Understanding Global Confidence Cycles

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Abstract: We study the main cyclical features of consumer and business confidence using a new comprehensive database over the 1960Q1-2017Q2 period. The database covers business confidence for 91 countries and consumer confidence for 95 countries, with almost half of the countries in each series comprising of emerging and developing economies. A novel feature of the database is that confidence measures are carefully standardized across countries so that they are suitable for cross-country analysis. We report three major results. First, business and consumer confidence are procyclical and tend to lead business and financial cycles. Second, confidence measures help forecast output, house prices and credit. Third, business and consumer confidence exhibit sizeable comovement across countries, suggesting the presence of a global confidence cycle.

Keywords: Business confidence, consumer confidence, business cycles, and financial cycles.
JEL Classification: E32, F20, F42.

The cornerstone of our theory is confidence and the feedback mechanisms between it and the economy that amplify disturbances... When people are confident they go out and buy; when they are unconfident they withdraw, and they sell. Economic history is full of such cycles of confidence followed by withdrawal. George A. Akerlof and Robert J. Shiller (2009)

1. Introduction

Business and consumer confidence are used for monitoring and forecasting activity, and understanding the drivers and international transmission of business cycles. Compared to most indicators of activity, business and consumer confidence are released in a more timely manner and less subject to data revisions, and hence they are particularly useful to assess the state of economic activity in real time. Some studies conclude that confidence helps forecast output and consumption. Moreover, a rich literature finds that confidence plays an important role in explaining business cycles and their cross-border transmission.[1]

However, a systematic empirical analysis of the role of confidence is often limited to advanced economies. This is partly because cross-country consistent confidence measures are mostly available for these economies. In this paper, we introduce the first comprehensive cross-country database on consumer and business confidence. Our database covers business confidence for 91 countries—35 advanced economies and 56 emerging market and developing economies (EMDEs). For consumer confidence, it includes 95 countries—36 advanced economies and 59 EMDEs. The time series coverage of the database is quite long: some of the series begin as early as 1960 and data for most economies are available from the early 2000s.

In Section 2, we introduce our database and explain why it is suitable for cross-country work. Our database is much more comprehensive than the well-known cross-country data sources of confidence provided by the Organisation for Economic Cooperation and Development (OECD) and European Commission (EC). For example, the OECD database covers business confidence for 42 countries and consumer confidence for 39 countries, most of which are advanced economies. The EC provides harmonized data for 31 and 32 European countries on business and consumer confidence, respectively. In terms of country coverage, the database we introduce is twice as large as that of OECD and almost three times as large as that of the EC.

Our database is particularly useful for cross-country work since we undertake multiple steps to make confidence measures more comparable across countries. Confidence indicators are available for individual countries. For instance, the University of Michigan Consumer Sentiment Index tracks consumer confidence for the United States. Similarly, the EC compiles business and consumer indices for individual countries. In the case of EMDEs, national governments, statistical agencies, and central banks compile business and consumer confidence for their respective economies. However, confidence measures from

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[1] For studies on the ability of confidence in forecasting activity, see Throop (1992), Matsusaka and Sbordone (1995), Howrey (2001), Easaw and Heravi (2004), and Kwan and Cotsomotis (2006). For the role of confidence in explaining business cycles, see Taylor and McNabb (2007), Leduc and Sill (2013), and Ahmed and Cassou (2016). For the role of confidence in the transmission of business cycles across borders, see Colombo (2013), Dees and Güntner (2014), and Levchenko and Pandalai-Nayar (2017). Movements in business and consumer confidence can also have important implications for movements in equity markets (Møller, Nørholm and Rangvid 2014).

these national sources are not cross-country consistent: they ask different survey questions; they are reported at different frequencies; with different scales; and some are seasonally adjusted while others are not. We standardize confidence measures along these dimensions to minimize deviations among different survey designs. Thus, our database serves as the first ever one-stop repository of confidence measures from multiple sources, and is suitable for cross-country analyses.

In Section 3, we present the main stylized facts about business and consumer confidence and examine their cyclical features. We first analyze the temporal evolution of business and consumer confidence in the last two decades. Next, we examine the comovement between confidence measures and output. We then document how business and consumer confidence series are correlated with each other and how persistent they are. We find that business and consumer confidence exhibit the most pronounced movements during recessions. Confidence tends to deteriorate before recessions and often stabilizes prior to the end of recessions. These patterns hold across subgroups of countries. Business and consumer confidence are highly correlated, especially in advanced economies.

An important advantage of confidence measures over macroeconomic aggregates in tracking the cyclical stance of an economy is that they are more timely and less subject to data revisions. Yet, there is mixed evidence about the extent to which confidence measures correlate with macroeconomic and financial aggregates, and the extent to which such a correlation is leading or coincident. A leading nature of confidence is particularly important because it not only implies that confidence is useful for forecasting, but also suggests that movements in confidence can have causal effects on the economy.[2] The breadth of country coverage in our database – spanning advanced, emerging, and developing economies – allows us to examine these issues in greater detail than the previous work.

In Section 4, we examine the extent of comovement between measures of confidence and business and financial cycles. For this purpose, we first deploy an event study and look at the dynamics of confidence around turning points of business and financial cycles. We also calculate correlations, at different leads and lags, between confidence and the main macroeconomic and financial aggregates using a VAR model. We find that business and consumer confidence tend to lead turning points of business cycles, house price cycles, and credit cycles.

We illustrate the use of our database in two distinct applications. In Section 5, we examine the potential of confidence series in forecasting movements in the main macroeconomic and financial aggregates using a panel regression framework. Our results provide support to the forecasting ability of business and consumer confidence and both measures help predict growth of activity. A unit increase in business confidence is followed by a 1.5 percentage point increase in one-quarter-ahead output growth. As the forecast horizon increases, the magnitude of this correlation shrinks but remains statistically significantly positive. Confidence measures also help predict growth in house prices and credit.

There is by now a large set of studies that documents sizeable cross-country comovement of business cycles. There is also some recent work on the global comovement of financial

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[2] In a purely temporal sense, confidence could lead activity by incorporating "news" about fundamentals that will eventually be reflected in activity. In a causal as well as a temporal sense, confidence could lead activity by reflecting shifts in sentiments or animal spirits unrelated to fundamentals that have causal effects on activity.

variables.[3] However, less is known about the global comovement of business and consumer confidence. In our second application, we investigate the extent of cross-country comovement in business and consumer confidence by estimating a standard dynamic factor model in Section 6. In particular, we investigate the extent to which confidence comovement is global (i.e., common to all countries) or specific to country groups (e.g., advanced economy-specific and EMDE-specific). Our findings suggest that business and consumer confidence exhibit sizeable comovement across countries. A significant portion of comovement in confidence (47 and 25 percent of the variance of business and consumer confidence, respectively) is explained by forces that are global in nature, thereby implying the existence of a global confidence cycle. This pattern of comovement in confidence mirrors that of output. We also document that cross-country comovement is larger for business confidence than consumer confidence and for advanced economies than EMDEs.

2. Database

The construction of our database involves the following two steps. First, we compile "raw" business and consumer confidence data from many sources: OECD, European Commission, national statistical agencies, central banks, and non-official sources such as universities, research institutions, and private companies. When collecting data, we take as given the methodology used in these sources in terms of how confidence measures are constructed and reported. Second, we standardize the raw data to make them comparable across countries. This step includes seasonal adjustment, if the raw series is not seasonally adjusted by sources yet, removal of high-frequency noise, and normalization to make the series have the same mean and variance across countries.

2.1. Data sources

In order to construct a database that covers a number of countries, we rely on multiple data sources. First, we obtain business and consumer confidence data from the cross-country databases managed by the OECD and the EC. Their data are available on a monthly basis and seasonally adjusted. In the OECD database, confidence measures and their underlying surveys come from a large number of sources. In the case of member states of the European Union, business and consumer confidence data are based on business and consumer opinion surveys from the EC. These surveys are conducted by public and private partner institutions in the member states under the framework of the Joint Harmonised EU Programme of Business and Consumer Surveys (European Commission 2016).[4]

For those countries that are not covered by the statistics of EC but by the OECD, business and consumer confidence series are collected from national agencies. For instance, in the case of Mexico, business confidence is compiled from the results of the Monthly Business

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[3] Some recent studies find strong comovement of business and financial cycles across countries. For example, using a dynamic factor model, Stock and Watson (2005) and Kose, Otrok and Whiteman (2003, 2008) document the roles played by global and/or group-specific factors in driving global business cycles. Using a factor model, Miranda-Agrippino and Rey (2015) document that a common factor drives a sizeable portion of variation in equity prices, commodity prices, and bond indices. Hirata et al. (2012) and Ha et al. (2017) report that common factors play an important role in explaining cycles in certain financial variables.

[4] In addition, several entities in the private sector carry out cross-country surveys on consumer confidence. For example, a survey conducted by the Nielsen includes 60 countries all over the world, while Bayt.com surveys countries in the Middle East and North Africa. These firms utilize online technology to collect data, hence samples are restricted to respondents with online access.

Tendency Survey of the Bank of Mexico; and for China, consumer confidence is from the National Bureau of Statistics of China. In total, the OECD database covers business and consumer confidence for 42 countries and 39 countries, and the one by the European Commission does 31 countries and 32 countries, respectively.

The databases by the OECD and EC are, however, limited in country coverage. Specifically, a small number of EMDEs are covered by the OECD database, and the one by the EC is for select European countries only.[5] We augment the country coverage by compiling confidence data from a wide range of sources: national statistical agencies, central banks, and non-official providers that include academic and research institutions and private firms.[6] Central banks and government agencies regularly collect information on consumer and business sentiment, as input into monetary and fiscal policy decisions. For commercial companies, especially financial corporations, it is essential to know how consumers assess the state of the economy for their activities and market analyses. In some countries, there are collaborative projects to collect confidence related information. For example, in Uruguay, an academic institution carries out a survey on consumer confidence, in cooperation with a private financial firm.

Our broader database includes 91 countries for business confidence and 95 countries for consumer confidence. We obtain data series from national and other sources for 44 countries for business confidence and 48 countries for consumer confidence (Table A1). Overall, our database includes business confidence for 35 advanced economies and 56 EMDEs and consumer confidence for 36 advanced economies and 59 EMDEs. This means that the country coverage of our database is about twice as large as that of the OECD and almost three times as large as that of the European Commission.

Quarterly data are available for about 90 percent of the countries (83 countries) in our main database used in this paper (Table 1).[7] The quarterly database covers business confidence for 82 economies—35 advanced economies and 47 EMDEs. For consumer confidence, it also includes 83 economies—36 advanced economies and 47 EMDEs. The long time-series data are available in some countries, especially in advanced economies, where the series starts in the 1960s and 1970s. Still, data for most countries, including many EMDEs, are available since the early 2000s. As confidence measures from these sources are based on surveys conducted by various entities, they differ in several dimensions, including reporting bases, scaling, seasonal adjustment, and frequency. We next briefly examine the main differences in information content and design of surveys among these sources.

2.2. Information content and design of confidence surveys

Examining the content and design of surveys on which business and consumer confidence is based and their consistency across countries is an important initial step in constructing the database. While questionnaires differ across countries, there are similarities in questions that survey respondents (i.e., firms and households/individuals) are asked and the information content captured by the responses. Survey questions can be broadly classified into two types: questions specific to firms and consumers, and those related to the overall economy (Tables 2 and A5). These two types of questions are interacted with

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[5] Specifically, the OECD database covers 12 EMDEs for business confidence and 10 EMDEs for consumer confidence. In the EC database, confidence data are available for nine EMDEs.
[6] Tables A1-A3 explain the source, original frequency, and time coverage for each country in the sample.
[7] Table A4 summarizes the data series used in the analysis in the paper.

the time dimension (e.g., current situation and future outlook). As the time horizon in question tends to depend upon the survey frequency, there are similarities in the questions. For most countries (and all harmonized indicators by the EC), composite consumer and business confidence indicators are the unweighted averages of net responses to a number of questions related to consumer and business confidence.

In surveys of business confidence, firms are asked about their own conditions based on different measures and their assessment of the aggregate economy. In addition to the overall business situation, questions capture various aspects of state of their business, including sales (Arab Republic of Egypt, Peru, Sierra Leone, Ukraine), profits (Bahrain), order books (European Commission, Nigeria, Thailand), demand (Albania, Peru), employment (Canada, Georgia), and competitiveness (Albania, European Commission, Nigeria). In some countries, surveys also include questions about the economic conditions in the industry to which firms belong (Singapore) and in the aggregate economy (Brazil, Indonesia, Republic of Korea, Ukraine).

In the case of consumer confidence, questionnaires ask households about their economic and financial situations and, as in business surveys, their assessment of the aggregate economic conditions. Questions about the economic and financial conditions of households are about, for example, consumption (Chile), purchase of durable goods (Argentina, European Commission, Russian Federation, United States), income (India), and savings (Albania, Philippines, Russian Federation). Households are also asked to evaluate the aggregate economic conditions (Argentina, Chile, European Commission, Nigeria, Norway, the United States), labor market (Ecuador, Morocco, Thailand), price levels (Albania, Pakistan), and business conditions (the United States).

In terms of the time horizon, questions focus on current conditions (or comparison to the past) and future expectations. For instance, business surveys by the European Commission ask firms about current order books and stocks of finished products. They also ask how they expect their production to change over the next three months. Similarly, consumer surveys in Argentina ask households whether it is a good time to make purchases (current conditions) and what they think about their financial situation in the next year (future conditions). This dimension of survey questions has important implications for business and consumer confidence indexes. To the extent that survey questions refer to current conditions, confidence indexes are expected to be coincident with macroeconomic aggregates. The indexes can be leading as well, to the extent that questions refer to expectations of future conditions by firms and households.

While surveys of business and consumer confidence ask different questions, they are similar in that they track the assessment of the current and expected state of the overall economy by firms and households. In addition, business conditions and household financial situations are also linked to the aggregate economic conditions. For instance, it is reasonable to expect both business conditions and household finances to improve during expansions and deteriorate during recessions.

Despite these broad similarities, there are finer differences across countries in terms of the design of questionnaires. Specifically, the number of questions in the surveys used to construct the index are different by source, which could affect the depth of surveys. For example, the consumer survey compiled by the EC has four questions—two on households' financial situations and two on their views on the overall economic situation. The consumer

confidence survey in Uruguay has six questions—two on durable goods purchases in addition to the four questions by the European Commission. The number of questions for consumer confidence indexes in Mexico and the United States is five, while the survey in Argentina asks six questions (three on current situation and three on expectations about future).

In addition to these differences in the design of surveys, the frequency of surveys also varies across countries. While business and consumer confidence indexes are available on a monthly basis in almost all advanced economies, only about a half of EMDEs have the monthly confidence series (Tables A2 and A3).[8] The frequency of surveys affects the structure of questions and the information content, especially with respect to the time dimension.

2.3. Standardization of confidence series

We standardize the business and consumer confidence series across countries in order to minimize the discrepancies that could stem from differences in information content, design and frequency of surveys. Specifically, we standardize the confidence data by undertaking the following steps. First, we present all the confidence measures at a common frequency— on a quarterly basis. Second, we normalize the measures to have the same mean and variance across countries, after conducting seasonal adjustment if the measures are not adjusted by the original source. Unfortunately, through these two steps, the country and time coverages become smaller and shorter because there are gaps in survey implementation or they are available only at lower frequencies (i.e., half-year or annual) in several countries.

Frequency. We present the confidence series at the quarterly frequency. For countries where the monthly data are reported, we convert them into quarterly series by taking an average across months in each quarter. The choice of quarterly frequency is driven by several reasons. First, the main questions we focus here on are about the linkages between confidence and business cycles and most business cycle indicators are available on a quarterly basis. Second, in order to maximize the country coverage, we use series available at the quarterly frequency since not all countries report monthly business and consumer confidence series.

Normalization. We convert confidence measures to have a mean of 100 and a standard deviation of 1 for each country over the full sample period. It is important to note that the choices of mean and standard deviation are arbitrary and without loss of generality. We select the series that do not contain any data gaps. We then adjust all non-seasonally-adjusted data using the U.S. Census Bureau's X-13 program, after excluding countries without the sufficient number of observations to conduct the adjustment. Once being seasonally-adjusted, the confidence series are normalized for cross-country consistency since they have different scales depending on the source. For example, for business confidence for Thailand and Uganda and consumer confidence for Uruguay, a score of 50 is used to show the stable and neutral level of confidence, while the long-term average is

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[8] Although almost all advanced economies have the monthly confidence data, the series at that frequency are available in only 30 EMDEs out of 56 for business confidence and 29 EMDEs out of 59 for consumer confidence. The quarterly confidence series (including the bi-monthly series) are reported in 25 EMDEs for business confidence and 26 EMDEs for consumer confidence. In the remaining countries, data are available only on a half-year or annual basis.

set at 100 in standardized confidence measures by the OECD. We follow the procedure of the OECD to simply set the long-term average as 100 to facilitate the cross-country comparison.

In addition to the average, we adjust the confidence series to have the same variance across countries—a unit standard deviation—because of differences in survey designs. While, in many countries, survey results are interpreted as "percentage balance" (i.e., difference between the percent of favorable responses and the percent of unfavorable ones), there are a few countries that employ different methodology. For instance, in Ecuador, specific weights are assigned to respective responses. In a question with three options, the favorable one has a weight of 100 while the neutral and unfavorable choices have weights of 50 and 0, respectively. The survey results are therefore ranged from 0 to 100.

Even though results are shown as percentage balance, individual responses are not always aggregated in the same manner across countries, which could cause, by construction, differences in variances from one another. Surveys managed by the European Commission and those on consumer confidence in Albania and Pakistan, for example, include questions with two options in both favorable and unfavorable sides by the strength of opinion (e.g., "a lot better" versus "a little better"), and different weights are assigned to these responses in computing percentage balance. Other surveys, such as business confidence in Georgia and Ukraine and consumer confidence in Uruguay, just have an option in both favorable and unfavorable sides, and therefore, no weights are assigned. Finally, amplitude adjustment in the OECD's standardized series also makes variances different from those in non-OECD sources. In computing their standardized confidence measures, the OECD adjusts the confidence series so their amplitude matches that of the de-trended GDP.[9]

3. Stylized facts

This section documents the main stylized facts about business and consumer confidence. First, we study the evolution of business and consumer confidence for selected countries and country groups. Next, we present a preliminary analysis of the degree of comovement between confidence measures and output. We then briefly document the extent of comovement between business and consumer confidence series and their persistence properties. We measure the degree of comovement using simple correlations.

3.1. Behavior of confidence over time

Country-specific confidence measures. To provide a flavor of the behavior of business and consumer confidence at the country level, we briefly describe their temporal evolutions in four selected countries: China, Russia, Japan and the United States. Business and consumer confidence in these economies often move in tandem with their business cycles. While confidence measures fluctuate over the business cycle, the most pronounced movements are associated with recessions and crisis periods (Figure 1). In the two advanced economies, confidence dipped around recessions in the late 1990s to early 2000s (Japan) and in the late 2000s (Japan and the United States). Confidence tended to

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[9] This adjustment is for confidence measures to have the same amplitude as the business cycle, represented by de-trended GDP. Having the same amplitude for confidence and business cycle measures makes the relationship between two indicators easier to interpret (i.e., confidence as a leading indicator of economic aggregates) clearer (OECD, 2012).

deteriorate before recessions and crisis periods and often picked up prior to the end of recessions. Business and consumer confidence in EMDEs act in the same way as in advanced economies. For example, confidence in Russia clearly weakened during the crises in the late 1990s and the late 2000s. The deterioration of business confidence was followed by the crisis in 1998, while the improvement in confidence started right after the 2009 recession.

Global and group-specific confidence measures. Global and group-specific aggregates of confidence measures show that the relationship between confidence and business cycles also holds for groups of economies. Global aggregates are computed over 65 economies for business confidence and 67 economies for consumer confidence. These aggregates capture major cyclical episodes, such as the Asian financial crisis in 1997-98 and the GFC in 2008-09, and the global expansion in the mid-2000s (Figure 2). While each recessionary episode is associated with a decline in confidence, the most striking one is the GFC. This is in line with the unprecedented scale and synchronized collapse in real activity during the GFC (Kose and Terrones, 2015). Recoveries tend to be associated with rising business and consumer confidence, as shown during the mid-2000s. The recent ongoing expansion since the GFC also coincide with a pick-up in confidence measures, although the recovery in confidence has been weaker than the past global expansions.

The main cyclical features of confidence measures are also confirmed in the groups of countries. The full sample is first split into advanced economies and EMDEs and then, among EMDEs, into commodity exporters and commodity importers. Although confidence behaves similarly in advanced economies and EMDEs, the magnitudes of changes differ between the two groups (Figure 3). Confidence measures registered larger declines in EMDEs during the Asian financial crisis and in advanced economies during the GFC, in line with the epicenter of each crisis episode. Consumer confidence provides a clearer picture about the origin of these episodes. In advanced economies, a decline in confidence during the Asian financial crisis was marginal but a sizeable decline was recorded during the GFC.

In the ongoing expansion, confidence in advanced economies has been recovering strongly and consumer confidence has recently reached its highest level since the GFC. On the contrary, although there is an indication of recent pick-up, consumer confidence in EMDEs has risen only slowly since the crisis. The decline in confidence in EMDEs occurred in tandem with a growth slowdown in these economies that began in 2010 (Didier et al., 2015).

Among EMDEs, confidence measures show a clear divergence between commodity exporters and commodity importers (Figure 4). Booms and busts of commodity prices are important factors in driving business cycle fluctuations in commodity-exporting EMDEs and are closely related to movements in confidence in these economies. During the commodity price boom prior to the GFC, business and consumer confidence increased sharply in commodity exporters, reflecting the favorable economic prospects led by high commodity prices, while the improvement in commodity importers was small. In commodity exporters, business and consumer confidence has worsened, especially after the oil price plunge in 2014. The deterioration has been larger in consumer than in business confidence. In commodity-importing EMDEs, confidence readings have been better partly because low commodity prices have helped support activity.

3.2. Correlation and persistence

Correlation between confidence and output. The relationship between confidence and the economy's cyclical position is also supported by cross-correlations between them. The cyclical position is represented as the cyclical component of output and computed with the Hodrick-Prescott filter (with lambda of 1,600 as the smoothing parameter). While the contemporaneous correlation between confidence and the cyclical component of output is positive and high based on the full sample (i.e., 0.41 for business and 0.36 for consumer confidence), the highest correlation is obtained when confidence measures are lagged by two quarters (Table 3). Even lagged by a year (i.e., four quarters), high and statistically significant coefficients are calculated. This suggests that business and consumer confidence is a *leading* indicator of the cyclical position of the economy.

Splitting samples into advanced economies and EMDEs confirms the results, though the correlation is weaker in EMDEs. The contemporaneous correlation in advanced economies is 0.43 and 0.38 for business and consumer confidence, respectively, but declines to 0.39 and 0.34 in the sample of EMDEs (although the coefficients for advanced economies are not statistically significantly different from those for EMDEs). In addition, the correlation is the highest when confidence measures are lagged by a quarter in EMDEs and by two quarters in advanced economies. However, correlation coefficients remain high, even lagged by four quarters in both country groups.

On the contrary, for both confidence measures, correlation coefficients drop when confidence is moved forward. They are still statistically significant when one-quarter-ahead confidence measures are used, but forwarding by two quarters makes the coefficients insignificant and then moving ahead by three and four quarters turns into negative correlation.

Correlation between business and consumer confidence. The extent of comovement between business and consumer confidence points to some similarities in their cyclical dynamics. On average, the contemporaneous correlation between business and consumer confidence is quite high—0.55 based on the full sample (Table 4). Higher and lower coefficients are reported for advanced economies and EMDEs, respectively, as in the correlation with the cyclical component of output. The cross-correlation between the confidence measures (i.e., business confidence leading and lagging consumer confidence) is somewhat lower than the contemporaneous correlation, suggesting that neither business confidence nor consumer confidence systematically leads or lags the other.

Persistence. Both confidence measures are quite persistent but consumer confidence tends to be stickier than business confidence (Table 4). Persistence properties of confidence measures are measured as the autoregressive (AR) correlation coefficients, in other words, correlation with its own lags. While both confidence measures are highly persistent, especially in the lower-order terms, the AR correlation remains high even with the fifth order in the case of consumer confidence. The first AR correlation coefficients for the two series are, on average, 0.85 and there is no difference between them. However, differences in correlation coefficients become larger from the third AR coefficient. The fifth AR coefficient in business confidence is relatively small, while that in consumer confidence is still about 0.3, on average.

4. Cyclical behavior of confidence

This section further examines the cyclical behavior of business and consumer confidence, by undertaking two exercises. The first exercise is an event study analysis focusing on the dynamics of confidence around the turning points of business and financial cycles. The second one analyzes the degree of comovement between confidence measures and the main macroeconomic and financial variables using a vector-autoregression (VAR) model. The set of macroeconomic variables includes output, investment, private consumption, and industrial production while the financial variables are private sector credit, equity prices, and house prices. The analysis with the VAR model also includes the volatility of equity prices—a widely used measure of uncertainty.

4.1. Confidence over the cycle: an event study

Design of the event study. In analyzing the dynamics of confidence around the turning points of business and financial cycles, we define peaks and troughs of cycles as event dates and study the evolution of confidence measures around these events. Peaks and troughs are identified in each variable using the algorithm by Harding and Pagan (2002). Specifically, peaks and troughs are computed over two quarters on both sides of turning points. Recessionary and expansionary phases last at least two quarters, and the minimum length of the full cycle is set to five quarters. For financial indicators, we use three quarters on both sides of turning points. We assume that the minimum length of cycles is seven quarters following Pagan and Sossounov (2003).[10] Once peaks and troughs are identified in each economy, the confidence series is rescaled to equal 100 at the turning point. The results suggest that while business and consumer confidence leads turning points of business and financial cycles, the timing differs by confidence measure, the indicator used to define cycles, the type of turning points, and country group.

Confidence around business cycles. Results of the event study analysis show that business and consumer confidence tend to lead turning points of business cycles. Both business and consumer confidence start declining prior to business cycle peaks and falls sharply during recessions (Figure 5.A). Prior to the beginning of expansions, confidence measures tend to stabilize and then start rising as activity picks up with the expansion. The leading nature of confidence is also observed when turning points are based on other indicators of activity, especially investment and private consumption.

Confidence around financial cycles. The picture is less clear in the case of financial cycles. Confidence measures tend to lead turning points of credit and house price cycles, but they appear to move together with equity price cycles. Consumer confidence becomes the highest in three quarters prior to the peak of credit cycles (Figure 5.B). Similarly, in the case of house prices, the highest confidence reading materializes two quarters prior to peaks (Figure A1). However, peaks of equity markets do not appear to be led by confidence (Figure A2).

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[10] As a result, for instance, focusing on the sample of 71 countries (in Table 1), we have 323 output peaks covering 57 economies and 328 output troughs in 58 economies, while there are 248 credit peaks in 68 economies and 247 credit troughs in 68 economies. As the event studies are based on episodes without any missing data points, only 50 countries (195 events) and 49 countries (179 events) are used in output peak episodes for business and consumer confidence, respectively. Similarly, credit peak events are based on 51 countries (130 episodes) for business confidence and 50 countries (113 episodes) for consumer confidence.

Splitting samples into advanced economies and EMDEs yields broadly similar conclusions, though results are often more pronounced for the group of advanced economies. Output cycle peaks are preceded by peaks of business and consumer confidence by around three quarters in both groups. In advanced economies, the same three-quarter-ahead peak is identified with investment, consumption and industrial production, especially in the case of consumer confidence. In EMDEs, troughs of business and financial cycles are preceded by the lowest readings of confidence measures by a quarter or two in most indicators.

4.2. Comovement between confidence and cycles

VAR model. We measure the degree of comovement between confidence and business and financial cycles using correlations based on a VAR model that follows the methodology by den Haan (2000). The framework is particularly suitable for our analysis because it can accommodate both stationary and non-stationary series without the need for data transformation. In our setting, the confidence series are stationary, while measures of economic and financial activity, especially those in the real economy, tend to show trends.[11] Thus, the latter variables need to be transformed, such as detrending as discussed in Section 3. However, as extensively documented in the business cycle literature, detrending may affect the cyclical behavior of variables and hence the estimated correlation coefficients (e.g., Canova 1998; Stock and Watson 1999). The key innovation of using the VAR model is that, while endogenous variables can be both stationary and nonstationary, the correlations between them are analyzed in terms of the estimated forecast errors which themselves are stationary. In addition, the VAR-based approach allows us to compute correlations at different time horizons.

The reduced-form VAR model can be represented by:

$$Z_t = \mu + \sum_{i=1}^{p} \delta_i Z_{t-i} + \varepsilon_t$$

where Z is an n-vector of endogenous—potentially both stationary and nonstationary— variables, μ is an n-vector of constant terms, δ_i is $n{\times}n$ matrices of coefficients, ε is an n-vector of (possibly correlated) error terms, and p is the number of lags. We estimate a bivariate VAR for each country, one by one, that includes in the vector Z a measure of confidence and an indicator in the real economy or the financial sector for that country.[12] The estimated model is used to generate dynamic forecasts of confidence, and a macroeconomic or financial indicator at different horizons.

We use four macroeconomic and four financial sector indicators. Following Bachmann and Sims (2012), these variables are used in the VAR model in log levels, while confidence is used as levels. We present the correlation coefficients for different forecast horizons. For

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[11] Confidence measures are stationary because the underlying surveys are designed to measure short-run changes in the state of the economy or households'/firms' finances. For instance, survey questions regarding the current state of the economy are benchmarked to the recent past (typically the year before). With regard to questions about the future, they refer to the medium term (at most five years ahead) and they are benchmarked to the current period.

