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celebrate arkansas
TBP Business Journal
Business Forecast 2019  
February 1, 2019  
11:30 a.m. - 1:30 p.m.

Schedule of Events

Welcome Joseph Steinmetz  
Chancellor  
University of Arkansas

Special Remarks Matt Waller  
Dean, Sam M. Walton College of Business  
University of Arkansas

2018 Contest Awards Mervin Jebaraj  
Director, Center for Business and Economic Research  
Sam M. Walton College of Business  
University of Arkansas

Introduction of Moderator Matt Waller

Introduction of Panelists Amy Tu  
Executive Vice President and General Counsel  
Tyson Foods, Inc.

Global Forecaster Carolyn Evans  
Head Economist and Senior Data Scientist  
Intel Corporation

Domestic Forecaster Ross DeVol  
Walton Fellow  
Walton Family Foundation

Regional Forecaster Mervin Jebaraj

Panel Discussion Amy Tu, Carolyn Evans, Ross DeVol, Mervin Jebaraj

Recognitions and Announcements Matt Waller

Business Forecast 2019 is in association with the National Association for Business Economics (NABE). Please use Twitter hashtag #BF2019 for this event.
Amy Tu is an executive vice president and general counsel responsible for Tyson Foods’ legal, government affairs, ethics and compliance, and internal audit functions enterprise-wide. She leads Tyson Ventures, a venture capital fund investing in companies developing breakthrough technologies, business models and products to sustainably feed the growing world population. Amy joined Tyson from The Boeing Company where she held progressive leadership positions in law and corporate development and strategy departments. She served as chief counsel for Boeing global law affairs, commercial airplanes and aviation services divisions, supporting multiple business and functional leaders worldwide. Amy was also instrumental in helping to shape the global law affairs practice as Boeing’s first regional counsel based in London, U.K., with responsibilities for commercial, military and defense matters in Europe, Russia, and Israel. Prior to joining Boeing in 2001, Amy led global transactions and international legal matters as an international corporate counsel at the Gap and Walmart. Amy earned a Juris Doctorate degree from the University of Arkansas School of Law and a Bachelor of Arts degree in economics from Wellesley College.

Carolyn Evans is head economist and senior data scientist at Intel Corporation. Prior to joining Intel, Evans held the positions of associate professor of economics at Santa Clara University, senior economist at the Board of Governors of the Federal Reserve, senior staff economist for international trade on the President’s Council of Economic Advisers, and economist at the Federal Reserve Bank of New York. She has published academic articles and books in the areas of international trade, political economy, global macroeconomics and corporate finance. Evans is a member of the Conference of Business Economists, the Harvard University Discussion Group of Industrial Economists, the National Association for Business Economics (NABE), and the American Economic Association and serves on the Board of Directors of NABE and the Advisory Board for the M.S. in Business Analytics at Santa Clara University. Carolyn holds a Ph.D. and M.A. in Economics and a B.A. in east Asian languages and civilizations from Harvard University. She also holds a M.Sc. from the London School of Economics.

Ross DeVol is a fellow, Walton Family Foundation, a program enlisting subject-matter experts to conduct research and develop best practices supporting the foundation’s philanthropic efforts. He is assessing opportunities for regional innovation and entrepreneurial ecosystems that foster job creation, wage gains and economic growth for the American heartland. He works with universities, colleges, the business community, public policy leaders and philanthropy to analyze resources supporting the startup community and identify workforce and talent gaps. DeVol is former chief research officer for the Milken Institute, an economic think tank headquartered in California where he spent nearly 20 years. He oversaw research on international, national and comparative regional growth performance, access to capital and its role in economic growth and job creation, and health-related topics. He has been ranked among the “Superstars of Think Tank Scholars” by International Economy magazine. DeVol is transitioning to lead the new Core Economic Institute (a think and do tank) whose mission will be to improve economic performance in the center of the United States. The Institute will pursue its mission through independent, data-driven research, action-oriented convenings and impactful policy recommendations.

Mervin Jебaraj is the director of the Center for Business and Economic Research. During his time at the center, he has been instrumental in creating and executing economic studies for clients such as the Arkansas Economic Development Commission, the Northwest Arkansas Council, the Walton Family Foundation, Arvest Bank, the University of Arkansas and many others. His work has been noted by the state’s business media. The Northwest Arkansas Business Journal recognized him as one of its “Fast 15” and Arkansas Business put him on its list of “20 in their 20s.” He is an exceptional source of business and economics-related expertise that journalists and business people alike rely on to understand how national and regional issues impact Northwest Arkansas and Arkansas as a whole. He makes presentations that share the center’s expertise directly to over 5,000 individuals annually and tens of thousands more hear and see his economic analysis and commentary through TV, radio and print media. Jебaraj is a member of the National Association for Business Economics and serves on the Board of Directors of the Association for University Business and Economic Research.
Risk Factors

Today’s presentations contain forward-looking statements. All statements made that are not historical facts are subject to a number of risks and uncertainties, and actual results may differ materially. Please refer to our most recent earnings release, Form 10-Q and 10-K filing available on our website for more information on the risk factors that could cause actual results to differ.
Disclaimer

The views in this presentation are solely the responsibility of the author and should not be interpreted as reflecting the views of Intel Corporation or of any other person associated with Intel Corporation.

