

Slack and Monetary Policy

Late Exit

Jan Hatzius

Chief Economist

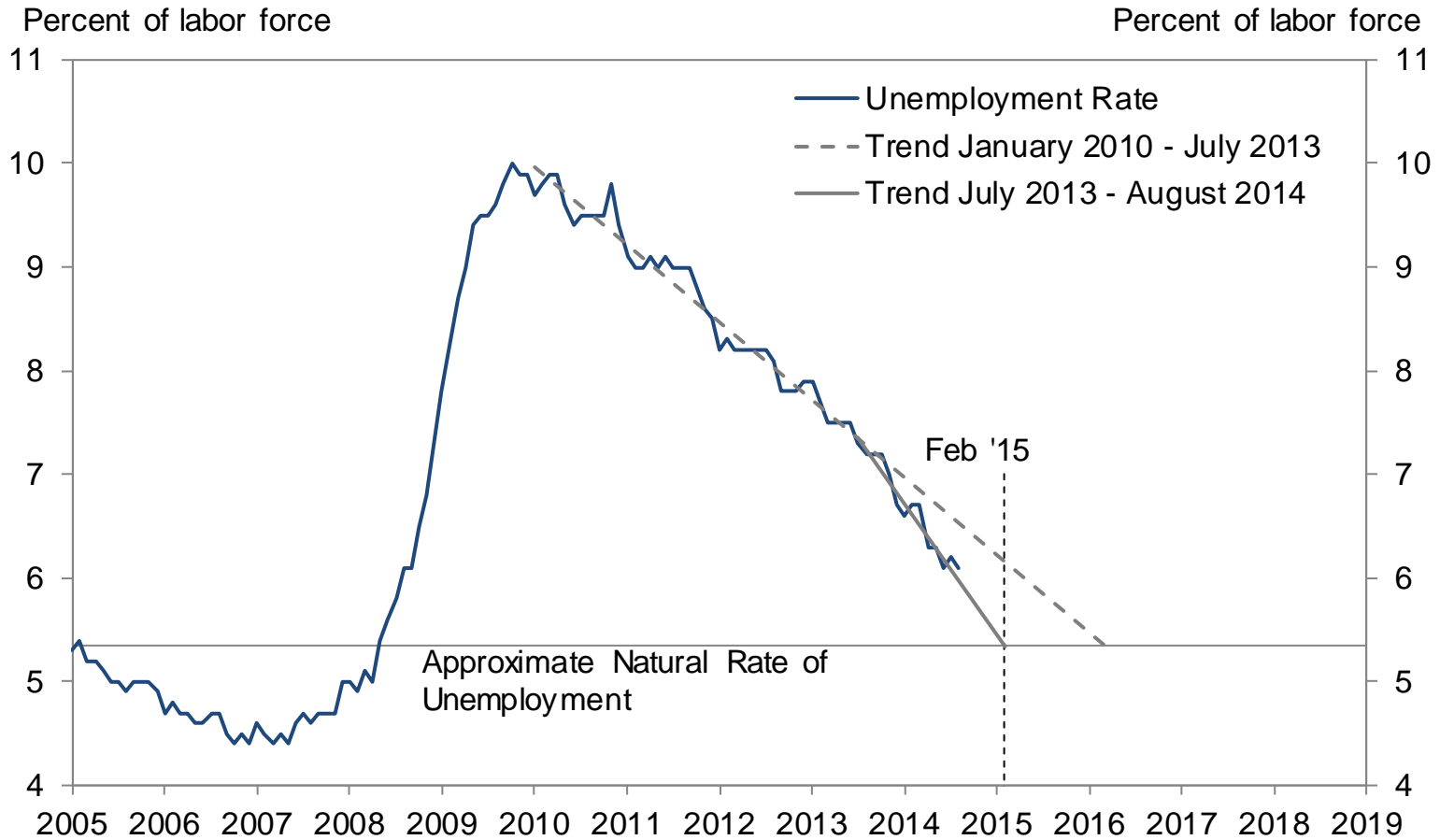
Jan.Hatzius@gs.com

212-902-0394

September 24, 2014

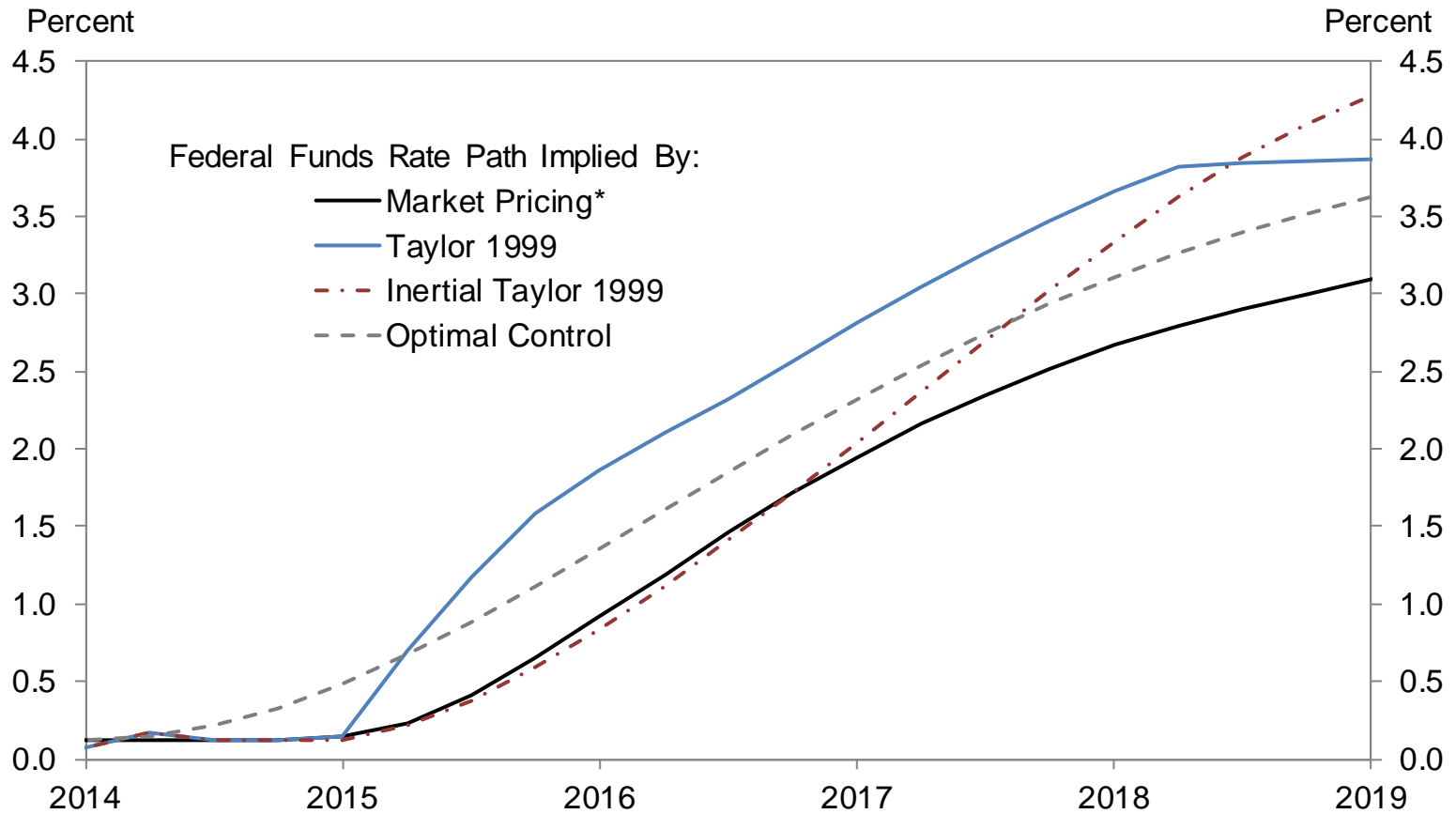
Goldman Sachs Global Macro Research

Unemployment on Track to Normalize in 2015



Source: Department of Labor. Goldman Sachs Global Investment Research.

FRB/US Simulations Using Unemployment Rate Suggest Earlier Exit than Market Pricing



*Derived from Eurodollar futures and LIBOR - Fed Funds basis swaps.
 Source: Bloomberg. Goldman Sachs Global Investment Research.

