it is well known that consumption is less volatile than investment (Backus et al., 1995). Households tend to maintain a relatively stable level of consumption through varying economic and financial circumstances because of life-cycle consumption smoothing or consumption habits. Second, business investment often depends on the medium- to long-run outlook of the economy. Rapid credit growth may be perceived as an indicator of an economy in a boom. Based on this, businesses will make greater adjustments to their investment spending when credit conditions are favorable. Third, it is likely that investment is more dependent on external financing than consumption, in which case, credit booms or busts likely affect investment spending more.

### **The Effect of Credit: Some Nuances**

Does the effect of credit vary depending on other economic and financial conditions? We explore how interacting credit with other financial and economic indicators affects its relationship to real variables.

Figures 6 to 8 present the distributions of real variables conditional on credit and another indicator, including house prices, the financial account balance, and the output gap. We focus on the conditional distributions when both of the conditioning variables are at the lowest quintile, or when both are at the highest quintile. For example, Figure 6 plots real GDP growth distribution when both credit and house price growth are in the lowest quintile, and when both credit and house price growth are in the highest quintile of their distributions.<sup>15</sup>

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<sup>15</sup> Low-income countries are excluded because data on house prices is not available for this group.

Some general patterns that we described in the previous section continue to hold within each country group when we condition real GDP growth on credit and house price growth, and similarly, on credit growth and the output gap. Figure 6 shows that when a country experiences low credit and house price growth, GDP growth tends to be lower and more extreme, negative values are likely. Similarly, when a country experiences the highest rates of credit and house price growth, higher real GDP growth outcomes are more likely, especially in advanced economies and low-income countries. Furthermore, a comparison between Figure 1 and Figure 6 shows that conditional on low credit and house price growth, GDP growth tends to be even lower compared to only conditioning on low credit growth. This result is consistent with prior evidence that business cycles are more volatile when they have a high degree of synchronization with credit and housing cycles (Claessens et al. 2012). We find similar results based on double conditioning on credit and the output gap (Figure 8). When credit growth and the output gap are in the top quintile, growth is higher than otherwise. Moreover, the relationship between credit growth and GDP is stronger when the output gap is unusually low or unusually high. This result suggests that the cyclical position of the economy is important. Because financial crises are usually accompanied by large negative output gaps, our result also reflects the fact that credit and GDP growth are likely to be low after a crisis.

In contrast, we do not find clear evidence on the effect of the financial account balance. Comparing Figure 7 to Figure 1 shows that adding information on either high or low financial account balances does not systematically change the relationship between credit and GDP growth. Our result is consistent with prior evidence in the literature referred to as the “Lucas paradox” or the “allocation puzzle” (Lucas, 1990; Gourinchas and Jeanne, 2008).

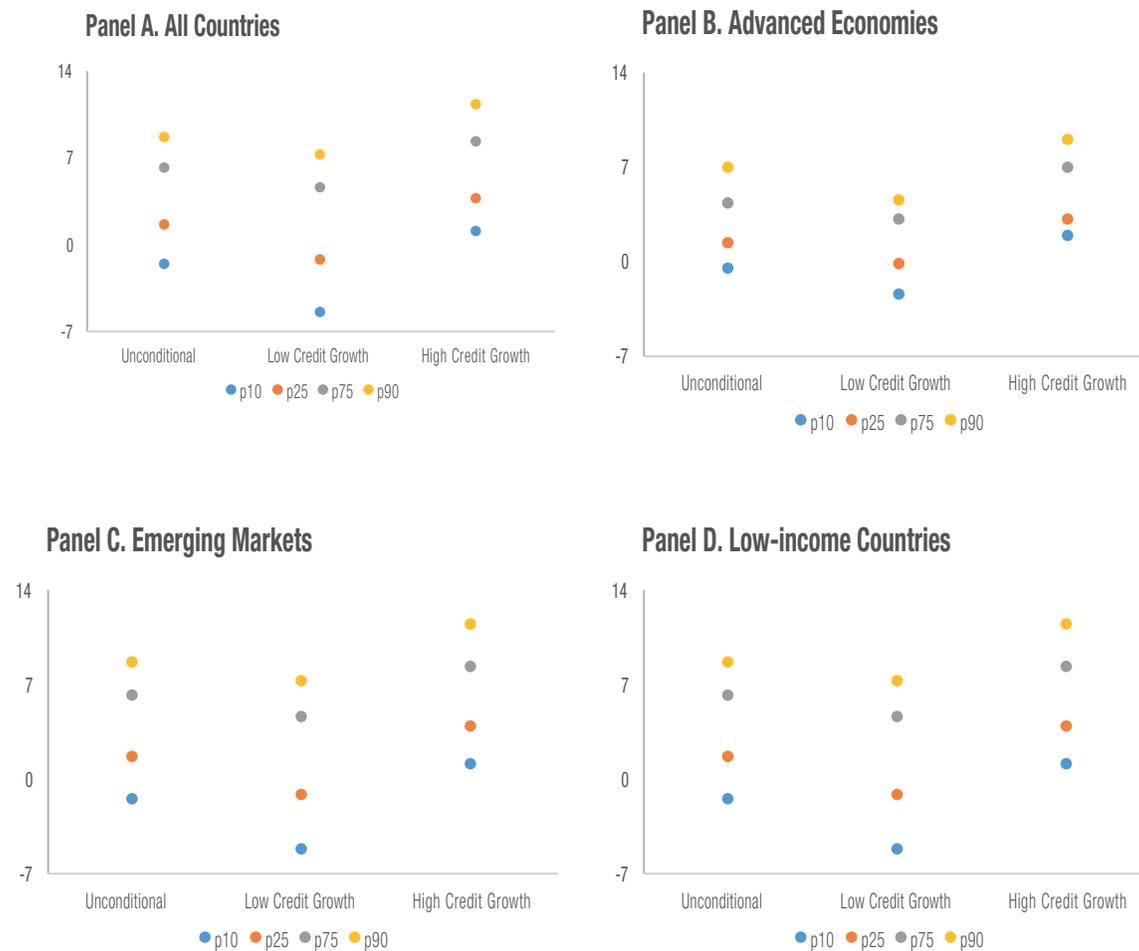
## V. Concluding Remarks

We develop a toolkit to assess the consistency between real and financial sector forecasts. This note describes the theoretical background and empirical findings on which the toolkit is based. Using data on 182 economies from 1980 to 2015, we show that credit growth is linked to real sector performance including GDP, consumption, investment, and employment growth. The relationship is particularly strong when credit growth takes unusually high or low values. However, credit and inflation tend to be weakly negatively correlated. Our results hold for different country groups, including advanced economies, emerging markets and low-income countries. Furthermore, we show that conditioning on other financial and economic indicators (e.g. house prices and the output gap) in addition to credit growth helps explain real sector outcomes, but that including the financial account balance as a second conditioning variable does not appear to make a difference.

