

The Virginia Tech – U.S. Forest Service

May 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



2018

Virginia Polytechnic Institute and State University

CNRE-22NP

Virginia Cooperative Extension programs and employment are open to all, regardless of age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, veteran status, or any other basis protected by law. An equal opportunity/affirmative action employer. Issued in furtherance of Cooperative Extension work, Virginia Polytechnic Institute and State University, Virginia State University, and the U.S. Department of Agriculture cooperating. Edwin J. Jones, Director, Virginia Cooperative Extension, Virginia Tech, Blacksburg; M. Ray McKinnie, Administrator, 1890 Extension Program, Virginia State University, Petersburg.

Table of Contents

Slide 3: [Opening Remarks](#)
Slide 4: [Housing Scorecard](#)
Slide 5: [Wood Use in Construction](#)
Slide 8: [New Housing Starts](#)
Slide 13: [Regional Housing Starts](#)
Slide 22: [New Housing Permits](#)
Slide 25: [Regional New Housing Permits](#)
Slide 32: [Housing Under Construction](#)
Slide 34: [Regional Under Construction](#)
Slide 39: [Housing Completions](#)
Slide 44: [Regional Housing Completions](#)

Slide 46: [New Single-Family House Sales](#)
Slide 49: [Regional SF House Sales & Price](#)
Slide 56: [New SF Sales-Population Ratio](#)
Slide 65: [Construction Spending](#)
Slide 68: [Construction Spending Shares](#)
Slide 72: [Remodeling](#)
Slide 73: [Existing House Sales](#)
Slide 76: [First-Time Purchasers](#)
Slide 77: [Affordability](#)
Slide 81: [Summary](#)
Slide 82: [Virginia Tech Disclaimer](#)
Slide 83: [USDA Disclaimer](#)

This report is a free monthly service of Virginia Tech. Past issues are available at: <http://woodproducts.sbio.vt.edu/housing-report>.

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

Opening Remarks

May's aggregate housing data mostly positive on a monthly and year-over-year basis. The exception was existing sales, which remain on a slight declining trend. New single-family starts, under construction, completions, and sales improved on a month-over-month basis and were fairly robust on a year-over-year basis. New single-family construction spending indicated a minimal positive change on a monthly basis. Regionally, data were mixed across all sectors. The July 11th Atlanta Fed GDPNow™ residential investment spending model projects an aggregate 0.2% for Quarter Two 2018. New private permanent site expenditures were projected for a 0.6% increase; the improvement spending forecast was a 4.8% increase; and the manufactured/mobile housing projection was a -19.8% decline (all: quarterly log change and seasonally adjusted annual rate).¹

“Slowing home price appreciation in the second quarter was not enough to counteract an 11 percent increase in mortgage rates compared to a year ago, resulting in the worst home affordability we've seen in nearly 10 years. Meanwhile home price appreciation continued to outpace wage growth, speeding up the affordability treadmill for prospective homebuyers even without the rise in mortgage rates.”² – Daren Blomquist, Senior Vice President, ATTOM Data Solutions

This month's commentary also contains applicable housing data, home ownership, building products; and economic information. Section I contains data and commentary and Section II includes Federal Reserve analysis, private indicators, and demographic and economic commentary.

Sources: ¹ <https://www.frbatlanta.org/cqer/research/gdpnow.aspx>; 7/16/18;

