

# Conference Call

## In Search of Potential GDP

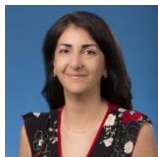
The assessment of the cyclical position of the economy relative to its potential is the key to formulating economic policy – specifically monetary policy. Therefore, an incorrect estimate of the potential output would mislead the policymaker and result in ill-advised monetary policies. Despite the fact that potential GDP plays an important role in policymaking, its assessment is not uniform since potential GDP is unobservable and can only be estimated as the healthy, non-recessionary long-run trend of GDP.

How much economic health is enough? Is the future of U.S. potential growth gloomy or bright? Several alternative and some hypothetical scenarios for supply side factors of labor, capital, and technological growth are examined in order to draw conclusions.

*Please join us for an informative discussion with Dr. Chen and Dr. Papanyan*



Kan Chen, Ph.D.  
Senior Economist, BBVA Research USA  
[kan.chen@bbva.com](mailto:kan.chen@bbva.com)  
[www.bbva.com/research](http://www.bbva.com/research)



Shushanik Papanyan, Ph.D.  
Senior Economist, BBVA Research USA  
[shushanik.papanyan@bbva.com](mailto:shushanik.papanyan@bbva.com)  
[www.bbva.com/research](http://www.bbva.com/research)

**Thursday, July 28, 2016**

**10:00 am | CDT (GMT -05:00) | 30 min**

[Join WebEx Meeting](#)

**Meeting Number: 718 219 975**

**Meeting Password: bbva1234**

**Join by phone**

**+1-877-768-4036 US Toll Free**

**+1-972-932-2100 US Toll**

**Access code: 718 219 975**

**WebEx Link**

<https://bbvacompass.webex.com/bbvacompass/j.php?MTID=mc57d1ba1c151a414daff01ab422b89cd>

**Global Call-in Numbers**

<https://bbvacompass.webex.com>



# In Search of Potential GDP

Kan Chen  
Senior Economist  
BBVA Research USA

Shushanik Papanyan  
Senior Economist  
BBVA Research USA  
Houston, Texas

July 28th, 2016

# Is the future of potential growth gloomy or bright?

The assessment of the cyclical position of the economy is the key to formulating economic policy, but views diverge

## Why?

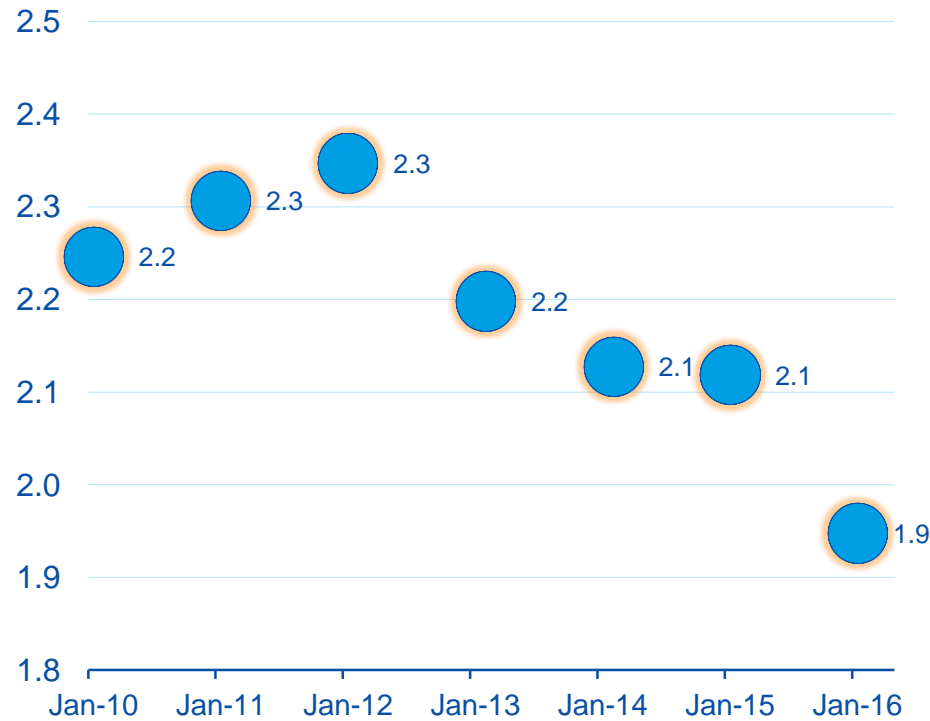
- Potential GDP is unobservable and can only be estimated
- The level of GDP relative to its potential, healthy growth is not uniform