Table 1. Summary Statistics

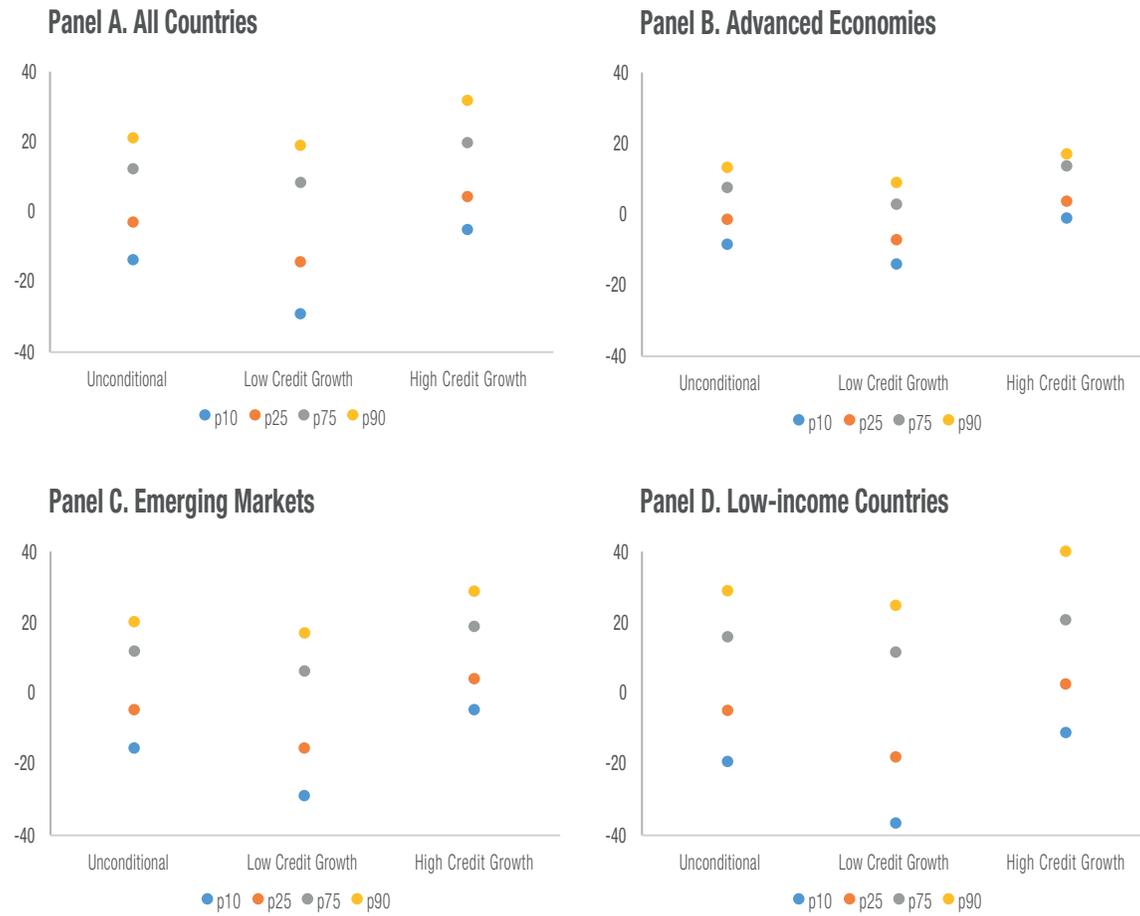
VARIABLE	MEAN	SD	MIN	MEDIAN	MAX	P20	P40	P60	P80
<b>Panel A. All countries</b>									
GDP	3.5	4.4	-9.3	3.6	14.3	0.7	2.8	4.4	6.6
Consumption	3.4	7.0	-16.1	3.3	24.0	-0.5	2.3	4.4	7.6
Investment	3.6	15.4	-39.8	4.2	44.8	-6.2	1.4	6.8	14.0
Employment	1.3	3.4	-8.6	1.3	11.0	-0.7	0.8	1.9	3.3
Inflation	9.1	13.0	-1.6	5.1	69.6	1.8	3.7	6.7	11.8
Credit	6.1	15.6	-39.4	5.9	46.9	-3.6	3.2	8.5	16.2
House prices	2.5	8.6	-18.8	2.0	25.7	-3.4	0.4	3.8	8.7
Financial Account	-2.4	8.0	-24.5	-2.3	20.1	-7.5	-3.6	-1.0	2.2
Output Gap	-3.0	18.3	-100.2	-0.1	20.3	-3.1	-0.7	0.7	3.0
<b>Panel B. Advanced economies</b>									
GDP	2.9	3.3	-9.3	2.8	14.3	0.8	2.2	3.4	4.9
Consumption	2.6	3.6	-16.1	2.5	21.0	0.5	2.0	3.1	5.0
Investment	2.4	9.0	-39.8	2.7	44.8	-3.4	1.2	4.5	8.4
Employment	0.9	2.6	-8.6	1.0	11.0	-0.6	0.6	1.4	2.5
Inflation	4.8	8.1	-1.6	2.6	69.6	1.3	2.2	3.2	6.1
Credit	5.2	10.5	-39.4	4.7	46.9	-0.7	3.0	6.4	10.9
House prices	2.5	8.1	-18.8	2.1	25.7	-3.1	0.6	4.0	8.0
Financial Account	0.3	6.9	-24.5	-0.4	20.1	-4.4	-1.7	1.0	4.6
Output Gap	-0.4	6.8	-100.2	-0.1	20.3	-1.6	-0.5	0.2	1.5
<b>Panel C. Emerging markets</b>									
GDP	3.7	4.5	-9.3	4.1	14.3	0.8	3.2	4.8	6.9
Consumption	3.7	7.5	-16.1	3.9	24.0	-1.0	2.7	5.0	8.4
Investment	3.6	15.2	-39.8	4.8	44.8	-6.8	1.5	7.5	14.4
Employment	1.6	3.5	-8.6	1.6	11.0	-0.6	1.1	2.3	3.8
Inflation	11.0	15.2	-1.6	6.1	69.6	2.3	4.6	7.7	13.7
Credit	6.4	15.7	-39.4	6.7	46.9	-3.5	3.9	9.5	17.3
House prices	2.6	9.8	-18.8	1.3	25.7	-3.9	0.1	3.7	10.6
Financial Account	-2.4	7.8	-24.5	-2.3	20.1	-7.5	-3.6	-1.1	2.1
Output Gap	-3.8	20.6	-100.2	-0.1	20.3	-3.9	-0.9	0.7	3.5
<b>Panel D. Low-income countries</b>									
GDP	3.5	4.9	-9.3	3.9	14.3	0.1	2.8	4.7	6.9
Consumption	3.6	8.1	-16.1	3.7	24.0	-1.8	2.4	5.1	9.0
Investment	4.5	19.1	-39.8	5.4	44.8	-9.0	1.6	8.5	17.8
Employment	1.0	5.0	-8.6	1.4	11.0	-3.0	0.3	2.3	5.0
Inflation	9.6	11.7	-1.6	6.4	69.6	2.0	4.9	8.0	13.3
Credit	6.1	18.0	-39.4	6.2	46.9	-5.9	2.5	9.6	19.0
House prices	—	—	—	—	—	—	—	—	—
Financial Account	-4.0	8.3	-24.5	-3.4	20.1	-9.6	-5.1	-2.0	0.9
Output Gap	-3.5	19.9	-100.2	0.1	20.3	-3.7	-0.8	1.1	4.0

