

Virginia Tech – U.S. Forest Service

September 2015 Housing Commentary

Part B: Current Markets



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Virginia Polytechnic Institute and State University

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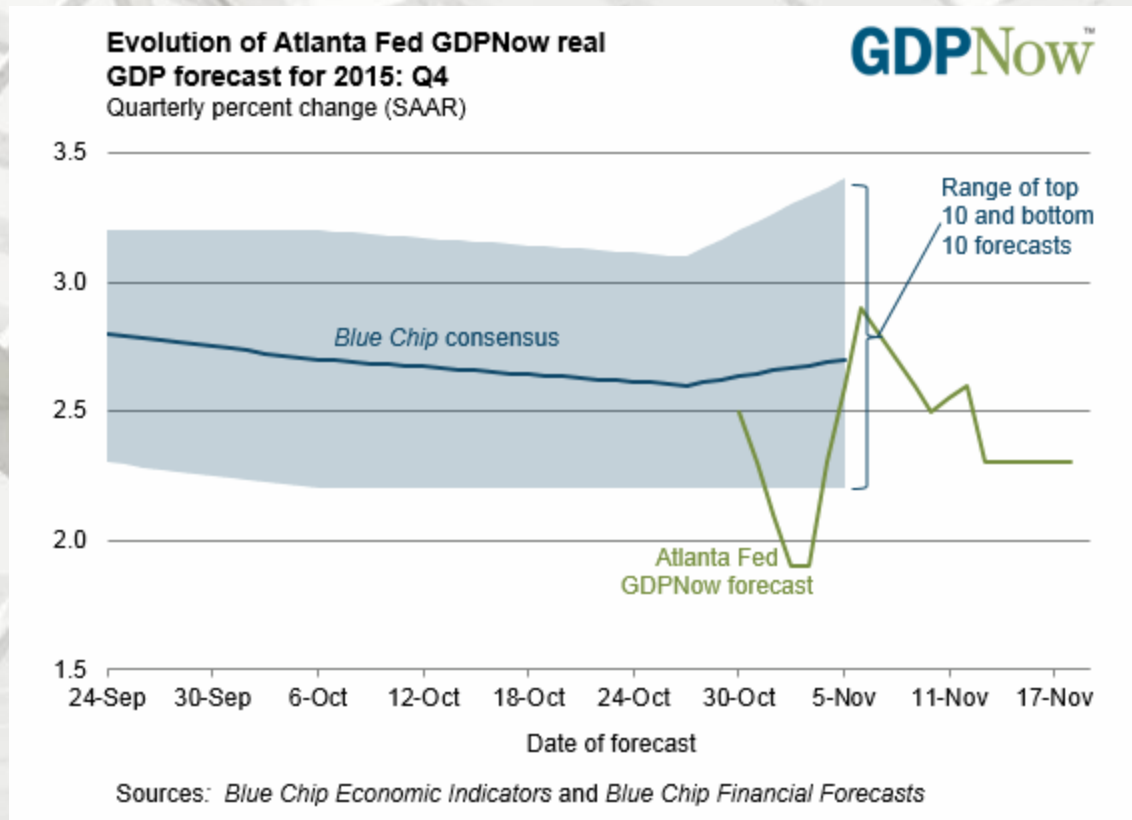
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The background of the slide is a grayscale photograph of a wooden roof truss structure. The beams are arranged in a complex, geometric pattern, creating a sense of depth and structural complexity. The lighting is soft, highlighting the textures of the wood.

Private and Government Indicators

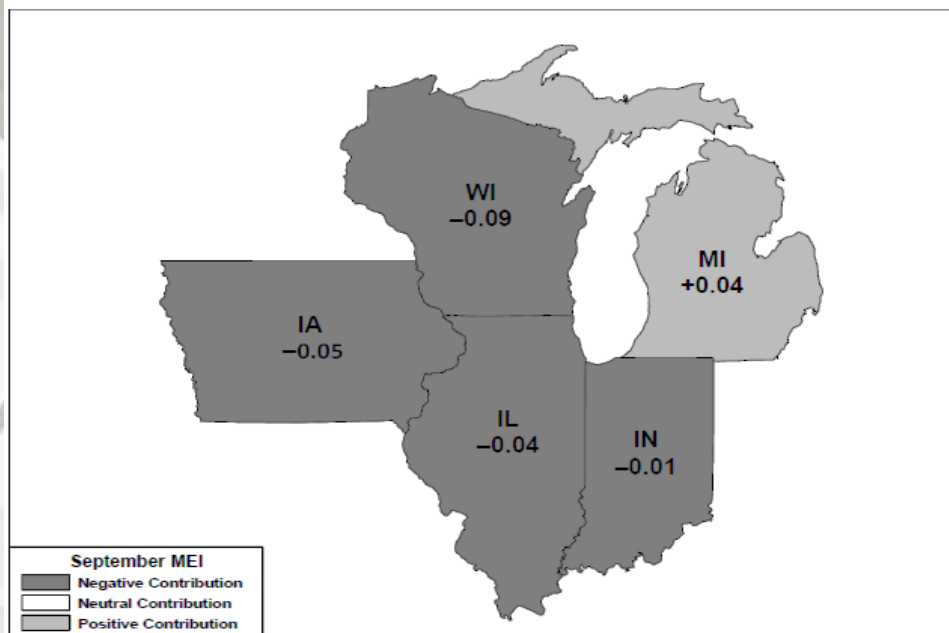
Atlanta Fed: GDPNow™



The GDPNow model forecast for real GDP growth (seasonally adjusted annual rate) in the fourth quarter of 2015 is 2.3 percent on November 18, unchanged from November 13. The forecast of real growth has remained at 2.3 percent after Tuesday's releases for October data on industrial production from the Federal Reserve Board, consumer prices (CPI) from the U.S. Bureau of Labor Statistics, and this morning's release of October housing starts from the U.S. Census Bureau.

U.S. Economic Indicators

MEI and the Seventh Federal Reserve District States



Note: The map's shading summarizes the most recent contribution to growth in Midwest economic activity from each of the five states in the Seventh Federal Reserve District (Illinois, Indiana, Iowa, Michigan, and Wisconsin).

Midwest Economy Index **Index shows Midwest growth** **below average in September**

The Midwest Economy Index (MEI) was unchanged at -0.15 in September. The relative MEI moved down to -0.29 in September from -0.27 in August.

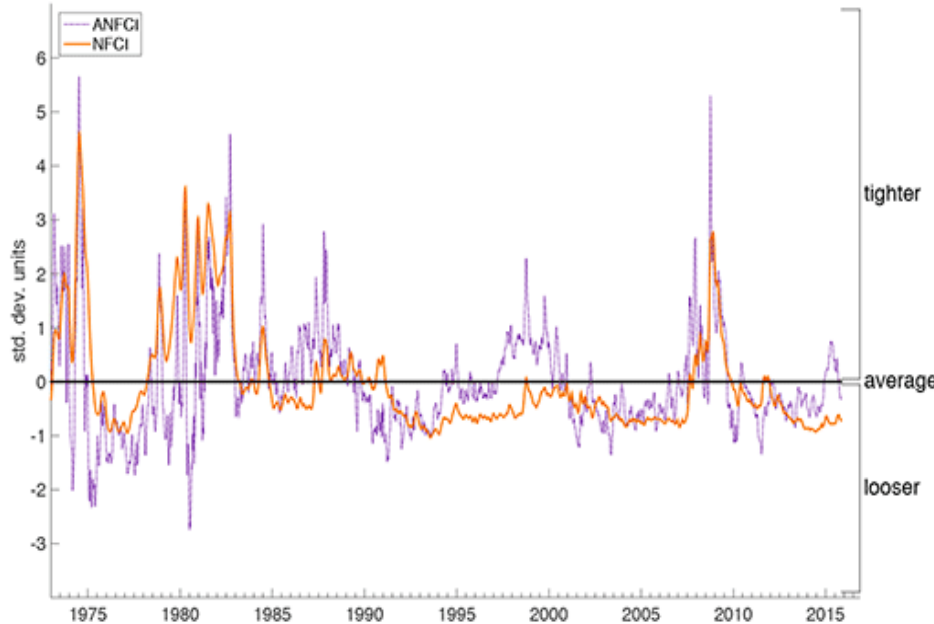
September's value for the relative MEI indicates that Midwest economic growth was somewhat lower than what would typically be suggested by the growth rate of the national economy.

The Federal Reserve Bank of Chicago

Manufacturing's contribution to the MEI decreased to -0.06 in September from -0.01 in August. The construction and mining sector's contribution to the MEI was unchanged at -0.14 in September. The contribution from consumer spending indicators to the MEI edged up to $+0.04$ in September from $+0.01$ in August.

The service sector's contribution to the MEI ticked up to $+0.01$ in September from -0.01 in August.

U.S. Economic Indicators



Financial Conditions Little Changed on Balance

The NFCI was unchanged at -0.72 in the week ending November 13.

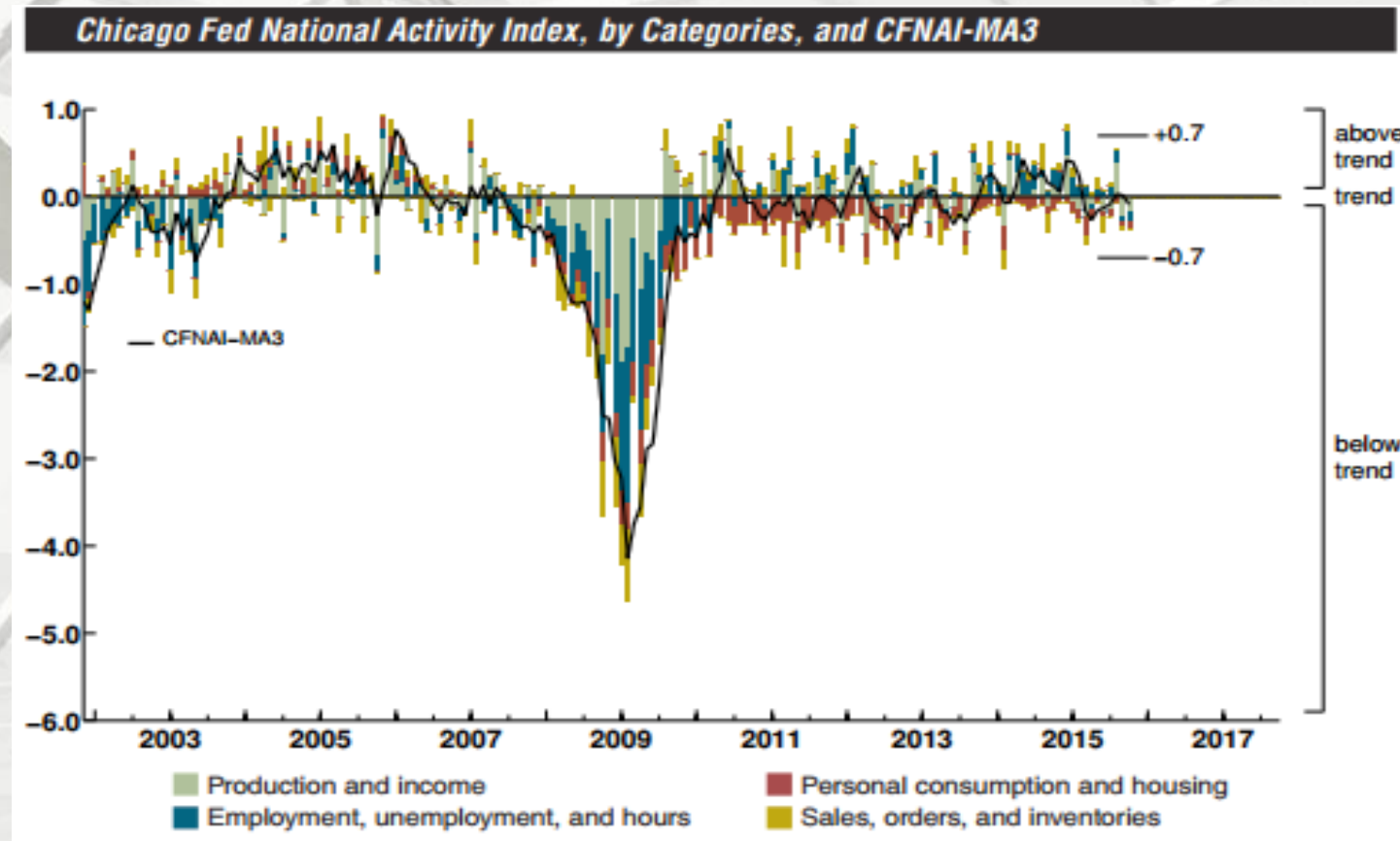
The risk and leverage subindexes ticked down from the previous week, while the credit and nonfinancial leverage subindexes were unchanged.

	Current	Previous	1 Month Ago	3 Months Ago	6 Months Ago	12 Months Ago
Index	11/13/2015	11/6/2015	10/16/2015	8/14/2015	5/15/2015	11/14/2014
NFCI	-0.72	-0.72	-0.67	-0.72	-0.77	-0.83
ANFCI	-0.29	-0.32	-0.23	0.28	0.69	-0.36

The Federal Reserve Bank of Chicago

The ANFCI edged up to -0.29 from the previous week. The current level of the ANFCI indicates that financial conditions in the latest week were somewhat looser than what would typically be suggested by current economic conditions as captured by the three-month moving average of the Chicago Fed National Activity Index (CFNAI-MA3) and three-month total inflation according to the Price Index for Personal Consumption Expenditures (PCE).

