Long-Term Macro Trends and Implications for BEA Data

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The following is a brief review of major trends that are likely to affect the economy and present challenges to BEA's measures of the economy. The review identifies specific BEA data likely to be affected and steps that might be taken to strengthen this data. The review first looks at key factors in the 10-year outlook for the economy and then looks at so called "megatrends" for the 20-year outlook.

Why a 10–20 Year Outlook?

Given the accuracy of forecasting, a 10- or 20-year outlook seems pretty bold, but unlike short-term forecasts, broad emerging trends hold up fairly well. Also, major changes in measurement have, at least in the past, taken 10 to 20 years, resulting in changes in the economy outpacing our ability to measure it well.

For example, looking back at futurists' projections in the 1950s and 1960s, many of the broad trends, such as trends in population growth, the importance of computers and technology, and increasing life expectancy, have come to fruition. Where projections have tended to be wrong was the pace, acceptance, and impact of specific new technologies (think, Jetson's flying cars).

On the statistical side, it can take time to:

- Recognize structural changes in the economy, distinguishing new trends from temporary changes
- Analyze the impact of these changes on measurement
- Develop new methods and build professional consensus
- Design and test new or expanded surveys or other data sources
- Obtain funding for these surveys and estimates
- Field the new surveys or data purchases necessary to implement the changes in measurement

One example of these lags is in services. One of the underlying themes of the Boskin Initiative put forth by the Council of Economic Advisers in 1990 was better measures for the service sector. While progress has been made, especially the 2009 expansion of the Services Annual Survey, over 20 years later, there is much work remaining, including emerging measurement issues related to the transformation of retail trade.

Internationally, building consensus and developing new guidelines, such as the UN-international *System of National Accounts* and the IMF *Balance of Payments*, also take time. The *SNA*, for example, is revised infrequently, and those revisions take years. The original international *SNA* was published by the UN in 1952, followed by revisions in 2003 and 2008. Such revisions are followed by a long process across countries to develop the source data, methods, and funding to implement these *SNA* revisions.

Responding to changes in the economy is essential to keeping BEA's data relevant. The business community and international organizations are already busy identifying and forecasting megatrends and commercializing opportunities based on these megatrends and artificial intelligence (AI). BEA and the U.S. statistical community would do well to try and partner with business by providing official benchmarks for businesses' up-to-date and extensive, but often less than representative, data sets. Official statisticians and the business community may also be able to jointly improve both of their data sets, through weights and tailored aggregations that protect confidentiality while improving extrapolators and benchmarks for public and commercial data.

Ten-Year Outlook

Most major forecasters are projecting continued moderate growth and reductions in inflation over the 10-year projection horizon. These forecasts are naturally based on assumptions about emerging changes in the economy. The following are amongst the most important of these trends cited by CBO, OECD, CEA, and Brookings:

- ***Growing deficits and debts.*** Although the CBO projects that the federal deficit remains roughly constant at 6 percent over their 10-year horizon, these deficits result in the federal debt rising to a record 121 percent of GDP.
    - » These federal deficits lower national saving and investment, which in the long run, slows growth in capital stocks and capital services, which reduces growth in GDP, productivity, and standards of living.
    - » Shorter-term attempts to reduce the deficit too fast may jeopardize a soft landing.
    - » Also, interest costs are projected to rise to nearly two-thirds of the federal deficit, requiring a declining budget share for noninterest programs to balance the budget.
- ***Slower growth in international trade.*** Rising protectionism, the COVID–19 pandemic, and other factors have resulted in a significant slowdown in trade and economic growth, with further slowdowns in trade brought on by uncertainty about further increases in protectionism. The trade deficit is projected to gradually shrink from 2.9 percent of GDP to 2.3 percent in 2034 as exports grow faster than imports, but overall growth is expected to be slower.
- ***Risk of another financial crisis.*** Although actions taken during and after the financial crisis stabilized the big banks, there are still risks to other banks in the system (e.g., San Fransico Fed study, up to 186 other banks).