Figure 1. Distribution of GDP Growth



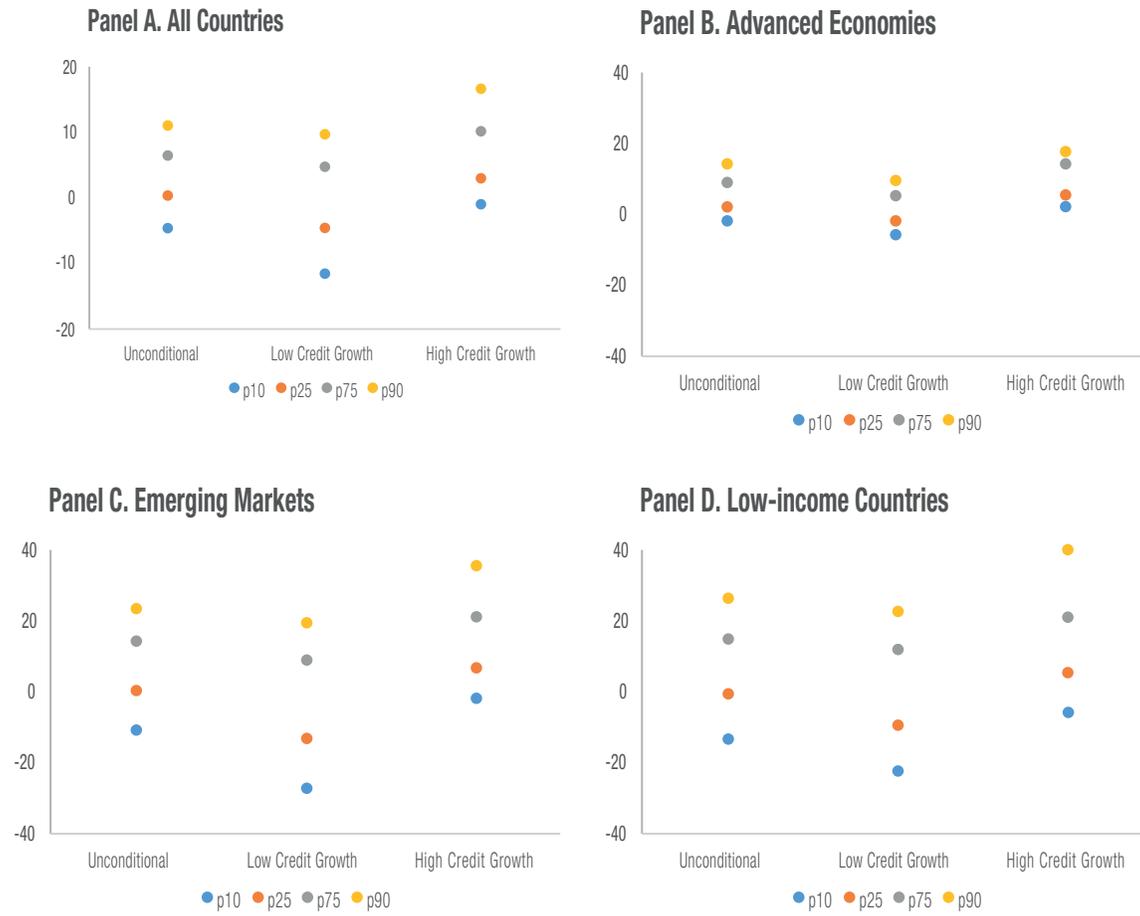
Note: This figure plots the critical values of real GDP growth distribution for all countries (Panel A), advanced economies (Panel B), emerging markets (Panel C), and low-income countries (Panel D). “Unconditional” refers to the unconditional distribution; “Low credit growth” refers the distribution conditional on the lowest quintile of real credit growth; “High credit growth” refers to the distribution conditional on the highest quintile of real credit growth.