[12] We do not include other controls in the VAR model for two main reasons. First, a set of controls is not consistently available for all the counties in our sample. Second, including more variables would result in a loss of degrees of freedom, diluting the statistical significance obtained from the more parsimonious bivariate specification.

each VAR, the lag length is determined by the Akaike information criterion (AIC), with the maximum lag length considered being set eight quarters. The model is estimated with the ordinary least squares (OLS), based on the data over 1960Q1-2017Q2.

Once we obtain the baseline result with OLS, we perform simulations to measure the accuracy of forecasts and to determine the statistical confidence. In the simulations, we consider both uncertainty associated with the estimated parameters and random errors. At each replication, we take random draws for the parameters and random normal errors and then, using the simulated results, re-compute the correlation coefficients. By comparing results from the baseline VAR and simulation exercises, we derive the statistical significance. Specifically, the significance level is defined as the percent share of simulation results that contain the same correlation coefficient sign as in the baseline VAR. For instance, if the baseline correlation result is positive, we compute the share of simulation replications that show a positive correlation.[13]

Comovement with business cycles. The correlation results based on the VAR model suggest that there is a strong contemporaneous relationship between confidence and macroeconomic indicators. On average across all countries, the correlation coefficients with confidence measures are sizeable on impact for all macroeconomic indicators (Table 5).[14] For instance, they range from 0.2 to 0.4 for business confidence and from 0.2 to 0.3 for consumer confidence. The coefficients tend to peak around at the two-year horizon in the case of business confidence, ranging from 0.6 to 0.7, and after two to three years in consumer confidence, from 0.1 to 0.7.[15]

Compared with business confidence, consumer confidence is somewhat less correlated with output, investment and industrial production, but more correlated with private consumption, especially at earlier lags. Using a sample of OECD countries, Santero and Westerlund (1996) find consumer confidence has a looser association with output movements than business confidence. The difference in the strength of the relationship could partly reflect the characteristics of each confidence measure.[16] In both business and consumer confidence, at the two-year horizon, contemporaneous correlations with output are statistically significant at the 5 percent level in almost all countries in the sample.

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[13] We perform 50 simulations and show 90 percent and 95 percent confidence levels. In aggregating country-level results, we run *t*-tests to examine whether an average of baseline correlation coefficients across samples is statistically different from zero.

[14] Tables A6-A7 present country-specific correlations at the two-year horizon. The correlations are sizeable and statistically significant at the 5 percent level for almost all economies in the sample (Table A8). Tables A9 and A10 show the results based on advanced economies and EMDEs, separately. The results remain strong and statistically significant.

[15] One way to reconcile why the correlations are different at different horizons is as follows. The joint dynamics of confidence and activity can be thought of as being generated by some underlying (unidentified) shock. On impact of the shock, confidence and activity respond in a similar manner: positive correlation on impact. Beyond the initial shock, confidence and activity also endogenously propagate over time; this is what the correlations at longer horizons capture. The fact that correlations on impact are significant suggest that such endogenous propagation mechanisms are important.

[16] One explanation of the looser relationship between consumer confidence and output is that consumer confidence is probably more subject to measurement errors than business confidence. Households have access to fewer resources and do not maintain as thorough a book-keeping as firms for a systematic assessment of the state of the economy and their own finances, and therefore, households' assessments can be more subjective and noisier. Cotsomitis and Kwan (2006) show that consumer confidence provides limited information about future household spending for the European countries.

The results also show the leading nature of business and consumer confidence. In the case of business confidence, the average correlation coefficient with one-quarter-ahead output is 0.26 on impact, while the coefficient is 0.17 when output is lagged by a quarter. While the coefficient of lead correlation (i.e., confidence leading the behavior of real sector) is smaller than the contemporaneous one on impact, both coefficients are same at the two-year horizon. The other macroeconomic indicators also exhibit the same trend. Similar results are found in correlations with consumer confidence. The lead correlation coefficients are larger than the lag coefficients and become larger than the contemporaneous coefficients after two years. For both business and consumer confidence, correlation coefficients get smaller as the number of leads increases, especially those on impact.

Comovement with financial cycles. The correlation between confidence measures and financial variables is also found to be strong but often smaller than those for macroeconomic indicators. As with the real sector variables, the contemporaneous correlations are relatively large on impact, ranging from 0.1 to 0.3 in business and consumer confidence (Table 6). The sizeable coefficients with an index of market volatility are consistent with the existing literature that document correlations between confidence and uncertainty (e.g., Baker, Bloom, and Davis, 2016). Partly because of the design of surveys, house prices are more correlated with consumer confidence than business confidence. While, as in the real-sector variables, the coefficients increase as the time-horizon lengthens, the lag-lead correlations show different results. The lag correlations of equity prices and financial market volatility are larger than the lead correlations, especially for business confidence. This result suggests that developments in the financial sector can have a bearing on business confidence.

The correlation results are robust to different specifications. The average correlation coefficients between confidence measures and output are found to be sizeable and statistically significant and, in most cases, the lead correlation is larger than the lag correlation (Table A11). We first re-estimate the VAR model by including a linear time trend as an exogenous variable. The resulting correlation coefficients are materially unchanged from those in the baseline specification, with the average contemporaneous coefficient of 0.65 after 1 year and the lead and lag coefficients of 0.63 and 0.54. Second, instead of the time trend, we include a dummy variable for the GFC. Then, we include both the linear trend and the GFC dummy at the same time. These two robustness tests also show strong correlations between confidence and output. Finally, we use output growth rates, not log levels, in the model. While, in consumer confidence, the lead correlation is still larger than the lag correlation in the full sample and advanced economies, the results with business confidence show the opposite.

The results of these two exercises—the leading nature of confidence for business cycles and, to a lesser extent, for financial cycles—are also consistent with recent theoretical studies that highlight how waves of optimism and pessimism, which characterize fluctuations in confidence, could drive the business cycle (e.g., Angeletos, Collard and Dellas, 2014). Such fluctuations in confidence can arise when agents make decisions in an environment of incomplete information. In the theoretical literature, there are two possible explanations for the leading nature of confidence. One explanation is that confidence reflects "news" about future fundamentals; and the other attributes it to the causal effects

of animal spirits. In the context of the United States, Barsky and Sims (2012) find evidence that confidence reflects (noisy) measures of changes in expected productivity growth.[17]

5. Forecasting ability of confidence

5.1. Methodology: A panel regression model

The leading nature of confidence implies that business and consumer confidence is a useful tool for forecasting and can even have causal effects on the economy. This section employs a panel regression framework to analyze whether confidence measures can help predict future movements in the main macroeconomic and financial variables. In particular, following Gilchrist and Zakrajšek (2012), we estimate the model:

$$\nabla^h v_{j,t+h} = \alpha + \sum_{i=1}^{p} \beta_i \nabla v_{j,t-i} + \gamma ci_{j,t} + \varepsilon_{j,t+h},$$

where v is a macroeconomic/financial variable, ci is a measure of confidence (business or consumer). The subscript j refers to country. The model regresses h-quarter-ahead growth of the respective indicator on current confidence after controlling for p lags of its own growth.[18] The parameter of interest is γ. If confidence is a "positive" leading indicator, the parameter is expected to be positive and statistically significant. For each forecast horizon $h \geq 0$, the annualized growth rate is defined as:

$$\nabla^h v_{j,t+h} \equiv \frac{400}{h+1} \ln\left(\frac{v_{j,t+h}}{v_{j,t-1}}\right).$$

The number of lags, p, included in the equation is determined by AIC, with eight quarters as the maximum lag length. Since this is a panel setting, we decide the lag length for each country based on the AIC and then use the longest lags for p. The panel regression model is estimated by OLS with country fixed-effects. In order to maximize the country coverage and balance the number of observations across countries, the sample period is 1990Q1-2017Q2. In addition to the full sample, we estimate the model separately for advanced economies and EMDEs. For instance, in the specification with full sample, 61 countries are included when business confidence and output are used.

The model is extended to examine the potentially different effects during different phases of business and financial cycles. By using the information on turning points constructed in the previous section, the equation can be written as:

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[17] There is now a new strand of research that explores how the dynamics of consumer and business sentiment unrelated to economic fundamentals can be an important transmission mechanism and source of business cycle fluctuations. From a theoretical standpoint, recent studies formalize the Keynesian insight that aggregate demand driven by changes in sentiments can generate business cycle fluctuations when agents make decisions under imperfect information (Barsky and Sims 2012; Angeletos and La'O 2013; Benhabib, Wang and Wen 2015).

[18] As with the VAR models in the previous section, we do not include additional controls in the model mainly because a set of controls is not consistently available for all the counties in our sample. Due to overlapping observations for the forecasting horizons, the error term could be serially correlated. We address this by using Newey and West (1987) standard errors that correct for heteroskedasticity and autocorrelation.

$$\nabla^h v_{j,t+h} = \alpha + \sum_{i=1}^{p} \beta_i \nabla v_{j,t-i} + \gamma^r \left(ci_{j,t} \cdot d_{j,t} \right) + \gamma^e \left[ci_{j,t} \cdot \left(1 - d_{j,t} \right) \right] + \chi d_{j,t} + \varepsilon_{j,t+h} \,,$$

where the superscripts *r* and *e* denote the recessionary and expansionary periods, respectively. The variable $d_{j,t}$ is a dummy taking a value of 1 if economy *j* in quarter *t* is in a recession (or financial downturn) and 0 if an economy is in an expansion (or financial upturn).

5.2. Results

Forecasting activity. The estimation results provide strong support to the forecasting ability of business and consumer confidence. Both confidence measures help predict growth of activity as the coefficient γ is found to be positive and statistically significant in most cases (Table 7).[19] A unit increase in business confidence is associated with an increase in one-quarter-ahead (i.e., $h = 1$) output growth by 1.5 percentage points. The magnitude of the coefficient decreases, as the forecast horizon increases, but it still has the positive sign and remains statistically significant. Even with other activity indicators (i.e., investment, private consumption and industrial production), the coefficient of interest remains positive and significant in most cases. Similar results are found when consumer confidence is used (e.g., Lahiri, Monokroussos and Zhao 2016).

The forecasting ability of confidence differs by the phase of the business cycle. In the case of output growth, while coefficients are both significant for recessions and expansions, the magnitude is larger during recessions than expansions. The two coefficients are also statistically different from each other in the case of business confidence. However, in the one-year (i.e., four-quarter) ahead forecast horizon, the coefficient for recessions becomes insignificant while that for expansions remains significant.

These findings are consistent with Ahmed and Cassou (2016) who show that consumer confidence shocks reflect "animal spirits" and "news" during expansions and recessions, respectively: the former often leads temporary changes while the latter tends to have long-lasting effects. It could also reflect that the recessionary phase is generally much shorter than expansions.[20] The coefficients for investment and industrial production remain significant and that for recessions are larger over the entire two-year forecast horizon, while the results for private consumption are somewhat similar to those for output.

Forecasting financial variables. The estimations for financial sector variables show that confidence measures help predict growth in house prices and credit, but forecasting performance over the financial cycle differs between house price and credit cycles. The coefficient of interest γ is positive and statistically significant for credit and house prices (Table 8).[21] Dividing the sample periods by the phases of the financial cycle, business and consumer confidence helps predict credit growth during upturns, while consumer confidence appears to forecast credit growth during downturns.

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[19] Indeed, the literature offers no consensus on the predictive ability of confidence measures. For instance, in the context of the Euro Area, Bengoechea, Camacho, and Perez-Quiros (2006) report that industrial (business) confidence is useful for predicting business cycle conditions. On the other hand, Claveria, Pons, and Ramos (2007) argue that the predictive ability of confidence is limited.

[20] Using the output data for all samples since 1990, the share of recessions is around 15 percent and the remaining 85 percent is identified as expansions.

[21] The results are similar, when splitting the samples into advanced economies and EMDEs (Tables A12 and A13).

6.   Global confidence cycles

6.1. Methodology: A dynamic factor model

We use a dynamic factor model to characterize the cross-country comovement of confidence. Exploiting the large country coverage of our dataset, we investigate the extent to which confidence comovement is global (i.e., common to all countries) or specific to country groups (e.g., advanced economy-specific and EMDE-specific). Specifically, we adapt the dynamic factor model framework used in Kose, Otrok, and Whiteman (2003) to characterize global confidence cycles, i.e., cross-country comovement of business and consumer confidence.

The dynamic factor model is suitable for our analysis for a variety of reasons. First, it is designed to extract a small number of unobservable common elements from a set of (observable) time series across countries. Thus, the model allows for a more parsimonious representation of the data in terms of the latent factors. Second, the parametric feature of the factor model allows us to simultaneously capture both global and group-specific comovement – a feature which is not available in a non-parametric framework like Principal Components Analysis. This is particularly important given that the sample we analyze includes a large number of advanced economies and EMDEs that can have group-specific drivers as often argued in the literature on global business cycles (e.g., Kose, Otrok, and Prasad 2012). Third, from a theoretical standpoint, dynamic factor models are appealing because they can be framed as reduced-form solutions to a standard Dynamic Stochastic General Equilibrium (DSGE) model.

We estimate a dynamic factor model that decomposes business and consumer confidence into three types of factors and an idiosyncratic term: (i) a global factor that captures the common elements in business and consumer confidence across all countries; (ii) group-specific factors that capture the common elements in business and consumer confidence in a country group (advanced economies and EMDEs);[22] (iii) country-specific factors that capture the common elements in business and consumer confidence in a country; and (iv) idiosyncratic terms that capture elements specific to business and consumer confidence series that cannot be explained by the other factors.

More formally, the dynamic factor model we estimate can be described as follows. Let $Y_t^{i,k}$ denote the observable variable i in country j of group k. There are two observable variables per country (business and consumer confidence) indexed by i, K (2) country groups indexed by k, and J (38) countries indexed by j. The dynamic factor model can be written as:

$$Y_t^{i,j,k} = \beta_{global}^{i,j,k} f_t^{global} + \beta_{group\,k}^{i,j,k} f_t^{group\,k} + \beta_{country\,j}^{i,j,k} f_t^{country\,j} + \varepsilon_t^{i,j,k}$$

$$f_t^m = \Phi^m(L)f_{t-l}^m + \mu_t^m \text{ for } m = 1, 2, \dots (1 + K + J)$$

$$\varepsilon_t^{i,j,k} = \Phi^{i,j,k}(L)\varepsilon_{t-l}^{i,j,k} + \nu_t^{i,j,k}$$

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[22] One can consider a more refined country grouping by looking at subgroups of countries within these broad groups. From the discussion in Section 3, it seems particularly important to divide EMDEs into commodity exporters and importers. We refrain from doing so mainly because of data limitations. The factor model estimation (unlike Section 3) requires a balanced panel, and the number of countries, especially EMDEs, in the balanced panel is not large enough to satisfactorily estimate multiple group factors.

where f_t^m denote the factors (1 global factor, K group-specific factors, and J country-specific factors) and $\varepsilon_t^{i,j,k}$ denote the residual idiosyncratic terms. The terms $\Phi^m(L)$ and $\Phi^{i,j,k}(L)$ are the lag polynomial operators which define the autoregressive process of the factors and the idiosyncratic terms respectively. In our implementation, we restrict them to be *AR(3)* for each factor and *AR(2)* for the idiosyncratic term.[23] The innovations to the factor and idiosyncratic terms, μ_t^m and $v_t^{i,j,k}$ respectively, are mutually orthogonal across all equations and are assumed to be normally distributed. The *β* parameters are called factor loadings and capture the sensitivity of each observable variable to the latent factors (denoted by f_t^m).

The dynamic factor model, as specified above which we label the "baseline model," characterizes the joint dynamics of business and consumer confidence. Thus, the factors—global, group-specific, and country-specific—capture dynamics that are common to both business and consumer confidence.[24] The joint modeling of business and consumer confidence allows us to distil the common drivers of the two while at the same time allowing us to differentiate between the two series with regard to cross-country synchronization. To the extent that business and consumer confidence reflects economy-wide phenomena, one would expect some common dynamics to emerge across the two confidence series. And, to the extent that business and consumer confidence contain information that are specific to each series, there can be differences between them. The joint modeling is a parsimonious framework to investigate these two aspects in a coherent manner.

As is standard in the literature, we measure the importance of each factor using a variance decomposition exercise. We decompose the volatility of business and consumer confidence into volatility components due to each of the estimated factors and the idiosyncratic term. This is achieved by applying the variance operator to each equation in the system. With orthogonal factors, the variance of the variable $Y_t^{i,j,k}$ is decomposed as follows:

$$Var(Y_t^{i,j,k}) = \left(\beta_{global}^{i,j,k}\right)^2 Var(f_t^{global}) + \left(\beta_{group\,k}^{i,j,k}\right)^2 Var(f_t^{group\,k})$$
$$+ \left(\beta_{country\,j}^{i,j,k}\right)^2 Var(f_t^{country\,j}) + Var(\varepsilon_t^{i,j,k})$$

Then, the fraction of variance attributable to the global factor is:

$$\frac{\left(\beta_{global}^{i,j,k}\right)^2 Var(f_t^{global})}{Var(Y_t^{i,j,k})}$$

The variance shares due to the group- and country-specific factors and the idiosyncratic terms are calculated in a similar manner.

How does the extent of synchronization of confidence compare with that of real activity? This is an important question in light of recent studies that highlight the role confidence in

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[23] The lag polynomials can in principle be of different order. Specifying the number of lags in the idiosyncratic term to be one less than that of the factor is without loss of generality.

[24] An alternative approach would be to estimate separate models for business confidence and consumer confidence. In this specification, the global and group-specific factors would capture commonalities across countries but specific to each series. Compared with the baseline model, this alternative model would not feature country-specific factors. We present the results from this model in Figure A3.

transmitting shocks across borders (Colombo 2013; Dees and Brinca 2013; Levchenko and Pandalai-Nayar 2017). A pattern of confidence synchronization that mirrors synchronization in activity would provide evidence for the relevance of the confidence channel in transmitting business cycles across borders. To explore these issues, we also estimate a dynamic factor model for output. The model decomposes output growth into global and group-specific factors, and the idiosyncratic terms. The variance decomposition exercise follows a similar procedure as before.

We estimate the dynamic factor model using Bayesian techniques as described in Kose, Otrok, and Whiteman (2003). The estimation routine requires observable variables to be stationary. For business and consumer confidence, we estimate the model using first differences; and for output we use quarter-to-quarter growth rates. Even though the levels of business and consumer confidence are stationary, we use first differences for two main reasons. First, the levels of confidence are highly persistent and this renders estimation of the group-specific and country-specific factors, while imposing stationarity conditions, difficult. Second, the persistence of the first differences of confidence is more in line with the persistence of quarter-to-quarter growth rates of output. This transformation, therefore, presents an easy reference point for comparing global confidence and business cycles. The factor models are estimated using a balanced panel covering 38 countries (26 advanced economies and 12 EMDEs) during the period 2002Q1-2015Q4 (Table 1).

6.2. Results

Evolution of factors. We first examine the estimated factors from the baseline model (Figure 6). The global factor declines sharply during the GFC, while it shows less volatility outside of this episode during the sample period considered here.[25] This is consistent with our earlier narrative that the GFC is a truly significant global event with a synchronous collapse in business and consumer confidence. The group-specific factors (for both advanced economies and EMDEs) also decline somewhat during the GFC, though not as pronounced as the global factor, indicating that factors specific to the country groups have a residual role in explaining the collapse in confidence during the crisis. The EMDEs-specific factor shows a gradual decline in recent years in tandem with the growth slowdown that began in 2010 (Didier et. al 2015).

Importance of factors. We next study the variance decompositions (Tables 9 and A14 for business confidence and Tables 10 and A15 for consumer confidence). The global factor, on average, explains a sizeable share of the variance of business and consumer confidence, about 47 and 25 percent respectively. Thus, the global factor plays a significant role in explaining the cross-country dynamics of business and consumer confidence implying that there exists a global confidence cycle. Group-specific factors, explain a non-trivial but small share of the variance of business and consumer confidence, about 7 and 6 percent respectively. Overall cross-country comovement in business and consumer confidence, which is captured by the sum of the variance shares explained by the global and group-specific factors (54 and 31 percent respectively), is sizeable. Note that the global and group-specific factors in the baseline model are common to business confidence and consumer confidence. Thus, our results would be consistent with the view that business and consumer

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[25] The dynamic factor model is estimated using demeaned first differences of confidence series. The estimated factors retain these data transformations.

confidence share common dynamics insofar as they reflect common economy-wide phenomena.[26]

Yet, our results also suggest that there are important differences between business and consumer confidence. Cross-country comovement of business confidence is much larger than consumer confidence. This is mainly attributed to the role of the global factor: compared with consumer confidence, the global factor explains almost twice the variance share of business confidence while the group-specific factors play similar roles. Put another way, country-specific factors and the idiosyncratic terms play relatively more important roles in explaining the dynamics of consumer confidence than business confidence. As in the correlation analysis, one possible explanation is that consumer confidence is noisier than business confidence due to measurement issues.

Across country groups, comovement of confidence is larger among advanced economies than EMDEs. Both the global and group-specific factors explain a larger share of the variance of confidence, both business and consumer, among advanced economies than EMDEs. For instance, the variance share of business confidence in advanced economies explained by the global factor is about 52 percent as opposed to just 36 percent in EMDEs. For the group-specific factors, it is 9 percent in advanced economies as opposed to a mere 3 percent in EMDEs. Even though there are subtle differences across business and consumer confidence, and across country groups, the main takeaway from these findings is that there is a global confidence cycle: the global factor explains a sizeable portion of the variance share of business and consumer confidence.

Since the estimates from the full sample (2002-15) include the global financial crisis of 2008-09, a natural question is whether we are picking up outlier effects due to the crisis. To address this, we estimate the baseline model over 5-year rolling samples. Figure 7 presents the variance share explained by the global and group-specific factors. While it is true that the global factor plays a more significant role during the global financial crisis, its role remains sizeable outside of the crisis period as well. For instance, the variance share of business confidence explained by the global factor during 2002-07 (pre-crisis) and 2010-15 (post-crisis) is about 30-35 percent. For consumer confidence, it is in the order of 10 percent. Thus, this corroborates our headline result on the relevance of the global confidence cycle, especially for business confidence.

Global confidence and business cycles. There is by now a rich literature that documents the global business cycle: comovement of fluctuations in real activity across countries. Given this, a natural question is: how does the global confidence cycle compare with the global business cycle? This is an important question if movements in confidence play an important role for business cycles and if confidence matters for the cross-border transmission of shocks. For this, we use the results from the factor model estimated on output to characterize the global business cycle. In particular, we compare the estimated factors and the variance decompositions from that model with the results we obtained from confidence.

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[26] Figures A4-A5 in the Supplementary Appendix present historical decomposition results for selected advanced economies, and emerging and developing economies. Consistent with the variance decompositions (which relate to unconditional second moments), historical decompositions (which relate to conditional first moments) also suggest that global and group-specific factors are important drivers of business and consumer confidence. The global factor is particularly important for business confidence during the global financial crisis of 2008-09.

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Figure 8 presents the global and group-specific factors for output. The global factor for output exhibits similar temporal patterns as the global factor for confidence (Figure 6). In particular, it falls sharply in the runup to and during the global financial crisis period. Over the entire sample period considered in this analysis (2002-2015), the global factors for output and confidence show sizeable correlation, about 0.4.[27] We also find similar dynamics in the group-specific factors: both the advanced economies- and EMDEs- specific factors decline somewhat during the global financial crisis, as in the case of confidence.

Figure 9 presents the variance decomposition results for output.[28] The global factor, on average, explains about 40 percent of the variance of output. Our results are therefore consistent with previous studies that document the existence of a global business cycle (e.g., Kose, Otrok, and Prasad 2012). Group-specific factors play a relatively minor but non-trivial role, and explain about 8 percent of the variance of output. Output comovement is larger among advanced economies than EMDEs.

While it is much more significant during the global financial crisis, output comovement remains significant outside of the crisis episode. Such patterns in output comovement – (i) a dominant role of the global factor; (ii) a small but non-trivial role of the group-specific factors; (iii) larger comovement in advanced economies then EMDEs; (iv) significant comovement even controlling for the global financial crisis – are similar with the patterns of comovement in confidence. Quantitatively, the variance share of output explained by the global factor, about 40 percent, is also in the range of the corresponding variance share of confidence explained by the global factor, about 30-50 percent. Thus, our results suggest strong commonalities in the cross-country dynamics of confidence and output, and therefore provide suggestive evidence regarding the relevance of movements in confidence for business cycles, in particular the cross-border transmission of shocks.

We consider additional exercises to check the robustness of our headline results. First, we estimate the factor model separately for business and consumer confidence using the alternative model (Figure A3). Second, we estimate the baseline model for a much longer time period (1994Q1-2015Q4) covering a group of six advanced economies – France, Germany, Italy, Japan, United Kingdom, and United States (Figure A6).[29] Our headline results remain robust to these specifications.

7. Conclusions

This paper analyzes the main cyclical features of consumer and business confidence using a comprehensive database over the 1960Q1-2017Q2 period. The database covers business confidence for 91 countries and consumer confidence for 95 countries, with almost half of the countries in each series comprising of emerging and developing economies. It is much richer in terms of country coverage than other well-known cross-country data sources of confidence. For example, the database we introduce is twice as large as that of OECD and almost three times as large as that of the EC. A novel feature of the database is that

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[27] Note that confidence enters the factor model in terms of first differences, and output in terms of quarter-to-quarter growth rates. Even though the persistence of confidence and output with these transformations are similar, they are not the same. The estimated factors retain these data transformations. Hence, any significant correlation between the estimated factors of confidence and output is despite these differences in persistence.
[28] Table A16 in the Supplementary Appendix presents variance decomposition results at the country level.
[29] These are the Group of Seven (G7) countries minus Canada. Confidence data for Canada starts only in 1999, and hence Canada is excluded from this exercise.

confidence measures are carefully standardized across countries so that they are suitable for cross-country analysis.

We first employ the database to study the main stylized facts about business and consumer confidence. We document that business and consumer confidence tend to lead turning points of business cycles, house price cycles, and credit cycles. Confidence tends to deteriorate before recessions and often stabilizes prior to the end of recessions.

We then present two empirical applications of the database. First, using a panel regression framework, we examine the potential of confidence series in forecasting movements in the main macroeconomic and financial aggregates. Both confidence measures help predict growth of activity, house prices and credit. Second, we examine the comovement of confidence across countries using a dynamic factor model. Our results suggest that business and consumer confidence exhibit sizeable comovement across countries: the global factor, on average, explains a sizeable share of the variance of business and consumer confidence, about 47 and 25 percent, respectively. This suggests that there indeed exists a global confidence cycle. Across country groups, comovement of confidence is larger among advanced economies than EMDEs.

There are several avenues for future work. While our analysis shows the leading nature of confidence, it does not explore whether that leading nature is indicative of "news" or "sentiments". Such a distinction can shed further light on the causal implications of confidence for business cycles. Research on the role of confidence for the transmission of fiscal and monetary policy has been limited to the advanced economies. One can use the confidence database to study such roles in the context of EMDEs.

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Table 1. Country coverage in the quarterly database

	BCI	CCI		BCI	CCI		BCI	CCI
Advanced economies			*EMDE commodity exporters*			*EMDE commodity importers*		
Australia	✓	✓	Albania	✓	✓	**Bulgaria**	✓	✓
Austria	✓	✓	Algeria		✓	Cabo Verde	✓	✓
Belgium	✓	✓	Angola	✓		**China**	✓	✓
Canada	✓	✓	Argentina		✓	Croatia	✓	✓
Cyprus	✓	✓	Armenia	✓	✓	Dominican Republic	✓	
Czech Republic	✓	✓	Bahrain		✓	Egypt, Arab Rep.		✓
Denmark	✓	✓	**Brazil**	✓	✓	El Salvador	✓	✓
Estonia	✓	✓	Chile	✓	✓	Georgia	✓	✓
Finland	✓	✓	**Colombia**	✓	✓	**Hungary**	✓	✓
France	✓	✓	Costa Rica	✓	✓	India	✓	✓
Germany	✓	✓	Ecuador	✓	✓	Jordan		✓
Greece	✓	✓	Guatemala	✓		Lebanon		✓
Hong Kong SAR, China	✓	✓	**Indonesia**	✓	✓	Macedonia, FYR	✓	✓
Iceland		✓	Kazakhstan	✓		Maldives	✓	
Ireland	✓	✓	Kenya	✓		Mauritius	✓	
Israel	✓	✓	Kuwait		✓	**Mexico**	✓	✓
Italy	✓	✓	Malaysia	✓	✓	Montenegro	✓	✓
Japan	✓	✓	Morocco		✓	New Caledonia	✓	
Korea, Rep.	✓	✓	Mozambique	✓		Pakistan		✓
Latvia	✓	✓	Nigeria	✓	✓	Philippines	✓	✓
Lithuania	✓	✓	Peru	✓	✓	**Poland**	✓	✓
Luxembourg	✓	✓	Qatar		✓	**Romania**	✓	✓
Macao SAR, China		✓	**Russian Federation**	✓	✓	Serbia	✓	✓
Malta	✓	✓	Saudi Arabia	✓	✓	Sri Lanka	✓	
Netherlands	✓	✓	Sierra Leone	✓		Syrian Arab Republic		✓
New Zealand	✓	✓	**South Africa**	✓	✓	**Thailand**	✓	✓
Norway	✓	✓	Uganda	✓		Tunisia	✓	✓
Portugal	✓	✓	Ukraine	✓	✓	Turkey	✓	✓
Singapore	✓		United Arab Emirates		✓	Vietnam	✓	
Slovak Republic	✓	✓	Uruguay		✓			
Slovenia	✓	✓	Venezuela, RB		✓			
Spain	✓	✓	West Bank & Gaza	✓				
Sweden	✓	✓						
Switzerland	✓	✓						
Taiwan, China	✓	✓						
United Kingdom	✓	✓						
United States	✓	✓						
Total	35	36		23	24		24	23

Note: BCI and CCI refer to business confidence index and consumer confidence index, respectively. Countries underlined are in the sample used in Sections 3 to 5 and those underlined in bold are used in Section 6 on dynamic factor model. There are 98 countries—37 advanced economies and 61 EMDEs (32 commodity exporters and 29 commodity importers)—where at least one confidence series is available.