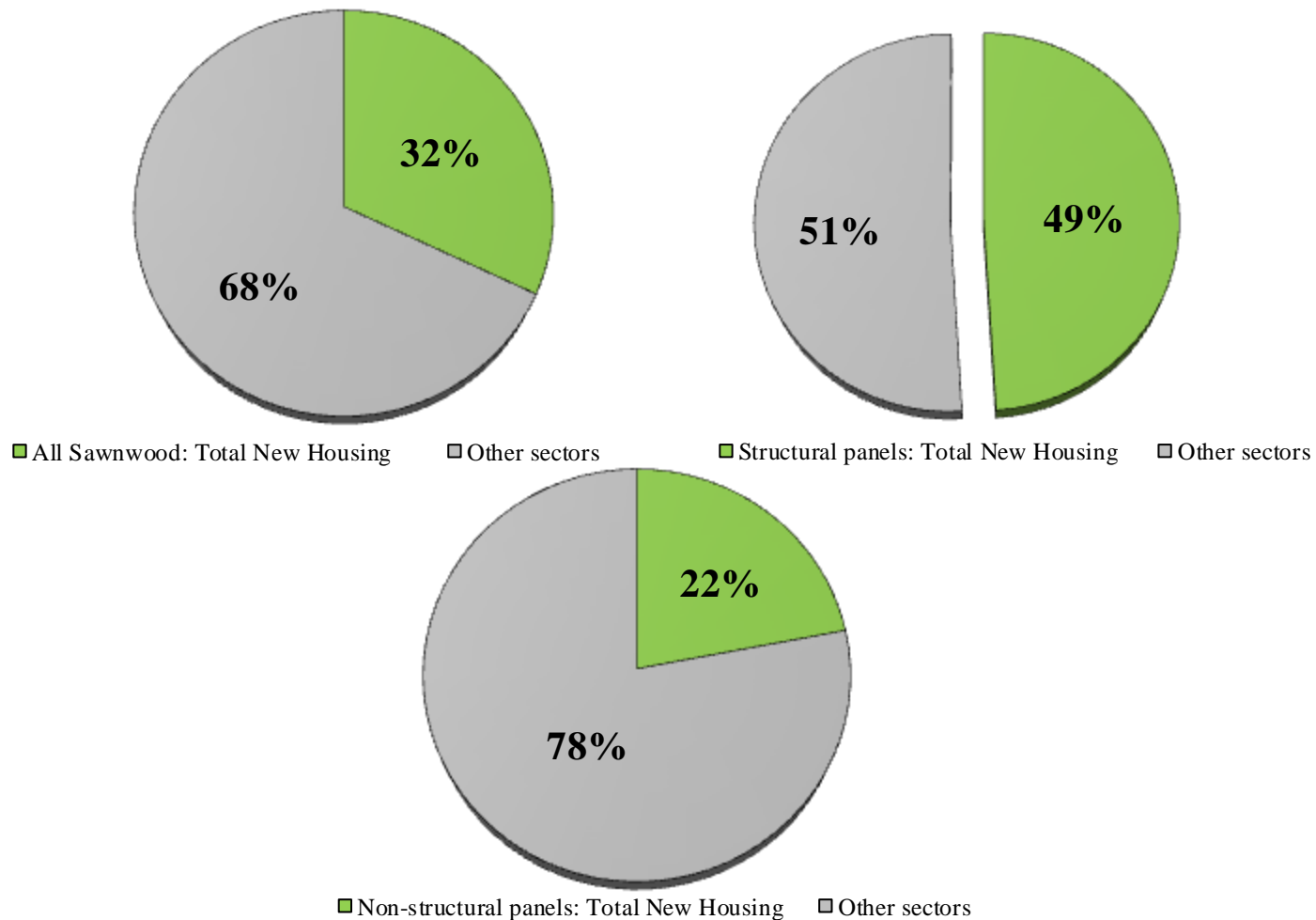
² <https://www.attomdata.com/news/market-trends/home-sales-prices/q2-2018-u-s-home-affordability-report>; 6/21/18

May 2018

Housing Scorecard

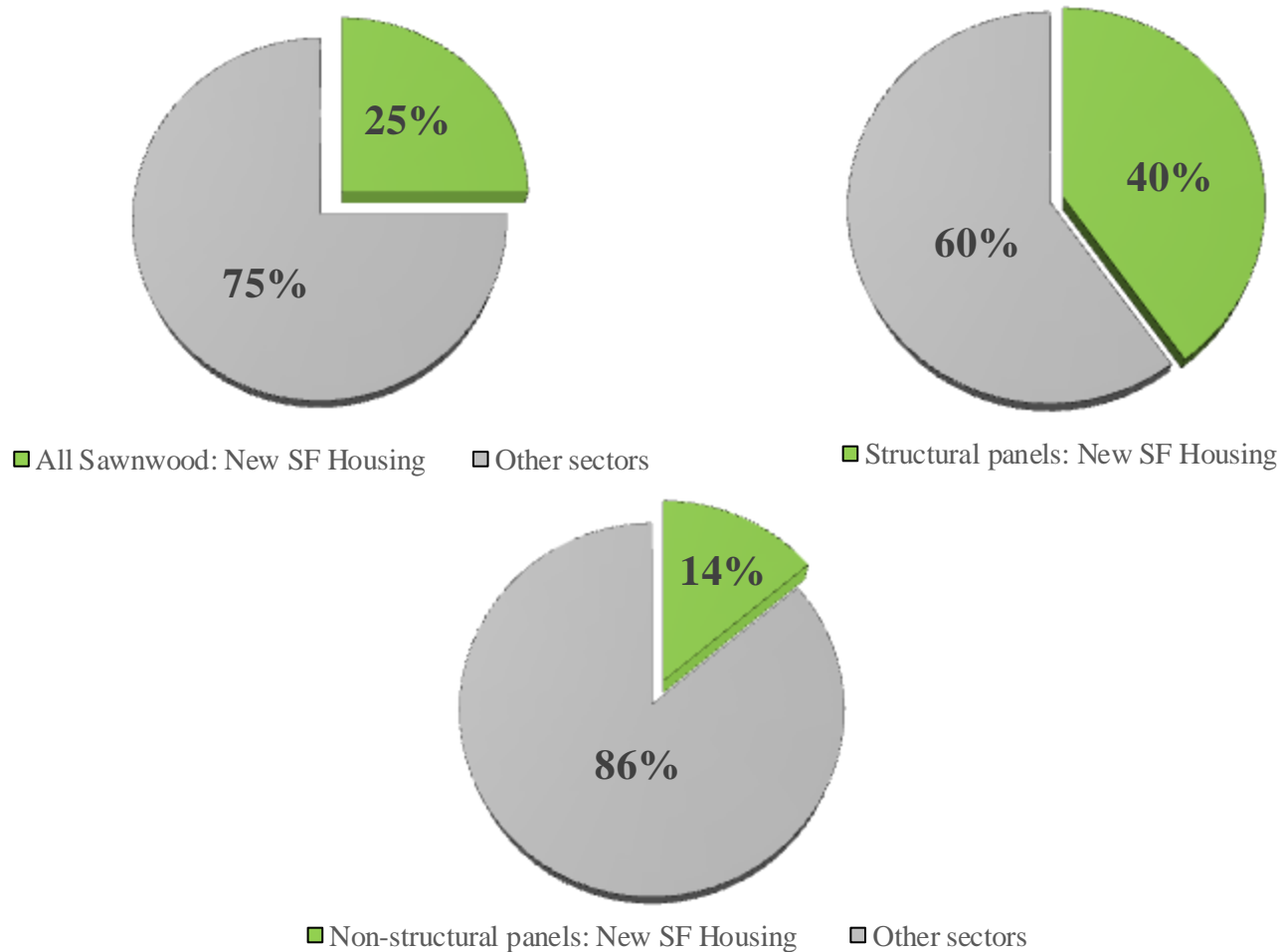
	M/M	Y/Y
Housing Starts	△ 5.0%	△ 20.3%
Single-Family Starts	△ 3.9%	△ 18.3%
Housing Permits	▽ 4.6%	△ 8.0%
Single-Family Permits	▽ 2.2%	△ 7.7%
Housing Under Construction	△ 0.2%	△ 5.3%
Single-Family Under Construction	△ 0.2%	△ 12.0%
Housing Completions	△ 1.9%	△ 10.4%
Single-Family Completions	△ 11.0%	△ 11.5%
New Single-Family House Sales	△ 6.7%	△ 14.1%
Private Residential Construction Spending	△ 0.8%	△ 6.6%
Single-Family Construction Spending	△ 0.6%	△ 8.2%
Existing House Sales ¹	▽ 0.4%	▽ 3.0%