Unemployment Rate Understates Slack

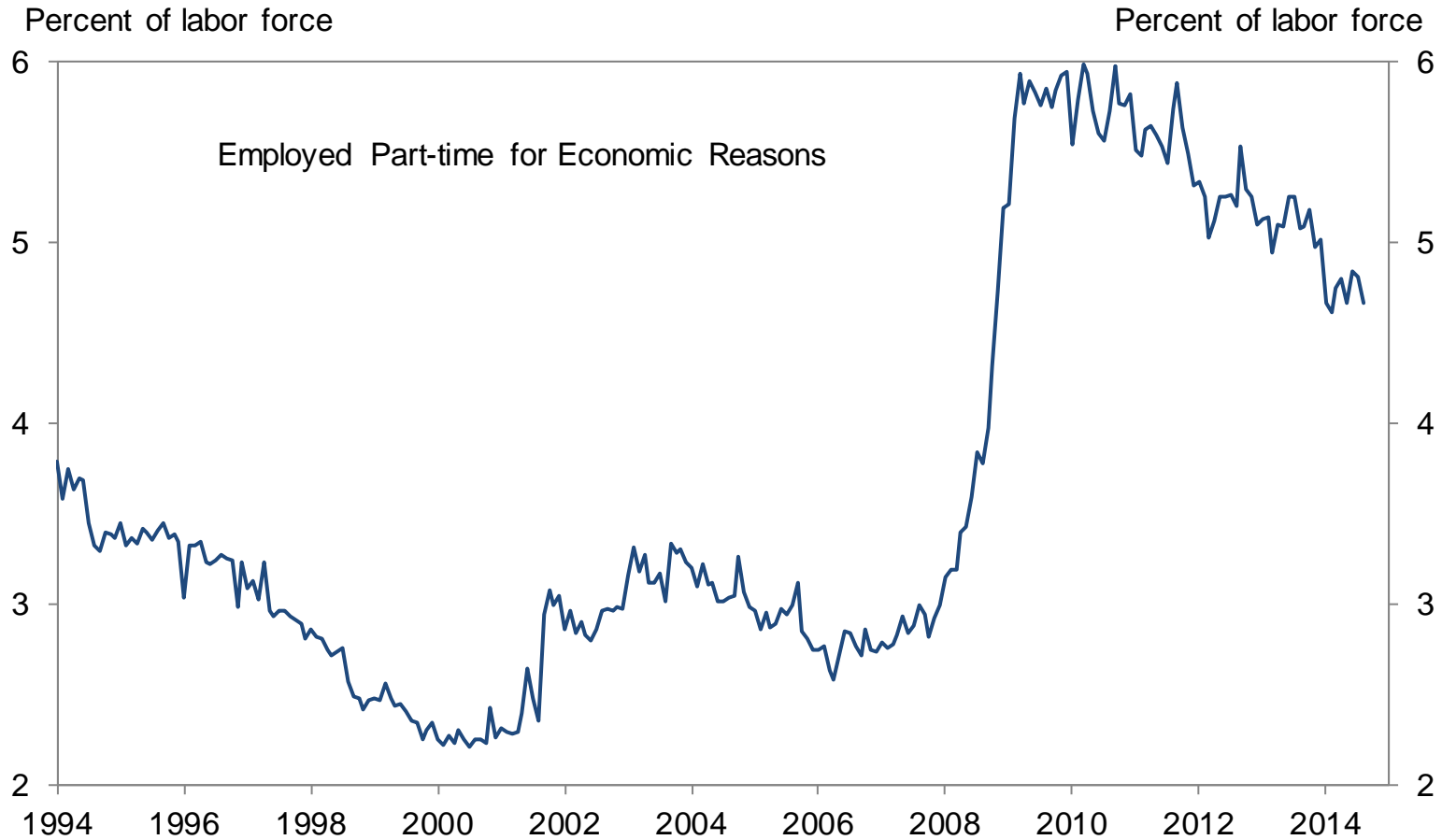
1. Participation Drop Partly Cyclical

Paper	Time Period	PP Contribution to LFPR:	
		<u>Trend</u>	<u>Cyclical</u>
Aaronson, Davis, and Hu (2012)	2008 - 2011	0.45	1.35
Van Zandweghe (2012)	2007 - 2011	0.8	1.1
Shierholz (2012)	2007 - 2011	0.6	1.3
Reifschneider, Wascher, and Wilcox (2013)	2008 - 2012	1.3	1.0
Kudlyak (2013)	2007 - 2012	1.8	0.4
Hotchkiss and Rios-Avila (2013)	2007 - 2012	0.8	2.6
CBO (2014) - August Revision	2007 Q4 - 2014 Q2	1.8	0.75
Barnes, Gumbau-Brisa, and Olivei (2013)	2008 Q1 - 2013 Q1	1.75	0.75
Hall (2014)	2007 - 2013	1.5	0.5
Erceg and Levin (2013)	2008 Q1 - 2013 Q1	0.6	1.9
CEA (2014)	2007 Q4 - 2014 Q2	1.6	0.5
IMF (2014)	2007 - 2013	1.5 - 1.8	1.0 - 1.2
Cooper and Luengo-Prado (2014)	2007 M12 - 2014 M7	2.1	1.1
Aaronson <i>et al</i> (2014)	2007 Q4 - 2014 Q2	2.0 - 2.5	0.25 - 1.0
Median		1.6	1.1

Source: Goldman Sachs Global Investment Research.

