Executive summary. The global economy is grappling with the most severe financial shock since the Great Depression. Indicative of the magnitude of the shock, equity market volatility is at or near unprecedented levels, corporate bond yields are extremely high relative to U.S. Treasury yields, and commodity and equity prices have plummeted. With the global financial system deleveraging and the U.S. economy in the midst of a severe recession, the global economy is decelerating quickly after years of heady growth.

These profound recent developments raise important longer-term questions with respect to the world economy and global financial markets. In this paper, we address several related questions:

- Given the increased linkages among financial markets, trading partners, and capital flows around the world, how synchronized is the global economy?
- Has the global business cycle become less sensitive to the U.S. economy over time? Is the United States still the “locomotive” that drives world economic growth?
- Have emerging markets “decoupled” from the rest of the world? Can the explosive growth of the so-called BRIC (Brazil, Russia, India, and China) economies counteract recessions in developed markets?
- How do changes in the global business cycle affect the diversification benefits of international investing? Is global diversification at risk?

1 We would like to thank Lindsay Fay and Julieann Shanahan for excellent research assistance.
We find that—despite more integrated trade and financial linkages around the world—the global business cycle accounts for only approximately 50%–60% of the variation in real GDP growth across the major developed and emerging market economies. The remaining economic volatility is a result of region-specific and country-specific factors. Of course, the correlation among international business cycles varies over time, by country, and by the source and magnitude of financial shocks. Broadly speaking, cross-country correlations in real GDP growth rise whenever (1) asset-price shocks are systemic (e.g., the 1970s oil-price shock) and (2) the world’s largest economies are severely impaired in the process (e.g., the situation in the United States today).

We further show that the U.S. economy remains the primary accelerator of world economic growth, even though the BRIC economies have clearly emerged as another important engine. Based on this and other factors, emerging market economies remain fully coupled to severe U.S. recessions and global financial crises. In more normalized conditions, the economic correlations between emerging markets and developed markets tend to be lower than business-cycle correlations among industrialized countries.

Finally, we document the well-recognized pattern that short-run correlations among international equity markets tend to be asymmetric: Correlations rise dramatically during global financial crises. However, this stylized fact does not invalidate the benefits of global equity diversification. Indeed, the diversification benefits of international investing are most apparent once financial crises subside, given the heterogeneous economic structures, capital-flow sensitivities, commodity-price exposures, and varied monetary and fiscal policy responses of countries around the world. The expected secular reduction in the world economy’s reliance on the U.S. consumer should also contribute to lower-than-present international equity correlations over the following decade.

Notes on risk: Investments are subject to risk. Foreign investing involves additional risks including currency fluctuations and political uncertainty. Stocks of companies in emerging markets are generally more risky than stocks of companies in developed countries.

Diversification does not ensure a profit or protect against a loss in a declining market.

Past performance is not a guarantee of future results. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.
Introduction

The global economy is grappling with the most severe financial shock since the Great Depression. Financial market volatility is at or near unprecedented levels; yields on corporate, sovereign, and high-yield bonds have spiked; and global equity and commodity prices have plummeted. As illustrated in Figure 1, financial markets around the world are under considerable stress. Figure 1 clearly indicates not only the magnitude of this extraordinary financial shock, but also how integrated international financial markets have become.

Policymakers around the world have taken unprecedented and coordinated action to address the financial panic. In the United States, the Federal Reserve Board has slashed short-term interest rates aggressively, has created an array of novel liquidity facilities, and has drastically expanded its balance sheet to provide an unprecedented amount of liquidity to the impaired financial system. At the same time, the U.S. Treasury has used public funds to implement a number of extraordinary steps, including the injection of capital into certain financial institutions.

Despite these policy actions, the U.S. economy is expected to contract significantly at the end of 2008 and well into 2009 as a result of the financial crisis. The extreme financial shock has significantly tightened the supply and increased the costs of credit for consumers, businesses, and other institutions.

Figure 1. A profound global financial shock

Percentage of countries experiencing financial stress (1980–2008)

Despite these policy actions, the U.S. economy is expected to contract significantly at the end of 2008 and well into 2009 as a result of the financial crisis. The extreme financial shock has significantly tightened the supply and increased the costs of credit for consumers, businesses, and other institutions. According to the Vanguard Economic Strategy Group, the duration of the current U.S. recession will likely be the longest of the post-World War II era (see Figure 2).