Table 2. Summary of surveys

	Business confidence	**Consumer confidence**
Specific to survey respondents	Business conditions - Sales - Order books - Demand - Employment - Competitiveness	Household conditions - Consumption - Income - Savings
Overall economy	Assessment of overall economic situations - State of economy - Job market - Prices (Inflation)	
Time horizon	Current conditions: change from the past Future conditions: Expectations in the Future * Depending upon the frequency of surveys	

Note: This table provides a summary of information content available in confidence surveys. For details, see Table A5.

Table 3. Correlation with output

	Lag				t	Lead			
	t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4
Business confidence									
All countries (61)	0.33‡	0.42‡	0.49‡	0.49‡	0.41‡	0.22‡	0.01	-0.19‡	-0.34‡
Advanced economies (35)	0.36‡	0.46‡	0.52‡	0.52‡	0.43‡	0.24‡	0.00	-0.22‡	-0.39‡
EMDEs (26)	0.30‡	0.38‡	0.44‡	0.46‡	0.39‡	0.20‡	0.02	-0.16‡	-0.29‡
Consumer confidence									
All countries (62)	0.37‡	0.42‡	0.45‡	0.44‡	0.36‡	0.23‡	0.07‡	-0.07‡	-0.18‡
Advanced economies (36)	0.42‡	0.49‡	0.51‡	0.48‡	0.38‡	0.22‡	0.04	-0.12‡	-0.23‡
EMDEs (26)	0.29‡	0.33‡	0.36‡	0.37‡	0.34‡	0.24‡	0.11†	0.00	-0.12†

Note: Average cross-country correlation between confidence and (HP-detrended) output is presented. The number of economies in parentheses. *, †, and ‡ denote that the average coefficient is statistically different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively. In lag and lead correlations, the corresponding lags and leads are for confidence measures.

Table 4. Correlation and persistence

A. Correlation between business and consumer confidence

	Lag			Lead	
	t-2	t-1	t	t+1	t+2
All countries (61)	0.39	0.50	0.55	0.49	0.40
Advanced economies (34)	0.41	0.53	0.60	0.54	0.43
EMDEs (27)	0.38	0.45	0.48	0.43	0.35

B. Persistence of confidence

	AR(1)	AR(2)	AR(3)	AR(4)	AR(5)
Business confidence					
All countries (65)	0.84	0.63	0.41	0.22	0.09
Advanced economies (35)	0.84	0.61	0.35	0.13	-0.02
EMDEs (30)	0.84	0.65	0.48	0.33	0.22
Consumer confidence					
All countries (67)	0.85	0.69	0.54	0.41	0.30
Advanced economies (36)	0.88	0.71	0.56	0.41	0.28
EMDEs (31)	0.82	0.66	0.52	0.40	0.31

Note: Average cross-country correlation is presented. The number of countries in parentheses. All coefficients are statistically significant at the 1 percent level, except for the one for AR(5) for advanced economies in business confidence (-0.02), which is insignificant at least at 10 percent level. Panel A shows average cross-country correlation between business and consumer confidence. In lag and lead correlations, the corresponding lags and leads are for business confidence. Panel B shows autoregressive (AR) correlation of confidence. The number in parentheses after AR refers to the number of lag used. For instance, AR(1) refers to the correlation coefficient between the series and its first lag, and AR(2) is the correlation between the series and its second lag.

Table 5. Correlation with macroeconomic variables, all countries

	Business confidence				Consumer confidence			
	Output	Investment	Consumption	Industrial production	Output	Investment	Consumption	Industrial production
Contemporaneous								
On impact	0.37‡	0.23‡	0.25‡	0.40‡	0.25‡	0.15‡	0.27‡	0.23‡
1 year	0.66‡	0.48‡	0.51‡	0.64‡	0.52‡	0.40‡	0.53‡	0.42‡
2 years	0.73‡	0.57‡	0.59‡	0.67‡	0.61‡	0.52‡	0.63‡	0.48‡
Lead 1								
On impact	0.26‡	0.19‡	0.20‡	0.29‡	0.21‡	0.21‡	0.23‡	0.16‡
1 year	0.63‡	0.49‡	0.50‡	0.63‡	0.55‡	0.48‡	0.56‡	0.45‡
2 years	0.73‡	0.61‡	0.63‡	0.68‡	0.65‡	0.59‡	0.68‡	0.53‡
Lead 2								
On impact	0.09‡	0.11‡	0.09‡	0.09‡	0.17‡	0.15‡	0.14‡	0.09‡
1 year	0.48‡	0.41‡	0.40‡	0.48‡	0.50‡	0.47‡	0.49‡	0.37‡
2 years	0.70‡	0.59‡	0.61‡	0.63‡	0.66‡	0.62‡	0.68‡	0.49‡
Lead 3								
On impact	0.03	0.08‡	0.06‡	0.01	0.12‡	0.13‡	0.12‡	0.08‡
1 year	0.25‡	0.29‡	0.27‡	0.25‡	0.39‡	0.40‡	0.39‡	0.27‡
2 years	0.62‡	0.54‡	0.55‡	0.56‡	0.62‡	0.60‡	0.64‡	0.45‡
Lag 1								
On impact	0.17‡	0.13‡	0.15‡	0.11‡	0.10‡	0.06‡	0.10‡	0.10‡
1 year	0.55‡	0.36‡	0.44‡	0.50‡	0.39‡	0.28‡	0.40‡	0.28‡
2 years	0.65‡	0.49‡	0.55‡	0.60‡	0.53‡	0.44‡	0.55‡	0.38‡
Lag 2								
On impact	0.08‡	0.01	0.07‡	0.03	0.03†	0.05‡	0.05‡	-0.01
1 year	0.37‡	0.20‡	0.29‡	0.26‡	0.20‡	0.14‡	0.23‡	0.11‡
2 years	0.54‡	0.39‡	0.44‡	0.47‡	0.40‡	0.33‡	0.43‡	0.26‡
Lag 3								
On impact	0.03	0.01	0.03	-0.06‡	0.01	-0.04†	0.00	-0.06‡
1 year	0.17‡	0.08†	0.13‡	0.03	0.05	0.01	0.07†	-0.05
2 years	0.42‡	0.31‡	0.30‡	0.34‡	0.27‡	0.20‡	0.30‡	0.13‡

Note: Average cross-country correlation coefficients between confidence and macroeconomic variables at different horizons as estimated with a VAR model. Lead and lag refer to correlations where macroeconomic variables lead and lag confidence measures by the denoted quarters. For business confidence, the number of countries included is 58, 55, 55, and 55 in output, investment, consumption, and industrial production, respectively. For consumer confidence, 56, 52, 53, and 52 countries are included in output, investment, consumption, and industrial production, respectively. † and ‡ denote that the average coefficient is statistically significantly different from zero at the 5 percent and 1 percent levels, respectively.

Table 6. Correlation with financial variables, all countries

	Business confidence				Consumer confidence			
	Credit	Equity prices	House prices	Financial volatility	Credit	Equity prices	House prices	Financial volatility
Contemporaneous								
On impact	0.06‡	0.29‡	0.14‡	-0.26‡	0.09‡	0.31‡	0.22‡	-0.22‡
1 year	0.20‡	0.48‡	0.33‡	-0.33‡	0.18‡	0.49‡	0.41‡	-0.29‡
2 years	0.31‡	0.53‡	0.42‡	-0.30‡	0.28‡	0.56‡	0.48‡	-0.26‡
Lead 1								
On impact	0.11‡	-0.01	0.10‡	-0.02	0.09‡	0.05†	0.17‡	0.01
1 year	0.25‡	0.27‡	0.26‡	-0.16‡	0.24‡	0.37‡	0.38‡	-0.18‡
2 years	0.36‡	0.44‡	0.37‡	-0.19‡	0.33‡	0.52‡	0.48‡	-0.21‡
Lead 2								
On impact	0.09‡	-0.07‡	0.02	0.03*	0.09‡	0.01	0.06‡	-0.02
1 year	0.26‡	0.05	0.17‡	0.04	0.27‡	0.23‡	0.30‡	-0.06*
2 years	0.37‡	0.34‡	0.33‡	-0.06	0.37‡	0.44‡	0.46‡	-0.11‡
Lead 3								
On impact	0.08‡	-0.06‡	0.01	0.12‡	0.08‡	0.04†	0.01	0.01
1 year	0.23‡	-0.07†	0.05*	0.18‡	0.26‡	0.13‡	0.18‡	0.05*
2 years	0.36‡	0.21‡	0.27‡	0.05	0.38‡	0.37‡	0.41‡	-0.01
Lag 1								
On impact	0.03*	0.27‡	0.11‡	-0.15‡	0.00	0.21‡	0.09‡	-0.13‡
1 year	0.15‡	0.51‡	0.32‡	-0.32‡	0.13‡	0.45‡	0.31‡	-0.28‡
2 years	0.26‡	0.53‡	0.39‡	-0.34‡	0.24‡	0.53‡	0.40‡	-0.28‡
Lag 2								
On impact	0.03*	0.08‡	0.10‡	0.02	0.02	0.05‡	0.05†	0.02
1 year	0.11‡	0.41‡	0.27‡	-0.26‡	0.08†	0.31‡	0.20‡	-0.19‡
2 years	0.20‡	0.48‡	0.34‡	-0.35‡	0.18‡	0.45‡	0.32‡	-0.24‡
Lag 3								
On impact	0.03	0.09‡	0.05‡	-0.04‡	0.04†	0.02	0.01	-0.02
1 year	0.07‡	0.27‡	0.16‡	-0.23‡	0.07†	0.15‡	0.09†	-0.12‡
2 years	0.13‡	0.40‡	0.23‡	-0.36‡	0.14‡	0.35‡	0.21‡	-0.19‡

Note: Average cross-country correlation coefficients between confidence and financial variables at different horizons as estimated with a VAR model. Lead and lag refer to correlations where financial variables lead and lag by the denoted quarters. For business confidence, the number of countries included is 62, 56, 50, and 63 in credit, equity prices, house prices, and financial volatility, respectively. For consumer confidence, 58, 54, 51, and 61 countries are included in credit, equity prices, house prices, and financial volatility, respectively. *, †, and ‡ denote that the average coefficient is statistically significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 7. Forecasting ability of confidence: macroeconomic variables, all countries

	Business confidence				Consumer confidence			
Forecast horizon:	1 quarter		4 quarters		1 quarter		4 quarters	
Output								
Confidence	1.502‡		0.673‡		1.222‡		0.762‡	
	[0.130]		[0.089]		[0.139]		[0.107]	
× recessions (γ^r)		1.251‡		0.072		0.779†		0.253
		[0.239]		[0.174]		[0.375]		[0.298]
× expansions (γ^e)		0.807‡		0.348‡		0.593‡		0.412‡
		[0.102]		[0.087]		[0.108]		[0.096]
Adjusted R^2	0.28	0.43	0.29	0.35	0.27	0.40	0.27	0.31
$\gamma^r = \gamma^e$ (p-value)		0.06		0.12		0.59		0.57
Investment								
Confidence	0.122‡		0.071‡		0.115‡		0.074‡	
	[0.010]		[0.006]		[0.010]		[0.007]	
× recessions (γ^r)		0.093‡		0.052‡		0.095‡		0.064‡
		[0.013]		[0.009]		[0.014]		[0.010]
× expansions (γ^e)		0.058‡		0.039‡		0.048‡		0.038‡
		[0.008]		[0.006]		[0.009]		[0.007]
Adjusted R^2	0.15	0.33	0.14	0.26	0.13	0.31	0.14	0.26
$\gamma^r = \gamma^e$ (p-value)		0.01		0.17		0.00		0.01
Consumption								
Confidence	0.035‡		0.020‡		0.035‡		0.025‡	
	[0.004]		[0.003]		[0.003]		[0.003]	
× recessions (γ^r)		0.036‡		0.010*		0.036‡		0.019‡
		[0.008]		[0.005]		[0.006]		[0.005]
× expansions (γ^e)		0.020‡		0.016‡		0.019‡		0.016‡
		[0.003]		[0.002]		[0.003]		[0.002]
Adjusted R^2	0.18	0.31	0.21	0.28	0.24	0.36	0.24	0.31
$\gamma^r = \gamma^e$ (p-value)		0.06		0.29		0.01		0.66
Industrial production								
Confidence	0.095‡		0.032‡		0.061‡		0.033‡	
	[0.008]		[0.005]		[0.007]		[0.005]	
× recessions (γ^r)		0.099‡		0.025‡		0.086‡		0.046‡
		[0.010]		[0.006]		[0.011]		[0.007]
× expansions (γ^e)		0.039‡		0.010†		0.016‡		0.010†
		[0.006]		[0.005]		[0.006]		[0.005]
Adjusted R^2	0.20	0.37	0.19	0.26	0.14	0.34	0.21	0.28
$\gamma^r = \gamma^e$ (p-value)		0.00		0.02		0.00		0.00

Note: The dependent variable is growth rate of respective macroeconomic variables at different horizons. The Newey-West standard errors are presented in brackets below the corresponding coefficients. For business confidence, the number of countries is 61 (output: N=4,946), 59 (investment: N=4,789), 59 (consumption: N=4,790), and 57 (industrial production: N=4,332). For consumer confidence, the number of countries is 62 (output: N=4,703), 59 (investment: N=4,466), 59 (consumption: N=4,467), and 58 (industrial production: N=4,040). *, †, and ‡ denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The p-values of testing the equality of coefficients for recessions and expansions are also provided, while the null hypothesis is that the two coefficients are equal.

Table 8. Forecasting ability of confidence: financial variables, all countries

	Business confidence				Consumer confidence			
Forecast horizon:	1 quarter		4 quarters		1 quarter		4 quarters	
Credit								
Confidence	0.087‡ [0.021]		0.072‡ [0.011]		0.099‡ [0.031]		0.072‡ [0.015]	
× downturns (γ^r)		0.026 [0.020]		0.008 [0.012]		0.057* [0.032]		0.023* [0.012]
× upturns (γ^e)		0.077‡ [0.017]		0.070‡ [0.010]		0.067‡ [0.018]		0.057‡ [0.011]
Adjusted R^2	0.08	0.20	0.17	0.31	0.12	0.23	0.23	0.35
$\gamma^r = \gamma^e$ (p-value)		0.05		0.00		0.70		0.04
Equity prices								
Confidence	0.042 [0.032]		-0.067† [0.029]		0.052† [0.025]		-0.064‡ [0.023]	
× downturns (γ^r)		0.051 [0.037]		-0.118‡ [0.031]		0.121‡ [0.036]		-0.080‡ [0.028]
× upturns (γ^e)		-0.012 [0.027]		-0.038 [0.027]		-0.014 [0.024]		-0.047† [0.023]
Adjusted R^2	0.16	0.42	0.10	0.32	0.14	0.41	0.09	0.30
$\gamma^r = \gamma^e$ (p-value)		0.11		0.01		0.00		0.34
House prices								
Confidence	0.043‡ [0.009]		0.022‡ [0.008]		0.073‡ [0.011]		0.052‡ [0.010]	
× downturns (γ^r)		0.038‡ [0.012]		0.001 [0.010]		0.062‡ [0.012]		0.023* [0.012]
× upturns (γ^e)		0.011 [0.007]		0.010 [0.007]		0.029‡ [0.008]		0.032‡ [0.009]
Adjusted R^2	0.30	0.42	0.27	0.40	0.34	0.44	0.30	0.39
$\gamma^r = \gamma^e$ (p-value)		0.05		0.45		0.00		0.55

Note: The dependent variable is growth rate of respective financial variables at different horizons. The Newey-West standard errors are presented in brackets below the corresponding coefficients. For business confidence, the number of countries is 64 (credit: N=5,228), 58 (equity prices: N=4,750), and 57 (house prices: N=3,964). For consumer confidence, the number of countries is 65 (credit: N=4,815), 59 (equity prices: N=4,461), and 57 (house prices: N=3,838). *, †, and ‡ denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The p-values of testing the equality of coefficients for downturns and upturns are also provided, while the null hypothesis is that the two coefficients are equal.

Table 9. Variance decompositions: business confidence

	Global	Group	Global+Group	Country	Idiosyncratic
Australia	34.0	7.3	41.3	10.7	47.7
Austria	64.8	19.4	84.2	5.5	10.1
Belgium	65.8	11.3	77.1	2.8	19.6
Canada	20.7	1.0	21.7	6.6	71.4
Cyprus	31.9	3.4	35.3	10.7	53.4
Czech Republic	57.1	9.9	67.1	1.6	30.4
Denmark	44.8	5.8	50.6	8.7	40.2
Finland	61.7	8.3	70.0	2.0	27.1
France	72.3	12.4	84.7	1.9	12.6
Germany	74.7	16.5	91.2	1.8	6.8
Greece	35.2	2.4	37.6	9.4	52.6
Italy	67.9	14.9	82.7	4.6	12.4
Japan	30.1	25.6	55.7	6.2	37.2
Korea	40.0	1.3	41.3	3.6	53.6
Luxembourg	33.3	7.9	41.2	7.6	50.8
Netherland	67.2	17.7	84.9	6.0	9.1
New Zealand	21.2	13.7	34.9	31.3	33.0
Norway	67.8	0.5	68.3	0.2	30.0
Portugal	70.5	2.7	73.2	12.6	13.9
Slovak Republic	47.1	0.3	47.4	4.5	47.3
Slovenia	74.1	10.5	84.6	9.4	6.1
Spain	68.6	4.4	73.0	6.5	20.3
Sweden	47.2	8.8	55.9	21.2	22.8
Switzerland	53.3	8.2	61.5	14.3	24.0
United Kingdom	53.3	8.2	61.5	14.3	24.0
United States	56.8	0.3	57.1	6.2	35.8
Advanced economies					
Average	**52.4**	**8.6**	**60.9**	**8.1**	**30.5**
Median	**55.1**	**8.2**	**61.5**	**6.4**	**28.6**
Brazil	47.9	1.3	49.2	12.0	38.4
Bulgaria	14.5	3.3	17.8	7.1	72.7
China	18.4	4.2	22.6	13.4	61.2
Colombia	35.2	0.4	35.6	22.4	41.7
Hungary	67.8	3.7	71.5	4.8	22.9
Indonesia	27.5	1.3	28.8	5.0	64.3
Mexico	51.9	0.9	52.7	19.4	27.4
Poland	51.2	7.6	58.8	15.1	24.6
Romania	24.7	6.6	31.4	16.3	50.7
Russia	55.9	1.2	57.1	7.5	35.1
South Africa	15.8	4.9	20.7	12.6	65.6
Thailand	26.7	1.4	28.1	22.1	48.4
EMDEs					
Average	**36.5**	**3.1**	**39.5**	**13.1**	**46.1**
Median	**31.4**	**2.4**	**33.5**	**13.0**	**45.1**
All countries					
Average	*47.3*	*6.8*	*54.2*	*9.7*	*35.4*
Median	*49.6*	*5.4*	*55.8*	*7.6*	*34.1*

Note: Median variance share (percent) of business confidence explained by the global, group, and country factors, and the idiosyncratic term for each country. These are from the baseline factor model jointly estimated on business and consumer confidence during 2002-15 (full sample). 26 advanced economies and 12 EMDEs are included. For confidence bands, see Table A14.

Table 10. Variance decompositions: consumer confidence

	Global	Group	Global+Group	Country	Idiosyncratic
Australia	12.6	12.5	25.1	6.9	66.5
Austria	57.7	0.5	58.2	4.0	36.7
Belgium	44.4	3.7	48.1	14.3	36.9
Canada	48.4	6.9	55.3	3.5	39.1
Cyprus	11.7	0.3	12.0	34.2	53.4
Czech Republic	31.0	1.1	32.1	11.3	55.6
Denmark	33.9	15.6	49.4	16.3	33.9
Finland	57.8	1.9	59.7	3.4	35.1
France	40.9	2.7	43.5	5.7	49.4
Germany	42.7	2.9	45.5	26.0	27.8
Greece	9.3	13.8	23.1	21.0	55.7
Italy	10.9	10.2	21.1	54.3	23.4
Japan	19.7	9.3	29.0	11.1	58.9
Korea	25.1	22.1	47.2	6.2	44.7
Luxembourg	46.2	0.9	47.2	11.4	40.5
Netherland	46.8	0.5	47.3	8.0	44.2
New Zealand	2.6	14.0	16.6	49.4	33.3
Norway	38.0	3.5	41.5	0.6	55.4
Portugal	23.9	7.2	31.1	10.8	57.6
Slovak Republic	32.2	0.7	32.9	15.0	51.4
Slovenia	22.4	0.4	22.8	25.0	52.1
Spain	29.1	19.5	48.6	13.8	37.0
Sweden	45.8	2.9	48.7	12.2	38.0
Switzerland	26.7	16.6	43.4	29.8	25.3
United Kingdom	26.7	16.6	43.4	29.8	25.3
United States	15.9	10.7	26.6	5.5	65.2
Advanced economies					
Average	**30.9**	**7.6**	**38.4**	**16.5**	**43.9**
Median	**30.1**	**5.3**	**43.4**	**11.8**	**42.4**
Brazil	3.4	0.8	4.3	16.4	78.3
Bulgaria	0.3	3.3	3.7	31.1	62.3
China	11.7	1.1	12.8	15.6	70.7
Colombia	10.8	2.3	13.1	40.9	45.5
Hungary	19.3	1.0	20.4	7.6	71.1
Indonesia	0.1	4.2	4.3	6.5	86.8
Mexico	11.5	0.7	12.2	23.7	63.2
Poland	28.7	1.5	30.2	18.9	50.6
Romania	11.1	1.3	12.4	37.1	49.0
Russia	31.6	4.8	36.4	7.9	54.5
South Africa	5.4	0.7	6.2	21.5	71.3
Thailand	3.3	0.9	4.2	32.8	62.5
EMDEs					
Average	**11.4**	**1.9**	**13.4**	**21.7**	**63.8**
Median	**11.0**	**1.2**	**12.3**	**20.2**	**62.9**
All countries					
Average	*24.7*	*5.8*	*30.5*	*18.1*	*50.2*
Median	*24.5*	*2.9*	*30.7*	*14.7*	*51.0*

Note: Median variance share (percent) of consumer confidence explained by the global, group, and country factors, and the idiosyncratic term for each country. These are from the baseline factor model jointly estimated on business and consumer confidence during 2002-15 (full sample). 26 advanced economies and 12 EMDEs are included. For confidence bands, see Table A15.

Figure 1. Evolution of business confidence in select countries

A. Japan

B. United States

C. China

D. Russian Federation
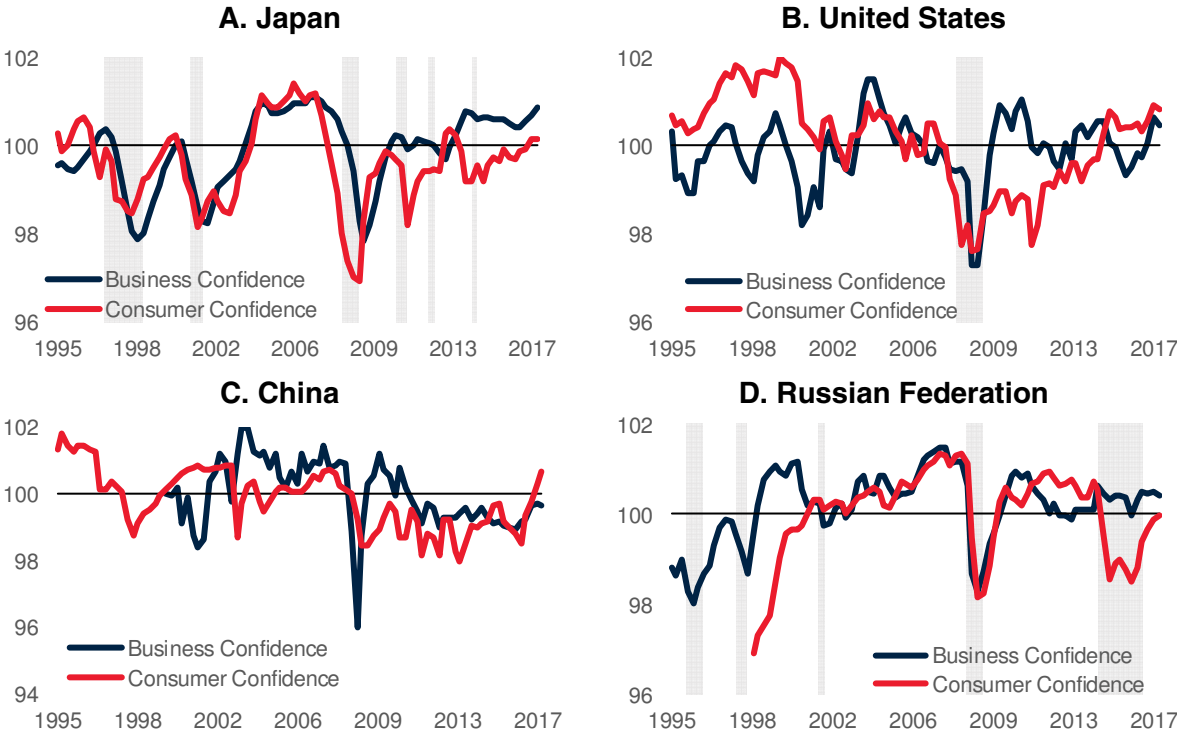
Note: Vertical shades refer to recessions in each country, as identified by the algorithm in Harding and Pagan (2002).

Figure 2. Evolution of global business and consumer confidence
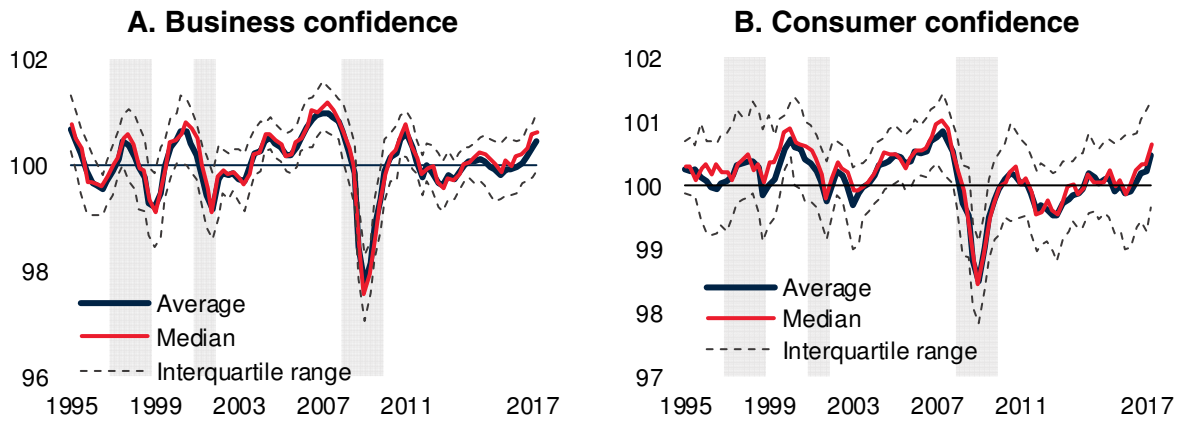
A. Business confidence

B. Consumer confidence

Note: The solid lines refer to the simple average (in blue) and median (in red) confidence across economies. The dashed lines are for the interquartile range. Recessionary or crisis episodes are shaded: the Asian crisis of 1997-98, collapse of the dot-com bubble in advanced economies in 2001, and the global financial crisis of 2008 and the subsequent global recession in 2009. The number of countries changes over time but at most 65 countries and 67 countries are included in business confidence (Panel A) and consumer confidence (Panel B), respectively. Last observation is 2017Q2.