New Construction Percentage of Wood Products Consumption

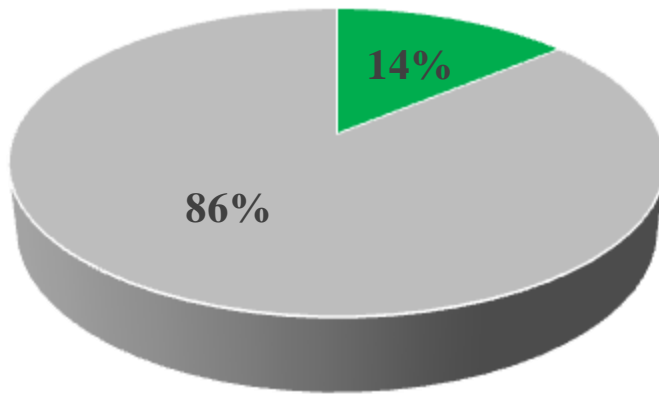


Source: U.S. Forest Service. Howard, J. and D. McKeever. 2017. U.S. Forest Products Annual Market Review and Prospects, 2013-2017

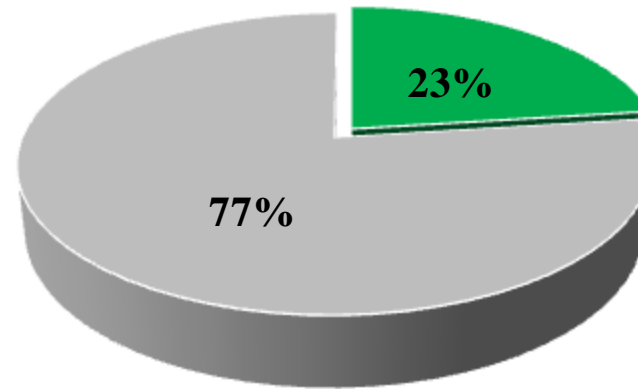
New SF Construction Percentage of Wood Products Consumption



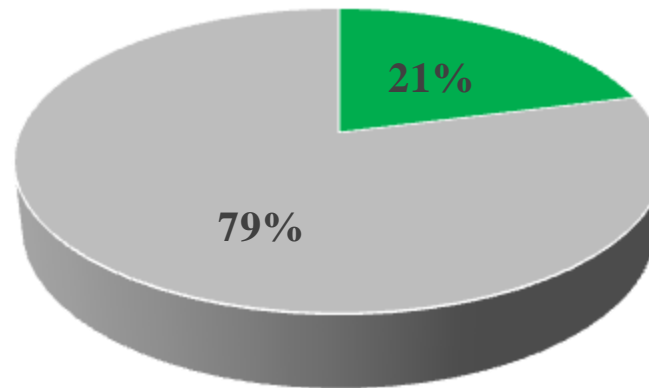
Repair and Remodeling's Percentage of Wood Products Consumption



