

The Virginia Tech – U.S. Forest Service November 2018 Housing Commentary: Section I



Urs Buehlmann

Department of Sustainable Biomaterials
College of Natural Resources & Environment

Virginia Tech
Blacksburg, VA

540.231.9759

buehlmann@gmail.com

Delton Alderman

Forest Products Marketing Unit
Forest Products Laboratory

U.S. Forest Service
Madison, WI

304.431.2734

dalderman@fs.fed.us



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To request the commentary, please email: buehlmann@gmail.com or dalderman@fs.fed.us

Opening Remarks

November housing data suggests a slowing down of the housing construction and sales markets. The questions are: Is this seasonal, or are the markets normalizing at levels substantially less than historical averages? November housing data was mixed, with month-over-month increases and declines in single-family starts, completions, and spending. Several housing data reports were negative on year-over-year basis. Total permits, total and single-family housing under construction, and expenditures remained positive. The February 14th Atlanta Fed GDPNow™ model for Q4: 2018 projects an aggregate 3.8% decline for residential investment spending. New private permanent site expenditures were projected at a 7.3% decrease; the improvement spending forecast was a 3.1% increase; and the manufactured/mobile housing projection was a 3.1% decrease (all: quarterly log change and seasonally adjusted annual rate)¹.

“Given the significant deceleration in activity exiting 2018, our prior forecast of an 11% increase in production single-family starts in 2019 would be extremely difficult to achieve absent a significant snapback in activity over the next several months. Accordingly, we now estimate just a 3% increase next year, with 2H19 stronger than 1H19... In total, our revised single-family starts estimate of 915,000 in 2019 would be up 3% year over year and is 8% lower than our prior view in absolute terms.

With momentum expected to build through 2019, we continue to underwrite solid growth in single-family starts in 2020, increasing 8% to 990,000, below our prior growth forecast of 11%. We still expect a demographic tailwind, significant pent-up demand and still-favorable absolute levels of affordability. However, the recent choppiness in demand is likely to stall incremental investment in land development, which could limit future new construction supply on the margin. Importantly, we still expect cyclical upside beyond our explicit forecasts, as our 2020 estimate sits 10-20% below our view of normalized demand.”² – Ivy Zelman, CEO, Zelman & Associates

This month’s commentary contains applicable housing data: Section I contains data and commentary and Section II includes regional Federal Reserve analysis, private indicators, and demographic and economic commentary.

Sources: ¹ www.frbatlanta.org/cqer/research/gdpnow.aspx; 2/14/19;

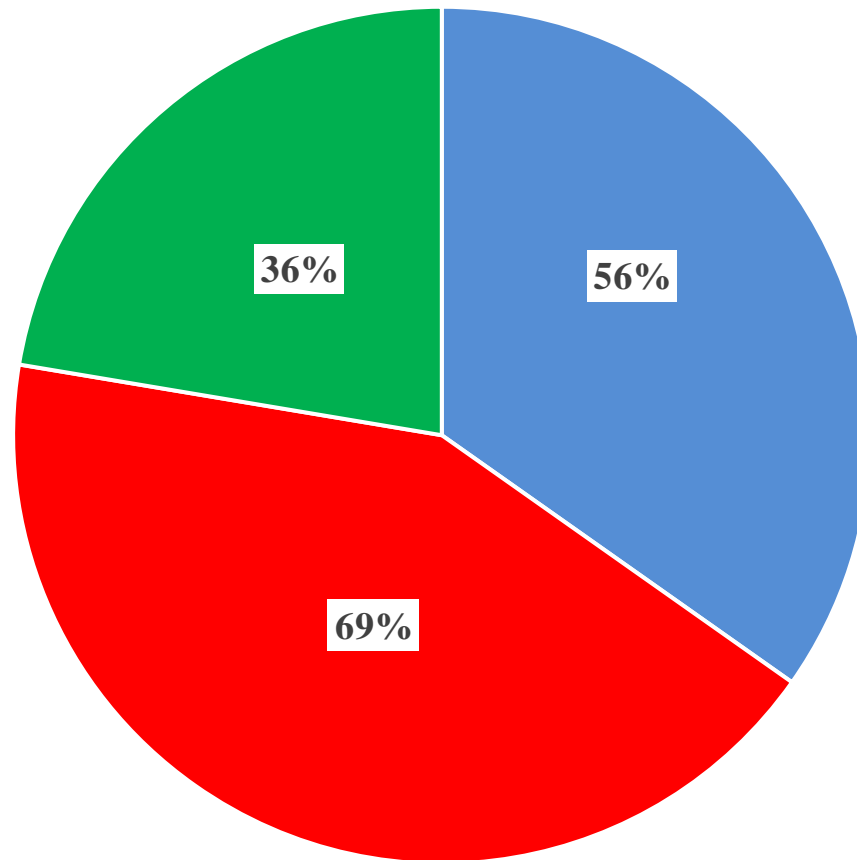
² www.builderonline.com/money/economics/will-the-housing-market-ever-really-recover_o; 1/4/19

November 2018 Housing Scorecard

	M/M	Y/Y
Housing Starts	△ 3.2%	▽ 3.6%
Single-family (SF) Starts	▽ 4.6%	▽ 13.1%
Housing Permits	△ 5.0%	△ 0.4%
SF Permits	△ 0.1%	▽ 1.9%
Housing Under Construction	△ 0.7%	△ 4.0%
SF Under Construction	△ 0.2%	△ 7.5%
Housing Completions	△ 0.4%	▽ 3.9%
SF Completions	▽ 5.4%	▽ 1.2%
New SF House Sales	△ 16.9%	▽ 7.7%
Private Residential Construction Spending	△ 3.5%	△ 0.8%
SF Construction Spending	▽ 1.8%	▽ 1.0%
Existing House Sales ¹	△ 1.9%	▽ 7.0%

M/M = month-over-month; Y/Y = year-over-year; NC = no change

New Construction's Percentage of Wood Products Consumption

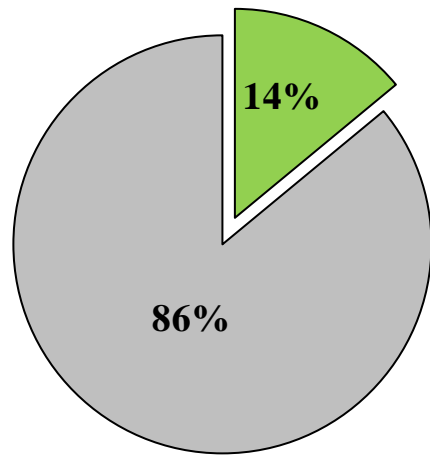


■ All Sawnwood

■ Structural panels

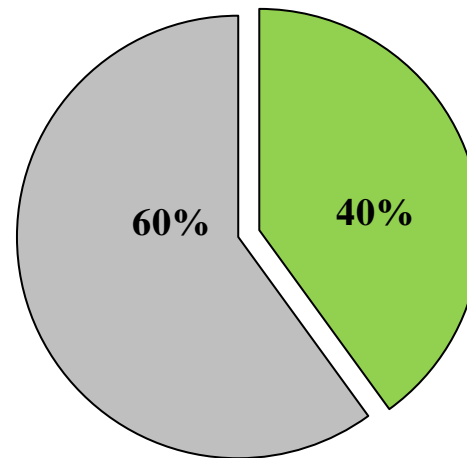
■ Non-structural panels

New SF Construction Percentage of Wood Products Consumption



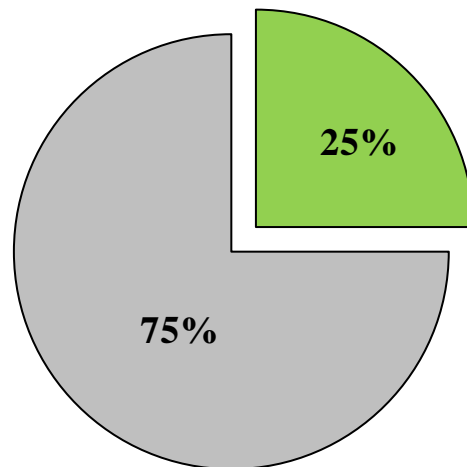
■ Non-structural panels:
New Housing

■ Other markets



■ Structural panels:
New housing

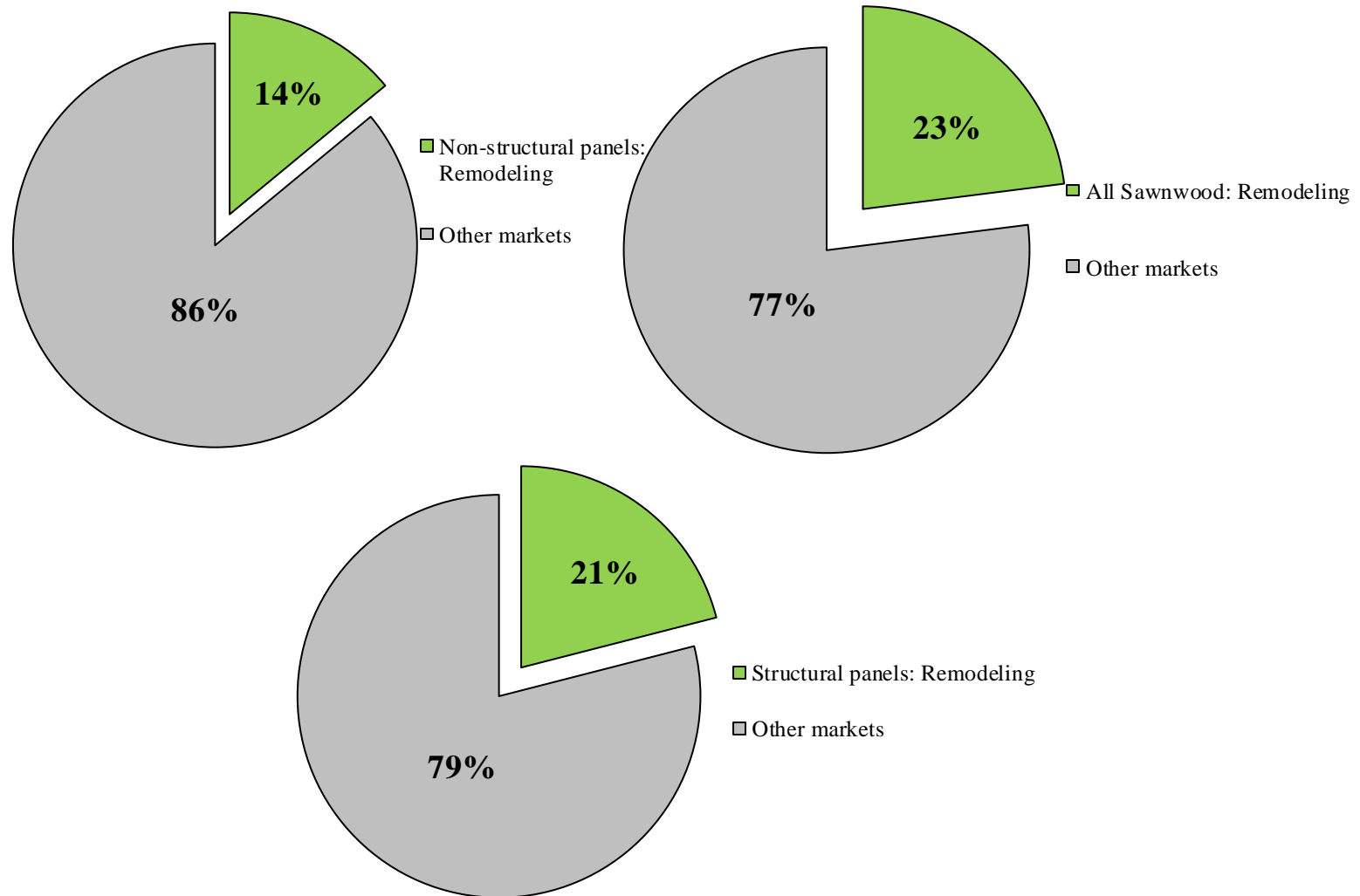
■ Other markets



■ All Sawnwood: New housing

■ Other markets

Repair and Remodeling's Percentage of Wood Products Consumption



2019 Housing Forecasts*

Total starts, range:	1,134 to 1,400	Median: 1,280
SF starts, range:	815 to 920	Median: 900
New SF house sales, range:	618 to 688	Median: 635

Organization	Total Starts	SF Starts	New SF House Sales
APA - The Engineered Wood Association ^a	1,230	850	
Bank of Montreal (BOM) ^b	1,240		
Blue Chip Economic Indicators ^c	1,332		
Deloitte ^d	1,160		
Dodge Data & Analytics ^e	1,280	815	
Forest2Market ^f	1,259		
Fannie Mae ^g	1,265	903	618
Freddie Mac ^h	1,290	900	640
Goldman Sachs ⁱ	1,134		688
Mortgage Bankers Association (MBA) ^j	1,285	900	635

* All in thousands of units

2019 Housing Forecasts*

Organization	Total Starts	Single-Family Starts	New House Sales
National Association of Homebuilders ^k	1,268	897	
National Association of Realtors ^l	1,290	900	640
PNC Financial Services Group ^m	1285		
RISI ⁿ	1,310	920	
Royal Bank of Canada (RBC) ^o	1,313		
Scotiabank ^p	1,250		
TD Economics ^q	1,240		
The Federal Reserve Bank of Chicago ^r	1,280		
UCLA Ziman Center for Real Estate ^s	1,310		
Urban Institute ^t	1,400		
Wells Fargo LLC ^u	1,300	920	630

* All in thousands of units

References

- a-*Random Lengths*, Volume 75, Issue 1 (1/4/19). Random Lengths Publications, Inc. Eugene, OR. 12 pps.
- b-<https://economics.bmcapitalmarkets.com/economics/forecast/us/usmodel.pdf>
- c-<https://chambermaster.blob.core.windows.net/userfiles/UserFiles/chambers/305/File/2018FederalReservePresentation.pdf>
- d-<https://www2.deloitte.com/insights/us/en/economy/us-economic-forecast/united-states-outlook-analysis.html>
- e-<http://urbanland.uli.org/economy-markets-trends/in-brief-u-s-construction-starts-in-2019-to-hold-steady-with-2018/>
- f-<http://blog.forest2market.com/housing-start-forecast-what-the-next-five-years-really-look-like>
- g-http://www.fanniemae.com/resources/file/research/emma/pdf/Housing_Forecast_012219.pdf
- h-http://www.freddiemac.com/research/forecast/20190129_economic_growth.html
- i-<http://www.goldmansachs.com/insights/pages/outlook-2019/us-outlook/report.pdf>
- j-<http://www.mba.org/Documents/Research/Mortgage%20Finance%20Forecast%20Jan%202019.pdf>. January 2019
- k-*Random Lengths*, Volume 75, Issue 1. Random Lengths Publications, Inc. Eugene, OR. 12 pps.
- l-<http://www.rbc.com/economics/economic-reports/pdf/other-reports/Econoscope.pdf>
- m-https://www.scotiabank.com/content/dam/scotiabank/sub-brands/scotiabank-economics/english/documents/economic-commentary/ec_comm18.pdf
- n-<https://economics.td.com/us-long-term-forecast>
- o-<https://www.chicagofed.org/~/media/publications/chicago-fed-letter/2019/cfl410-pdf.pdf>
- p-https://www.anderson.ucla.edu/Documents/areas/ctr/ziman/UCLA_Economic_Letter_Shulman_12.06.18.pdf
- q-https://www.pnc.com/content/dam/pnc-com/pdf/aboutpnc/EconomicReports/NEO%20Reports/NEO_Jan2018.pdf?WT.mc_id=CIB_Email_Ideas
- r-<http://www.urban.org/research/publication/housing-finance-glance-monthly-chartbook-january-2019>
- s-<http://www.gbm.scotiabank.com/scpt/gbm/scotiaeconomics63/forecast.pdf>
- t-<https://economics.td.com/us-long-term-forecast>
- u- <https://www.wellsfargo.com/assets/pdf/commercial/insights/economics/real-estate-and-housing/housing-whats-ahead-20190116.pdf>

2019 Housing Forecasts*

Total starts, range:	1,134 to 1,400	Median: 1,280
Single-family starts, range:	815 to 920	Median: 900
New SF house sales, range:	618 to 688	Median: 638

2018 Housing Forecasts*

Total starts, range:	1,248 to 1,320	Median: 1,280
Single-family starts, range:	850 to 981	Median: 912
New SF house sales, range:	653 to 700	Median: 672

2017 Housing Forecasts*

Total starts, range:	1,170 to 1,500	Median: 1,271
Single-family starts, range:	795 to 893	Median: 856
New SF house sales, range:	610 to 680	Median: 642

* All in thousands of units

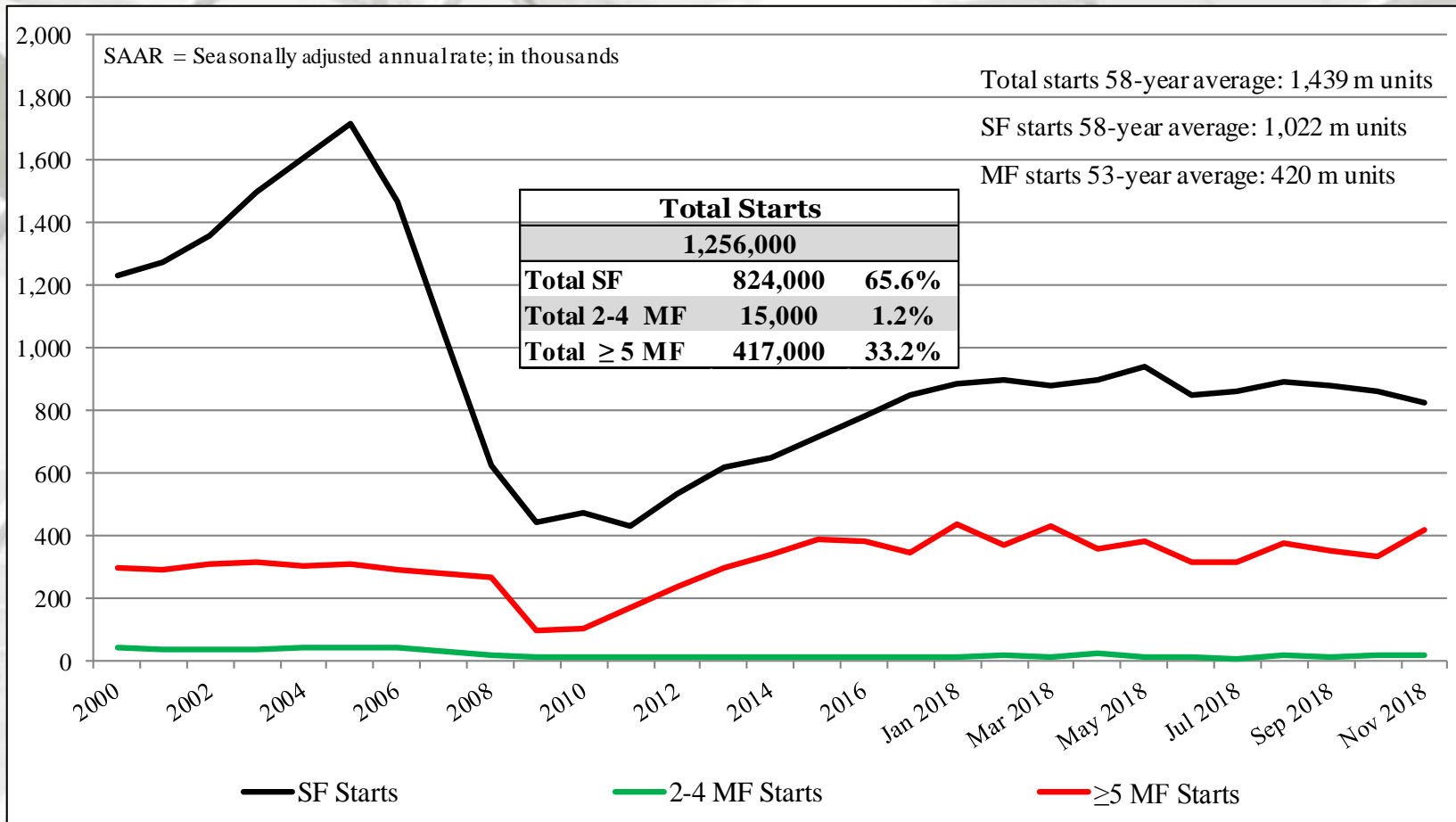
New Housing Starts

	Total Starts*	SF Starts	MF 2-4 Starts**	MF ≥5 Starts
November	1,256,000	824,000	15,000	417,000
October	1,217,000	864,000	19,000	334,000
2017	1,303,000	948,000	8,000	347,000
M/M change	3.2	-4.6	-21.1	24.9
Y/Y change	-3.6	-13.1	87.5	20.2

* All start data are presented at a seasonally adjusted annual rate (SAAR).

** US DOC does not report 2 to 4 multifamily starts directly, this is an estimation ((Total starts – (SF + 5 unit MF)).

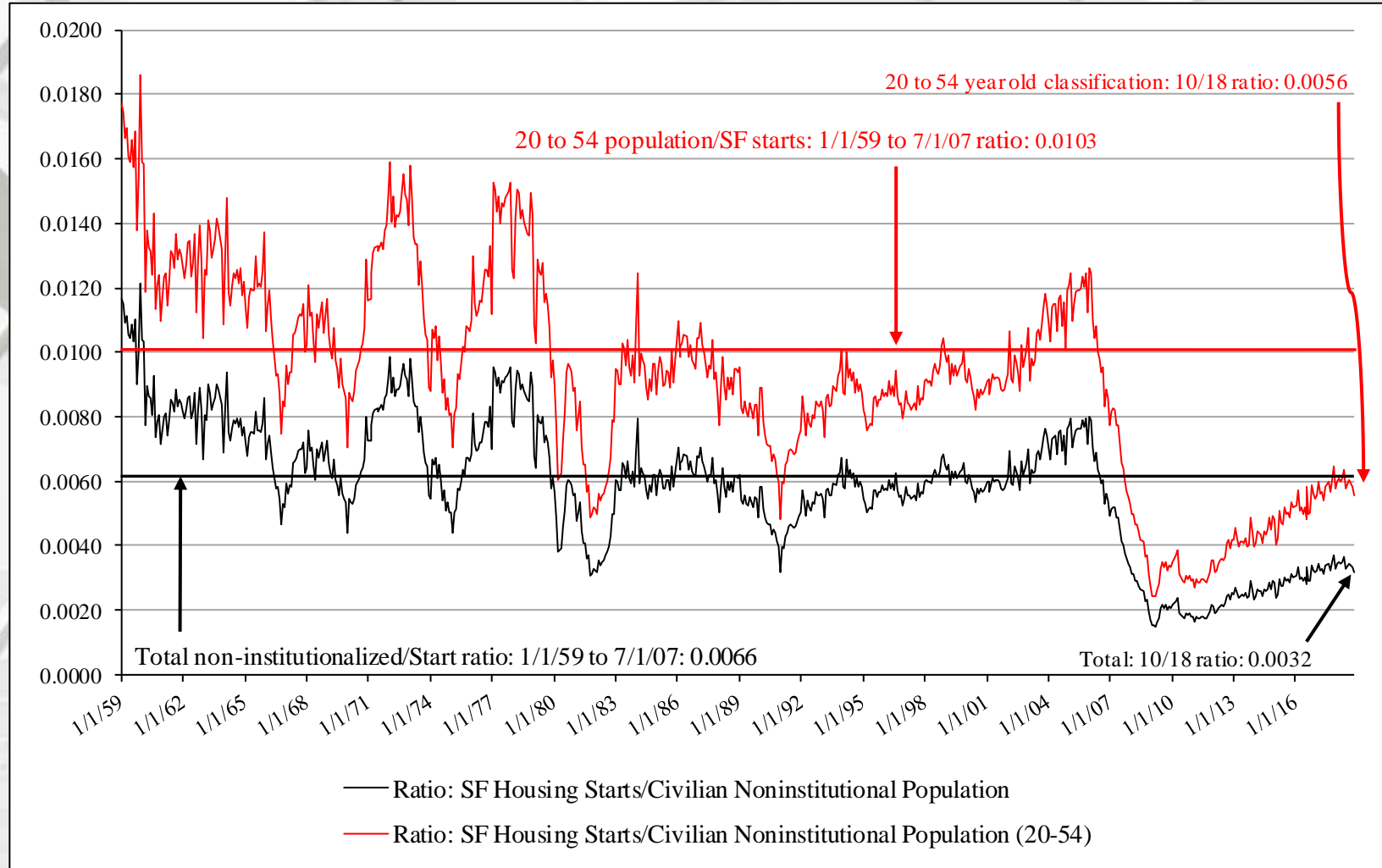
Total Housing Starts



US DOC does not report 2 to 4 multifamily starts directly, this is an estimation: ((Total starts – (SF + Total MF))).

* Percentage of total starts.

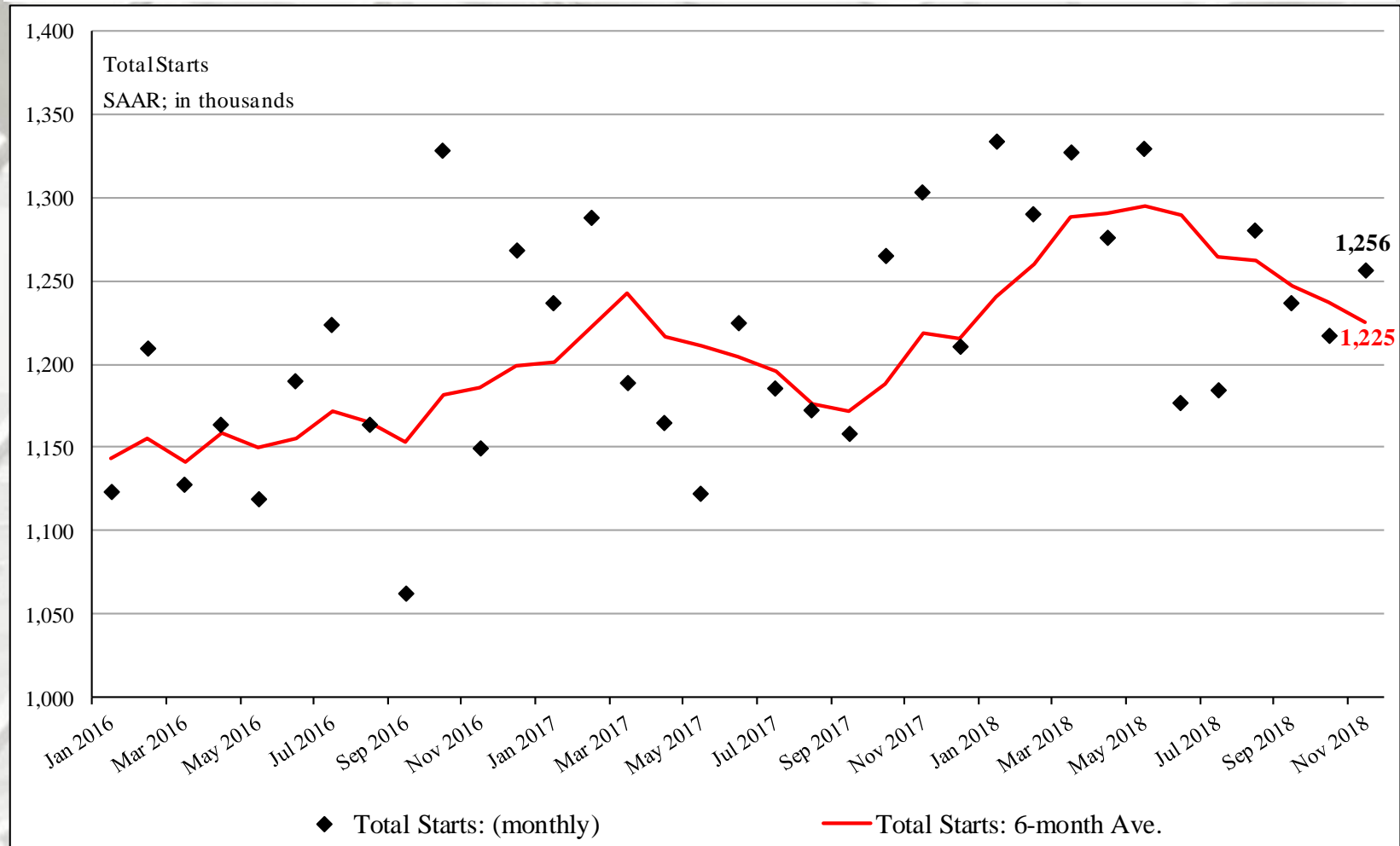
New SF Starts



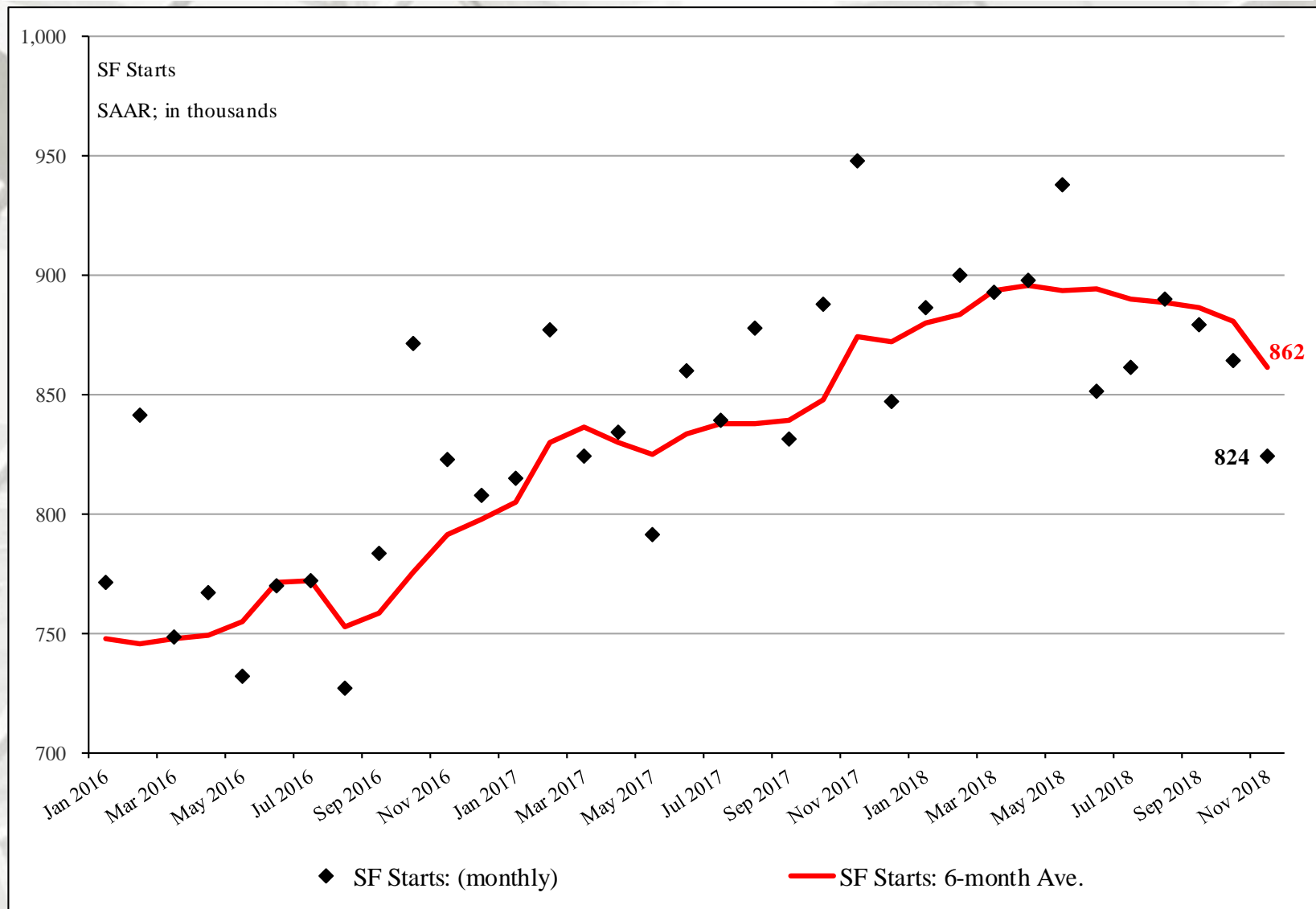
New SF starts adjusted for the US population

From November 1959 to November 2007, the long-term ratio of new SF starts to the total US non-institutionalized population was 0.0066; in November 2018 it was 0.0032 – a slight decrease from October (0.0033). The long-term ratio of non-institutionalized population, aged 20 to 54 is 0.0103; in November 2018 was 0.0056 – also a decline from October (0.0058). From a population worldview, new SF construction is less than what is necessary for changes in population (i.e., under-building).

