Global Business Cycle Indicators During the Pandemic
Pre-Conference Workshop of the 35th CIRET Conference
Ataman Ozyildirim
14 September 2021
Business Cycle Indicators (BCI - LEI) Program

- First developed at the NBER, then published by the BEA
- Transfer from BEA 1995 (Leading Index, BCI Database) to The Conference Board
- The Conference Board: evaluation and updating composite indicators, 1996
- Global Indicators since 2000
- Economic theory informs selection of indicators but country specific features influence choice
- Updated LEI methodology in 2001 and 2005
- Introduction of statistical imputation, 2001
- Comprehensive benchmark revisions, 2012
- “Real” time analytic and production goals
- http://www.conference-board.org/economics/bci
Global Business Cycle Indicators Program (BCI - LEI)

- The Conference Board introduced indexes for twelve new countries or economies since 2000
- Australia, Brazil, China, Euro Area, France, Germany, India, Japan, Mexico, South Korea, Spain, United Kingdom
- Consistent methodology allows international comparisons
Selection criteria for LEI components

- Consistent timing
- Conformity
- Smoothness
- Economic significance
- Statistical adequacy
- Currency
As summary measures Leading Indexes are composed of quantitative and qualitative indicators which help to identify assumptions and risks in the economy.
Labor market disruption during the pandemic recession also disrupts the LEI

For more information: [https://www.conference-board.org/data/bcicountry.cfm?cid=1](https://www.conference-board.org/data/bcicountry.cfm?cid=1)
Because of the sudden-stop supply shock, LEI contraction shows a different evolution of the recession and recovery than the Great Financial Crisis of 2008-2009.
Another highly synchronized global downturn: Global Coincident Economic Index (CEI) is a monthly measure of the global cycle and the LEI leads its peaks

Note: Shaded areas represent business cycle chronologies derived from the Global CEI; determined by The Conference Board using the Bry-Boschan (1971) algorithm. Source: The Conference Board
Global Coincident Economic Index and Global GDP are highly correlated: annual growth rates vs. the global growth cycle. Composite indexes can help forecast the recovery (if not the specific peak of February 2020)

Note: Shaded areas represent growth cycle chronologies derived from the de-trended Global CEI; determined by The Conference Board using Bry-Boschan (1971) algorithm. Source: The Conference Board
Global Leading Economic Index and Global GDP: annual growth rates vs. the global growth cycle

Note: Shaded areas represent growth cycle chronologies derived from the de-trended Global CEI; determined by The Conference Board using Bry-Boschan (1971) algorithm. Source: The Conference Board.
Contributions of Mature and Emerging Economies excl. China to Monthly Growth in Global LEI

Source: The Conference Board
Cumulative Contribution to Global LEI point to broad based global recovery in 2021
Evolution of the Global LEI over the last six months

Note: The figure shows the time evolution of the Global LEI over the last seven months. Scatterplots depict X-axis values as normalized deviation from trend (so that x= 0.5 corresponds to trend) and Y-values are the monthly change in the normalized deviation from trend. Deviations from trend are calculated using a Hodrick-Prescott filter with $\lambda = 129,600$. Source: The Conference Board.
Latest monthly LEI data for the thirteen economies

Note: The figure shows the latest monthly LEI data for all thirteen economies. Scatterplots depict X-axis values as normalized deviation from trend (so that \( x = 0.5 \) corresponds to trend) and Y-values are the monthly change in the normalized deviation from trend. Deviations from trend are calculated using a Hodrick-Prescott filter with \( \lambda = 129,600 \). Source: The Conference Board.
THANK YOU!
ADDITIONAL SLIDES
US LEI Components

- Yield Spread (10-Year T-bills minus Federal Funds)
- Leading Credit Index™
- Stock Prices (S & P 500)
- Average Weekly Hours for Manufacturing
- Building Permits, Private Housing
- Average Weekly Initial Claims for Unemployment Insurance
- ISM New Orders Index
- Manufacturer’s New Orders for Non-Defense Capital Goods (ex-aircraft)
- Manufacturer’s New Orders for Consumer Goods and Materials
- Consumer Expectations of Business and Economic Conditions
Summary: index construction

- Index should improve on the performance of the individual indicators.
  - Eliminate or reduce missed or extra cycles.
  - Result in leads or lags in more useful leads.