**Figure 2. Distribution of Investment Growth**



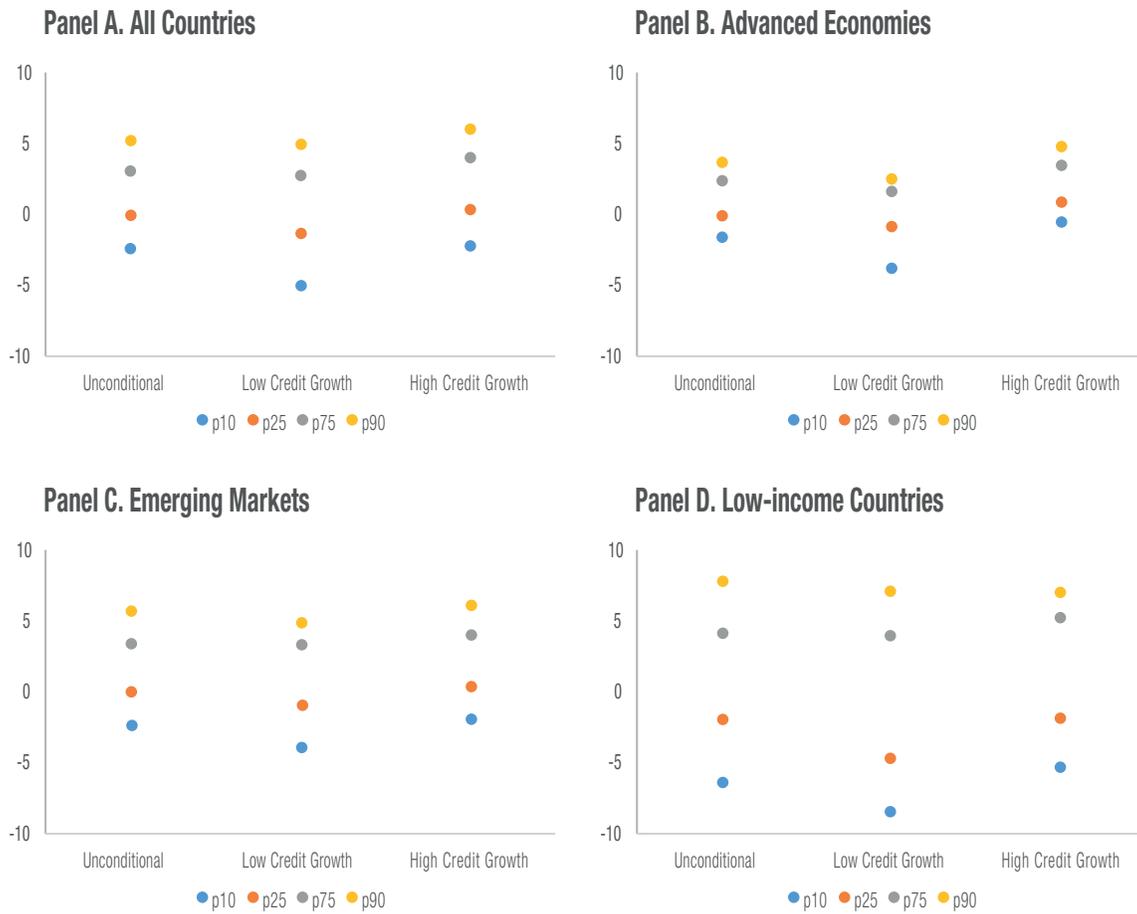
Note: This figure plots critical values of the distribution of real Investment growth for all countries (Panel A), advanced economies (Panel B), emerging markets (Panel C), and low-income countries (Panel D). “Unconditional” refers to the unconditional distribution; “Low credit growth” refers the distribution conditional on the lowest quintile of real credit growth; “High credit growth” refers to the distribution conditional on the highest quintile of real credit growth.

**Figure 3. Distribution of Consumption Growth**



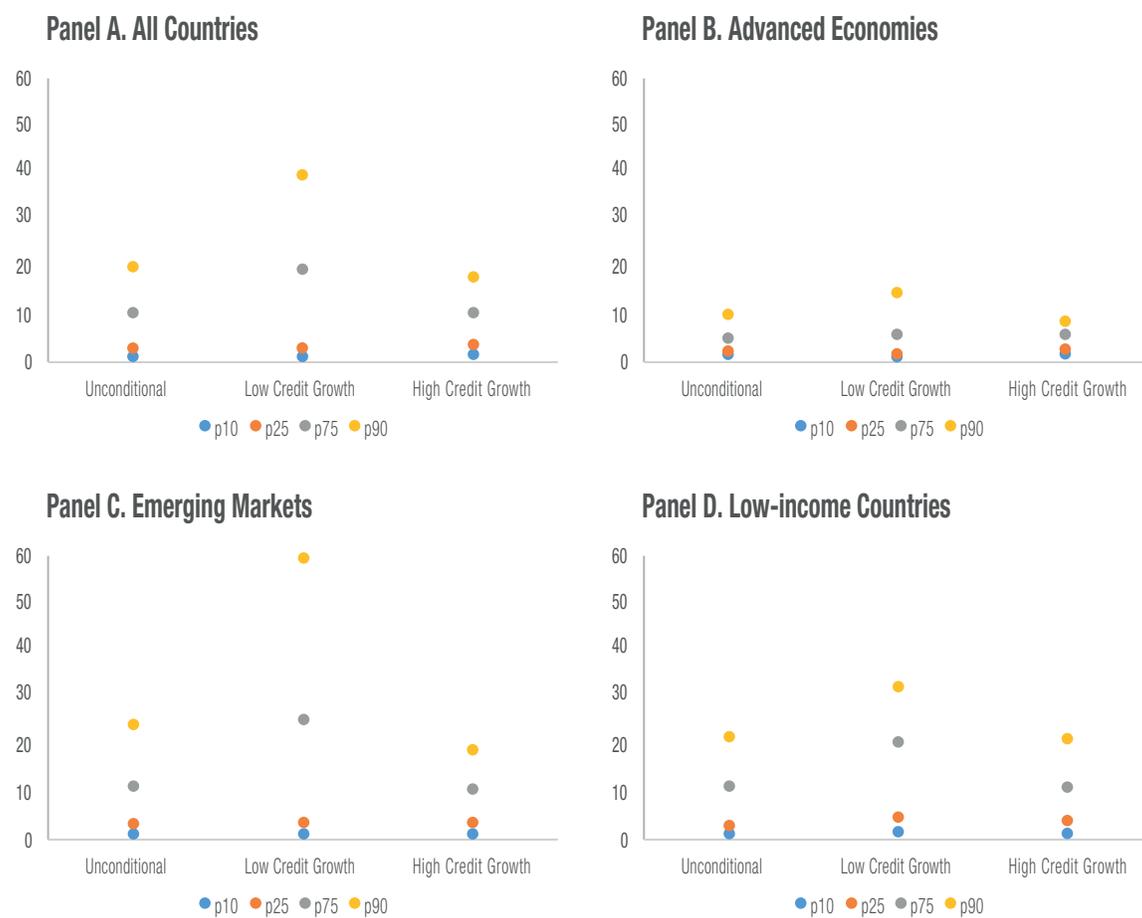
Note: This figure plots critical values of the distribution of real Household consumption growth for all countries (Panel A), advanced economies (Panel B), emerging markets (Panel C), and low-income countries (Panel D). “Unconditional” refers to the unconditional distribution; “Low credit growth” refers the distribution conditional on the lowest quintile of real credit growth; “High credit growth” refers to the distribution conditional on the highest quintile of real credit growth.