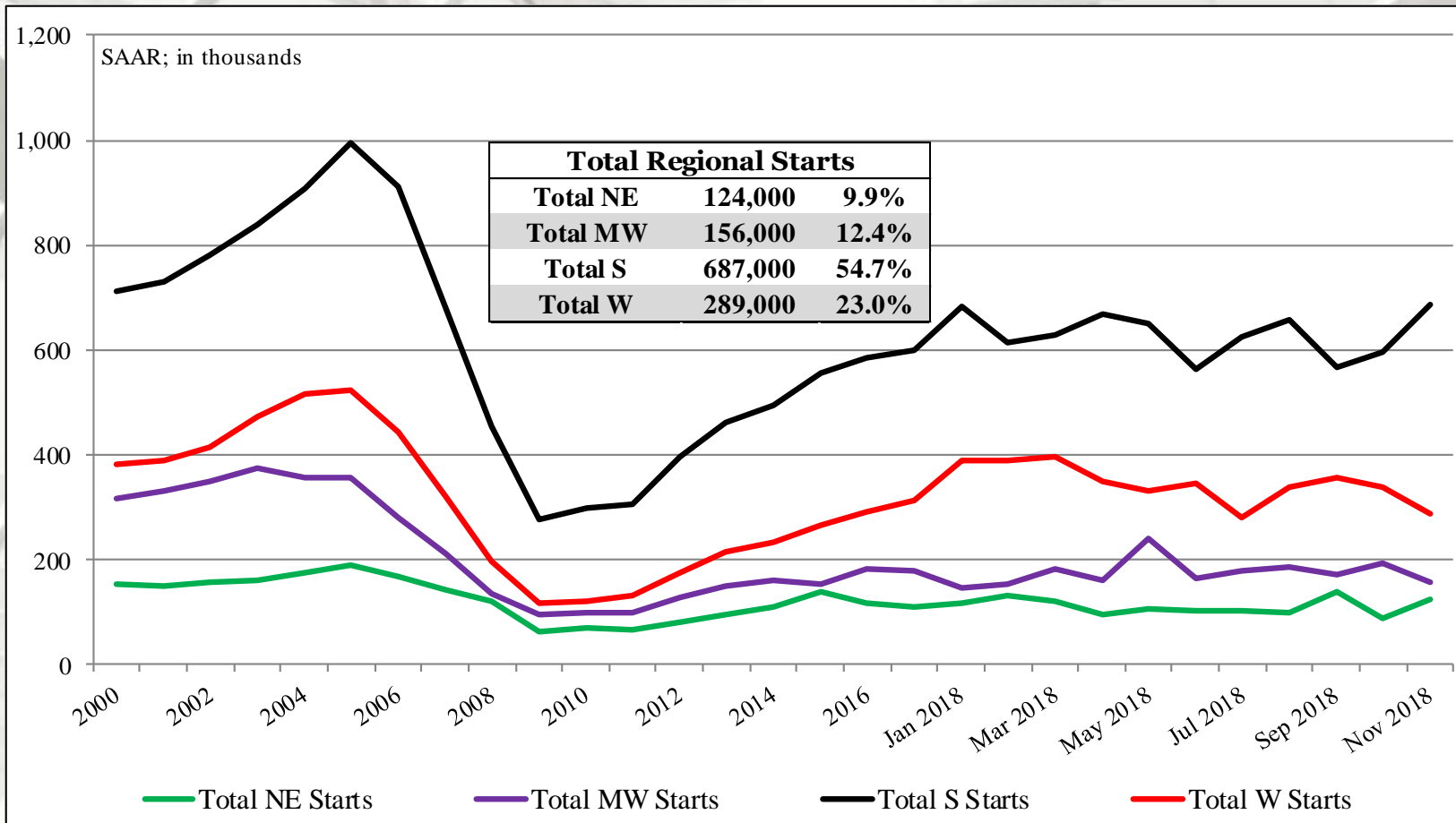
Total Housing Starts: Six-Month Average



SF Housing Starts: Six-Month Average



New Housing Starts by Region



NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total starts.

New Housing Starts by Region

	NE Total	NE SF	NE MF**
November	124,000	67,000	57,000
October	90,000	74,000	16,000
2017	93,000	62,000	31,000
M/M change	37.8	-9.5	256.3
Y/Y change	33.3	8.1	83.9
	MW Total	MW SF	MW MF
November	156,000	120,000	36,000
October	193,000	124,000	69,000
2017	178,000	138,000	40,000
M/M change	-19.2	-3.2	-47.8
Y/Y change	-12.4	-13.0	-10.0

All data are SAAR; NE = Northeast and MW = Midwest.

** US DOC does not report multifamily starts directly, this is an estimation (Total starts – SF starts).

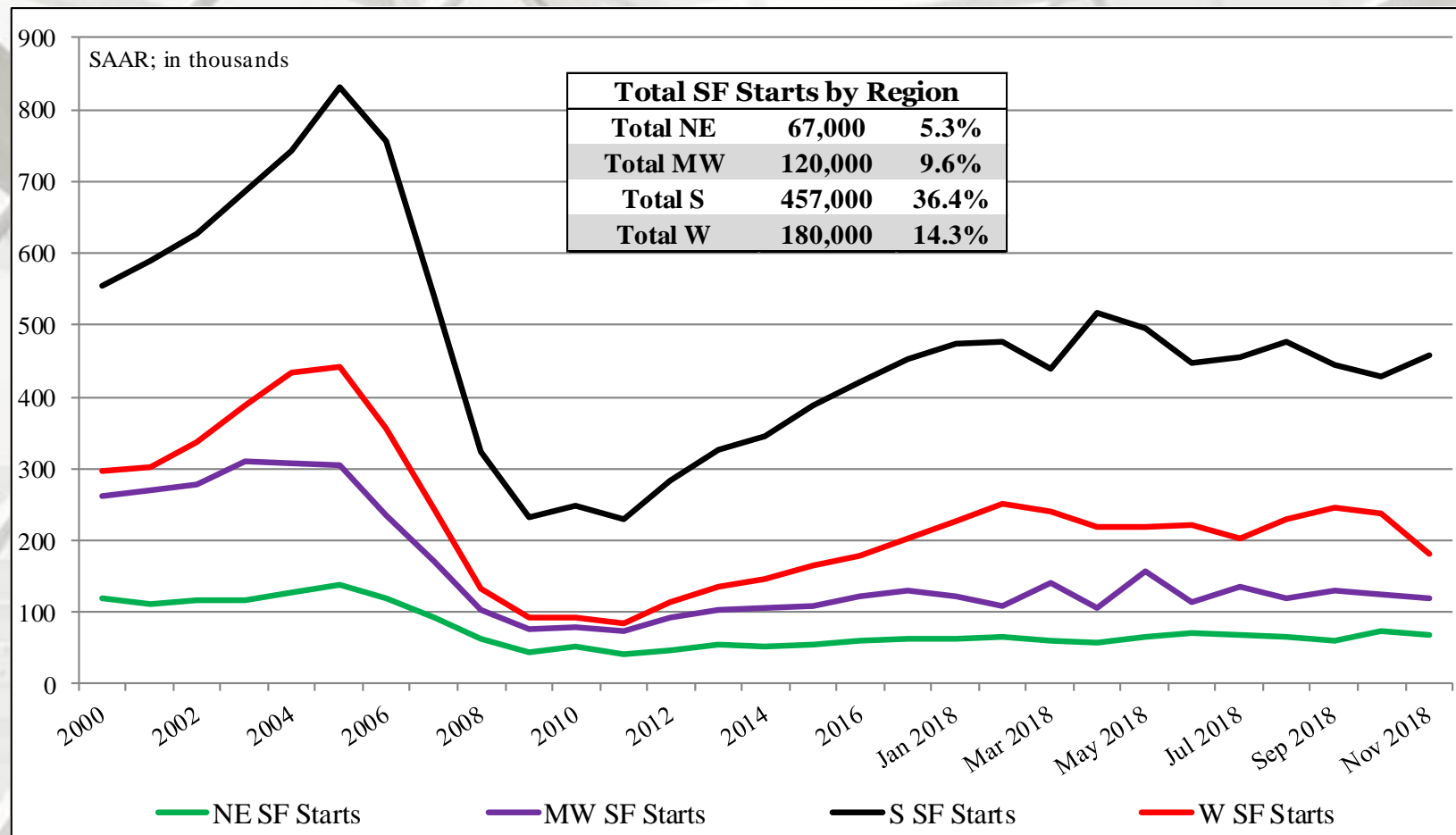
New Housing Starts by Region

	S Total	S SF	S MF**
November	687,000	457,000	230,000
October	597,000	428,000	169,000
2017	678,000	515,000	163,000
M/M change	15.1	6.8	36.1
Y/Y change	1.3	-11.3	41.1
	W Total	W SF	W MF
November	289,000	180,000	109,000
October	337,000	238,000	99,000
2017	354,000	233,000	121,000
M/M change	-14.2	-24.4	10.1
Y/Y change	-18.4	-22.7	-9.9

All data are SAAR; S = South and W = West.

** US DOC does not report multifamily starts directly, this is an estimation (Total starts – SF starts).

Total SF Housing Starts by Region

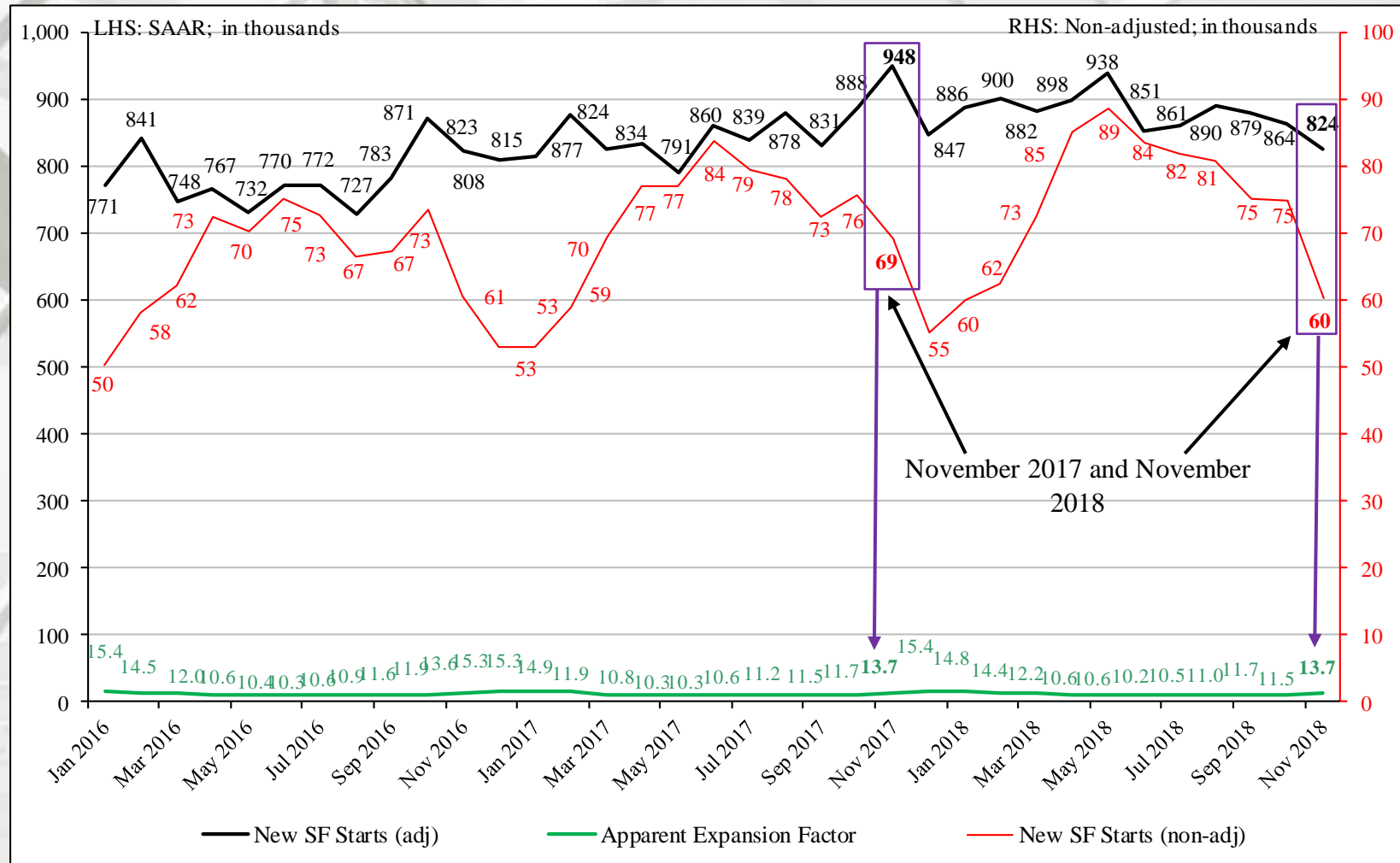


NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total starts.

Nominal & SAAR SF Starts

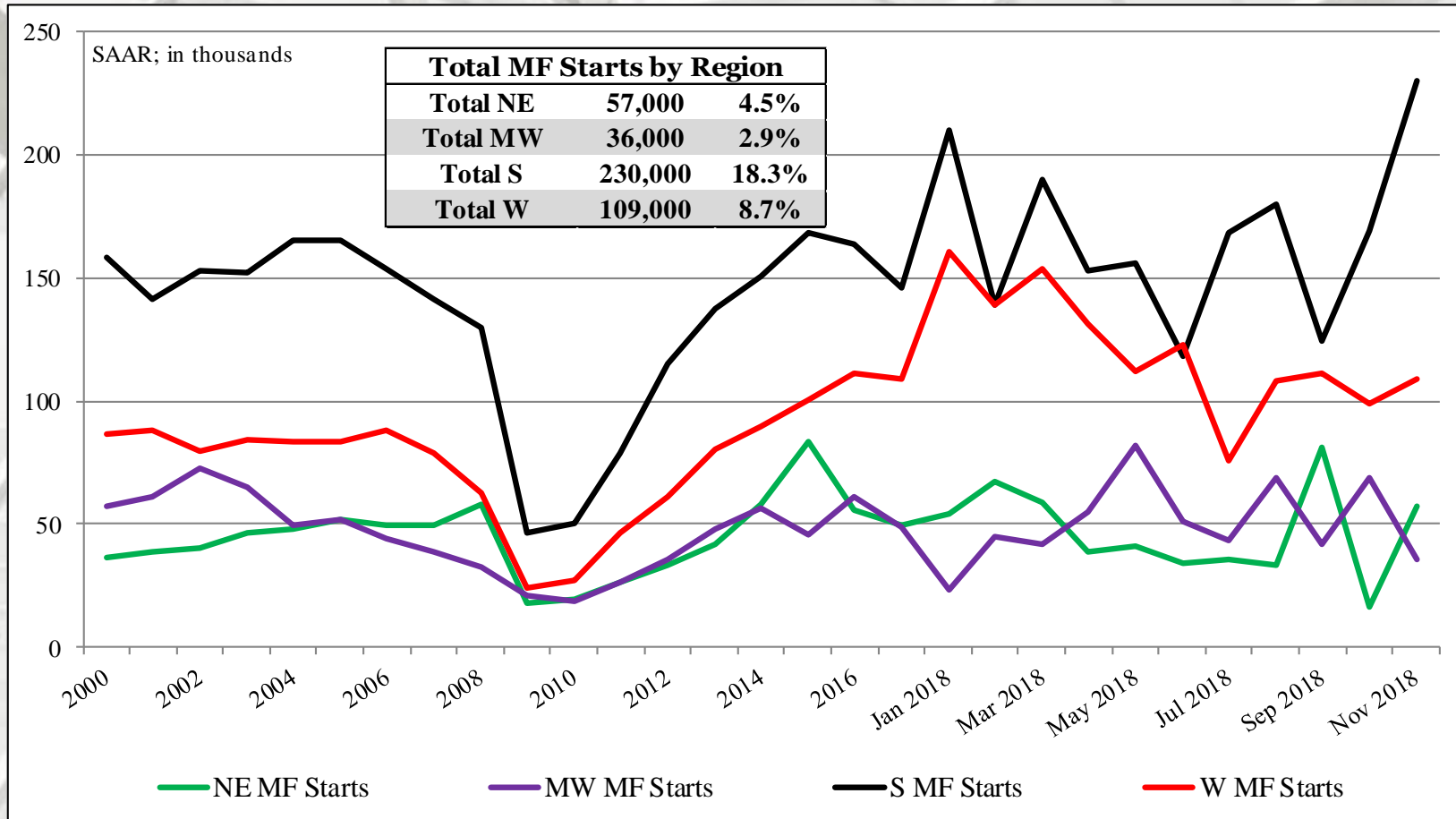


Nominal and Adjusted New SF Monthly Starts

Presented above is nominal (non-adjusted) new SF start data contrasted against SAAR data.

The apparent expansion factor "... is the ratio of the unadjusted number of houses started in the US to the seasonally adjusted number of houses started in the US (i.e., to the sum of the seasonally adjusted values for the four regions)." – U.S. DOC-Construction

MF Housing Starts by Region

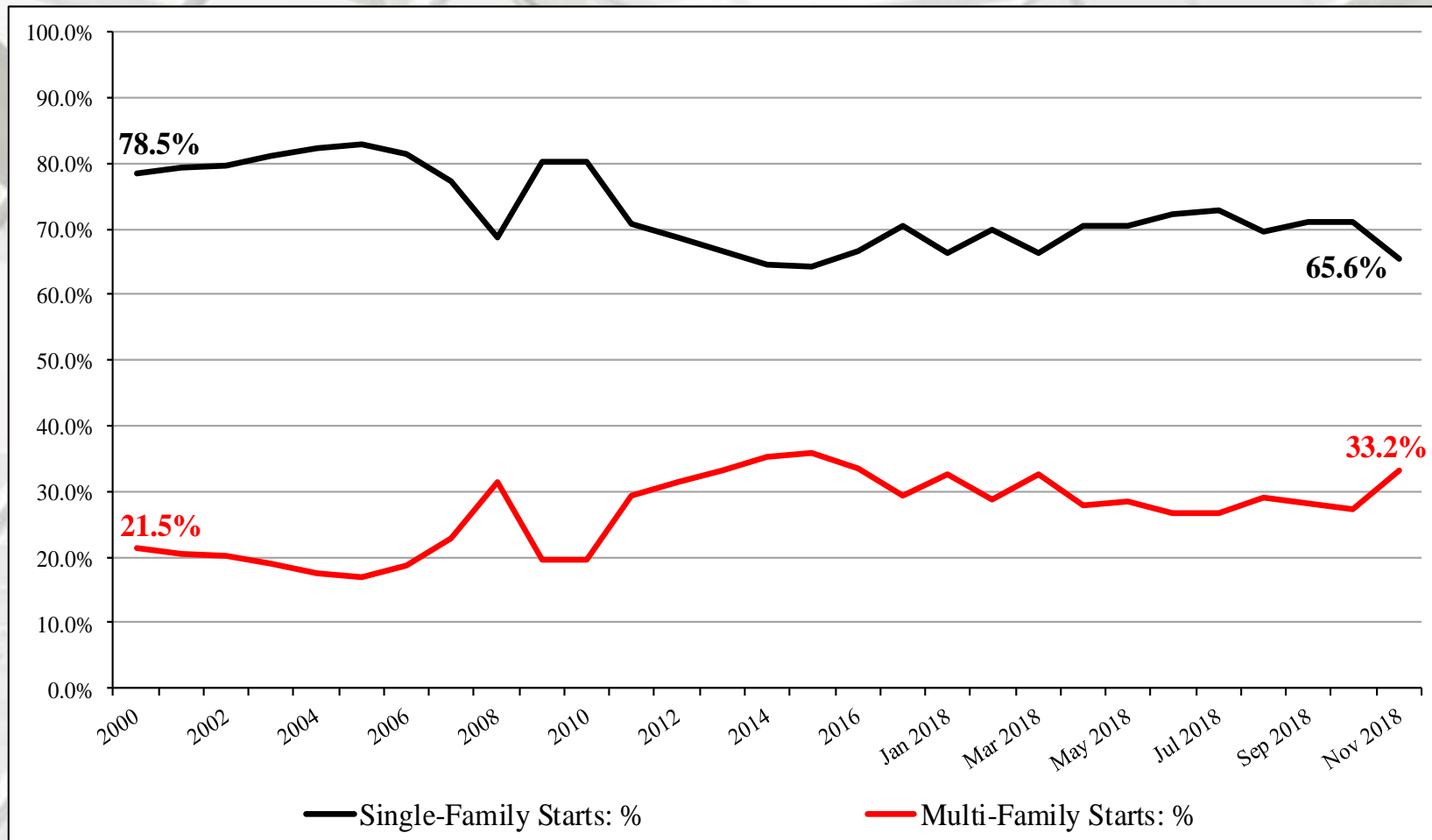


NE = Northeast, MW = Midwest, S = South, W = West

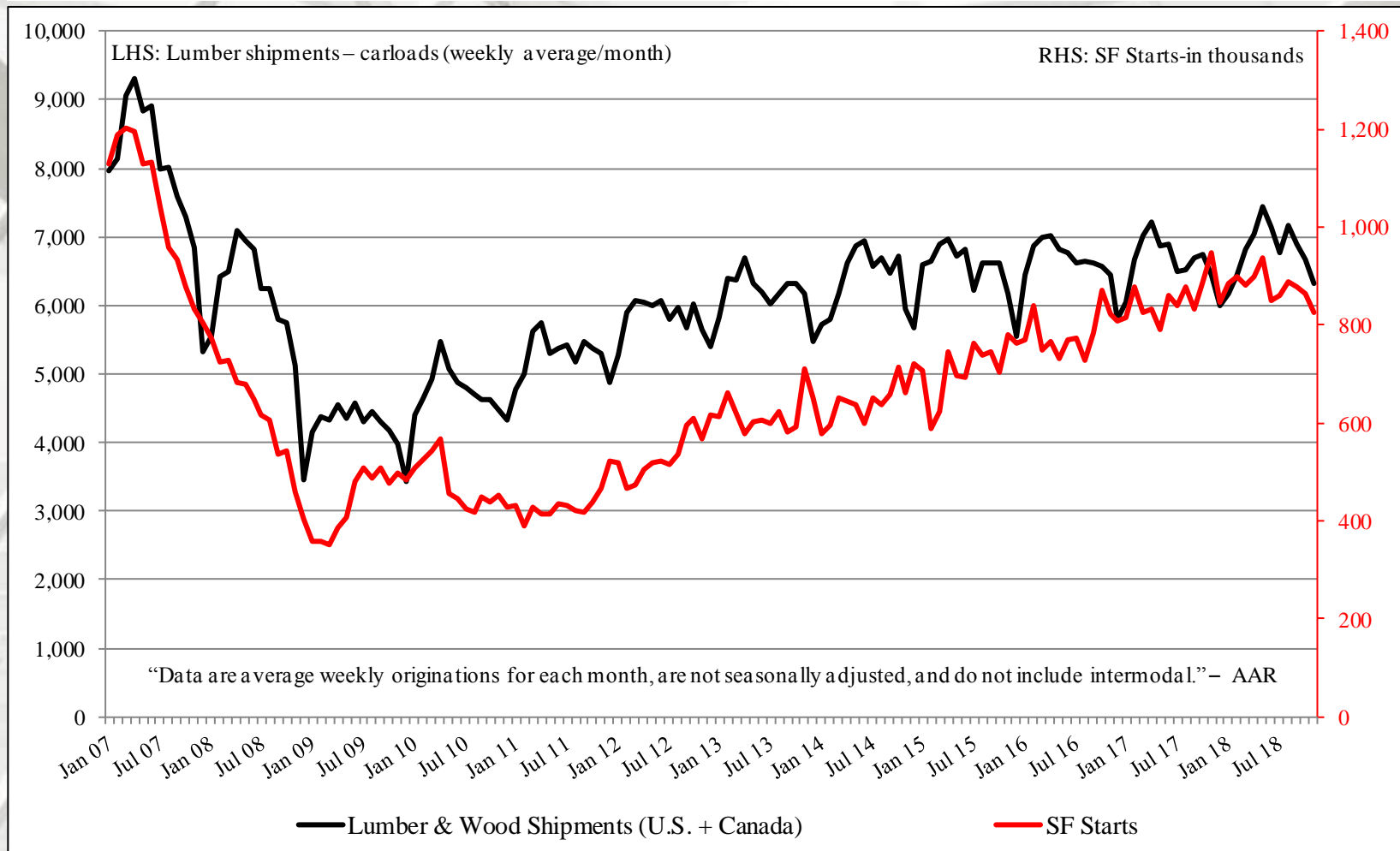
US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total starts.