## How much health is enough?

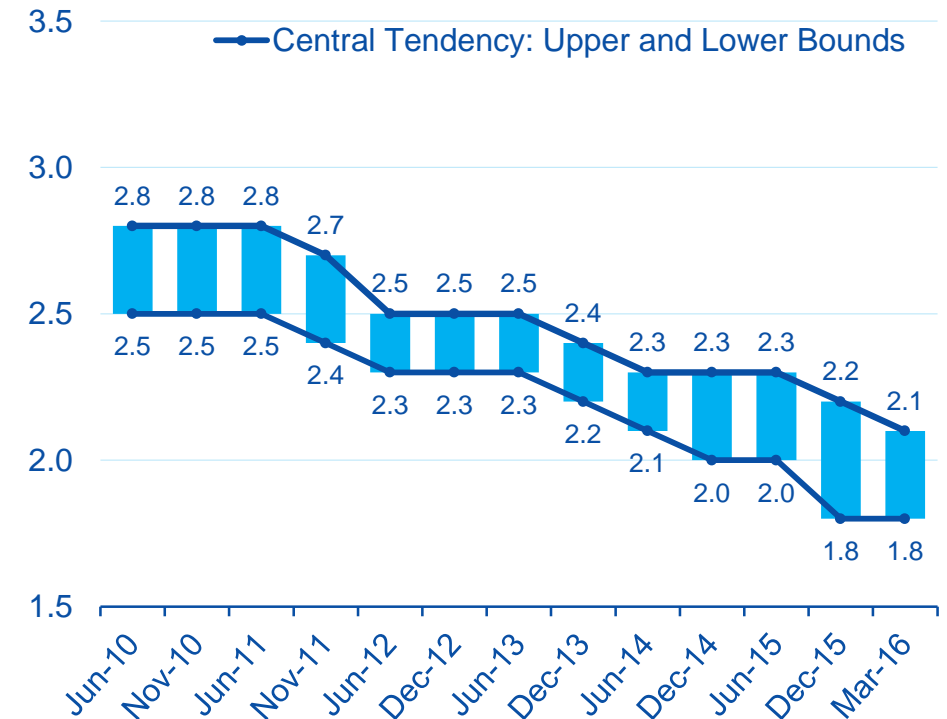
- Views diverge because methodologies on potential GDP estimation vary
- Despite differences in the estimation methodologies, one common thread has been the continuous downgrade of U.S. expected potential GDP growth

# The continuous downgrade of U.S. expected potential GDP growth

Potential Ten Year Real GDP Average Growth by Congressional Budget Office, %



Long-term Real GDP Projections by Federal Open Market Committee, %



# How to define potential GDP and why do the estimates vary?

## “attainable potential”

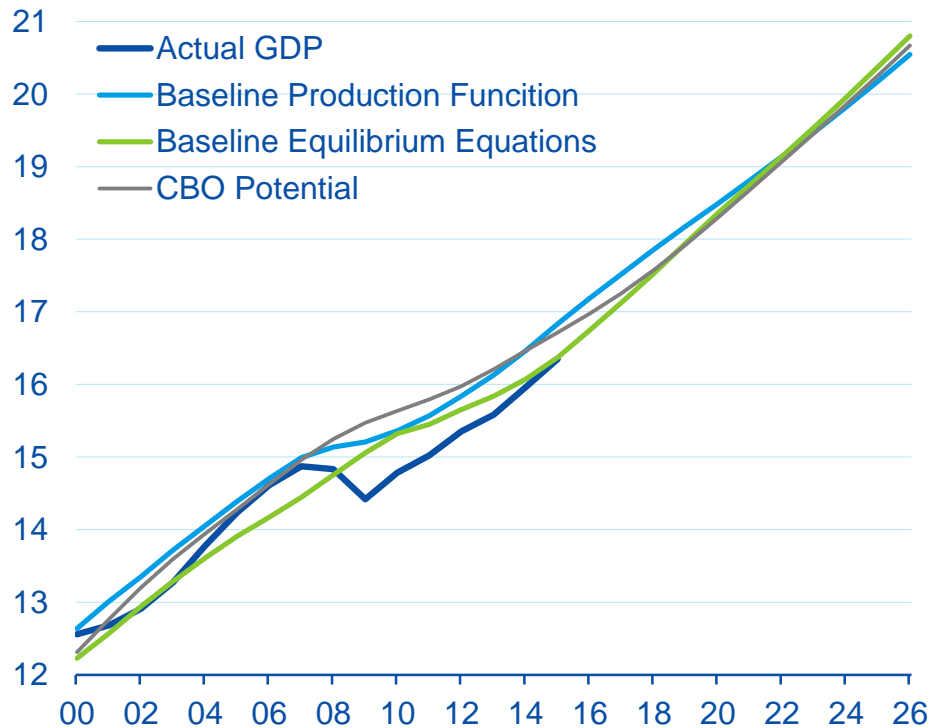
- The trend-cycle decomposition models
- The actual GDP level would fluctuate around the potential - be below potential during recession (“output gap”) and above potential during the expansions (“inflationary gap”)
- Exceeding the healthy state in the short run is possible