Figure 3. Evolution of confidence, by group

Advanced economies
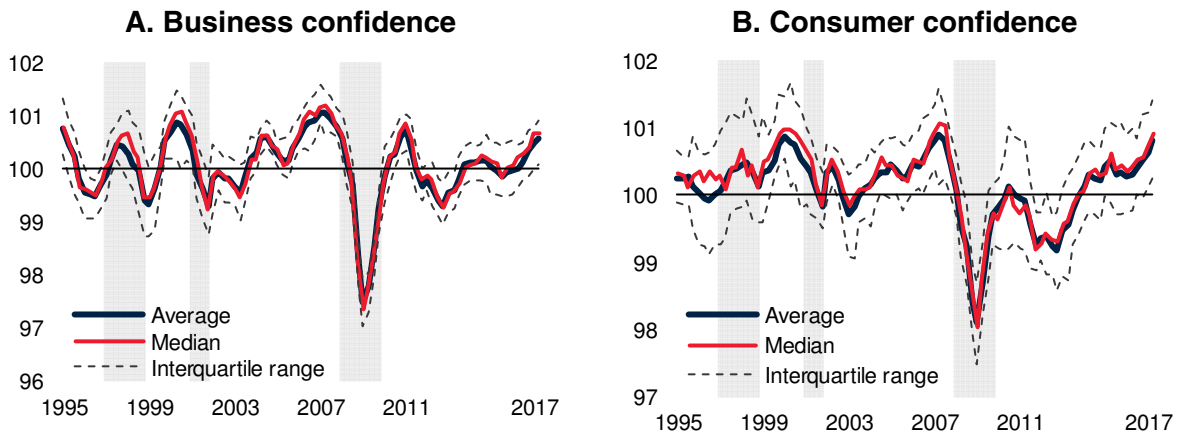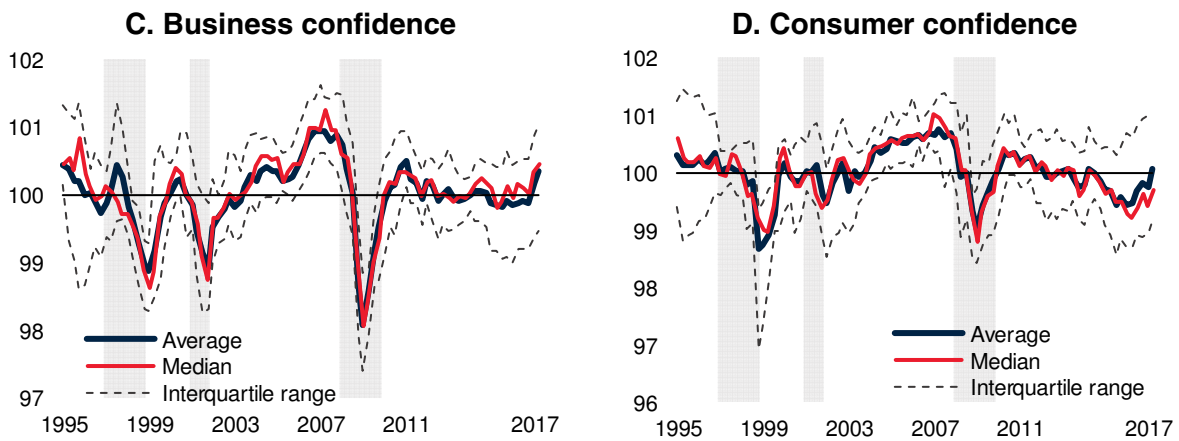
A. Business confidence

B. Consumer confidence

EMDEs

C. Business confidence

D. Consumer confidence

Note: The solid lines refer to the simple average (in blue) and median (in red) confidence across economies. The dashed lines are for the interquartile range. Recessionary or crisis episodes are shaded: the Asian crisis of 1997-98, collapse of the dot-com bubble in advanced economies in 2001, and the global financial crisis of 2008 and the subsequent global recession in 2009. The number of countries changes over time. For advanced economies, the sample includes 35 countries for business confidence (Panel A) and 36 countries for consumer confidence (Panel B). For EMDEs, 30 countries are included in business confidence (Panel C) and 31 countries are included in consumer confidence (Panel D). Last observation is 2017Q2.

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Figure 4. Evolution of confidence, by commodity-exporter status
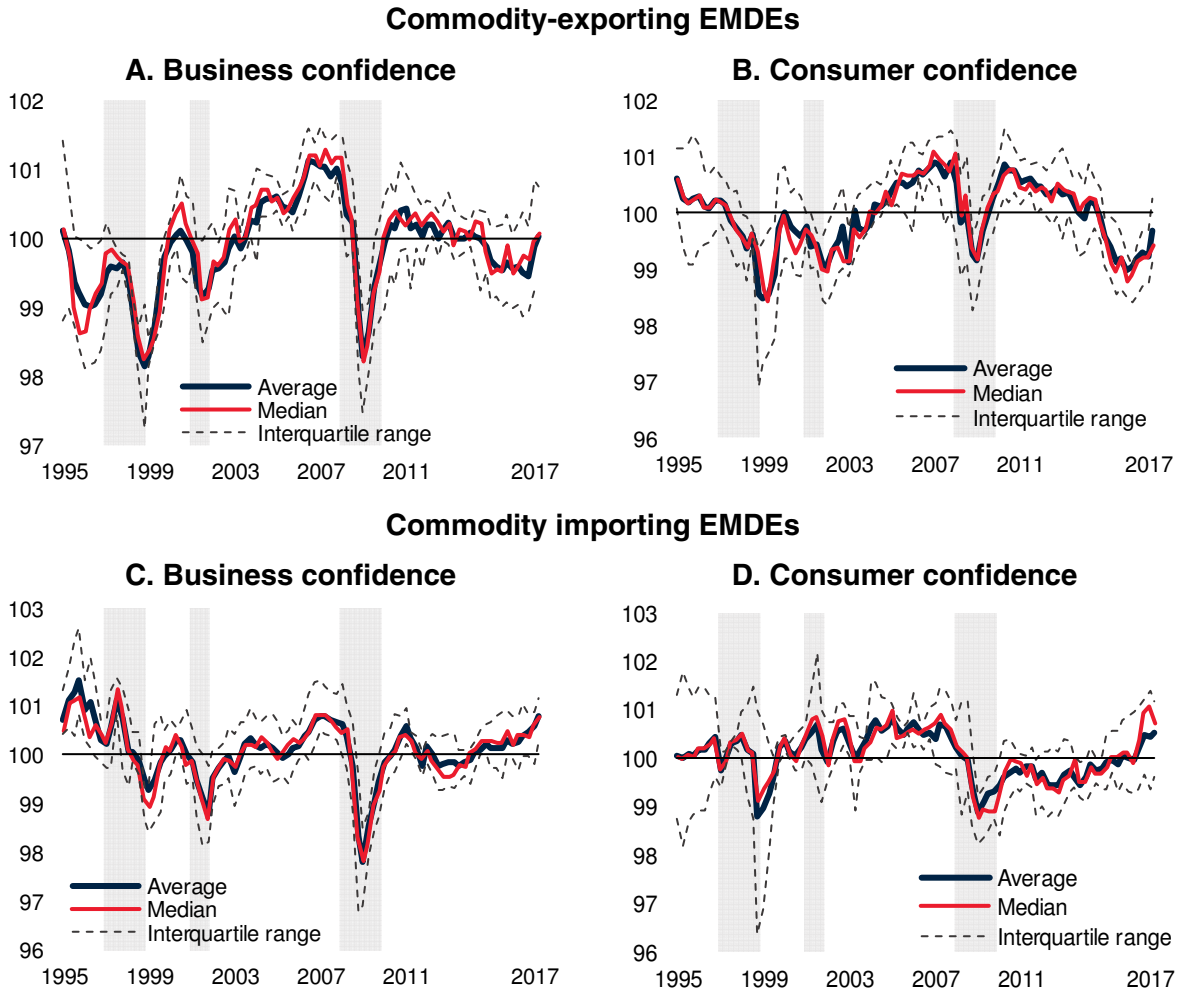
Commodity-exporting EMDEs

A. Business confidence

B. Consumer confidence

Commodity importing EMDEs

C. Business confidence

D. Consumer confidence

Note: The solid lines refer to the simple average (in blue) and median (in red) confidence across economies. The dashed lines are for the interquartile range. Recessionary or crisis episodes are shaded: the Asian crisis of 1997-98, collapse of the dot-com bubble in advanced economies in 2001, and the global financial crisis of 2008 and the subsequent global recession in 2009. The number of countries changes over time. 17 commodity-exporting EMDEs are included in business and consumer confidence (Panels A and B), while the number of commodity-importing EMDEs in business confidence (Panel C) and consumer confidence (Panel D) is 13 and 14, respectively. Last observation is 2017Q2.

Figure 5.A. Confidence over business cycles based on output, all countries

Evolution around peaks (index; t = 100)

A. Business confidence

B. Consumer confidence

Evolution around troughs (index; t = 100)

C. Business confidence

D. Consumer confidence
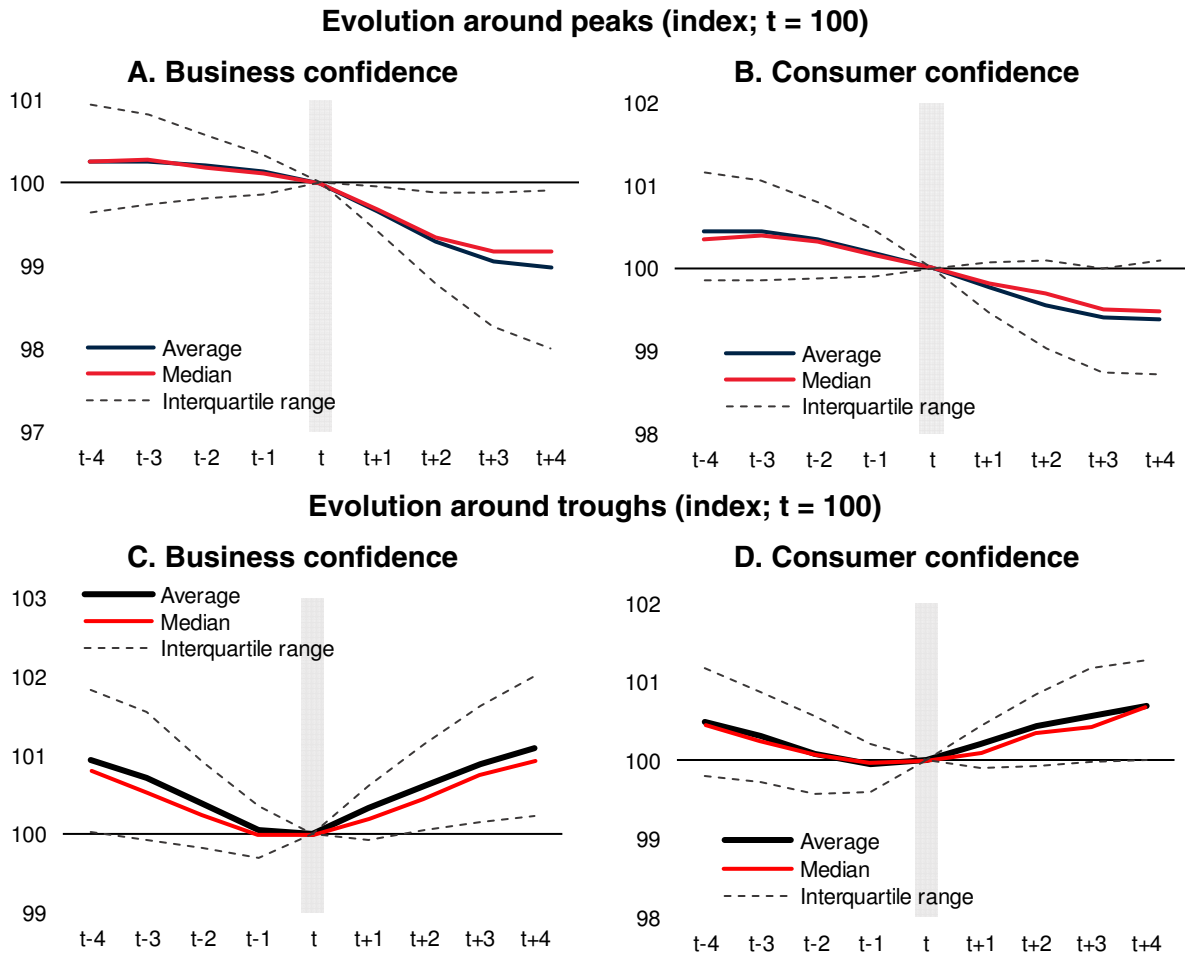
Note: Evolution of business and consumer confidence around at business cycle peaks (Panels A and B) and troughs (Panels C and D), which are denoted as *t*. The peaks and troughs are determined by the algorithm in Harding and Pagan (2002) and are based on output. All confidence series are rescaled to 100 at time *t*. The horizontal axis refers to the time period before and after the event in quarters. Panel A is based on 50 countries (195 episodes), Panel B is based on 49 countries (179 episodes), Panel C is based on 51 countries (200 episodes), and Panel D is based on 51 countries (187 episodes). The analysis is based on an unbalanced panel with a maximum time series coverage of 1960Q1-2017Q2.

Figure 5.B. Confidence over financial cycles based on credit, all countries

Evolution around peaks (index; t = 100)
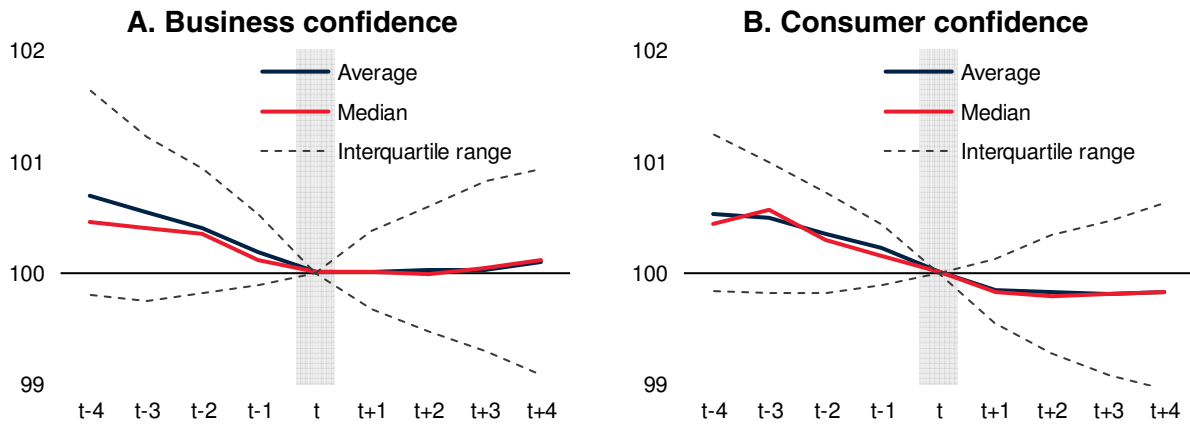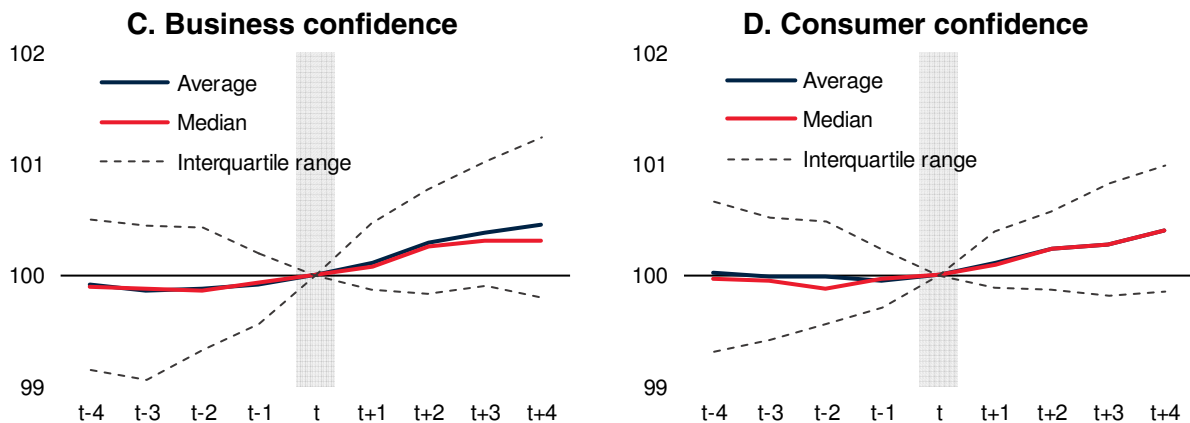
A. Business confidence

Average
Median
Interquartile range

B. Consumer confidence

Average
Median
Interquartile range

Evolution around troughs (index; t = 100)

C. Business confidence

Average
Median
Interquartile range

D. Consumer confidence

Average
Median
Interquartile range

Note: Evolution of business and consumer confidence around at financial cycle peaks (Panels A and B) and troughs (Panels C and D), which are denoted as *t*. The peaks and troughs are determined by the algorithm in Harding and Pagan (2002) and are based on credit. All confidence series are rescaled to 100 at time *t*. The horizontal axis refers to the time period before and after the event in quarters. In Panels A, B, C, and D, 51 countries (130 episodes), 50 countries (113 episodes), 53 countries (130 episodes), and 51 countries (108 episodes) are used, respectively. The analysis is based on an unbalanced panel with a maximum time series coverage of 1960Q1-2017Q2.

Figure 6. Estimated factors: business and consumer confidence

A. Global

B. Advanced economies
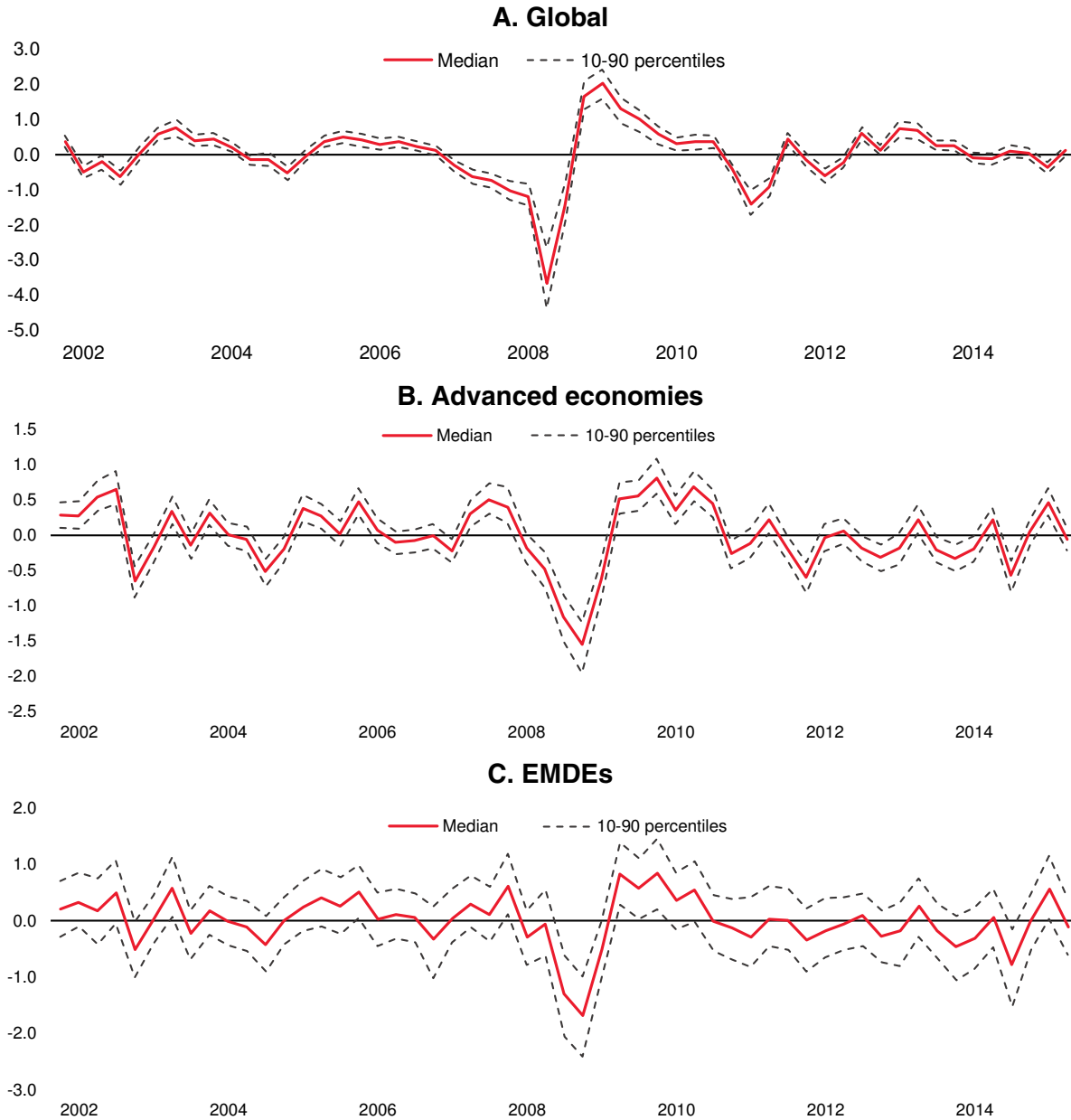
C. EMDEs

Note: The global and group-specific (advanced economies and EMDEs) factors for business and consumer confidence estimated using the dynamic factor model. The model is estimated using first differences of business and consumer confidence. Group-specific factors are orthoganalized with respect to the global factor. Solid line is the median estimate and the dashed lines represent the 10-90 percentile confidence band.

Figure 7 Variance share explained by global and group factors: rolling estimates

A. Business confidence

B. Consumer confidence
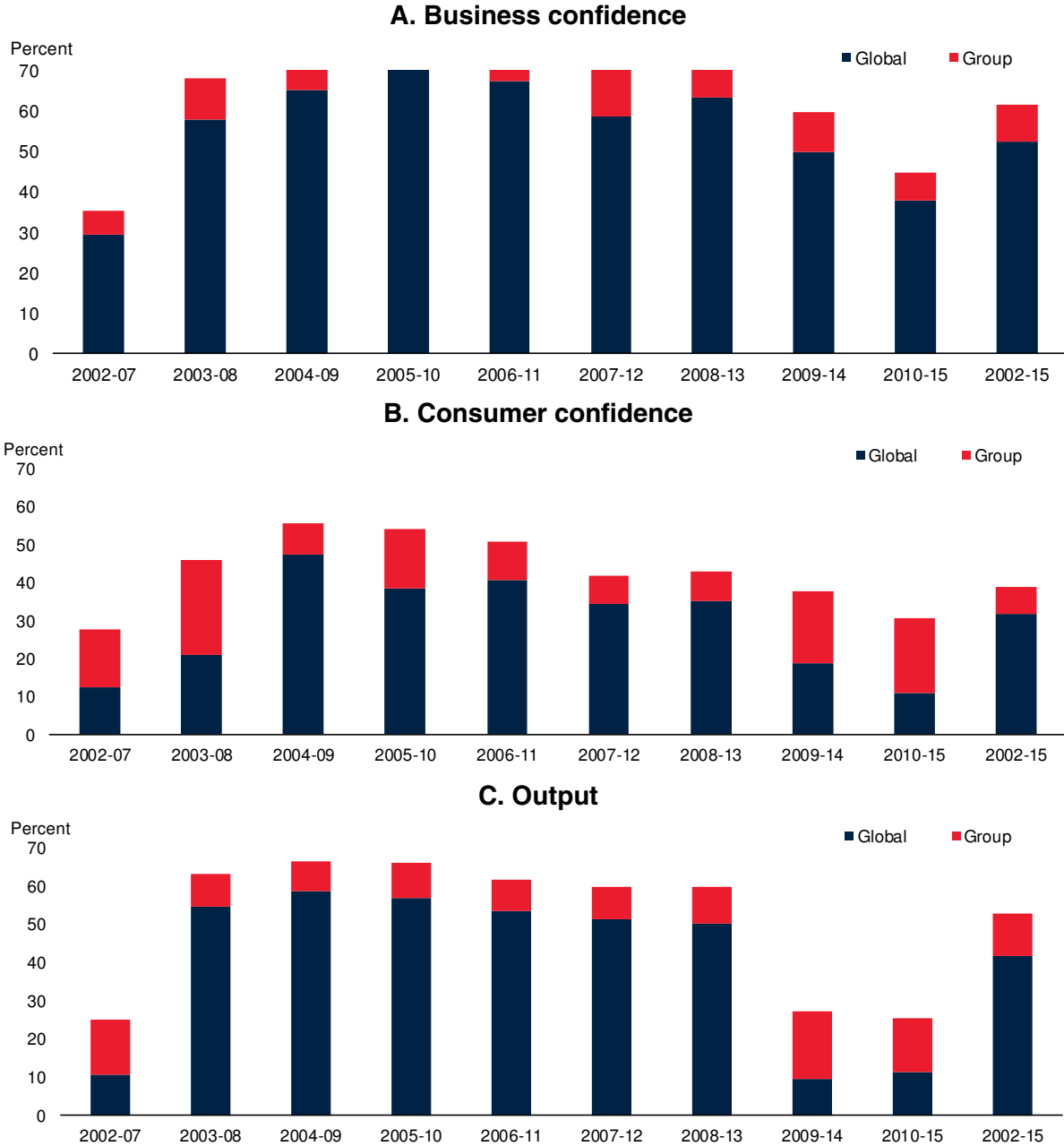
C. Output

Note: The variance shares (percent) of business confidence, consumer confidence, and output explained by the global and group factors over 5-year rolling samples. The "2002-15" sample refers to the full sample. Panels A and B are based on the baseline factor model jointly estimated on business and consumer confidence. Panel C is based on the alternative model estimated on output only. All figures refer to the cross-sectional average variance across all countries.

Figure 8. Estimated factors: output

A. Global

B. Advanced economies
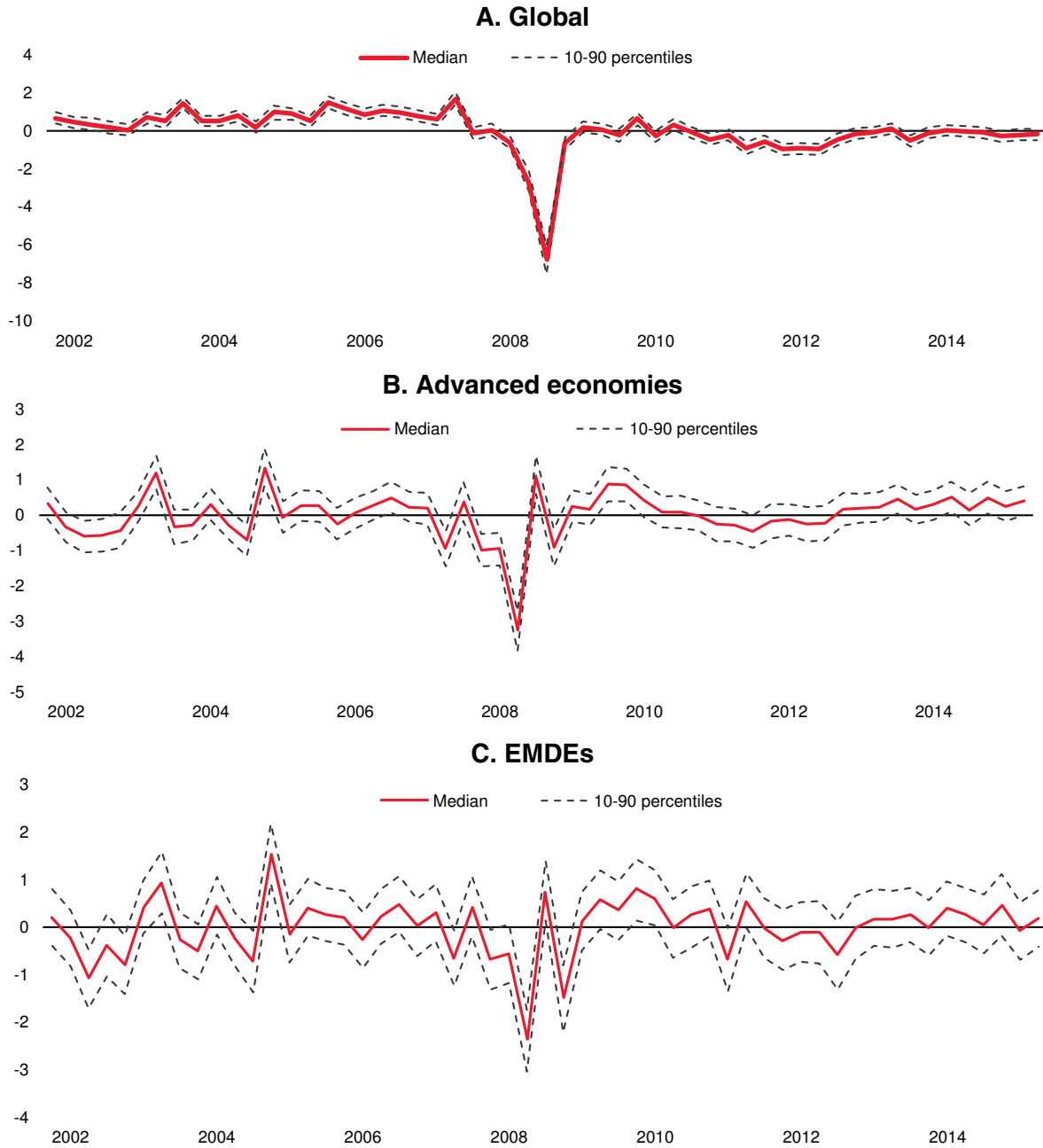
C. EMDEs

Note: The global and group-specific (advanced economies and EMDEs) factors for output estimated using the dynamic factor model. The model is estimated using quarter-to-quarter growth rates of output. Group-specific factors are orthoganalized with respect to the global factor. Solid line is the median estimate and the dashed lines represent the 10-90 percentile confidence band.

Figure 9. Variance share explained by global and group factors: output vs. confidence
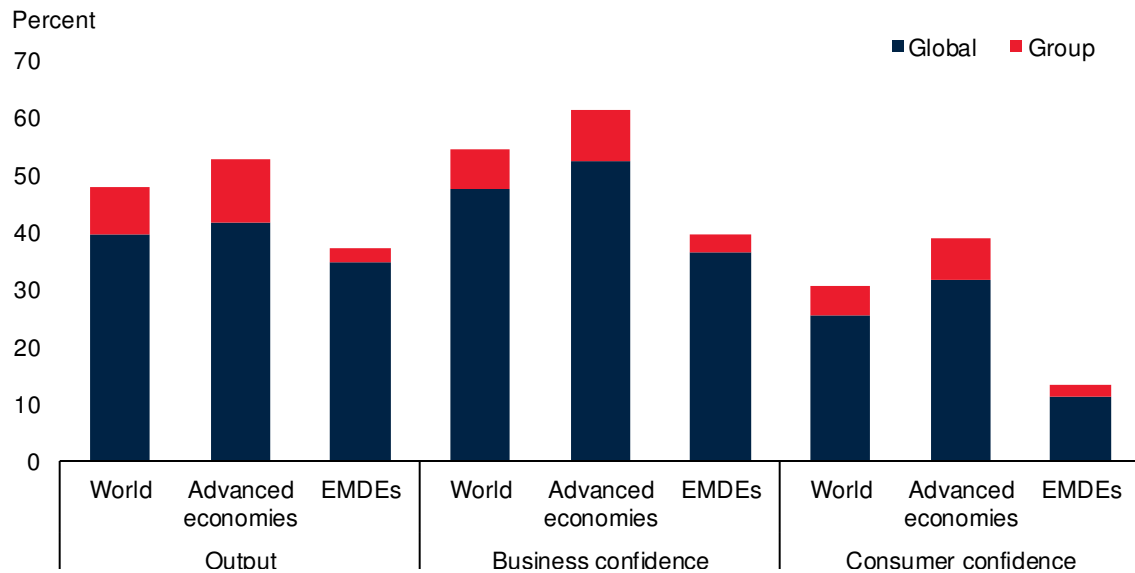
Percent

Note: The variance shares (percent) of output, business confidence, and consumer confidence explained by the global and group factors. Results for output are from the alternative factor model estimated only on output. Results for business and consumer confidence are from the baseline factor model jointly estimated on business and consumer confidence. All results are based on the period 2002-15 (full sample) and refer to the cross-sectional average variance share in each country group.