- ***Technology change and continued slow growth in total factor productivity.*** Technology has been the hardest to measure factor input and is usually measured by the residual in economic growth (multifactor productivity). Given the uncertainty in forecasting technological change, forecasters often simply assume that future growth in MFP will be equal to a long-run average growth rate of about 1 percent. This long-run average represents a ramp-up from the average MFP growth in recent years of 0.5 percent (2007–2023). What actually plays out will depend on innovations in a number of fields. Examples include information technology, such as AI and IT innovations in medical care, from diagnostics and instruments to records and administration.
- ***Slow growth in labor force.*** A key assumption in the CBO's projection of labor force is a continued surge in net immigration, which raises overall labor force growth from the 2008–2023 rate of 0.9 percent to 1.1 percent in 2024–2034 and is the most important factor raising CBO's projection of growth in real potential GDP. Trying to guess the future path of immigration is difficult, as is the effect of investments in, and measurement of, education that raises the effective labor force.
- ***Slow growth in capital services.*** As can be seen in the BEA net investment series and the BLS-BEA growth model, slow growth in investment and capital stocks have significantly slowed the growth in real GDP (see Table 1. Trends in Economic Growth). The CBO and most other forecasts assume this lower level of capital services will persist, but reductions in the federal deficits and higher national saving and investment *are* within the control of the Congress.

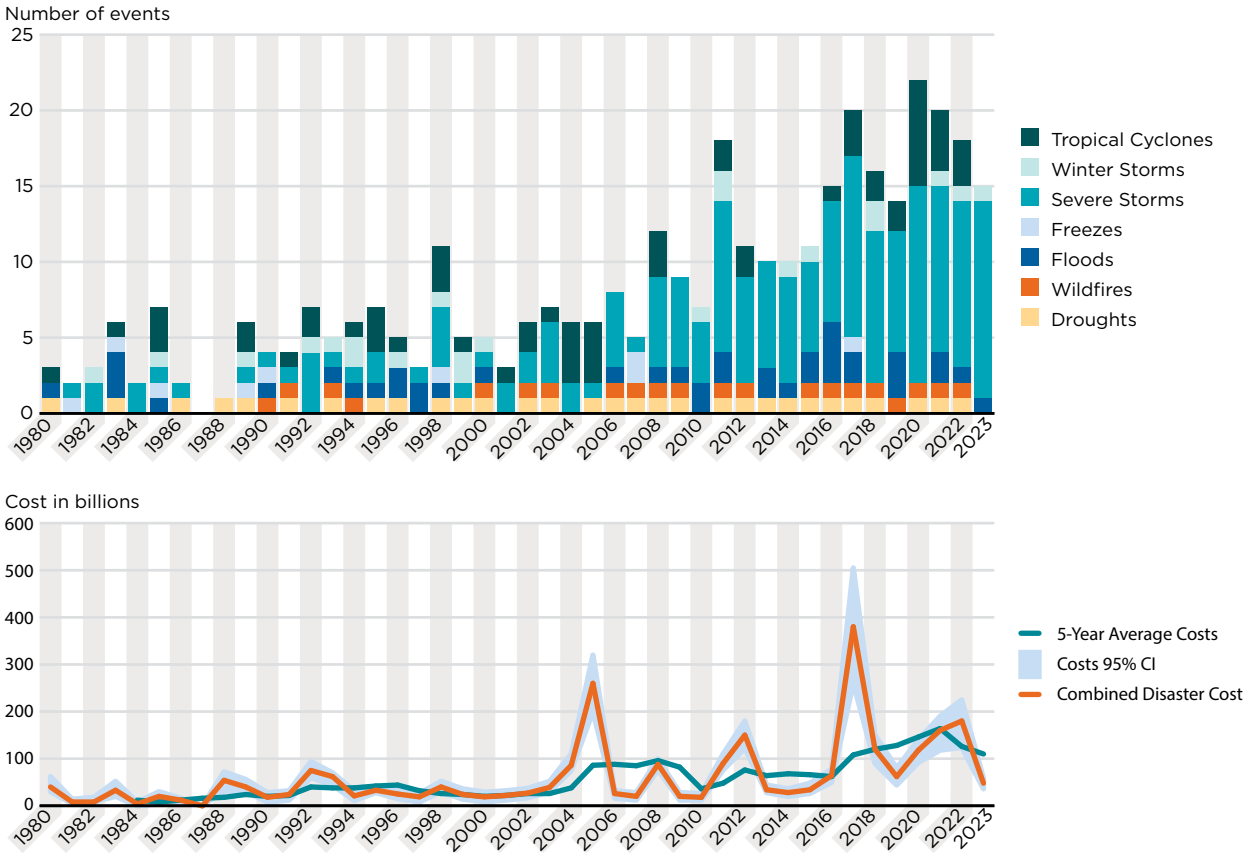
Table 1. Average Annual Real Growth and Contributions to Growth