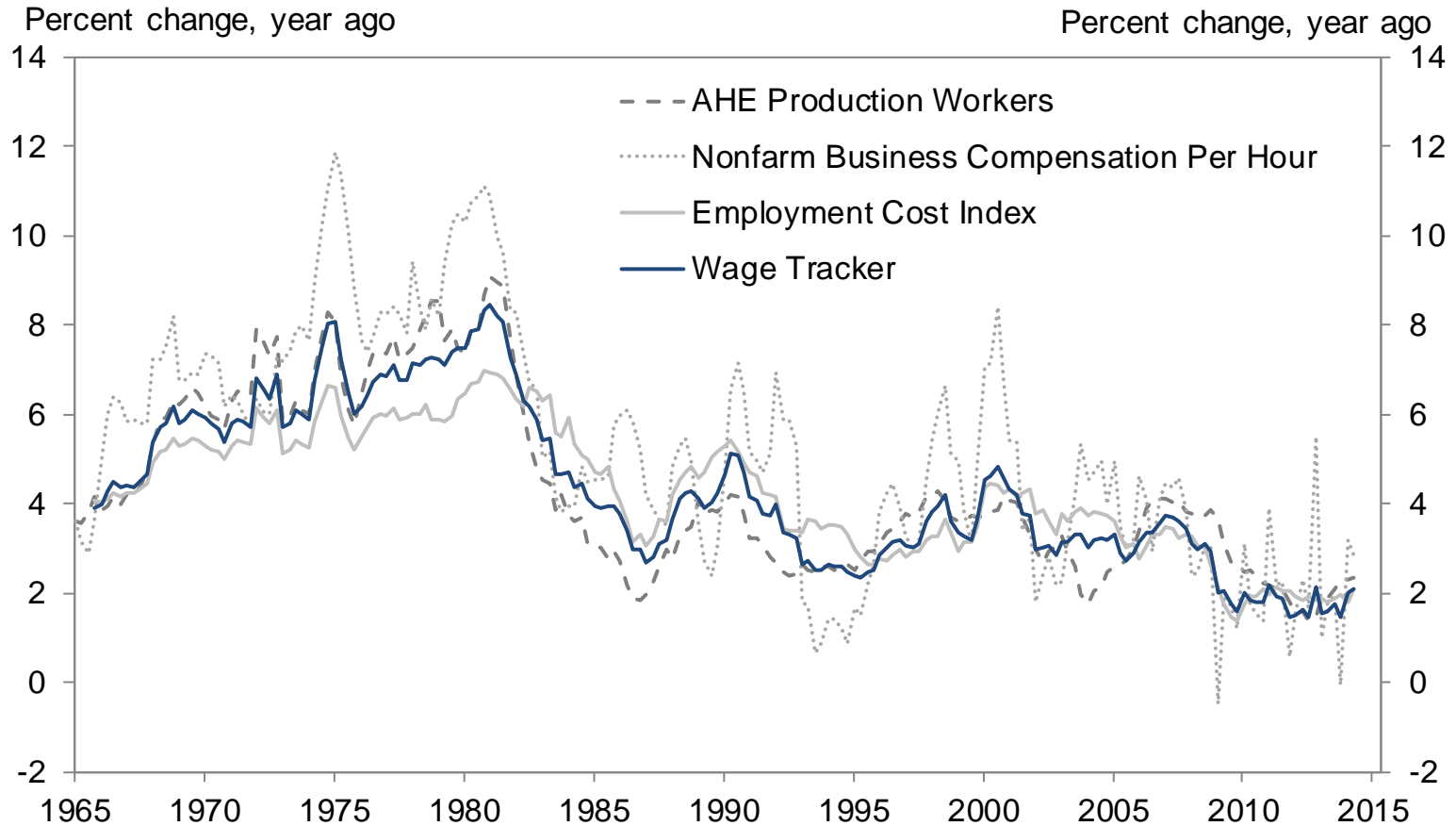
Unemployment Rate Understates Slack

2. Part-Time Unemployment Remains High



Source: Department of Labor.