- Mechanics
  - Volatility adjustments – use factors that are inversely related to the standard deviation of monthly changes in component
  - Equal weights
  - Trend adjustment
  - Interpolation, moving average
Current composition comprises 73.8% of global output

Share of Global GDP (PPP adjusted)

1. Australia - 1.1%
2. Brazil - 2.5%
3. Canada - 1.5%
4. China - 16.1%
5. Euro Area - 13.1%
6. India - 7.6%
7. Japan - 4.2%
8. South Korea - 1.9%
9. Mexico - 2.0%
10. Russia - 3.3%
11. South Africa - 0.6%
12. United Kingdom - 2.5%
13. United States - 17.3%

Note: This calculation includes the entire Euro Area and excludes France, Germany, and Spain where The Conference Board publishes individual country indexes.
Source: The Conference Board, Total Economy Database (TED), November 2020. Mature Economies are shown in bold.
Global Coincident Economic Index (CEI) is a measure of the global cycle and the LEI tends to lead its peaks and troughs.
Global, Mature and Emerging Economies Leading Economic Indexes vs. global business cycle

Note: Shaded areas represent business cycle chronologies derived from the Global CEI; determined by The Conference Board using the Bry-Boschan (1971) algorithm.

Source: The Conference Board
Global, Mature and Emerging Economies Leading Economic Indexes: annual growth vs. growth cycles

Note: Shaded areas represent growth cycle chronologies derived from the de-trended Global CEI; determined by The Conference Board using Bry-Boschan (1971) algorithm.

Source: The Conference Board
Consumer Confidence Index® (2006 – Present)

Index, 1985 = 100

*Shaded areas represent periods of recession.
Sources: The Conference Board; NBER
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For more information: http://www.conference-board.org/data/consumerdata.cfm
Present Situation and Expectations (2006 – Present)

Present Situation and Expectations Index

Index, 1985 = 100

*Shaded areas represent periods of recession.
Sources: The Conference Board; NBER
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For more information: http://www.conference-board.org/data/consumerdata.cfm
The Conference Board *Measure of CEO Confidence*™

CEO Confidence
(2021 Q2 Measure: 82)

*Quarterly changes in real Gross Domestic Product at annual rates, based on chain-type 2005 weighted measures.

Note: Shaded areas indicate periods of recession.

Sources: The Conference Board; The Business Council; U.S. Department of Commerce; NBER
Coincident Economic Index Components: 13 economies

<table>
<thead>
<tr>
<th>Country</th>
<th>Retail Sales</th>
<th>Manufacturing and Trade Sales</th>
<th>Non-Agricultural Employment</th>
<th>Employment: LFS</th>
<th>Personal Income less Transfer Payments</th>
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</thead>
<tbody>
<tr>
<td>United States</td>
<td>Retail Sales</td>
<td>Manufacturing and Trade Sales</td>
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<td>Real Average Weekly Earnings</td>
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<td>Russia</td>
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<td>Household Disposable Income</td>
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<td>Australia</td>
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<td>Wholesale and Retail Sales</td>
<td>Number of Employed Persons</td>
<td>Total Employment</td>
<td>Wage and Salary Income</td>
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<td>Japan</td>
<td>Retail Sales</td>
<td>Wholesale and Retail Sales</td>
<td>Number of Employed Persons</td>
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<td>Monthly Cash Earnings</td>
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<td>Korea</td>
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<td>Average Real Income of Workers</td>
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<tr>
<td>China</td>
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<td>Passenger Carried Volume</td>
<td>Employment LFS</td>
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<td>India</td>
<td>Car Sales: Passenger Vehicles</td>
<td>Occupied Employment</td>
<td>Employment LFS</td>
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<td>Average Real Income of Workers</td>
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<td>Brazil</td>
<td>Volume of Sales of the Retail Market</td>
<td>Formal Non-Agricultural</td>
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<td>South Africa</td>
<td>Value of Retail and New Vehicle Sales</td>
<td>Employment</td>
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</table>

The table above lists the coincident economic index components for 13 economies. Each country has multiple components related to retail sales, manufacturing and trade sales, non-agricultural employment, personal income, and production.
## Leading Economic Index Components: 13 economies

<table>
<thead>
<tr>
<th>Region</th>
<th>United States</th>
<th>Mexico</th>
<th>Canada</th>
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<td>Federal Funds Rate</td>
<td>Internal Rate Differential</td>
<td>Yield Spread (cumulative)</td>
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</table>

### Additional Components
- **Business Activity & Investment**
  - MNCs New Orders, Capital Goods, Non-Defense
  - MNCs New Orders, Consumer Goods & Materials
  - ISM New Orders Index
  - Manufacturing
  - Manufacturing
  - Manufacturing
  - Manufacturing
  - Manufacturing
  - Manufacturing

- **Consumer Confidence & Expenditure**
  - U.S. Initial Jobless Claims
  - Average Weekly Hours of All Employees
  - Average Weekly Hours of Production Workers
  - Unemployment Insurance
  - Consumer Confidence Index
  - Consumer Price Index
  - Personal Consumption Expenditures
  - Personal Income