Component	1987–2007	2007–2022	Difference
Average Annual Real Growth			
Real GDP	3.1%	1.8%	–1 .30%
Labor Input	1.6%	1.1%	–0.50%
Capital Services	4.0%	2.4%	–1.60%
Multifactor Productivity	1.0%	0.5%	–0.50%
Contributions to Growth (Percentage Points)			
Real GDP	3.10	1.8	–1.3
Labor Input	1.05	0.66	–0.4
Capital Services	1.36	0.94	–0.42
Multifactor Productivity	0.66	0.18	–0.49

Source: BLS-BEA Integrated GDP Productivity Accounts

- ***Heightened geopolitical tensions.*** Ukraine and Israel are just two recent examples of world instability and their economic implications. Shortages of grain and oil and their impact on U.S. and world inflation are leading examples. These tensions also underline the need for integrated diplomatic and economic policies and better measures of supply chains.
- ***Sustainable growth and natural disasters.*** According to NOAA, over the last 20 years, the inflation-adjusted cost of $100 billion-plus natural disasters have risen from $20 billion to over $150 billion. Most forecasts seem to assume that these trends as well as efforts to move to a more sustainable growth path will continue at the current pace. These forecasts are in part based on BEA data and estimates. Some observers have called for more comprehensive estimates.

Chart 1. Increasing Frequency, Severity, and Cost of Natural Disasters: U.S. Billion-Dollar Disaster Events, 1980–2023 (CPI-Adjusted)



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As will be discussed further below, each of these developments has implications for BEA and other statistical agencies. For example, new regulations or deficit reduction policies will undoubtedly result in requests for tracking and explanations of how these changes impact GDP and GDI and how they are incorporated in the accounts (such as those produced during the pandemic). Increased calls for protectionism suggest the need for data, like BEA's gross value added in trade estimates, to better understand the net domestic impact of bilateral trade.

Increased natural disasters will result in further calls for the expansion of NOAA and BEA's estimates of the impact of natural disasters as recommended by the Administration's natural resources initiative.

Other examples of updating BEA's accounts include better assessing global financial risk through better measures in BEA's international investment position for portfolio investment, similar to BEA's trial ultimate beneficial owner's (UBO) for foreign direct investment.

Twenty-Year Outlook: Megatrends

Unlike 10-year projections, 20-year, and other longer-term projections, tend to be qualitative rather than quantitative. They are developed by international organizations, business, and national governments, mainly scientific committees on specific topics like the environment or infrastructure. The following is a sampling of the top megatrends being discussed today.