## “full-capacity potential”

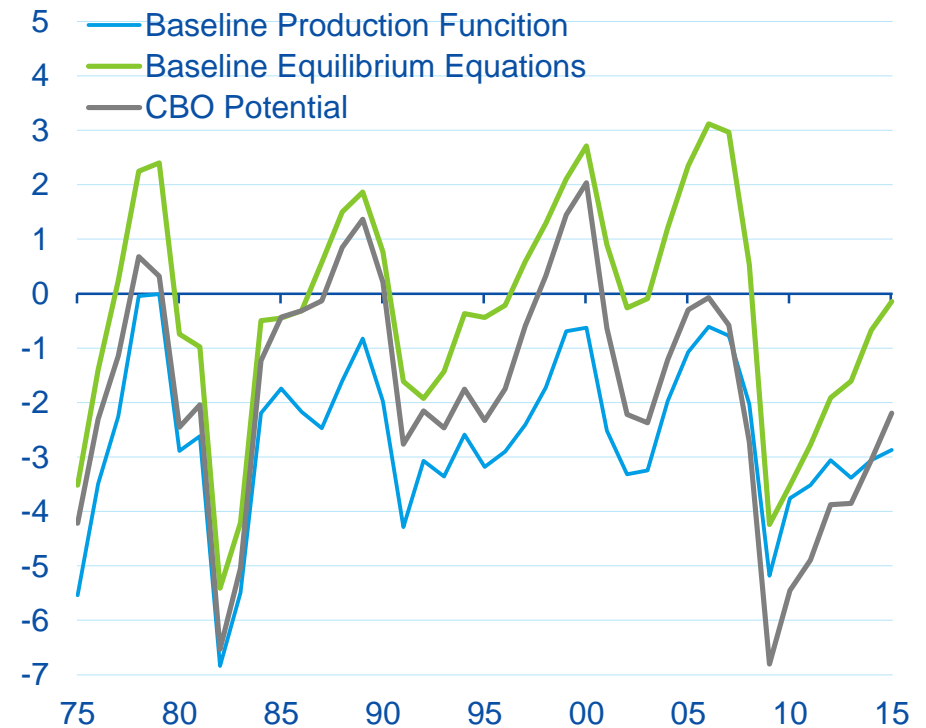
- Theoretical production function approach
- Directly builds the link from production input series encompassing labor, capital, and technology to potential output
- Preferred by CBO, the EU Commission, and OECD
- The potential GDP is an upper bound for the economic performance

# The divergence in the assessment of the cyclical position

**Real GDP and Potential GDP Estimates, \$ Bn.**



**Real Output Gap Estimates, %**



# In search of potential GDP

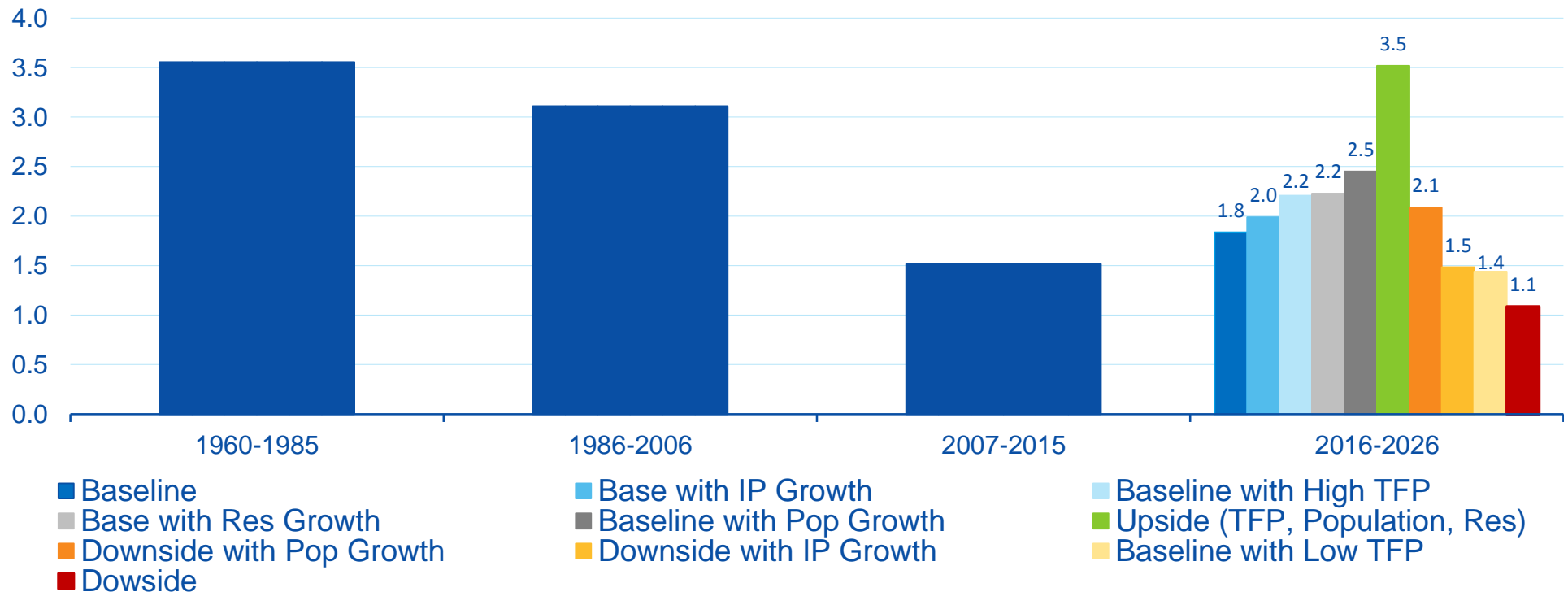
- The production function approach is a natural fit to illustrate the constraints posed by the last decade's structural changes in labor, capital, and technology
- Altered and hypothetical assumptions of capital, labor, and technology, including extreme adverse shocks like the Great Recession and extremely optimistic upside scenarios wherein all the stars align
- Under the baseline assumptions, we find potential GDP growth to be bound between 1.4% and 1.8%