■ Non-structural panels: RR ■ Other sectors



■ All Sawnwood: RR ■ Other sectors



■ Structural panels: RR ■ Other sectors

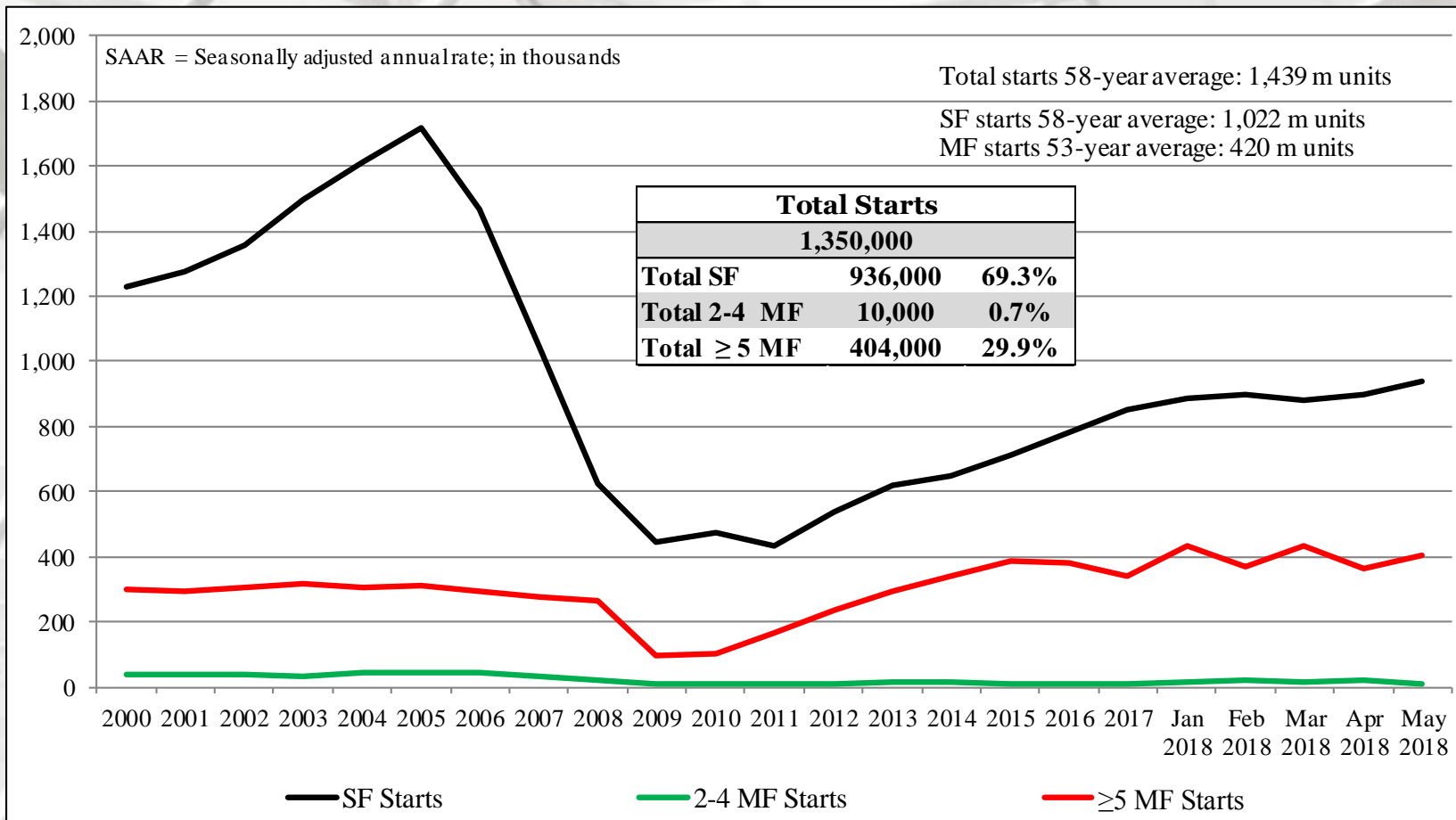
New Housing Starts

	Total Starts*	SF Starts	MF 2-4 Starts**	MF ≥5 Starts
May	1,350,000	936,000	10,000	404,000
April	1,286,000	901,000	22,000	363,000
2017	1,122,000	791,000	14,000	317,000
M/M change	5.0	3.9	-54.5	11.3
Y/Y change	20.3	18.3	-28.6	27.4

* 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)).