Nominal Wage Growth Remains at 2%



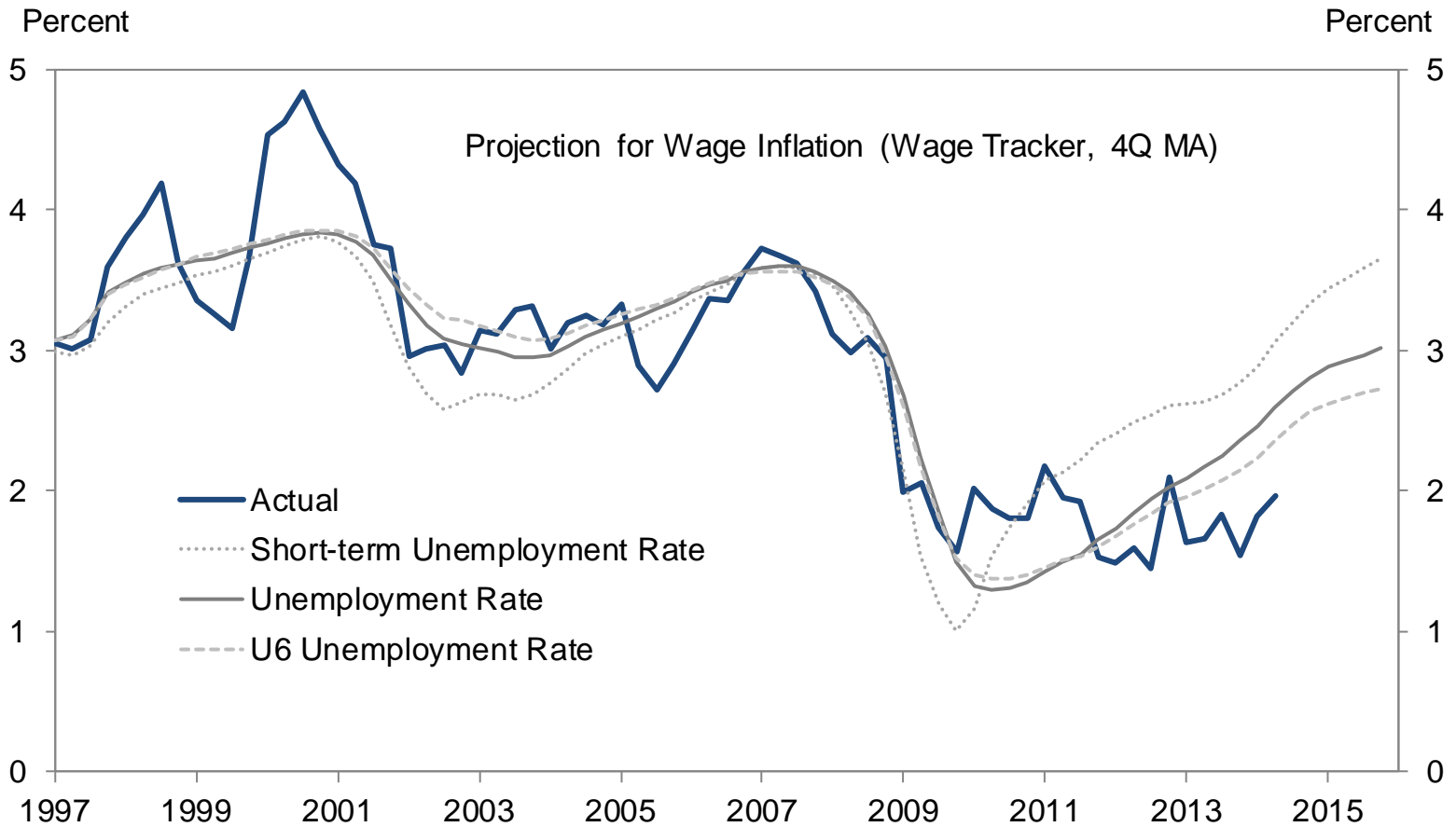
Source: Department of Labor. Goldman Sachs Global Investment Research.

Broader Slack Measures Outperform Statistically in Predicting Wage Growth

<u>Dependent Variable: Wage Tracker</u>				
	(1)	(2)	(3)	(4)
Constant	7.443 [8.3]**	5.595 [14.4]**	5.628 [15.4]**	5.726 [6.3]**
Short-term unemployment rate	-1.013 [-4.9]**			-0.475 [-2.1]*
Unemployment rate		-0.439 [-7.0]**		
U6			-0.252 [-7.8]**	
Long-term unemployment rate				-0.421 [-3.4]**
R-squared	0.40	0.49	0.52	0.49

T-statistics in brackets. Sample period is 1997Q1-2013Q4.

Recent Wage Data Have Undershot Even the Predictions from the Broadest Measures



Source: Goldman Sachs Global Investment Research.