SUPPLEMENTARY APPENDIX

Understanding Global Confidence Cycles

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May 2018

This appendix contains:

Table A1. Source of confidence data, by type

	List of countries
Business Confidence (91)	
European Commission	
Advanced economies (5)	Cyprus; Denmark; Greece; Luxembourg; Malta
EMDEs (5)	Bulgaria; Croatia; Montenegro; Romania; Serbia
OECD	
Advanced economies (26)	Australia; Austria; Belgium; Canada; Czech Republic; Estonia; Finland; France; Germany; Ireland; Israel; Italy; Japan; Latvia; Lithuania; Netherlands; New Zealand; Norway; Portugal; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States
EMDEs (11)	Brazil; China; Colombia; Hungary; India; Indonesia; Mexico; Poland; Russian Federation; South Africa; Turkey
National sources	
Advanced economies (2)	Hong Kong SAR, China; Singapore
EMDEs (25)	Albania; Angola; Armenia; Azerbaijan; Bahrain; Botswana; Cabo Verde; Ecuador; Guatemala; Kazakhstan; Macedonia, FYR; Malaysia; Maldives; Mozambique; New Caledonia; Nigeria; Peru; Philippines; Qatar; Sierra Leone; Sri Lanka; Thailand; Uganda; Ukraine; West Bank & Gaza
Non-official sources	
Advanced economies (2)	Korea, Rep.; Taiwan, China
EMDEs (15)	Bangladesh; Chile; Dominican Republic; Egypt, Arab Rep.; El Salvador; Georgia; Kenya; Mauritius; Nepal; Nicaragua; Pakistan; Saudi Arabia; Tunisia
Consumer Confidence (95)	
European Commission	
Advanced economies (2)	Cyprus; Malta
EMDEs (6)	Bulgaria; Croatia; Macedonia, FYR; Montenegro; Romania; Serbia
OECD	
Advanced economies (29)	Australia; Austria; Belgium; Canada; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Ireland; Israel; Italy; Japan; Korea, Rep.; Latvia; Lithuania; Luxembourg; Netherlands; New Zealand; Portugal; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States
EMDEs (10)	Brazil; China; Colombia; Hungary; Indonesia; Mexico; Poland; Russian Federation; South Africa; Turkey
National sources	
EMDEs (14)	Albania; Armenia; Azerbaijan; Cabo Verde; Chile; Dominican Republic; Ecuador; India; Kyrgyz Republic; Nigeria; Oman; Pakistan; Philippines; Qatar
Non-official sources	
Advanced economies (5)	Hong Kong SAR, China; Iceland; Macao SAR, China; Norway; Taiwan, China
EMDEs (29)	Algeria; Argentina; Bahrain; Bangladesh; Belarus; Costa Rica; Egypt, Arab Rep.; El Salvador; Georgia; Jordan; Kazakhstan; Kuwait; Lebanon; Malaysia; Morocco; Myanmar; Nicaragua; Panama; Peru; Saudi Arabia; Sri Lanka; Syrian Arab Republic; Thailand; Tunisia; Ukraine; United Arab Emirates; Uruguay; Venezuela, RB;Vietnam

Note: National sources refer to government entities and central banks. Non-official sources include academic and policy institutions, think tanks, and industrial organizations.

Table A2. Availability and source of business confidence

Country	Start date	End date	Frequency	Seasonal Adjustment	Data gap	Data source
Advanced economies (35)						
Australia	1966M2	2017M5	Monthly	Yes	No	OECD
Austria	1985M1	2017M7	Monthly	Yes	No	OECD
Belgium	1985M1	2017M7	Monthly	Yes	No	OECD
Canada	1998M7	2017M4	Monthly	Yes	No	OECD
Cyprus	2001M5	2017M7	Monthly	Yes	No	European Commission
Czech Republic	1993M2	2017M7	Monthly	Yes	No	OECD
Denmark	1980M1	2017M7	Monthly	Yes	No	European Commission
Estonia	1992M4	2017M7	Monthly	Yes	No	OECD
Finland	1993M1	2017M7	Monthly	Yes	No	OECD
France	1975M12	2017M7	Monthly	Yes	No	OECD
Germany	1962M12	2017M7	Monthly	Yes	No	OECD
Greece	1982M1	2017M7	Monthly	Yes	No	European Commission
Hong Kong SAR, China	2006Q1	2017Q2	Quarterly	No	No	Census and Statistics Department
Ireland	1985M1	2008M4	Monthly	Yes	No	OECD
Israel	1983M11	2017M6	Monthly	Yes	No	OECD
Italy	1962M2	2017M7	Monthly	Yes	No	OECD
Japan	1974M6	2017M6	Monthly	Yes	No	OECD
Korea, Rep.	1980M1	2017M8	Monthly	No	No	Korea Economic Research Institute
Latvia	1993M4	2017M7	Monthly	Yes	No	OECD
Lithuania	1993M5	2017M7	Monthly	Yes	No	OECD
Luxembourg	1980M1	2017M7	Monthly	Yes	No	European Commission
Malta	2002M11	2017M7	Monthly	Yes	No	European Commission
Netherlands	1963M6	2017M7	Monthly	Yes	No	OECD
New Zealand	1961M6	2017M6	Monthly	Yes	No	OECD
Norway	1987M3	2017M6	Monthly	Yes	No	OECD
Portugal	1987M1	2017M7	Monthly	Yes	No	OECD
Singapore	1970Q1	2017Q2	Quarterly	No	No	Department of Statistics
Slovak Republic	1993M8	2017M7	Monthly	Yes	No	OECD
Slovenia	1995M4	2017M7	Monthly	Yes	No	OECD
Spain	1963M10	2017M7	Monthly	Yes	No	OECD
Sweden	1996M1	2017M7	Monthly	Yes	No	OECD
Switzerland	1966M1	2017M6	Monthly	Yes	No	OECD
Taiwan, China	2010M3	2017M8	Monthly	No	No	Cathay Financial Holdings
United Kingdom	1977M3	2017M7	Monthly	Yes	No	OECD
United States	1960M1	2017M7	Monthly	Yes	No	OECD

Table A2. Availability and source of business confidence *(continued)*

Country	Start date	End date	Frequency	Seasonal Adjustment	Data gap	Data source
EMDEs (56)						
Albania	2002Q2	2017Q2	Quarterly	Yes	No	Bank of Albania
Angola	2008Q3	2017Q2	Quarterly	No	No	Instituto Nacional de Estatistica
Armenia	2005Q3	2016Q2	Quarterly	Yes	No	Central Bank of Armenia
Azerbaijan	2011Q1	2013Q4	Quarterly	No	Yes	Central Bank of the Republic of Azerbaijan
Bahrain	2013H1	2015H2	Half-yearly	N/A	Yes	Information and eGovernment Authority
	2017Q1	2017Q2	Quarterly	No	No	
Bangladesh	2016	2016	Annual	N/A	No	LightCastle Partners
Botswana	2005H1	2017H1	Half-yearly	N/A	No	Bank of Botswana
Brazil	1995M4	2017M7	Monthly	Yes	No	OECD
Bulgaria	1991M11	2017M7	Monthly	Yes	No	European Commission
Cabo Verde	2002Q1	2016Q3	Quarterly	No	No	Instituto Nacional de Estatistica
Chile	2003M11	2017M8	Monthly	No	No	Federation of Chilean Industry
China	2000M2	2017M7	Monthly	Yes	No	OECD
Colombia	1980M1	2017M6	Monthly	Yes	No	OECD
Costa Rica	2003Q1	2017Q2	Quarterly	No	No	Unión Costarricense de Cámaras y Asociaciones del Sector Empresarial Privado
Croatia	2008M5	2017M7	Monthly	Yes	No	European Commission
Dominican Republic	2011Q3	2017Q2	Quarterly	No	No	Asociacion de Industrias de la Republica Dominicana
Ecuador	2009M10	2017M7	Monthly	Yes	No	Banco Central del Ecuador
Egypt, Arab Rep.	2012Q1	2017Q1	Quarterly	No	Yes	Egyptian Center for Economic Studies
El Salvador	2008M1	2017M4	Monthly	No	No	Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES)
Georgia	2013Q4	2017Q2	Quarterly	No	No	ISET Policy Institute
Guatemala	2003M10	2017M7	Monthly	No	No	Bank of Guatemala
Hungary	1996M1	2017M7	Monthly	Yes	No	OECD
India	2000M5	2016M11	Monthly	Yes	No	OECD
Indonesia	2002M3	2017M6	Monthly	Yes	No	OECD
Kazakhstan	2008M1	2014M12	Monthly	No	No	Committee on Statistics
	2015Q1	2017Q2	Quarterly	No	No	
Kenya	2014M2	2017M1	Monthly	No	No	Standard Chartered
Macedonia, FYR	2001M4	2017M7	Monthly	No	No	State Statistical Office
Malaysia	1999Q1	2017Q2	Quarterly	No	No	Malaysian Institute of Economics Research
Maldives	2014Q1	2017Q2	Quarterly	No	No	Maldives Monetary Authority
Mauritius	2010Q1	2017Q1	Quarterly	No	No	Mauritius Chamber of Commerce and Industry
Mexico	1998M1	2017M6	Monthly	Yes	No	OECD
Montenegro	2012M5	2017M7	Monthly	Yes	No	European Commission

Table A2. Availability and source of business confidence *(continued)*

Country	Start date	End date	Frequency	Seasonal Adjustment	Data gap	Data source
Mozambique	2004M1	2017M7	Monthly	No	Yes	Instituto Nacional de Estatistica
Nepal	2012Q3	2014Q4	Quarterly	No	Yes	Federation of Nepalese Chambers of Commerce and Industry
New Caledonia	2009Q1	2017Q1	Quarterly	No	No	Institut de la Statistique et des Études Économiques
Nicaragua	2008M6	2017M5	Monthly	No	Yes	Fundación Nicaragüense para el Desarrollo Económico y Social (FUNIDES)
Nigeria	2008Q2	2017Q2	Quarterly	No	No	Central Bank of Nigeria
Pakistan	2010M4	2017M4	Monthly	No	Yes	Overseas Investors Chamber of Commerce and Industry
Peru	2002M4	2017M6	Monthly	No	No	Central Reserve Bank of Peru
Philippines	2001Q2	2017Q2	Quarterly	No	No	Bangko Sentral ng Pilipinas
Poland	1997M7	2017M7	Monthly	Yes	No	OECD
Qatar	2014Q2	2016Q4	Quarterly	No	No	Ministry of Development Planning and Statistics
Romania	1991M7	2017M7	Monthly	Yes	No	European Commission
Russian Federation	1992M9	2017M7	Monthly	Yes	No	OECD
Saudi Arabia	2009Q1	2016Q2	Quarterly	No	No	Dun & Bradstreet
Serbia	2013M5	2017M7	Monthly	Yes	No	European Commission
Sierra Leone	2010Q2	2013Q4	Quarterly	No	No	Statistics Sierra Leone
South Africa	1974M6	2017M6	Monthly	Yes	No	OECD
Sri Lanka	2014Q2	2017Q2	Quarterly	No	No	Central bank of Sri Lanka
Thailand	1999M2	2017M7	Monthly	No	No	Bank of Thailand
Tunisia	2011Q1	2017Q2	Quarterly	No	Yes	Instauring an Advocacy Champion for Economy
Turkey	1991M1	2017M7	Monthly	Yes	No	OECD
Uganda	2012M7	2017M7	Monthly	No	No	Central bank of Uganda
Ukraine	2006Q1	2017Q2	Quarterly	No	No	National Bank of Ukraine
Vietnam	2010Q4	2017Q1	Quarterly	No	Yes	European Chamber of Commerce in Vietnam
West Bank & Gaza	2013M1	2017M8	Monthly	No	No	Palestine Monetary Authority

Table A3. Availability and source of consumer confidence

Country	Start date	End date	Frequency	Seasonal Adjustment	Data gap	Data source
Advanced economies (36)						
Australia	1974M9	2017M7	Monthly	Yes	No	OECD
Austria	1977M1	2017M7	Monthly	Yes	No	OECD
Belgium	1973M1	2017M7	Monthly	Yes	No	OECD
Canada	1980M1	2017M7	Monthly	Yes	No	OECD
Cyprus	2001M5	2017M7	Monthly	Yes	No	European Commission
Czech Republic	1995M1	2017M7	Monthly	Yes	No	OECD
Denmark	1974M1	2017M7	Monthly	Yes	No	OECD
Estonia	1993M4	2017M7	Monthly	Yes	No	OECD
Finland	1987M11	2017M7	Monthly	Yes	No	OECD
France	1973M1	2017M7	Monthly	Yes	No	OECD
Germany	1973M1	2017M7	Monthly	Yes	No	OECD
Greece	1985M1	2017M7	Monthly	Yes	No	OECD
Hong Kong SAR, China	2000Q1	2017Q2	Quarterly	No	No	Chinese University of Hong Kong
Iceland	2001M3	2017M8	Monthly	No	No	Gallup
Ireland	1974M1	2017M6	Monthly	Yes	No	OECD
Israel	2011M3	2017M6	Monthly	Yes	No	OECD
Italy	1973M1	2017M7	Monthly	Yes	No	OECD
Japan	1982M4	2017M6	Monthly	Yes	No	OECD
Korea, Rep.	1998M12	2017M7	Monthly	Yes	No	OECD
Latvia	2001M5	2017M7	Monthly	Yes	No	OECD
Lithuania	2001M5	2017M7	Monthly	Yes	No	OECD
Luxembourg	2002M1	2017M7	Monthly	Yes	No	OECD
Malta	2002M11	2017M7	Monthly	Yes	No	European Commission
Macao SAR, China	2008Q4	2017Q1	Quarterly	No	No	Macau University of Science and Technology
Netherlands	1973M1	2017M7	Monthly	Yes	No	OECD
New Zealand	1988M6	2017M6	Monthly	Yes	No	OECD
Norway	1992Q3	2017Q2	Quarterly	No	No	Finans Norge
Portugal	1986M6	2017M7	Monthly	Yes	No	OECD
Slovak Republic	1999M4	2017M7	Monthly	Yes	No	OECD
Slovenia	1996M3	2017M7	Monthly	Yes	No	OECD
Spain	1986M6	2017M7	Monthly	Yes	No	OECD
Sweden	1995M10	2017M7	Monthly	Yes	No	OECD
Switzerland	1972M8	2017M5	Monthly	Yes	No	OECD
Taiwan, China	2001M1	2017M8	Monthly	No	No	National Central University
United Kingdom	1974M1	2017M7	Monthly	Yes	No	OECD
United States	1960M1	2017M7	Monthly	Yes	No	OECD

Table A3. Availability and source of consumer confidence *(continued)*

Country	Start date	End date	Frequency	Seasonal Adjustment	Data gap	Data source
EMDEs (59)						
Albania	2003Q2	2017Q2	Quarterly	Yes	No	Bank of Albania
Algeria	2007Q2	2012Q4	Quarterly	No	No	Bayt.com
	2013H1	2017H1	Half-yearly	N/A	No	
Argentina	2001M3	2017M8	Monthly	No	No	Universidad Torcuato di Tella
Armenia	2005Q3	2016Q2	Quarterly	Yes	No	Central Bank of Armenia
Azerbaijan	2013Q3	2014Q4	Quarterly	No	Yes	Central Bank of the Republic of Azerbaijan
Bahrain	2008Q2	2012Q4	Quarterly	No	No	Bayt.com
	2013H1	2017H1	Half-yearly	N/A	No	
Bangladesh	2012H2	2017H1	Half-yearly	N/A	No	MasterCard
Belarus	2016Q1	2016Q4	Quarterly	No	No	Nielsen
Brazil	1994M6	2017M6	Monthly	Yes	No	OECD
Bulgaria	2001M5	2017M7	Monthly	Yes	No	European Commission
Cabo Verde	2009Q2	2016Q3	Quarterly	No	No	Instituto Nacional de Estatistica
Chile	2002M3	2017M7	Monthly	No	No	Federation of Chilean Industry
China	1990M1	2017M6	Monthly	Yes	No	OECD
Colombia	2001M11	2017M6	Monthly	Yes	No	OECD
Costa Rica	2002Q3	2017Q2	Quarterly	No	Yes	Universidad de Costa Rica
Croatia	2005M5	2017M7	Monthly	Yes	No	European Commission
Dominican Republic	2007H2	2017H1	Half-yearly	N/A	No	Ministry of Economy, Planning and Development
Ecuador	2007M10	2017M7	Monthly	No	No	Banco Central del Ecuador
Egypt, Arab Rep.	2007Q1	2016Q4	Quarterly	No	Yes	Nielsen
El Salvador	2008M1	2015M5	Monthly	No	No	Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES)
Georgia	2012M5	2017M6	Monthly	No	No	ISET Policy Institute
Hungary	1993M2	2017M7	Monthly	Yes	No	OECD
India	2010Q4	2017Q2	Quarterly	No	No	Reserve Bank of India
Indonesia	2001M4	2017M6	Monthly	Yes	No	OECD
Jordan	2007Q3	2012Q4	Quarterly	No	No	Bayt.com
	2013H1	2017H1	Half-yearly	N/A	No	
Kazakhstan	2016Q1	2016Q4	Quarterly	No	No	Nielsen
Kuwait	2007Q2	2012Q4	Quarterly	No	No	Bayt.com
	2013H1	2017H1	Half-yearly	N/A	No	
Kyrgyz Republic	2012Q4	2014Q4	Quarterly	No	Yes	National Statistical Committee of the Kyrgyz Republic
	2015H1	2017H1	Half-yearly	N/A	No	
Lebanon	2007M7	2016M12	Monthly	No	No	Byblos Bank/AUB
	2007H2	2016H2	Half-yearly	N/A	No	
Macedonia, FYR	2012M5	2017M7	Monthly	Yes	No	European Commission
Malaysia	1999Q1	2017Q2	Quarterly	No	Yes	Malaysian Institute of Economics Research
Mexico	2001M4	2017M6	Monthly	Yes	No	OECD
Montenegro	2012M5	2017M7	Monthly	Yes	No	European Commission
Morocco	2007Q4	2017Q2	Quarterly	No	No	Haut-Commissariat au Plan
Myanmar	2012H2	2017H1	Half-yearly	N/A	Yes	MasterCard
Nicaragua	2008M5	2017M6	Monthly	No	Yes	Fundación Nicaragüense para el Desarrollo Económico y Social (FUNIDES)

Table A3. Availability and source of consumer confidence *(continued)*

Country	Start date	End date	Frequency	Seasonal Adjustment	Data gap	Data source
Nigeria	2009Q2	2017Q2	Quarterly	No	No	Central Bank of Nigeria
Oman	2014Q1	2016Q4	Quarterly	No	No	National Centre for Statistics and Information
Pakistan	2012M1	2017M7	Bi-Monthly	No	Yes	State Bank of Pakistan
Panama	2011M10	2017M3	Monthly	No	Yes	Cámara de Comercio, Industrias y Agricultura de Panamá
Peru	2014M1	2017M8	Monthly	No	No	GfK
Philippines	2007Q1	2017Q2	Quarterly	No	No	Bangko Sentral ng Pilipinas
Poland	2001M5	2017M7	Monthly	Yes	No	OECD
Qatar	2013Q3	2017Q2	Quarterly	No	No	Ministry of Development Planning and Statistics
Romania	2001M5	2017M7	Monthly	Yes	No	European Commission
Russian Federation	1998M11	2017M5	Monthly	Yes	No	OECD
Saudi Arabia	2010Q1	2016Q4	Quarterly	No	Yes	Nielsen
Serbia	2013M5	2017M7	Monthly	Yes	No	European Commission
South Africa	1982M6	2017M6	Monthly	Yes	No	OECD
Sri Lanka	2015H1	2017H1	Half-yearly	N/A	No	MasterCard
Syrian Arab Republic	2007Q2	2012Q4	Quarterly	No	Yes	Bayt.com
	2013H1	2016H2	Half-yearly	N/A	No	
Thailand	1998M10	2017M8	Monthly	No	No	University of the Thai Chamber of Commerce
Tunisia	2008Q1	2012Q4	Quarterly	No	No	Bayt.com
	2013H1	2017H1	Half-yearly	N/A	No	
Turkey	2004M1	2017M7	Monthly	Yes	No	OECD
Ukraine	2005M6	2017M7	Monthly	No	Yes	GfK
United Arab Emirates	2006Q3	2016Q4	Quarterly	No	Yes	Nielsen
Uruguay	2007M8	2017M7	Monthly	No	No	Catholic University of Uruguay
Venezuela, RB	2011Q2	2016Q4	Quarterly	No	No	Nielsen
Vietnam	2014M1	2015M12	Monthly	No	No	ANZ-Roy Morgan

Table A4. Summary of data series used in the paper

Variable	Definition	Source
Business confidence	Business confidence index (BCI)	Refer to Tables A1-A3.
Consumer confidence	Consumer confidence index (CCI)	Refer to Tables A1-A3.
Macroeconomic variables		
Output	Real GDP	Haver Analytics; Ilzetzki, Mendoza, and Végh (2013); OECD.
Investment	Real gross fixed capital formation	Haver Analytics; OECD.
Consumption	Real private consumption expenditure	Haver Analytics; OECD.
Industrial production	Industrial production index	World Bank.
Financial variables		
Credit	Private sector credit, deflated by CPI	Bank for International Settlements; Haver Analytics; International Monetary Fund.
Equity prices	Share prices, deflated by CPI	Haver Analytics; International Monetary Fund.
House prices	House and property prices, deflated by CPI	Bank for International Settlements; Haver Analytics; International Monetary Fund; OECD.
Financial volatility	Chicago Board Options Exchange Volatility Index (VIX)	Federal Reserve Bank of St. Louis.

Note: All variables except financial volatility are seasonally-adjusted. Due to the data availability, in some countries, private consumption is proxied by household consumption. In business and consumer confidence, if data are missing only for a quarter after 2010, the missing data point is linearly interpolated. There are four cases in business confidence (Azerbaijan in 2011Q4, Nepal in 2014Q3, Tunisia in 2011Q3, and Vietnam in 2016Q1) and three cases in consumer confidence (Azerbaijan in 2013Q4, Malaysia in 2014Q1, and Saudi Arabia in 2010Q2).

Table A5. Sample questions in confidence surveys

A. Overall economy vs. household/firm specific			
Series	Question type	Country	Question
Business confidence	Overall economy	Korea	1. How do you feel about the current business condition (overall condition)? 2. How do you feel about the current labor force situation?
		Indonesia	How do you expect the inflation this year?
		Brazil	What's your expectation of the Brazilian economy in the future?
	Firm-specific	Singapore	Do you expect total number of persons engaged/operating receipts/deposits of non-bank customers/loans and advances to non-bank customers/inventories of goods and materials at end period during the period [of next quarter] to be up, same or
		Indonesia	1. Do you think the current volume of products/services demand is increasing, the same or decreasing compared with previous month? 2. Do you think the expected operating income/business income is increasing, the same or decreasing compared with current month?
		Euro Area	Do you consider your current stock of finished products to be too large, adequate or too small?
Consumer confidence	Overall economy	Euro Area	1.How do you expect the general economic situation in this country to develop over the next 12 months? 2.How do you expect the number of people unemployed in this country to change over the next 12 months?
		United States	1. Now turning to business conditions in the country as a whole--do you think that during the next 12 months we'll have good times financially, or bad times, or what? 2. During the last few months, have you heard of any favorable or unfavorable changes in business conditions? 3. How about people out of work during the coming 12 months--do you think that there will be more unemployment than now, about the same, or less? 4. No one can say for sure, but what do you think will happen to interest rates for borrowing money during the next 12 months--will they go up, stay the same, or go down?
		Argentina	How do you think the country's economic situation will be in a year: better, worse or worse than the current one?
	Household-specific	Philippines	1. Do you think family financial condition become better, the same or worse? 2. Do you think the level of family income become better, the same or worse?
		United States	1. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago? 2. During the next year or two, do you expect that your (family) income will go up more than prices will go up, about the same, or less than prices will go up?
		Euro Area	1. How do you expect the financial position of your household to change over the next 12 months? 2. Over the next 12 months, how likely is it that you save any money?

Table A5. Sample questions in confidence surveys *(continued)*

			B. Current vs. future state of the economy
Business confidence	Current	Euro Area	Do you consider your current overall order books to be more than sufficient, sufficient or not sufficient?
		Brazil	How do you feel about the current condition of your company?
	Future	Euro Area	How do you expect your production to develop over the next 3 months?
		Singapore	Do you expect the general business situation in your industry to improve, remain the same or deteriorate in the next six months?
Consumer confidence	Current	Argentina	Do you think this is a good time to make purchases such as appliances?
		United States	Now thinking back 5 years, would you say that you (and your family living there) are better off or worse off financially now than you were 5 years ago?
	Future	Argentina	What do you think it will happen to your personal financial situation within a year: improve, stay the same, or get worse?
		United States	1.Now turning to business conditions in the country as a whole--do you think that during the next 12 months we'll have good times financially, or bad times, or what? 2. Now looking ahead--do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now? 3. During the next 12 months, do you think that prices in general will go up, or go down, or stay where they are now?
			C. Investment vs. consumption
Business confidence	Investment-specific	Euro Area	Do you consider your current overall order books to be more than sufficient, sufficient or not sufficient?
		Korea	Do you feel raw material purchase prices this month to become higher, the same or lower compared to the last month?
Consumer confidence	Consumption-specific	United States	1. Generally speaking, do you think now is a good time or a bad time to buy a house? 2. What about selling a house -- generally speaking, do you think now is a good time or a bad time to sell a house? 3.About the big things people buy for their homes--such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or a bad time for people to buy major household items? 4. Speaking now of the automobile market--do you think the next 12 months or so will be a good time or a bad time to buy a vehicle, such as a car, pickup, van or sport utility vehicle?
		Argentina	1. Do you think it's a good time to make major purchases like cars, or to move houses? 2. Do you think this is a good time to make purchases such as appliances?

Note: Surveys normally contain multiple questions, on which indexes on business and consumer confidence is based (e.g., consumer confidence index for the United states is based on five questions: two questions about current conditions and three about expectations). The index is constructed, in most cases, as a simple (unweighted) aggregate of those questions (e.g., Albania, European Commission, Georgia, Thailand, and United States).

Table A6. Correlations between business confidence and output: country results

	Contempo-ranious	Lead	Lag		Contempo-ranious	Lead	Lag
Advanced economies							
Australia	0.57†	0.63†	0.51†	Korea, Rep.	0.59†	0.72†	0.30†
Austria	0.78†	0.76†	0.72†	Latvia	0.82†	0.87†	0.72†
Belgium	0.89†	0.89†	0.84†	Lithuania	0.85†	0.89†	0.78†
Canada	0.90†	0.90†	0.85†	Luxembourg	0.50†	0.48†	0.48†
Cyprus	0.79†	0.79†	0.72†	Malta	0.57†	0.46†	0.61†
Czech Republic	0.78†	0.65†	0.81†	Netherlands	0.90†	0.91†	0.84†
Denmark	0.53†	0.53†	0.50†	New Zealand	0.26†	0.48†	0.09†
Estonia	0.89†	0.88†	0.85†	Norway	0.49†	0.55†	0.45†
Finland	0.77†	0.78†	0.71†	Portugal	0.90†	0.90†	0.85†
France	0.93†	0.91†	0.90†	Singapore	0.75†	0.79†	0.67†
Germany	0.80†	0.85†	0.68†	Slovak Republic	0.59†	0.66†	0.48†
Greece	0.81†	0.83†	0.75†	Slovenia	0.91†	0.92†	0.85†
Hong Kong SAR, China	0.85†	0.73†	0.83†	Spain	0.78†	0.79†	0.74†
Ireland	0.60†	0.64†	0.65†	Sweden	0.88†	0.82†	0.89†
Israel	0.64†	0.67†	0.54†	Switzerland	0.89†	0.88†	0.84†
Italy	0.64†	0.74†	0.55†	United Kingdom	0.77†	0.75†	0.72†
Japan	0.73†	0.74†	0.65†	United States	0.72†	0.72†	0.64†
EMDEs							
Brazil	0.95†	0.96†	0.91†	Malaysia	0.48†	0.68†	0.37†
Bulgaria	0.94†	0.96†	0.86†	Mexico	0.87†	0.84†	0.83†
Chile	0.82†	0.88†	0.68†	Mozambique	0.69†	0.57†	0.67†
China	0.61†	0.57†	0.61†	Peru	0.73†	0.81†	0.65†
Colombia	0.77†	0.76†	0.57†	Philippines	0.75†	0.72†	0.64†
Costa Rica	0.75†	0.71†	0.75†	Poland	0.86†	0.87†	0.83†
Croatia	0.67†	0.59†	0.51†	Romania	0.77†	0.79†	0.77†
Hungary	0.57†	0.55†	0.52†	Russian Federation	0.86†	0.88†	0.73†
India	0.85†	0.79†	0.83†	South Africa	0.75†	0.75†	0.68†
Indonesia	0.71†	0.76†	0.72†	Thailand	0.52†	0.61†	0.31†
Kazakhstan	0.93†	--	--	Turkey	0.28†	0.29†	0.30†
Macedonia, FYR	0.37†	0.49†	0.25*	Ukraine	0.63†	0.38†	0.22

Note: The correlation coefficients between business confidence and output at the two-year horizon as estimated with a VAR model. * and † denote the statistical significance at the 10 percent and 5 percent levels, respectively. Lead and lag refer to correlations where output leads and lags business confidence by one quarter. The correlation is not computed when the model is estimated with fewer than 30 observations.