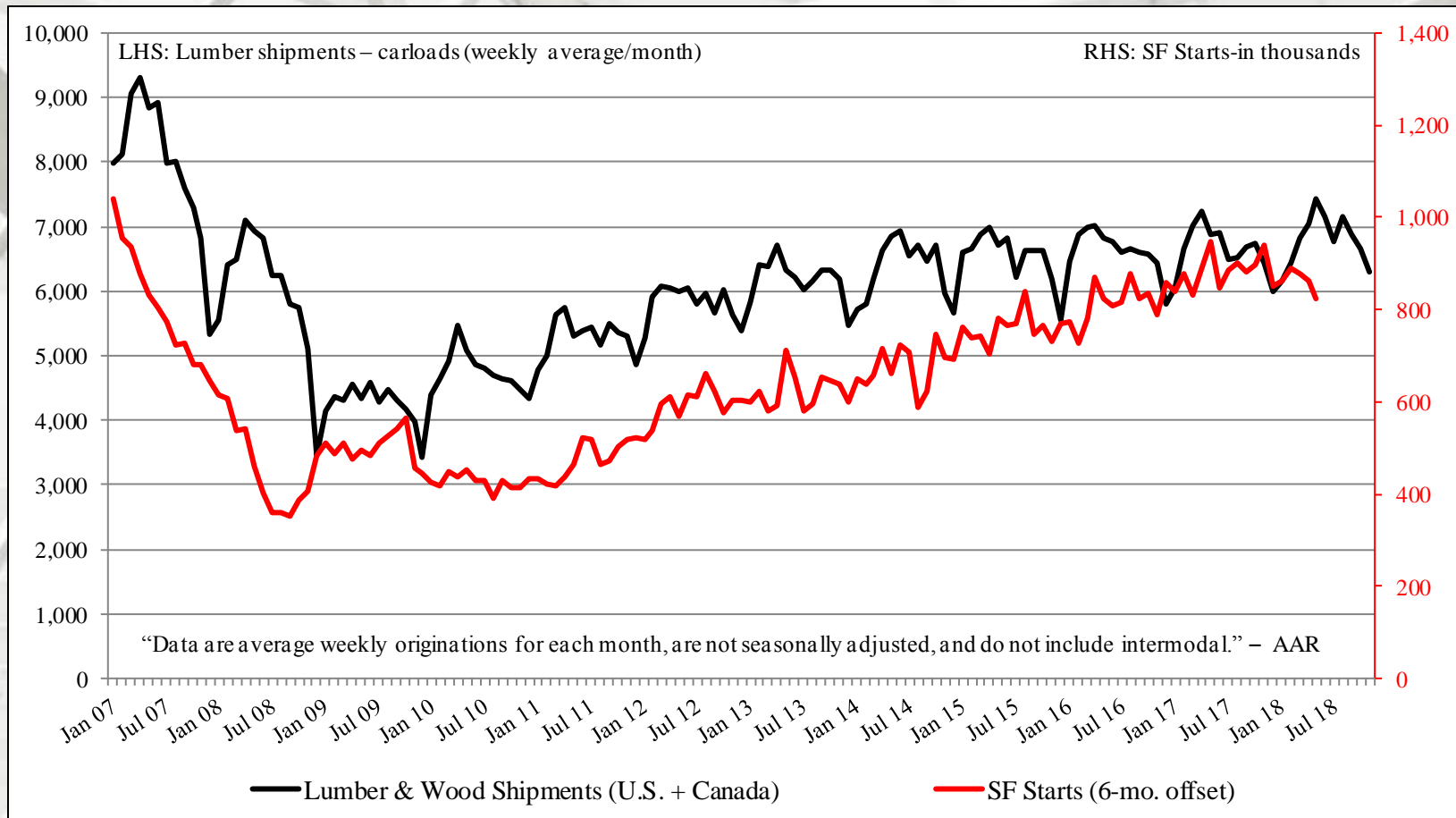
SF vs. MF Housing Starts (%)



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



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



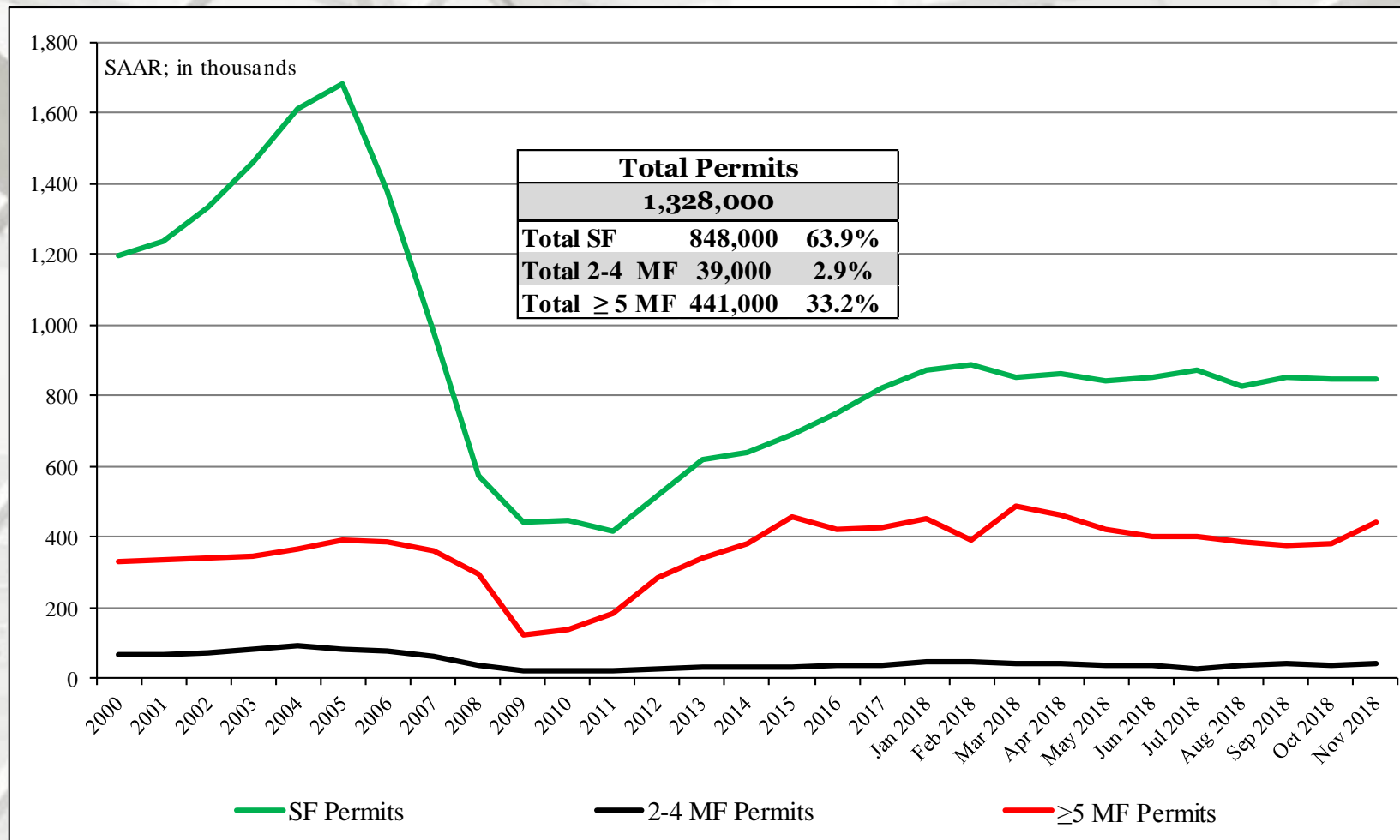
In this graph, January 2007 lumber shipments are contrasted with November 2007 SF starts, and continuing through November 2018 SF starts. The purpose is to discover if lumber shipments relate to future single-family starts. Also, it is realized that lumber and wood products are trucked; however, to our knowledge comprehensive trucking data is not available.

New Housing Permits

	Total Permits*	SF Permits	MF 2-4 unit Permits	MF ≥ 5 unit Permits
November	1,328,000	848,000	39,000	441,000
October	1,265,000	847,000	36,000	382,000
2017	1,323,000	864,000	41,000	418,000
M/M change	5.0	0.1	8.3	15.4
Y/Y change	0.4	-1.9	-4.9	5.5

* All permit data are presented at a seasonally adjusted annual rate (SAAR).

Total New Housing Permits

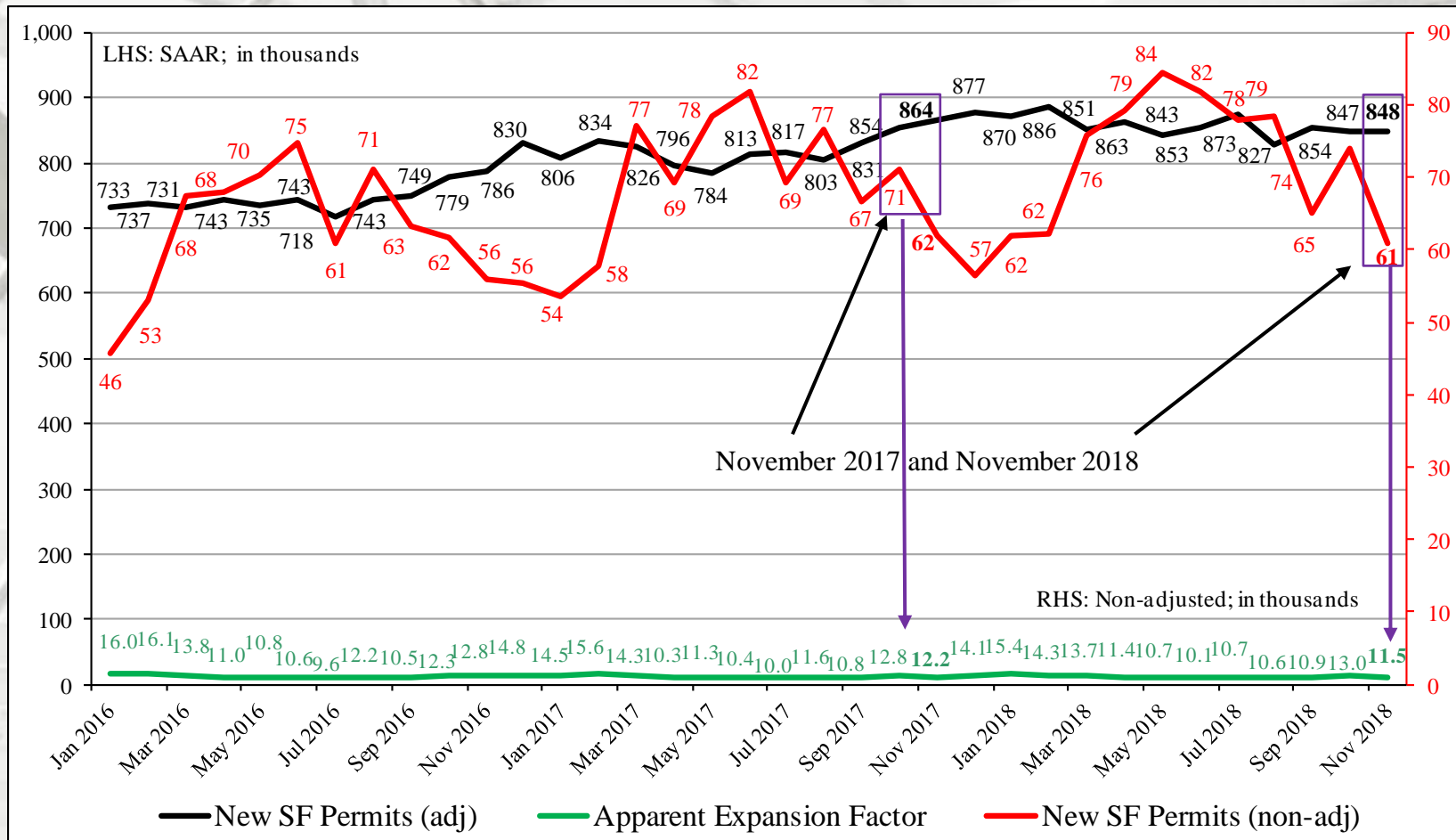


NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total permits.

Nominal & SAAR SF Permits



Nominal and Adjusted New SF Monthly Permits

Presented above is nominal (non-adjusted) new SF start data contrasted against SAAR data.

The apparent expansion factor "...is the ratio of the unadjusted number of houses started in the US to the seasonally adjusted number of houses started in the US (i.e., to the sum of the seasonally adjusted values for the four regions)." – U.S. DOC-Construction

New Housing Permits by Region

	NE Total*	NE SF	NE MF**
November	120,000	52,000	68,000
October	120,000	62,000	58,000
2017	113,000	52,000	61,000
M/M change	0.0	-16.1	17.2
Y/Y change	6.2	0.0	11.5
	MW Total*	MW SF	MW MF**
November	177,000	115,000	62,000
October	186,000	117,000	69,000
2017	187,000	130,000	57,000
M/M change	-4.8	-1.7	-10.1
Y/Y change	-5.3	-11.5	8.8

* All data are SAAR

** US DOC does not report multifamily starts directly, this is an estimation (Total starts – SF starts).

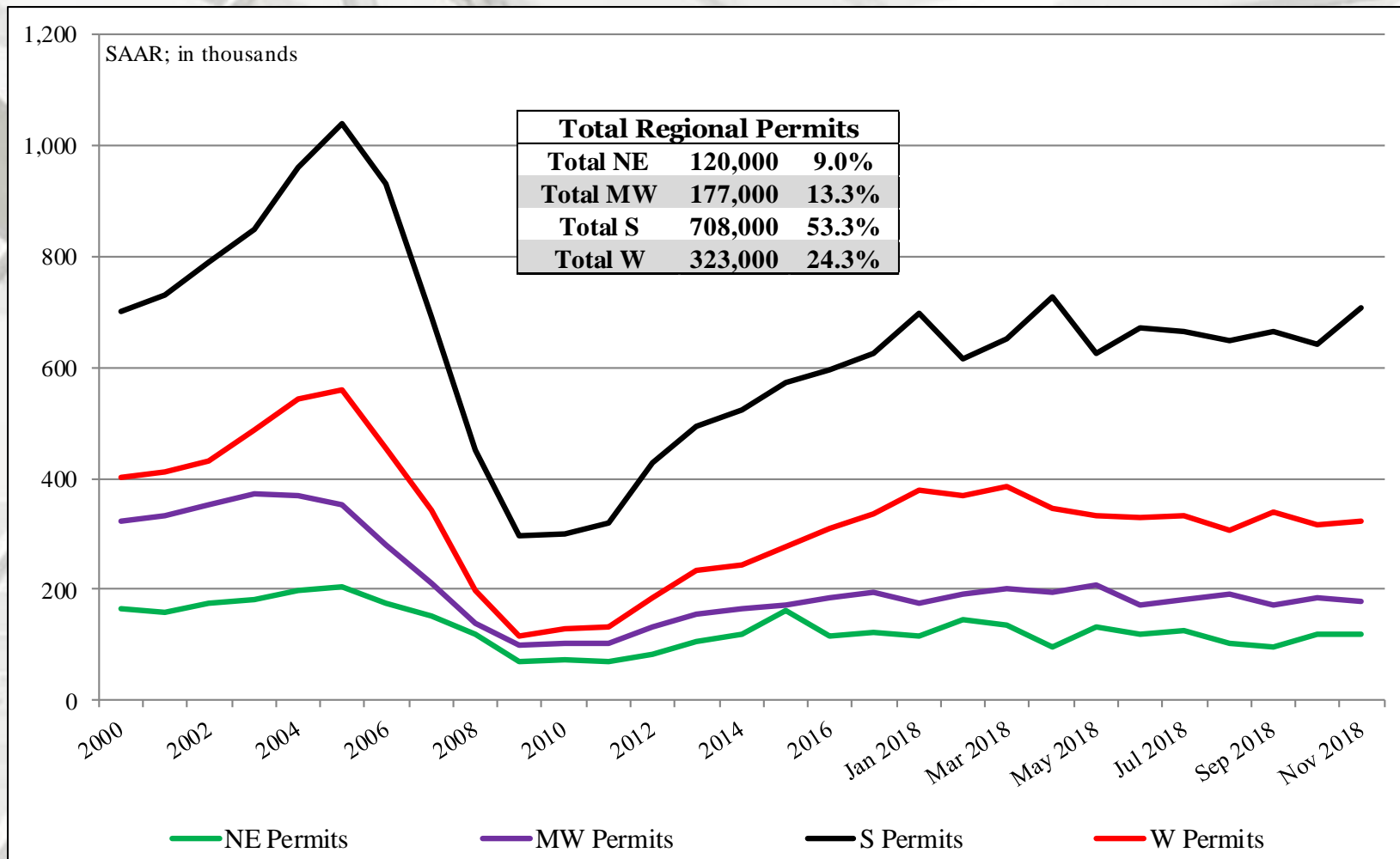
New Housing Permits by Region

	S Total*	S SF	S MF**
November	708,000	475,000	233,000
October	641,000	461,000	180,000
2017	660,000	469,000	191,000
M/M change	10.5	3.0	29.4
Y/Y change	7.3	1.3	22.0
	W Total*	W SF	W MF**
November	323,000	206,000	117,000
October	318,000	207,000	111,000
2017	363,000	213,000	150,000
M/M change	1.6	-0.5	5.4
Y/Y change	-11.0	-3.3	-22.0

All data are SAAR

** US DOC does not report multifamily starts directly, this is an estimation (Total starts – SF starts).

Total Housing Permits by Region

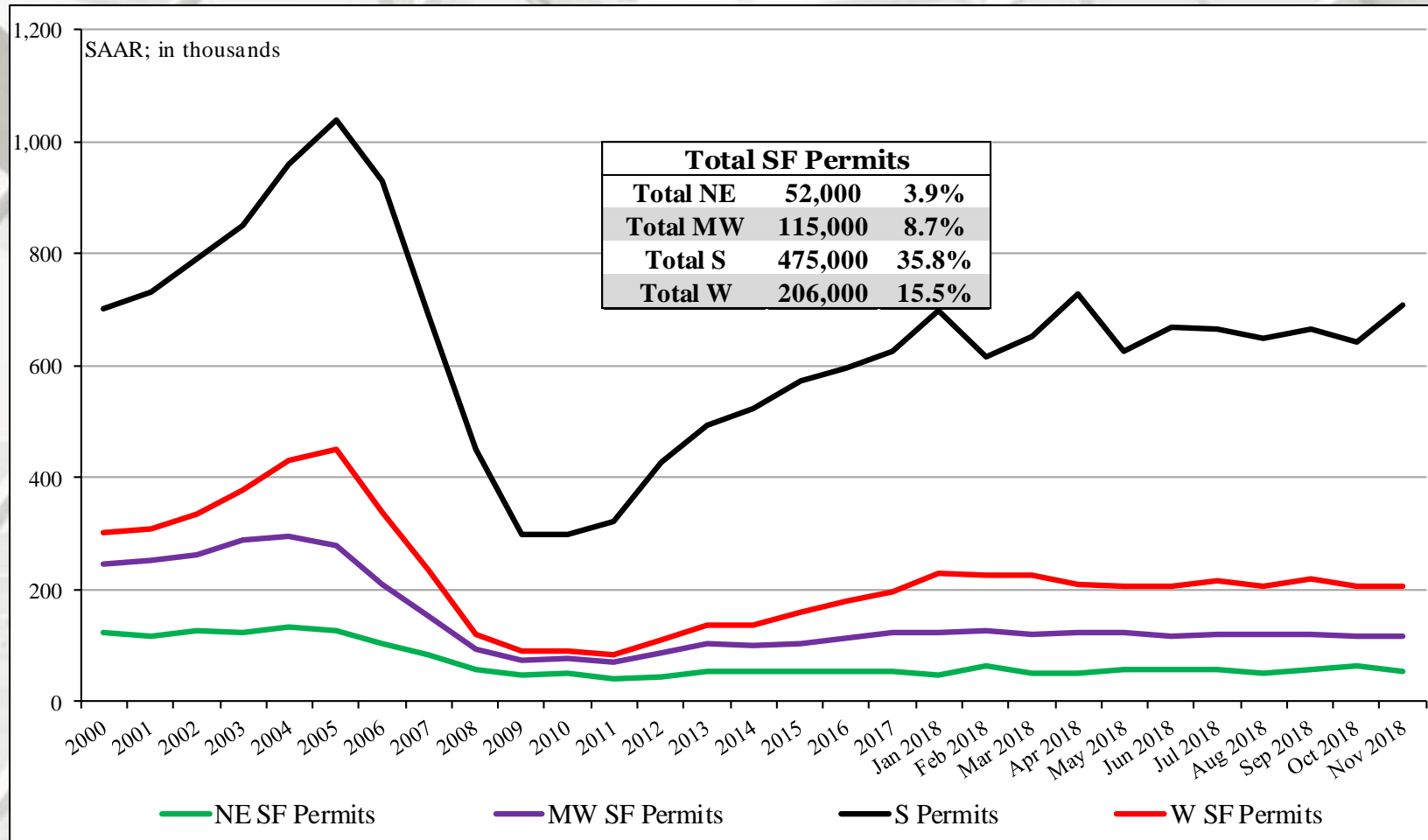


NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total permits.

SF Housing Permits by Region

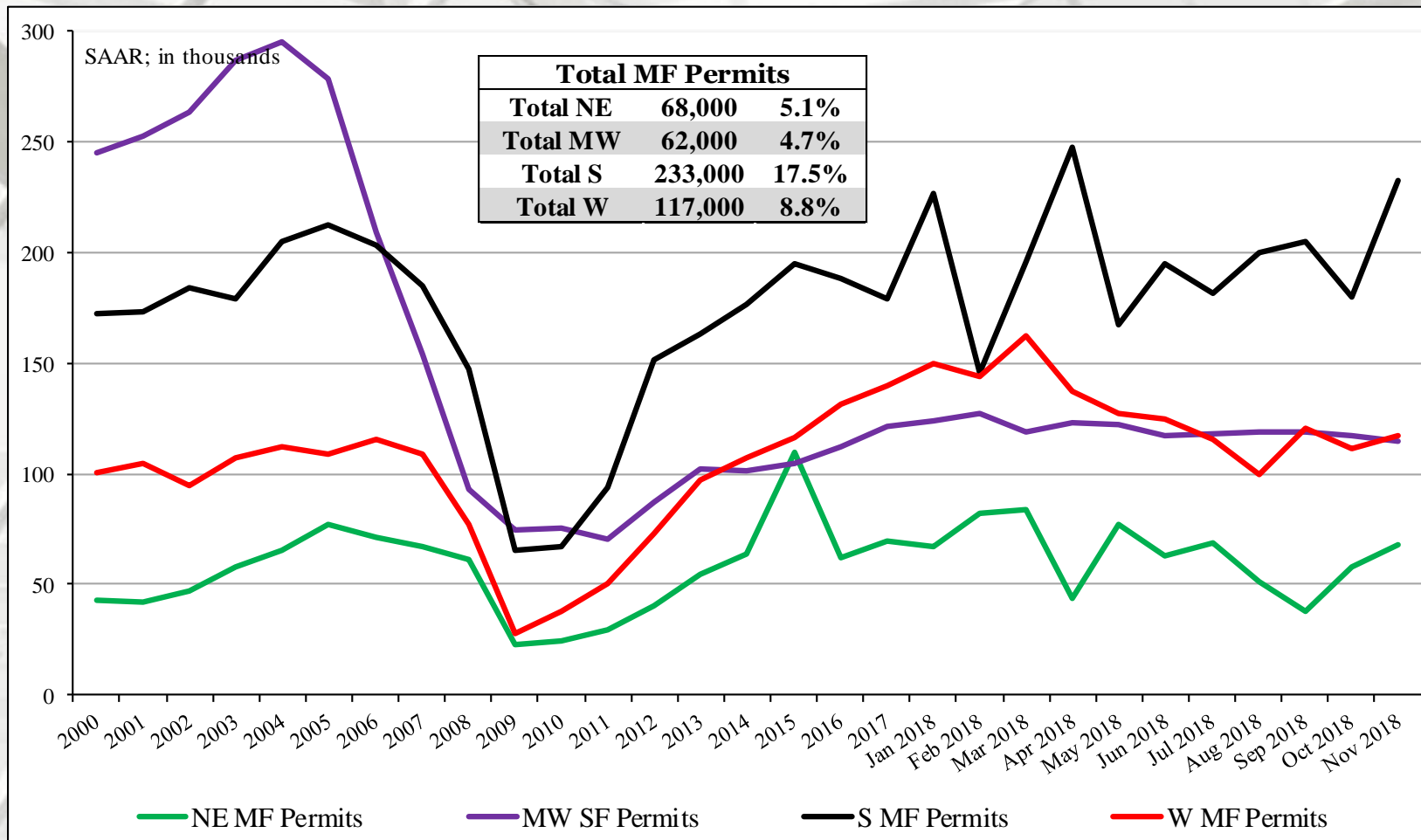


NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total permits.

MF Housing Permits by Region

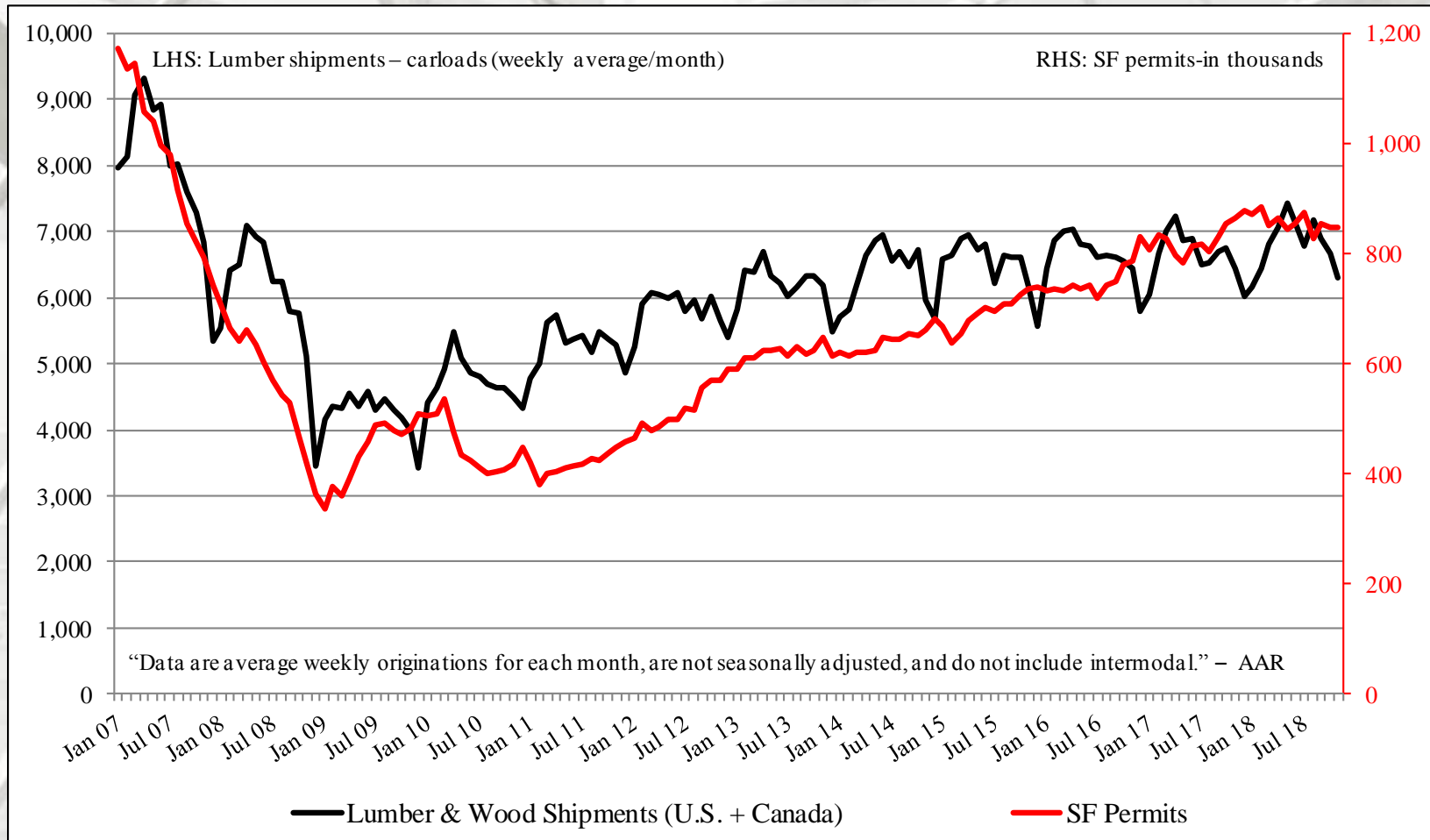


NE = Northeast, MW = Midwest, S = South, W = West

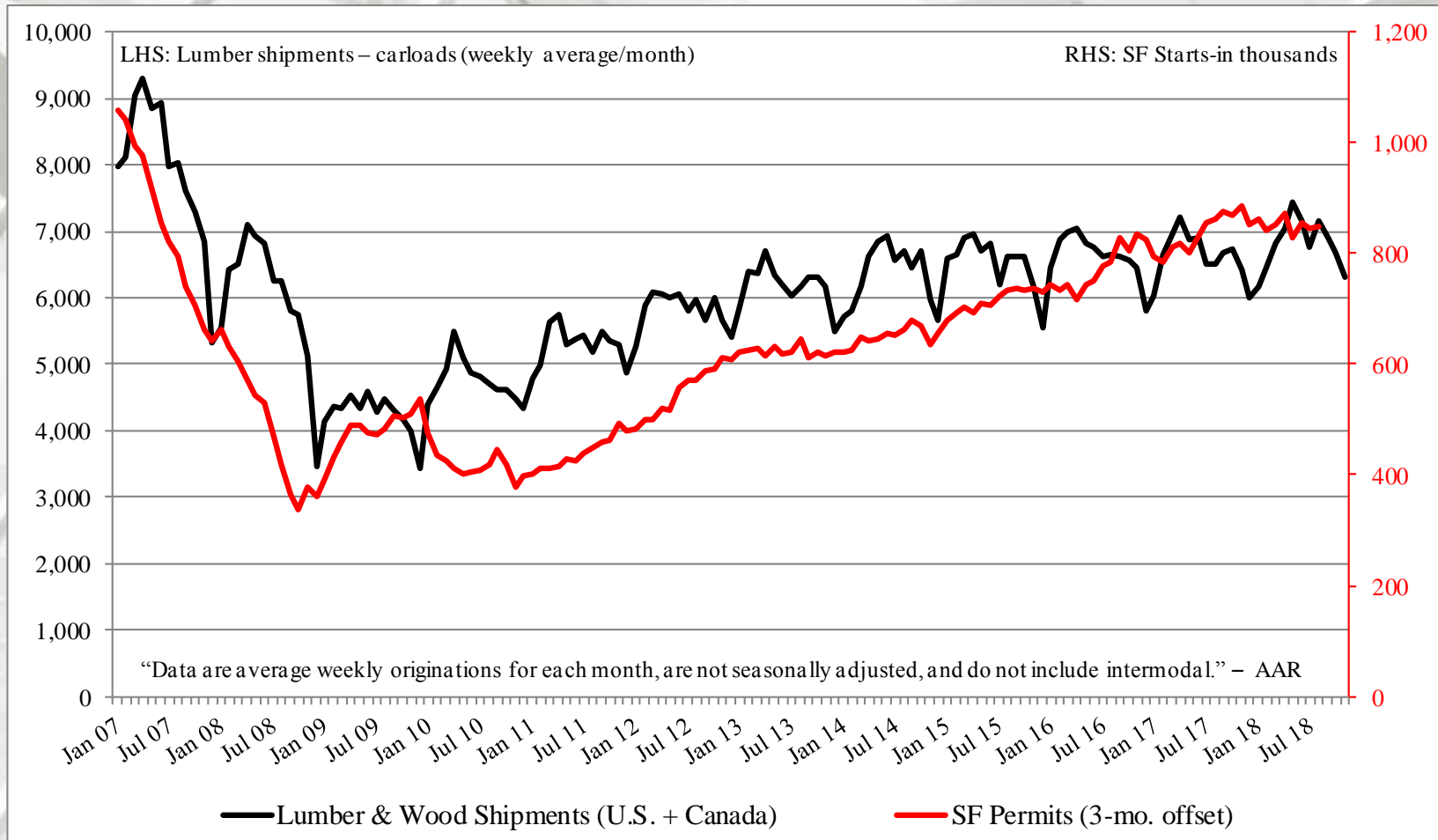
US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total permits.