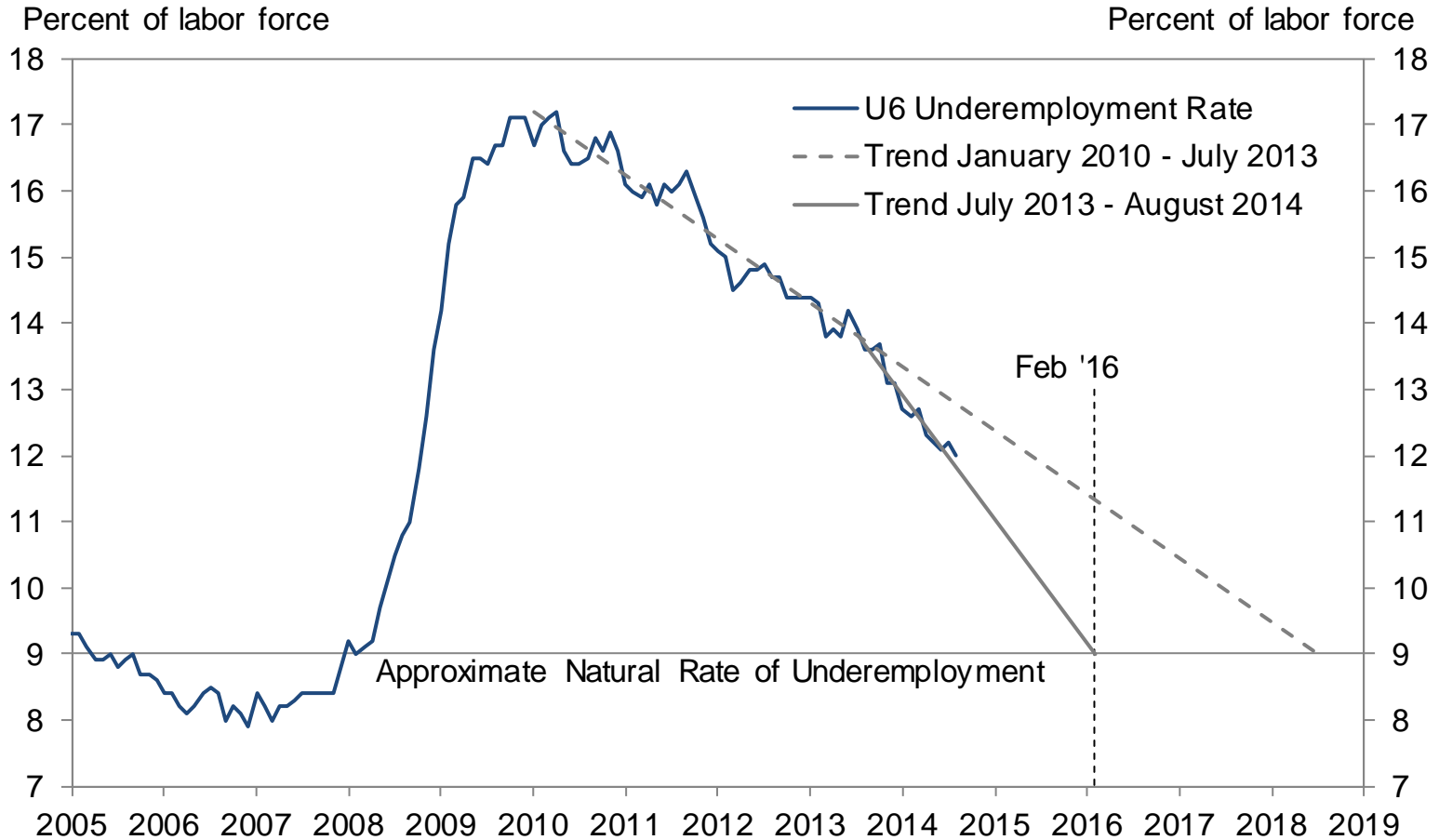
State Data Show Negative Wage Effects from Discouragement and Part-Time Unemployment

State-level Regressions of Annual Wage Growth on Measures of Labor Slack					
	(1)	(2)	(3)	(4)	(5)
Unemployed					-0.20 (0.42)
Short-term unemployed	-0.71** (0.27)	-0.45 (0.33)	-0.58* (0.32)	0.08 (0.36)	
Long-term unemployed	-0.67* (0.34)	-0.55 (0.33)	-0.37 (0.48)	0.64 (0.59)	
Out of labor force (OLF)	-0.08 (0.08)				
OLF, don't want job		-0.03 (0.08)	-0.03 (0.08)	-0.08 (0.08)	0.01 (0.15)
OLF, want job		-0.80** (0.36)			
OLF, want job, discouraged			-3.19 (2.15)	-2.83 (1.98)	-4.75** (2.07)
OLF, want job, marg. attached, not disc.			1.45 (1.27)	2.09 (1.33)	5.12*** (1.83)
OLF, want job, not marg. attached			-1.19** (0.53)	-1.62*** (0.54)	-2.01*** (0.63)
Part-time for econ. reasons				-1.76*** (0.43)	-1.82*** (0.52)
p-value, test for coeffs STU=LTU	0.95	0.85	0.74	0.39	
Time period	1994-2013	1994-2013	1994-2013	1994-2013	1994-2007

Note: All explanatory variables are expressed as a share of state population. Observations are at the state-year level and weighted by the state 15+ population. The sample size for regressions in columns 1-4 is 1,020 (50 states and D.C., 20 years), and 714 in column 5 (14 years). Standard errors clustered at the state-level are in parentheses. Statistical significance at the 10, 5, and 1 percent level is indicated by one, two, or three stars, respectively. All regressions include state and year fixed effects, lagged percent change in state median wages, and other demographic controls as indicated in the text. For equations that include the STU and LTU rates, the p-value for the Wald test of equality of the coefficients is presented in the bottom line of the table. For definitions of labor slack measures, see the text. Data for all variables are author's estimates, derived from the BLS's publicly available CPS microdata.