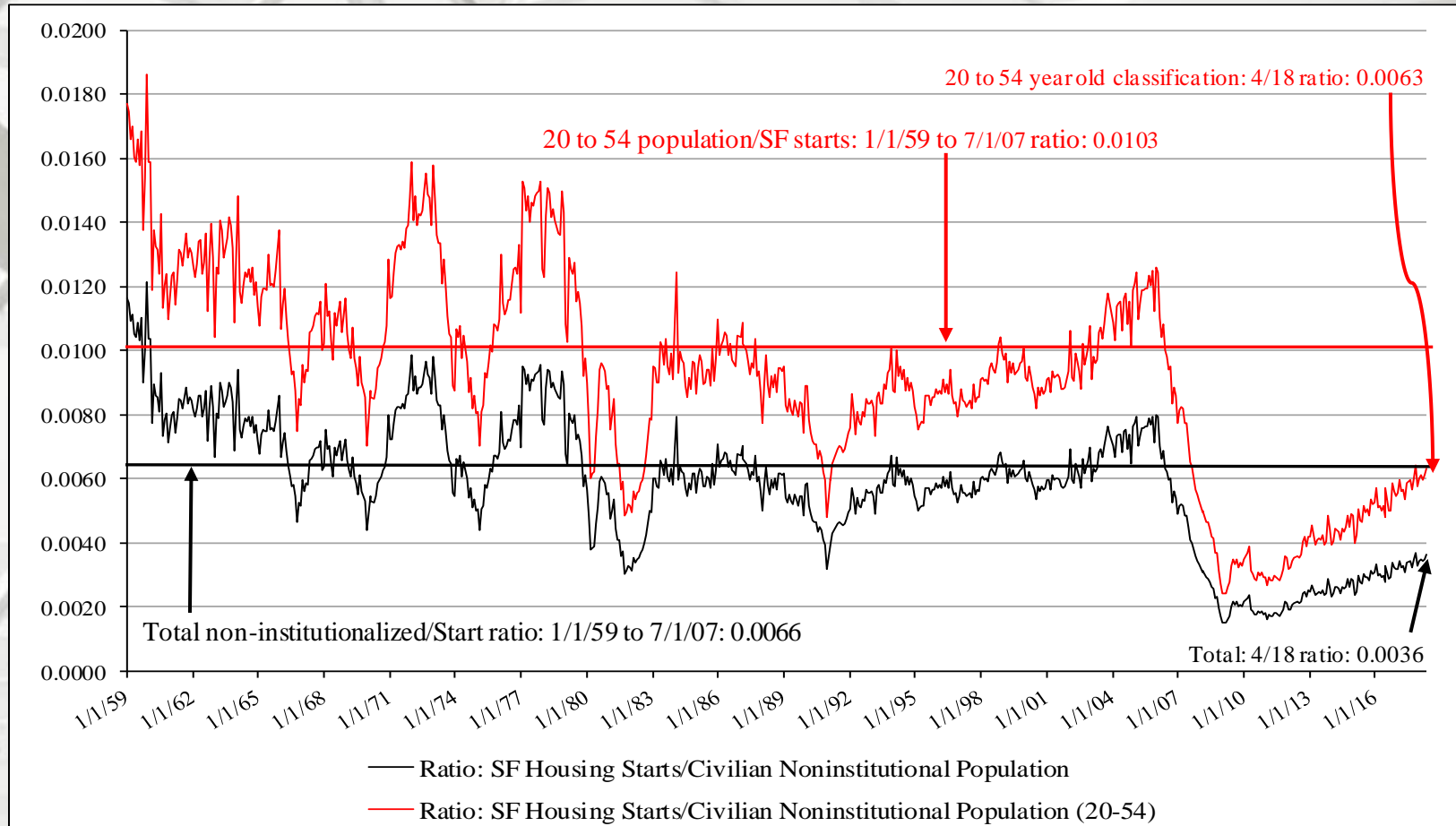
Total Housing Starts



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

* Percentage of total starts.