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



Railroad Lumber & Wood Shipments vs. U.S. SF Housing Permits: 3-month Offset



In this graph, January 2007 lumber shipments are contrasted with November 2007 SF permits, continuing through November 2018. The purpose is to discover if lumber shipments relate to future single-family permits. Also, it is realized that lumber and wood products are trucked; however, to our knowledge comprehensive trucking data is not available.

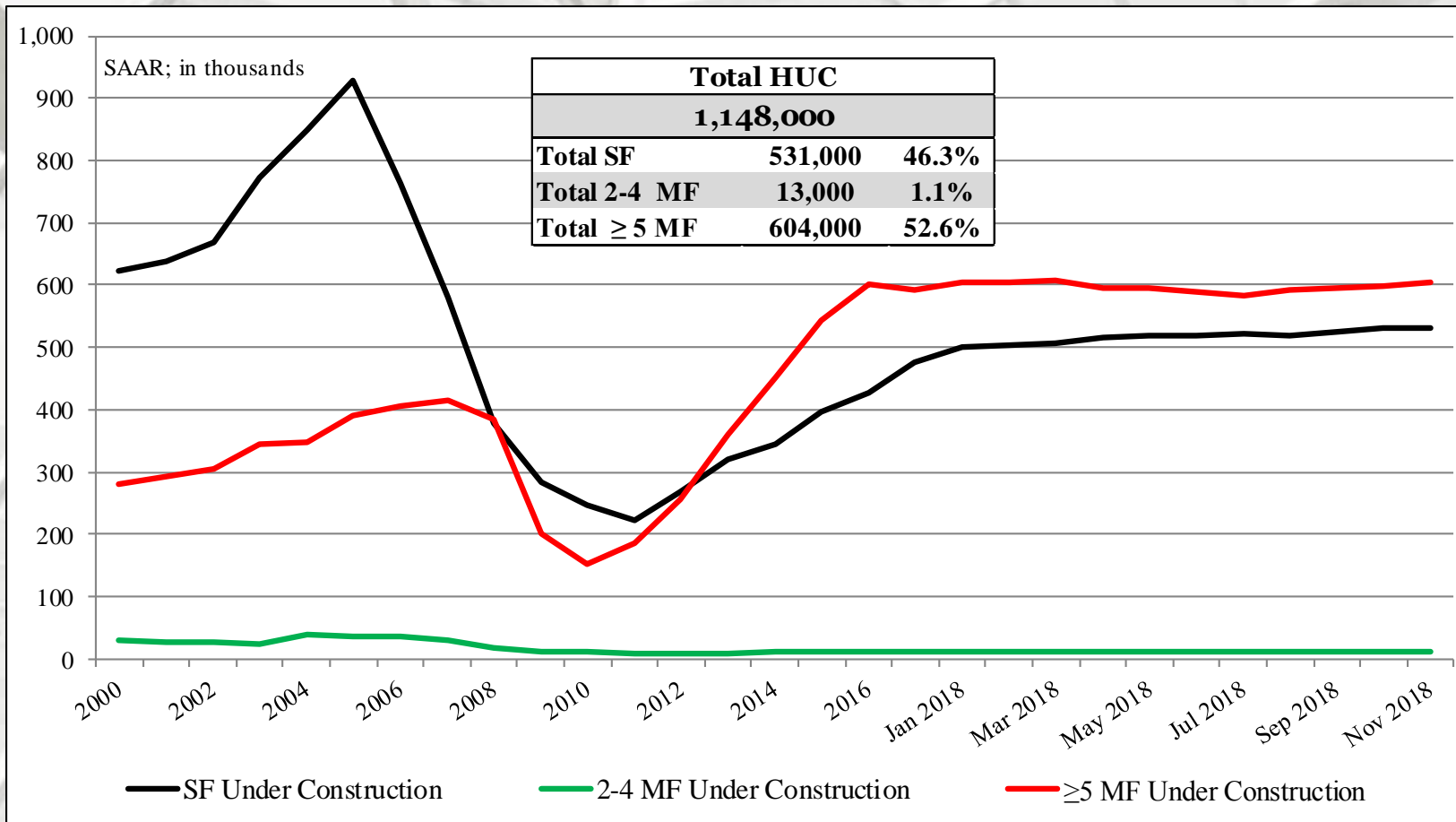
New Housing Under Construction (HUC)

	Total Under Construction*	SF Under Construction	MF 2-4 unit** Under Construction	MF ≥ 5 unit Under Construction
November	1,148,000	531,000	13,000	604,000
October	1,140,000	530,000	13,000	597,000
2017	1,104,000	494,000	11,000	599,000
M/M change	0.7	0.2	0.0	1.2
Y/Y change	4.0	7.5	18.2	0.8

All housing under construction data are presented at a seasonally adjusted annual rate (SAAR).

** US DOC does not report 2-4 multifamily units under construction directly, this is an estimation ((Total under construction – (SF + 5 unit MF)).

Total Housing Under Construction



NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing under construction units.

New Housing Under Construction by Region

	NE Total	NE SF	NE MF**
November	191,000	63,000	128,000
October	191,000	62,000	129,000
2017	188,000	53,000	135,000
M/M change	0.0	1.6	-0.8
Y/Y change	1.6	18.9	-5.2
	MW Total	MW SF	MW MF
November	150,000	80,000	70,000
October	152,000	81,000	71,000
2017	154,000	81,000	73,000
M/M change	-1.3	-1.2	-1.4
Y/Y change	-2.6	-1.2	-4.1

All data are SAAR; NE = Northeast and MW = Midwest.

** US DOC does not report multifamily units under construction directly, this is an estimation
(Total under construction – SF under construction).

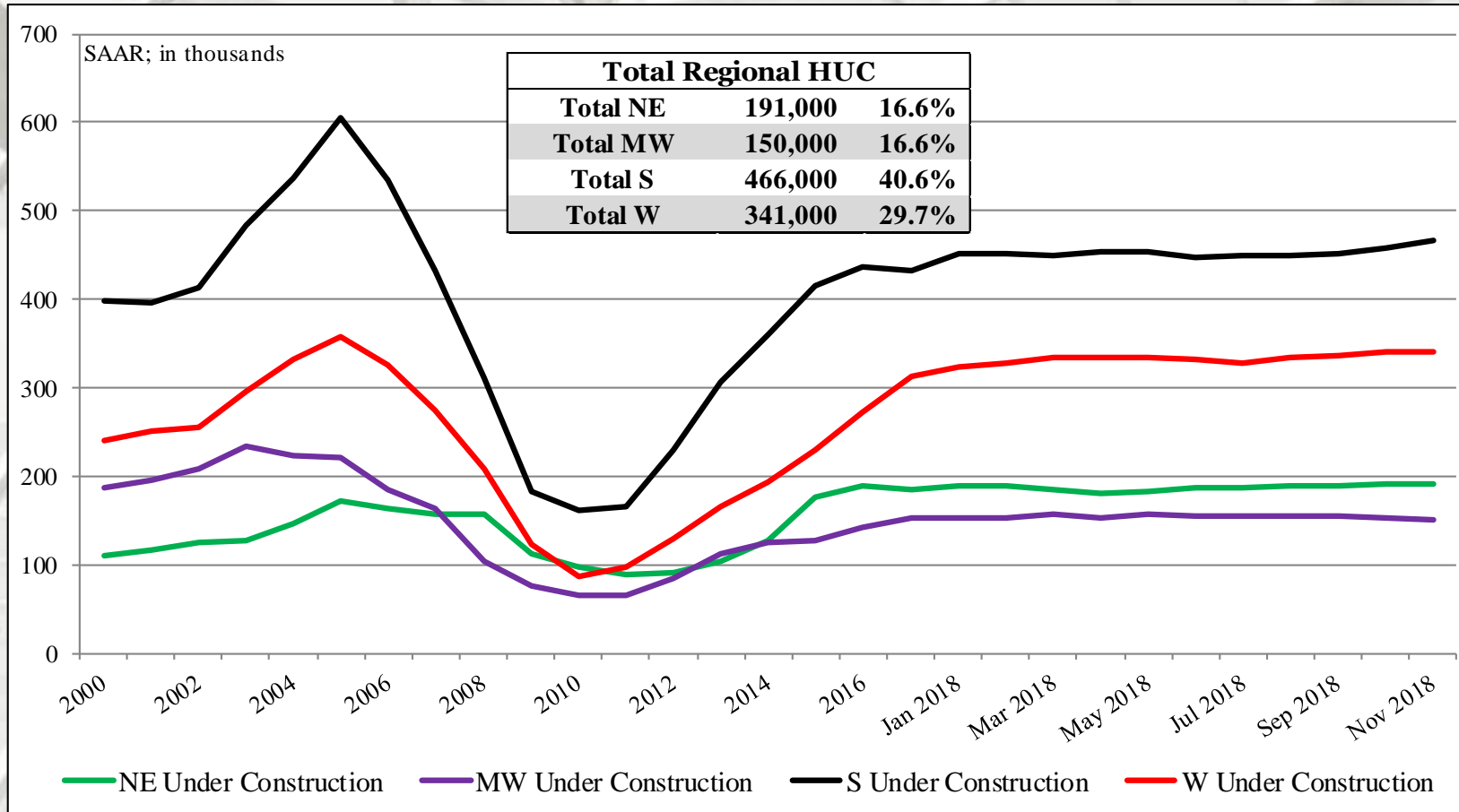
New Housing Under Construction by Region

	S Total	S SF	S MF**
November	466,000	242,000	224,000
October	457,000	242,000	215,000
2017	445,000	231,000	214,000
M/M change	2.0	0.0	4.2
Y/Y change	4.7	4.8	4.7
	W Total	W SF	W MF
November	341,000	146,000	195,000
October	340,000	145,000	195,000
2017	317,000	129,000	188,000
M/M change	0.3	0.7	0.0
Y/Y change	7.6	13.2	3.7

All data are SAAR; S = South and W = West.

** US DOC does not report multifamily units under construction directly, this is an estimation
(Total under construction – SF under construction).

Total Housing Under Construction by Region

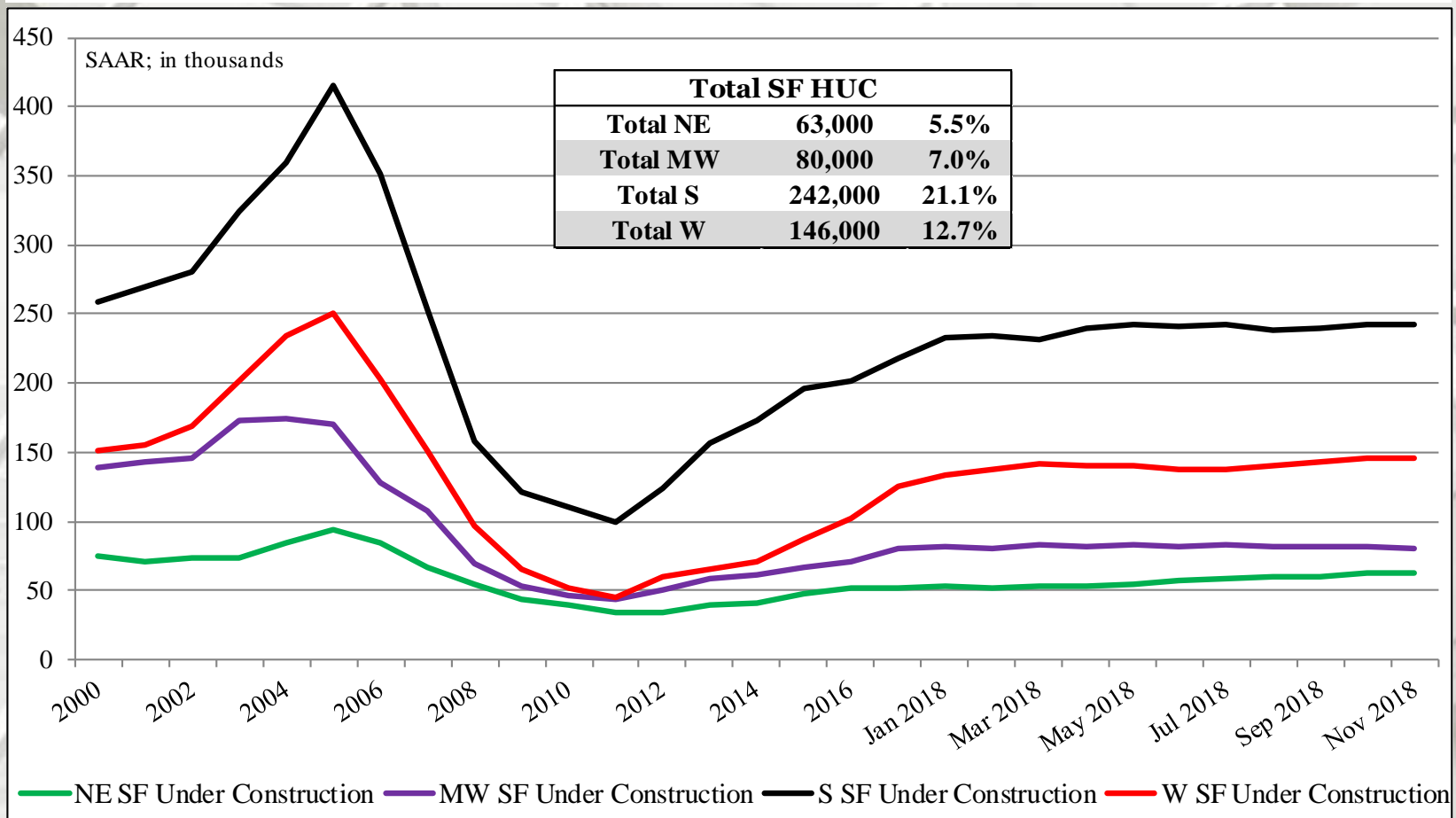


NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing under construction units.

SF Housing Under Construction by Region

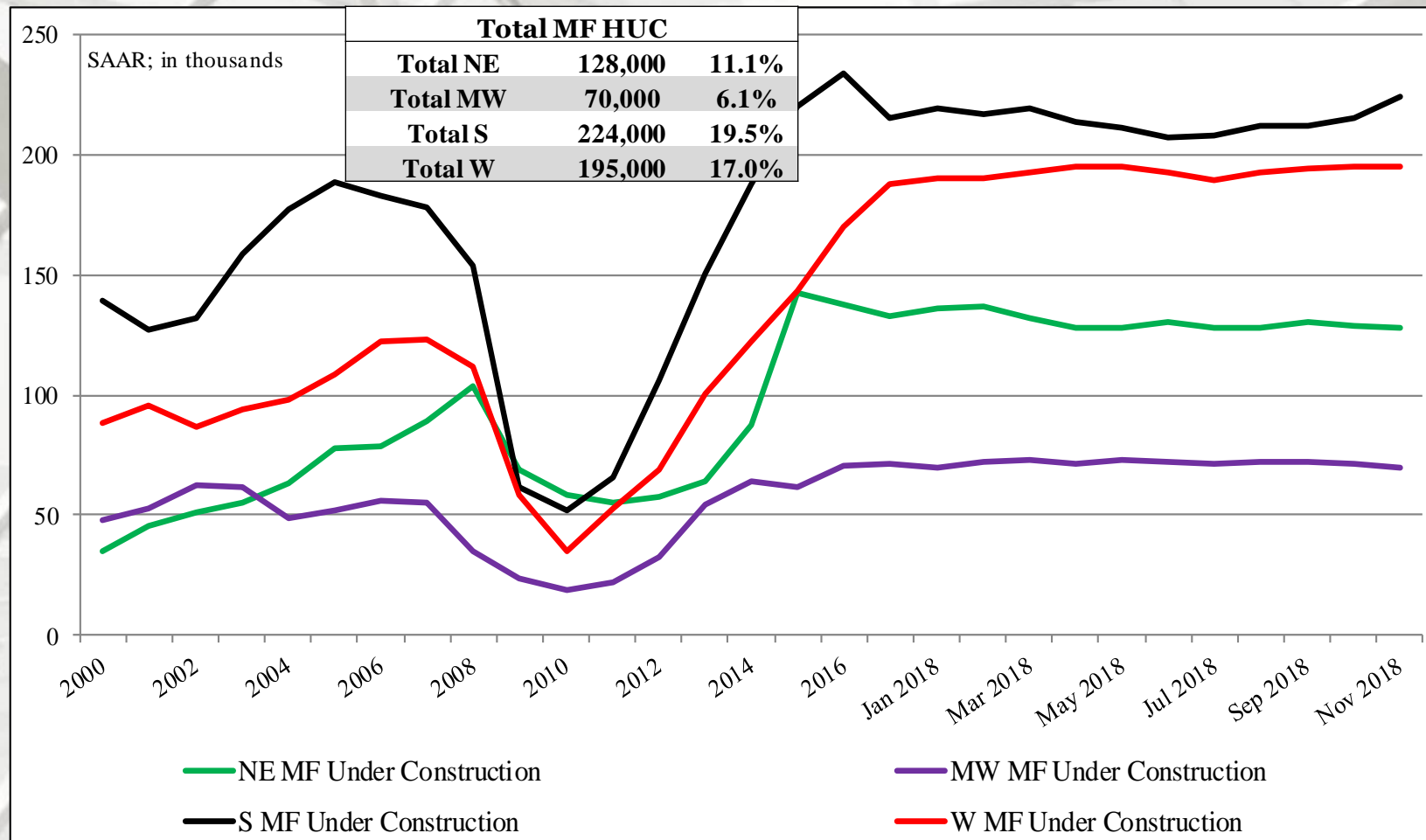


NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing under construction units.

MF Housing Under Construction by Region



NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing under construction units.

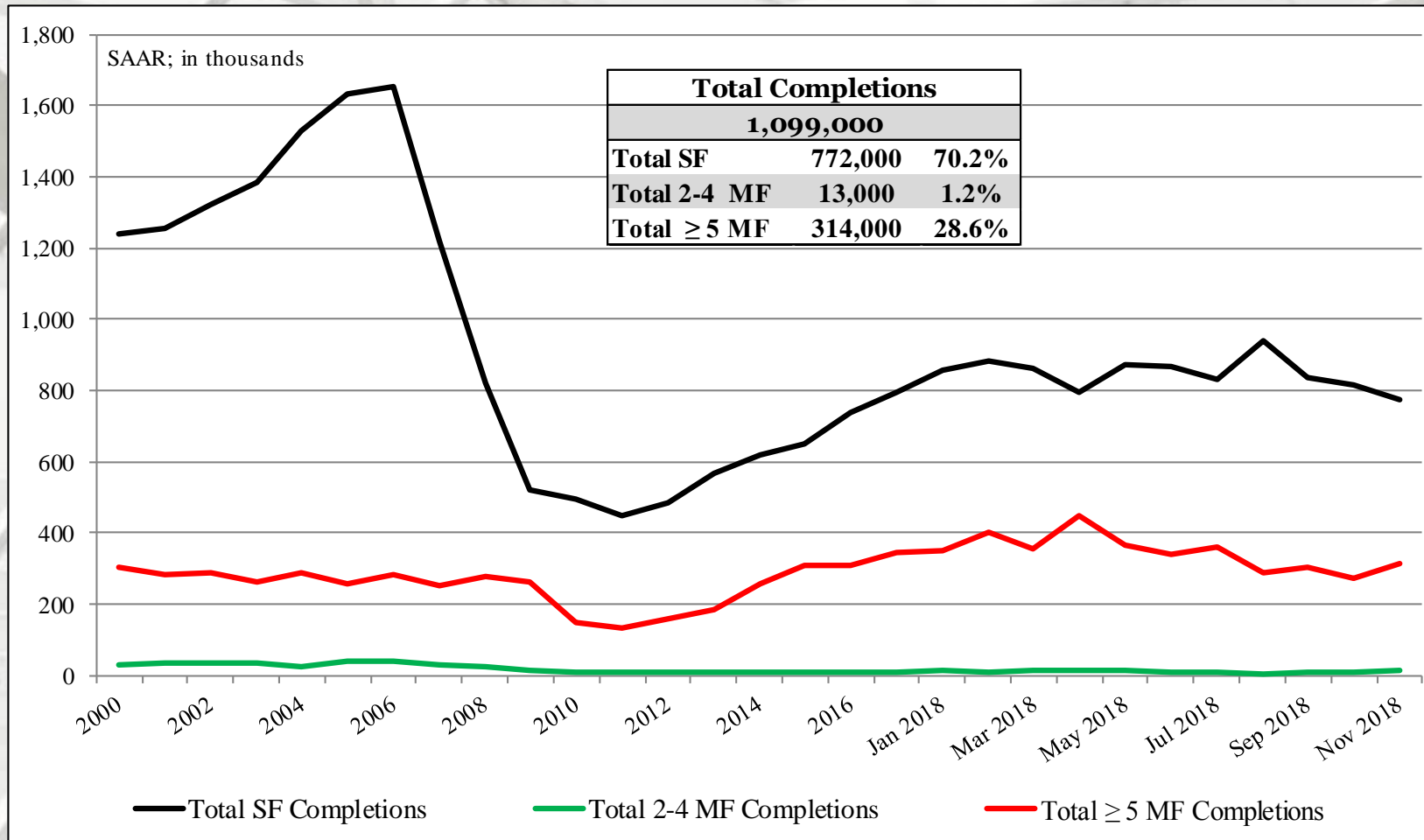
New Housing Completions

	Total Completions*	SF Completions	MF 2-4 unit**	MF ≥ 5 unit Completions
November	1,099,000	772,000	13,000	314,000
October	1,095,000	816,000	9,000	270,000
2017	1,144,000	781,000	15,000	348,000
M/M change	0.4%	-5.4%	44.4%	16.3%
Y/Y change	-3.9%	-1.2%	-13.3%	-9.8%

* All completion data are presented at a seasonally adjusted annual rate (SAAR).

** US DOC does not report multifamily completions directly, this is an estimation ((Total completions – (SF + 5 unit MF)).

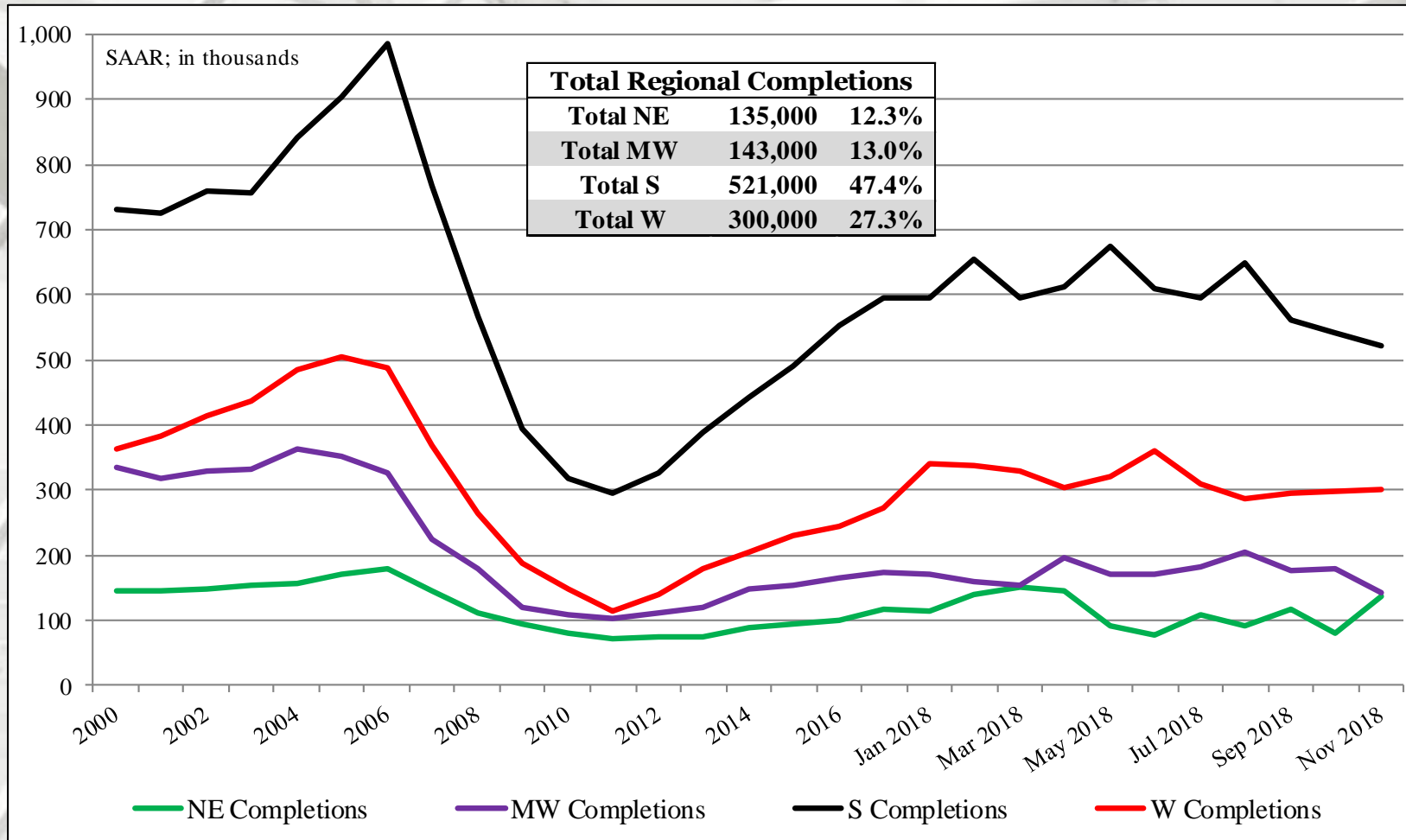
Total Housing Completions



US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing completions

Total Housing Completions by Region



NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing completions

New Housing Completions by Region

	NE Total	NE SF	NE MF**
November	135,000	59,000	76,000
October	79,000	50,000	29,000
2017	142,000	58,000	84,000
M/M change	70.9%	18.0%	162.1%
Y/Y change	-4.9%	1.7%	-9.5%
	MW Total	MW SF	MW MF
November	143,000	112,000	31,000
October	179,000	124,000	55,000
2017	178,000	111,000	67,000
M/M change	-20.1%	-9.7%	-43.6%
Y/Y change	-19.7%	0.9%	-53.7%

All data are SAAR; NE = Northeast and MW = Midwest.

** US DOC does not report multifamily units under construction directly, this is an estimation
(Total under construction – SF under construction).

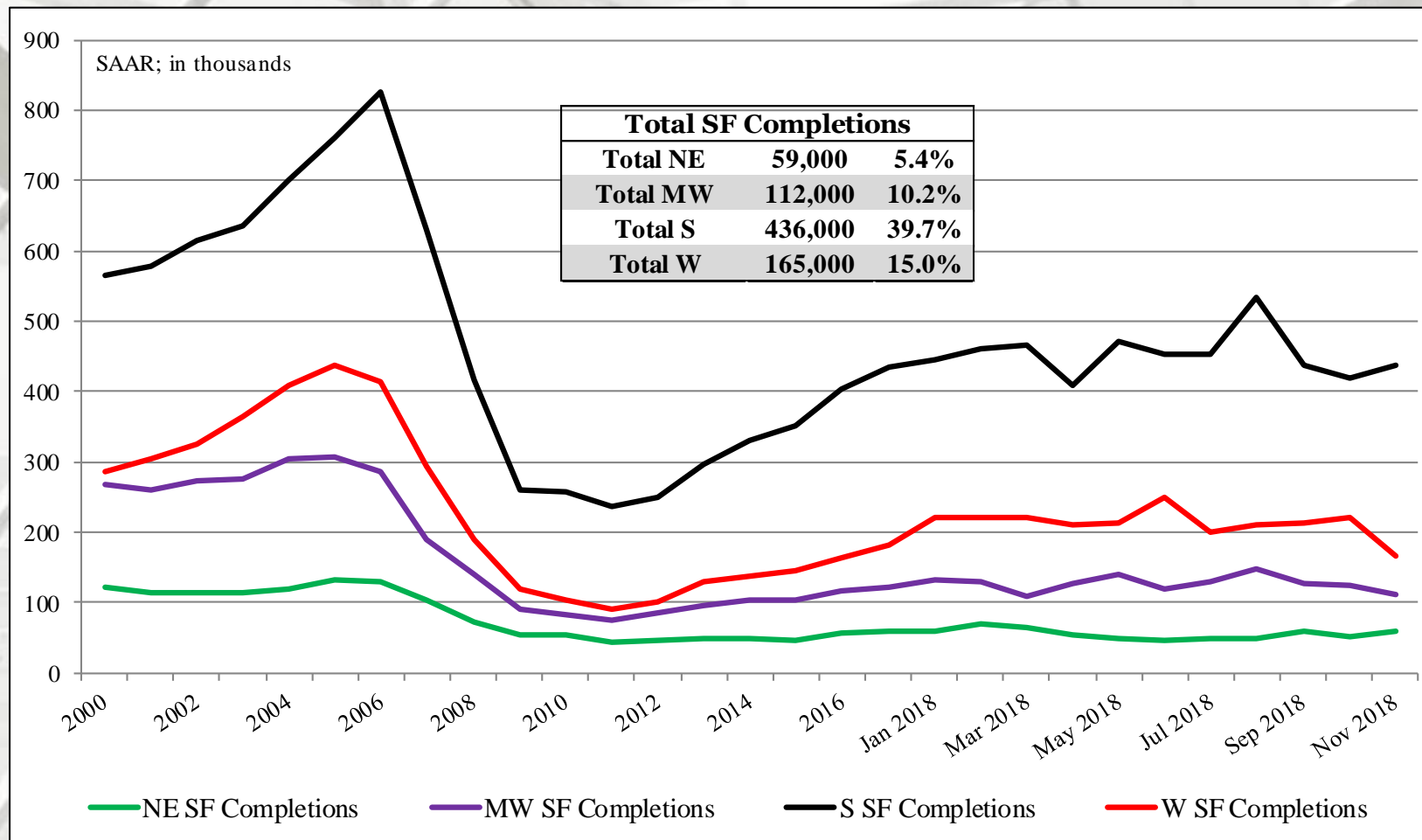
New Housing Completions by Region

	S Total	S SF	S MF**
November	521,000	436,000	85,000
October	540,000	420,000	120,000
2017	596,000	458,000	138,000
M/M change	-3.5%	3.8%	-29.2%
Y/Y change	-12.6%	-4.8%	-38.4%
	W Total	W SF	W MF
November	300,000	165,000	135,000
October	297,000	222,000	75,000
2017	228,000	154,000	74,000
M/M change	1.0%	-25.7%	80.0%
Y/Y change	31.6%	7.1%	82.4%

All data are SAAR; S = South and W = West.