With the global financial system deleveraging and the U.S. economy facing a severe recession, the global economy is decelerating quickly after years of heady growth. These profound recent developments raise important questions about the world economy and global financial markets.
Most obviously, how sensitive is the global economy to the U.S. business cycle? As shown in Figure 3, past U.S. recessions have either coincided with—or led to—global slowdowns because the rest of the world’s trade and financial markets are linked with those of the United States. Should investors expect the U.S. economy to continue to act as the proverbial “locomotive” for world growth in the years ahead?

Some analysts believe that the world economy has become less sensitive to U.S. developments as a result of rapid growth in emerging markets. Indeed, Figure 4 highlights the growing and outsized contribution of emerging market economies to recent worldwide economic growth. In light of explosive growth in the so-called BRIC economies (Brazil, Russia, India, and China), many analysts wonder whether the emerging markets have “decoupled” from the rest of the world.

As Figure 5 illustrates, as these economies have become more integrated with (and a more prominent share of) the world economy, the correlation of their business cycles to real GDP growth in the rest of the world has increased. Do these rising correlations reflect a greater risk of global economic contagion, or do they suggest that the explosive growth of the BRIC economies can help to counteract recessions in developed markets?

In terms of portfolio construction, how have changes in the global business cycle affected the diversification benefits of international investing? Is global diversification at risk? What are reasonable expectations for the correlations between U.S. and international equity returns in the years ahead?

We address each of these questions in turn.
The global business cycle

Over the past five decades, the average correlation among the world’s major economic blocks has been positive, but far from perfect. On average, the global business cycle has accounted for approximately 50%–60% of the variation in real GDP growth across the major developed and emerging market economies since 1950.2 The remaining 40%–50% of the economic variation observed across the four major economic regions has been associated with region-specific and country-specific factors, such as whether a country is a commodity exporter or importer and its level of reliance on international capital flows.

Business cycles in the developed markets have historically been the most highly correlated with the global business cycle by definition, since developed markets represent a large share of the world’s total economic output. Between 1950 and 2007, the contemporaneous correlation in annual real GDP growth between the developed markets and the world economy has been 74%. Over that same time period, the collective emerging market economy has had a 39% contemporaneous correlation with the world economy. Generally speaking, the economic correlations between emerging markets and developed markets have tended to be lower than business-cycle correlations among industrialized countries.

The effects of globalization: Convergence or decoupling over time?

Given the dramatic changes in the global economy over the past several decades, how have the correlations among international business cycles changed through time?

Conventional wisdom would suggest that the forces of globalization have led to a convergence in national business cycles and an increased risk for financial spillovers, or “contagion.” Economies around the world have generally become more integrated through the linkages of trade, finance, and banking. Statistics from the International Monetary Fund (IMF) show that the ratio of world trade to world GDP has nearly doubled over the past three decades, while the gross external assets of developed and emerging markets have risen exponentially over the same period.

2 These values represent the percentage of the fluctuations in annual real GDP per capita growth rates that are common across four economic regions (developed North America, developed Europe, developed Asia, and emerging markets) as derived from a dynamic factor model.
At the same time, the process of globalization has been accompanied by several structural changes in the world economy that have contributed to a less U.S.-centric global economy. Most importantly, intraregional trade has grown relative to traditional trade links between emerging economies and the developed world. The impressive performance of some emerging countries has led to a greater diversification of trade destinations, as emerging economies have begun to trade more often with each other.

Some analysts argue that the developments in the emerging markets have been so drastic that the emerging markets have decoupled from the rest of the world. According to the decoupling hypothesis, the emerging market business cycle is now unaffected by U.S. economic growth. However, Figure 6 delineates a number of arguments that would run counter to the emerging-market decoupling hypothesis. The relative decline in trade linkages of emerging markets with the United States, for instance, must be weighed against increased financial linkages with developed markets.

How closely do developed and emerging markets now move together?