## Potential GDP Growth Scenarios Summary with Varying Assumptions for Labor, Capital and Total Factor Productivity (TFP)

	Baseline	Baseline with High TFP	Baseline with Low TFP	Baseline with Working Age Pop Growth	Baseline with Residential Assets Growth	Baseline with IP Growth	Dowside	Downside with Working Age Population Growth	Downside with IP Growth	Upside with High TFP, Working Age Population and Resid. Assets Growth
<b>1960-1985</b>	<b>3.6</b>									
<b>1986-2006</b>	<b>3.1</b>									
<b>2007-2015</b>	<b>1.5</b>									
<b>2016-2020</b>	1.9	2.3	1.5	2.6	2.4	2.1	1.0	2.0	1.3	3.8
<b>2021-2026</b>	1.8	2.2	1.4	2.3	2.1	1.9	1.2	2.2	1.6	3.2

# In search of potential GDP

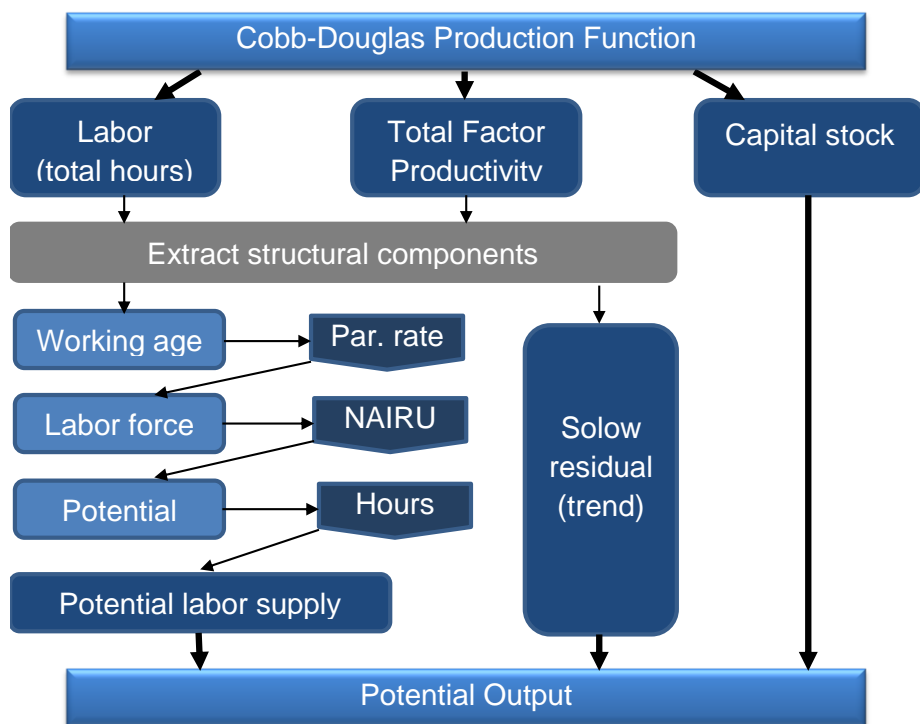
## Potential GDP Growth Scenarios Summary, %





# The estimation of potential output

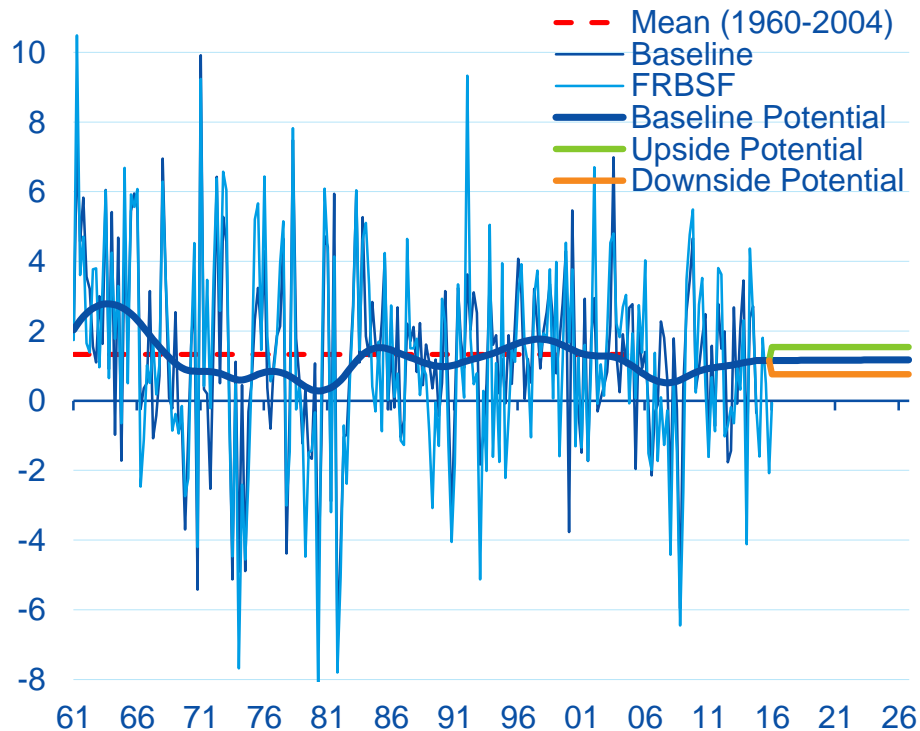
## Production Function Model Flow Chart



- The estimation of potential output relies on the forecast of labor, productivity, and capital
- Labor has the most components in the equation, and is subject to the most scrutiny
- The forecasts of the total factor productivity and capital are straightforward, yet uncertainty exists