**Figure 4. Distribution of Employment Growth**



Note: This figure plots critical values of the distribution of real Employment growth for all countries (Panel A), advanced economies (Panel B), emerging markets (Panel C), and low-income countries (Panel D). “Unconditional” refers to the unconditional distribution; “Low credit growth” refers the distribution conditional on the lowest quintile of real credit growth; “High credit growth” refers to the distribution conditional on the highest quintile of real credit growth.

Figure 5. Distribution of Inflation



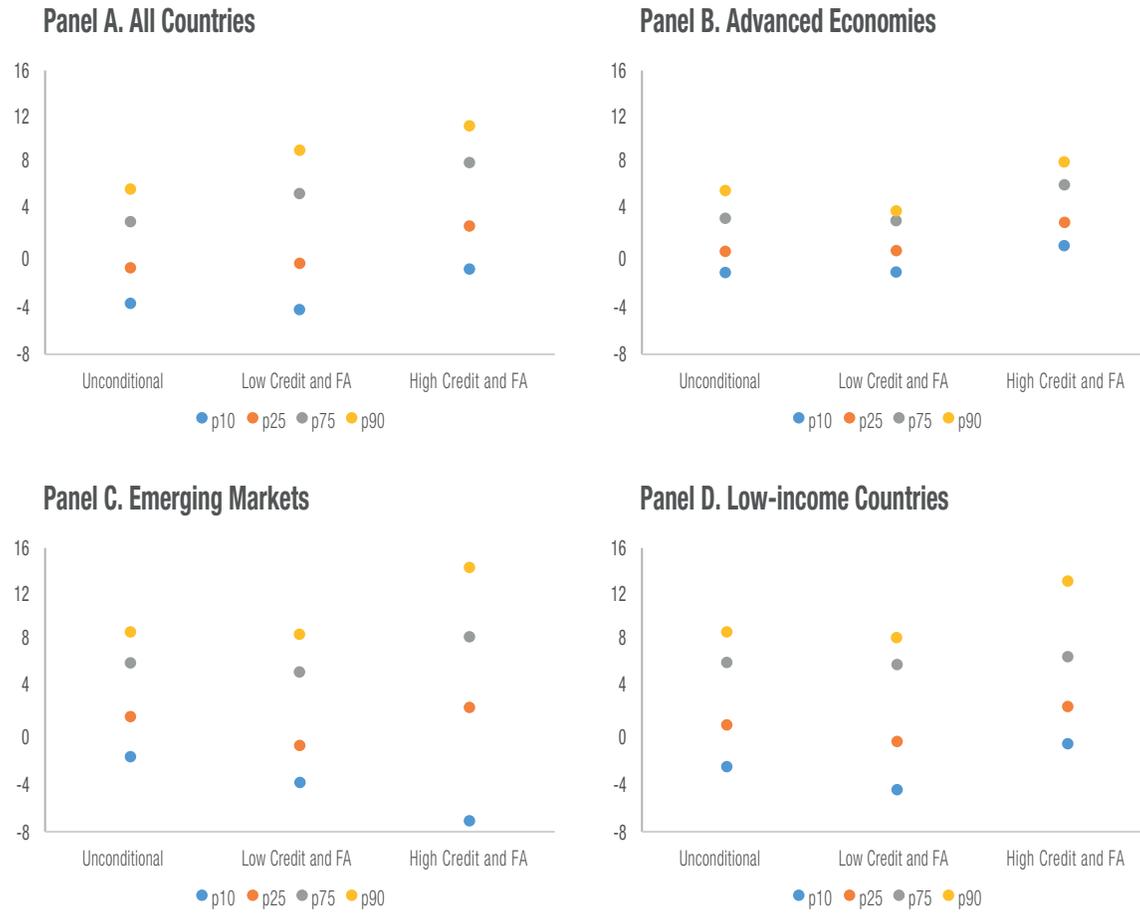
Note: This figure plots critical values of the distribution of Consumer price index inflation for all countries (Panel A), advanced economies (Panel B), emerging markets (Panel C), and low-income countries (Panel D). “Unconditional” refers to the unconditional distribution; “Low credit growth” refers the distribution conditional on the lowest quintile of real credit growth; “High credit growth” refers to the distribution conditional on the highest quintile of real credit growth.

Figure 6. Distribution of GDP growth, double condition on credit and house prices



Note: This figure plots critical values of the distribution of real GDP growth for all countries (Panel A), advanced economies (Panel B), and emerging markets (Panel C). “Unconditional” refers to the unconditional distribution; “Low credit and HP growth” refers to the distribution conditional on the lowest quintile of real credit growth and the lowest quintile of real house price growth; “High credit and HP growth” refers to the distribution conditional on the highest quintile of real credit growth and highest quintile of real house price growth.

Figure 7. Distribution of GDP growth, double condition on credit and financial account



Note: This figure plots critical values of the distribution of real GDP growth for all countries (Panel A), advanced economies (Panel B), emerging markets (Panel C), and low-income countries (Panel D). “Unconditional” refers to the unconditional distribution; “Low credit and FA” refers to the distribution conditional on the lowest quintile of real credit growth and the lowest quintile of the financial account-to-GDP ratio; “High credit and FA” refers to the distribution conditional on the highest quintile of real credit growth and highest quintile of the financial account-to-GDP ratio.