** US DOC does not report multifamily units under construction directly, this is an estimation
(Total under construction – SF under construction).

Total Housing SF Completions by Region

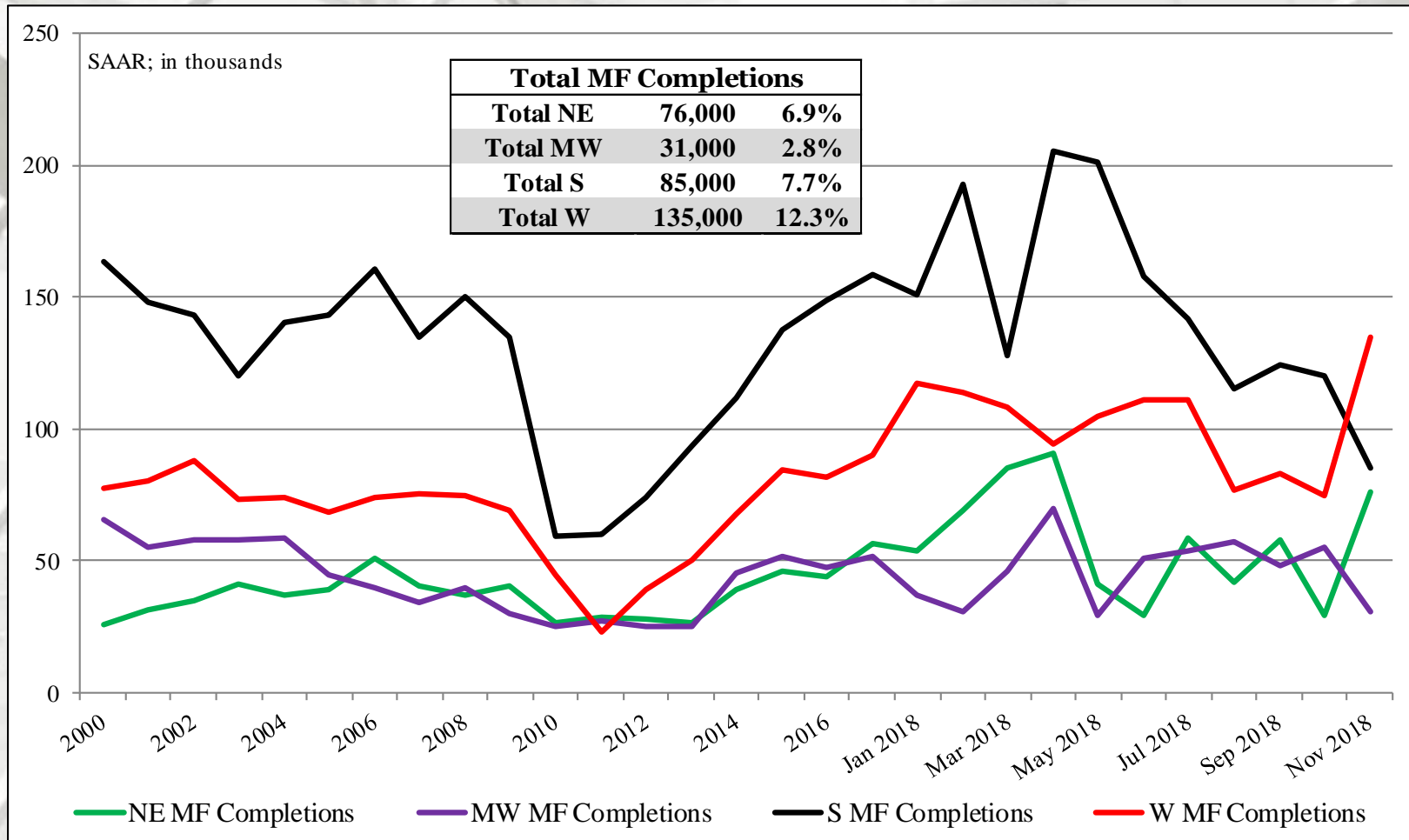


NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing completions

New Housing MF Completions by Region



NE = Northeast, MW = Midwest, S = South, W = West

US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total housing completions

All data are SAAR; NE = Northeast and MW = Midwest; * Percentage of total housing completions.

New Single-Family House Sales

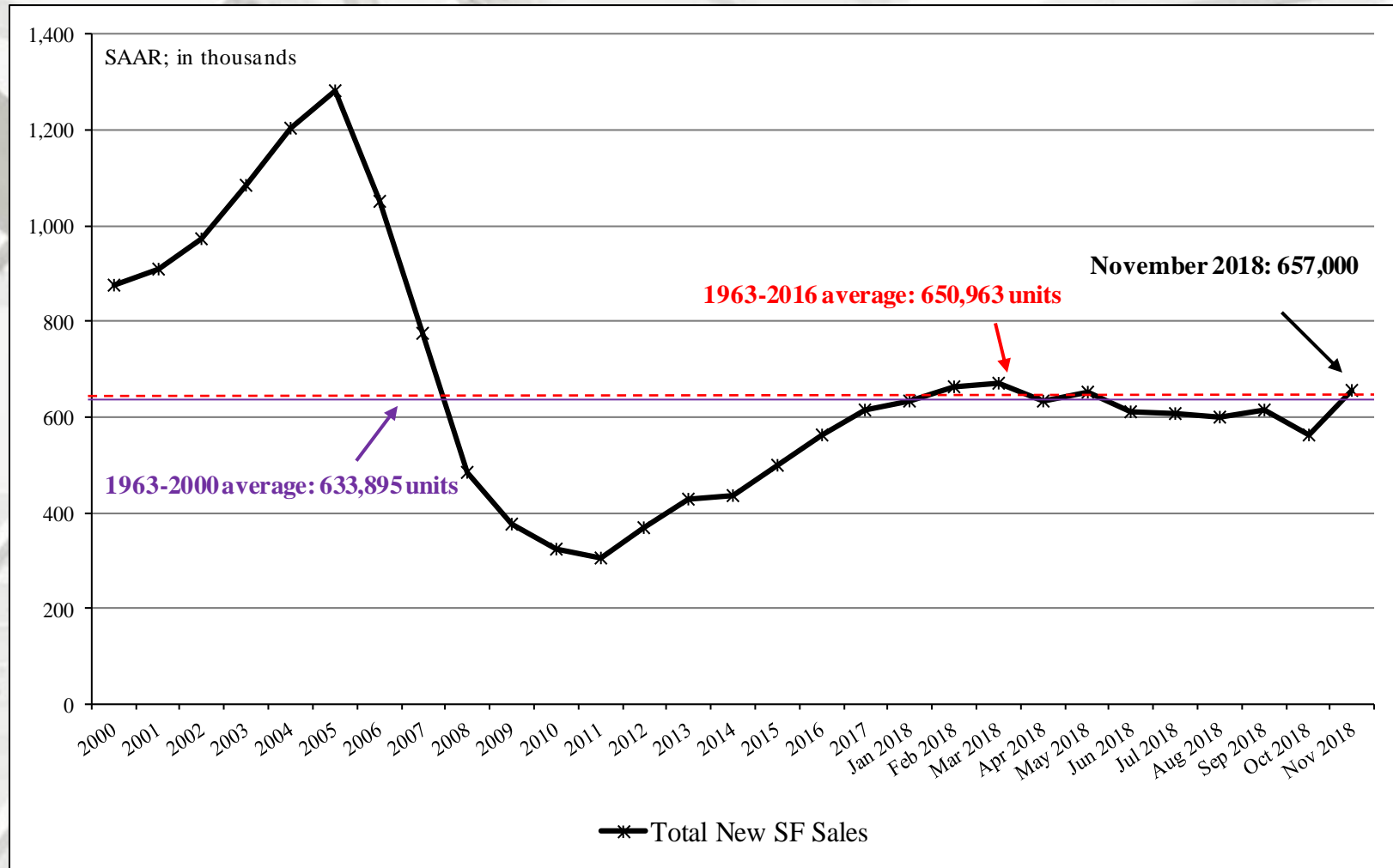
	New SF Sales*	Median Price	Mean Price	Month's Supply
November	657,000	\$302,400	\$362,400	7.0
October	562,000	\$325,100	\$395,500	7.6
2017	712,000	\$343,400	\$388,500	4.9
M/M change	16.9%	-7.0%	-8.4%	-7.9%
Y/Y change	-7.7%	-11.9%	-6.7%	42.9%

* All new sales data are presented at a seasonally adjusted annual rate (SAAR)¹ and housing prices are adjusted at irregular intervals².

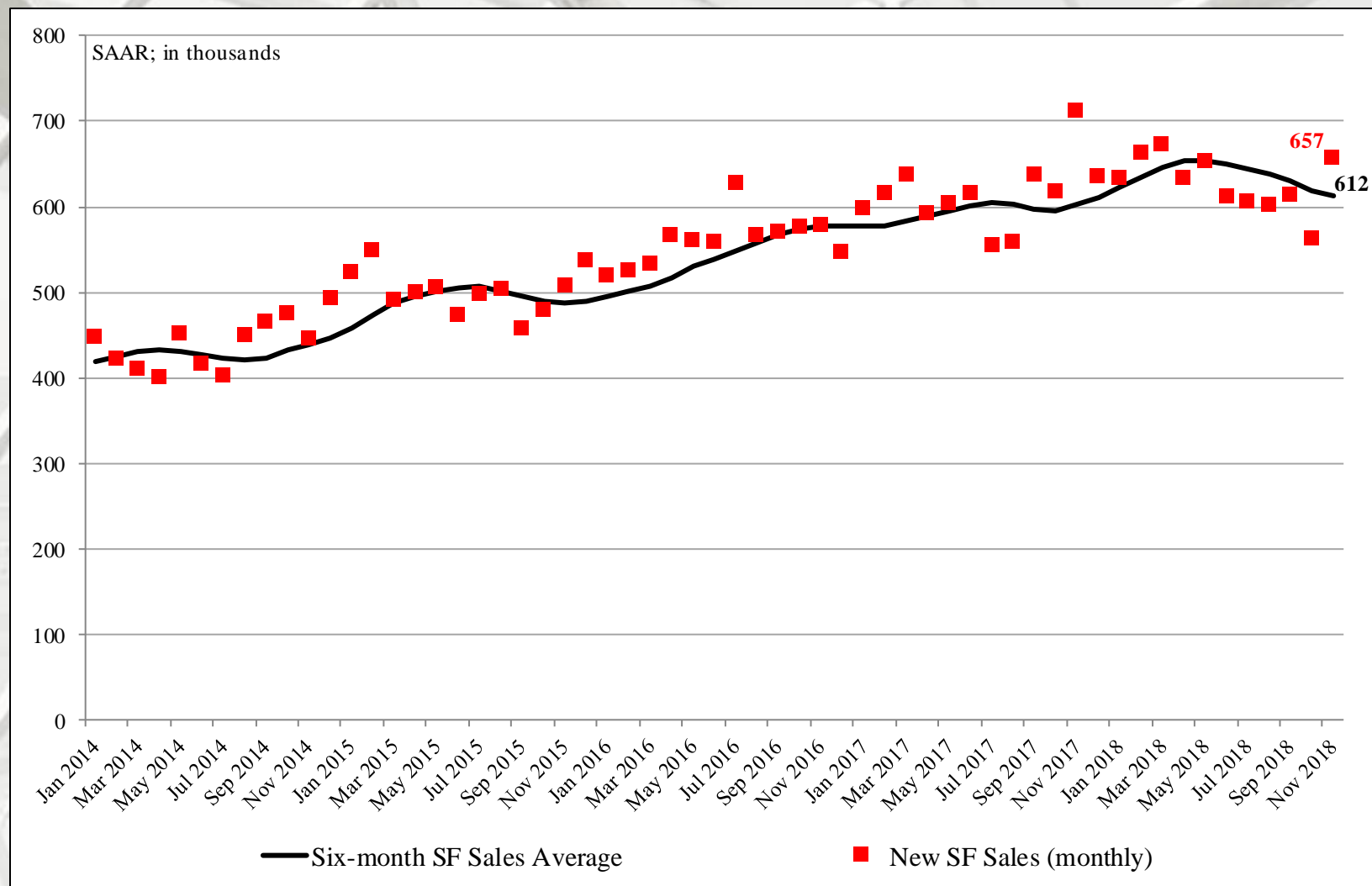
New SF sales were markedly greater than the consensus forecast³ of 560 m. The past three month's new SF sales data also were revised downward:

August initial:	629 m revised to 601 m;
September initial:	553 m revised to 613 m;
October initial:	544 m revised to 562 m.

New SF House Sales



New SF Housing Sales: Six-month average & monthly



New SF House Sales by Region and Price Category

	NE SF Sales	MW SF Sales	S SF Sales	W SF Sales			
November	46,000	77,000	374,000	160,000			
October	23,000	59,000	310,000	170,000			
2017	40,000	79,000	377,000	216,000			
M/M change	100.0%	30.5%	20.6%	-5.9%			
Y/Y change	15.0%	-2.5%	-0.8%	-25.9%			
	\$150 - ≤ \$150m	\$200 - \$199.9m - 299.9m	\$300 - \$399.9m	\$400 - \$499.9m	\$500 - \$749.9m	≥ \$750m	
November ^{1,2,3,4}	2,000	5,000	17,000	11,000	6,000	5,000	3,000
October	2,000	3,000	14,000	11,000	6,000	5,000	3,000
2017	1,000	4,000	15,000	14,000	7,000	7,000	2,000
M/M change	0.0%	66.7%	21.4%	0.0%	0.0%	0.0%	0.0%
Y/Y change	100.0%	25.0%	13.3%	-21.4%	-14.3%	-28.6%	50.0%
New SF sales: %	4.2%	10.4%	35.4%	22.9%	12.5%	10.4%	6.3%

¹ All data are SAAR

² Houses for which sales price were not reported have been distributed proportionally to those for which sales price was reported;

³ Detail may not add to total because of rounding.

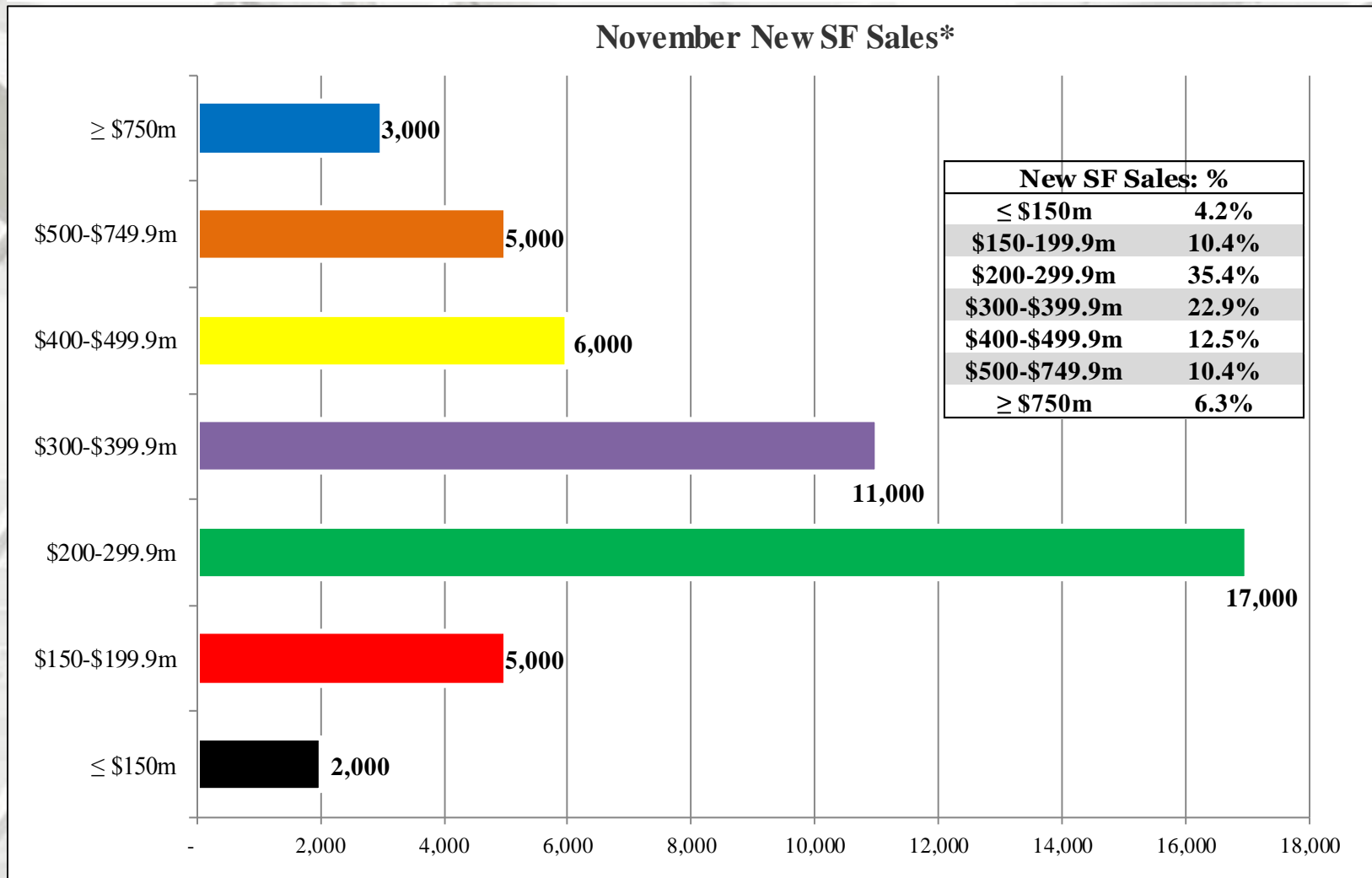
⁴ Housing prices are adjusted at irregular intervals.

Sources: ^{1,2,3} <http://www.census.gov/construction/nrc/pdf/newresconst.pdf>; 1/31/19;

⁴ https://www.census.gov/construction/cpi/pdf/descpi_sold.pdf

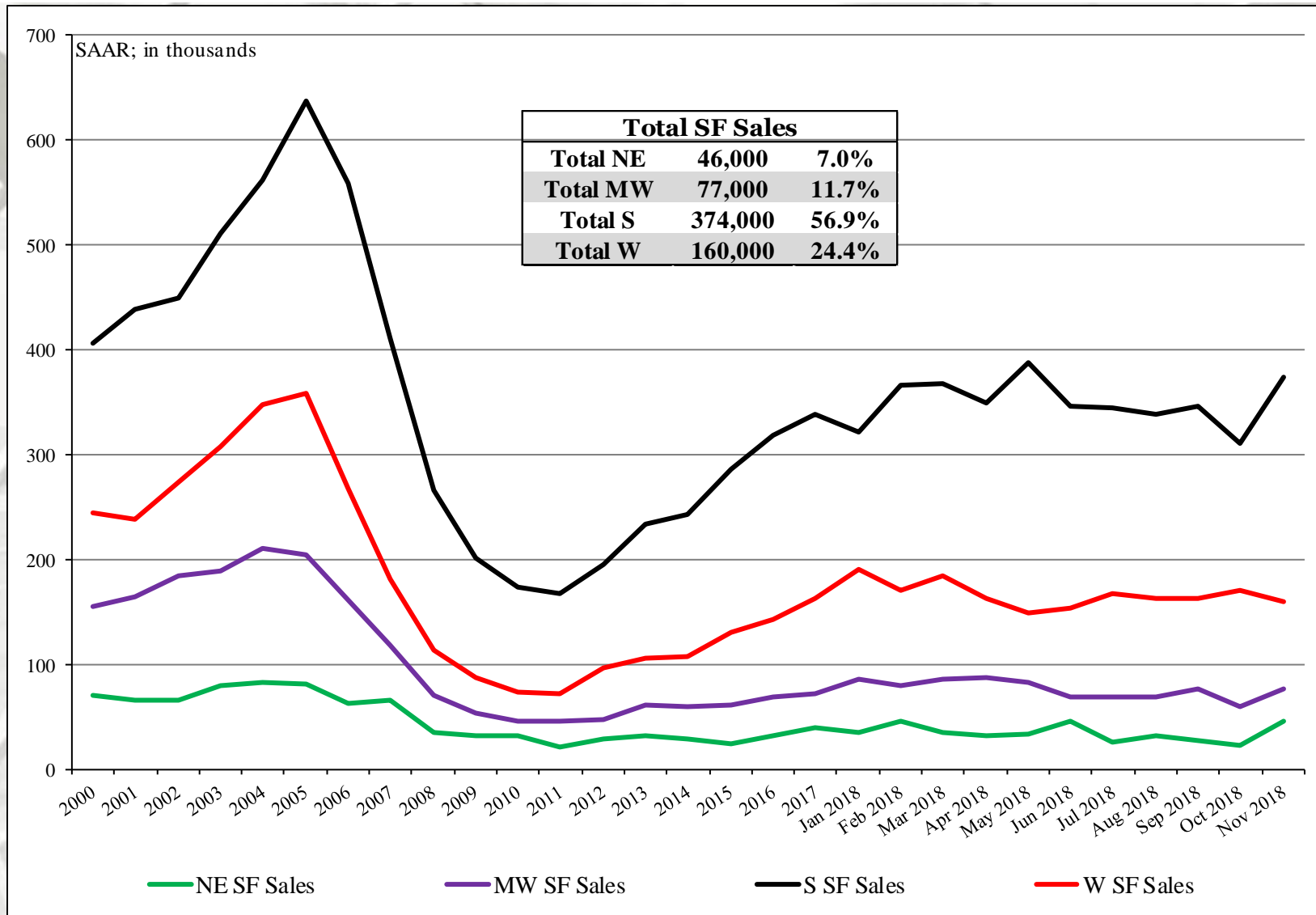
New SF House Sales

November New SF Sales*



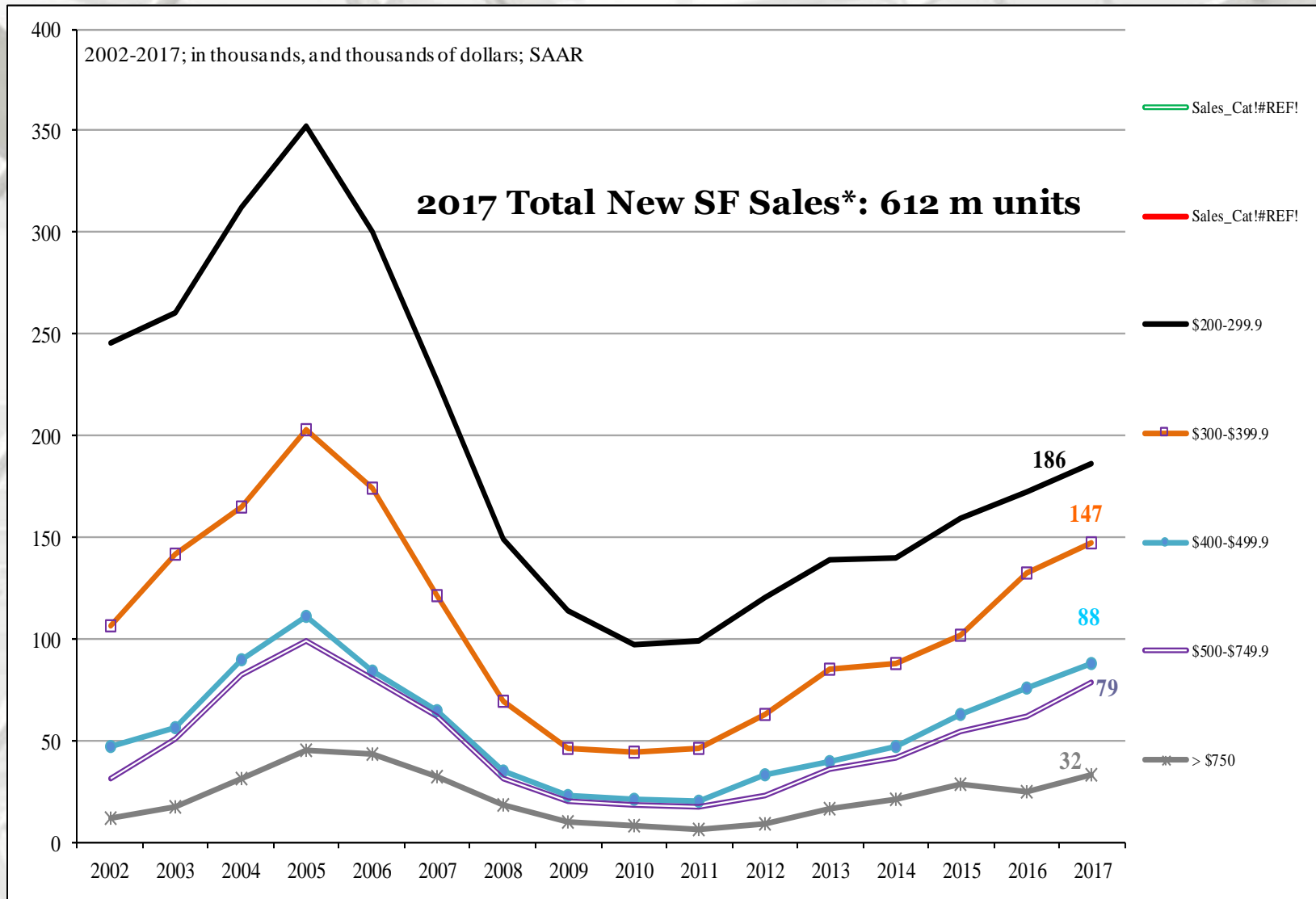
* Total new sales by price category and percent.

New SF House Sales by Region

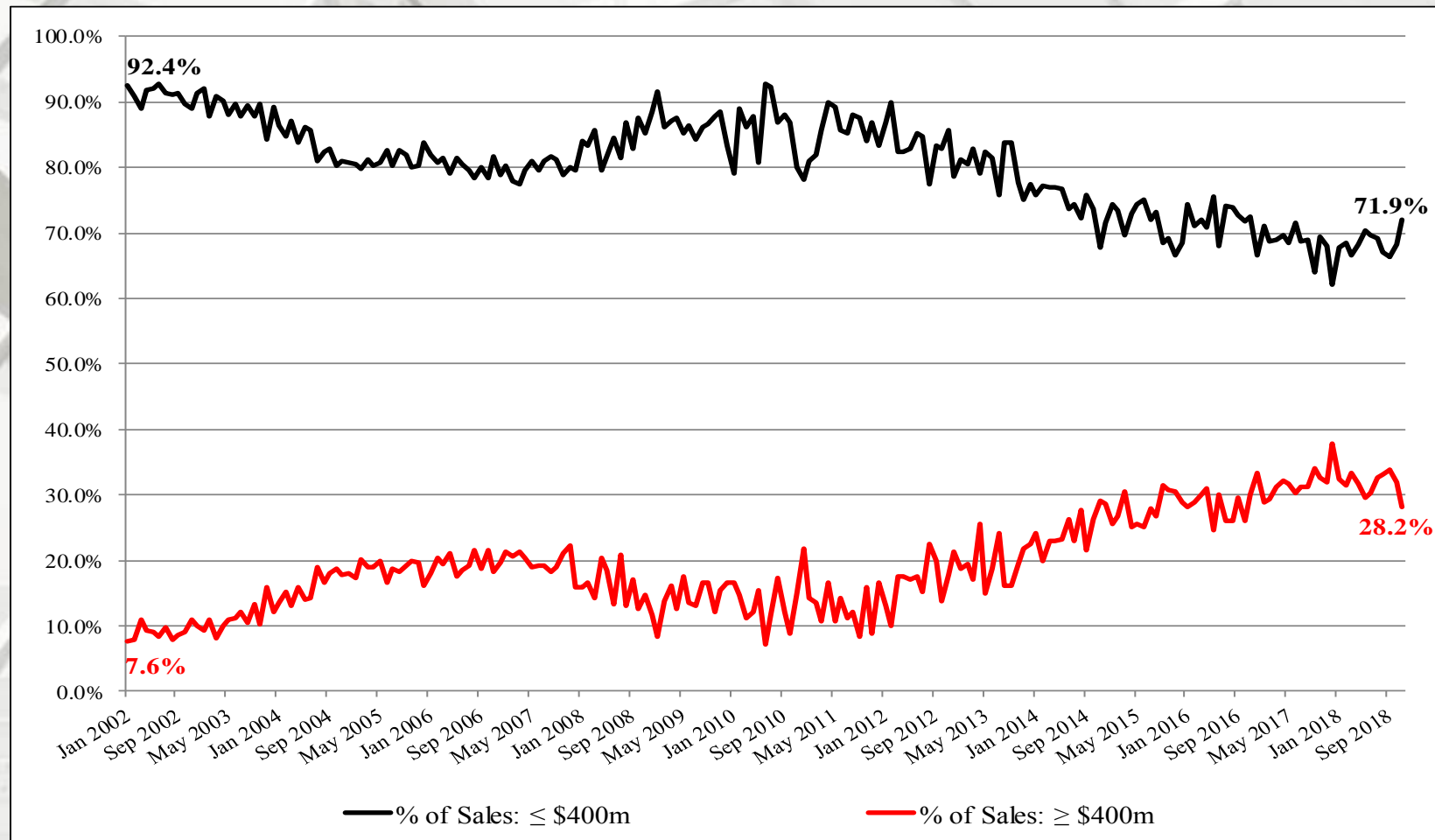


* Percentage of total new sales.