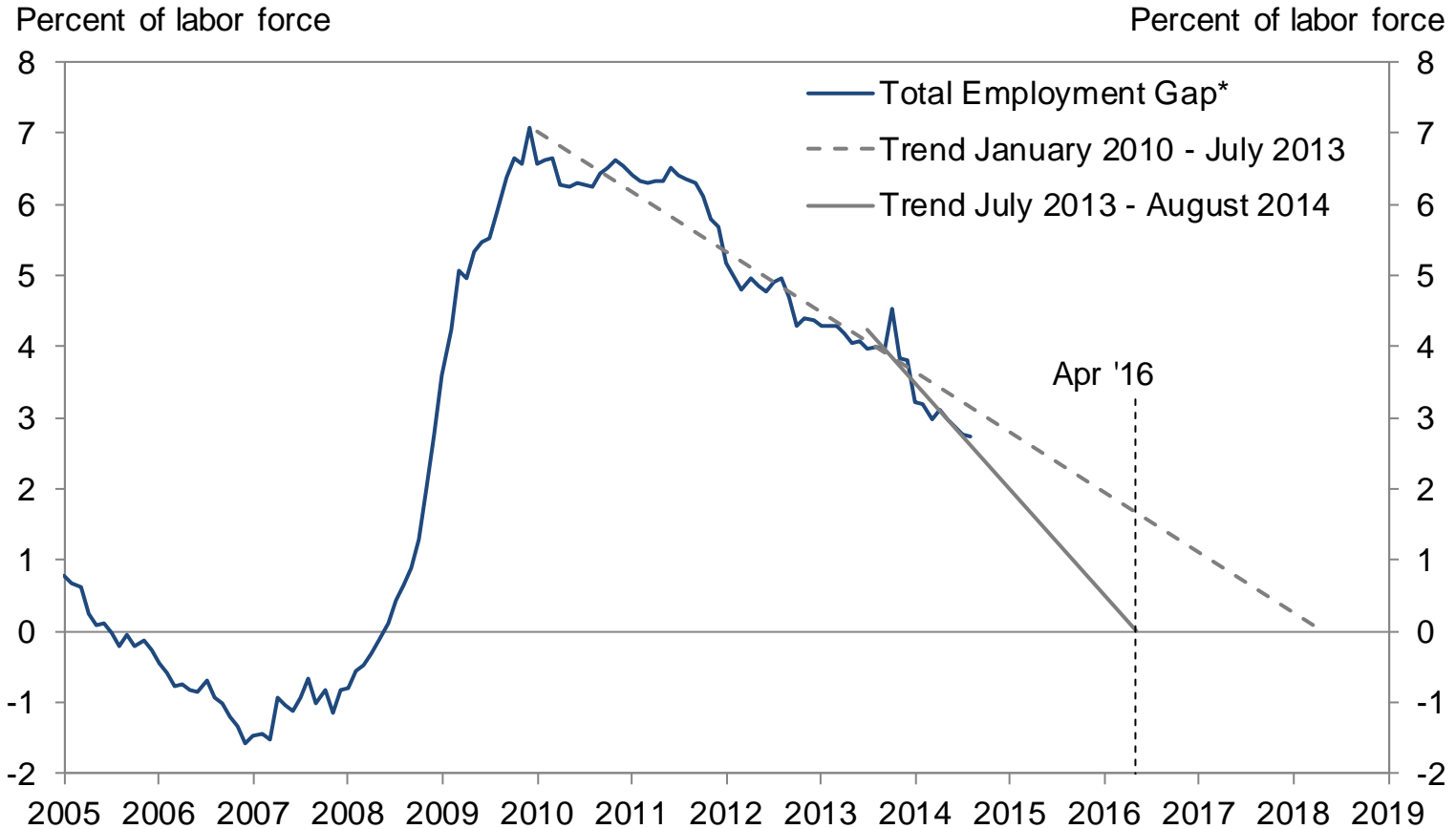
Source: Smith (2014).

Broader Slack Measures Such as U6...



Source: Department of Labor. Goldman Sachs Global Investment Research.