Figure 8. Distribution of GDP growth, double condition on credit and the output gap



Note: This figure plots critical values of the distribution of real GDP growth for all countries (Panel A), advanced economies (Panel B), emerging markets (Panel C), and low-income countries (Panel D). “Unconditional” refers to the unconditional distribution; “Low credit and output gap” refers the distribution conditional on the lowest quintile of real credit growth and the lowest quintile of the output gap; “High credit and output gap” refers to the distribution conditional on the highest quintile of real credit growth and highest quintile of the output gap.

## Appendix

Table A1. Country and Data Coverage

COUNTRY	NUMBER OF OBSERVATIONS						House Prices	Financial Account	Output Gap
	GDP	Consumption	Investment	Employment	Inflation	Credit			
Afghanistan	13	13	13	0	11	9	0	7	14
Albania	21	15	15	34	24	7	0	36	35
Algeria	35	35	35	26	36	36	0	23	35
Angola	13	13	13	0	20	10	0	30	17
Antigua and Barbuda	31	31	31	0	17	31	0	34	35
Argentina	35	29	35	23	0	35	22	36	36
Armenia	21	21	21	21	22	23	0	23	22
Australia	36	36	36	32	36	36	35	35	36
Austria	36	36	36	30	36	34	29	36	36
Azerbaijan	19	19	19	19	0	23	0	21	20
Bahamas, The	18	18	18	18	36	18	0	36	36
Bahrain	35	34	34	1	36	35	0	35	35
Bangladesh	36	36	36	3	29	36	0	36	36
Barbados	33	33	33	29	36	30	0	34	33
Belarus	25	25	25	30	0	21	0	23	26
Belgium	36	36	36	30	36	34	35	14	36
Belize	35	35	35	18	35	35	0	32	35
Benin	35	35	35	7	23	35	0	35	35
Bhutan	34	34	34	0	35	31	0	10	35
Bolivia	36	36	36	16	36	36	0	35	36
Bosnia and Herzegovina	18	10	10	6	10	18	0	18	19
Botswana	34	34	34	23	36	34	0	36	35
Brazil	32	32	32	35	35	32	14	36	36
Brunei Darussalam	35	11	11	11	35	15	0	15	35
Bulgaria	26	24	26	31	30	18	19	35	36
Burkina Faso	35	35	35	6	36	35	0	30	35
Burundi	34	34	34	6	36	34	0	29	36
Cabo Verde	24	17	24	0	32	24	0	36	32
Cambodia	26	22	22	0	21	21	0	23	28
Cameroon	34	34	34	0	36	34	0	34	34
Canada	36	36	36	30	36	29	35	36	36
Central African Republic	15	15	15	7	35	15	0	15	30
Chad	26	26	26	0	32	26	0	15	28

NUMBER OF OBSERVATIONS									
COUNTRY	GDP	Consumption	Investment	Employment	Inflation	Credit	House Prices	Financial Account	Output Gap
Chile	36	36	36	30	6	36	12	36	36
China	35	35	35	29	5	30	12	34	35
Colombia	36	36	36	30	36	32	27	36	36
Comoros	25	36	36	0	15	33	0	26	28
Congo, Democratic Republic of the	12	11	9	0	34	8	0	16	34
Congo, Republic of	21	20	20	0	28	21	0	28	30
Costa Rica	35	35	35	29	36	35	0	36	35
Croatia	21	21	21	23	28	20	9	23	22
Cyprus	36	36	36	24	36	36	13	28	36
Czech Republic	22	22	22	22	22	16	16	21	23
Côte d'Ivoire	35	35	35	0	36	35	0	34	35
Denmark	36	36	36	30	36	30	35	36	36
Djibouti	14	25	25	0	22	25	0	23	30
Dominica	31	31	31	0	35	31	0	34	35
Dominican Republic	36	36	36	23	36	36	0	36	36
Ecuador	36	36	36	26	36	35	0	36	36
Egypt	31	31	31	23	36	31	0	35	34
El Salvador	25	25	25	19	36	36	0	36	26
Equatorial Guinea	20	20	20	0	30	20	0	10	27
Eritrea	23	23	23	0	0	16	0	9	24
Estonia	22	22	22	26	23	22	18	18	23
Ethiopia	32	32	32	0	36	29	0	33	35
Fiji	35	35	35	0	36	35	0	34	35
Finland	36	36	36	30	36	36	35	36	36
France	36	36	36	30	36	34	35	36	36
Gabon	30	30	30	0	36	36	0	26	30
Gambia, The	24	11	11	4	35	24	0	28	34
Georgia	18	18	18	17	21	18	0	19	19
Germany	36	36	36	24	36	36	35	36	36
Ghana	18	18	18	6	36	18	0	36	35
Greece	36	36	36	32	36	36	21	35	36
Grenada	31	31	31	0	36	31	0	34	35
Guatemala	36	36	36	18	36	36	0	36	36
Guinea	2	2	2	0	11	23	0	28	3
Guinea-Bissau	28	28	28	0	28	24	0	29	29
Guyana	25	25	18	0	21	25	0	30	33

NUMBER OF OBSERVATIONS									
COUNTRY	GDP	Consumption	Investment	Employment	Inflation	Credit	House Prices	Financial Account	Output Gap
Haiti	33	33	33	0	36	33	0	36	34
Honduras	36	36	36	16	36	36	0	36	36
Hong Kong SAR	36	36	36	30	34	25	35	18	36
Hungary	36	36	36	23	36	27	17	34	36
Iceland	36	36	36	24	36	36	15	36	36
India	36	36	36	17	36	36	4	35	36
Indonesia	36	36	36	30	36	35	21	34	36
Iran	31	31	31	0	36	31	0	21	35
Ireland	36	36	36	29	36	36	35	36	36
Israel	36	36	36	30	36	33	25	36	36
Italy	36	36	36	36	36	36	35	36	36
Jamaica	36	35	35	28	36	36	0	36	36
Japan	36	36	36	30	36	36	35	36	36
Jordan	32	30	30	0	36	32	0	36	35
Kazakhstan	18	16	16	26	22	16	0	20	26
Kenya	33	33	33	15	36	33	0	35	35
Kiribati	35	0	0	0	0	0	0	24	36
Korea	36	36	36	30	36	36	29	36	36
Kosovo	12	12	12	0	13	14	0	12	13
Kuwait	32	32	30	0	36	32	0	36	35
Kyrgyz Republic	23	23	23	19	20	13	0	23	25
Lao P.D.R.	31	0	0	0	27	21	0	32	32
Latvia	25	25	23	23	24	20	11	24	26
Lesotho	34	33	33	0	33	34	0	36	35
Liberia	15	0	0	0	13	15	0	12	16
Libya	30	26	26	0	34	30	0	31	30
Lithuania	22	22	22	23	23	20	17	21	23
Luxembourg	30	30	30	26	36	26	8	14	36
Macedonia, FYR	15	22	16	26	22	22	10	20	16
Madagascar	36	36	35	7	36	36	0	34	36
Malawi	34	34	34	10	35	34	0	35	35
Malaysia	36	36	36	32	36	36	15	36	36
Maldives	30	16	22	0	10	30	0	36	35
Mali	34	34	34	0	27	34	0	34	35
Malta	36	36	36	30	36	36	15	13	36
Mauritania	9	9	9	0	30	2	0	23	31
Mauritius	36	36	36	30	36	36	0	36	36
Mexico	36	36	36	20	36	36	10	36	36
Micronesia	20	0	0	0	0	18	0	0	21
Moldova	24	24	24	25	21	24	0	22	25