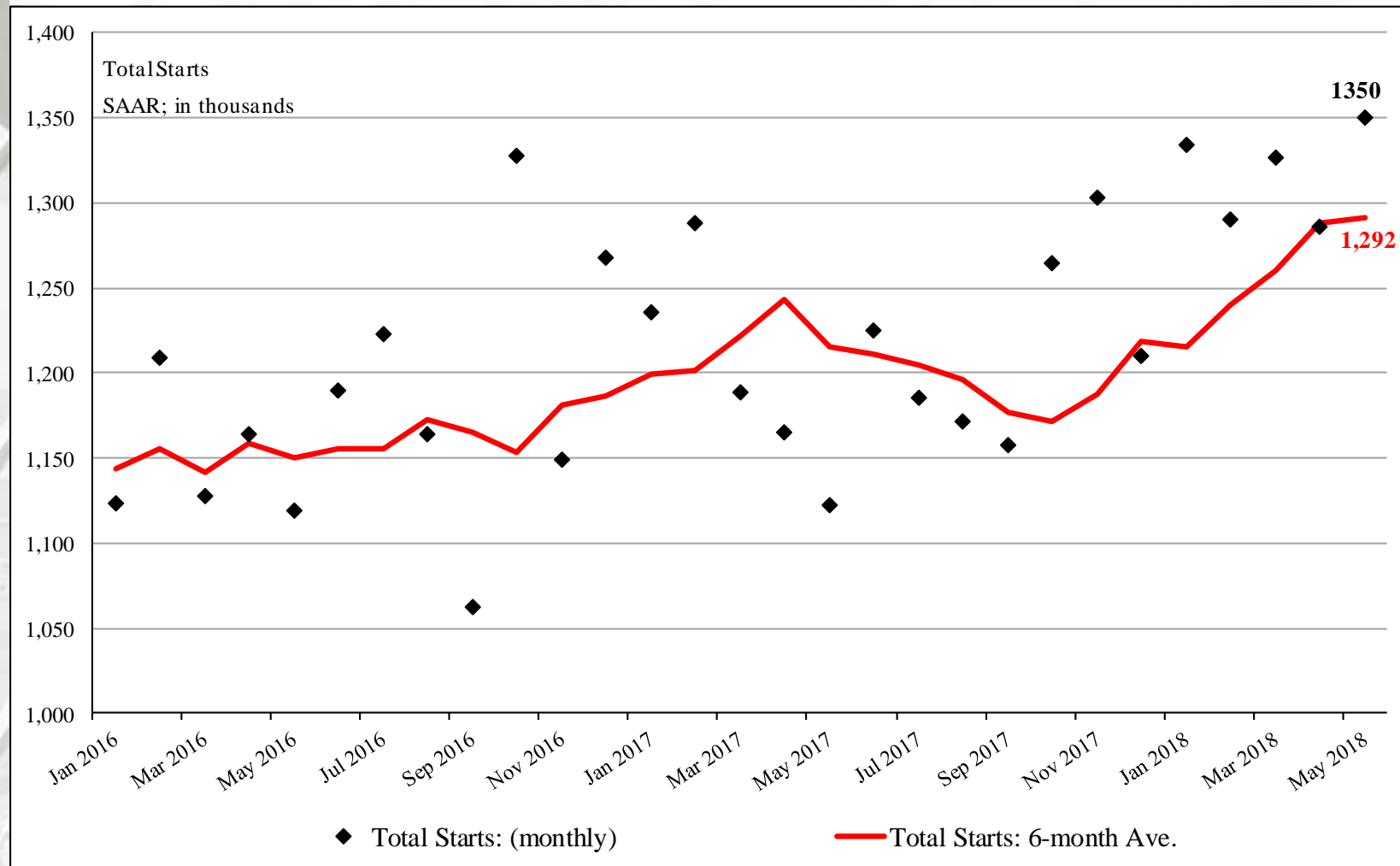
New SF Starts



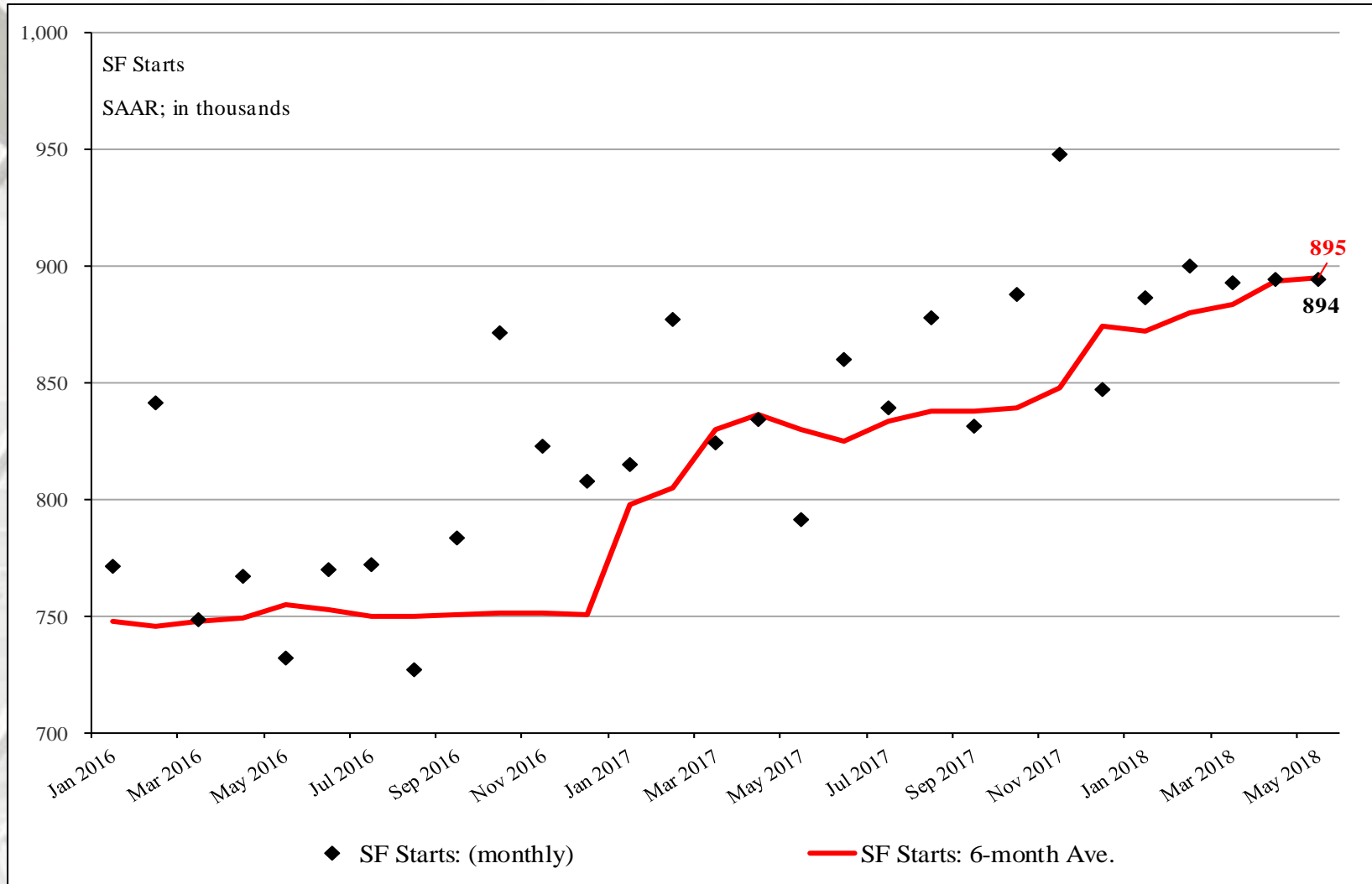
New SF starts adjusted for the US population