Chicago Fed: National Activity Index



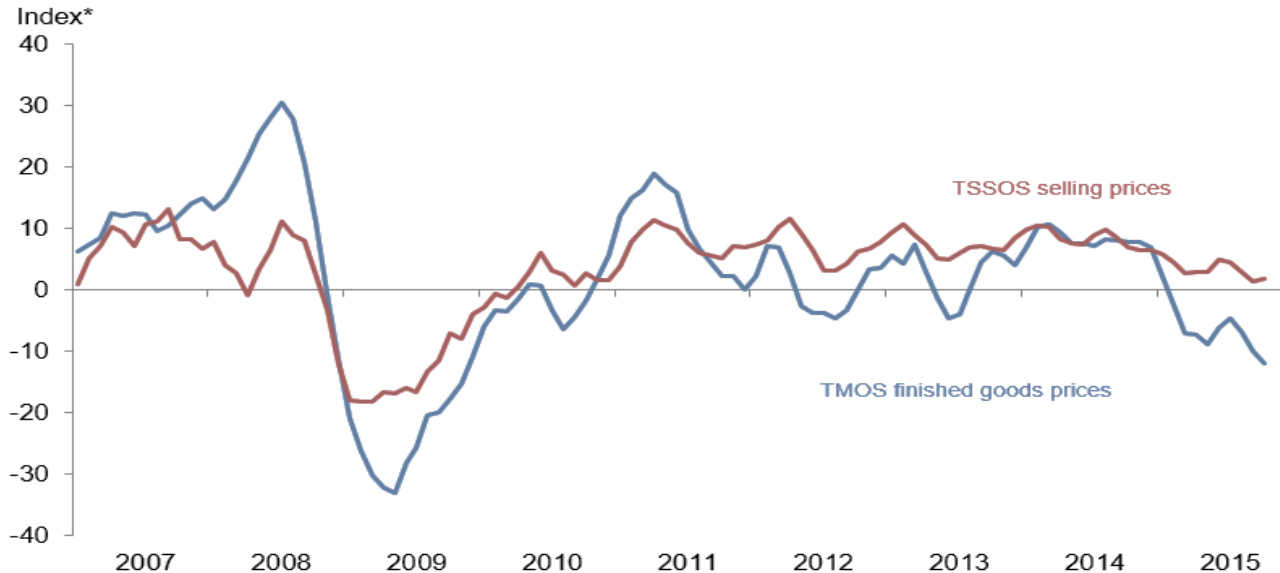
Index shows economic growth below average in September

The Chicago Fed National Activity Index (CFNAI) ticked down to -0.37 in September from -0.39 in August. Two of the four broad categories of indicators that make up the index decreased from August, and all four categories made nonpositive contributions to the index in September.

U.S. Economic Indicators

Chart 5

Manufacturing Continues to See Downward Price Pressure



*Seasonally adjusted, three-month moving average.

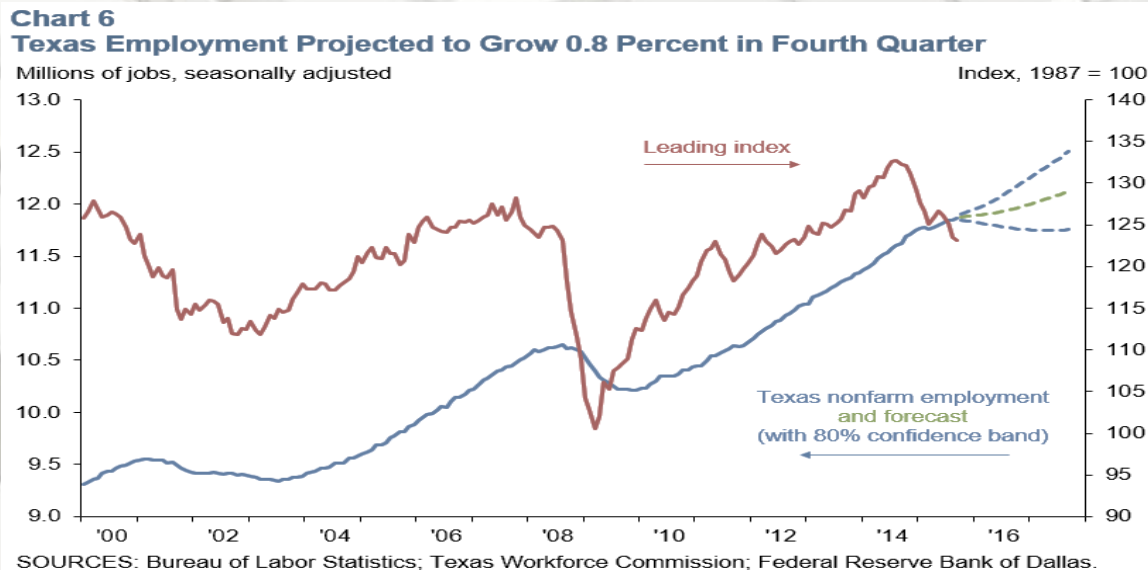
SOURCE: Federal Reserve Bank of Dallas' Texas Manufacturing Outlook Survey (TMOS) and Texas Service Sector Outlook Survey (TSSOS).

The Federal Reserve Bank of Dallas

Manufacturing and Services Price Pressures Diverge

The strong dollar and renewed fall in energy prices have put further downward pressure on prices. TBOS questions on current finished goods prices indicate that manufacturing respondents faced price declines for the 10th consecutive month in October. While service sector prices continue to rise, the number of respondents indicating price decreases has picked up considerably since last year.

U.S. Economic Indicators

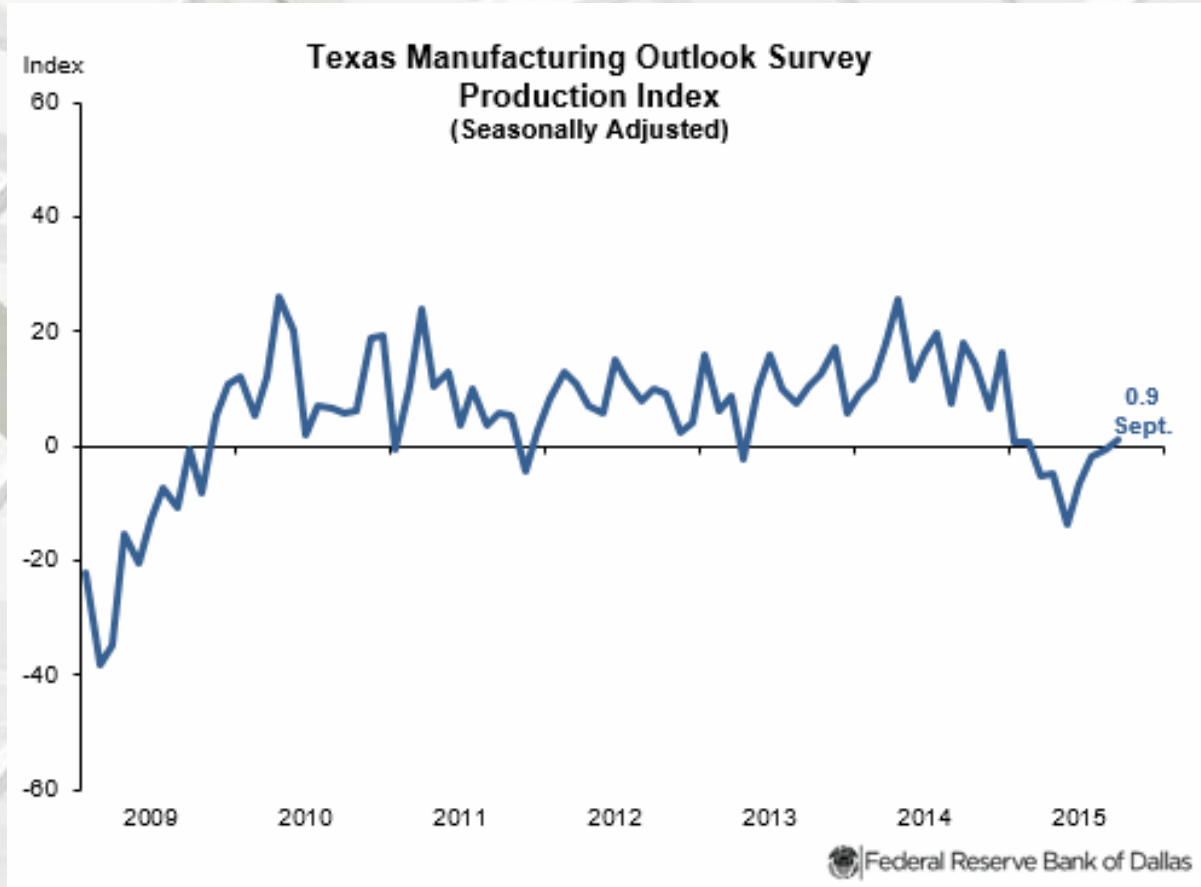


The Federal Reserve Bank of Dallas Outlook Dampened but Positive for 2015

The Texas Leading Index (TLI) fell 0.2 % in September on the heels of a sharp 1.4 % decline in August. Appreciation in the Texas Trade-Weighted Value of the Dollar and weakness in the stocks of Texas-based companies have been the primary drivers of the TLI decline since July. The health of the U.S. economy has continued to contribute positively to the index, and a slight uptick in well permits mitigated some of the decline in September.

The Texas employment forecast is for 1.2% growth for 2015. The forecast for the rest of the year is for annualized growth of 0.8%, which is slightly weaker than the 1.3 % rate thus far this year (Chart 6). This indicates that growth will likely fall back below the national rate in the fourth quarter.

U.S. Economic Indicators

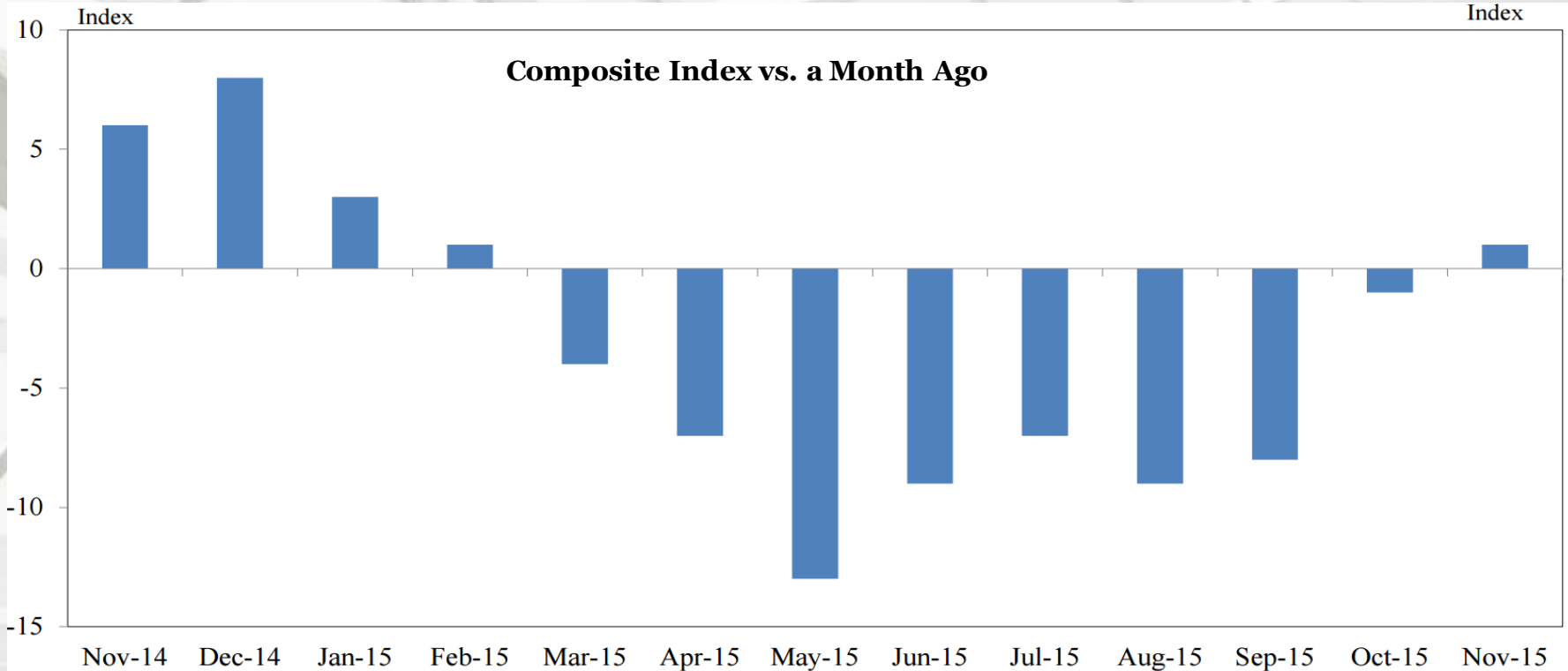


The Federal Reserve Bank of Dallas

Texas factory activity was essentially flat in September, according to business executives responding to the Texas Manufacturing Outlook Survey.

The company outlook index plunged to -10.3 in August but recovered somewhat this month, climbing to -5.2..

U.S. Economic Indicators



The Federal Reserve Bank of Kansas City

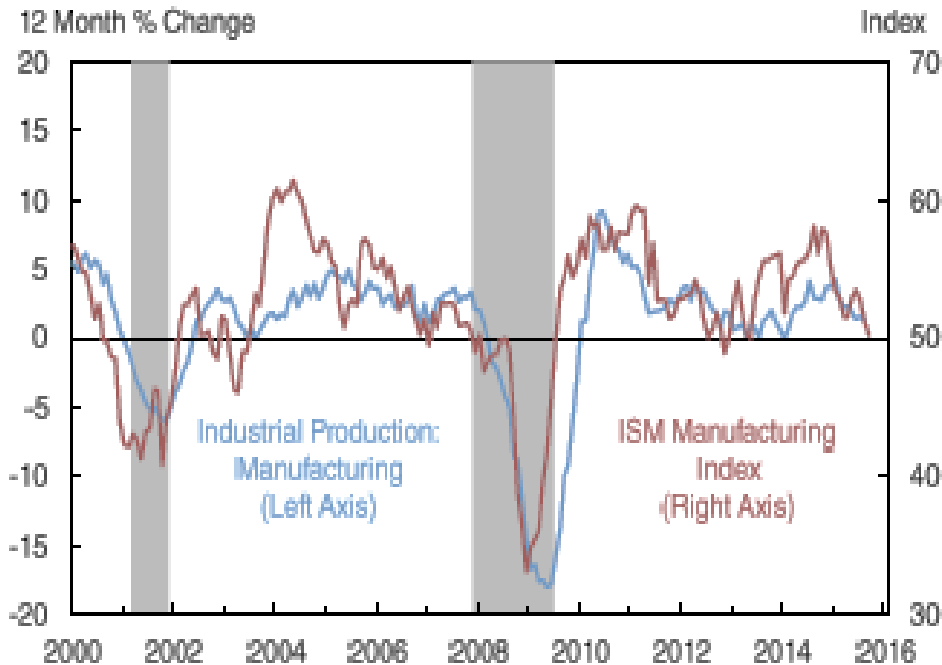
Most year-over-year factory indexes edged up in November, but stayed in negative territory. The composite year-over-year index improved from -7 to -5, and the shipments, new orders and order backlog indexes also moved slightly higher but remained negative. The production and employment indexes fell further, while the new orders for export index was mostly stable. Both inventory indexes increased moderately from the previous month.