- **Business Conditions**
  - ISM New Orders
  - ISM New Orders
  - ISM New Orders
  - ISM New Orders

- **Investment**
  - MNCs New Orders, capital goods, non-defense
  - MNCs New Orders, consumer goods & materials
  - ISM New Orders Index

- **Economic Activity**
  - Real GDP
  - GDP Growth Rate
  - Manufacturing
  - Manufacturing

- **Financial Markets**
  - Stock Prices
  - Stock Prices
  - Stock Prices
  - Stock Prices

- **Interest Rates**
  - Federal Funds Rate
  - Interest Rate Differential
  - Yield Spread (cumulative)

- **Exchange Rates**
  - Exchange Rate
  - Exchange Rate
  - Exchange Rate
  - Exchange Rate

- **Inflation**
  - Consumer Price Index
  - Core Consumer Price Index
  - Core PCE Price Index

- **Productivity**
  - Productivity
  - Productivity
  - Productivity

- **Housing**
  - Housing Starts
  - New Home Sales
  - Existing Home Sales

- **Unemployment**
  - Unemployment Rate
  - Initial Unemployment Claims
  - Continuing Claims

- **Stock Prices**
  - S&P 500 Index
  - NASDAQ Composite Index
  - Dow Jones Industrial Average

- **Interest Rates**
  - Federal Funds Rate
  - Yield Spread (cumulative)

- **Exchange Rates**
  - Exchange Rate
  - Exchange Rate

- **Inflation**
  - Consumer Price Index
  - Core Consumer Price Index

- **Productivity**
  - Productivity
  - Productivity

- **Housing**
  - Housing Starts
  - New Home Sales
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- **Unemployment**
  - Unemployment Rate
  - Initial Unemployment Claims
  - Continuing Claims

- **Stock Prices**
  - S&P 500 Index
  - NASDAQ Composite Index
  - Dow Jones Industrial Average
## Business Cycle Reference Dates

<table>
<thead>
<tr>
<th>Dates at Business Cycle Peaks</th>
<th>North America</th>
<th>Europe</th>
<th>Asia-Pacific</th>
<th>Latin America</th>
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<tbody>
<tr>
<td></td>
<td>U.S.</td>
<td>Mexico</td>
<td>Euro Area</td>
<td>France</td>
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<tr>
<td>1940s</td>
<td>Feb 45</td>
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<td>1950s</td>
<td>Nov 48</td>
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<td>1960s</td>
<td>Jul 53</td>
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<td>Oct 50</td>
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<td>1970s</td>
<td>Aug 62</td>
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<td>1980s</td>
<td>May 69</td>
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<td>Dec 79</td>
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<table>
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<th>Europe</th>
<th>Asia-Pacific</th>
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<td>1960s</td>
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<tr>
<td>1990s</td>
<td>Apr 36</td>
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Source: NBER; IBRE/FGV; The Conference Board

Notes: U.S. and Brazil business cycle chronologies are determined by the NBER and CODACE Business Cycle Dating Committees, respectively; all other business cycle reference dates are determined by The Conference Board using a business cycle dating algorithm (see Bry and Boschan (1971) and Harding and Pagan (2002)).
# Global Business & Growth Cycle Chronology

## Business Cycle Chronology

<table>
<thead>
<tr>
<th>Peaks</th>
<th>LEI Peaks</th>
<th>Troughs</th>
<th>LEI Troughs</th>
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<tr>
<td>Oct-90</td>
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<td>May-91</td>
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<td>Feb-08</td>
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## Growth Cycle Chronology

<table>
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<th>LEI Troughs</th>
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<td>miss</td>
<td>Feb-99</td>
<td>miss</td>
</tr>
<tr>
<td>Sep-00</td>
<td>0</td>
<td>Aug-03</td>
<td>-22</td>
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<tr>
<td>Feb-08</td>
<td>-4</td>
<td>May-09</td>
<td>-2</td>
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<tr>
<td>Feb-12</td>
<td>-7</td>
<td>Feb-13</td>
<td>-3</td>
</tr>
<tr>
<td>Nov-19</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The peak date for the global recession in 2020 is placed in January 2020 when the World Health Organization declared a global health emergency.*

Note: Business cycle chronologies are derived from the Global CEI, while growth cycle chronologies derived from the de-trended Global CEI; both chronologies are determined by the Bry-Boschan (1971) business cycle dating algorithm.
Macro data continue to show strength across the US economy
Leading and Coincident Economic Indexes show the US economy in expansion
Note: Shaded areas represent recessions as determined by the NBER Business Cycle Dating Committee.

For more information: https://www.conference-board.org/data/bci-country.cfm?cid=1
Strengths among the leading indicators are very widespread