From May 1959 to July 2007, the long-term ratio of new SF starts to the total US non-institutionalized population was 0.0066; in May 2017 it was 0.0036 – a slight increase from April (0.0035). The long-term ratio of non-institutionalized population, aged 20 to 54 is 0.0103; in May 2017 was 0.0063 – also an increase change from April (0.0061). From a population worldview, construction is less than what is necessary for changes in population (i.e., under-building).

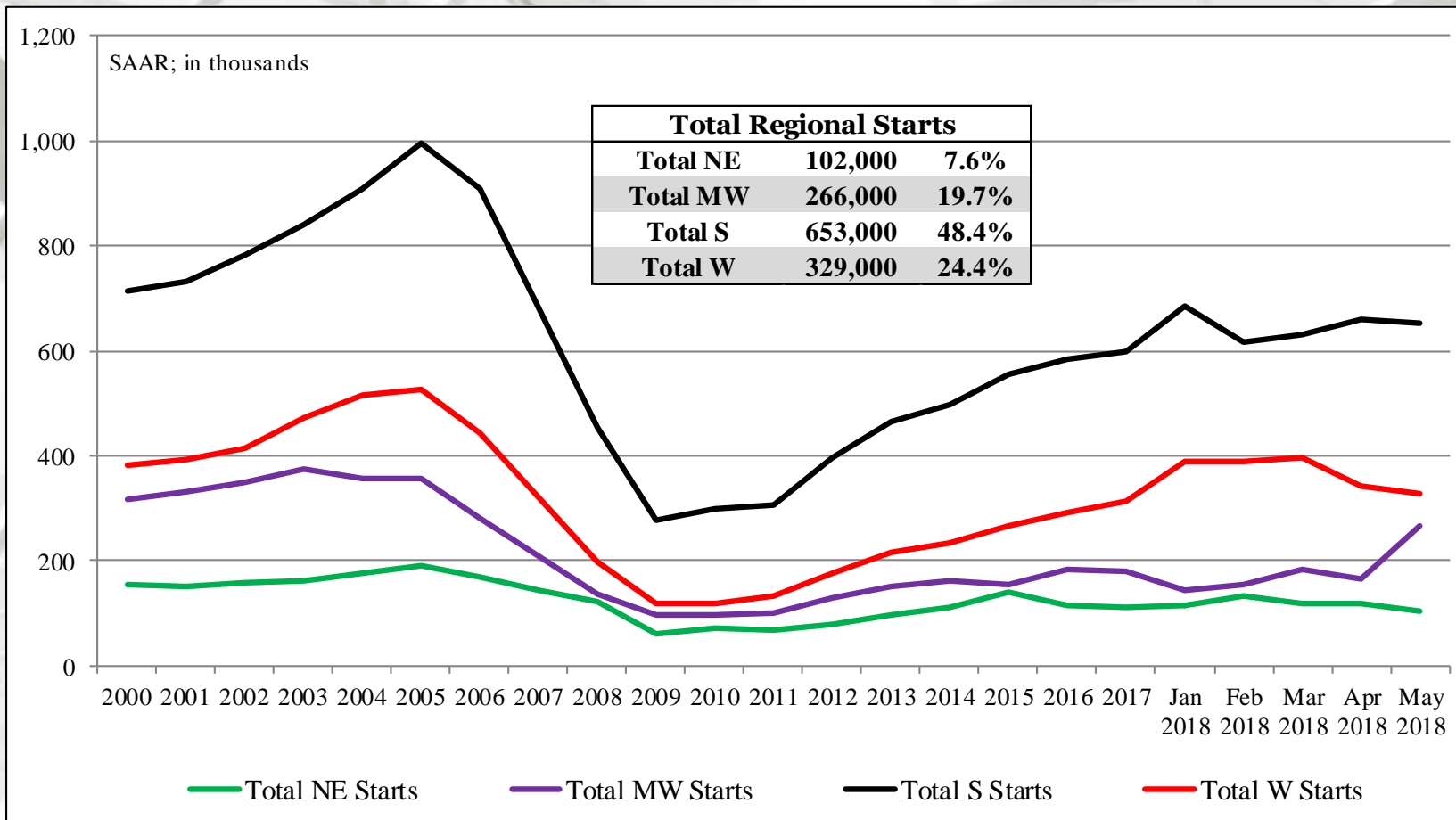
Total Housing Starts: Six-Month Average



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**
May	102,000	65,000	37,000
April	120,000	59,000	61,000
2017	85,000	55,000	30,000
M/M change	-15.0	10.2	-39.3
Y/Y change	20.0	18.2	23.3
	MW Total	MW SF	MW MF
May	266,000	156,000	110,000
April	164,000	108,000	56,000
2017	164,000	139,000	25,000
M/M change	62.2	44.4	96.4
Y/Y change	62.2	12.2	340.0

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).