“We saw our composite index move just slightly into positive territory for the first time since February, as some segments of durable manufacturing improved even as activity in our energy states remained sluggish,” -- Chad Wilkerson, Vice President and Economist, The Federal Reserve Bank of Kansas City

U.S. Economic Indicators

The Federal Reserve Bank of New York

Manufacturing and ISM Manufacturing Index



Source: Institute for Supply Management, Federal Reserve Board, via Haver Analytics

Note: Shading shows NBER recessions.

Manufacturing continues to slow down

- Total industrial production declined by 0.4% in August.
 - Industrial production contracted by 2.5% (annual rate) in 2015Q2, the largest drop since the last recession.
- Manufacturing production declined by 0.5% in August.
 - Most of the recent decline in manufacturing activity was driven by a significant decline in the production of motor vehicles and parts.
- The ISM survey has generally declined since late 2014, with the September reading at 50.2.
 - The strong dollar has played a key role in the slowdown in manufacturing activity.

U.S. Economic Indicators

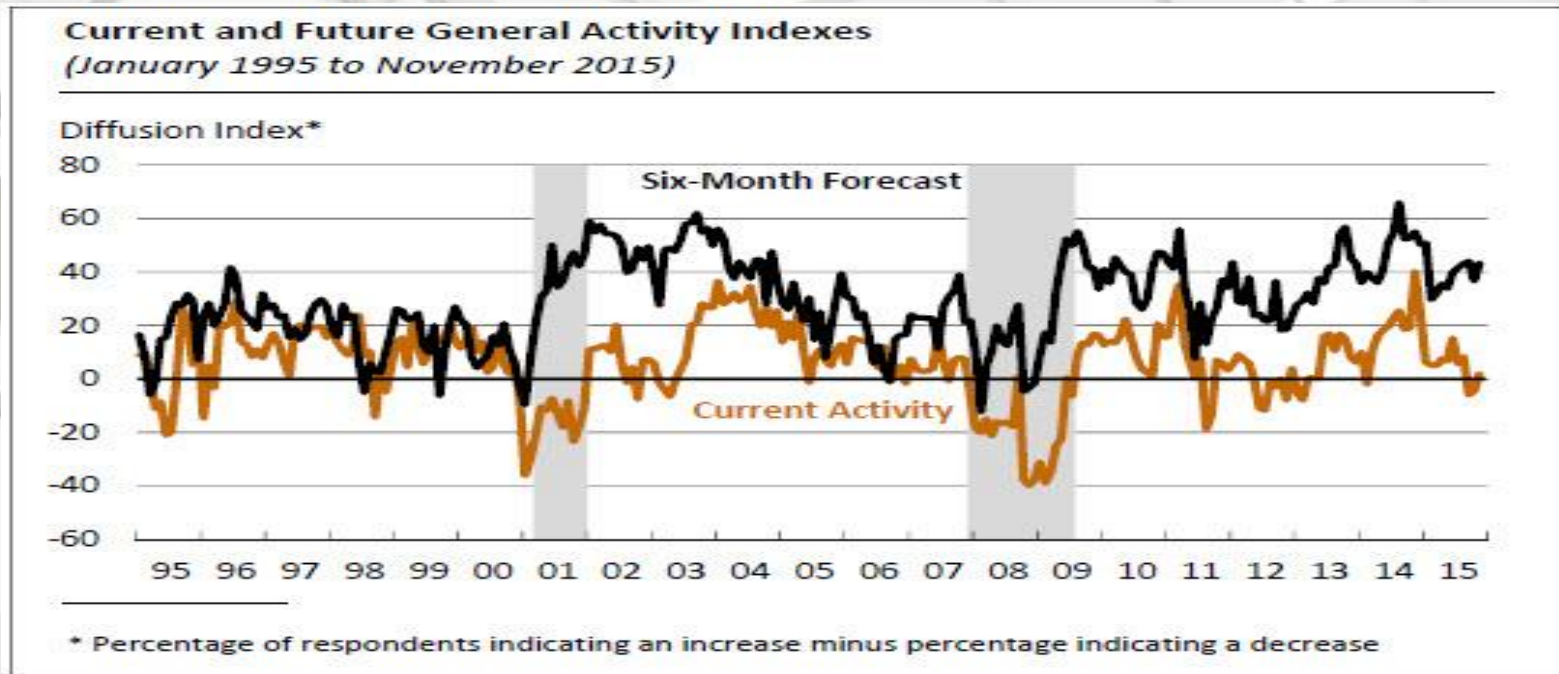
The Federal Reserve Bank of New York



Empire State Manufacturing Survey

The November 2015 Empire State Manufacturing Survey indicates that business activity declined for a fourth consecutive month for New York manufacturers. The headline general business conditions index was little changed at -10.7. New orders and shipments also declined, although at a slower pace than last month. Price indexes suggested that input prices increased slightly, while selling prices were slightly lower. Labor market conditions continued to deteriorate, with survey indicators pointing to a decline in both employment levels and hours worked. Indexes for the six-month outlook were little changed from last month, and suggested that optimism about future conditions remained tepid, even though employment is expected to increase.

U.S. Economic Indicators



The Federal Reserve Bank of Philadelphia Current Indicators Improved but Weakness Persists

The diffusion index for current activity edged higher this month, from -4.5 to 1.9, its first positive reading in three months. The indexes for current new orders and shipments approached zero this month, increasing 7 points and 4 points, respectively. Both indexes remained negative, however, suggesting continued weakness.

Regional manufacturers reported slight improvement in the general level of activity in November. Indexes for new orders, shipments, and average work hours, however, continued to suggest weakness. Firms reported slightly improved employment and near-steady manufactured goods prices this month, on balance. The firms' future expectations showed notable improvement, with only a small percentage of firms expecting declines in activity over the next six months. One-third of the surveyed firms expect employment gains over the next six months.

U.S. Economic Indicators

The Federal Reserve Bank of Philadelphia

Fourth Quarter 2015 Survey of Professional Forecasters

Forecasters Shave Their Growth Estimates for 2016 and 2017

Growth in real GDP in 2016 and 2017 looks a little slower now than it did three months ago, according to 45 forecasters surveyed by the Federal Reserve Bank of Philadelphia. The forecasters currently see growth in the annual-average level of real GDP at 2.6 percent in 2016 and 2.5 percent in 2017. These current estimates represent downward revisions to the outlook of three months ago, when the forecasters thought 2016 growth would be 2.8 percent and 2017 growth would be 2.6 percent. Notably, the forecasters have raised their growth estimates for 2018. They now see real GDP growing 2.8 percent in 2018, up from the previous estimate of 2.4 percent.

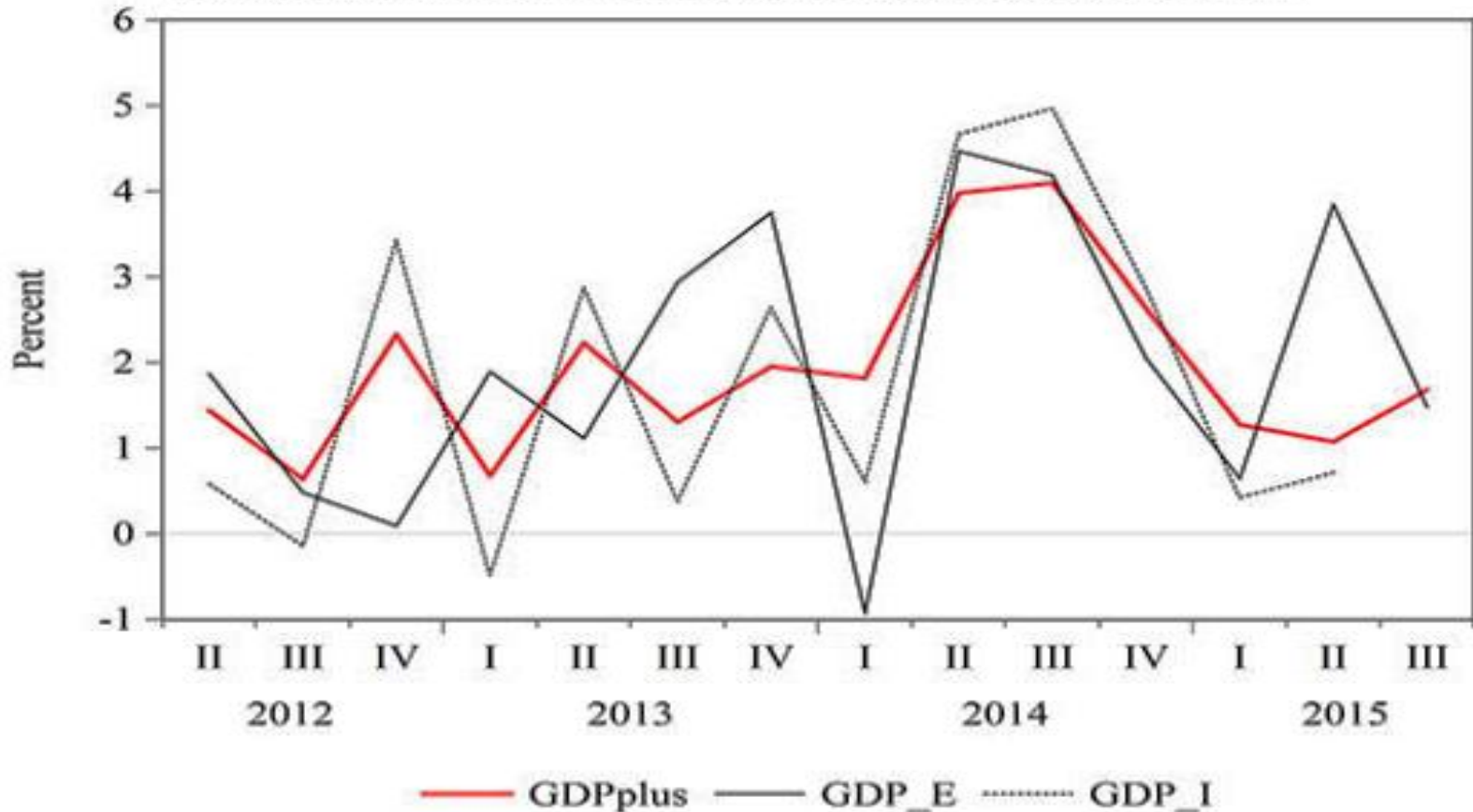
Median Forecasts for Selected Variables in the Current and Previous Surveys

	Real GDP (%)		Unemployment Rate (%)		Payrolls (000s/month)	
	Previous	New	Previous	New	Previous	New
<i>Quarterly data:</i>						
2015:Q4	2.8	2.6	5.1	5.0	220.4	201.5
2016:Q1	2.8	2.5	5.1	4.9	185.1	188.2
2016:Q2	2.8	2.6	5.0	4.8	191.3	193.5
2016:Q3	2.7	2.9	4.9	4.8	189.5	192.0
2016:Q4	N.A.	2.4	N.A.	4.7	N.A.	181.2

Philadelphia Fed: GDPplus

GDP Growth

GDPplus is a measure of the quarter-over-quarter rate of growth of real GDP in annualized percentage points. GDP_E and GDP_I are quarter-over-quarter rates of growth of expenditure and income-side measures of real GDP in annualized percentage points, respectively.



U.S. Economic Indicators



The Federal Reserve Bank of Richmond

Manufacturing Sector Activity Remained Soft; Volume of New Orders Levelled Off

Overall, manufacturing conditions remained soft in October. The composite index for manufacturing flattened to a reading of -1 , following last month's reading of -5 .

Additionally, the index for new orders leveled off this month, gaining 12 points to end at 0. The index for shipments remained negative, losing one point to end at -4 . Manufacturing employment continued to increase mildly this month. The indicator remained at a reading of 3 for a second month.

U.S. Economic Indicators

FRED 

— Capacity Utilization: Manufacturing (NAICS)



Source: Board of Governors of the Federal Reserve System (US)
research.stlouisfed.org

myf.red/g/2iqq

Capacity Utilization

The manufacturing capacity utilization rate is a rate that measures the utilization of a country's available manufacturing productive volume. It is a measure of potential output and actual output that can indicate slack in manufacturing and it provides a metric for potential output.

Month-over-month and year-over-year capacity utilization decreased 0.26% and increased 0.26%, respectively.

U.S. Economic Indicators



— Industrial Production: Durable manufacturing: Wood product



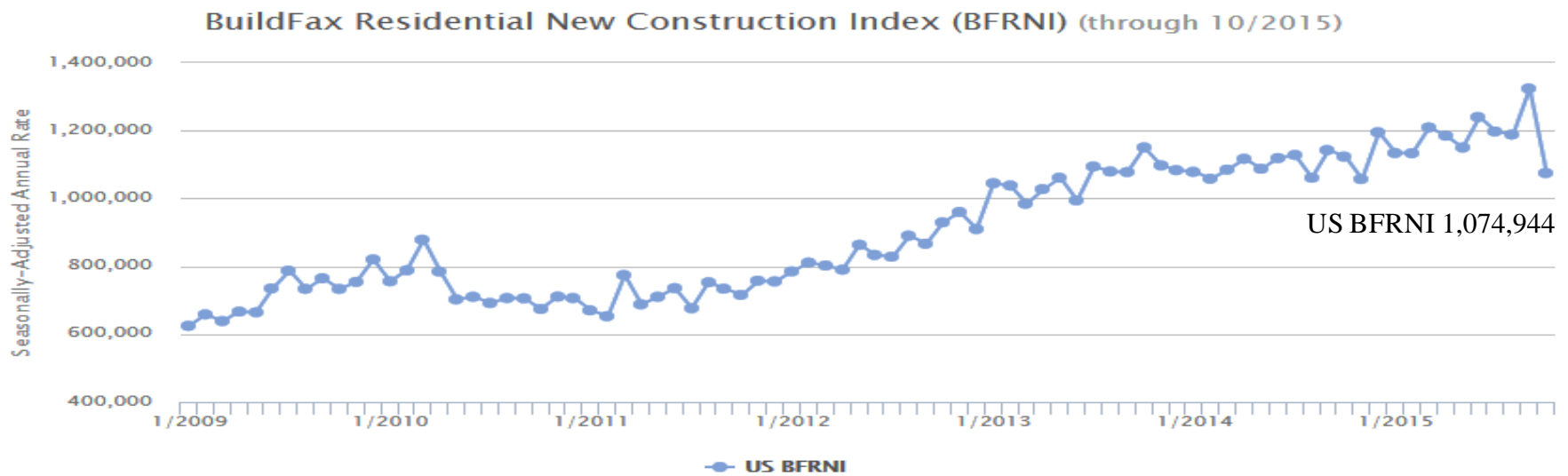
Source: Board of Governors of the Federal Reserve System (US)
research.stlouisfed.org

myf.red/g/2y62

Industrial Production: Durable manufacturing → Wood products

Month-over-month and year-over-year durable manufacturing of wood products decreased 1.95% and 1.98%, respectively.