NUMBER OF OBSERVATIONS									
COUNTRY	GDP	Consumption	Investment	Employment	Inflation	Credit	House Prices	Financial Account	Output Gap
Mongolia	33	33	33	0	23	22	0	35	34
Montenegro, Rep. of	14	14	14	9	10	11	0	9	15
Morocco	35	35	35	23	36	30	8	36	35
Mozambique	30	30	30	0	28	30	0	36	35
Myanmar	24	24	24	8	36	24	0	36	25
Namibia	28	28	28	0	13	23	0	26	30
Nepal	35	35	35	0	36	35	0	36	35
Netherlands	35	35	35	31	36	33	35	36	36
New Zealand	36	36	36	29	36	31	35	36	36
Nicaragua	21	22	22	17	16	22	0	36	35
Niger	28	28	28	6	36	28	0	34	36
Nigeria	29	29	27	0	36	29	0	35	35
Norway	36	36	36	35	36	27	35	36	36
Oman	35	35	11	0	15	35	0	35	35
Pakistan	36	36	36	26	36	36	0	36	36
Panama	35	35	35	23	36	35	0	36	35
Papua New Guinea	25	25	25	0	36	25	0	35	25
Paraguay	35	35	35	24	36	35	0	36	35
Peru	35	35	35	25	36	35	17	36	35
Philippines	36	36	36	31	36	36	20	36	36
Poland	34	34	34	30	36	28	9	36	36
Portugal	36	36	36	30	36	36	27	36	36
Qatar	34	34	34	0	36	34	0	5	35
Romania	35	35	35	30	24	29	6	36	36
Russia	19	19	19	23	23	19	15	22	24
Rwanda	33	33	33	0	34	26	0	36	35
Samoa	22	0	0	0	36	22	0	31	23
San Marino	10	10	10	5	12	10	0	0	17
Saudi Arabia	36	36	36	23	36	36	0	36	36
Senegal	35	35	35	1	36	35	0	32	35
Serbia	20	20	20	0	21	18	16	9	21
Seychelles	22	22	19	23	36	22	0	36	35
Sierra Leone	35	35	35	3	9	35	0	35	35
Singapore	35	35	35	28	36	35	17	36	35
Slovak Republic	22	22	22	22	22	22	10	23	23
Slovenia	25	22	25	23	23	24	20	15	26
Solomon Islands	35	27	25	20	36	36	0	36	35
South Africa	36	36	36	21	36	34	35	36	36

NUMBER OF OBSERVATIONS									
COUNTRY	GDP	Consumption	Investment	Employment	Inflation	Credit	House Prices	Financial Account	Output Gap
Spain	36	36	36	36	36	36	35	36	36
Sri Lanka	35	35	35	23	36	35	0	36	35
St. Kitts and Nevis	31	31	31	0	36	31	0	34	35
St. Lucia	31	31	31	9	36	31	0	34	35
St. Vincent and the Grenadines	31	31	31	0	36	31	0	34	35
Sudan	34	36	36	0	34	36	0	36	34
Suriname	31	22	28	7	36	31	0	36	31
Swaziland	27	27	27	0	36	27	0	35	30
Sweden	36	36	36	30	36	30	35	36	36
Switzerland	36	36	36	30	36	36	35	36	36
Syria	31	30	31	10	33	31	0	31	31
São Tomé and Príncipe	36	14	14	0	19	20	0	30	36
Taiwan Province of China	36	36	36	0	0	0	0	0	36
Tajikistan	22	17	23	0	0	17	0	14	23
Tanzania	26	26	26	0	36	26	0	36	34
Thailand	36	36	36	30	36	36	24	36	36
Timor-Leste	11	11	11	0	13	9	0	10	13
Togo	35	35	35	12	36	35	0	35	35
Tonga	33	22	18	0	36	33	0	27	33
Trinidad and Tobago	34	29	25	25	36	34	0	32	34
Tunisia	35	35	35	14	32	35	0	36	35
Turkey	28	28	28	27	36	28	5	36	29
Uganda	32	32	32	0	22	32	0	36	33
Ukraine	12	12	12	20	23	12	15	22	24
United Arab Emirates	13	12	12	0	8	13	8	0	35
United Kingdom	36	36	36	23	27	36	35	36	36
United States	36	36	36	36	36	36	35	36	36
Uruguay	36	36	36	20	36	36	14	36	36
Uzbekistan	24	23	23	0	0	0	0	0	25
Vanuatu	30	28	28	0	36	30	0	33	32
Venezuela	35	35	35	30	7	35	0	36	35
Vietnam	24	24	24	0	20	20	0	20	25
Yemen	22	22	22	0	24	22	0	26	24
Zambia	34	33	33	4	30	34	0	31	35
Zimbabwe	25	25	25	17	6	20	0	0	26