- United Nations:
  - ***Climate change, natural capital and pollution.*** As the effects of climate change that are visible to the public increase (e.g., record-high U.S. temperatures, rising disasters, bigger wildfires, and diminished air quality) so will their economic impact. These impacts include property losses and increased medical care costs to treat respiratory and other environmentally related diseases and the costs of pollution abatement control programs.
  - ***Demographic trends in an aging world.*** The share of U.S. population 65 and over has risen from 12 to 17 percent over the last 20 years and is projected to rise to 23 percent by 2050. This aging population will have significant effects on the patterns of consumer spending, saving, and investment as well as on social programs.

  - ***Urbanization.*** Urbanization has slowed in the United States but is still projected to increase from 83 percent in 2020 to 89 percent in 2050. Urbanization brings with it additional needs for new infrastructure and updating existing infrastructure for changes in lifestyles and the structure of work (e.g., remote work).
  - ***Emerging and frontier technologies.*** New technologies may have a significant impact on the skills and overall composition of the U.S. labor force. Other potential economic impacts include raising productivity and perhaps lowering income equality.
  - ***Inequality.*** Although there is some uncertainty regarding the much-cited rise in inequality, there is little question that the top quintile, and particularly the top 1 percent, control a disproportionate share of U.S. income. As of 2022, the top quintile of households received 51 percent of personal income, and the bottom quintile received 5 percent. As political concerns grow over this inequality, good data will be needed to study the impact of associated tax, spending, and transfer programs to help small businesses, the "middle" class, and lower income groups.

- Blackrock Megatrends (Jeff Speigel):
  - Technology
  - Demographics
  - Urbanization
  - Climate change
  - Emerging global wealth
  - Artificial intelligence on megatrends (Copilot):
    - Climate change and sustainability
    - Demographic shifts
    - Urbanization
    - Technology
    - Energy transition
    - Geopolitical instability
    - Peak of globalization
    - Space exploration
    - Moral capitalism
    - Smart everything

Likely Measurement Challenges

As noted above, these 10- and 20-year trends suggest important changes in the economy that will present challenges in measuring those changes. This section tries to identify the measurement challenges associated with these trends and related changes in the economy.

Growing deficits and debt. If concern for mounting U.S. debt and deficits results in program-specific reductions to slow growth in the deficit, there will be ongoing demands for real-time updates to incorporate and explain the treatment and impact of these programs on BEA's GDP, income, government receipts and expenditures, regional, and other data.

BEA did excellent work during the pandemic in quickly incorporating more timely data, new methods, and thorough explanations of these changes and of the new pandemic-related programs. This work can be a model for BEA's response to possible contractionary (or expansionary) fiscal and monetary policies in the future.

The federal deficit and attempts to reduce it, point to the continued need for BEA to focus on net national saving and investment and their impact on sustainable growth through use of an updated and better highlighted BLS-BEA growth model. The updating of the growth model will, of course, need to be integrated with updates to BEA's GDP by industry data and participatory work with BLS in their efforts to better measure retail trade productivity.

Avoiding another financial crisis. One of the accounting issues that came out of the financial crisis was the need for better measures of risk. The United States' and most other countries' Balance of Payments Accounts record financial transactions on the basis of the immediate counterparties to an international transaction. This practice makes the identification of risk difficult, especially with complex ownership chains and new and complex financial instruments. BEA has done pathbreaking work on the measurement of the ultimate beneficial owner for foreign direct investment. The IMF also has underlined the importance of these "who owes what to who" data to supplement existing BOP for debt and other portfolio investments.

Such data on ultimate country risk exposures could help avoid the "surprises" that U.S. and European policymakers, regulators, and investors experienced during the 2007–2008 financial crisis.

Slow growth in international trade. Protectionism and slowing growth in trade slows economic growth by lowering productivity growth. Less trade slows productivity growth by (1) reducing the ability of the United States to exploit the U.S. comparative advantages of trade, (2) slowing the rate of

adoption of new technology, and (3) reducing competition and the efficiency it creates. Also threats of further protections create uncertainty for business and investors, both of which are bad for growth.