Private Indicators



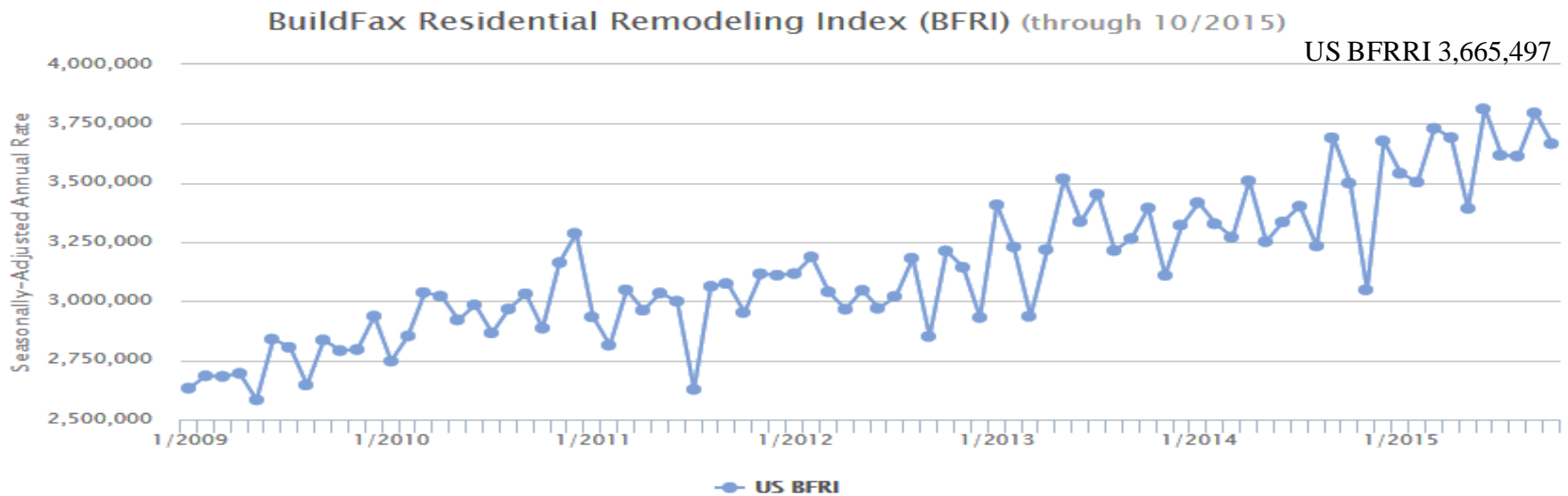
BuildFax Residential New Construction Index

Residential new construction authorized by building permits in the United States in October were at a SAAR of 1,074,944. This is 19% below the revised September rate of 1,324,156 and is 4% below the revised October 2014 estimate of 1,123,352. BuildFax reports on total new residential projects, this is unlike the U.S. Census that reports total number of housing units.

Regional Residential New Construction

SAARs of residential new construction across the country in October 2015 are estimated as follows: Northeast, 67,161 (up 24% from September and up 48% from October 2014); South, 542,185 (down 29% from September and down 18% from October 2014); Midwest, 203,432 (10% down from September and 2% down from October 2014); West, 266,123 (down 2% from September and up 21% from October 2014).

Private Indicators



BuildFax Residential Remodeling Index

Residential remodels authorized by building permits in the United States in October were at a SAAR of 3,665,497. This is 3% below the revised September rate of 3,795,680 and is 5% above the revised October 2014 estimate of 3,499,295.

Regional Residential Remodeling

SAARs of residential remodeling across the country in October 2015 are estimated as follows: Northeast, 1,869,700 (down 4% from September and up 10% from October 2014); South, 1,529,270 (down 6% from September and up 5% from October 2014); Midwest, 411,375 (down 8% from September and down 18% from October 2014); West, 997,689 (up 3% from September and up 22% from October 2014).

Private Indicators

National Indices for New Home Construction and Existing Home Remodeling (Seasonally adjusted)

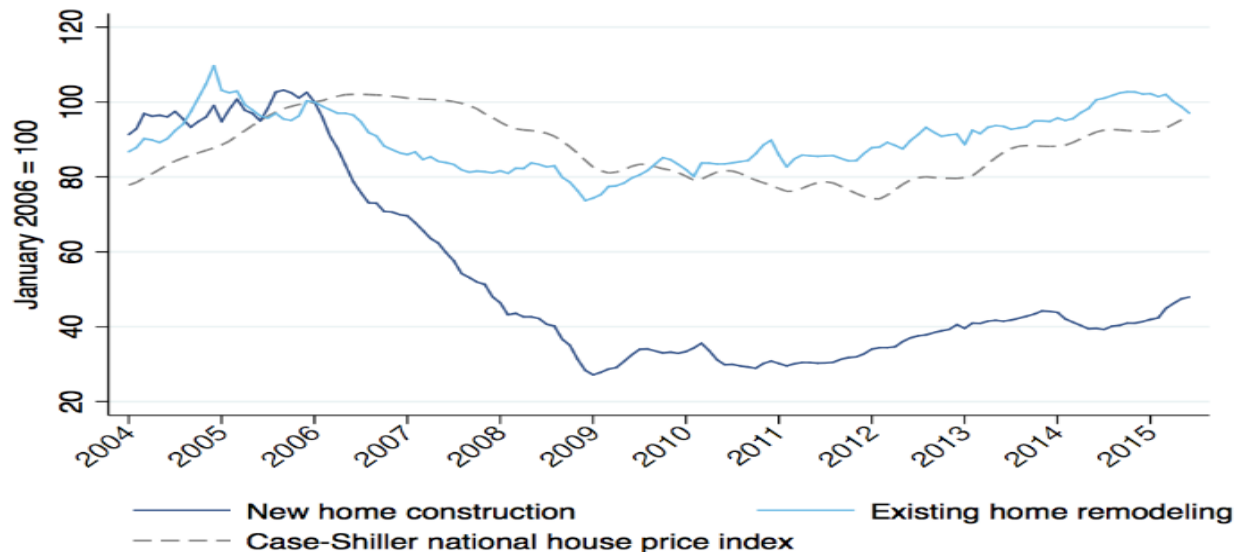
	2009 vs. 2005 (1)	Last 12 months vs. 2005 (2)	Percent recovered ¹ (3)	Year-on-year change ² (4)
Construction of New Homes	-68.5%	-57.0%	16.8%	18.7%
Remodeling of Existing Homes ³	-18.6%	2.8%	114.8%	0.0%

¹ Column(3) is calculated as the greater of 0 or 1 - (Column (2) / Column (1)), and only in areas in which activity fell from 2005 to 2009.

² Year-on-year change is calculated on a quarterly basis, i.e. the last 3 months vs. the same period last year.

³ Throughout the report, the term remodeling is used broadly to include home improvement, maintenance and repair.

Source: BuildZoom.



The BuildZoom and Urban Economics Lab Index: Second Quarter 2015

Remodeling of existing homes has fully recovered since the housing bust, and is 2.8% above its 2005 level. In contrast, new home construction is recovering gradually and remains 57.0% below its 2005 level. However, year-over-year, residential new construction increased by 18.7%, while residential remodeling remained at the same level as a year ago.

Private Indicators

Remodeling Spending Expected to Accelerate into 2016

“After several quarters of slackening growth, home improvement spending is projected to pick-up pace moving into next year, according to the Leading Indicator of Remodeling Activity released by the Remodeling Futures Program at the Joint Center for Housing Studies of Harvard University. The LIRA projects annual spending growth for home improvements will accelerate from 2.4% last quarter to 6.8% in the second quarter of 2016.

Home improvement spending continues to benefit from the last years’ upswing in housing market conditions, including new construction, price gains, and sales. Strengthening housing market conditions are encouraging owners to invest in more discretionary home improvements, such as kitchen and bath remodeling and room additions, in addition to the necessary replacements of worn components such as roofing and siding.

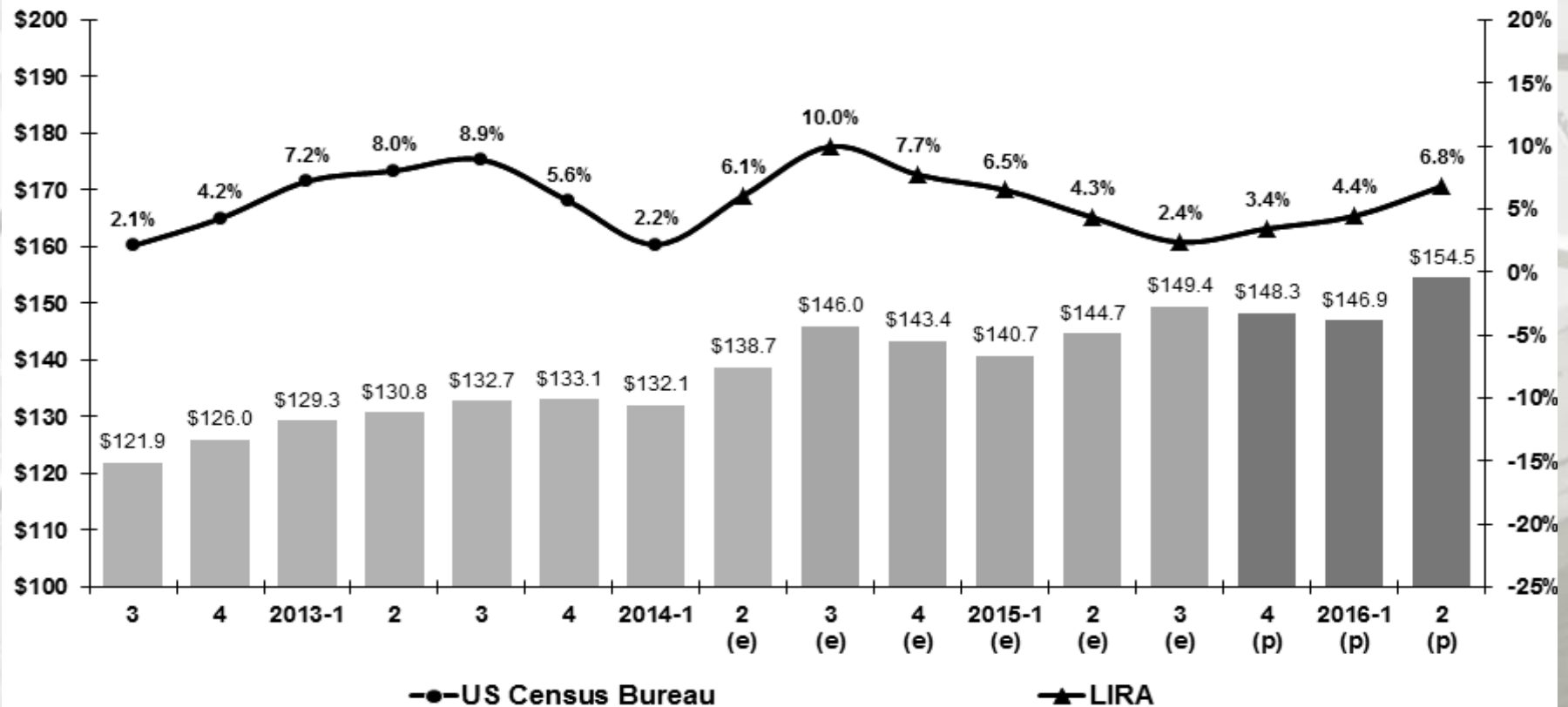
Although we expect remodeling activity to strengthen through the first half of 2016, further gains could be tempered. Current slowdowns in shipments of building materials and remodeling contractor employment trends, as well as restrictive consumer lending environments, are lowering remodeler sentiment and could keep spending gains in the mid-single digit range moving forward.” -- Abbe Will, Research Analyst, Joint Center for Housing Studies, Harvard U

Private Indicators

Leading Indicator of Remodeling Activity – Third Quarter 2015

Homeowner Improvements
Four-Quarter Moving Totals
Billions of \$

Four-Quarter Moving
Rate of Change



Notes: (e) – estimated; (p) – projected. Historical data from the second quarter 2014 onward is estimated using the LIRA.
Source: Joint Center for Housing Studies of Harvard University.

Private Indicators

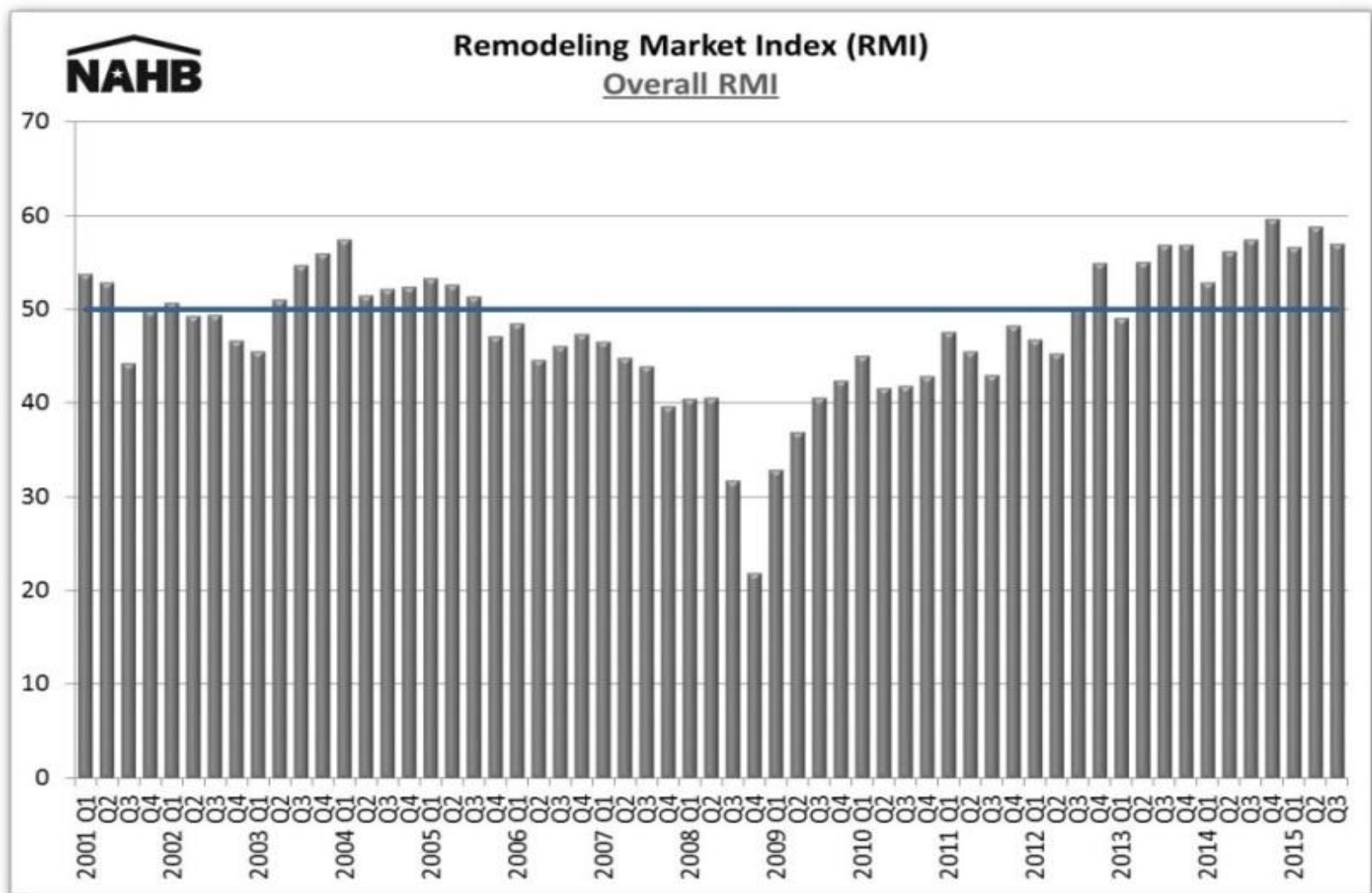
Remodeling Market Index Over 50 for Ten Straight Quarters

“NAHB’s Remodeling Market Index (RMI) was 57 in the third quarter — two points down from the previous quarter, but the tenth straight quarter it has been above the key break-even point of 50. The RMI and all its components lie on a scale of 0 to 100, where an index number above 50 means more remodelers report that activity has improved (compared to the prior quarter) than report activity has deteriorated.