# Total Factor Productivity does matter but not enough for a strong boost

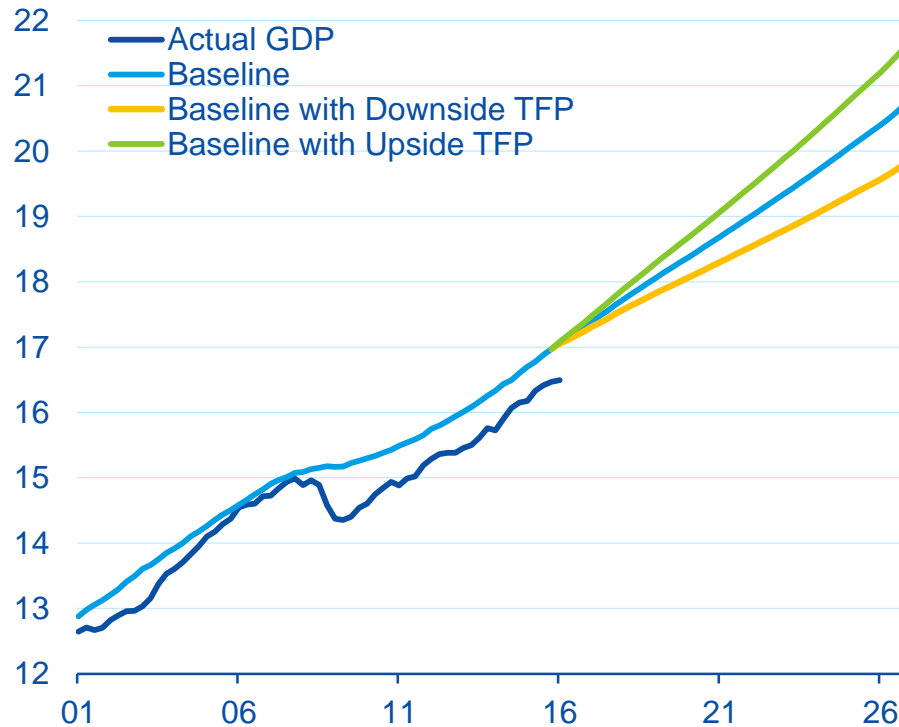
## The U.S. Total Factor Productivity, %



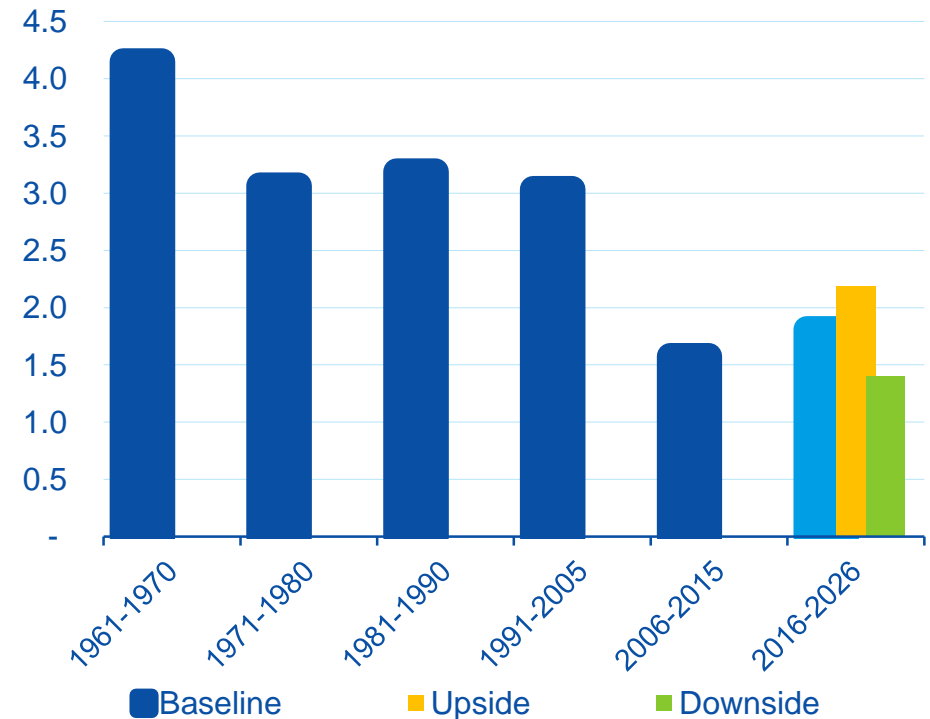
- Productivity growth is highly volatile throughout history
- TFP significantly declined around 2004, and the following recovery has been modest
- Our scenarios represent three likely average values of the future TFP growth