To investigate the countervailing forces of global integration and decoupling, Figure 7 shows the correlations in real economic activity between the developed and emerging economies over a rolling 10-year period. Figure 7 reveals two stylized facts. First, there has been only a modest rise in correlations between developed and emerging market business cycles since the 1950s. This observation is consistent with the results of several studies, including Stock and Watson (2005), which have found minimal evidence of increased international synchronization of business cycles, despite increases in international trade flows, integration of developed markets, and the introduction of the euro.

The second obvious pattern of Figure 7 is that correlations in international business cycles vary meaningfully over time. Indeed, the time-varying correlations underscore the important role that systemic asset-price shocks (i.e., “contagion” or “terms-of-trade” shocks) can have on the co-movement of international business cycles. For example, the massive oil-price shocks of the mid-1970s and early 1980s (and their economic and inflationary fallout) formed a primary channel through which international business cycles moved...

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**Figure 6. Are emerging markets coupled to developed markets?**

<table>
<thead>
<tr>
<th>Arguments in favor of decoupling</th>
<th>Arguments against decoupling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decline in relative reliance on U.S. export market.</td>
<td>Increase in total trade with developed markets.</td>
</tr>
<tr>
<td>Increased share of trade within regions.</td>
<td>Emerging markets very export-oriented.</td>
</tr>
<tr>
<td>High BRIC economic growth rates.</td>
<td>United States remains the largest import market.</td>
</tr>
<tr>
<td>Emerging markets financial market depth less than that of developed markets.</td>
<td>Reliance on foreign investment and capital flows.</td>
</tr>
<tr>
<td>General improvement in fiscal balances.</td>
<td>Global financial integration.</td>
</tr>
<tr>
<td></td>
<td>Financial market spillovers/contagion.</td>
</tr>
<tr>
<td></td>
<td>High commodity-price exposure or dependence.</td>
</tr>
</tbody>
</table>
more in tandem during that period (Kose, Otrok, and Prasad, 2008). Most recently, co-movement has risen following the bursting of the global IT bubble in 2000, the ensuing global slowdown, the subsequent global economic boom, and the recent financial crisis.

Conversely, correlations among developed and emerging economies turned negative during the 1990s, since many economic shocks did not engender global systemic crises. For instance, the savings and loan crisis in the United States and Japan’s “lost decade” during the 1990s remained more localized, thereby having a more subdued influence on other countries.

Is the United States still the locomotive of the world economy?

Correlations among global business cycles also rise significantly when financial shocks severely impair the world’s largest economies through the secondary “spillover” channel. Past U.S. recessions have most adversely affected the broader global economy through two primary links: trade (the United States is the largest importer of foreign goods in the world) and finance (U.S. financial markets are the core of the global financial system). Forbes and Chinn (2003), for instance, show that the performance of the U.S. equity market tends to significantly affect the returns of most global markets, rather than vice versa.

Given the aforementioned changes in the global economic landscape, how sensitive is the global economy to the U.S. business cycle? In an attempt to isolate the causality effects of the secondary “spillover” channel from the high contemporaneous correlations observed through the primary “contagion” channel, we have estimated a growth accelerator model for the global business cycle. Specifically, the model is designed to quantify how much the rest of the world’s real GDP growth will change next year given the relative growth-rate differential between the United States and the rest of the world this year. We estimate this model over different time periods and include the BRIC economies as well.

Figure 8, on page 8, presents the estimated growth accelerator effects for both the U.S. and the BRIC economies over the most recent 20-year period and the previous 20 years. The estimated coefficients in Figure 8 show that the U.S. economy remains the primary driver of world economic growth, although the BRIC economies have clearly emerged as a secondary locomotive. Since 1990, for instance, economic growth in the rest of the world has accelerated on average 0.25% whenever the growth-rate differential between the United States and the rest of the world widened by 1 percentage point the previous year. By comparison, the growth multiplier effect of the BRICs on the rest of the world is currently 0.20%, a notable rise from virtually zero a generation ago.
Taken together, Figures 7 and 8 indicate that emerging market decoupling is unlikely in global financial crises because economic growth in the BRIC economies would have to accelerate significantly to counteract recessions in developed markets. As a result, emerging market economies remain coupled to severe U.S. recessions and global financial crises.