The overall RMI averages ratings of current remodeling activity with indicators of future remodeling activity. The current market conditions index declined three points to 56 this quarter. Among its components, major additions and alterations, the slowest-recovering component, fell to 52 from 57 in the previous quarter. The smaller remodeling projects and home maintenance and repair components of the RMI decreased four and two points to 57 and 58, respectively.

At 58, the RMI’s future market conditions index was unchanged from the previous quarter. Among its four components, backlog of jobs rose to 60 from 58 while calls for bids and appointments for proposals — at 57 and 58, respectively — each dropped three points from the previous quarter’s readings. The amount of work committed for the next three months held steady from the previous quarter at 55.” -- Paul Emrath, Economist, National Association of Home Builders

Private Indicators



Private Indicators

2Q's Remodeling Volume Surpassed Old Peak, Latest RRI Finds

“Remodeling and replacement activity nationwide grew 5.5% in the second quarter from the year-earlier period to produce its best showing since at least before the housing boom, according Metrostudy reported with the release of its latest Residential Remodeling Index (RRI).

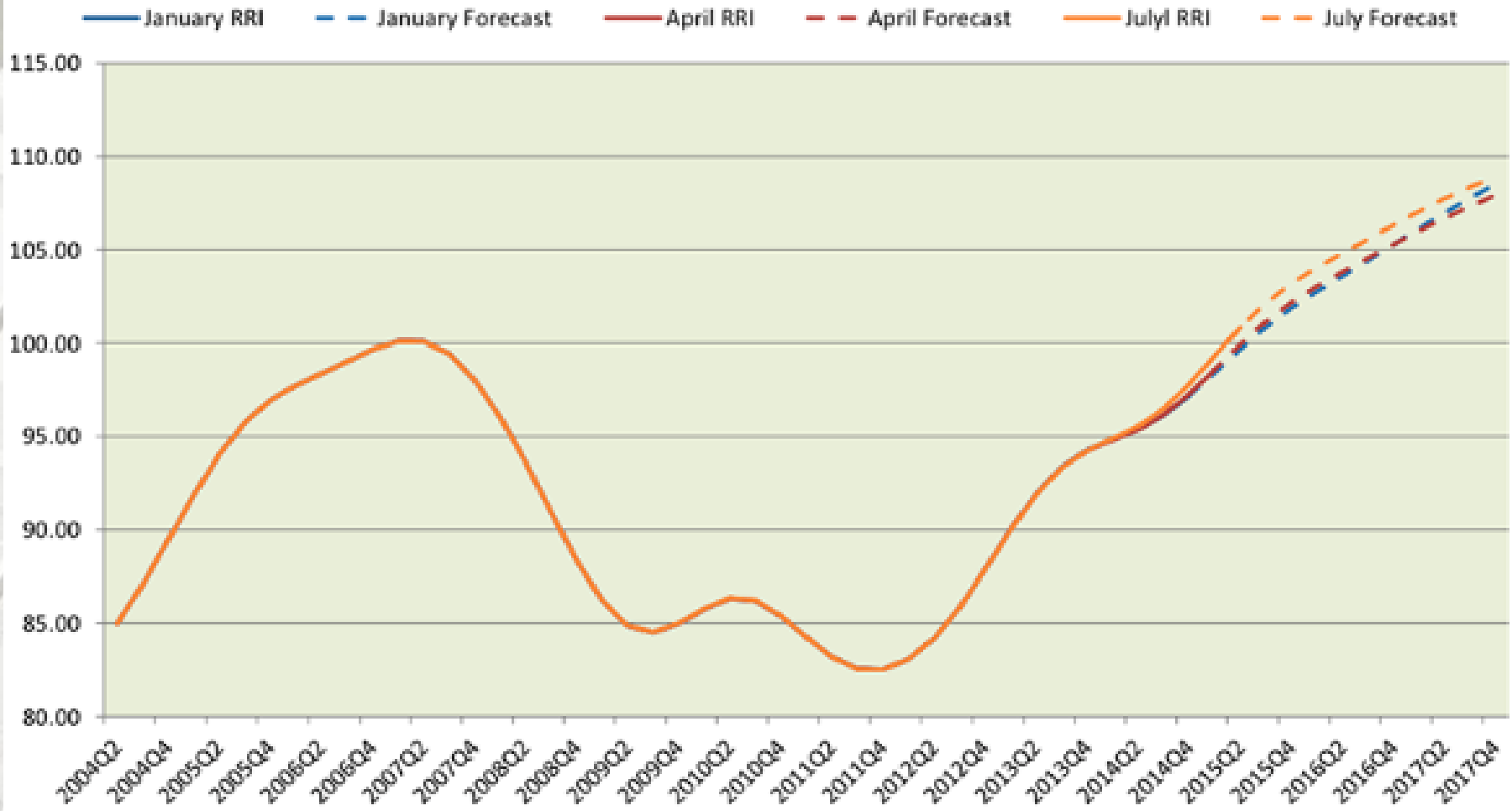
The index of economic indicators hit 100.8 for the April-to-June period, topping the high-water mark of 100 set in the first quarter of 2007. Metrostudy ... previously had thought the RRI wouldn't reach 100 until this fall.

“Growth through the first two quarters of 2015 is much stronger than what was observed in 2014, when the overall housing market had cooled,” Brad Hunter, Metrostudy's chief economist. “A big driver of recent remodeling activity has been solid job gains, but the industry stands to benefit even more over the next year from existing home sales hitting an eight-and-a-half year high at the end of second quarter. Stronger resales benefits remodeling activity, as recent homebuyers typically spend more on home improvements than other homeowners. Continued home price appreciation is also encouraging people to put money into their homes.”

Metrostudy now forecasts year-over-year RRI growth of 5.9% in the third quarter, 5.5% in the fourth quarter, 4.8% in the first quarter of 2016 and 4% in the second quarter of next year. It also believes that the number of pro-worthy projects for all 2015 will total 11.1 million, a 6% gain from 2014.” -- Craig Webb, Editor-in-Chief, *Remodeling*

Private Indicators

Residential Remodeling Index and Forecast as of July 2015



Source: Metrostudy, July 2015 RRI Report

Private Indicators

October Architecture Billings Index

Firm Billings Remain Solid in October

“U.S. architecture firms reported another solid month of growth in October 2015. The AIA’s Architecture Billings Index (ABI) was 53.1 for the month, demonstrating a solid increase in firm billings that was just below the 53.7 score for September. New project inquiries, with a score of 58.5 for the month, and new design contracts at 51.7, point to healthy business conditions at architecture firms. However, both readings fell a bit from their September level, suggesting that growth may moderate just a bit in the coming months.

The overall strong performance in business activity in recent months is beginning to show a regional pattern. Firms in the South have been reporting continued strong business conditions through the year, while firms in the West have been reporting acceleration in billings over the past few months. In contrast, Northeast firms have been reporting weak conditions in recent months, and Midwest firms — while reporting growth — have seen billings increase at a somewhat slower pace.

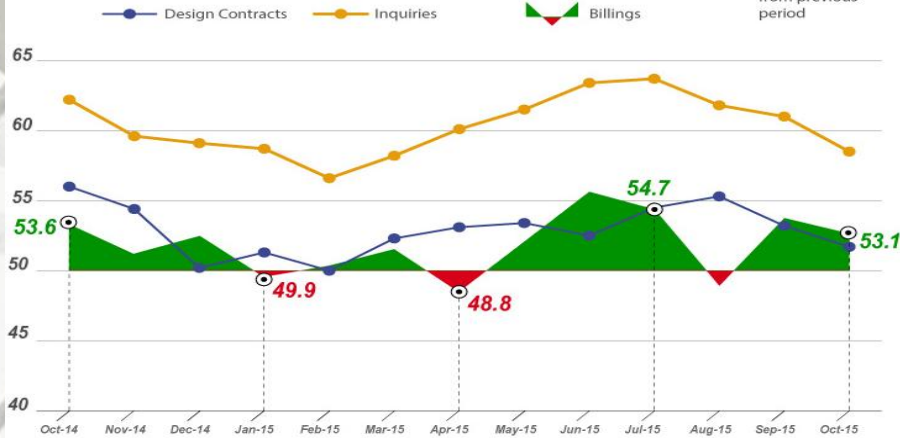
Firms in all the major construction sectors reported healthy conditions in October, with the strongest growth coming from commercial/industrial firms. Residential firms recorded their second straight monthly increase after seven straight monthly declines. Institutional firms saw growth on par with September, but their ABI scores have been declining for the past several months, indicating that the pace of growth of billings at these firms has been moderating.” -- Kermit Baker, Chief Economist, AIA

Private Indicators

NATIONAL

Architecture Firm Billings Continue to Show Strength in October

Graphs represent data from October 2014 – October 2015.

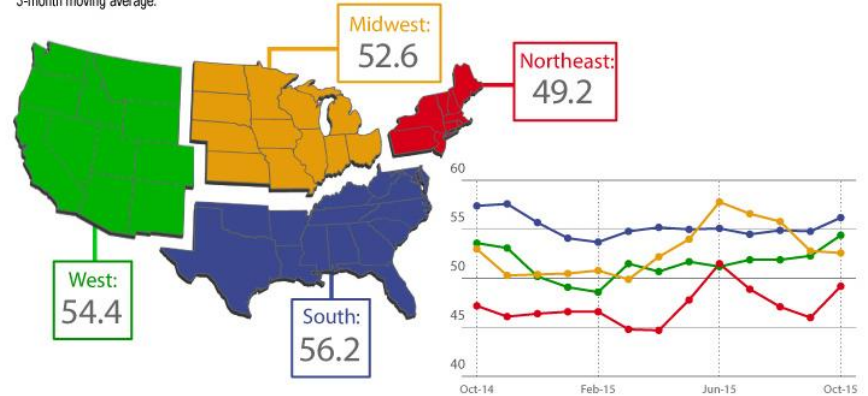


REGIONAL

Firms in Sunbelt Regions Reporting Strongest Growth in Billings

Graphs represent data from October 2014 – October 2015 across the four regions.

50 represents the diffusion center. A score of 50 equals no change from the previous month. Above 50 shows increase; Below 50 shows decrease. 3-month moving average.



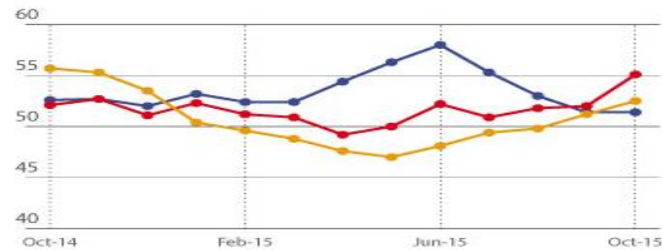
SECTOR

All Major Construction Sectors Seeing Growth

Graph represents data from October 2014 – October 2015 across the three sectors.

50 represents the diffusion center.

A score of 50 equals no change from the previous month. Above 50 shows increase; Below 50 shows decrease. 3-month moving average.



Commercial/Industrial: 55.1



Institutional: 51.4



Residential: 52.5

Private Indicators

New Construction Starts in September Slip 5 Percent

“The level of construction starts was subdued during both August and September, retreating from the strength shown earlier in the year. The pause for total construction is perhaps best viewed from the vantage point of the three major construction sectors. For nonresidential building, the volume of construction starts soared 24% in 2014. While activity has leveled off in the near term for its commercial and institutional segments, much of this year’s softness for nonresidential building is related to a decreased amount of manufacturing plant construction, adversely affected by the sluggish global economy and falling energy prices. Economic factors that influence the commercial and institutional segments, such as receding vacancies and funding support from state and local bond measures, remain positive.