Outline

• Snapshot of The Global Economy

• 2018 in Review

• The Year Ahead
Snapshot of the Global Economy

2010 Real GDP

- Western Europe: 24%
- USA: 25%
- China: 12%
- Middle East & Africa: 7%
- Latin America: 7%
- Japan: 7%
- Central & Eastern Europe: 5%
- Asia/Pacific (ex. JP, PRC): 11%
- Canada: 2%

2017 Real GDP

- Western Europe: 25%
- USA: 24%
- China: 16%
- Middle East & Africa: 7%
- Latin America: 7%
- Japan: 6%
- Central & Eastern Europe: 4%
- Asia/Pacific (ex. JP, PRC): 12%
- Canada: 2%

Source: IHS Markit.

Snapshot of the Global Economy

2018 in Review

• Growth

• Exchange rates

• Trade policy

<table>
<thead>
<tr>
<th>Real GDP Growth Rates</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHS Markit (Jan 2019)</td>
<td>2.7%</td>
<td>3.3%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Oxford Economics (Jan 2019)</td>
<td></td>
<td></td>
<td>3.0%</td>
</tr>
<tr>
<td>World Bank (Jan 2019)</td>
<td>2.4%</td>
<td>3.1%</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

Note: GDP in Real USD; Oxford Economics and World Bank, 2010 base year; IHS Markit, 2015 base year. Forecasts represented by italics.

2018 in Review

• Growth

• Exchange rates

• Trade policy

Source: Yahoo Finance. YoY calculations show growth over last trading days of the year.
The Year Ahead

“Global economic growth is projected to soften from a downwardly revised 3 percent in 2018 to 2.9 percent in 2019 amid rising downside risks to the outlook, the World Bank’s Global Economic Prospects says.”

Global Economic Prospects: A solid 2019 as market falls overstate loss of momentum

The global economy: Rising recession risks
16 Jan 2019
The danger of a global economic downturn has risen, but the probability of a recession in 2019 is still low. After a brief spurt in 2017 and 2018, growth in the G7 economies is reverting to trend, and emerging markets are unlikely to come to the rescue.
Global Business Sentiment

Source: IHS Markit, Caixin, data through December 2018. Above 50.0 = increase since previous month.

EU and Euro Area Confidence Indicators

Source: Eurostat, data through December 2018.

US NFIB Optimism Index

Source: NFIB, data through December 2018.

Employment

Source: REDE, BLS, openings through November 2018, unemployed through December 2018.

Source: Statistics Bureau of Japan, data through November 2018.
# World Real GDP Growth Forecasts

<table>
<thead>
<tr>
<th>Source</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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</thead>
<tbody>
<tr>
<td>IHS Markit (Jan 2019)</td>
<td>2.7%</td>
<td>3.3%</td>
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<td>2.9%</td>
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<td>Oxford Economics (Jan 2019)</td>
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<td></td>
<td>2.7%</td>
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<tr>
<td>World Bank (Jan 2019)</td>
<td>2.4%</td>
<td>3.1%</td>
<td>3.0%</td>
<td>2.9%</td>
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<tr>
<td>IMF (Oct 2018)</td>
<td>3.3%</td>
<td>3.7%</td>
<td>3.7%</td>
<td>3.7%</td>
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<tr>
<td>OECD (Nov 2018)</td>
<td>3.1%</td>
<td>3.6%</td>
<td>3.7%</td>
<td>3.5%</td>
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Notes: Methods of aggregation and base years differ across sources. Forecasts represented by italics.
Innovation and What’s Ahead for the U.S. Economy

25th Annual Business Forecast Luncheon

Sam M. Walton College of Business
Rogers, AR
February 1, 2019
Presented by: Ross DeVol
Fellow, Walton Family Foundation

Presentation overview

• Innovation and long-term growth
  - research and development
  - entrepreneurship and risk capital
  - human capital
  - STEM workforce
  - technology dynamism

• Near-term U.S. economic outlook
  - consumer
  - business investment
  - housing
  - trade
  - financial
  - fiscal
  - summary outlook
Business increasingly driving innovation

U.S. Research and Development Spending
Billions of 2009 Dollars

- Total R&D
- Business
- Federal Government
- Higher Education

Source: National Science Foundation

STSI Research and Development Inputs index

Source: Milken Institute
Entrepreneurs vital to a dynamic economy

Percent of U.S. Employment at Young Firms

Source: Census Bureau

STSI Risk Capital and Entrepreneurial Infrastructure Index

Source: Milken Institute
Human capital investment key to growth

Percent of U.S. 25 and Older Population with a Bachelor’s Degree or Higher

Source: Census Bureau

STSI Human Capital Investment Index

Source: Milken Institute
STEM workforce converts research to viable firms

U.S. Science and Engineering Jobs

- Number of Jobs (Left Axis)
- Share of all U.S. Jobs (Right Axis)