Table A7. Correlations between consumer confidence and output: country results

	Contempo-ranious	Lead	Lag		Contempo-ranious	Lead	Lag
Advanced economies							
Australia	0.41†	0.50†	0.30†	Latvia	0.80†	0.83†	0.74†
Austria	0.63†	0.69†	0.57†	Lithuania	0.88†	0.95†	0.76†
Belgium	0.74†	0.75†	0.66†	Luxembourg	0.63†	0.48†	0.61†
Canada	0.59†	0.67†	0.43†	Macao SAR, China	--	--	0.90†
Cyprus	0.39†	0.44†	0.32†	Malta	0.74†	0.77†	0.72†
Czech Republic	0.70†	0.70†	0.66†	Netherlands	0.80†	0.83†	0.74†
Denmark	0.65†	0.73†	0.53†	New Zealand	0.76†	0.79†	0.70†
Estonia	0.81†	0.74†	0.75†	Norway	0.28†	0.40†	0.12*
Finland	0.77†	0.87†	0.60†	Portugal	0.70†	0.72†	0.64†
France	0.60†	0.66†	0.52†	Slovak Republic	0.80†	0.85†	0.71†
Germany	0.62†	0.65†	0.51†	Slovenia	0.73†	0.72†	0.68†
Greece	0.60†	0.57†	0.62†	Spain	0.75†	0.81†	0.67†
Hong Kong SAR, China	0.70†	0.74†	0.53†	Sweden	0.54†	0.56†	0.48†
Iceland	0.84†	0.90†	0.81†	Switzerland	0.58†	0.64†	0.45†
Ireland	0.78†	0.82†	0.73†	Taiwan, China	0.62†	0.63†	0.38†
Italy	0.50†	0.55†	0.39†	United Kingdom	0.57†	0.60†	0.48†
Japan	0.68†	0.74†	0.54†	United States	0.67†	0.75†	0.50†
Korea, Rep.	0.54†	0.65†	0.37†				
EMDEs							
Argentina	0.02	0.03	-0.43†	Malaysia	0.11	0.24†	-0.08
Brazil	0.77†	0.83†	0.66†	Mexico	0.85†	0.84†	0.78†
Bulgaria	0.83†	0.90†	0.72†	Morocco	-0.66†	-0.73†	-0.65†
Chile	0.46†	0.49†	0.45†	Philippines	0.48†	0.66†	--
China	0.38†	0.37†	0.39†	Poland	0.61†	0.73†	0.69†
Colombia	0.74†	0.77†	0.67†	Romania	0.96†	0.88†	0.91†
Costa Rica	-0.11	0.36†	-0.27	Russian Federation	0.86†	0.86†	0.77†
Croatia	0.76†	0.79†	0.65†	South Africa	0.61†	0.63†	0.52†
Ecuador	0.71†	--	0.62†	Thailand	0.55†	0.50†	0.51†
Hungary	0.68†	0.74†	0.57†	Turkey	0.92†	0.89†	0.88†
Indonesia	0.29†	0.35†	0.26†	Ukraine	0.98†	0.95†	0.96†

Note: The correlation coefficients between consumer confidence and output at the two-year horizon as estimated with a VAR model. * and † denote the statistical significance at the 10 percent and 5 percent levels, respectively. Lead and lag refer to correlations where output leads and lags consumer confidence by one quarter. The correlation is not computed when the model is estimated with fewer than 30 observations.

Table A8. Share of economies with statistically significant correlations

A. Macroeconomic variables

	Business confidence				Consumer confidence			
	Output	Investment	Consumption	Industrial production	Output	Investment	Consumption	Industrial production
All countries								
Contemporaneous	100.0	75.0	77.9	75.8	77.6	69.1	73.5	76.6
Lag	94.8	73.5	76.5	75.8	77.6	67.6	68.7	65.1
Lead	98.3	77.9	79.4	77.3	80.3	73.5	76.5	71.9
Advanced economies								
Contemporaneous	100.0	97.1	100.0	90.9	100.0	94.1	97.1	96.9
Lag	100.0	97.1	100.0	93.9	97.1	91.2	94.1	87.5
Lead	100.0	100.0	100.0	93.9	100.0	97.1	97.1	93.8
EMDEs								
Contemporaneous	100.0	52.9	55.9	60.6	55.9	44.1	50.0	56.3
Lag	87.5	50.0	52.9	57.6	57.6	44.1	42.4	41.9
Lead	95.8	55.9	58.8	60.6	60.6	50.0	55.9	50.0

B. Financial variables

	Business confidence				Consumer confidence			
	Credit	Equity prices	House prices	Financial volatility	Credit	Equity prices	House prices	Financial volatility
All countries								
Contemporaneous	64.7	75.0	63.2	70.6	64.2	76.5	64.7	60.3
Lag	64.7	75.0	57.4	70.6	61.8	73.5	62.7	61.2
Lead	67.6	69.1	58.8	58.8	64.2	73.5	67.6	61.8
Advanced economies								
Contemporaneous	79.4	97.1	94.1	76.5	75.8	97.1	85.3	70.6
Lag	79.4	100.0	85.3	79.4	70.6	94.1	82.4	76.5
Lead	76.5	94.1	82.4	67.6	76.5	97.1	91.2	64.7
EMDEs								
Contemporaneous	50.0	52.9	32.4	64.7	52.9	55.9	44.1	50.0
Lag	50.0	50.0	29.4	61.8	52.9	52.9	42.4	45.5
Lead	58.8	44.1	35.3	50.0	51.5	50.0	44.1	58.8

Note: The share of economies where the correlation coefficients are statistically significant at least at the 10 percent level at two-year horizon as estimated with a VAR model. Lead and lag refer to correlations where output leads and lags consumer confidence by one quarter. The correlation is not computed when the model is estimated with fewer than 30 observations. In Panel A, for business confidence, 34 advanced economies and 24 EMDEs in output, 34 advanced economies and 21 EMDEs in investment and consumption, and 33 advanced economies and 22 EMDEs in industrial production. For consumer confidence, 35 advanced economies and 22 EMDEs in output, 34 advanced economies and 18 EMDEs in investment, 34 advanced economies and 19 EMDEs in consumption, and 32 advanced economies and 20 EMDEs in industrial production. In Panel B, for business confidence, 34 advanced economies and 29 EMDEs in credit, 34 advanced economies and 22 EMDEs in equity prices, 34 advanced economies and 17 EMDEs in house prices, and 34 advanced economies and 29 EMDEs in financial volatility. For consumer confidence, 34 advanced economies and 25 EMDEs in credit, 34 advanced economies and 20 EMDEs in equity prices, 34 advanced economies and 17 EMDEs in house prices, and 35 advanced economies and 26 EMDEs in financial volatility.

Table A9. Correlations with macroeconomic variables, by group

A. Advanced economies

	Business confidence				Consumer confidence			
	Output	Investment	Consumption	Industrial production	Output	Investment	Consumption	Industrial production
Contemporaneous								
On impact	0.37‡	0.22‡	0.25‡	0.38‡	0.24‡	0.15‡	0.24‡	0.22‡
1 year	0.66‡	0.50‡	0.49‡	0.63‡	0.56‡	0.41‡	0.52‡	0.42‡
2 years	0.74‡	0.61‡	0.60‡	0.65‡	0.66‡	0.55‡	0.64‡	0.49‡
Lead 1								
On impact	0.26‡	0.19‡	0.16‡	0.29‡	0.26‡	0.22‡	0.24‡	0.19‡
1 year	0.64‡	0.51‡	0.45‡	0.62‡	0.60‡	0.50‡	0.55‡	0.48‡
2 years	0.75‡	0.64‡	0.61‡	0.67‡	0.70‡	0.62‡	0.67‡	0.55‡
Lead 2								
On impact	0.09‡	0.14‡	0.08‡	0.10‡	0.21‡	0.18‡	0.15‡	0.13‡
1 year	0.48‡	0.42‡	0.34‡	0.48‡	0.55‡	0.50‡	0.50‡	0.41‡
2 years	0.72‡	0.61‡	0.57‡	0.64‡	0.69‡	0.64‡	0.67‡	0.52‡
Lag 1								
On impact	0.18‡	0.14‡	0.17‡	0.10‡	0.09‡	0.06‡	0.10‡	0.06†
1 year	0.56‡	0.40‡	0.44‡	0.48‡	0.40‡	0.27‡	0.39‡	0.25‡
2 years	0.68‡	0.55‡	0.55‡	0.58‡	0.57‡	0.47‡	0.56‡	0.39‡
Lag 2								
On impact	0.08‡	0.02	0.06‡	0.02	0.02	0.03	0.04†	-0.01
1 year	0.39‡	0.24‡	0.30‡	0.25‡	0.19‡	0.13‡	0.22‡	0.06
2 years	0.57‡	0.45‡	0.45‡	0.48‡	0.43‡	0.34‡	0.45‡	0.26‡

B. EMDEs

	Business confidence				Consumer confidence			
	Output	Investment	Consumption	Industrial production	Output	Investment	Consumption	Industrial production
Contemporaneous								
On impact	0.38‡	0.23‡	0.27‡	0.42‡	0.26‡	0.15†	0.32‡	0.23‡
1 year	0.66‡	0.44‡	0.53‡	0.66‡	0.47‡	0.37‡	0.56‡	0.43‡
2 years	0.71‡	0.50‡	0.57‡	0.69‡	0.53‡	0.45‡	0.63‡	0.46‡
Lead 1								
On impact	0.28‡	0.19‡	0.27‡	0.28‡	0.13†	0.20‡	0.21‡	0.11†
1 year	0.62‡	0.46‡	0.58‡	0.65‡	0.46‡	0.44‡	0.57‡	0.40‡
2 years	0.70‡	0.56‡	0.68‡	0.70‡	0.57‡	0.52‡	0.70‡	0.48‡
Lead 2								
On impact	0.07*	0.07*	0.11‡	0.07	0.11‡	0.09‡	0.12‡	0.04
1 year	0.48‡	0.40‡	0.49‡	0.48‡	0.43‡	0.41‡	0.47‡	0.29‡
2 years	0.68‡	0.57‡	0.67‡	0.62‡	0.60‡	0.56‡	0.69‡	0.43‡
Lag 1								
On impact	0.16‡	0.11‡	0.11†	0.12†	0.11†	0.08*	0.11‡	0.17‡
1 year	0.54‡	0.30‡	0.45‡	0.53‡	0.39‡	0.30‡	0.43‡	0.33‡
2 years	0.62‡	0.41‡	0.53‡	0.62‡	0.46‡	0.40‡	0.54‡	0.35‡
Lag 2								
On impact	0.07†	0.00	0.08‡	0.04	0.06	0.09†	0.07*	-0.02
1 year	0.34‡	0.13*	0.27‡	0.28‡	0.22‡	0.16†	0.24‡	0.18†
2 years	0.50‡	0.29‡	0.41‡	0.44‡	0.36‡	0.30‡	0.40‡	0.26†

Note: Average cross-country correlation coefficients between confidence and macroeconomic variables at different horizons as estimated with a VAR model. Lead and lag refer to correlations where macroeconomic variables lead and lag confidence measures by the denoted quarters. In Panel A (advanced economies), for business confidence, the number of countries included is 34, 34, 34, and 33 in output, investment, consumption, and industrial production, respectively. For consumer confidence, 34, 34, 34, and 32 countries are included in output, investment, consumption, and industrial production, respectively. In Panel B (EMDEs), for business confidence, the number of countries included is 24, 21, 21, and 22 in output, investment, consumption, and industrial production, respectively. For consumer confidence, 22, 18, 19, and 20 countries are included in output, investment, consumption, and industrial production, respectively. *, †, and ‡ denote that the average coefficient is statistically significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table A10. Correlations with financial variables, by group

A. Advanced economies

	Business confidence				Consumer confidence			
	Credit	Equity prices	House prices	Financial volatility	Credit	Equity prices	House prices	Financial volatility
Contemporaneous								
On impact	0.05†	0.28‡	0.18‡	-0.26‡	0.08‡	0.33‡	0.21‡	-0.27‡
1 year	0.20‡	0.48‡	0.38‡	-0.32‡	0.17‡	0.51‡	0.43‡	-0.36‡
2 years	0.32‡	0.54‡	0.48‡	-0.29‡	0.26‡	0.56‡	0.51‡	-0.32‡
Lead 1								
On impact	0.10‡	0.02	0.10‡	-0.02	0.09‡	0.08‡	0.19‡	-0.03
1 year	0.22‡	0.28‡	0.29‡	-0.15‡	0.20‡	0.41‡	0.41‡	-0.23‡
2 years	0.34‡	0.45‡	0.43‡	-0.18‡	0.30‡	0.53‡	0.51‡	-0.24‡
Lead 2								
On impact	0.06‡	-0.07‡	-0.01	0.04‡	0.06‡	0.00	0.06‡	0.02
1 year	0.19‡	0.04	0.17‡	0.06*	0.19‡	0.24‡	0.31‡	-0.06*
2 years	0.33‡	0.33‡	0.37‡	-0.05	0.30‡	0.45‡	0.48‡	-0.13†
Lag 1								
On impact	0.08‡	0.27‡	0.16‡	-0.15‡	0.01	0.19‡	0.08‡	-0.13‡
1 year	0.18‡	0.51‡	0.38‡	-0.33‡	0.11‡	0.46‡	0.33‡	-0.32‡
2 years	0.29‡	0.56‡	0.47‡	-0.35‡	0.21‡	0.53‡	0.44‡	-0.34‡
Lag 2								
On impact	0.03	0.07‡	0.10‡	0.02	0.01	0.04†	0.10‡	0.02
1 year	0.15‡	0.41‡	0.31‡	-0.26‡	0.09†	0.29‡	0.23‡	-0.22‡
2 years	0.25‡	0.51‡	0.40‡	-0.36‡	0.20‡	0.45‡	0.35‡	-0.30‡

B. EMDEs

	Business confidence				Consumer confidence			
	Credit	Equity prices	House prices	Financial volatility	Credit	Equity prices	House prices	Financial volatility
Contemporaneous								
On impact	0.07†	0.31‡	0.07	-0.25‡	0.09†	0.26‡	0.23‡	-0.14‡
1 year	0.20‡	0.49‡	0.22†	-0.34‡	0.21‡	0.44‡	0.36‡	-0.21‡
2 years	0.31‡	0.51‡	0.27†	-0.31‡	0.31‡	0.56‡	0.40‡	-0.18†
Lead 1								
On impact	0.12‡	-0.06*	0.09	-0.01	0.11‡	0.00	0.12†	0.07†
1 year	0.29‡	0.26‡	0.21†	-0.18‡	0.29‡	0.31‡	0.32‡	-0.12†
2 years	0.38‡	0.42‡	0.27†	-0.20‡	0.36‡	0.49‡	0.42‡	-0.16†
Lead 2								
On impact	0.13‡	-0.08†	0.08*	0.02	0.14‡	0.03	0.06*	-0.08*
1 year	0.33‡	0.07	0.17*	0.02	0.38‡	0.21‡	0.27‡	-0.05
2 years	0.41‡	0.35‡	0.25†	-0.07	0.47‡	0.42‡	0.42‡	-0.09
Lag 1								
On impact	-0.02	0.28‡	0.00	-0.16‡	0.00	0.24‡	0.11†	-0.14‡
1 year	0.11†	0.50‡	0.19*	-0.32‡	0.14†	0.45‡	0.28‡	-0.23‡
2 years	0.22‡	0.47‡	0.22*	-0.34‡	0.27‡	0.54‡	0.33‡	-0.20†
Lag 2								
On impact	0.03	0.09‡	0.09	0.01	0.03	0.08†	-0.05	0.00
1 year	0.06	0.41‡	0.19†	-0.26‡	0.07	0.33‡	0.14*	-0.15‡
2 years	0.15‡	0.42‡	0.19	-0.34‡	0.15	0.45‡	0.26†	-0.15*

Note: Average cross-country correlation coefficients between confidence and financial variables at different horizons as estimated with a VAR model. Lead and lag refer to correlations where financial variables lead and lag confidence measures by the denoted quarters. In Panel A (advanced economies), for business confidence, the number of countries included is 34 in credit, equity prices, house prices and financial volatility. For consumer confidence, 33, 34, 34, and 35 countries are included in credit, equity prices, house prices, and financial volatility, respectively. In Panel B (EMDEs), for business confidence, the number of countries included is 28, 22, 16, and 29 in credit, equity prices, house prices, and financial volatility, respectively. For consumer confidence, 25, 20, 17, and 26 countries are included in credit, equity prices, house prices, and financial volatility, respectively. *, †, and ‡ denote that the average coefficient is statistically significantly different from zero at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table A11. Correlations between confidence and output, robustness check

	Trend	GFC	Trend+GFC	Output growth
Business confidence				
All countries				
Contemporaneous	0.65	0.63	0.62	0.65
Lead	0.63	0.59	0.59	0.55
Lag	0.54	0.50	0.50	0.64
Advanced economies				
Contemporaneous	0.66	0.63	0.63	0.64
Lead	0.63	0.61	0.61	0.54
Lag	0.55	0.50	0.51	0.63
EMDEs				
Contemporaneous	0.65	0.62	0.60	0.65
Lead	0.61	0.56	0.55	0.56
Lag	0.52	0.48	0.48	0.65
Consumer confidence				
All countries				
Contemporaneous	0.51	0.46	0.46	0.55
Lead	0.54	0.49	0.50	0.52
Lag	0.38	0.32	0.34	0.47
Advanced economies				
Contemporaneous	0.54	0.49	0.50	0.57
Lead	0.59	0.56	0.57	0.55
Lag	0.39	0.32	0.33	0.48
EMDEs				
Contemporaneous	0.46	0.40	0.40	0.52
Lead	0.45	0.38	0.39	0.46
Lag	0.37	0.32	0.35	0.47

Note: Average cross-country correlation coefficients at the two-year horizon estimated from various specifications of the VAR model. "Trend" and "GFC" refer to the specification that includes the linear time trend and a dummy variable for the GFC in the model, respectively. "Trend+GFC" means both linear trend and the GFC dummy are included. "Output growth" means that the model uses output growth, rather than log levels, in the estimation. In all cases, the average coefficient is statistically significantly different from zero at the 1 percent level.

Table A12. Forecasting ability of confidence: macroeconomic variables, by group

A. Advanced economies

	Business confidence				Consumer confidence			
Forecast horizon:	1 quarter		4 quarters		1 quarter		4 quarters	
Output								
Confidence	1.432‡		0.602‡		1.220‡		0.712‡	
	[0.159]		[0.112]		[0.178]		[0.131]	
× recessions (γ^r)		1.340‡		0.020		0.778*		0.215
		[0.291]		[0.217]		[0.440]		[0.332]
× expansions (γ^e)		0.673‡		0.232†		0.530‡		0.323‡
		[0.115]		[0.106]		[0.128]		[0.110]
Adjusted R^2	0.29	0.45	0.24	0.35	0.26	0.40	0.22	0.31
$\gamma^r = \gamma^e$ (p-value)		0.02		0.31		0.52		0.73
Investment								
Confidence	0.119‡		0.070‡		0.120‡		0.074‡	
	[0.010]		[0.007]		[0.012]		[0.009]	
× recessions (γ^r)		0.094‡		0.057‡		0.102‡		0.070‡
		[0.013]		[0.010]		[0.017]		[0.012]
× expansions (γ^e)		0.051‡		0.033‡		0.041‡		0.029‡
		[0.009]		[0.007]		[0.012]		[0.008]
Adjusted R^2	0.17	0.34	0.13	0.25	0.14	0.31	0.13	0.26
$\gamma^r = \gamma^e$ (p-value)		0.00		0.03		0.00		0.00
Consumption								
Confidence	0.026‡		0.016‡		0.029‡		0.021‡	
	[0.004]		[0.003]		[0.003]		[0.003]	
× recessions (γ^r)		0.037‡		0.011*		0.032‡		0.019‡
		[0.010]		[0.006]		[0.006]		[0.005]
× expansions (γ^e)		0.012‡		0.011‡		0.016‡		0.013‡
		[0.003]		[0.003]		[0.002]		[0.002]
Adjusted R^2	0.25	0.38	0.24	0.31	0.28	0.39	0.24	0.31
$\gamma^r = \gamma^e$ (p-value)		0.01		0.98		0.00		0.26
Industrial production								
Confidence	0.100‡		0.037‡		0.071‡		0.038‡	
	[0.009]		[0.006]		[0.008]		[0.006]	
× recessions (γ^r)		0.104‡		0.031‡		0.096‡		0.050‡
		[0.012]		[0.007]		[0.013]		[0.008]
× expansions (γ^e)		0.043‡		0.015‡		0.022‡		0.014†
		[0.006]		[0.006]		[0.006]		[0.006]
Adjusted R^2	0.21	0.38	0.18	0.26	0.16	0.35	0.19	0.29
$\gamma^r = \gamma^e$ (p-value)		0.00		0.04		0.00		0.00

B. EMDEs

	Business confidence				Consumer confidence			
Forecast horizon:	1 quarter		4 quarters		1 quarter		4 quarters	
Output								
Confidence	1.512‡		0.656‡		1.196‡		0.812‡	
	[0.226]		[0.145]		[0.198]		[0.155]	
× recessions (γ^r)		0.965‡		-0.123		0.633		0.099
		[0.374]		[0.277]		[0.578]		[0.433]
× expansions (γ^e)		0.974‡		0.454‡		0.766‡		0.600‡
		[0.211]		[0.167]		[0.189]		[0.171]
Adjusted R^2	0.25	0.42	0.31	0.33	0.26	0.40	0.32	0.32
$\gamma^r = \gamma^e$ (p-value)		0.98		0.07		0.83		0.26
Investment								
Confidence	0.125‡		0.071‡		0.104‡		0.073‡	
	[0.020]		[0.012]		[0.018]		[0.012]	
× recessions (γ^r)		0.084‡		0.036†		0.074‡		0.042‡
		[0.025]		[0.015]		[0.017]		[0.015]
× expansions (γ^e)		0.075‡		0.051‡		0.068‡		0.059‡
		[0.016]		[0.012]		[0.016]		[0.012]
Adjusted R^2	0.12	0.34	0.14	0.27	0.11	0.35	0.15	0.29
$\gamma^r = \gamma^e$ (p-value)		0.74		0.37		0.78		0.35
Consumption								
Confidence	0.048‡		0.025‡		0.047‡		0.033‡	
	[0.007]		[0.005]		[0.007]		[0.006]	
× recessions (γ^r)		0.017		-0.006		0.034*		-0.003
		[0.013]		[0.010]		[0.020]		[0.018]
× expansions (γ^e)		0.032‡		0.021‡		0.027‡		0.024‡
		[0.007]		[0.005]		[0.006]		[0.006]
Adjusted R^2	0.12	0.30	0.13	0.25	0.18	0.36	0.18	0.30
$\gamma^r = \gamma^e$ (p-value)		0.29		0.01		0.74		0.14
Industrial production								
Confidence	0.086‡		0.023‡		0.041‡		0.021†	
	[0.013]		[0.008]		[0.012]		[0.009]	
× recessions (γ^r)		0.087‡		0.011		0.052‡		0.031‡
		[0.018]		[0.010]		[0.020]		[0.011]
× expansions (γ^e)		0.034‡		0.002		0.009		0.006
		[0.011]		[0.009]		[0.011]		[0.009]
Adjusted R^2	0.17	0.37	0.19	0.25	0.11	0.32	0.22	0.26
$\gamma^r = \gamma^e$ (p-value)		0.01		0.44		0.04		0.04

Note: The dependent variable is growth rate of respective macroeconomic variables at different horizons. The Newey-West standard errors are presented in brackets below the corresponding coefficients. *, †, and ‡ denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The p-values of testing the equality of coefficients for recessions and expansions are also provided, while the null hypothesis is that the two coefficients are equal.

Table A13. Forecasting ability of confidence: financial variables, by group

A. Advanced economies

	Business confidence				Consumer confidence			
Forecast horizon:	1 quarter		4 quarters		1 quarter		4 quarters	
Credit								
Confidence	0.026‡ [0.005]		0.031‡ [0.005]		0.031‡ [0.005]		0.033‡ [0.006]	
× downturns (γ^r)		0.011 [0.008]		0.002 [0.010]		0.014 [0.009]		0.016* [0.009]
× upturns (γ^e)		0.025‡ [0.005]		0.034‡ [0.006]		0.026‡ [0.006]		0.027‡ [0.006]
Adjusted R^2	0.47	0.53	0.44	0.52	0.53	0.57	0.53	0.58
$\gamma^r = \gamma^e$ (p-value)		0.12		0.00		0.25		0.30
Equity prices								
Confidence	0.000 [0.032]		-0.113‡ [0.029]		0.051* [0.029]		-0.077‡ [0.025]	
× downturns (γ^r)		0.052 [0.040]		-0.135‡ [0.034]		0.180‡ [0.042]		-0.059* [0.031]
× upturns (γ^e)		-0.054† [0.026]		-0.091‡ [0.026]		-0.048* [0.025]		-0.087‡ [0.024]
Adjusted R^2	0.15	0.45	0.12	0.35	0.16	0.43	0.11	0.32
$\gamma^r = \gamma^e$ (p-value)		0.01		0.22		0.00		0.45
House prices								
Confidence	0.027‡ [0.008]		0.009 [0.008]		0.059‡ [0.008]		0.045‡ [0.007]	
× downturns (γ^r)		0.032‡ [0.011]		0.000 [0.009]		0.050‡ [0.009]		0.027‡ [0.009]
× upturns (γ^e)		0.000 [0.007]		-0.003 [0.008]		0.027‡ [0.008]		0.026‡ [0.008]
Adjusted R^2	0.38	0.51	0.28	0.42	0.42	0.52	0.33	0.44
$\gamma^r = \gamma^e$ (p-value)		0.01		0.73		0.03		0.96

B. EMDEs

	Business confidence				Consumer confidence			
Forecast horizon:	1 quarter		4 quarters		1 quarter		4 quarters	
Credit								
Confidence	0.146‡		0.112‡		0.180‡		0.114‡	
	[0.037]		[0.019]		[0.062]		[0.025]	
× downturns (γ^r)		-0.004		-0.010		0.194		0.040
		[0.048]		[0.025]		[0.134]		[0.027]
× upturns (γ^e)		0.124‡		0.107‡		0.102‡		0.084‡
		[0.026]		[0.017]		[0.029]		[0.020]
Adjusted R^2	0.07	0.23	0.13	0.29	0.14	0.26	0.18	0.30
$\gamma^r = \gamma^e$ (p-value)		0.02		0.00		0.46		0.17
Equity prices								
Confidence	0.074		-0.027		0.039		-0.051	
	[0.059]		[0.055]		[0.049]		[0.048]	
× downturns (γ^r)		0.032		-0.120†		-0.002		-0.137‡
		[0.070]		[0.054]		[0.061]		[0.052]
× upturns (γ^e)		0.032		0.042		0.075		0.055
		[0.056]		[0.057]		[0.054]		[0.053]
Adjusted R^2	0.17	0.41	0.11	0.30	0.12	0.39	0.08	0.28
$\gamma^r = \gamma^e$ (p-value)		0.99		0.01		0.34		0.00
House prices								
Confidence	0.067‡		0.043‡		0.100‡		0.061‡	
	[0.019]		[0.015]		[0.028]		[0.021]	
× downturns (γ^r)		0.047		0.000		0.103‡		0.009
		[0.032]		[0.027]		[0.037]		[0.038]
× upturns (γ^e)		0.038†		0.043‡		0.032*		0.047†
		[0.017]		[0.016]		[0.019]		[0.023]
Adjusted R^2	0.24	0.33	0.27	0.38	0.27	0.33	0.25	0.32
$\gamma^r = \gamma^e$ (p-value)		0.81		0.16		0.04		0.42

Note: The dependent variable is growth rate of respective financial variables at different horizons. The Newey-West standard errors are presented in brackets below the corresponding coefficients. *, †, and ‡ denote the statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The p-values of testing the equality of coefficients for downturns and upturns are also provided, while the null hypothesis is that the two coefficients are equal.