For residential building, the month-to-month variation has reflected the pattern of multifamily housing, which in August and September fell back from robust activity in June and July. Multifamily housing is still on track for double-digit growth in 2015..” -- Robert Murray, Chief Economist, McGraw Hill Construction

MONTHLY SUMMARY OF CONSTRUCTION STARTS Prepared by Dodge Data & Analytics

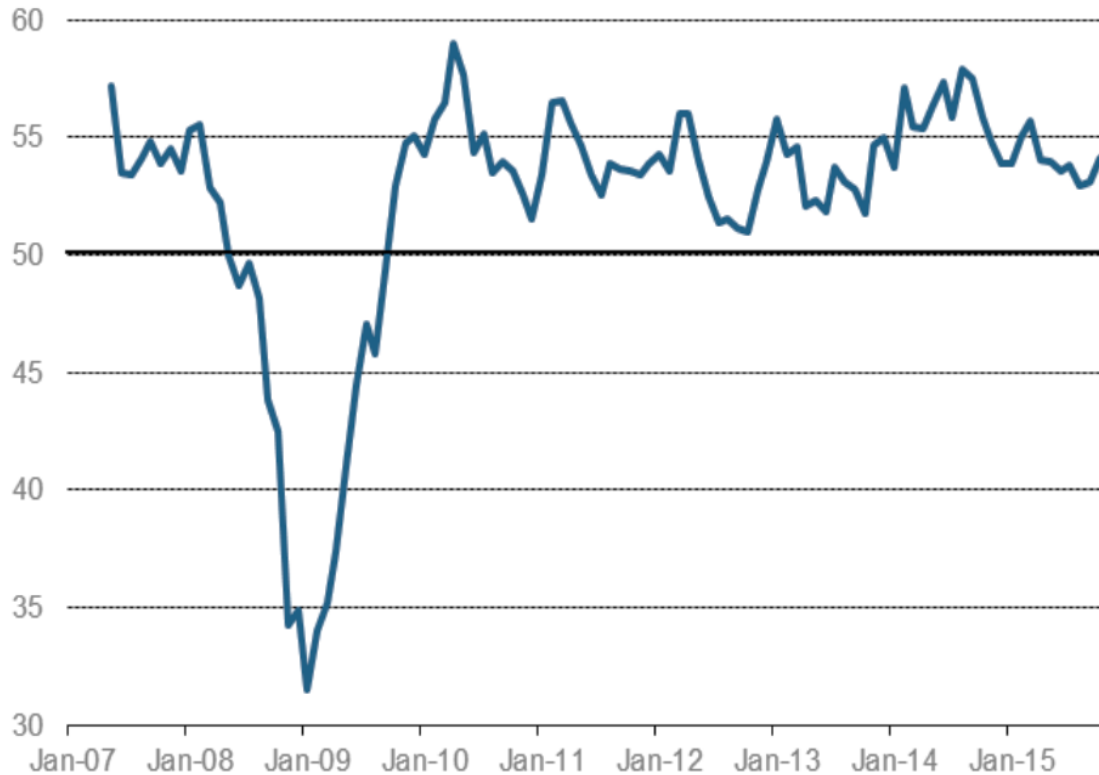
MONTHLY CONSTRUCTION STARTS			
Seasonally Adjusted Annual Rates, In Millions of Dollars			
	<u>September 2015</u>	<u>August 2015</u>	<u>% Change</u>
Nonresidential Building	\$152,882	\$159,821	-4
Residential Building	236,910	265,855	-11
Nonbuilding Construction	<u>133,912</u>	<u>127,504</u>	<u>+5</u>
TOTAL Construction	\$523,704	\$553,180	-5

THE DODGE INDEX
(Year 2000=100, Seasonally Adjusted)
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YEAR-TO-DATE CONSTRUCTION STARTS			
Unadjusted Totals, In Millions of Dollars			
	<u>9 Mos. 2015</u>	<u>9 Mos. 2014</u>	<u>% Change</u>
Nonresidential Building	\$154,188	\$165,580	-7
Residential Building	200,227	171,408	+17
Nonbuilding Construction	<u>142,969</u>	<u>106,036</u>	<u>+35</u>
TOTAL Construction	\$497,384	\$443,024	+12

Private Indicators

Markit U.S. Manufacturing PMI



Source: Markit.

Key points:

- Manufacturing PMI picks up to six-month high
- Output and new orders rise at fastest pace since March
- Input costs decline at a sharper pace in October

Manufacturing sector growth rebounds in October

“October data highlighted a modest rebound in U.S. manufacturing performance, driven by faster rises in output, new orders and employment levels. At 54.1, up from 53.1 in September, the final seasonally adjusted Markit U.S. Manufacturing Purchasing Managers’ Index™ pointed to the sharpest improvement in overall business conditions since April. Moreover, the latest data signalled a turnaround in growth momentum from the 22-month low recorded in August.”

Private Indicators

Global factory output



Signs of global manufacturing slowdown bottoming out as PMI hits seven-month high

- Global PMI rises to 51.4, highest since March
- Emerging market PMI signals ongoing, but moderating, recession
- Asia remains major drag on global expansion

“The JPMorgan Global Manufacturing PMI™, compiled by Markit, rose from 50.7 in September to 51.4 in October, recording the largest monthly rise for almost two years to reach its highest level since March.

The latest reading is a welcome improvement after the PMI signalled the weakest quarter of manufacturing expansion for just over two years in the three months to September. However, growth remains weak by historical standards: the survey is merely signalling an annual rate of growth of global manufacturing output of just less than 2%.”

Private Indicators

Eurozone industrial output up 1.7% on a year ago despite September drop

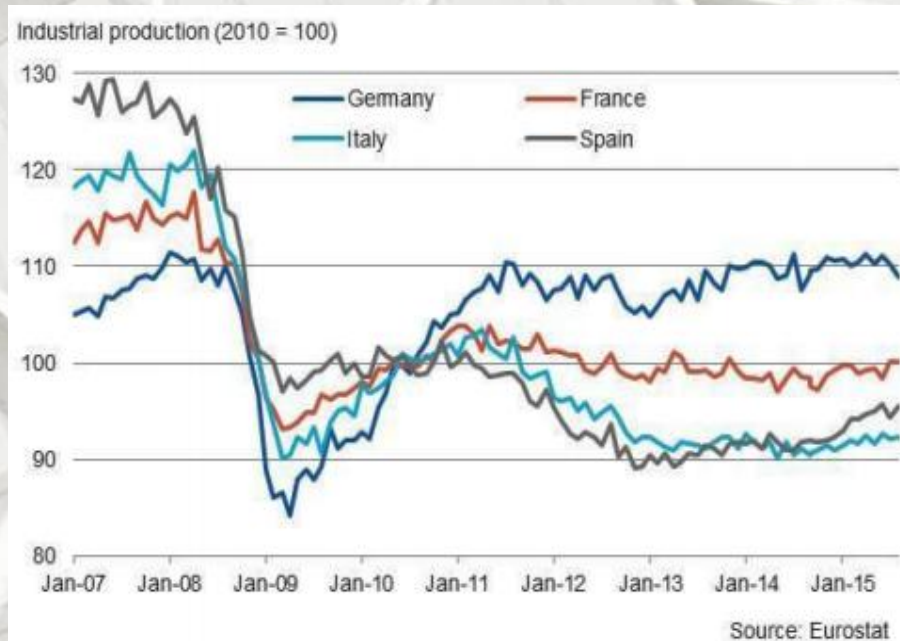
- Eurozone industry sees 0.3% fall in production in September
- but output 1.7% higher than a year ago, and
- PMI points to further rise in October

Industry still decimated from crises

Industrial production in the euro area fell 0.3% in September, according to official data, piling additional pressure on policymakers to inject more stimulus to tackle the region's economic malaise.

The weakness was greater than economists had been expecting, and contrasted with a more positive picture painted by recent survey data. The weakness was also something of a surprise given that it was led by a sharp drop in production of consumer goods, a sector which has, in theory at least, been buoyed this year by slumping oil prices and low inflation boosting consumers' spending power."

Eurozone industrial production



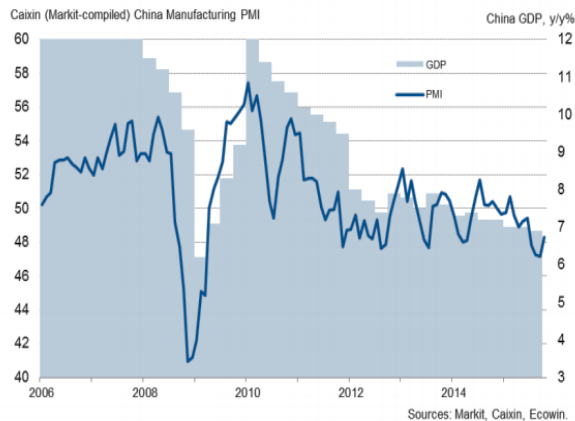
Private Indicators

China manufacturing PMI sees largest rise for 16 months as exports stabilise

- PMI shows largest rise for 16-months
- Slumping domestic demand hits production
- Exports stabilise
- Further job losses as firms cut capacity
- Price falls moderate as supply comes more into line with demand

“China’s manufacturing economy started the fourth quarter on a firmer footing, with the sector still in decline but the rate of contraction easing amid a stabilising of export sales.” -- Chris Williamson, Chief Economist, Markit®

1. PMI shows largest rise for 16 months



3. Exports stabilise

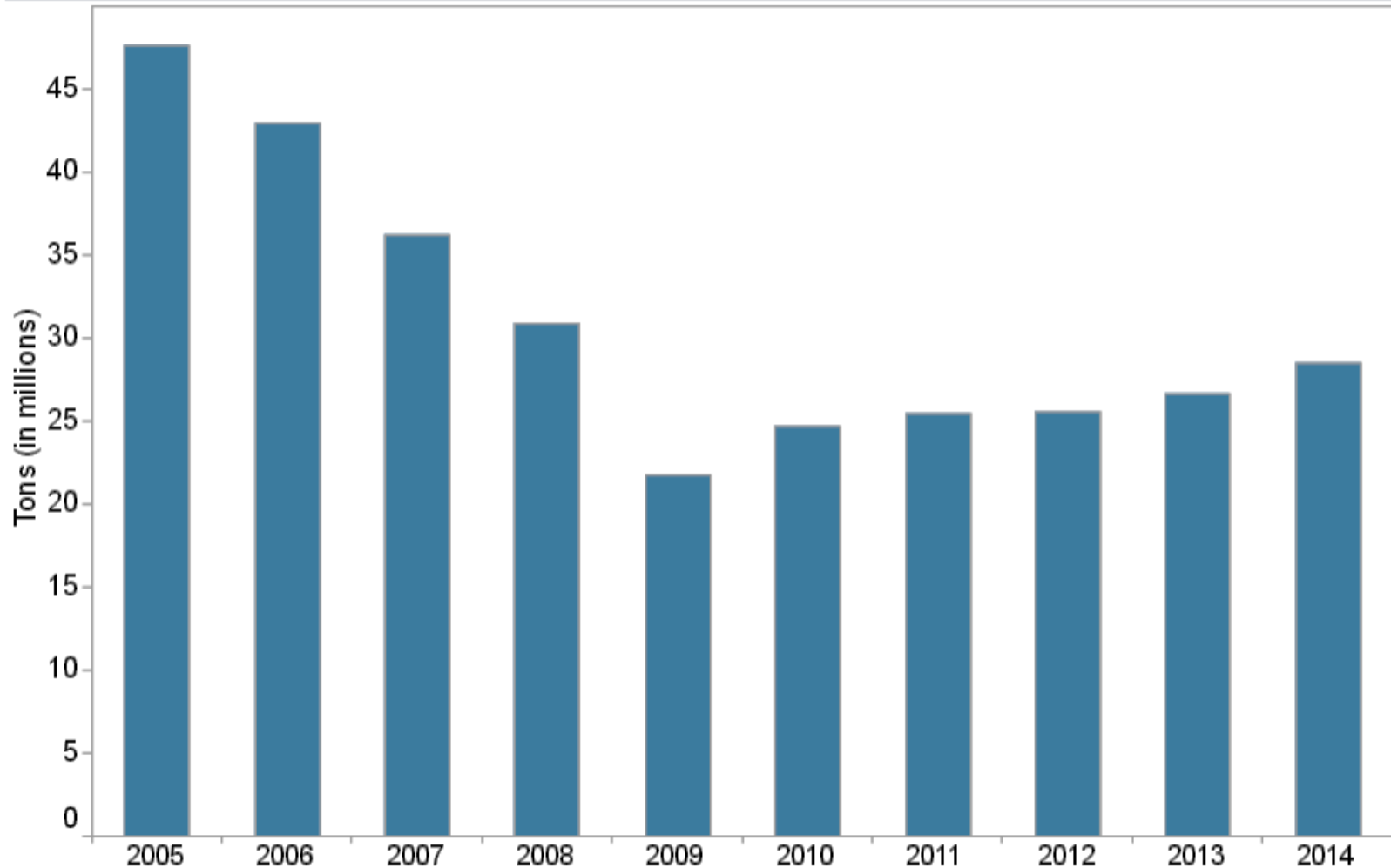


2. Slumping domestic demand hits production



Lumber Shipments via Railroad

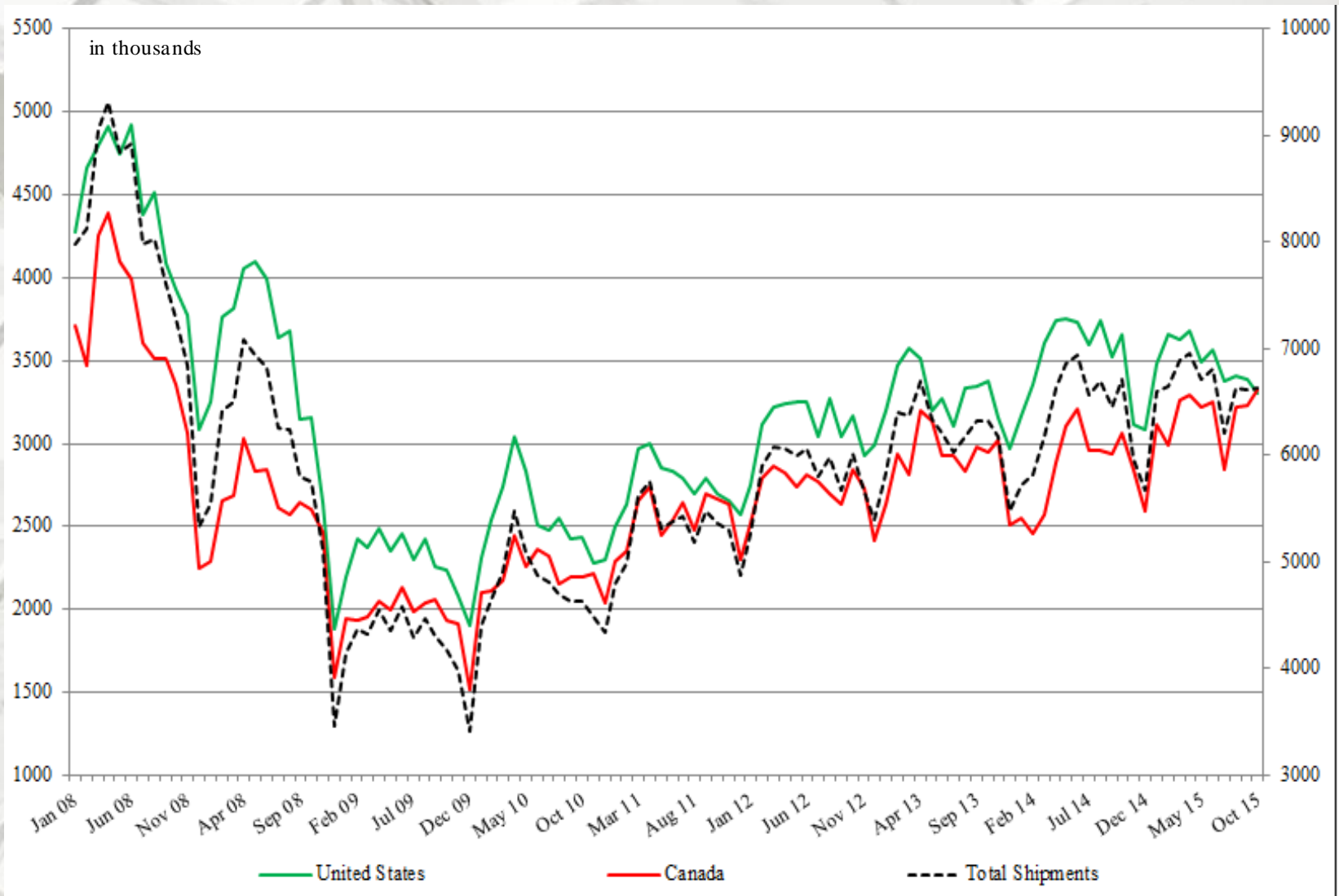
Annual U.S. Class I Rail Tons
Lumber and wood



Data are originations and include the U.S. operations of CN and CP.