New SF House Sales by Price Category



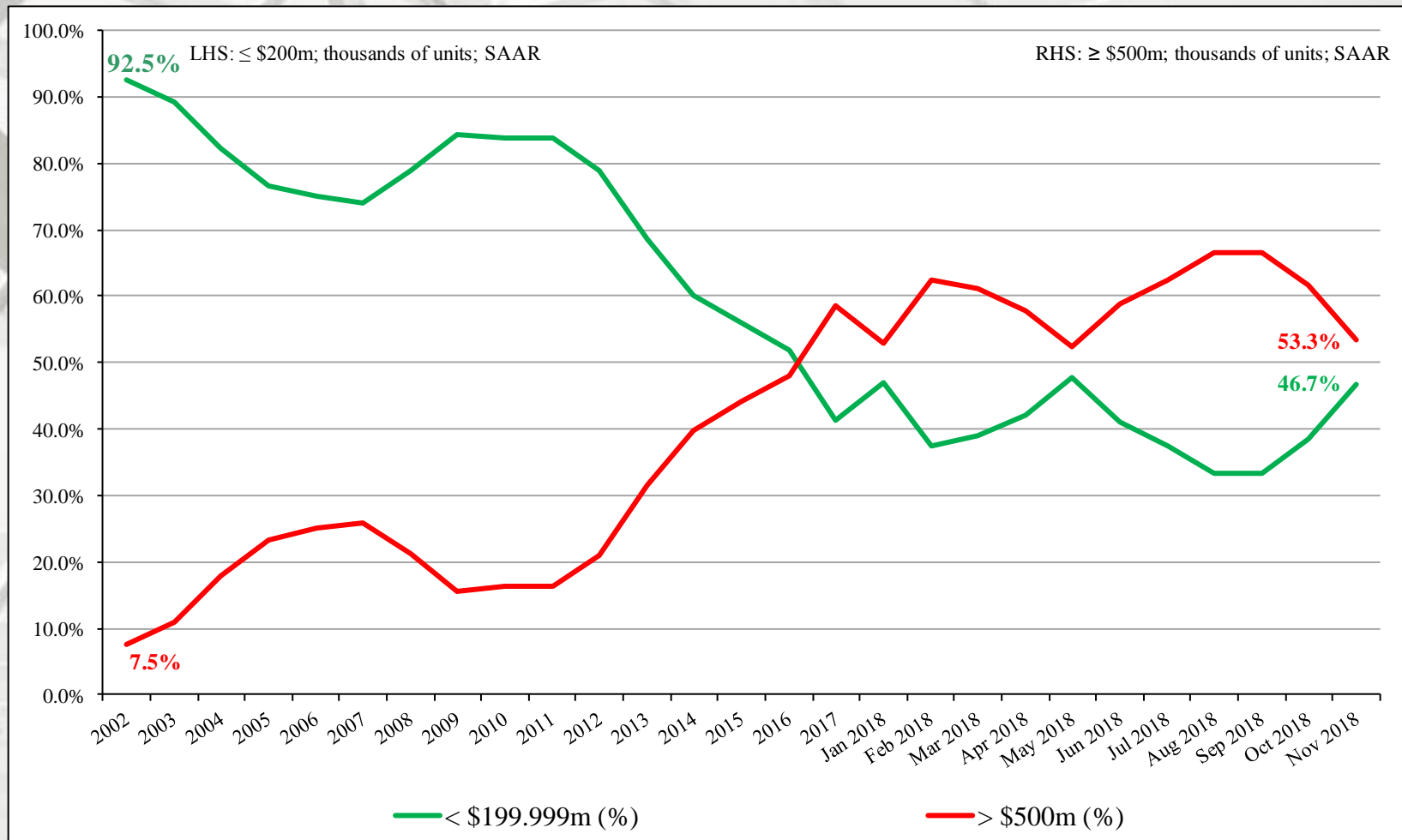
New SF House Sales



New SF Sales \$400m houses: 2002 – November 2018

The sales share of \$400 thousand plus SF houses is presented above^{1,2}. Since the beginning of 2012, the upper priced houses have and are garnering a greater percentage of sales. A decreasing spread indicates that more high-end luxury homes are being sold. Several reasons are offered by industry analysts; 1) builders can realize a profit on higher priced houses; 2) historically low interest rates have indirectly resulted in increasing house prices; and 3) purchasers of upper end houses fared better financially coming out of the Great Recession.

New SF House Sales

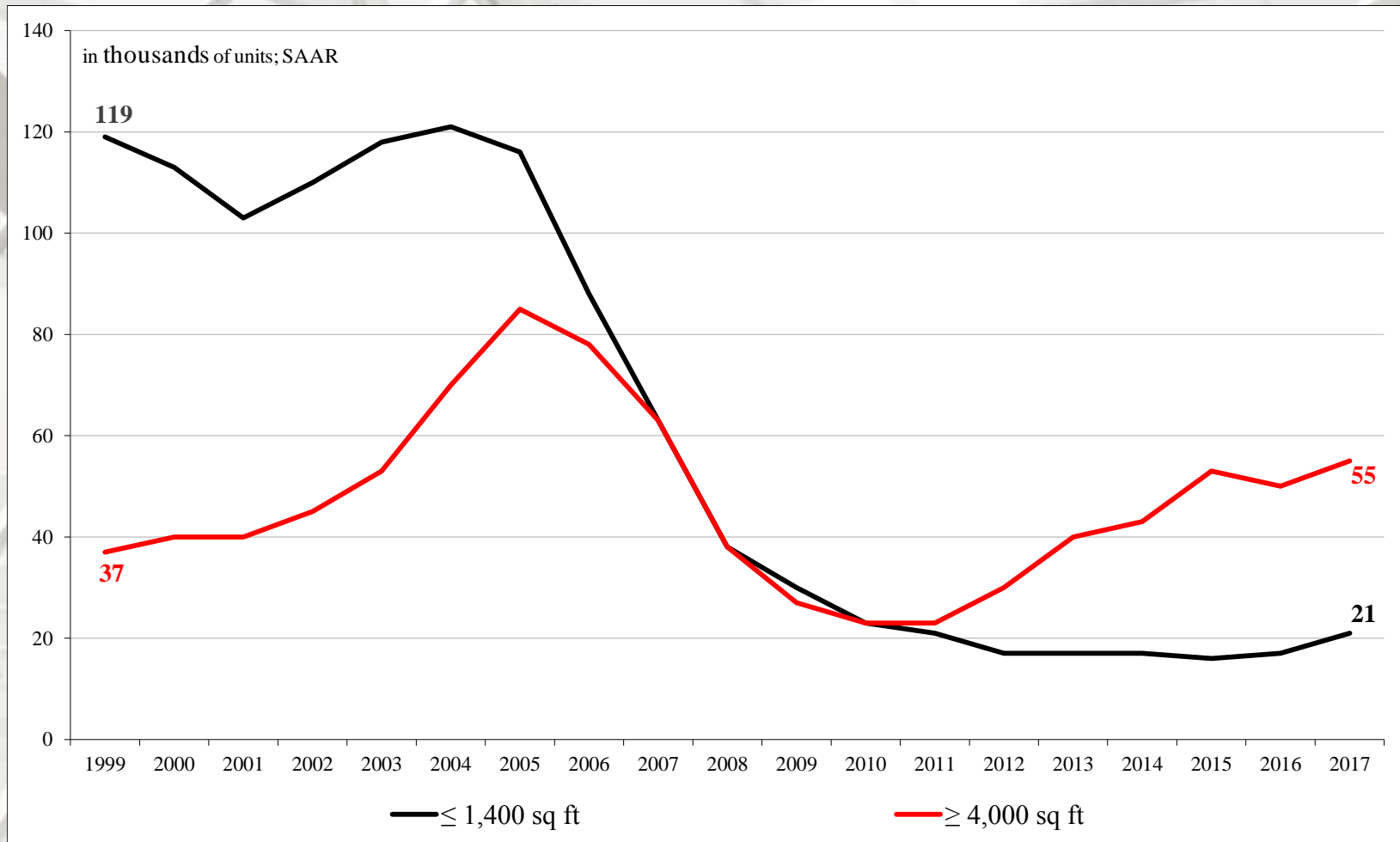


New SF Sales: ≤ \$ 200m and ≥ \$500m: 2002 to November 2018

The number of ≤ \$200 thousand plus SF houses has declined dramatically since 2002^{1,2}. Subsequently, from 2012 onward, the ≥ \$500 thousand class has soared (on a percentage basis) in contrast to the ≤ \$200m class. One of the most oft mentioned reasons for this occurrence is builder net margins.

Note: Sales values are not adjusted for inflation.

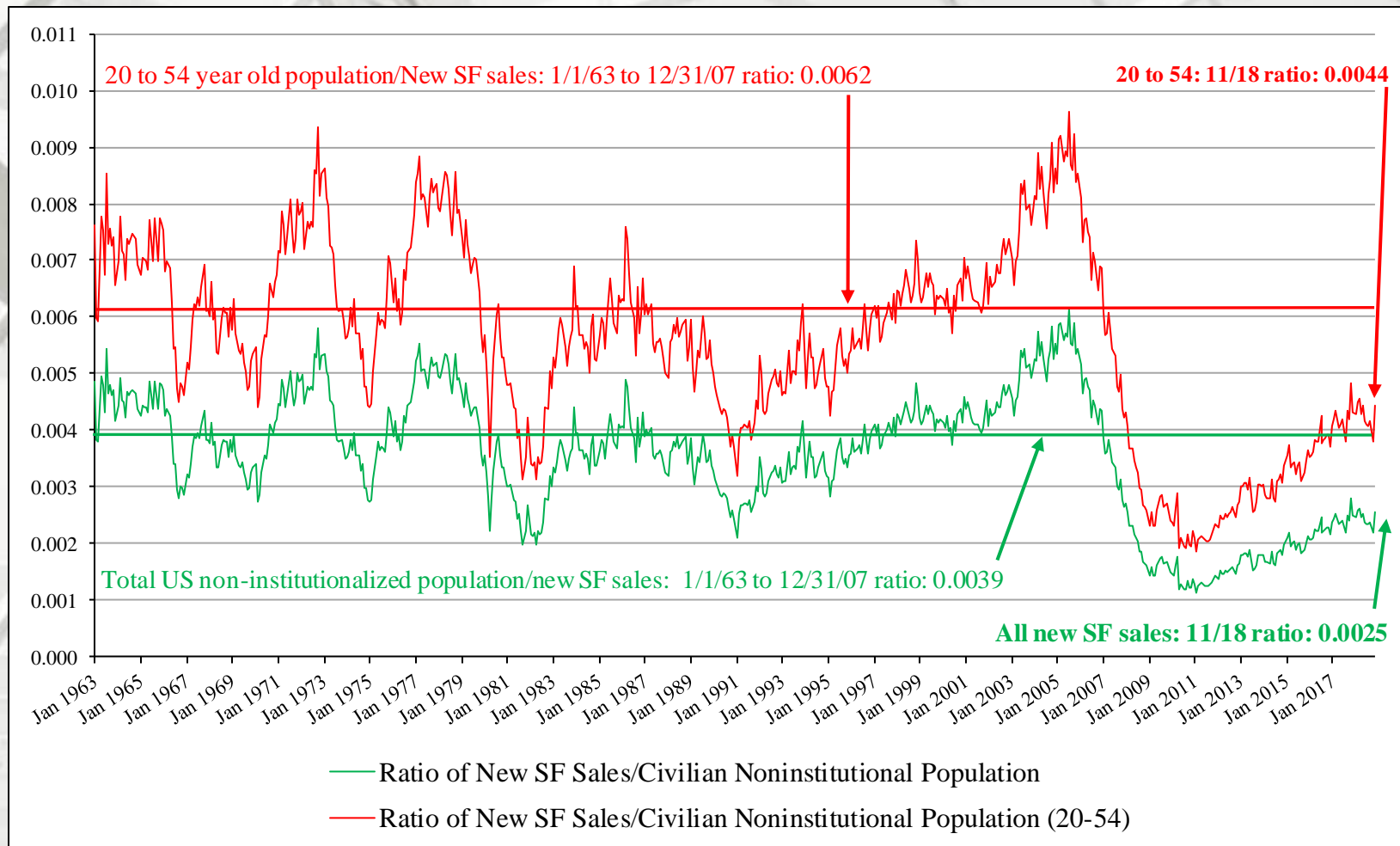
New SF House Sales by Square Feet of Floor Area



New SF Sales: $\leq 1,400$ square feet and $\geq 4,000$ square feet: 1999 to 2017

The number of SF houses sold ($\geq 4,000$ sq ft) has risen dramatically since 2010. Some of the most oft mentioned reasons for this is builder net margins; regulations, and finance availability.

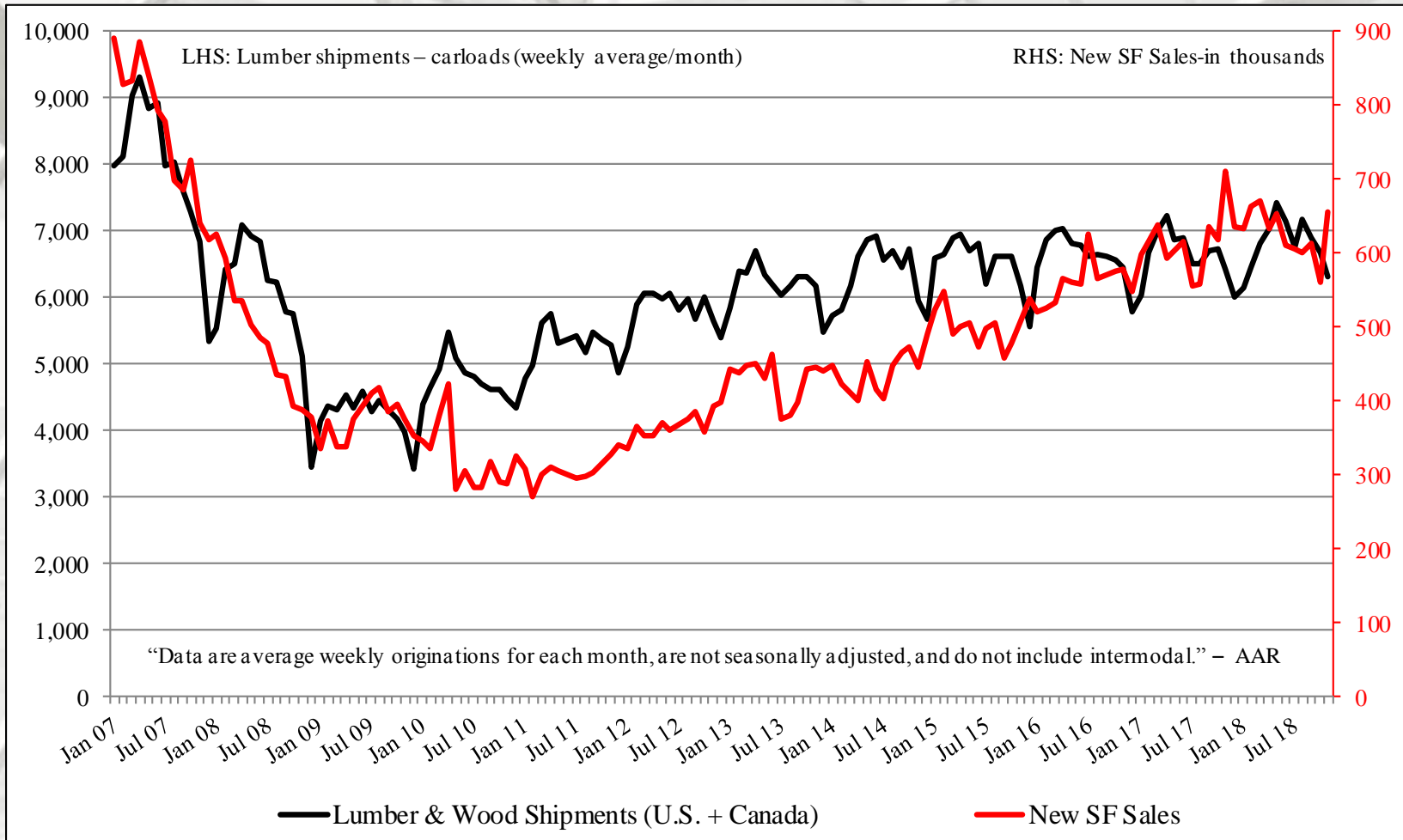
New SF House Sales



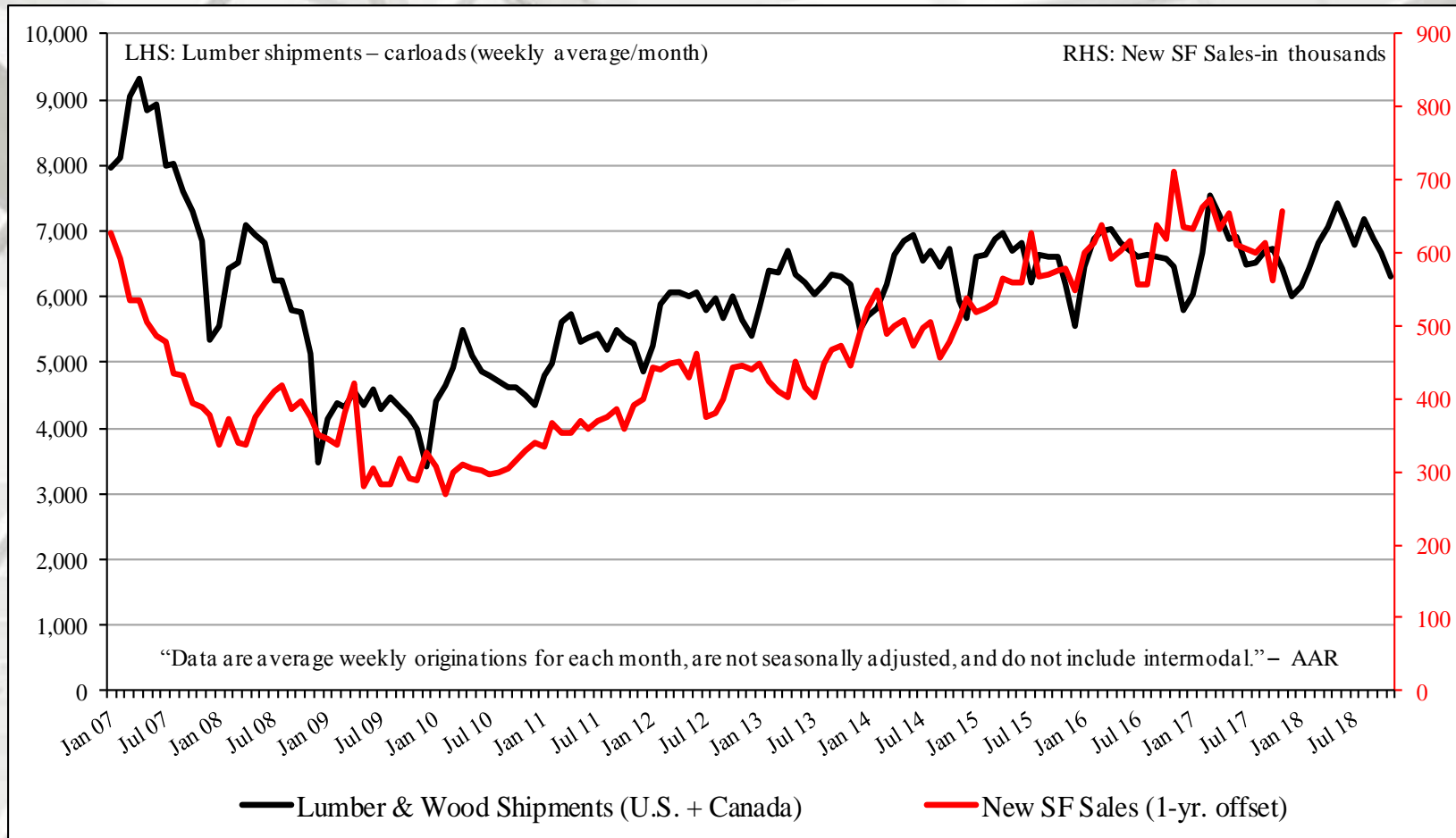
New SF sales adjusted for the US population

From November 1963 to November 2007, the long-term ratio of new house sales to the total US non-institutionalized population was 0.0039; in November 2018 it was 0.0025 – a increase from October (0.0022). The non-institutionalized population, aged 20 to 54 long-term ratio is 0.0062; in November 2018 it was 0.0044 – also increase from October (0.0038). All are non-adjusted data. From a population viewpoint, construction is less than what is necessary for changes in the population (i.e., under-building).

Railroad Lumber & Wood Shipments vs. U.S. SF House Sales

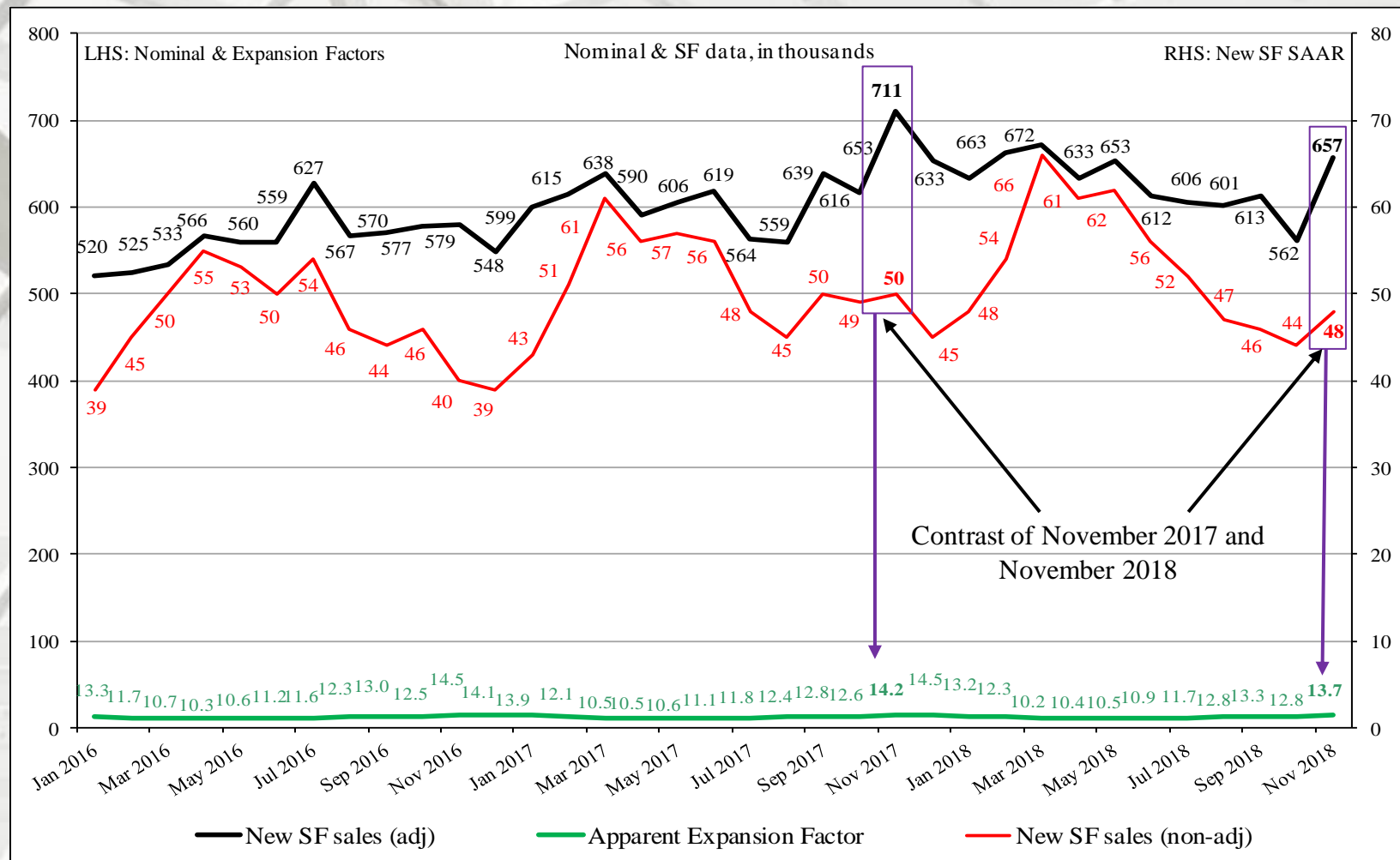


Railroad Lumber & Wood Shipments vs. U.S. SF Housing Sales: 1-year Offset



In this graph, January 2007 lumber shipments are contrasted with January 2008 SF sales, and continuing through November 2018. The purpose is to discover if lumber shipments relate to future single-family sales. Also, it is realized that lumber and wood products are trucked; however, to our knowledge comprehensive trucking data is not available.

Nominal vs. SAAR New SF House Sales



Nominal and Adjusted New SF Monthly Sales

Presented above is nominal (non-adjusted) new SF sales data contrasted against SAAR data. The apparent expansion factor "... is the ratio of the unadjusted number of houses sold in the US to the seasonally adjusted number of houses sold in the US (i.e., to the sum of the seasonally adjusted values for the four regions)." – U.S. DOC-Construction

New SF House Sales

New SF Houses Sold During Period

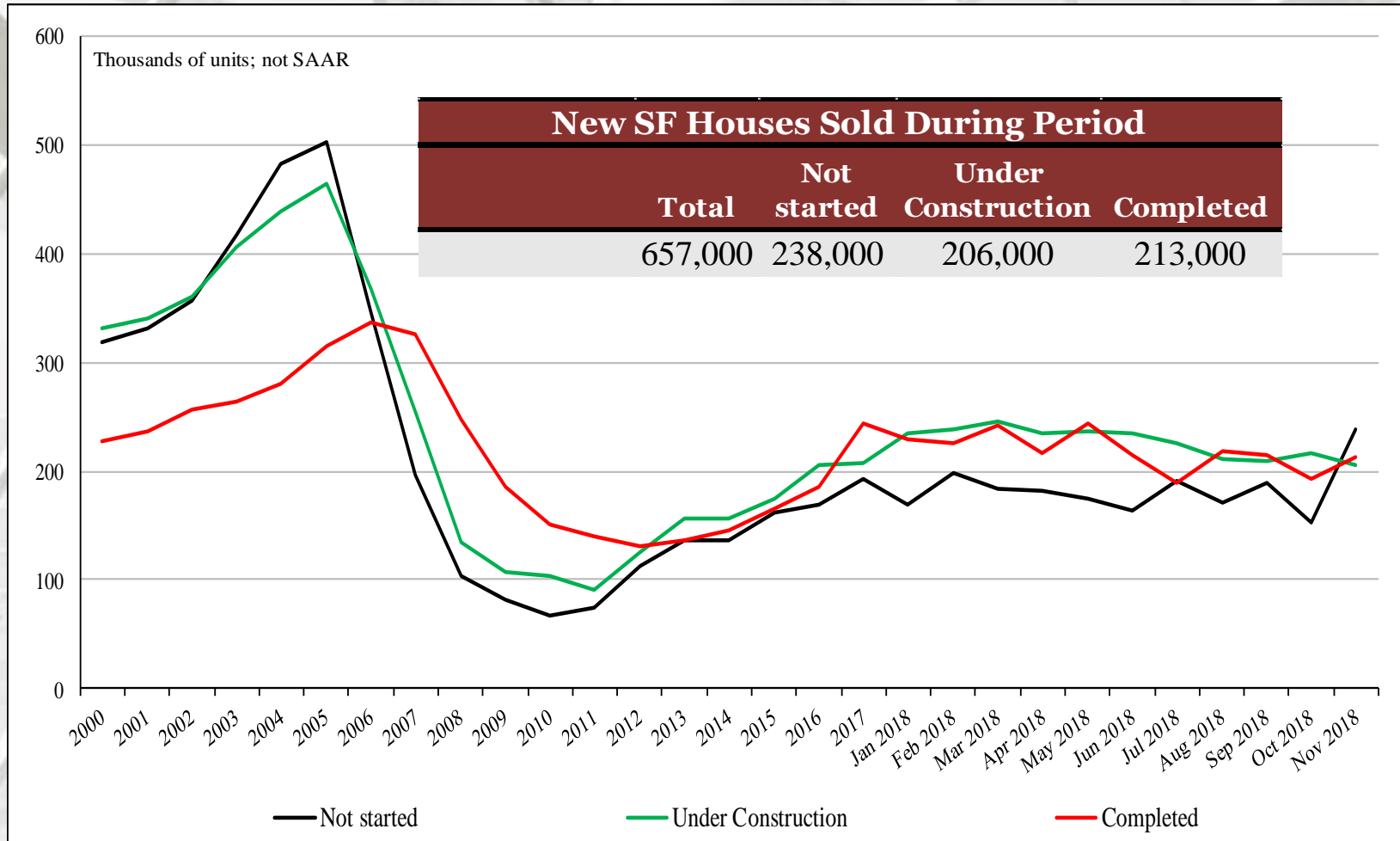
	Total	Not started	Under Construction	Completed
November	657,000	238,000	206,000	213,000
October	562,000	153,000	217,000	192,000
2017	712,000	246,000	237,000	229,000
M/M change	16.9%	55.6%	-5.1%	10.9%
Y/Y change	-7.7%	-3.3%	-13.1%	-7.0%
Total percentage		36.2%	31.4%	32.4%

New SF Houses Sold During Period

In November 2018, a substantial portion of new sales, 36.2% – have not been started; an increase from October.