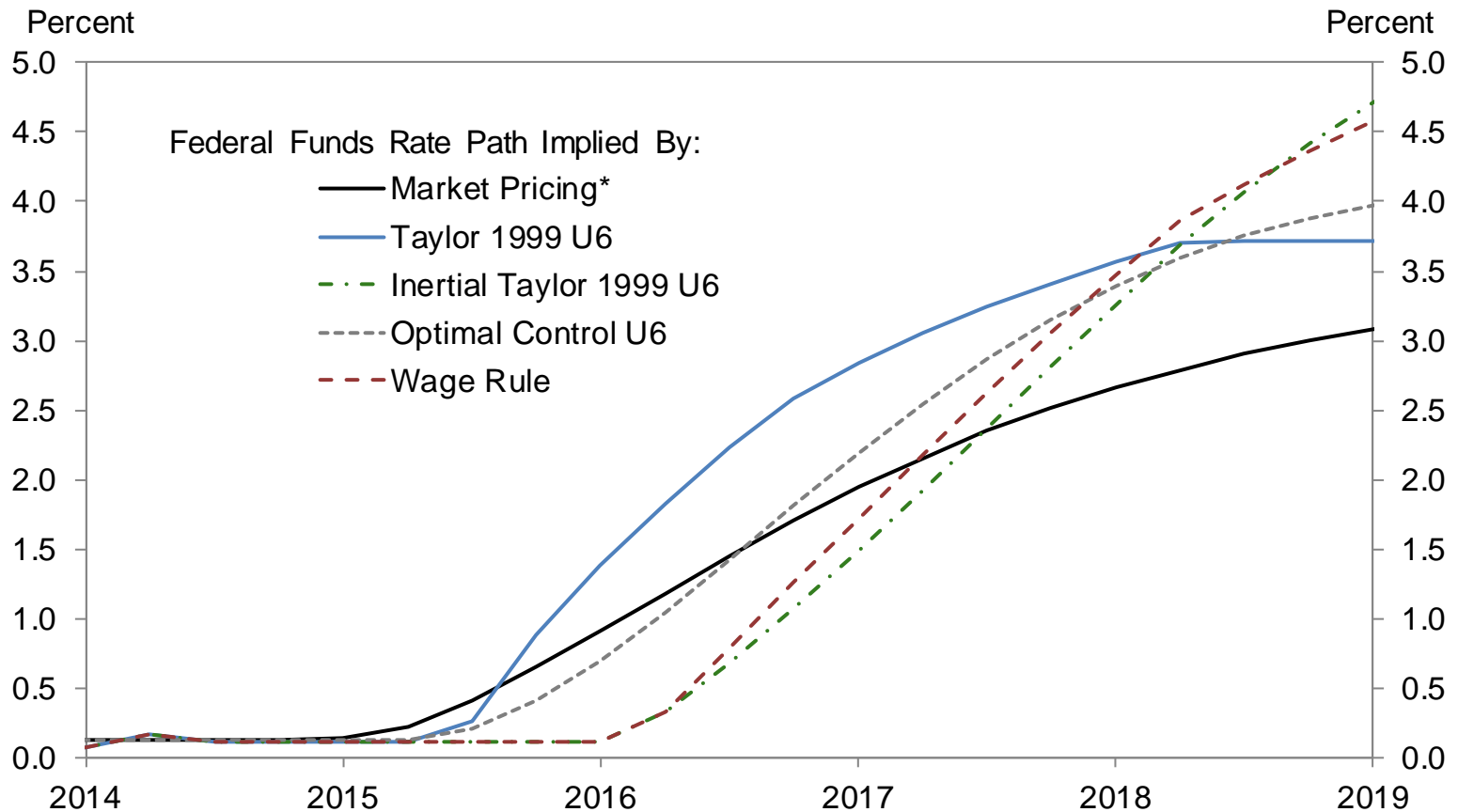
...And the Total Employment Gap Are Unlikely to Normalize Until 2016



*Based on Andrew Levin, *The Design and Communication of Systemic Monetary Policy Strategies*, 2014.

Source: Department of Labor. Goldman Sachs Global Investment Research.

FRB/US Simulations Using U6 Gap Suggest Later But Steeper Exit than Market Pricing



*Derived from Eurodollar futures and LIBOR - Fed Funds basis swaps.
 Source: Bloomberg. Goldman Sachs Global Investment Research.

Disclosure Appendix

I, Jan Hatzius, hereby certify that all of the views expressed in this report accurately reflect my personal views, which have not been influenced by considerations of the firm's business or client relationships.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce equity research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; in Canada by Goldman, Sachs & Co. regarding Canadian equities and by Goldman, Sachs & Co. (all other research); in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman, Sachs & Co. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

European Union: Goldman Sachs International authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, has approved this research in connection with its distribution in the European Union and United Kingdom; Goldman Sachs AG and Goldman Sachs International Zw eignerlassung Frankfurt, regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, may also distribute research in Germany.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman, Sachs & Co., the United States broker dealer, is a member of SIPC (<http://www.sipc.org>).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and our proprietary trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, our proprietary trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

The analysts named in this report may have from time to time discussed with our clients, including Goldman Sachs salespersons and traders, or may discuss in this report, trading strategies that reference catalysts or events that may have a near-term impact on the market price of the equity securities discussed in this report, which impact may be directionally counter to the analysts' published price target expectations for such stocks. Any such trading strategies are distinct from and do not affect the analysts' fundamental equity rating for such stocks, which rating reflects a stock's return potential relative to its coverage group as described herein.

We and our affiliates, officers, directors, and employees, excluding equity and credit analysts, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research.

The views attributed to third party presenters at Goldman Sachs arranged conferences, including individuals from other parts of Goldman Sachs, do not necessarily reflect those of Global Investment Research and are not an official view of Goldman Sachs.

Any third party referenced herein, including any salespeople, traders and other professionals or members of their household, may have positions in the products mentioned that are inconsistent with the views expressed by analysts named in this report.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options disclosure documents which are available from Goldman Sachs sales representatives or at <http://www.theocc.com/about/publications/character-risks.jsp>. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the issuers the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For all research, models or other data available on a particular security, please contact your sales representative or go to <http://360.gs.com>.

Disclosure information is also available at <http://www.gs.com/research/hedge.html> or from Research Compliance, 200 West Street, New York, NY 10282.

© 2014 Goldman Sachs.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.