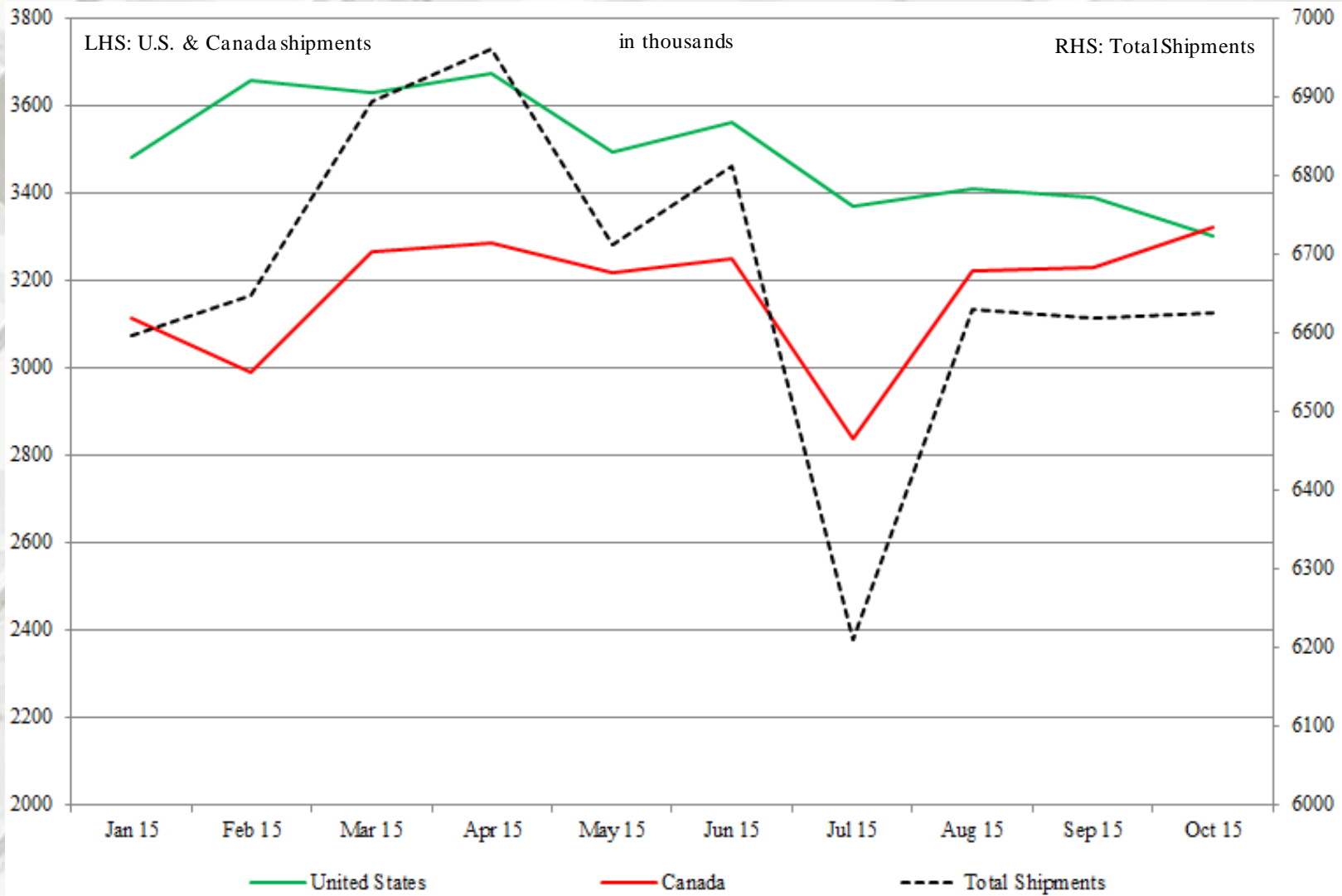
Lumber Shipments via Railroad



Source: Association of American Railroads, *Rail Time Indicators* report; 11/6/15

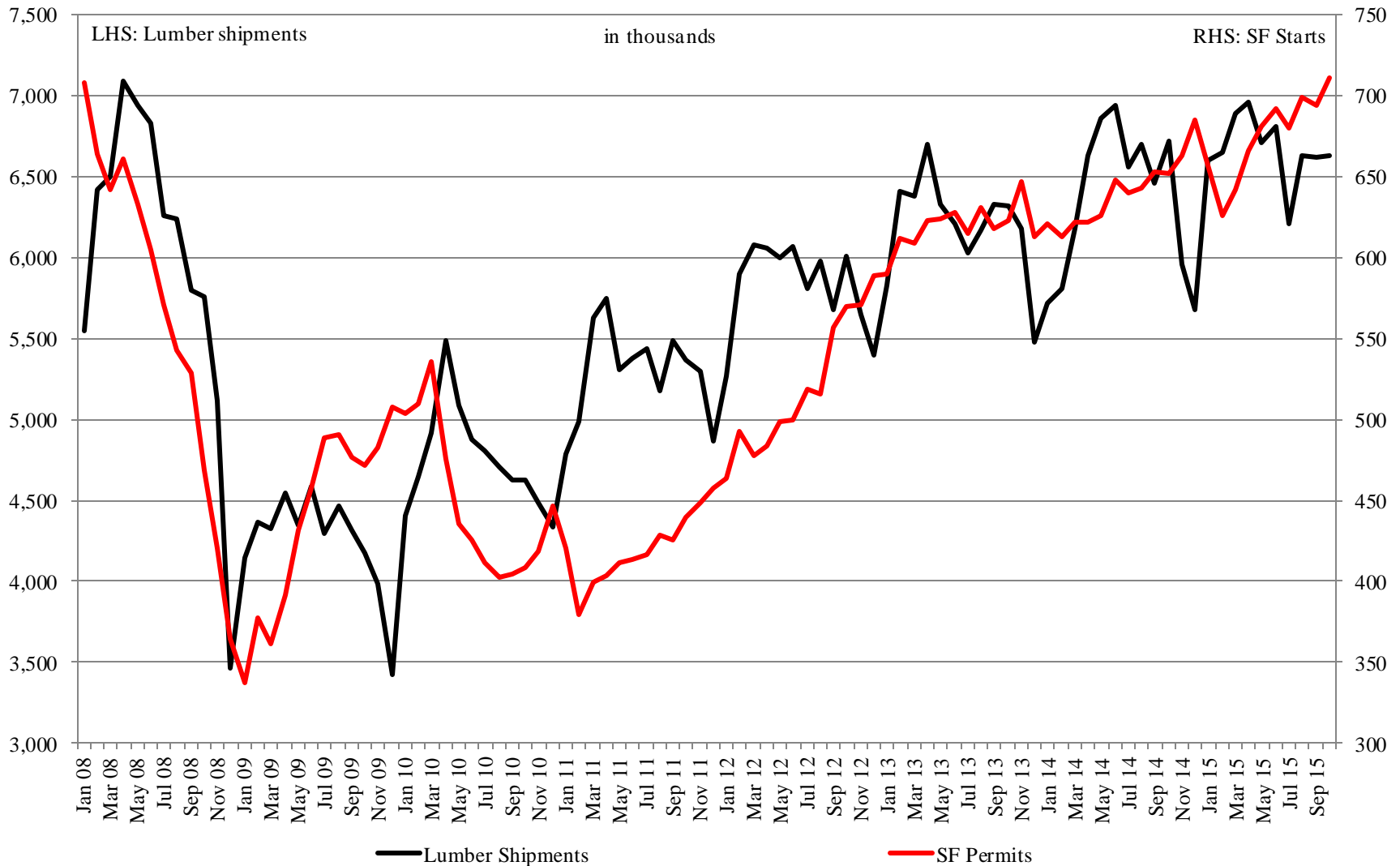
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Lumber Shipments via Railroad: 2015

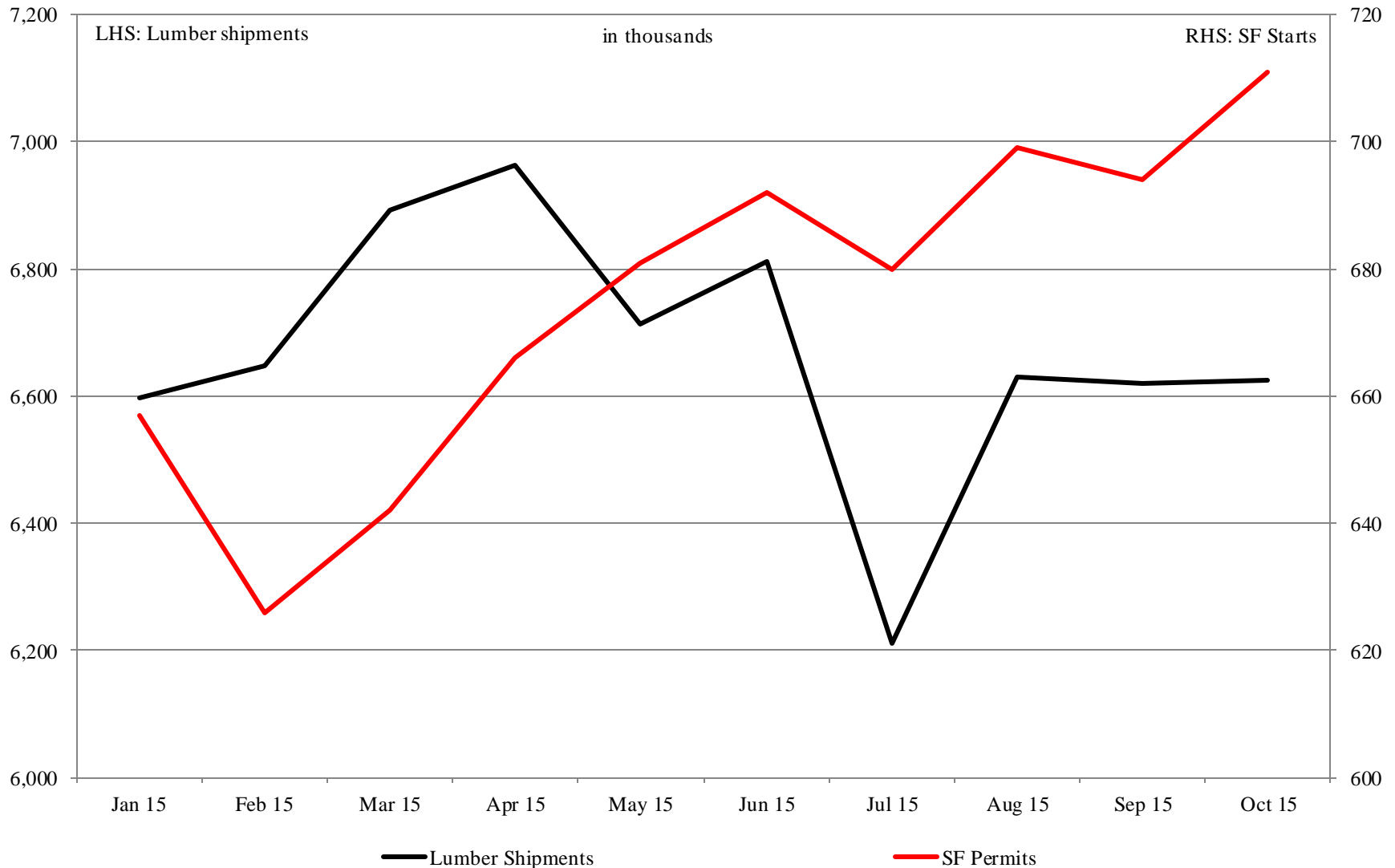


Source: Association of American Railroads, *Rail Time Indicators* report; 11/6/15