# Potential output under TFP scenarios

**Potential GDP under Three TFP Scenarios, Trillion 2009\$**



**Average Potential Output Growth under Three TFP Scenarios, %**



# Weaknesses in capital growth

- Estimation of capital involves estimation of investment, depreciation, and accounting of intangible properties
- Our baseline estimate of the capital growth rate is 2.0%, higher than the post-recession average but lower than the historic average
- In the medium-term (5-10 years), the economy may not accumulate capital at the pace of the historical average growth rate

## Capital Growth Scenarios Summary

		Net Stock of Fixed Assets	Equipment	Nonresidential Structures	Intellectual Property	Residential Assets
10Y Forecast Baseline	2017-2026	2.0%	3.6%	0.9%	2.9%	1.1%
10Y Forecast Downside	2017-2026	1.6%		0.2%		0.1%
10Y Forecast Upside	2017-2026	3.0%	3.8%	1.2%	4.1%	2.9%
Post 2005, Including Recession	2006-2015	1.5%	2.6%	1.1%	3.0%	0.8%
Historic Growth Rate	1950-2005	3.3%	3.7%	2.5%	5.8%	3.0%

# The growth in the labor force is a key determinant of sustainable potential GDP

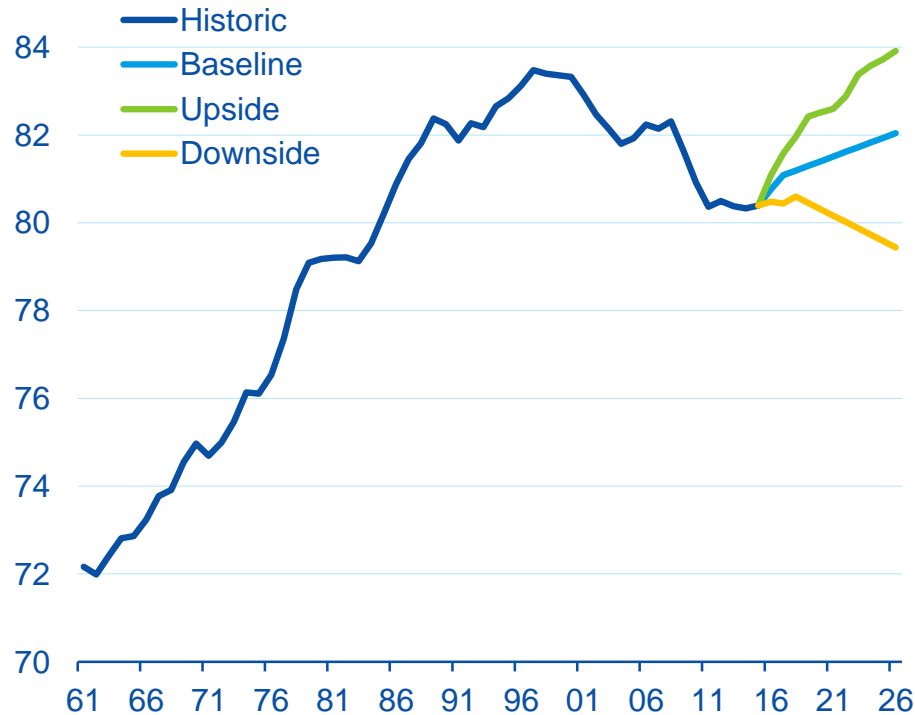
Labor force participation rate assumptions encompass various scenarios for **labor force to working age population ratio** and **working age population growth**

The current economic trends in the labor force participation rate

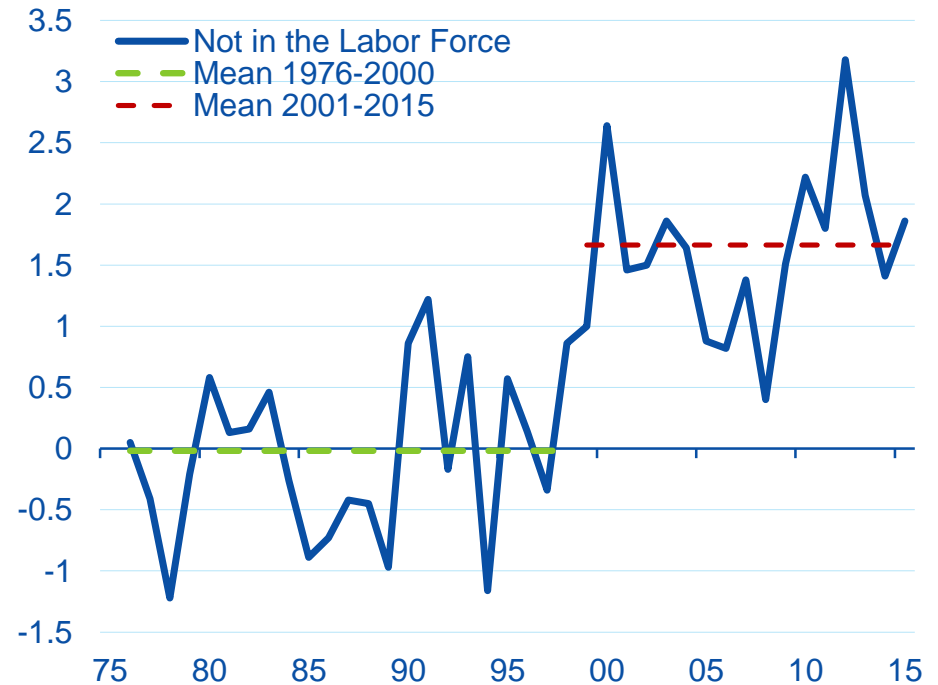
- The labor force participation rate has consistently declined since 2000
- At least half of the decline can be explained by the increased share of the aging population
- The relationship between the labor force and the working age population underwent a structural shift in late 1990s
- The phenomenon is mostly explained by the plateau in the women's labor force participation rate followed by a decline in that rate