* Not SAAR

New SF House Sales



Not SAAR

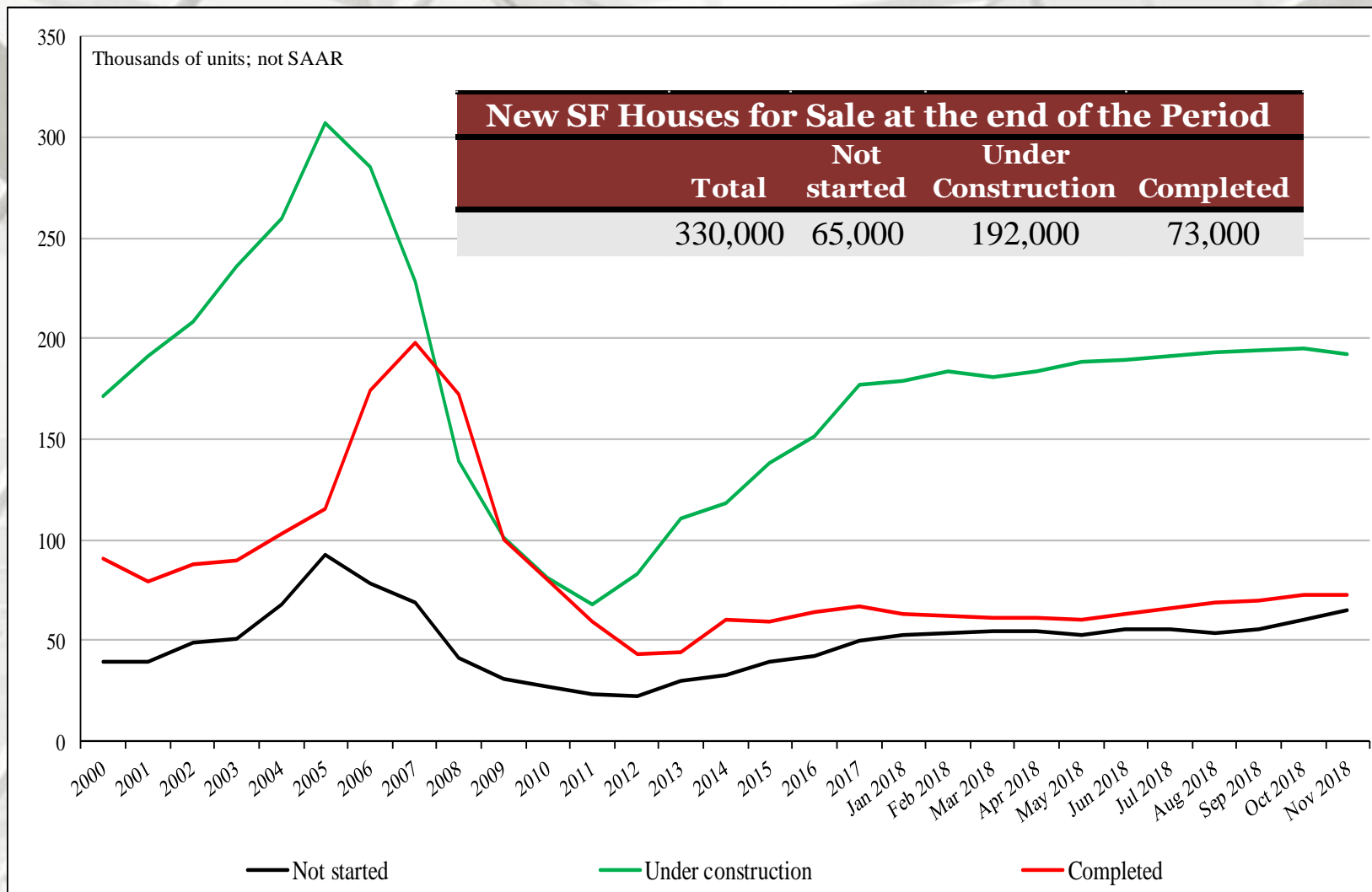
New SF House Sales

New SF Houses for Sale at the end of the Period

	Total	Not started	Under Construction	Completed
November	330,000	65,000	192,000	73,000
October	328,000	60,000	195,000	73,000
2017	292,000	47,000	181,000	65,000
M/M change	0.6%	8.3%	-1.5%	0.0%
Y/Y change	13.0%	38.3%	6.1%	12.3%
Total percentage		19.7%	58.2%	22.1%

Not SAAR

New SF House Sales



Not SAAR

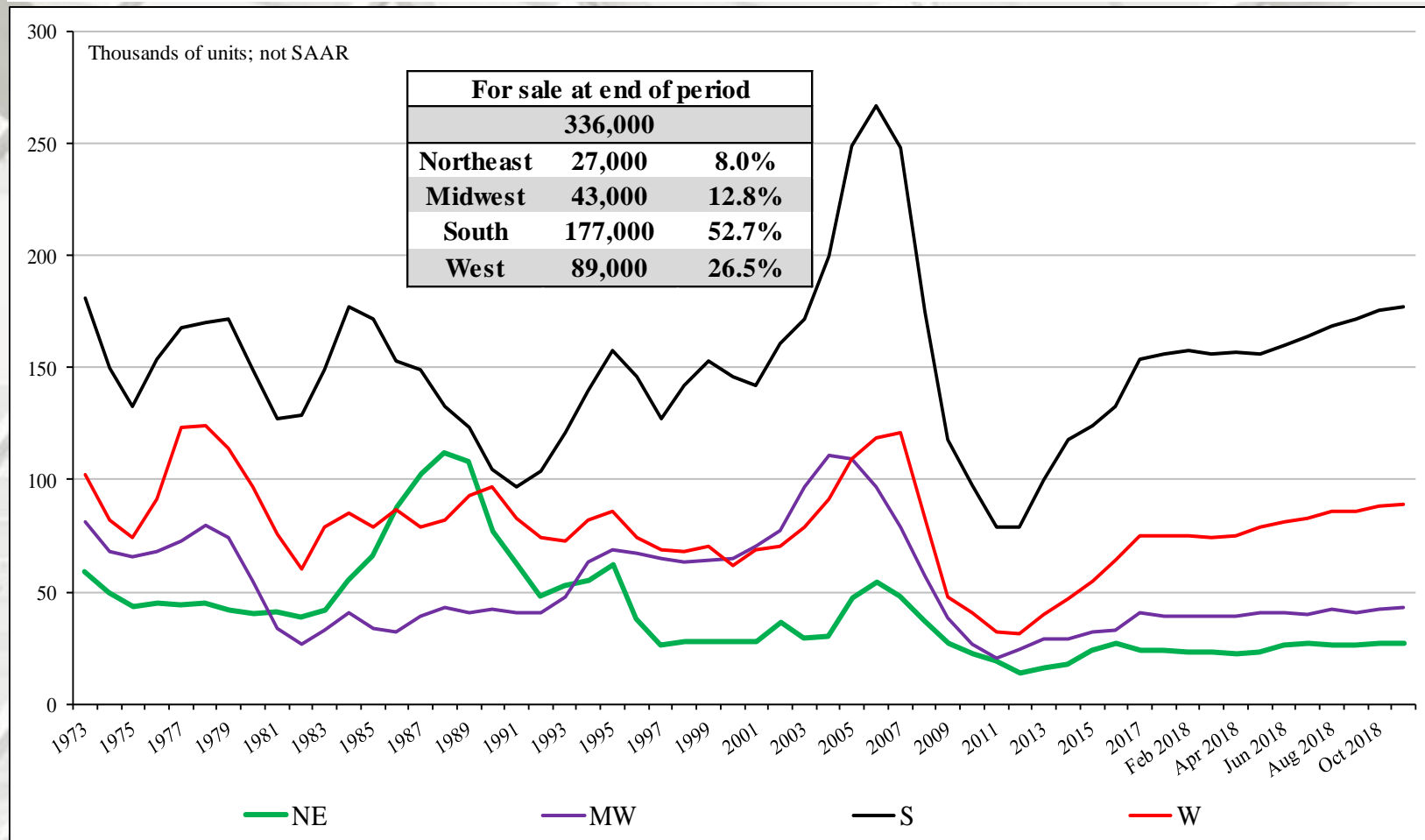
New SF House Sales

New SF Houses for Sale at the end of the Period by Region*

	Total	NE	MW	S	W
November	336,000	27,000	43,000	177,000	89,000
October	333,000	27,000	42,000	176,000	88,000
2017	292,000	25,000	40,000	154,000	73,000
M/M change	0.9%	0.0%	2.4%	0.6%	1.1%
Y/Y change	15.1%	8.0%	7.5%	14.9%	21.9%

* Not SAAR

New SF Houses Sale at End of Period by Region



November 2018 Construction Spending

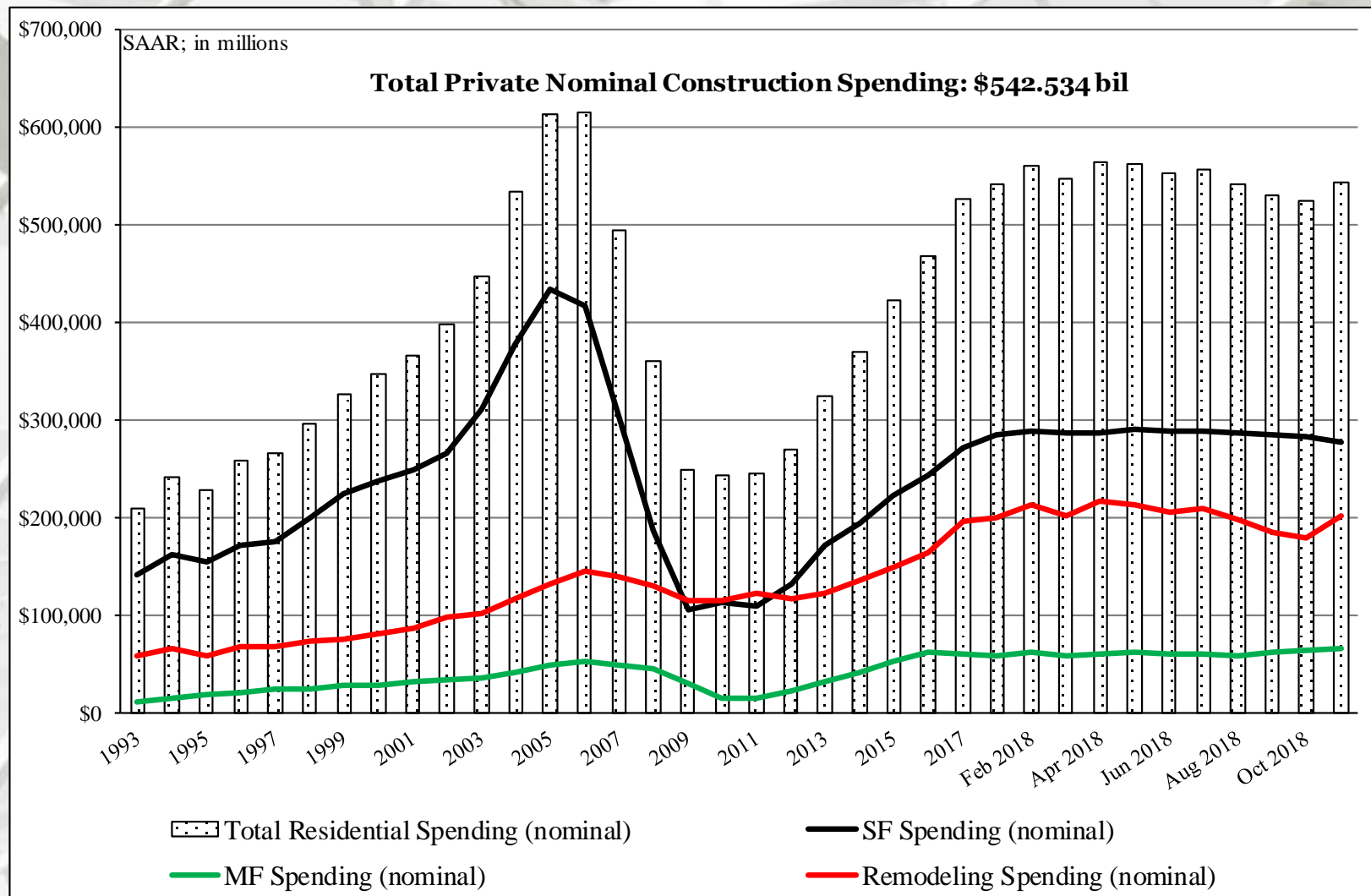
	Total Private Residential*	SF	MF	Improvement**
November	\$542,534	\$277,512	\$64,729	\$200,293
October	\$524,223	\$282,544	\$63,084	\$178,595
2017	\$538,181	\$280,238	\$59,763	\$198,180
M/M change	3.5%	-1.8%	2.6%	12.1%
Y/Y change	0.8%	-1.0%	8.3%	1.1%

* billion.

** The US DOC does not report improvement spending directly, this is a monthly estimation:
((Total Private Spending – (SF spending + MF spending)).

All data are SAARs and reported in nominal US\$.

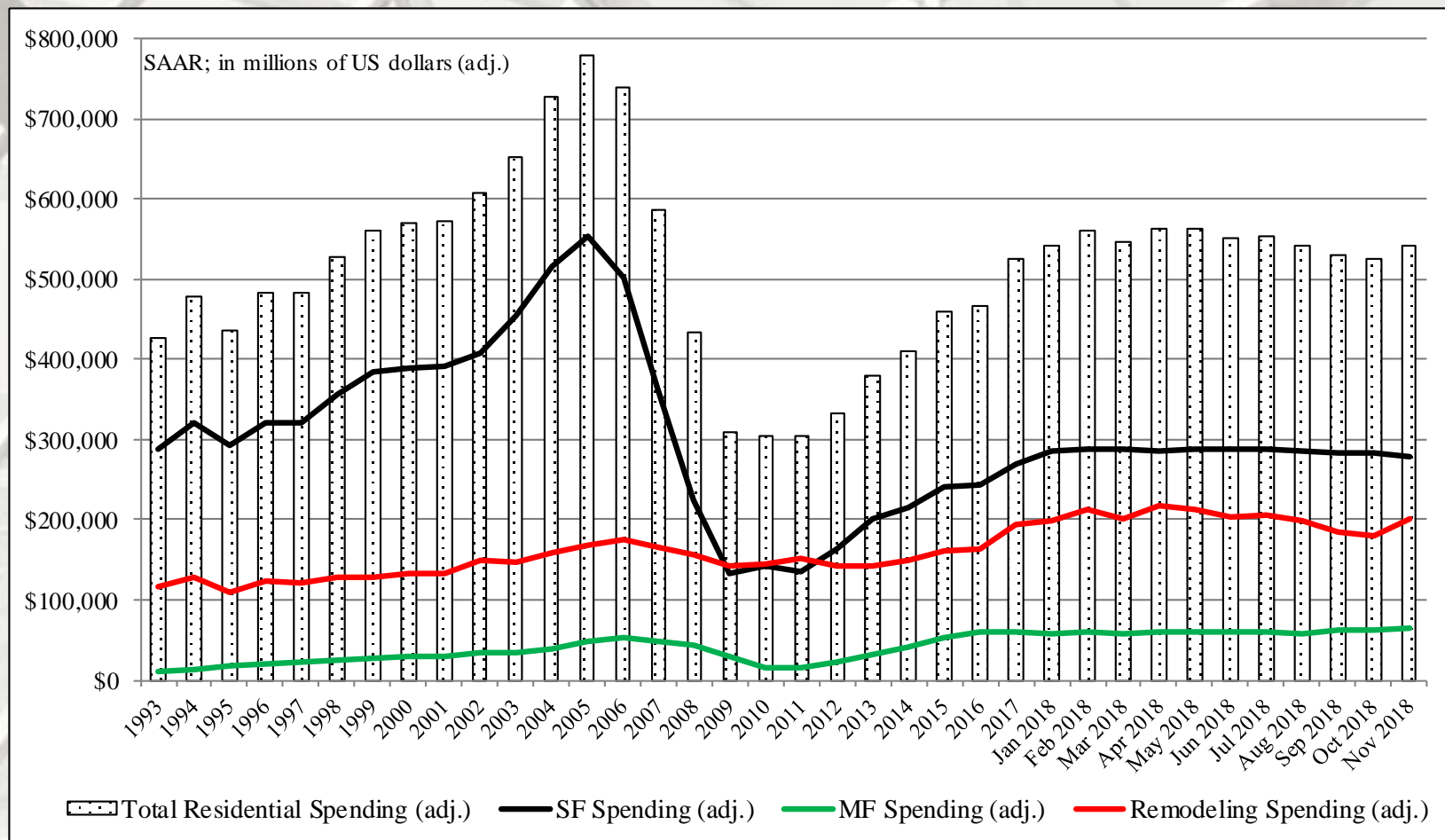
Total Construction Spending (nominal): 1993 – November 2018



Reported in nominal US\$.

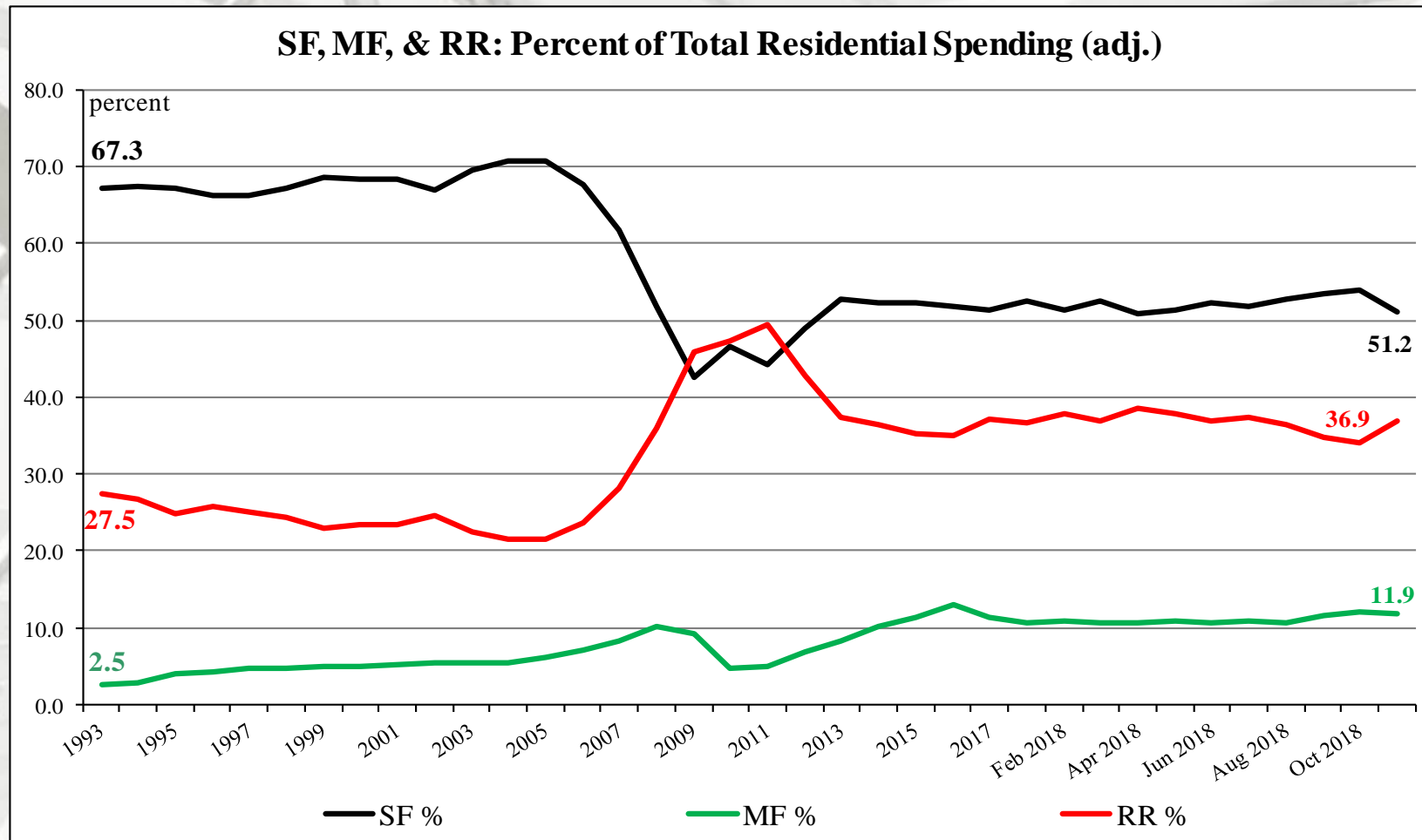
The US DOC does not report improvement spending directly, this is a monthly estimation for 2018.

Total Construction Spending (adjusted): 1993-2018*



Reported in adjusted US\$: 1993 – 2017 (adjusted for inflation, BEA Table 1.1.9); *January 2018 to November 2018 reported in nominal US\$.

Construction Spending Shares: 1993 to November 2018



Total Residential Spending: 1993 through 2006

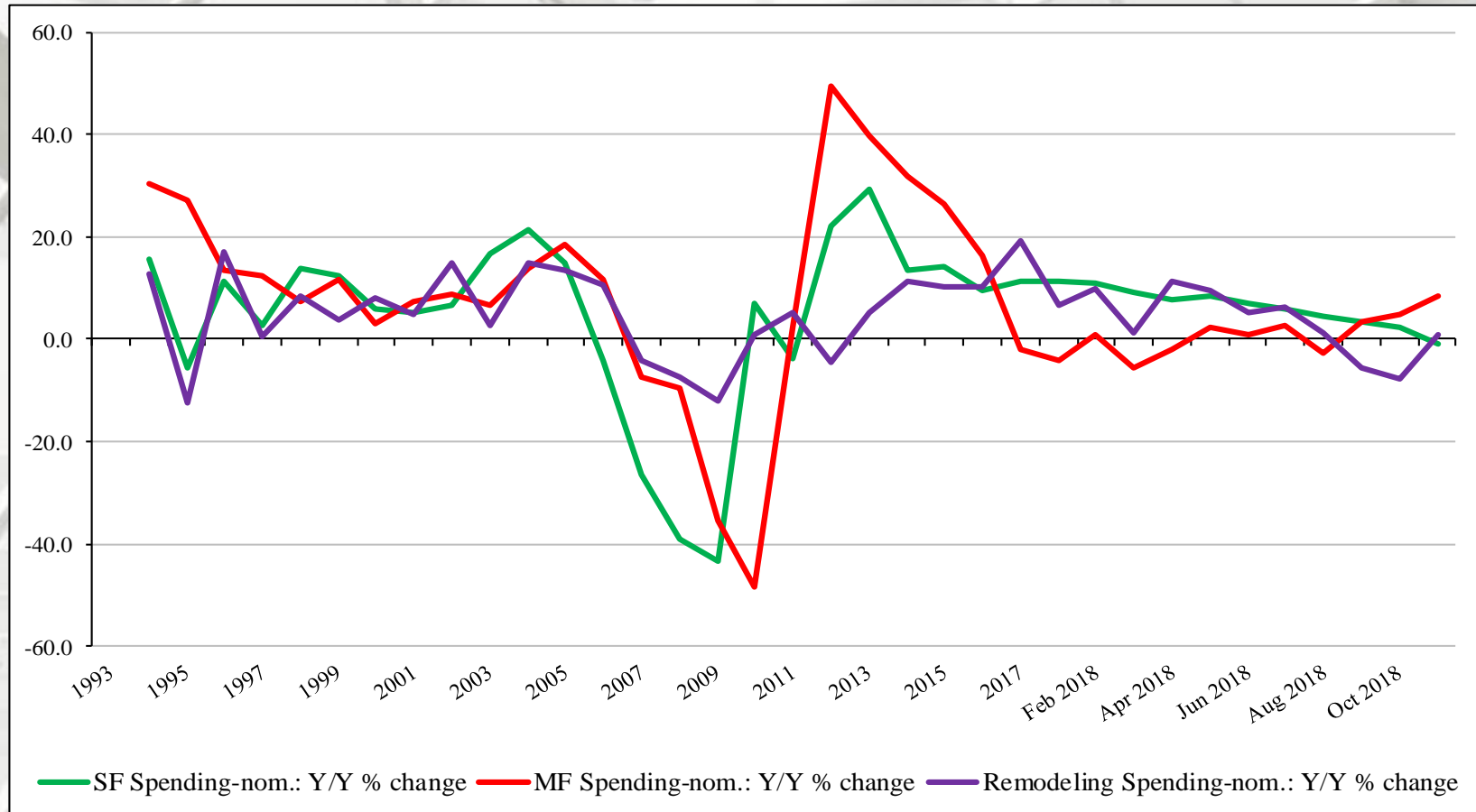
SF spending average: 69.2%

MF spending average: 7.5%

Residential remodeling (RR) spending average: 23.3% (SAAR).

Note: 1993 to 2017 (adjusted for inflation, BEA Table 1.1.9); Jan-November 2018 reported in nominal US\$.