The implications for international investing

As trade barriers have subsided, large inter-country trading blocs have emerged, and financial market restrictions have relaxed, world equity markets have become increasingly integrated. This has led to rising equity market correlations, a fact well documented by Vanguard research. The global financial crisis of 2008 has led to even higher correlations as stock markets around the world have fallen markedly in value. These recent events may tempt investors, as they have in the past, to conclude that the long-term case for international investing—portfolio diversification—is invalid.

To be sure, the long-term diversification benefits of international investing can be obscured by short-term economic and financial factors such as bear markets, financial crises, and recessions. Indeed, Figures 9 and 10 document the well-recognized pattern that short-run correlations among international equity markets tend to be asymmetric: correlations across national stock markets are higher when the U.S. stock market declines significantly (Figure 9), and when the U.S. economy is in recession (Figure 10).

Figure 9 illustrates that when there is a bear market in U.S. stocks, other markets tend to experience bear markets as well, increasing the correlation between markets. Tokat (2006) shows that since the early 1970s more than 70% of developed countries have experienced bear markets in stocks simultaneously with a U.S. bear market. The high international stock market correlations during U.S. bear markets help to explain why global contractions tend to be more highly synchronized across countries than global expansions.

3 See, for instance, recent Vanguard research papers by Philips (2008), Labarge (2008), and Tokat (2006).
The higher short-term correlation between U.S. and international stock markets may seem to weaken the case for international investing, validating the oft-heard complaint that “diversification disappears when you need it most.” We stress, however, that this stylized fact does not invalidate the long-term benefits of global equity diversification. For instance, Figure 9 shows that even during U.S. “tail events” (such as when the monthly return on the U.S. stock market is down more than one standard deviation from its historical average), international equity market correlations with the United States do not equal 100%, on average. A good example is the case of a worldwide commodity-price shock because of falling oil supplies. While an oil-price shock will tend to adversely impact the markets for industrialized (commodity-importing) countries, such an oil shock may benefit (on a relative basis) certain commodity-producing countries.4

Most importantly, Figures 9 and 10 reveal that the diversification benefits of international investing are most apparent once stock market volatility subsides and recessions end. Indeed, as financial crises subside, the economic and financial market performance of countries will differ because of their heterogeneous economic structures, capital-flow sensitivities, commodity-price exposures, and varied monetary and fiscal policy responses to crisis events.

4 See the sidebar on page 11 for a deeper discussion of the relationship between commodity prices and emerging markets.
To illustrate this point, Figure 11 presents the past and expected future rolling 10-year correlations of monthly stock market returns between the U.S. markets and a broad international index. The expected future distribution of U.S.–international stock market correlations is derived from the Vanguard Capital Markets Model (VCMM). These estimates of future long-term correlations are based in part on the historical record and in part on reasonable assumptions about the likely course of global economic and financial integration. Historical evidence suggests that the financial and economic integration of different regions—through trade and financial flows—increases the correlation between these regions’ financial markets and economies (Bekaert and Harvey, 2000).

Figure 11 shows that global correlations over the next 10 years are expected to more closely resemble those observed in recent years, rather than the lower correlations observed in the 1970s and 1980s. That said, the simulations indicate that the correlations between the U.S. and international equity markets are likely to decline from their currently elevated levels over the next 10 years as stock market volatility gradually wanes and the financial crisis eventually passes. Secular global economic developments that will alter interregional and intraregional trade patterns should also contribute to lower-than-present international equity correlations over the following decade. Among the expected developments are a reduced reliance on the U.S. consumer to drive the world’s economy and a gradual shift in focus within emerging market economies from export-led growth to economic expansion fueled by internal consumption demand.

5 The VCMM simulates returns and volatilities for a wide array of asset classes by implementing regression-based Monte Carlo methods. Asset returns are modeled and then simulated based on their relationship to valuation, economic, fixed income, and global risk factors. For each asset class, the VCMM creates 10,000 possible paths for these risk factors, then computes the implied asset returns and volatilities. For further details on the VCMM, see Wallick, Aliaga-Díaz, and Davis (2008).
Commodity prices and emerging markets

Over the past several years, commodity prices rose and fell dramatically with changes in the commodity demands of the BRIC economies, among other factors (see Figure 12). These recent events have raised important questions about the sensitivity of emerging market economies and their stock markets to movements in commodity prices.