# Significance of labor force to working age population ratio structural shift

**Labor Force to Working Age Population 18-64 Ratio Assumptions, %**



**Women 16-Years and Up, Not in Labor Force %, Year over Year**



# Labor scenarios are complex

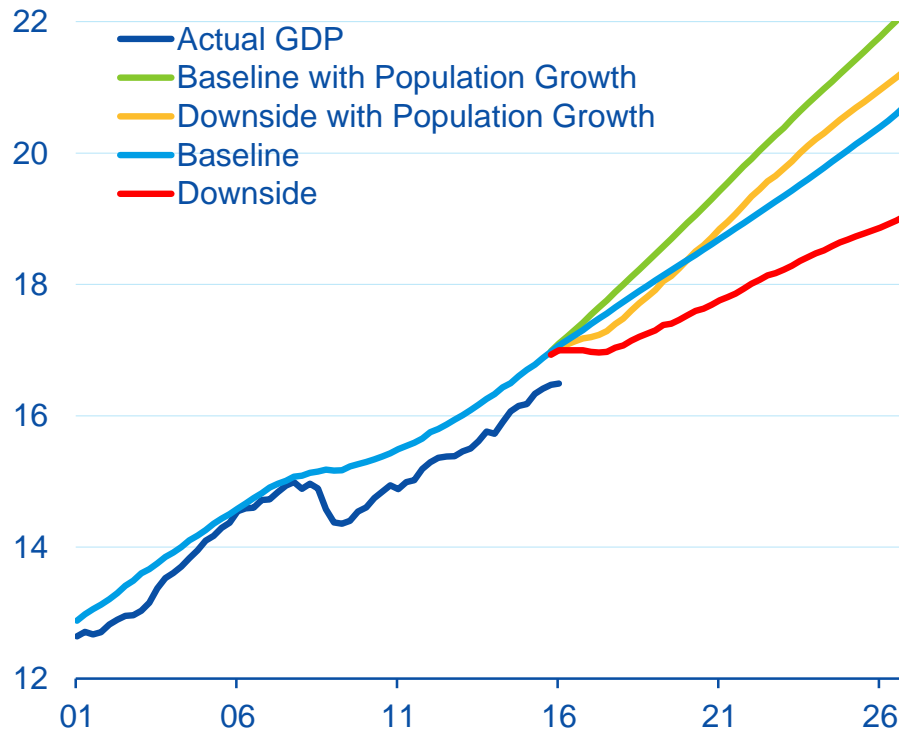
- The most optimistic scenario assumes growth in the working age population, a high labor participation rate, and low NAIRU

## Population Growth Scenarios Summary: 2016 – 2026 Average

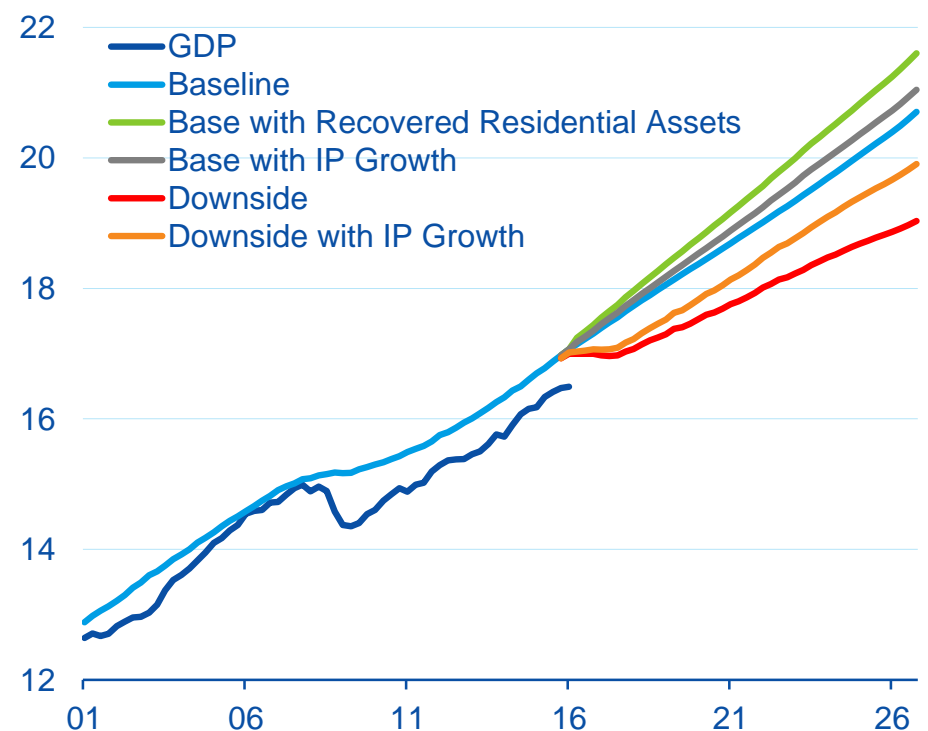
		Labor Force to Working Age Population Ratio		
		Baseline 81.6%	Downside 80.1%	Upside 82.9%
Working Age Population Growth	Baseline 0.3%	<b>Labor Force Participation Rate - 61.2%</b> Weekly Labor Hours - 32.8 NAIRU - 4.6% Capital Growth - 2.0%	<b>Labor Force Participation Rate - 60.1%</b> Weekly Labor Hours - 32.6 NAIRU - 5.9% Capital Growth - 1.6%	
	Upside 1.0%	<b>Labor Force Participation Rate - 62.0%</b> Weekly Labor Hours - 32.8 NAIRU - 4.6% Capital Growth - 2.0%	<b>Labor Force Participation Rate - 60.9%</b> Weekly Labor Hours - 32.6 NAIRU - 5.9% Capital Growth - 1.6%	<b>Labor Force Participation Rate - 63.0%</b> Weekly Labor Hours - 33.4 NAIRU - 4.1% Capital Growth - 3.1%