These economic costs increase the importance of objective, and *relevant* data that more accurately assesses the bilateral benefits of trade. For example, in 2006, the European Commission imposed antidumping duties on shoes imported from China and Vietnam based on bilateral trade deficits. Yet in 2007, a study from the Swedish Bureau of Trade estimates that 50 to 80 percent of the value added of shoes "manufactured" in Asia accrues to the EU through services, such as management, design, advertising, and distribution services embodied in the shoes, suggesting that the EU may have metaphorically shot themselves in their own foot.

As protectionist pressures rise in the United Sates and abroad, it underlines the importance of continued work on BEA's trial global value chain (GVC) supplemental estimates that provide a better perspective on the gains from trade. Such estimates are not only important for international trade and investment policy but for better informed political discourse and public opinion.

The example also points to the importance of continued work on extended Input-Output Accounts and the expansion of measurement of international trade in services, the source of a significant share of U.S. value added.

Slow GDP growth. Continued slow growth in GDP will highlight the need for improvements in the measurement of the sources of the slowdown in the BLS-BEA growth accounting estimates (see below). Such estimates can be helpful in policy choices, such as the impact of restrictions on immigration and investments in education and human capital, higher national saving and investment, and investments in R&D and human capital. These improvements in growth accounting include:

Labor inputs. Existing estimates of labor inputs use labor hours that are adjusted for quality using differences in wages and educational attainment, age, and gender. Changes in the economy suggest that measuring skills by changes in tasks may better measure quality-adjusted labor inputs.

One example is in retail trade, where there are big changes in the workforce. As the CNSTAT panel study on measuring the transformation in retail trade notes, there have been large increases in high-end programming and data analysis skills that support e-commerce.

Given the important contribution immigration has been to U.S. labor supply labor in recent years it would be helpful if labor inputs were broken down into native-born and immigrant components. It would be especially useful if these breakdowns also included quality adjustments by skills, as described above.

Capital services. More clearly recording the cumulative impact of federal deficits (debt) and low personal saving on national investment and economic growth and standards of living would be useful. Such public education and data on the impact of federal deficits may bolster public support for a wide range of deficit reduction efforts likely to be increasingly important in the future (see above).

Technology. Better measures of the impact of new technologies, especially research on more direct measures of technology than the residual component of growth accounting, would be a huge step forward in better understanding long-term economic growth.

Examples include artificial intelligence; medical care diagnosis, records, remote monitoring, and in-home patient support and care; management innovations, including remote work; and advances in extracting efficiencies from global value chains.

Heightened geopolitical tensions. While it is unlikely that statistics will materially affect these tensions, it is possible that better data may help assess their impact. Better data on global value chains (think Ukrainian wheat and Russian oil and their impact on U.S. and other countries' inflation).

Such data are another example of how long-term efforts already underway at BEA on global value chains and extended international Input-Output Accounts will be of increasing value over time.

Climate change and sustainability, natural capital, and pollution. The rising impact of natural disasters and the long-run environmental impact of climate change may finally push BEA's efforts in environmental accounting over the top. The extensions described in BEA's GDP and Beyond and the expanded natural disaster impact estimates as suggested in the White House Initiative on Natural Resource and Environmental Accounting point the way for this work. Such work includes long-term work to develop new source data and methods using a mix of market and nonmarket data to develop proxies for market values. And as the White House report points out, progress in this field will be dependent on a multidisciplinary and multiagency research and data collection agenda.

Demographic trends in an aging world. One offshoot of an aging population is movement from owner-occupied housing to assisted living and senior living rentals. This movement will put additional pressure on existing measures of owner-occupied housing and rentals. Research and development of updated price indexes for housing will help not only with the long-term measurement challenges but may also help address existing concerns about the methods and source data used for housing in the BEA and BLS measures of consumer inflation.