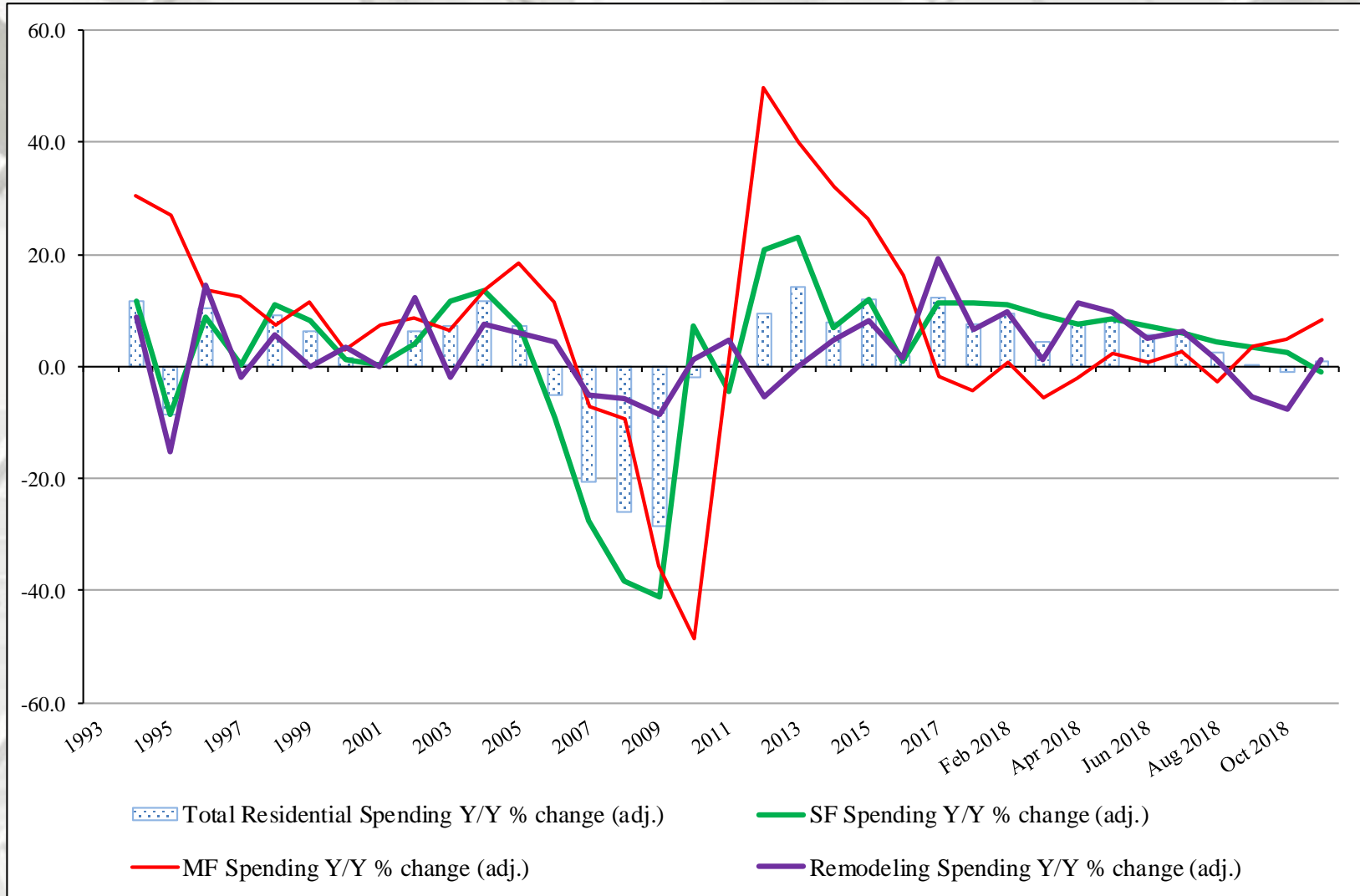
Adjusted Construction Spending: Y/Y Percentage Change, 1993 to November 2018



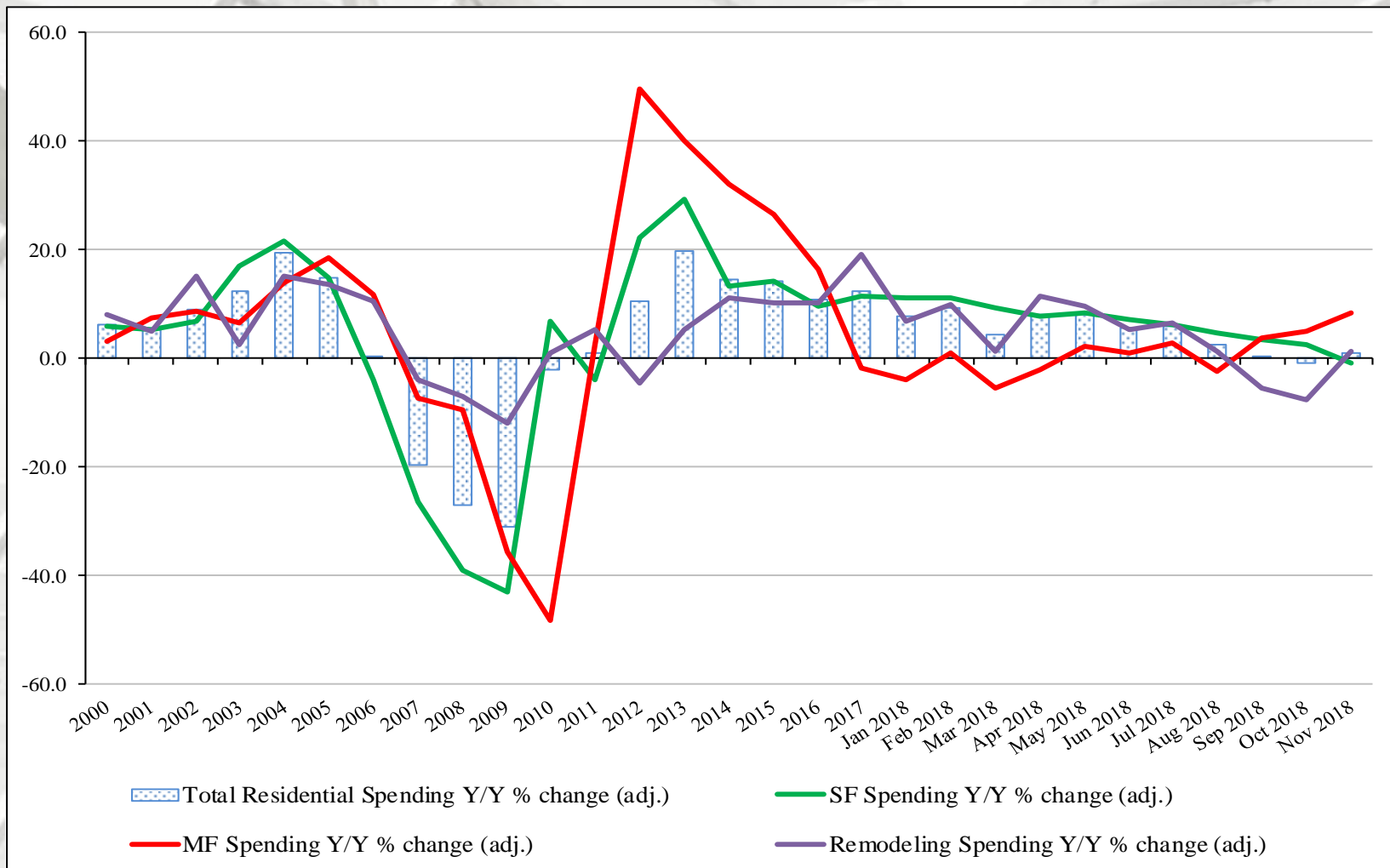
Nominal Residential Construction Spending: Y/Y percentage change, 1993 to November 2018

Presented above is the percentage change of inflation adjusted Y/Y construction spending. SF declined; MF and Remodeling expenditures were positive, on a percentage basis, year-over-year.

Adjusted Construction Spending: Y/Y Percentage Change, 2000 to November 2018



Total Adjusted Construction Spending: Y/Y Percentage Change, 1993 to November 2018



Y/Y percentage change, 1993 to November 2018

Total, MF, and Remodeling were minimally to slightly positive in November, with SF minimally negative. January to November 2018 reported in nominal percent.

Remodeling

Harvard Joint Center for Housing Studies

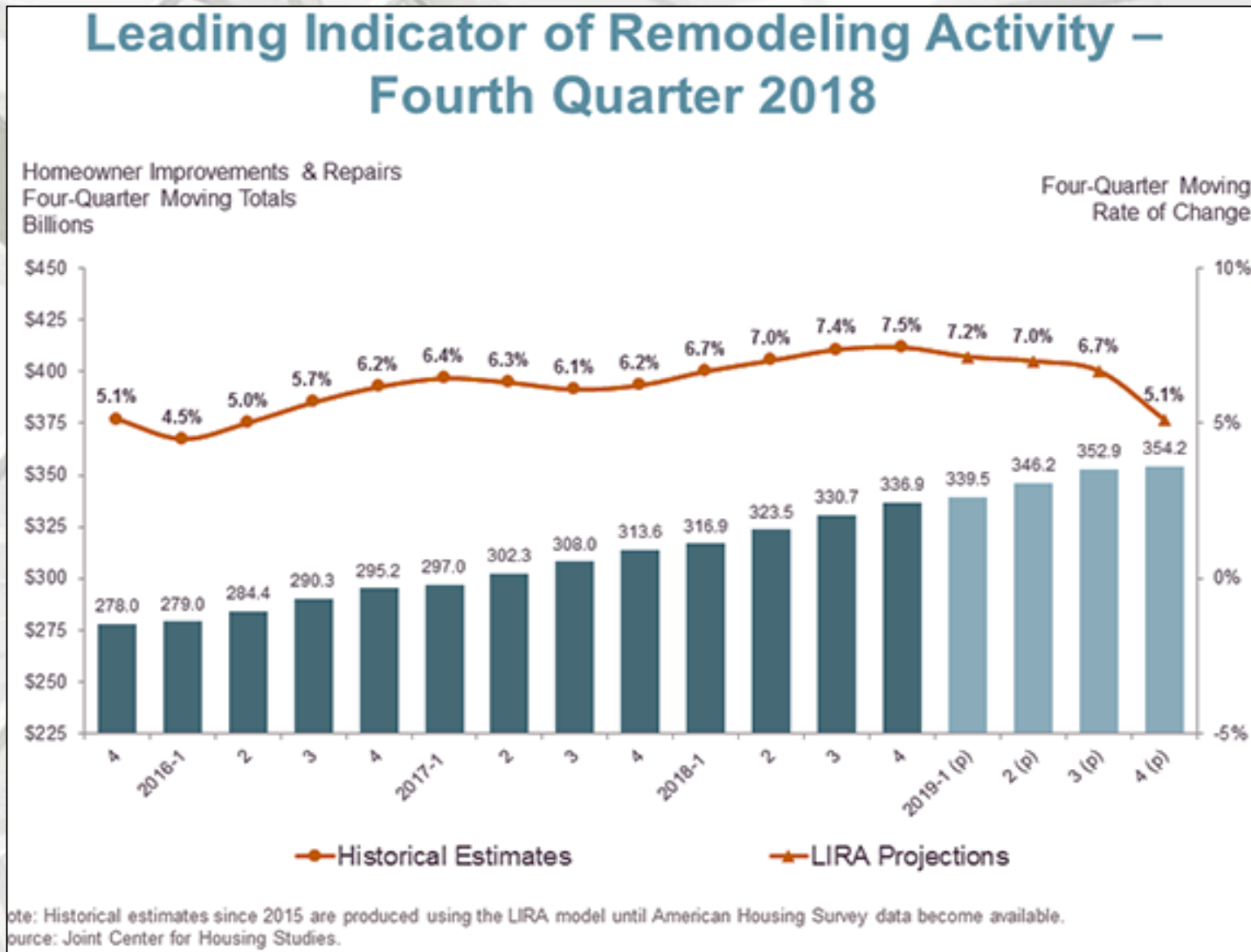
Expected Gains In Remodeling Spending To Slide Lower In 2019

“Annual growth in the national market for home improvement and repair is expected to slow considerably by the end of the year, according to our latest [Leading Indicator of Remodeling Activity](#) (LIRA) released today. The LIRA projects that gains in renovation and repair spending to owner-occupied homes in the U.S. will shrink from 7.5 percent in 2018 to 5.1 percent in 2019.

Slowing house price appreciation, flat home sales activity, and rising mortgage interest rates are deflating owners’ interest in making major investments in home improvements this year. Continued slowdowns in homebuilding, sales of building materials, and remodeling permits all point to a more challenging environment for home remodeling in 2019.

Despite the growing headwinds, improvement and repair spending is still set to expand this year to over \$350 billion. But after several years of stronger-than-average increases, the pace of growth in remodeling activity is expected to fall back to the market’s historical average annual gain of 5.2 percent.” – Abbe Will, Research Analyst, Joint Center for Housing Studies

Remodeling



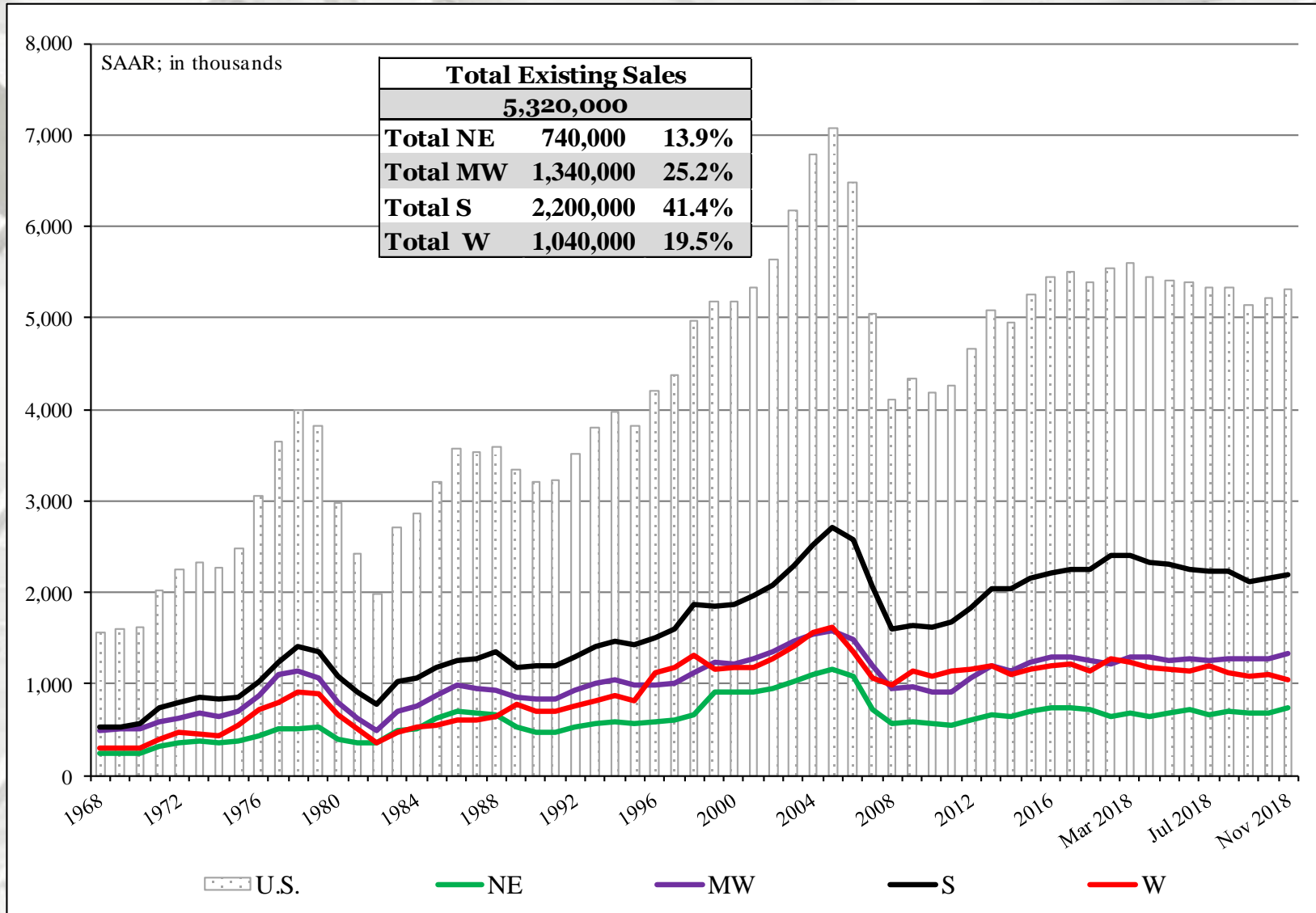
Existing House Sales

National Association of Realtors
November 2018 sales: 5.320 thousand

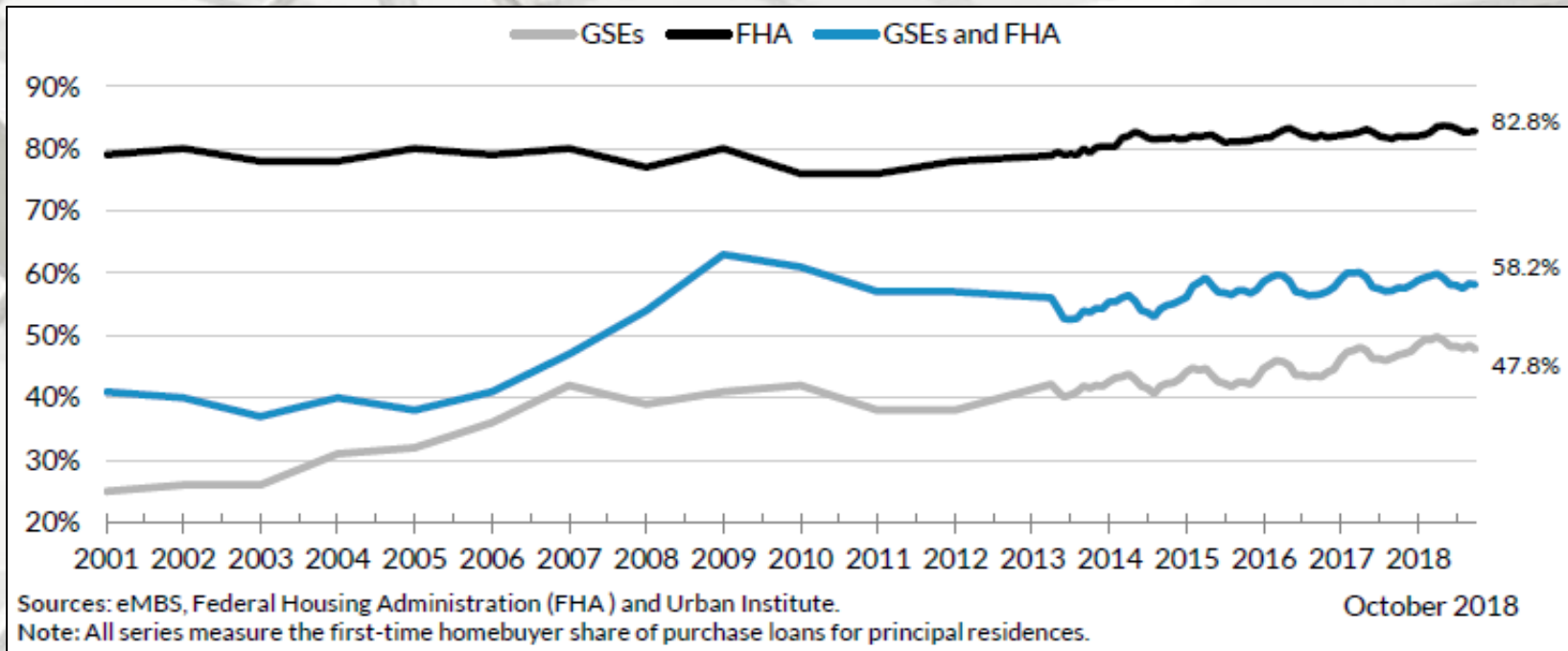
	Existing Sales*	Median Price	Mean Price	Month's Supply
November	5,320,000	\$257,700	\$296,300	3.9
October	5,220,000	\$255,100	\$293,900	4.3
2017	5,720,000	\$247,200	\$289,500	3.5
M/M	1.9%	1.0%	0.8%	-9.3%
Y/Y change	-7.0%	4.2%	2.3%	11.4%

* All sales data: SAAR

Existing House Sales



First-Time Purchasers

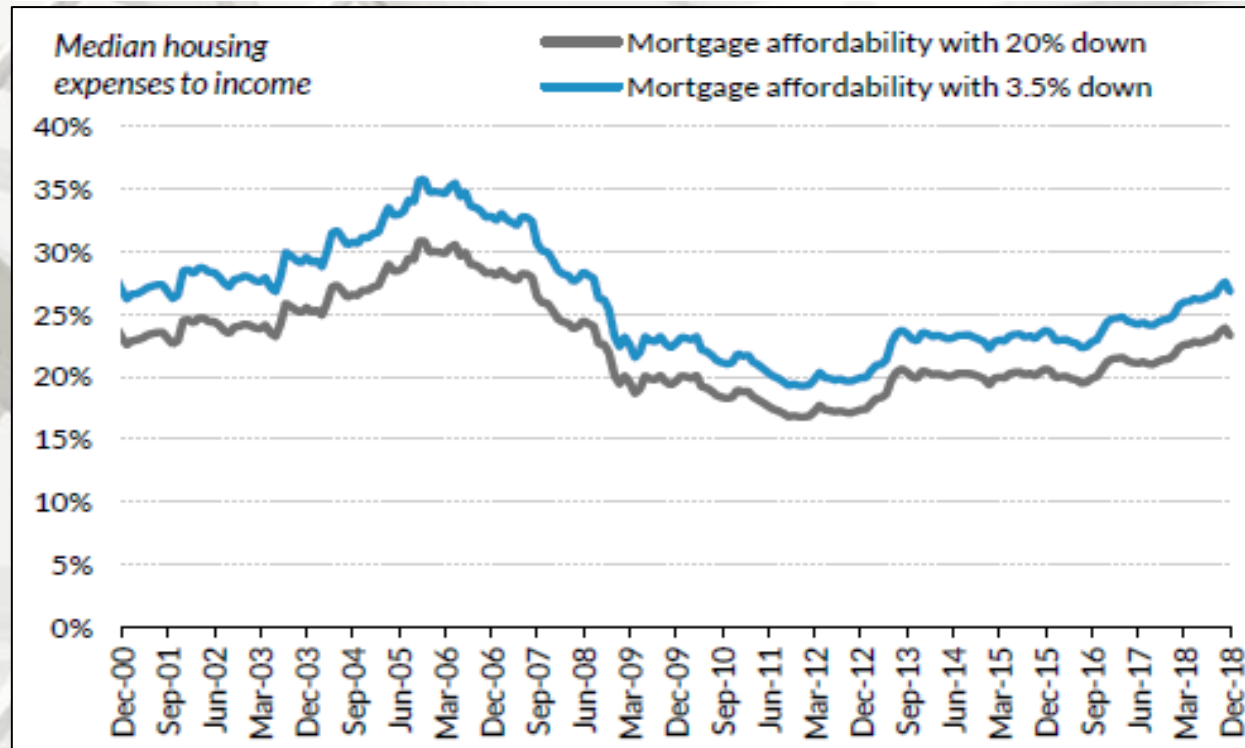


Urban Institute

“In October 2018, the first time homebuyer (FTHB) share of purchase loans increased very slightly for FHA and conventional mortgages. The FTHB share for FHA, which has always been more focused on first time homebuyers, stood at 82.8 percent in Oct 2018. The GSE FTHB share in Oct 2018 was 47.8 percent. ...based on mortgages originated in Oct 2018, the average FTHB was more likely than an average repeat buyer to take out a smaller loan, have a lower credit score, and higher LTV and higher DTI, thus paying a higher interest rate.” – Laurie Goodman, *et al.*, Co-director, Housing Finance Policy Center

Housing Affordability

National Housing Affordability Over Time



Urban Institute

“Home prices remain affordable by historic standards, despite price increases over the last 6.5 years and recent interest rate increases. As of December 2018, with 20 down payment, the share of median income needed for the monthly mortgage payment stood at 23.2; with 3.5 down, it is 26.8. As of December, the median housing expenses to income ratio is in line with the 2001-2003 average. As shown in the bottom picture, mortgage affordability varies widely across MSAs.” – Bing Lai, Research Associate, Housing Finance Policy Center

Mortgage Credit Availability

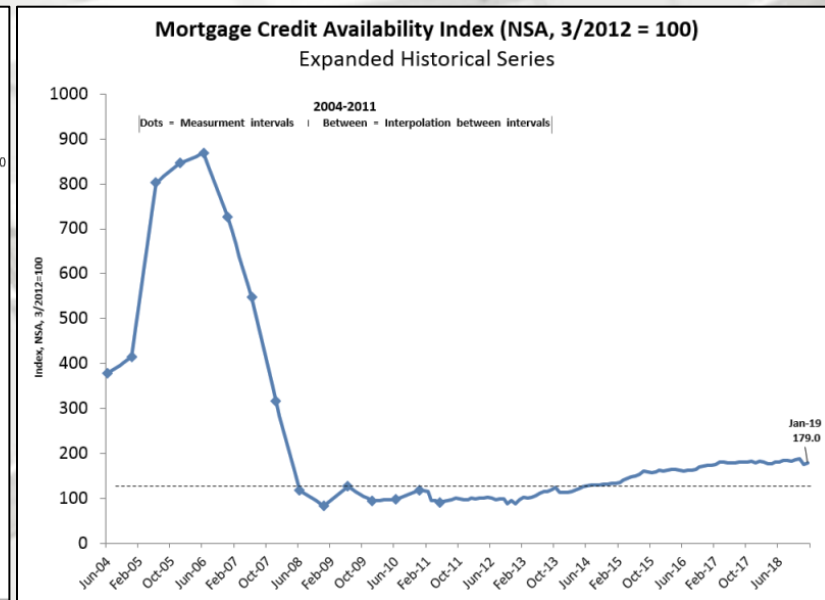
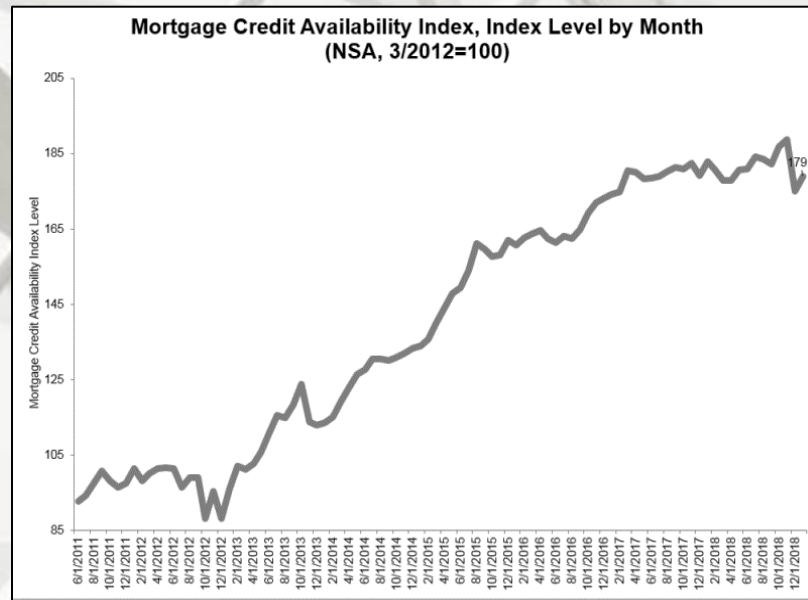
Mortgage Credit Availability Increased in January

“Mortgage credit availability increased in January according to the Mortgage Credit Availability Index (MCAI), a report from the Mortgage Bankers Association (MBA) which analyzes data from Ellie Mae's AllRegs[®] Market Clarity[®] business information tool.

The MCAI rose 2.3 percent to 179.0 in January. A decline in the MCAI indicates that lending standards are tightening, while increases in the index are indicative of loosening credit. The index was benchmarked to 100 in March 2012. The Conventional MCAI increased (4.9 percent), while the Government MCAI was unchanged. Of the component indices of the Conventional MCAI, the Conforming MCAI increased by 7.3 percent, and the Jumbo MCAI increased by 3.0 percent.

There was an increase in the supply of mortgage credit in January, which was a reversal from the December pullback that was caused by the end of the Home Affordable Refinance Program (HARP) and a reduction in jumbo offerings. Last month, investors and lenders added more programs to cater to lower credit score borrowers, in addition to new relief refinance programs. These relief refinance programs are not a direct replacement for HARP, but do serve a similar purpose to assist borrowers who may have run into financial challenges.” – Joel Kan, Vice President of Economic and Industry Forecasting, MBA

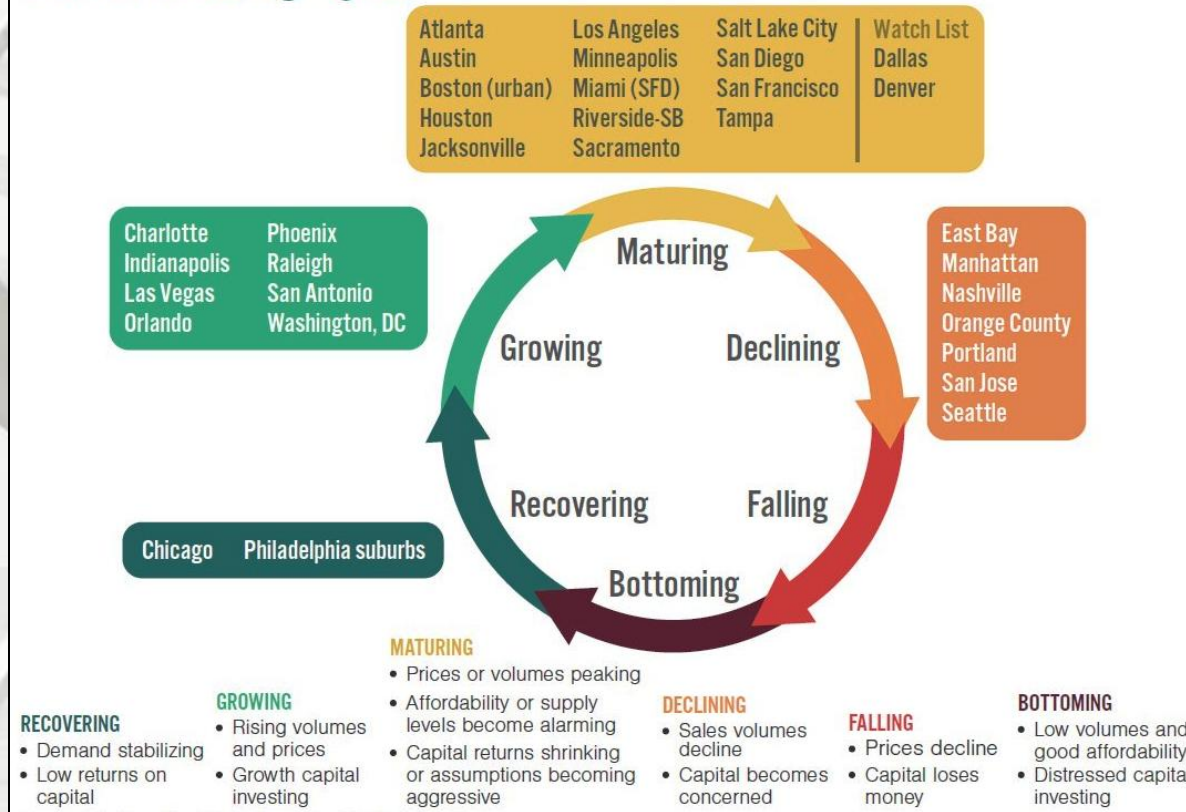
Mortgage Credit Availability



Sources: Mortgage Bankers Association; Powered by Ellie Mae's AllRegs® Market Clarity®

Housing Market

Most Markets in Growing/Maturing Phase of Their Long-Term Housing Cycle



Source: John Burns Real Estate Consulting, LLC (Pub: Jan-19)

Where are we in the housing cycle?

“Where are we in the [#housing](#) cycle? Here is [@JBREC](#) answer for major markets across the country. A lot more markets in the ‘Maturing’ & ‘Declining’ stage vs. one year ago.” – Rick Palacios Jr., Director of Research, John Burns Real Estate Consulting LLC

Summary

In summary:

November housing data was mixed, with month-over-month increases and declines in single-family starts, completions, and spending. Several housing data reports were negative on year-over-year basis. Total permits, total and single-family housing under construction, and expenditures remained positive. The new SF construction market needs consistent improvement in to influence the housing construction market upward. Existing sales continued their stagnating trend based on yearly analysis.

Housing, in the majority of categories, continues to be substantially less than their historical averages. The new SF housing construction sector is where the majority of value-added forest products are utilized and this housing sector has room for improvement.

Pros:

- 1) Historically low interest rates are still in effect, though in aggregate rates are incrementally rising;
- 2) Housing affordability is suffering – and deteriorating in discrete U.S. metros;
- 3) Select builders are beginning to focus on entry-level houses.

Cons:

- 1) Lot availability and building regulations (according to several sources);
- 2) Increasing interest rates;
- 3) Laborers;
- 4) Household formations still lag historical averages;
- 5) Changing attitudes towards SF ownership;
- 6) Job creation is improving and consistent but some economists question the quantity and types of jobs being created;
- 7) Debt: Corporate, personal, government – United States and globally;
- 8) Other global uncertainties.

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