# The one hypothetical assumption that significantly raises potential growth is the higher working age population

**Potential GDP under Labor Scenarios, Trillion 2009\$**



**Potential GDP under Capital Scenarios, Trillion 2009\$**





## Key messages

- The potential output growth for the next decade is alarmingly hard to judge
- The policy implications of the potential GDP outlook can be critical
- Theory-based productivity function accounting is challenged by the rise of digital capital, declining share of labor income, and changes in the mixes of capital-augmented and labor-augmented technologies
- It misses out on structural changes that cancel each other out in the aggregation, such as large reallocations of production and resources from the manufacturing sector to the service sector

There is a possibility that the “full capacity potential” GDP growth may understate the true living standard

## Key messages

The state-of-the-art approach employed to estimate potential output for the U.S. yields 1.8% average potential GDP growth in the baseline

The heavy downward weight of economic trends is hard to reject

- the low growth rate of the net stock residential assets
- the deceleration of the working age population growth
- the decline in the labor force to working age population ratio

The probability that all the stars align is low

Under the luckiest circumstances, U.S. potential growth can be closer to its optimal 3.5%

# References

- Blau, Francine D. and Lawrence M. Kahn. 2013. "Female Labor Supply: Why is the US Falling Behind?" NBER Working Paper No. 18702
- Bullard, James. 2016. "Slow Normalization or No Normalization?" The Official Monetary and Financial Institutions Forum's City Lecture, Singapore, May 26, 2016 <https://www.stlouisfed.org/~media/Files/PDFs/Bullard/remarks/Bullard-OMFIF-Singapore-26-May-2016.pdf>
- Bullard, James. 2016. "Outspoken Fed Official Frets about Following Japan's Path." The New York Times Interview, May 4, 2016 <http://www.nytimes.com/2016/05/05/upshot/outspoken-fed-official-frets-about-following-japans-path.html>
- Doménech, Rafael and Víctor Gómez. 2006. "Estimating Potential Output, Core Inflation, and the NAIRU as Latent Variables," Journal of Business and Economic Statistics, Vol. 24(3)
- Gordon, Robert. 2012. "Is U.S. Economic Growth Over? Faltering Innovation Confronts The Six Headwinds." NBER Working Paper 18315.
- Hall, Robert E. 2014. "Quantifying the Lasting Harm to the U.S. Economy from the Financial Crisis." NBER Working Paper 20183.
- Hotchkiss, Julie L. 2005. "Employment Growth and Labor Force Participation: How Many Jobs Are Enough?" Econometric Review, First Quarter, Federal Reserve Bank of Atlanta
- Papanyan, Shushanik. 2015. "Digitization and Productivity: Measuring Cycles of Technological Progress." BBVA Research Working Paper N° 15/33  
<https://www.bbvaresearch.com/en/publicaciones/digitization-and-productivity-measuring-cycles-of-technological-progress/>.
- Roeger, Werner. 2006. "The Production Function Approach to Calculating Potential Growth and Output Gaps Estimates for EU Member States and the US." Working paper, EU-Commission, DG ECFIN
- Saxena, M.S.C. and Cerra, M.V., 2000. "Alternative Methods of Estimating Potential Output and the Output Gap: an Application to Sweden." International Monetary Fund.
- Weidner, Justin and John C. Williams. 2016. "Update of "How Big is the Output Gap?" Working Paper

# In Search of Potential GDP

Kan Chen  
Senior Economist  
BBVA Research USA

Shushanik Papanyan  
Senior Economist  
BBVA Research USA  
Houston, Texas

July 28th, 2016