Table A14. Variance decompositions: business confidence

A. Advanced economies

	Global	Group	Global+Group	Country	Idiosyncratic
Australia	**34.0**	**7.3**	**41.3**	**10.7**	**47.7**
	[32.3 35.9]	[5.6 8.8]	[37.9 44.7]	[3.9 21.0]	[37.5 53.1]
Austria	**64.8**	**19.4**	**84.2**	**5.5**	**10.1**
	[61.2 67.8]	[16.2 23.5]	[77.4 91.3]	[2.5 9.0]	[6.2 13.0]
Belgium	**65.8**	**11.3**	**77.1**	**2.8**	**19.6**
	[63.0 67.9]	[9.2 14.1]	[72.2 82]	[1.4 5.4]	[17.2 21.1]
Canada	**20.7**	**1.0**	**21.7**	**6.6**	**71.4**
	[19.9 21.5]	[0.6 1.6]	[20.5 23.1]	[2.0 15.2]	[62.4 75.7]
Cyprus	**31.9**	**3.4**	**35.3**	**10.7**	**53.4**
	[30.2 33.5]	[2.1 4.9]	[32.3 38.4]	[6.8 17.9]	[46.3 57.3]
Czech Republic	**57.1**	**9.9**	**67.1**	**1.6**	**30.4**
	[54.3 59.3]	[7.8 12.8]	[62.1 72]	[0.5 4.3]	[28.0 31.9]
Denmark	**44.8**	**5.8**	**50.6**	**8.7**	**40.2**
	[42.7 46.5]	[4.1 7.9]	[46.9 54.4]	[5.3 15.1]	[34.0 43.7]
Finland	**61.7**	**8.3**	**70.0**	**2.0**	**27.1**
	[59.3 63.7]	[6.3 10.7]	[65.7 74.4]	[0.6 6.0]	[23.7 28.6]
France	**72.3**	**12.4**	**84.7**	**1.9**	**12.6**
	[68.9 74.8]	[9.9 16.1]	[78.9 90.9]	[0.6 4.7]	[10.2 13.9]
Germany	**74.7**	**16.5**	**91.2**	**1.8**	**6.8**
	[71.0 77.6]	[13.4 20.3]	[84.5 97.9]	[1.2 2.6]	[5.9 7.5]
Greece	**35.2**	**2.4**	**37.6**	**9.4**	**52.6**
	[33.5 36.5]	[1.5 3.7]	[35.0 40.3]	[5.0 24.6]	[37.3 57.0]
Italy	**67.9**	**14.9**	**82.7**	**4.6**	**12.4**
	[64.3 70.8]	[11.9 18.8]	[76.2 89.6]	[3.7 5.8]	[11.1 13.4]
Japan	**30.1**	**25.6**	**55.7**	**6.2**	**37.2**
	[27.0 33.1]	[21.9 29.6]	[48.9 62.7]	[3.3 10.3]	[32.9 40.5]
Korea	**40.0**	**1.3**	**41.3**	**3.6**	**53.6**
	[38.9 41.1]	[0.6 2.1]	[39.5 43.2]	[1.1 9.6]	[48.4 56.2]
Luxembourg	**33.3**	**7.9**	**41.2**	**7.6**	**50.8**
	[31.5 34.7]	[6.4 9.8]	[37.9 44.4]	[3.3 18.6]	[40.0 54.9]
Netherland	**67.2**	**17.7**	**84.9**	**6.0**	**9.1**
	[63.5 70.4]	[14.5 21.4]	[78.0 91.8]	[3.5 8.5]	[6.1 11.6]
New Zealand	**21.2**	**13.7**	**34.9**	**31.3**	**33.0**
	[19.7 23.1]	[11.7 15.8]	[31.4 38.9]	[27.5 35.1]	[29.5 36.4]
Norway	**67.8**	**0.5**	**68.3**	**0.2**	**30.0**
	[66.7 69.0]	[0.2 0.9]	[66.8 70.0]	[0.1 0.3]	[28.5 31.3]
Portugal	**70.5**	**2.7**	**73.2**	**12.6**	**13.9**
	[68.5 72.0]	[1.5 4.3]	[70.0 76.4]	[8.8 16.3]	[9.8 17.7]
Slovak Republic	**47.1**	**0.3**	**47.4**	**4.5**	**47.3**
	[46.0 48.1]	[0.1 0.7]	[46.2 48.8]	[1.7 11.0]	[41.0 49.8]
Slovenia	**74.1**	**10.5**	**84.6**	**9.4**	**6.1**
	[71.2 76.4]	[8.1 13.5]	[79.3 89.9]	[7.5 11.1]	[4.4 7.9]
Spain	**68.6**	**4.4**	**73.0**	**6.5**	**20.3**
	[66.5 70.5]	[2.9 6.2]	[69.4 76.6]	[3.8 10.6]	[16 22.7]
Sweden	**47.2**	**8.8**	**55.9**	**21.2**	**22.8**
	[45.0 48.9]	[7.0 11.4]	[52 60.3]	[15.5 26.8]	[16.8 28.4]
Switzerland	**53.3**	**8.2**	**61.5**	**14.3**	**24.0**
	[51.7 58]	[14.7 21.9]	[66.4 79.9]	[18.4 23.1]	[3.4 8.2]
United Kingdom	**53.3**	**8.2**	**61.5**	**14.3**	**24.0**
	[51.2 55.4]	[6.0 10.4]	[57.2 65.8]	[10.8 19.2]	[19 27.6]
United States	**56.8**	**0.3**	**57.1**	**6.2**	**35.8**
	[55.7 57.9]	[0.1 0.6]	[55.8 58.5]	[1.6 18.7]	[23.9 40.2]

B. EMDEs

	Global	Group	Global+Group	Country	Idiosyncratic
Brazil	**47.9**	**1.3**	**49.2**	**12.0**	**38.4**
	[46.4 49.1]	[0.5 2.6]	[46.9 51.7]	[6.5 18.6]	[31.9 43.7]
Bulgaria	**14.5**	**3.3**	**17.8**	**7.1**	**72.7**
	[12.8 16]	[1.4 5.8]	[14.2 21.8]	[4 11.5]	[68.1 76.4]
China	**18.4**	**4.2**	**22.6**	**13.4**	**61.2**
	[17 20.2]	[2.4 6.1]	[19.4 26.3]	[7 23.2]	[51.9 68.2]
Colombia	**35.2**	**0.4**	**35.6**	**22.4**	**41.7**
	[34.2 36.1]	[0.2 0.9]	[34.4 37]	[17.2 29.6]	[34.5 46.7]
Hungary	**67.8**	**3.7**	**71.5**	**4.8**	**22.9**
	[65.1 70.1]	[2.1 5.7]	[67.2 75.7]	[1.9 10.2]	[18.1 25.5]
Indonesia	**27.5**	**1.3**	**28.8**	**5.0**	**64.3**
	[26.4 28.6]	[0.6 2.5]	[27 31.1]	[1.6 12.5]	[57.1 68.2]
Mexico	**51.9**	**0.9**	**52.7**	**19.4**	**27.4**
	[50.5 53.2]	[0.3 1.7]	[50.9 54.9]	[14.3 25.2]	[21.2 32.8]
Poland	**51.2**	**7.6**	**58.8**	**15.1**	**24.6**
	[47.5 54.1]	[4.3 11.4]	[51.8 65.5]	[9.8 23.6]	[16 30.6]
Romania	**24.7**	**6.6**	**31.4**	**16.3**	**50.7**
	[22.4 26.8]	[3.4 10.4]	[25.8 37.2]	[11.5 21.3]	[45.4 55.5]
Russia	**55.9**	**1.2**	**57.1**	**7.5**	**35.1**
	[54.4 57.3]	[0.5 2.3]	[54.9 59.6]	[3.2 13.6]	[29.3 38.7]
South Africa	**15.8**	**4.9**	**20.7**	**12.6**	**65.6**
	[14.3 17]	[2.7 7.4]	[17 24.3]	[7.6 19.6]	[58.3 70.7]
Thailand	**26.7**	**1.4**	**28.1**	**22.1**	**48.4**
	[25.3 28.2]	[0.6 2.5]	[25.9 30.7]	[15.2 29.1]	[40.9 55.6]

Note: The median variance share (percent) and the 33-66 percentile range of business confidence explained by the global, group, and country factors, and the idiosyncratic term for each country. These are from the baseline factor model jointly estimated on business and consumer confidence during 2002-15 (full sample).

Table A15. Variance decompositions: consumer confidence

A. Advanced economies

	Global	Group	Global+Group	Country	Idiosyncratic
Australia	**12.6** [11.3 13.9]	**12.5** [10.4 14.6]	**25.1** [21.7 28.5]	**6.9** [3.1 16]	**66.5** [57.7 70.4]
Austria	**57.7** [56.5 58.8]	**0.5** [0.2 1.1]	**58.2** [56.7 59.9]	**4.0** [2.2 7.8]	**36.7** [33.1 38.6]
Belgium	**44.4** [43 45.7]	**3.7** [2.2 5.3]	**48.1** [45.2 51]	**14.3** [6.4 25.6]	**36.9** [25.5 44.6]
Canada	**48.4** [46.4 50.4]	**6.9** [5 9.1]	**55.3** [51.4 59.5]	**3.5** [1.2 7.7]	**39.1** [35.1 41.9]
Cyprus	**11.7** [11 12.4]	**0.3** [0.1 0.6]	**12.0** [11.1 13.1]	**34.2** [19.1 49.4]	**53.4** [38.2 68.6]
Czech Republic	**31.0** [29.9 32]	**1.1** [0.5 1.9]	**32.1** [30.4 33.9]	**11.3** [4.2 23.4]	**55.6** [43.9 62.7]
Denmark	**33.9** [31.7 36.1]	**15.6** [12.8 18.1]	**49.4** [44.5 54.3]	**16.3** [9 25.1]	**33.9** [24.5 40.6]
Finland	**57.8** [56.2 59.3]	**1.9** [1 2.8]	**59.7** [57.3 62.1]	**3.4** [1.1 9.4]	**35.1** [30 37.9]
France	**40.9** [39.7 42.1]	**2.7** [1.6 3.9]	**43.5** [41.3 46]	**5.7** [2.2 13.8]	**49.4** [41.7 52.8]
Germany	**42.7** [40.8 44.2]	**2.9** [1.7 4.8]	**45.5** [42.5 49]	**26.0** [17.9 34.4]	**27.8** [19.3 36.2]
Greece	**9.3** [8.2 10.5]	**13.8** [11.7 15.9]	**23.1** [19.9 26.4]	**21.0** [8.5 43.4]	**55.7** [32.5 67.4]
Italy	**10.9** [9.9 12]	**10.2** [8.1 12]	**21.1** [18 24]	**54.3** [45.3 62.2]	**23.4** [15.3 33.2]
Japan	**19.7** [18.2 21.3]	**9.3** [7.6 11]	**29.0** [25.9 32.3]	**11.1** [5.4 20.1]	**58.9** [49.6 64.8]
Korea	**25.1** [22.8 27.7]	**22.1** [19.4 24.8]	**47.2** [42.1 52.5]	**6.2** [2.7 12.7]	**44.7** [38.5 48.8]
Luxembourg	**46.2** [45 47.4]	**0.9** [0.4 1.6]	**47.2** [45.5 49]	**11.4** [4 26.6]	**40.5** [25.4 47.6]
Netherland	**46.8** [45.7 47.8]	**0.5** [0.2 1]	**47.3** [45.9 48.8]	**8.0** [4.9 13.2]	**44.2** [38.8 47.1]
New Zealand	**2.6** [2.2 3.3]	**14.0** [11.8 16.2]	**16.6** [14 19.5]	**49.4** [44 54.5]	**33.3** [28.3 38.2]
Norway	**38.0** [36.4 39.7]	**3.5** [2.3 5]	**41.5** [38.6 44.7]	**0.6** [0.4 0.9]	**55.4** [52.5 57.6]
Portugal	**23.9** [22.5 25.2]	**7.2** [5.3 9.2]	**31.1** [27.8 34.4]	**10.8** [7.2 16.5]	**57.6** [51.9 61]
Slovak Republic	**32.2** [31.1 33.3]	**0.7** [0.3 1.3]	**32.9** [31.4 34.6]	**15.0** [4.8 30.5]	**51.4** [36 61.1]
Slovenia	**22.4** [21.3 23.4]	**0.4** [0.1 0.8]	**22.8** [21.5 24.2]	**25.0** [20.3 31.4]	**52.1** [45.8 56.5]
Spain	**29.1** [27.1 31.2]	**19.5** [16.1 22.4]	**48.6** [43.1 53.6]	**13.8** [7.4 24.2]	**37.0** [26.7 42.9]
Sweden	**45.8** [44.3 47.3]	**2.9** [1.8 4.2]	**48.7** [46.1 51.6]	**12.2** [9 16.9]	**38.0** [33.1 41.6]
Switzerland	**26.7** [45.8 49.2]	**16.6** [3.9 7.5]	**43.4** [49.7 56.7]	**29.8** [10.7 14.8]	**25.3** [31.8 35.6]
United Kingdom	**26.7** [25.1 28.8]	**16.6** [13.8 19.6]	**43.4** [38.8 48.3]	**29.8** [22.1 37.5]	**25.3** [17 34.2]
United States	**15.9** [14.5 17.3]	**10.7** [8.9 12.6]	**26.6** [23.4 30]	**5.5** [1.7 19.1]	**65.2** [53.4 69.6]

B. EMDEs

	Global	Group	Global+Group	Country	Idiosyncratic
Brazil	**3.4**	**0.8**	**4.3**	**16.4**	**78.3**
	[3.0 3.9]	[0.3 1.7]	[3.4 5.6]	[9.4 25.7]	[68.7 85.1]
Bulgaria	**0.3**	**3.3**	**3.7**	**31.1**	**62.3**
	[0.2 0.5]	[1.4 6.3]	[1.6 6.8]	[17 49.2]	[43.9 76.1]
China	**11.7**	**1.1**	**12.8**	**15.6**	**70.7**
	[11.0 12.4]	[0.4 2.2]	[11.4 14.5]	[8.5 25.6]	[60.7 78]
Colombia	**10.8**	**2.3**	**13.1**	**40.9**	**45.5**
	[10.0 11.6]	[1.2 3.8]	[11.2 15.4]	[30 51.4]	[34.5 56.3]
Hungary	**19.3**	**1.0**	**20.4**	**7.6**	**71.1**
	[18.3 20.2]	[0.5 2.2]	[18.7 22.4]	[3.5 16.2]	[62.8 74.9]
Indonesia	**0.1**	**4.2**	**4.3**	**6.5**	**86.8**
	[0.1 0.3]	[2.4 6.4]	[2.4 6.7]	[2.4 16.6]	[76.8 91.7]
Mexico	**11.5**	**0.7**	**12.2**	**23.7**	**63.2**
	[10.8 12.1]	[0.3 1.4]	[11.2 13.6]	[17.5 33.1]	[54.2 69.6]
Poland	**28.7**	**1.5**	**30.2**	**18.9**	**50.6**
	[26.9 30.3]	[0.7 2.9]	[27.6 33.1]	[13.1 29.5]	[39.7 57.1]
Romania	**11.1**	**1.3**	**12.4**	**37.1**	**49.0**
	[9.8 12.1]	[0.6 2.6]	[10.4 14.8]	[27.2 46.7]	[39.4 58.5]
Russia	**31.6**	**4.8**	**36.4**	**7.9**	**54.5**
	[29.4 33.4]	[2.9 7.1]	[32.2 40.5]	[4.1 14.4]	[48.8 58.2]
South Africa	**5.4**	**0.7**	**6.2**	**21.5**	**71.3**
	[4.9 6.0]	[0.3 1.4]	[5.2 7.4]	[11.3 38.2]	[54.6 81.7]
Thailand	**3.3**	**0.9**	**4.2**	**32.8**	**62.5**
	[3.0 3.7]	[0.4 1.7]	[3.3 5.4]	[24.8 40.3]	[54.7 70.3]

Note: The median variance share (percent) and the 33-66 percentile range of consumer confidence explained by the global, group, and country factors, and the idiosyncratic term for each country. These are from the baseline factor model jointly estimated on business and consumer confidence during 2002-15 (full sample).

Table A16. Variance decompositions: output

A. Advanced economies

	Global	Group	Global+Group	Idiosyncratic
Australia	**0.2**	**17.9**	**18.1**	**81.8**
	[0.1 0.4]	[15.2 20.5]	[15.3 20.9]	[79.2 84.5]
Austria	**43.9**	**10.0**	**53.8**	**46.0**
	[41.5 46]	[7.9 12.4]	[49.4 58.4]	[44.6 47.5]
Belgium	**46.3**	**24.9**	**71.2**	**28.7**
	[42.8 49.2]	[21.7 28.5]	[64.5 77.7]	[27.3 30.2]
Canada	**45.5**	**3.9**	**49.5**	**50.2**
	[43.7 47.1]	[2.7 5.5]	[46.4 52.7]	[49 51.5]
Cyprus	**20.3**	**1.2**	**21.5**	**77.7**
	[18.6 21.9]	[0.5 2.4]	[19.1 24.3]	[76.3 79]
Czech Republic	**73.9**	**2.4**	**76.3**	**23.1**
	[71.8 75.6]	[1.2 4.0]	[73.1 79.6]	[21.9 24.4]
Denmark	**25.4**	**21.2**	**46.6**	**53.3**
	[22.8 27.8]	[17.4 25.1]	[40.2 52.9]	[51.0 55.6]
Finland	**79.3**	**0.5**	**79.8**	**19.7**
	[77.9 80.6]	[0.2 1.2]	[78.1 81.8]	[18.6 20.8]
France	**61.6**	**13.2**	**74.7**	**25.1**
	[58.8 64.3]	[10.5 16.1]	[69.3 80.4]	[24 26.2]
Germany	**54.0**	**8.6**	**62.6**	**37.1**
	[51.5 56.3]	[6.4 11.3]	[57.8 67.6]	[35.7 38.5]
Greece	**28.6**	**0.5**	**29.1**	**70.6**
	[27.1 30.0]	[0.2 1.0]	[27.3 31.0]	[69.0 72.1]
Italy	**60.8**	**17.3**	**78.0**	**22.0**
	[57.7 63.6]	[14.2 20.4]	[71.9 84.0]	[20.9 23.1]
Japan	**33.3**	**4.8**	**38.1**	**61.6**
	[31.7 34.9]	[3.3 6.5]	[34.9 41.4]	[60.3 62.9]
Korea	**21.3**	**26.1**	**47.4**	**52.6**
	[18.9 23.7]	[22.5 29.8]	[41.4 53.4]	[50.0 55.3]
Luxembourg	**8.5**	**35.5**	**44.0**	**56.0**
	[7.0 10.2]	[31.1 39.8]	[38.1 50.0]	[52.0 59.7]
Netherland	**75.8**	**1.1**	**76.9**	**22.6**
	[74.3 77.1]	[0.5 2.2]	[74.8 79.3]	[21.6 23.6]
New Zealand	**9.4**	**3.6**	**13.0**	**86.6**
	[8.4 10.4]	[2.1 5.2]	[10.5 15.6]	[85.5 87.6]
Norway	**5.4**	**1.0**	**6.4**	**92.9**
	[4.7 6.2]	[0.4 2.0]	[5.1 8.2]	[92.0 93.6]
Portugal	**45.4**	**7.6**	**53.0**	**46.7**
	[43.1 47.3]	[5.2 10.3]	[48.3 57.6]	[45.4 48.0]
Slovak Republic	**65.3**	**4.2**	**69.5**	**29.6**
	[63.2 67.4]	[2.4 6.3]	[65.6 73.7]	[27.1 32.0]
Slovenia	**70.4**	**9.1**	**79.5**	**20.3**
	[67.6 72.7]	[7.0 11.8]	[74.5 84.5]	[19.2 21.4]
Spain	**51.0**	**6.7**	**57.7**	**41.6**
	[48.3 53.4]	[4.3 9.5]	[52.6 62.8]	[39.9 43.5]
Sweden	**40.1**	**16.6**	**56.7**	**43.0**
	[37.4 42.8]	[13.1 20.4]	[50.6 63.2]	[41.1 44.8]
Switzerland	**41.9**	**17.6**	**59.5**	**40.5**
	[40.4 46.0]	[14.7 20.6]	[55.2 66.7]	[37.3 40.5]
United Kingdom	**41.9**	**17.6**	**59.5**	**40.5**
	[39.2 44.3]	[14.9 20.6]	[54.1 64.8]	[38.8 42.1]
United States	**35.8**	**9.9**	**45.7**	**54.2**
	[33.8 37.8]	[7.8 12.1]	[41.6 49.9]	[52.6 55.5]
Average	*41.7*	*10.9*	*52.6*	*47.1*
Median	*42.9*	*8.9*	*55.3*	*44.5*

B. EMDEs

	Global	Group	Global+Group	Idiosyncratic
Brazil	**23.2**	**2.5**	**25.7**	**73.6**
	[21.5 24.7]	[1.3 4.2]	[22.8 28.9]	[72 75.2]
Bulgaria	**54.5**	**0.9**	**55.4**	**44.0**
	[52.5 56.6]	[0.4 1.6]	[52.9 58.1]	[41.9 46.1]
China	**15.1**	**0.9**	**16.0**	**83.4**
	[14 16.2]	[0.4 1.7]	[14.4 17.9]	[82.3 84.5]
Colombia	**12.1**	**3.8**	**15.9**	**83.7**
	[10.8 13.3]	[2.3 5.6]	[13.1 18.8]	[82.4 85]
Hungary	**53.2**	**3.4**	**56.6**	**43.0**
	[51.2 55.1]	[2 5]	[53.1 60.1]	[41.6 44.4]
Indonesia	**1.1**	**6.5**	**7.7**	**92.2**
	[0.7 1.6]	[4.5 8.8]	[5.2 10.4]	[90 94.1]
Mexico	**52.0**	**3.0**	**55.0**	**44.5**
	[50.2 53.6]	[1.8 4.5]	[51.9 58.1]	[42.9 46]
Poland	**9.3**	**2.8**	**12.1**	**87.2**
	[8.2 10.3]	[1.3 4.7]	[9.6 15.1]	[85.9 88.5]
Romania	**65.2**	**0.3**	**65.4**	**34.3**
	[63.7 66.6]	[0.1 0.5]	[63.8 67.1]	[32.9 35.8]
Russia	**58.3**	**2.5**	**60.8**	**38.9**
	[56.3 60.1]	[1.6 3.8]	[57.9 63.8]	[37.4 40.3]
South Africa	**56.0**	**0.9**	**56.8**	**42.7**
	[54.5 57.5]	[0.4 1.6]	[54.9 59.1]	[41.4 44]
Thailand	**17.8**	**0.3**	**18.2**	**81.5**
	[16.7 18.9]	[0.1 0.7]	[16.8 19.6]	[80.4 82.6]
Average	*34.8*	*2.3*	*37.1*	*62.4*
Median	*37.6*	*2.5*	*40.4*	*59.1*

Note: The variance share (percent) of output explained by the global and group factors, and the idiosyncratic term. The model features no country factors. These are from the alternative factor model estimated only on output during 2002-15 (full sample). Bolded denote medians. Numbers in the parentheses refer to the 33 and 66 percentiles.
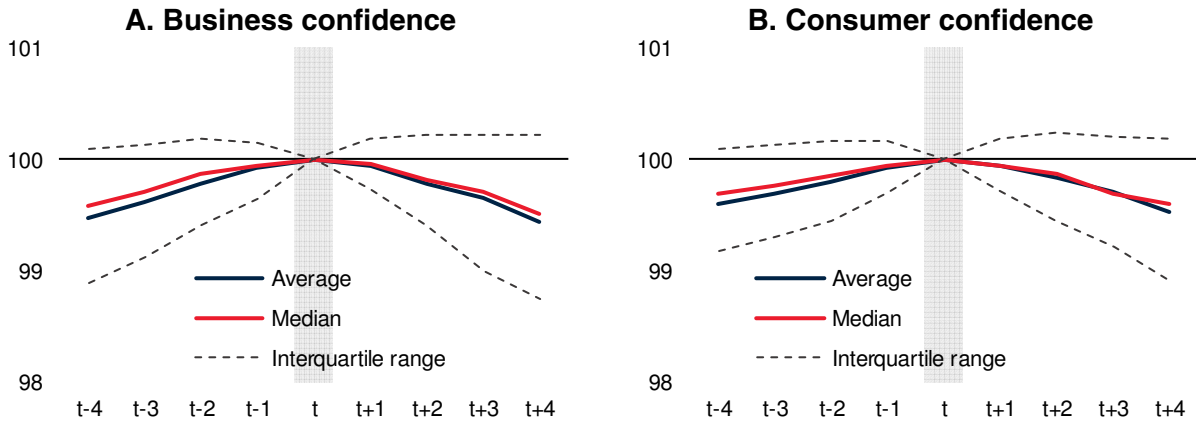
Figure A1. Confidence over financial cycles based on house prices, all countries
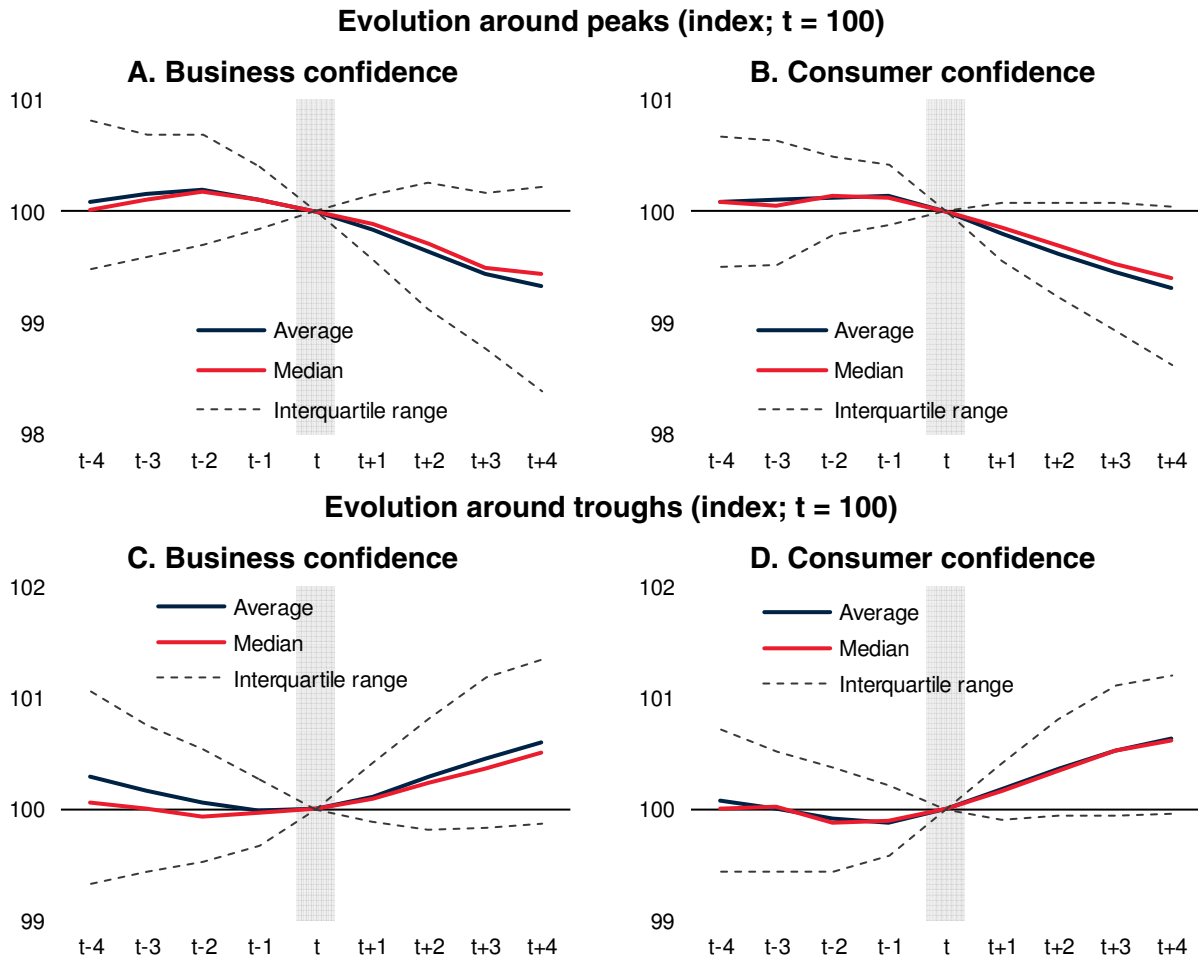
Evolution around peaks (index; t = 100)

A. Business confidence

B. Consumer confidence

Evolution around troughs (index; t = 100)