Seniors account for a disproportionate share of health care services. As the population ages, medical care services will account for an increasing share of consumer spending, and accurate and relevant measures of medical expenditures, inflation, and productivity will become increasingly important.

BEA has made significant progress on the development of output price indexes that measure the costs of treating diseases rather than input cost indexes that measure the costs of different types of services.

Thus far, BEA has used hedonic models to estimate "nonmarket" quality difference for computers and other products by differences in market prices that presumably reflect differences in product characteristics. Unfortunately, most medical prices are administratively determined with costs borne by third-party insurers and treatment determined by medical care providers, rather than by patients/consumers.

Moving forward will be difficult, but within BEA's satellite account for health care, there may be means of moving forward. For example, studies suggest that home health care is cost effective, produces similar health outcomes, and is preferred by patients. Do current price indexes for home health care (there are at least five BLS sub-price items that cover types of home health care) capture those characteristics? Would it be possible to use information from robust case studies to develop indirect quality adjustments for the costs of at-home medical care? Other adjustments could be including the significant time cost of volunteer caregivers

Urbanization. Urbanization (cities and surrounding areas with a population of 5,000 or more) has slowed in the United States but is still growing, rising from 83 percent in 2020 to a projected 89 percent in 2050. This growth in urbanization will call for investments in commercial, residential, and public infrastructure.

This infrastructure is likely to be different from today's. These differences include changes in the scale and characteristics of infrastructure, such as remote work, green architecture, sustainable building, energy efficiency/net-zero buildings, public transit, and electric vehicles; aging and architectural modifications for in-home heath care; and Zoom and other changes in technology that facilitate remote work.

Accurately measuring this new infrastructure will require more attention to quality than quantity, information technology, and nonmarket benefits. Specifically, BEA will probably need to develop new quality-adjusted prices, service lives, and depreciation rates. Indeed, BEA's existing capital stock data may require a major update. The basic research behind BEA's selection of geometric depreciation as the default option for most assets and the empirical evidence for other assets is relatively old.

Inequality. Continued concern about inequality will only increase the importance of BEA producing accurate, timely, and relevant data on the distribution of personal income, consumption, and coordinating with the Fed on distribution of wealth.

Globalization and international trade. Although some predict that, with increasing protectionism, globalization is near its peak, even without further growth, globalization is not dead. And will remain a major feature of the U.S. and world economy.

Globalization brings with it calls for protectionism. One way in which BEA can help is to further work on extended international input-output tables and global value chain work. Such estimates can complement existing BOP estimates by providing a better picture of the value-added contributions of multinational corporations to U.S. production and incomes. As noted above, in the example on "Asian" shoes, such data can be important in guiding international trade and investment policy.

Structural change, emerging technology, and changing markets. Advances in technology, management, and changes in the composition of demand and supply bring increases in productivity and incomes but also challenges to measurement. Changes in the retail trade sector, remote work, health care, renewable energy, artificial intelligence, gig workers, global supply chains, and the aging of the population are examples confronting BEA today.

Since the founding of the accounts, one of their greatest strengths is in continuously updating them to provide timely, accurate and relevant data that capture changes in the economy. This updating will involve many of the same processes, which should be addressed in BEA's annual plans and checklists 10 to 20 years out and beyond. These generic goals include:

- New and better source data
    - » Research on innovative methods for nominal, price, and real estimates

Also, in today's 24/7, data-driven economy, there is growing demand for:

- More timely (real-time) data
- More detailed data
- More relevant presentation of data

Finally, the long-term fiscal outlook suggests that BEA continue its efforts to be as innovative and effective as possible through:

- More use of microdata
- More use of new technologies, including AI
- More efficient human capital policies, including recruitment and management (including remote work)
- Collaborative cross-agency and multidisciplinary work on issues such as environmental, resource, and health accounting.
- Regular updates across all the accounts

Perhaps, most important, addressing all of these forward-looking measurement challenges will require maintaining a proactive research age.

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