Figure 13, on page 12, presents the average correlation of emerging and developed markets with changes in commodity prices, measured here as the total return on the S&P GSCI Commodity Total Return Index. Broadly speaking, emerging markets tend to correlate more positively with commodity prices than do developed markets (i.e., EAFE countries or the United States). This is not surprising, since emerging markets tend to be more commodity-intensive than developed markets and are generally net commodity exporters.

Perhaps more surprising is the fact that the average economic and financial correlation of emerging markets with commodity prices in Figure 13 is fairly low. Since 1988, the average monthly correlation between the GSCI Commodity Total Return Index and the stock market return on the MSCI Emerging Markets Index has been approximately 19%.

The positive-but-low correlations between commodity prices and emerging market stock returns can be explained by a number of factors, including the relative importance of supply, demand, currency fluctuations, and other factors that may influence commodity prices at any given time (Davis and Aliaga-Díaz, 2008). Over the past several years, for instance, the correlations between emerging markets and commodity prices have been higher than those indicated in Figure 13 because of changes in the commodity demands of the BRIC economies.

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Figure 12. Global commodity demand and GSCI commodity investment returns

*Both series indexed to 100 in December 1990 and reflect data through November 2008*

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6 See Davis and Aliaga-Díaz (2008) for more details on the Baltic Dry Cargo Index and the influence of global demand and other factors on oil prices.
Overall, Figure 13 is a reminder that stock returns on a broad emerging market index are not driven solely by changes in commodity prices. Moreover, the relationship between commodity prices and stock prices varies significantly across individual emerging markets, depending on their own commodity intensity and relative terms of trade (the ratio of commodity export prices to import prices). The monthly returns on the MSCI Chile Stock Index, for instance, are highly correlated with copper prices (Chile is a prominent exporter of copper), yet are virtually uncorrelated with oil prices (Chile is a net importer of oil).

<table>
<thead>
<tr>
<th>Correlations with real GDP growth (annual data)</th>
<th>Emerging</th>
<th>EAFE*</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSCI, all commodities</td>
<td>0.43</td>
<td>0.25</td>
<td>0.30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Correlations with stock market returns (monthly data)</th>
<th>Emerging</th>
<th>EAFE*</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSCI, all commodities</td>
<td>0.19</td>
<td>0.15</td>
<td>0.04</td>
</tr>
<tr>
<td>GSCI, agricultural and livestock</td>
<td>0.24</td>
<td>0.14</td>
<td>0.17</td>
</tr>
<tr>
<td>GSCI, grains</td>
<td>0.22</td>
<td>0.11</td>
<td>0.17</td>
</tr>
<tr>
<td>GSCI, industrial metals</td>
<td>0.29</td>
<td>0.28</td>
<td>0.22</td>
</tr>
<tr>
<td>GSCI, precious metals</td>
<td>0.18</td>
<td>0.18</td>
<td>−0.06</td>
</tr>
<tr>
<td>GSCI, petroleum</td>
<td>0.15</td>
<td>0.09</td>
<td>−0.02</td>
</tr>
<tr>
<td>GSCI, energy</td>
<td>0.12</td>
<td>0.10</td>
<td>−0.02</td>
</tr>
</tbody>
</table>

Notes: EAFE includes developed countries in Europe, Australasia, and the Far East. Monthly stock market returns are based on the MSCI Total Return Index. Commodities are based on the S&P GSCI Commodity Total Return Index. Real GDP growth data at annual frequency (see the Appendix for details).

Conclusions
The financial crisis that first erupted in the U.S. subprime mortgage market in August 2007 has evolved into the largest financial shock since the Great Depression, inflicting heavy damage on markets and institutions around the world. Indicative of the magnitude of the shock, equity market volatility is at or near unprecedented levels, corporate bond yields are extremely high relative to U.S. Treasury yields, and commodity prices have plummeted. With the global financial system deleveraging and the U.S. economy in the midst of a severe recession, the global economy is decelerating quickly after years of heady growth.