Sources: National Science Foundation analysis of Census Bureau and Bureau of Labor Statistics

STSI Tech and Science Workforce Index

Source: Milken Institute
Advanced services’ success critical to job creation

U.S. Employment in Advanced Industries
Millions of Workers

Sources: Brookings Institution analysis of Emsi data

Advanced industries account for majority of U.S innovation

Advanced Industries’ Share of 2015 U.S. Macro Measures

Source: Brookings Institution analysis of Moody’s Analytics, Export Nation 2013, and Bureau of Labor Statistics data
STSI Tech Concentration and Dynamism Index

Source: Milken Institute

State Science and Technology Index

Source: Milken Institute
**Innovate to create high wage jobs**

Actual versus STSI-predicted Average Annual Pay

![Graph showing actual versus predicted average annual pay](image)

Source: Walton Family Foundation analysis of Milken Institute and Bureau of Labor Statistics data

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**Income gains remain steady**

Real Disposable Income Growth

Percent Change, Year-over-year

![Graph showing real disposable income growth](image)

Source: Bureau of Economic Analysis
Consumers able and willing to spend

Consumer Spending and Confidence
Percent Change, Year-over-year

Real Personal Consumption Expenditures Growth (Left Axis)
Consumer Confidence (Right Axis)

Sources: Bureau of Economic Analysis and Conference Board

Businesses invest after tax and regulatory reform

U.S. Core Capital Good Purchases and Business Optimism
Billions of US Dollars (3-month MA)

New Core Capital Orders (Left Axis)
Core Capital Shipments (Left Axis)
Small Business Optimism Index (Right Axis)

Sources: Census Bureau and National Federation of Independent Businesses
Home sales retreat after mortgage rates rise

Single-family Home Sales and Starts
Millions of Units

2012 2013 2014 2015 2016 2017 2018

Home Sales (Left Axis)
Home Starts (Right Axis)

Sources: Census Bureau and National Association of Realtors

Strong U.S. growth draws in imports, trade war looms

Non-petroleum Import and Export Growth
3-month MA of Year-over-year Percent Change

2012 2013 2014 2015 2016 2017 2018

Imports
Exports

Source: Bureau of Economic Analysis
Federal government spending adds 0.6 pp. to GDP growth in 2019

Projected Federal Budget Deficits
Billions of US Dollars

Sources: US Treasury and Moody's Analytics

Fed starts to allow balance sheet to run off; Wall Street worries

Federal Reserve Balance Sheet (Total Assets)
Trillions of US Dollars

Source: Federal Reserve System
**Will yield curve invert? – Does it signal recession?**

Spread Between 10-Year and 3-Month Treasuries
Percentage Points

| Source: Federal Reserve System |

**Economic Outlook Summary**

Percent Change, Real

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
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<tr>
<td>Consumption</td>
<td>2.7</td>
<td>2.5</td>
<td>2.7</td>
<td>2.6</td>
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<tr>
<td>Business Fixed Investment</td>
<td>1.7</td>
<td>4.8</td>
<td>5.5</td>
<td>5.4</td>
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<tr>
<td>Residential Investment</td>
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<td>3.3</td>
<td>0.3</td>
<td>4.1</td>
<td>3.1</td>
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<tr>
<td>Exports</td>
<td>0.1</td>
<td>3.0</td>
<td>4.1</td>
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<td>5.0</td>
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<tr>
<td>Imports</td>
<td>1.9</td>
<td>4.6</td>
<td>4.8</td>
<td>6.0</td>
<td>4.1</td>
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<tr>
<td>Government</td>
<td>1.4</td>
<td>-0.1</td>
<td>1.7</td>
<td>4.0</td>
<td>2.2</td>
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<tr>
<td>GDP</td>
<td>1.6</td>
<td>2.2</td>
<td>2.9</td>
<td>2.6</td>
<td>1.2</td>
</tr>
</tbody>
</table>
The Arkansas Economy in 2019

Mervin Jebaraj, Director
Center for Business and Economic Research
February 1, 2019

Twitter: #BF2019
@uawaltoncollege @MervinJebaraj

Unemployment Rates, Not Seasonally Adjusted

Source: Bureau of Labor Statistics
Unemployment Rates, Not Seasonally Adjusted

Labor Force, Year Over Year Percent Change

Source: Bureau of Labor Statistics
Annual Labor Force Participation Rate

Source: Bureau of Labor Statistics

Arkansas Non-Farm Employment

Source: Bureau of Labor Statistics
Metro v Non-Metro Arkansas Non-Farm Employment Growth

Source: Bureau of Labor Statistics

Change in Arkansas Employment by Sector
December 2017 - December 2018

Source: Bureau of Labor Statistics, CBER Calculations
Change in Little Rock-North Little Rock-Conway MSA Employment by Sector, December 2017 - December 2018

Source: Bureau of Labor Statistics, CBER Calculations
Change in Northwest Arkansas MSA Employment by Sector, December 2017 - December 2017

Source: Bureau of Labor Statistics, CBER Calculations

Per Capita Personal Income

Source: Bureau of Economic Analysis