**Table A2. Sources and Definitions of Variables**

<b>VARIABLE</b>	<b>DEFINITION</b>	<b>SOURCE</b>
GDP	Gross domestic product, deflated by GDP deflator, annualized growth rate	IFS and WEO
Consumption	Household consumption expenditure, deflated by GDP deflator, annualized growth rate	IFS and WEO
Investment	Gross fixed capital formation, deflated by GDP deflator, annualized growth rate	IFS and WEO
Employment	Total Employment, annualized growth rate	IFS
GDP deflator	Deflator of Gross domestic product	IFS and WEO
Inflation	Consumer price index inflation	IFS
Credit	Claims on private sector, annualized growth rate	IFS
GDP (US dollars)	Gross domestic product, in US dollars	WEO
Exchange rate	Last exchange rate valuation of former currencies of Euro Area countries	Eurostat
Financial account	Net acquisition of financial assets, normalized by GDP in US dollars	IFS
House prices	Real house price index, annualized growth rate	OECD, BIS, and Global Property Guide
Output gap	Percentage deviation of GDP from its trend. Trend GDP is estimated using a Hodrick Prescott (HP) filter	IFS and authors' calculations

**Table A3. Country Groups**

<b>PANEL A. INCOME</b>	
Advanced economies	Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong SAR, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, San Marino, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States
Emerging markets	Albania, Algeria, Angola, Antigua and Barbuda, Argentina, Armenia, Azerbaijan, Bahamas, The, Bahrain, Barbados, Belarus, Belize, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Chile, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Fiji, Gabon, Georgia, Guatemala, Hungary, India, Indonesia, Iran, Jamaica, Jordan, Kazakhstan, Kosovo, Kuwait, Libya, Lithuania, Macedonia, FYR, Malaysia, Mauritius, Mexico, Mongolia, Montenegro, Rep. of, Morocco, Namibia, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russia, Saudi Arabia, Serbia, Seychelles, South Africa, Sri Lanka, St. Kitts and Nevis, Suriname, Swaziland, Syria, Thailand, Trinidad and Tobago, Tunisia, Turkey, Ukraine, United Arab Emirates, Uruguay, Venezuela, Vietnam
Low-income countries	Afghanistan, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Central African Republic, Chad, Comoros, Congo, Democratic Republic of the, Congo, Republic of, Côte d'Ivoire, Djibouti, Dominica, Eritrea, Ethiopia, Gambia, The, Ghana, Grenada, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Kenya, Kiribati, Kyrgyz Republic, Lao P.D.R., Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Micronesia, Moldova, Mozambique, Myanmar, Nepal, Nicaragua, Niger, Papua New Guinea, Rwanda, Samoa, Senegal, Sierra Leone, Solomon Islands, St. Lucia, St. Vincent and the Grenadines, Sudan, São Tomé and Príncipe, Tajikistan, Tanzania, Timor-Leste, Togo, Tonga, Uganda, Uzbekistan, Vanuatu, Yemen, Zambia, Zimbabwe
<b>PANEL B. REGION</b>	
Euro Area	Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovak Republic, Slovenia, Spain
Other Advanced Economies	Australia, Canada, Czech Republic, Denmark, Hong Kong SAR, Iceland, Israel, Japan, Korea, New Zealand, Norway, San Marino, Singapore, Sweden, Switzerland, Taiwan Province of China, United Kingdom, United States
Commonwealth of Independent States	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Ukraine, Uzbekistan
Emerging and developing Asia	Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, India, Indonesia, Kiribati, Lao P.D.R., Malaysia, Maldives, Micronesia, Mongolia, Myanmar, Nepal, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Tonga, Vanuatu, Vietnam
Emerging and developing Europe	Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Kosovo, Macedonia, FYR, Montenegro, Rep. of, Poland, Romania, Serbia, Turkey
Latin America and the Caribbean	Antigua and Barbuda, Argentina, Bahamas, The, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela
Middle East and North Africa	Afghanistan, Algeria, Bahrain, Djibouti, Egypt, Iran, Jordan, Kuwait, Libya, Mauritania, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen
Sub-Sahara Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Democratic Republic of the, Congo, Republic of, Côte d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, The, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, São Tomé and Príncipe, Tanzania, Togo, Uganda, Zambia, Zimbabwe
<b>PANEL C. SOURCE OF EXPORT EARNINGS</b>	
Fuel	Algeria, Angola, Azerbaijan, Bahrain, Bolivia, Brunei Darussalam, Chad, Colombia, Congo, Republic of, Ecuador, Equatorial Guinea, Gabon, Iran, Kazakhstan, Kuwait, Libya, Nigeria, Oman, Qatar, Russia, Saudi Arabia, Timor-Leste, Trinidad and Tobago, United Arab Emirates, Venezuela, Yemen
Manufacturing	Bangladesh, Botswana, Cambodia, China, Hungary, Lesotho, Malaysia, Mexico, Pakistan, Poland, Romania, Swaziland, Thailand, Tunisia, Turkey, Vietnam

Primary products excluding Fuel	Afghanistan, Argentina, Burkina Faso, Burundi, Central African Republic, Chile, Congo, Democratic Republic of the, Côte d'Ivoire, Eritrea, Guinea, Guinea-Bissau, Guyana, Liberia, Malawi, Mali, Mauritania, Mongolia, Niger, Papua New Guinea, Paraguay, Sierra Leone, Solomon Islands, South Africa, Sudan, Suriname, Uruguay, Uzbekistan, Zambia
Services, Income, Transfers	Albania, Antigua and Barbuda, Armenia, Bahamas, The, Barbados, Bosnia and Herzegovina, Cabo Verde, Comoros, Croatia, Djibouti, Dominica, Dominican Republic, Egypt, Ethiopia, Fiji, Gambia, The, Georgia, Grenada, Haiti, Honduras, Jamaica, Jordan, Kiribati, Kosovo, Kyrgyz Republic, Macedonia, FYR, Maldives, Mauritius, Montenegro, Rep. of, Morocco, Nepal, Panama, Philippines, Rwanda, Samoa, Senegal, Seychelles, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, São Tomé and Príncipe, Tajikistan, Tonga, Uganda, Vanuatu
Diversified	Belarus, Belize, Benin, Bhutan, Brazil, Bulgaria, Cameroon, Costa Rica, El Salvador, Ghana, Guatemala, India, Indonesia, Kenya, Lao P.D.R., Madagascar, Micronesia, Moldova, Mozambique, Myanmar, Namibia, Nicaragua, Peru, Serbia, Tanzania, Togo, Ukraine, Zimbabwe

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