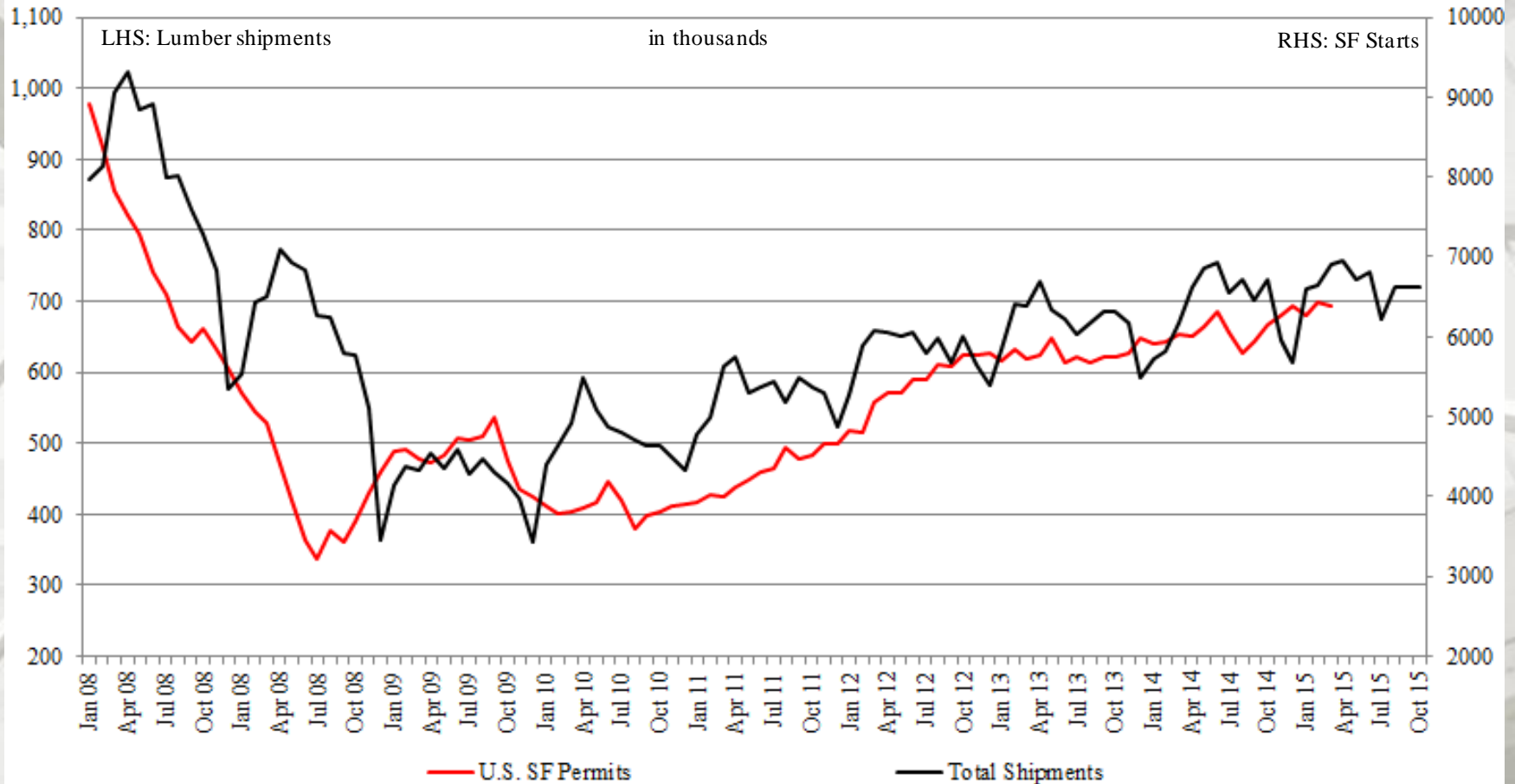
Lumber & Wood Shipments via Railroad vs. U.S. SF Housing Permits



Lumber & Wood Shipments via Railroad vs. U.S. SF Housing Permits: 2015

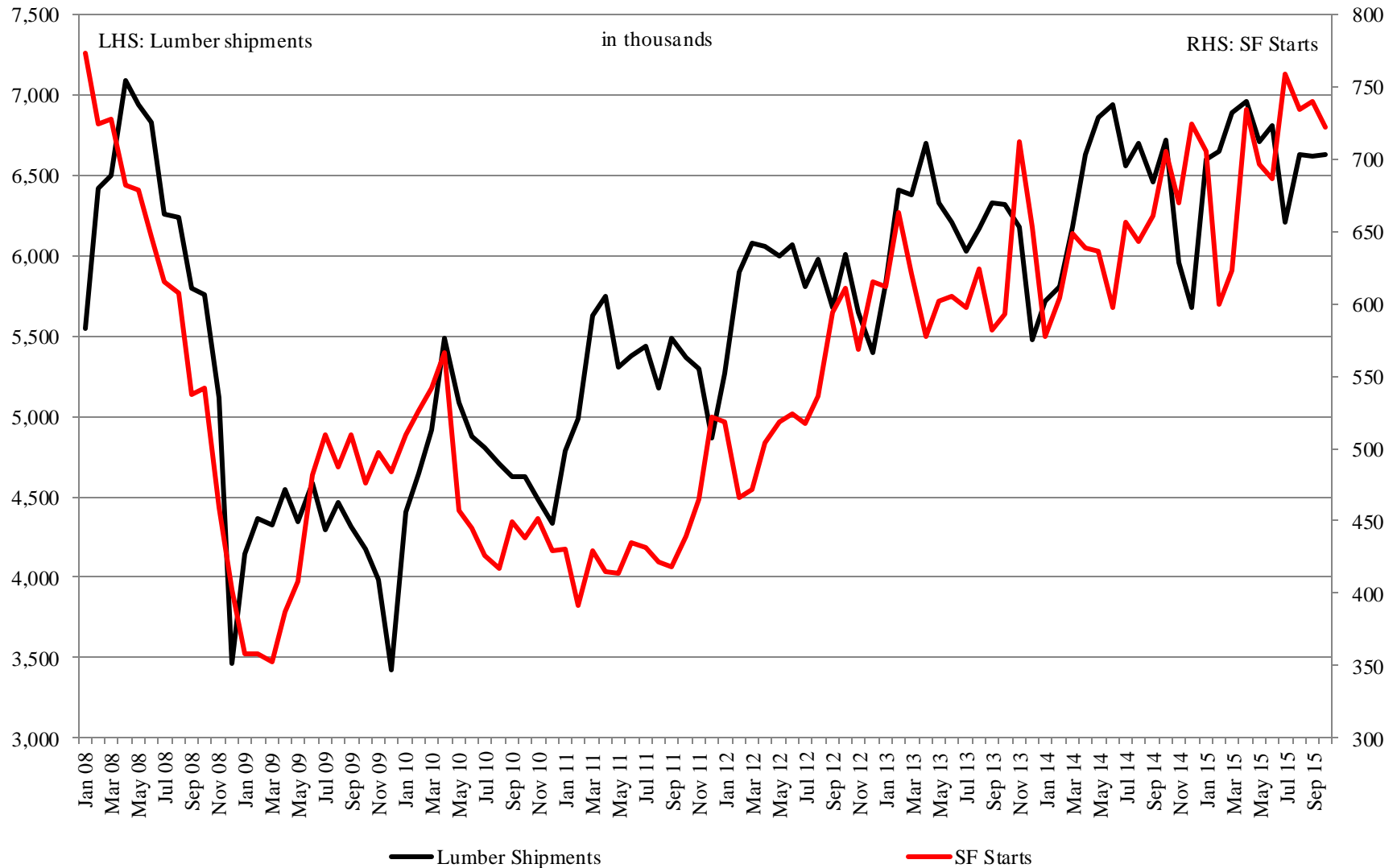


Lumber & Wood Shipments via Railroad vs. U.S. SF Housing Permits: Offset 6-months

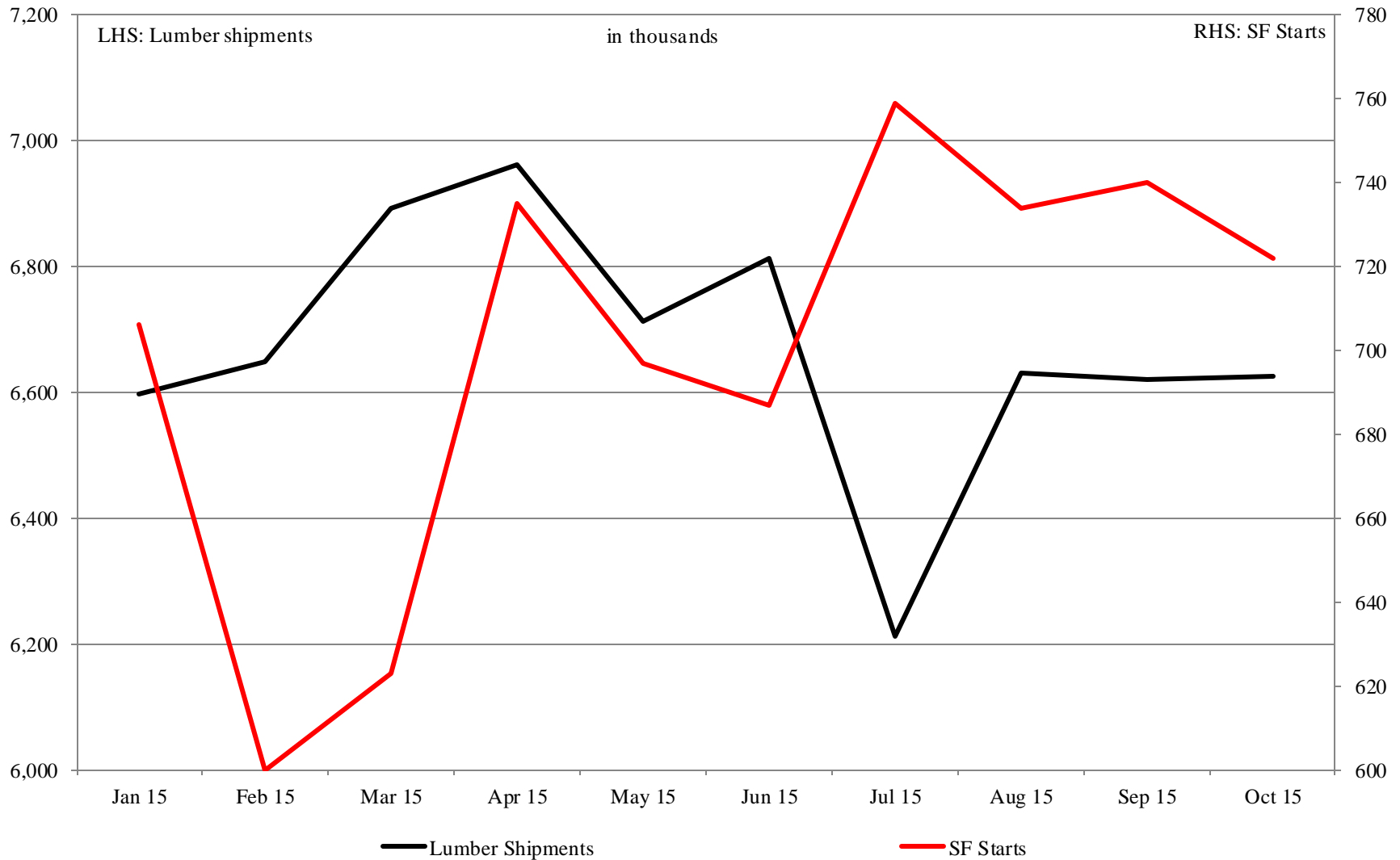


In this graph, January 2008 lumber shipments are contrasted with July 2008 permits. The purpose is to discover if lumber shipments correlate with future single-family building permits. Next month another exogenous indicator will be used in this exercise. Also it is realized that trucking hauls lumber; however, comprehensive trucking data is not available.

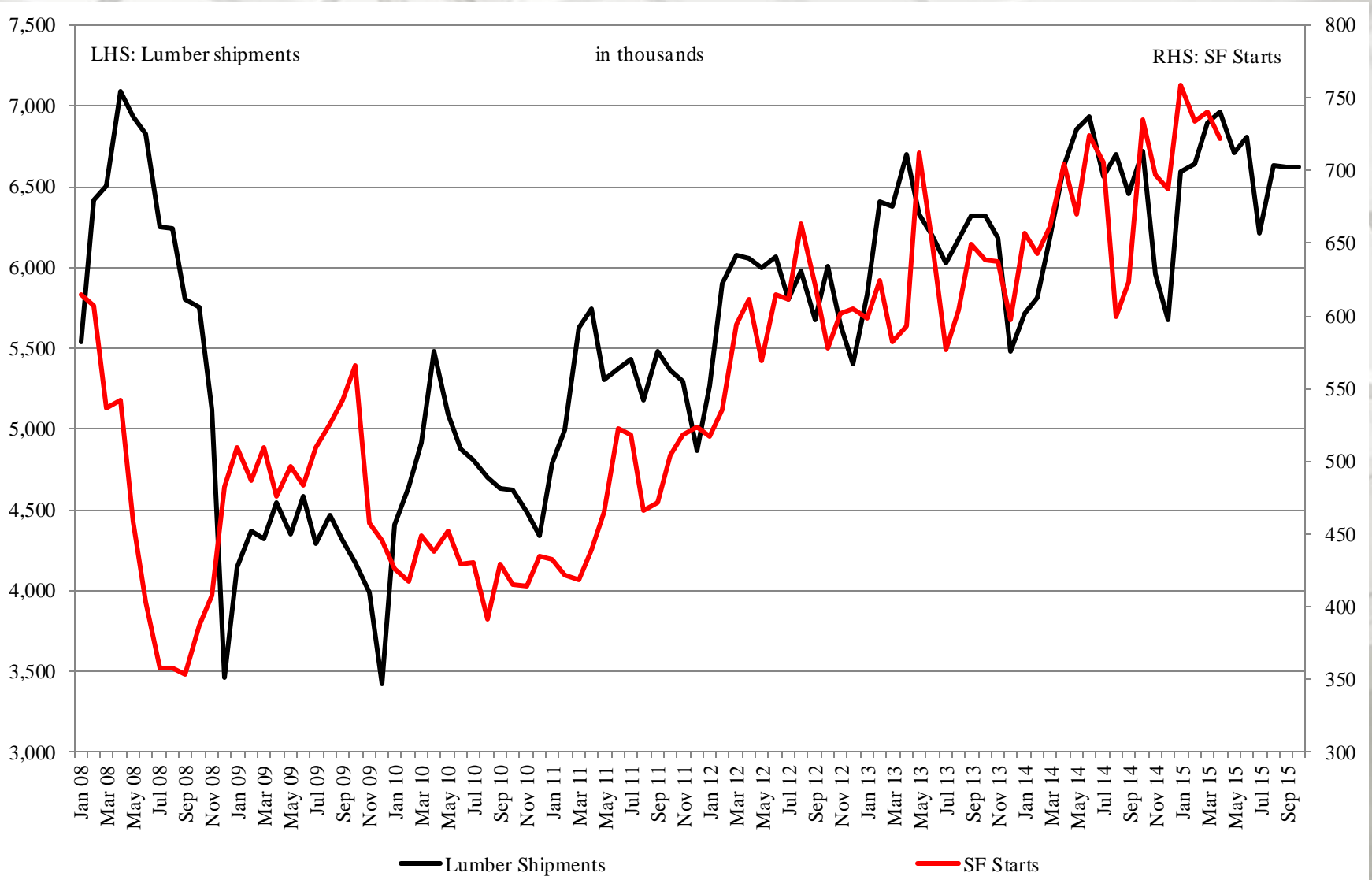
Lumber & Wood Shipments via Railroad vs. U.S. SF Housing Starts



Lumber & Wood Shipments via Railroad vs. U.S. SF Housing Starts: 2015



Lumber & Wood Shipments via Railroad vs. U.S. SF Housing Starts: Offset 6-months



Source: Association of American Railroads, *Rail Time Indicators* report; 11/6/15 & U.S. DOC-Construction: www.census.gov/construction/nrc/pdf/newresconst.pdf; 11/17/15

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