These profound recent developments raise important longer-term questions with respect to the world economy and global financial markets. In this paper, we find that—despite more integrated trade and financial linkages around the world—the global business cycle accounts for only approximately 50%–60% of the volatility in real GDP growth across the major developed and emerging market economies. The remaining economic volatility is a result of region-specific and country-specific factors. Of course, the correlation among international business cycles varies over time, by country, and by the source and magnitude of financial shocks. Broadly speaking, cross-country correlations in real GDP growth rise whenever (1) asset-price shocks are systemic (e.g., the 1970s oil-price shock) and (2) the world’s largest economies are severely impaired in the process (e.g., the situation in the United States today).

We further show that the U.S. economy remains the primary accelerator of world economic growth, even though the BRIC economies have clearly emerged as an important factor. As a result, emerging market economies remain fully coupled to severe U.S.
recessions and global financial crises. In more normal conditions, the economic correlations between emerging markets and developed markets tend to be lower than the business-cycle correlations among industrialized countries.

Finally, we document the well-recognized pattern that short-run correlations among international equity markets tend to be asymmetric: correlations rise dramatically during global financial crises. However, this stylized fact does not invalidate the benefits of global equity diversification. Indeed, the diversification benefits of international investing are most apparent after financial crises subside, given the heterogeneous economic structures, capital-flow sensitivities, commodity-price exposures, and varied monetary and fiscal policy responses of countries around the world.

References


Appendix

We collected annual data on real per-capita GDP growth over the sample period 1951–2007 for the 49 countries currently in the MSCI World Equity Index. We calculated real GDP growth rates for developed markets, emerging markets, and various regions based on real GDP weights. Figure 14 provides a complete list of the countries and regional classifications and the first year for which data were available for each country.

Figure 14. Regional classifications and data availability for international real GDP data

<table>
<thead>
<tr>
<th>Developed</th>
<th>Emerging</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>United States</td>
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<td>Latin America</td>
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<td></td>
<td>Canada</td>
<td>1951</td>
<td></td>
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<td></td>
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<tr>
<td>Europe</td>
<td>Austria</td>
<td>1951</td>
<td></td>
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<tr>
<td></td>
<td>Belgium</td>
<td>1951</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Denmark</td>
<td>1951</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finland</td>
<td>1951</td>
<td></td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>1951</td>
<td>Asia</td>
</tr>
<tr>
<td></td>
<td>Germany**</td>
<td>1971</td>
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<td></td>
<td>Greece</td>
<td>1952</td>
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<td></td>
<td>Ireland</td>
<td>1951</td>
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<td></td>
<td>Italy</td>
<td>1951</td>
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<td></td>
<td>Netherlands</td>
<td>1951</td>
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<td></td>
<td>Portugal</td>
<td>1951</td>
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<td></td>
<td>Spain</td>
<td>1951</td>
<td></td>
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<tr>
<td></td>
<td>Sweden</td>
<td>1951</td>
<td>Africa</td>
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<tr>
<td></td>
<td>United Kingdom</td>
<td>1951</td>
<td></td>
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<tr>
<td></td>
<td>Norway</td>
<td>1951</td>
<td></td>
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<tr>
<td></td>
<td>Switzerland</td>
<td>1951</td>
<td></td>
</tr>
<tr>
<td>Pacific</td>
<td>Japan</td>
<td>1951</td>
<td>Eastern Europe &amp; Middle East</td>
</tr>
<tr>
<td></td>
<td>Australia</td>
<td>1951</td>
<td></td>
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<tr>
<td></td>
<td>New Zealand</td>
<td>1951</td>
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<td></td>
<td>Hong Kong</td>
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<td></td>
<td>Singapore</td>
<td>1961</td>
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<tr>
<td></td>
<td>Korea</td>
<td>1971</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Taiwan</td>
<td>1952</td>
<td></td>
</tr>
</tbody>
</table>

*BRIC country.
**Unified Germany. Before 1990 East and West Germany GDP data are combined. Data availability for East Germany limited to 1970 through 1990.

Sources: International Monetary Fund World Economic Outlook database, World Bank World Development Indicators, Penn World Tables, Thomson Datastream, U.S. Census Bureau, and Vanguard Economic Strategy Group.
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