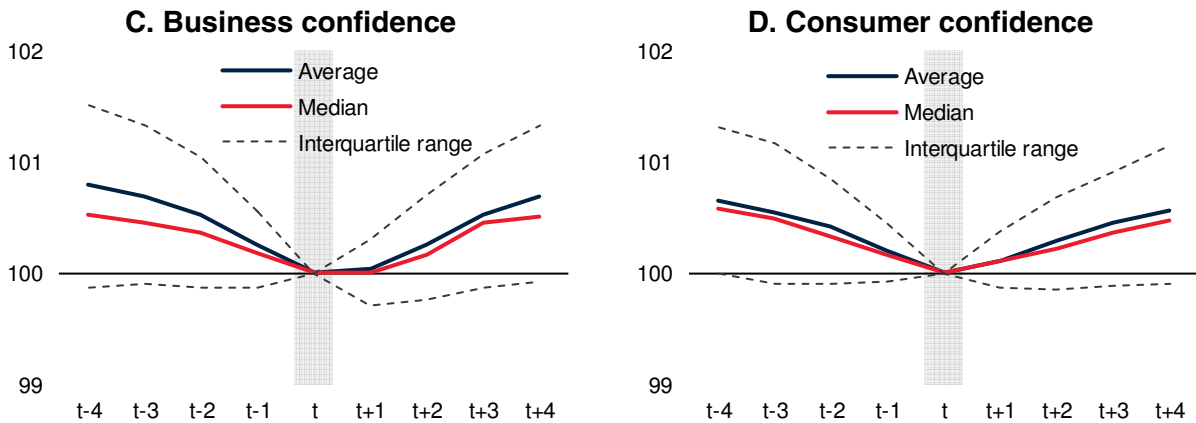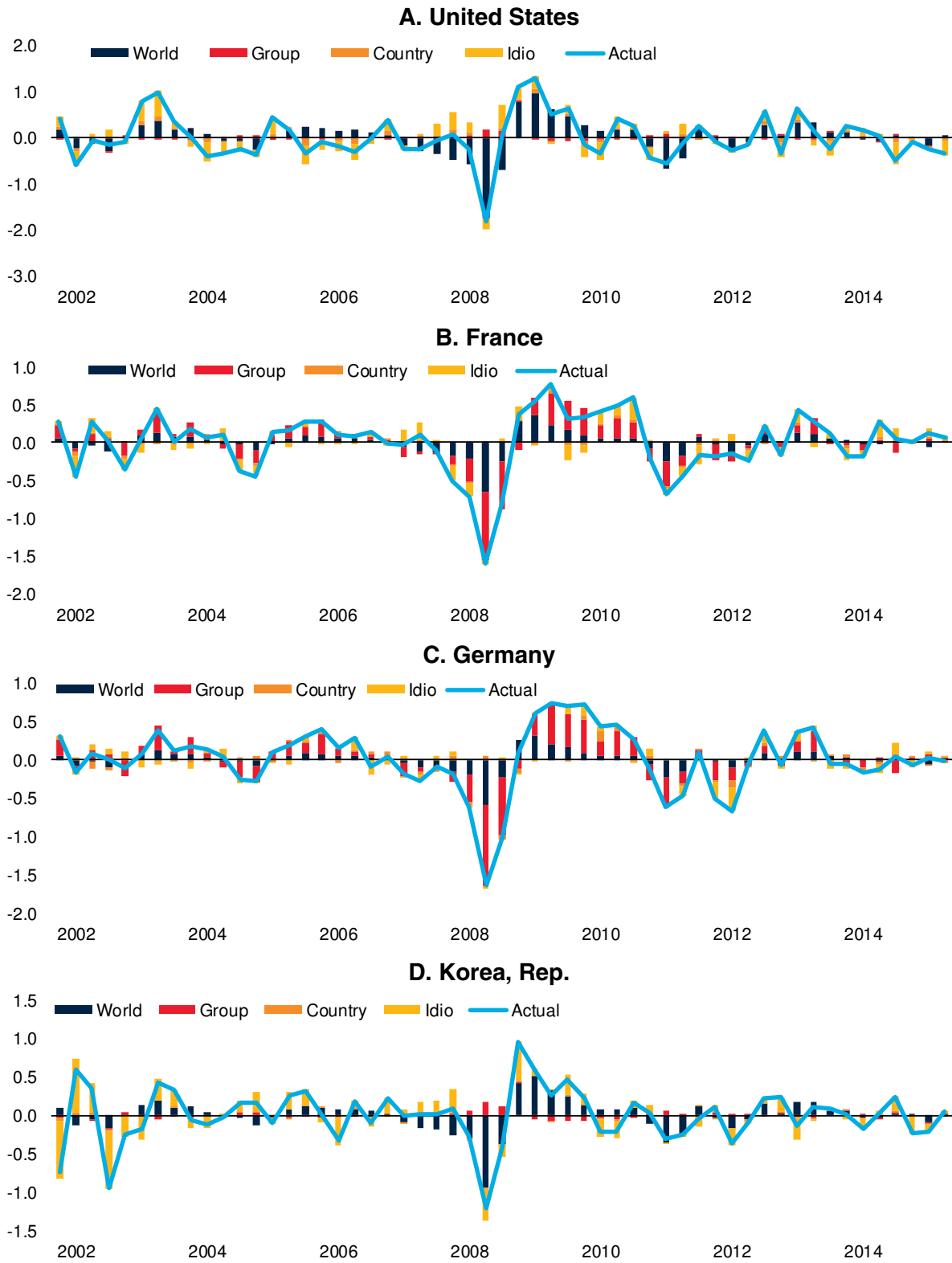**C. Business confidence**

D. Consumer confidence

Note: Evolution of business and consumer confidence around at financial cycle peaks (Panels A and B) and troughs (Panels C and D), which are denoted as *t*. The peaks and troughs are determined by the algorithm in Harding and Pagan (2002) and are based on house prices. All confidence series are rescaled to 100 at time *t*. The horizontal axis refers to the time period before and after the event in quarters. The analysis is based on an unbalanced panel with a maximum time series coverage of 1960Q1-2017Q2.
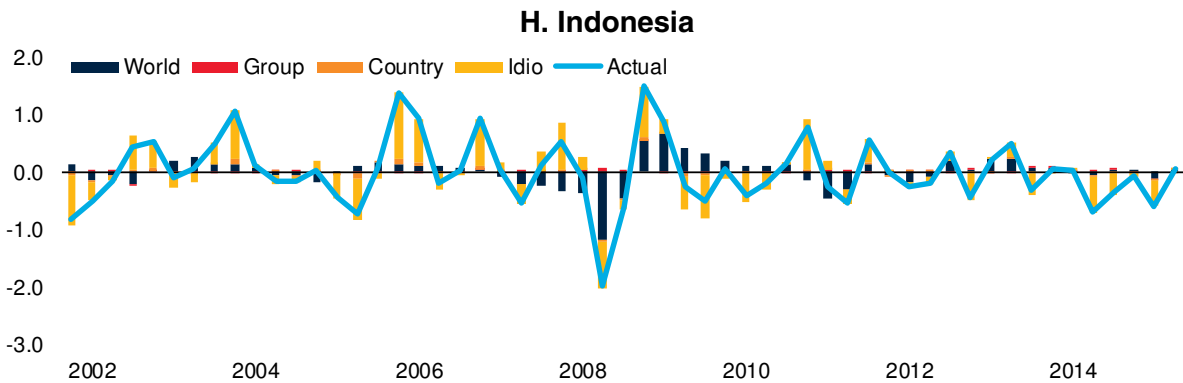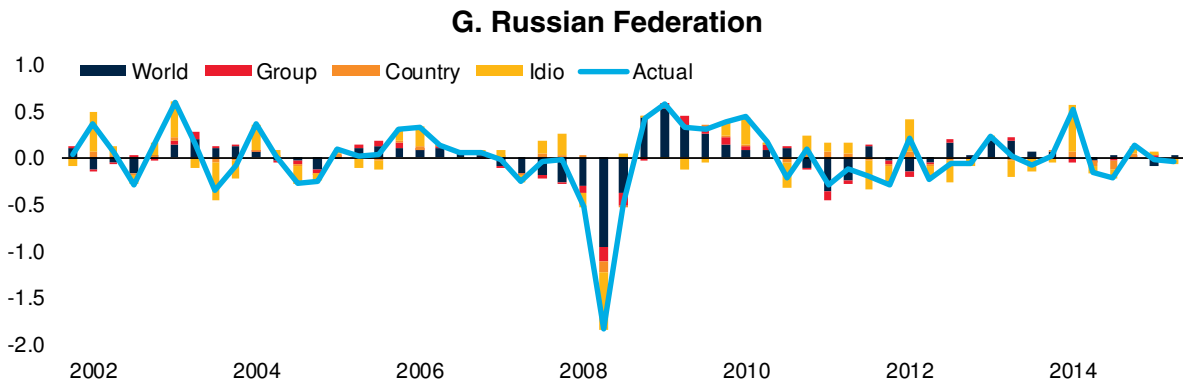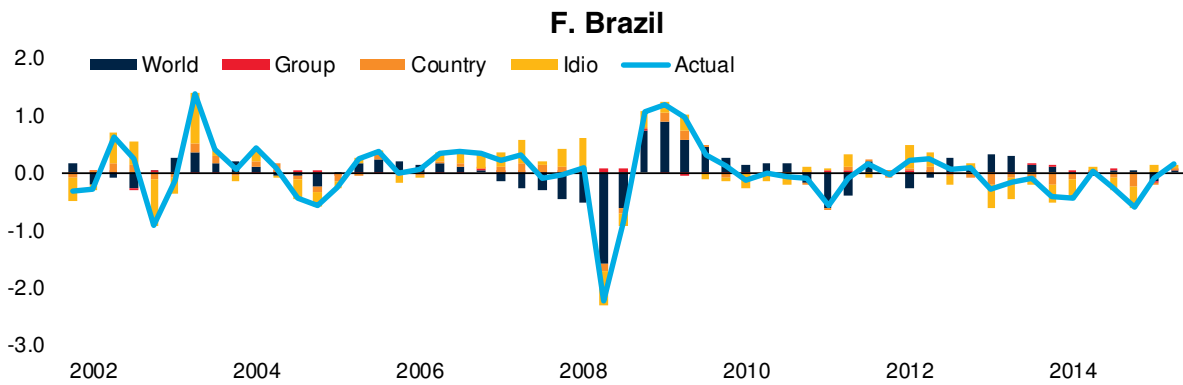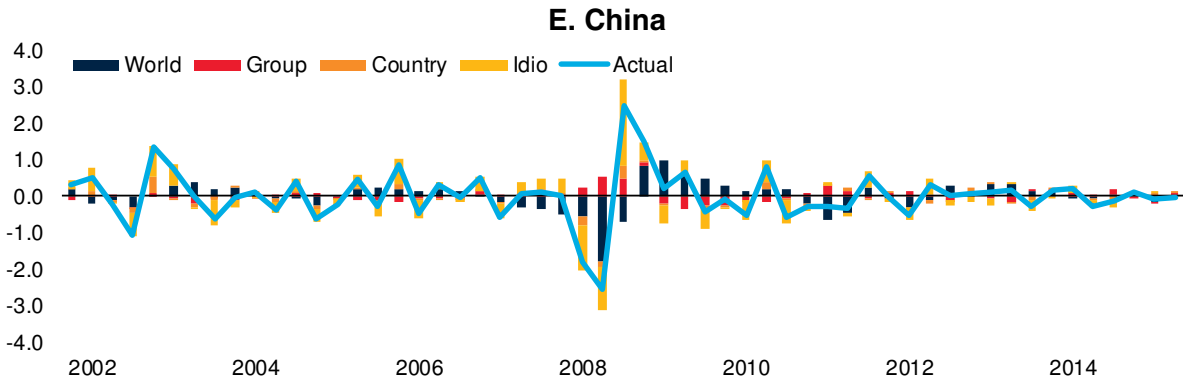
Figure A2. Confidence over financial cycles based on equity prices, all countries

Evolution around peaks (index; t = 100)

A. Business confidence

Average
Median
Interquartile range

B. Consumer confidence

Average
Median
Interquartile range

Evolution around troughs (index; t = 100)

C. Business confidence

Average
Median
Interquartile range

D. Consumer confidence

Average
Median
Interquartile range

Note: Evolution of business and consumer confidence around at financial cycle peaks (Panels A and B) and troughs (Panels C and D), which are denoted as *t*. The peaks and troughs are determined by the algorithm in Harding and Pagan (2002) and are based on equity prices. All confidence series are rescaled to 100 at time *t*. The horizontal axis refers to the time period before and after the event in quarters. The analysis is based on an unbalanced panel with a maximum time series coverage of 1960Q1-2017Q2.

Figure A3. Variance share explained by global and group factors: robustness

A. Business confidence

B. Consumer confidence
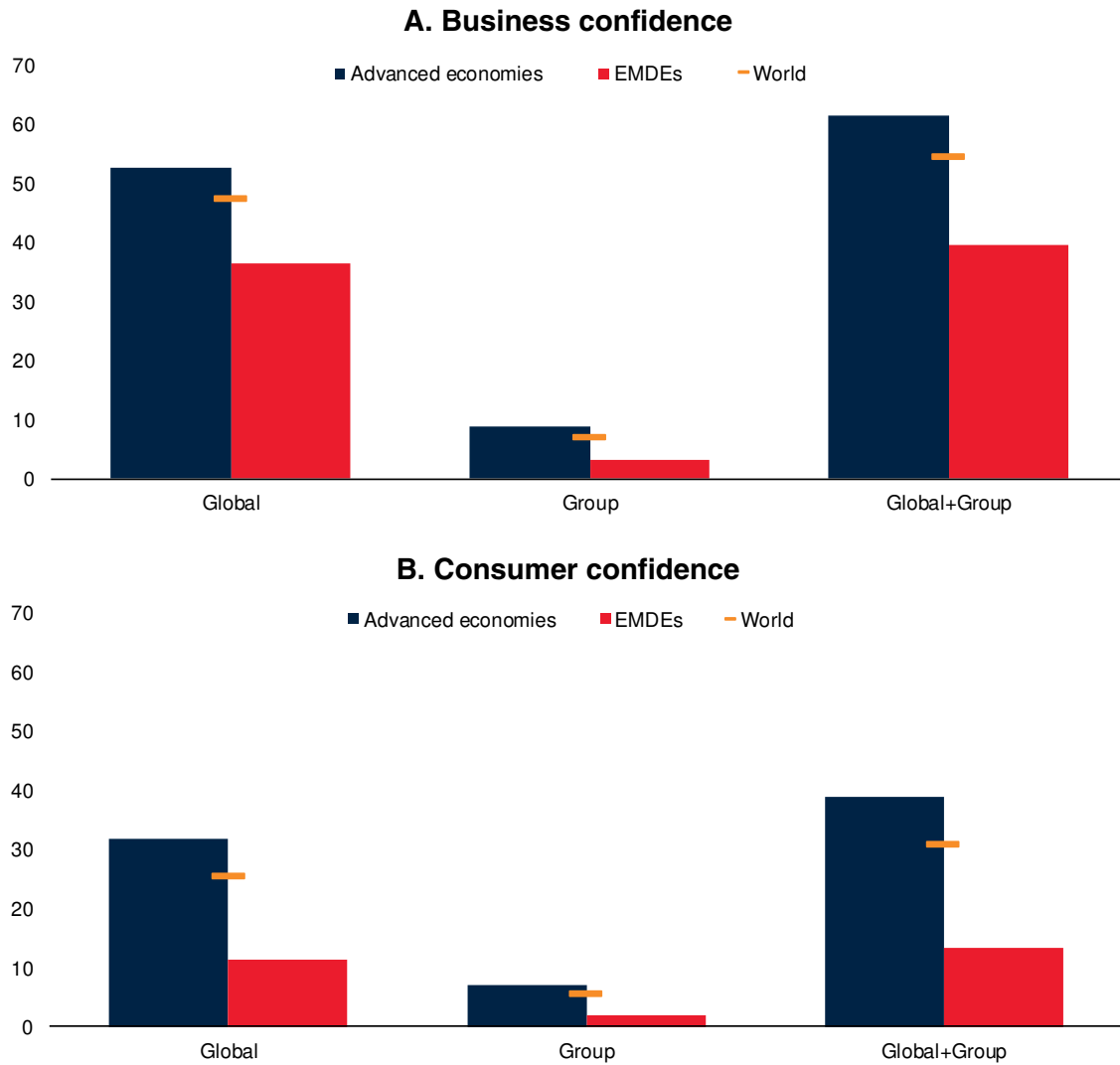
Note: The variance share (percent) of business and consumer confidence explained by the global and group factors. Results for business (consumer) confidence are based on the alternative model estimated only on business (consumer) confidence during 2002-15 (full sample). All figures refer to the cross-sectional average variance share in each country group.
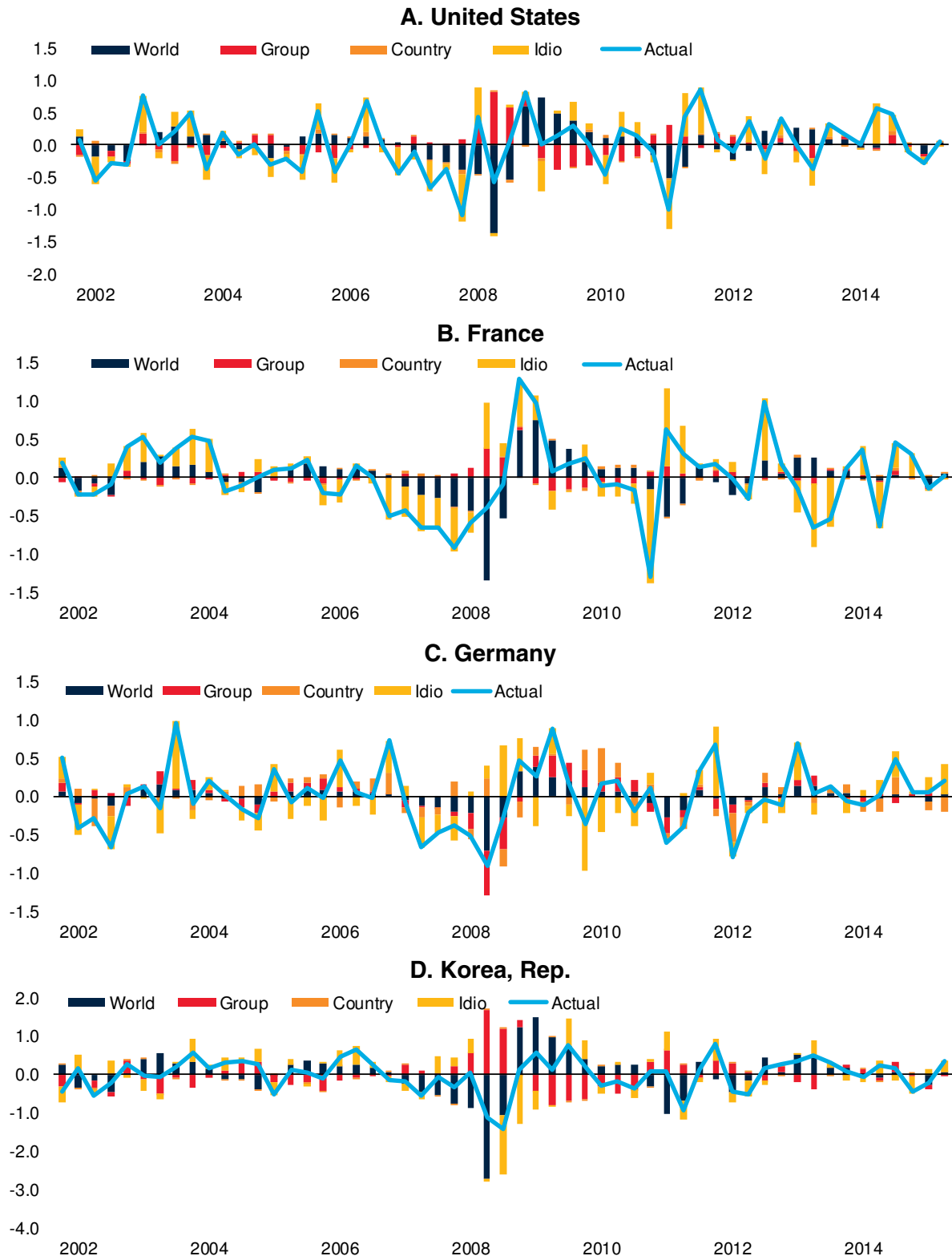
Figure A4. Decomposition of business confidence in select countries

A. United States

B. France

C. Germany

D. Korea, Rep.

E. China
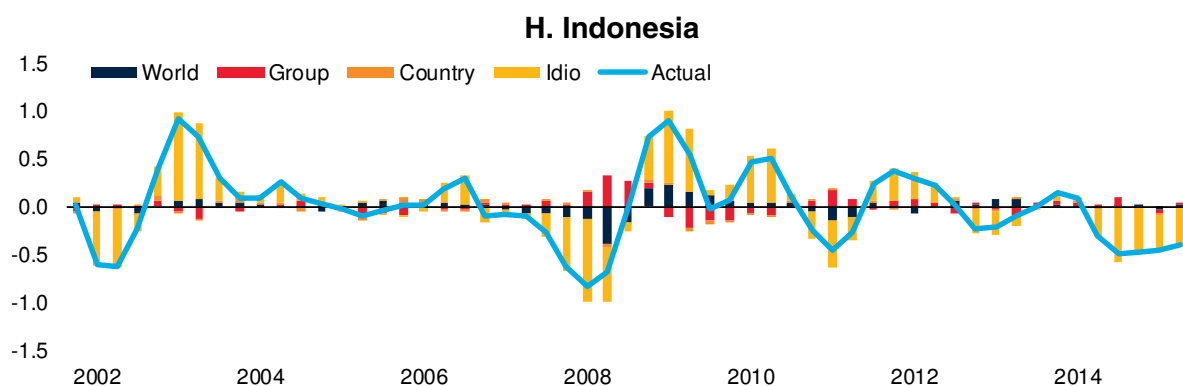

F. Brazil

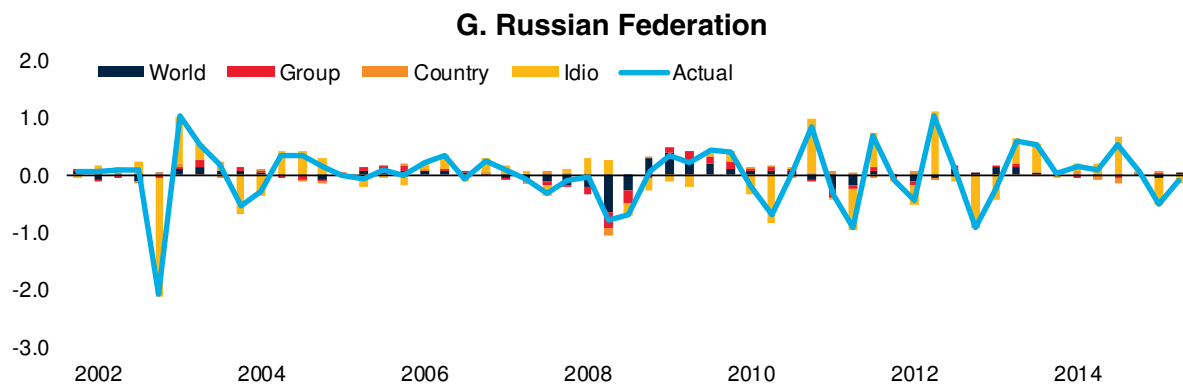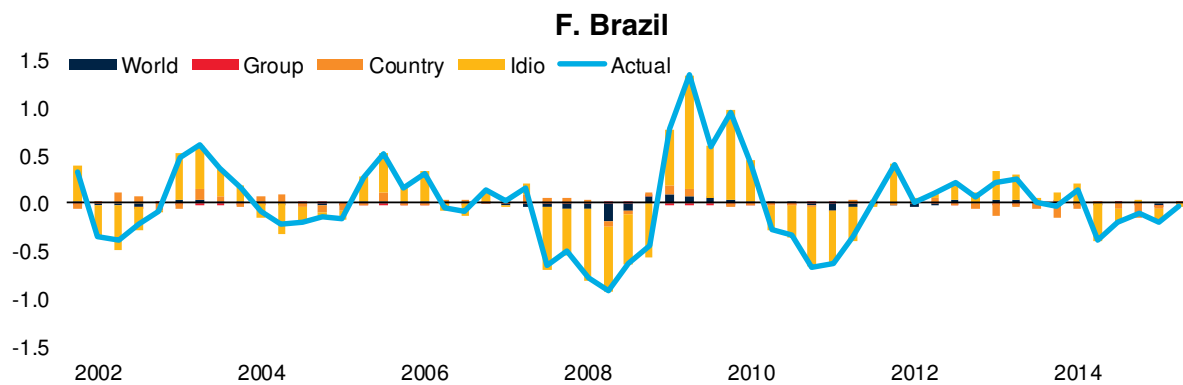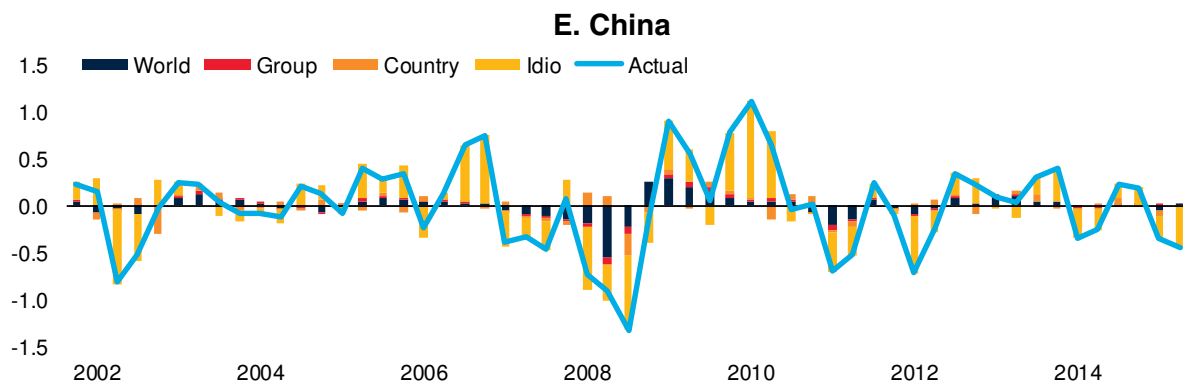## G. Russian Federation

H. Indonesia

Note: Change in business confidence in select advanced economies (Panels A-D) and EMDEs (Panels E-H), and the contributions of the global, group, and country factors, and the idiosyncratic term. These are from the baseline factor model estimated jointly on business and consumer confidence during 2002-15 (full sample).

Figure A5. Decomposition of consumer confidence in select countries

A. United States

B. France

C. Germany

D. Korea, Rep.

E. China

Legend: World | Group | Country | Idio | Actual

Y-axis: 1.5, 1.0, 0.5, 0.0, -0.5, -1.0, -1.5
X-axis: 2002, 2004, 2006, 2008, 2010, 2012, 2014

F. Brazil

Legend: World | Group | Country | Idio | Actual

Y-axis: 1.5, 1.0, 0.5, 0.0, -0.5, -1.0, -1.5
X-axis: 2002, 2004, 2006, 2008, 2010, 2012, 2014

G. Russian Federation

Legend: World | Group | Country | Idio | Actual

Y-axis: 2.0, 1.0, 0.0, -1.0, -2.0, -3.0
X-axis: 2002, 2004, 2006, 2008, 2010, 2012, 2014

H. Indonesia

Legend: World | Group | Country | Idio | Actual

Y-axis: 1.5, 1.0, 0.5, 0.0, -0.5, -1.0, -1.5
X-axis: 2002, 2004, 2006, 2008, 2010, 2012, 2014

Note: Change in consumer confidence in select advanced economies (Panels A-D) and EMDEs (Panels E-H), and the contributions of the global, group, and country factors, and the idiosyncratic term. These are from the baseline factor model estimated jointly on business and consumer confidence during 2002-15 (full sample).
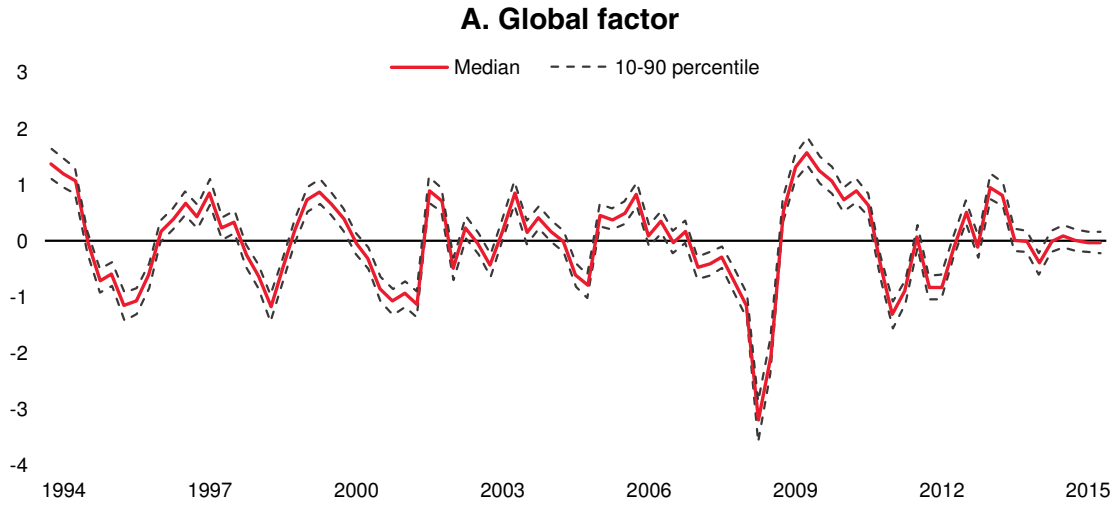
Figure A6. Factor model estimates for G6 countries

A. Global factor

B. Variance share explained by the global factor
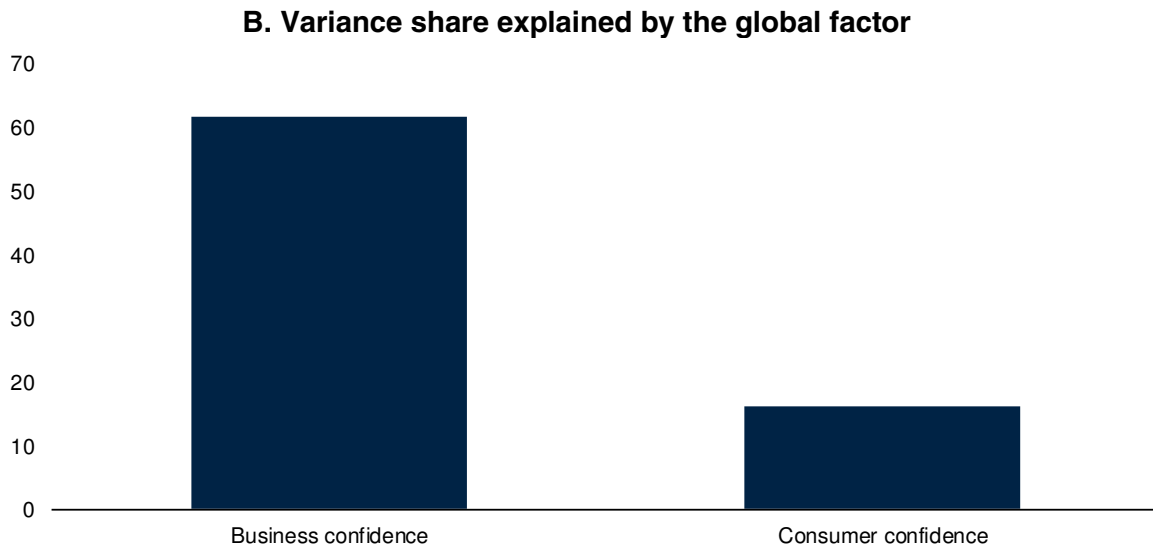
Note: Panel A shows the estimated global factor for the G6 (G7 minus Canada) countries. In Panel B, the average variance shares of business and consumer confidence explained by the global factor is presented.