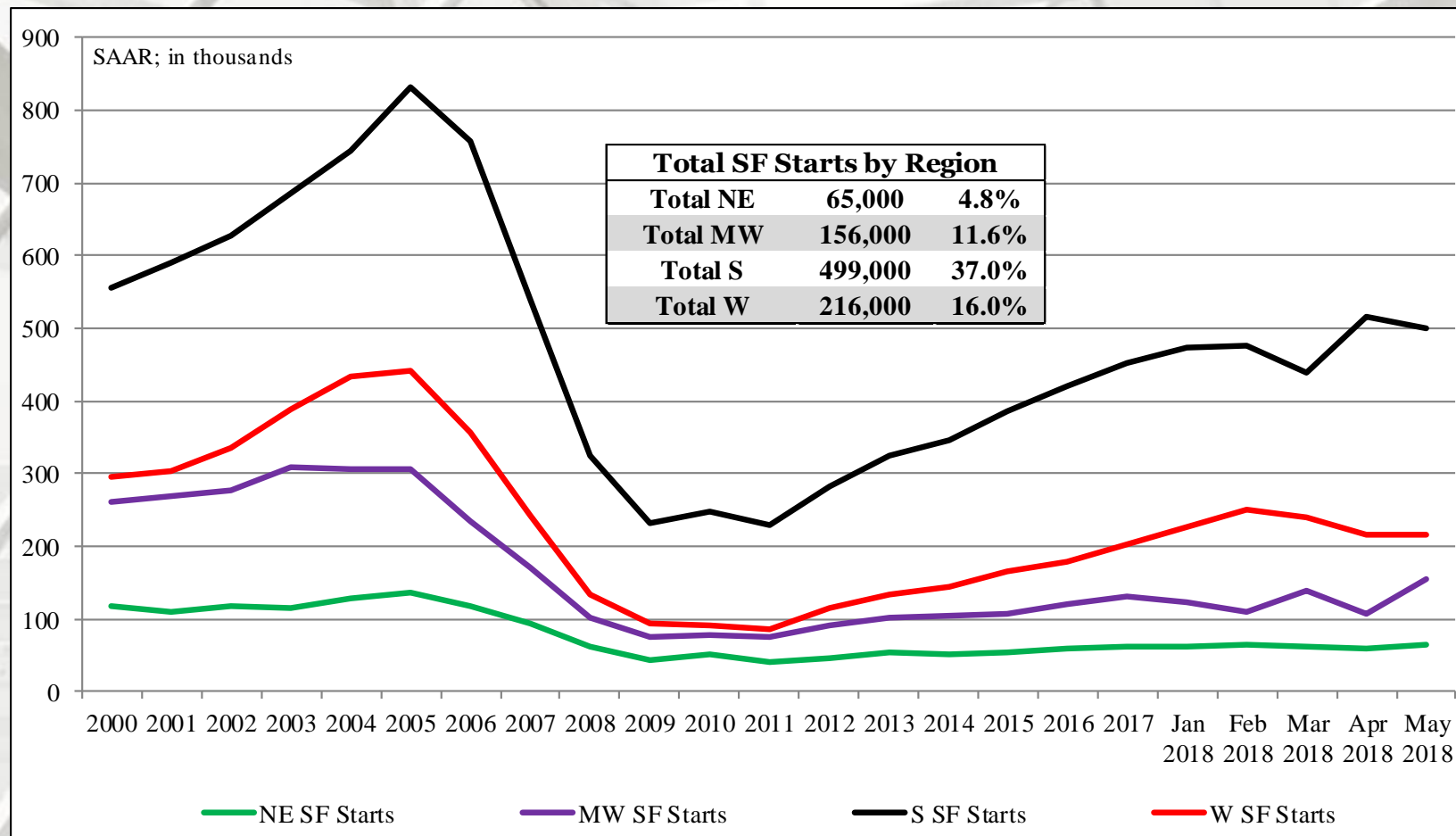
New Housing Starts by Region

	S Total	S SF	S MF**
May	653,000	499,000	154,000
April	659,000	517,000	142,000
2017	559,000	407,000	152,000
M/M change	-0.9	-3.5	8.5
Y/Y change	16.8	22.6	1.3
	W Total	W SF	W MF
May	329,000	216,000	113,000
April	343,000	217,000	126,000
2017	314,000	190,000	124,000
M/M change	-4.1	-0.5	-10.3
Y/Y change	4.8	13.7	-8.9

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

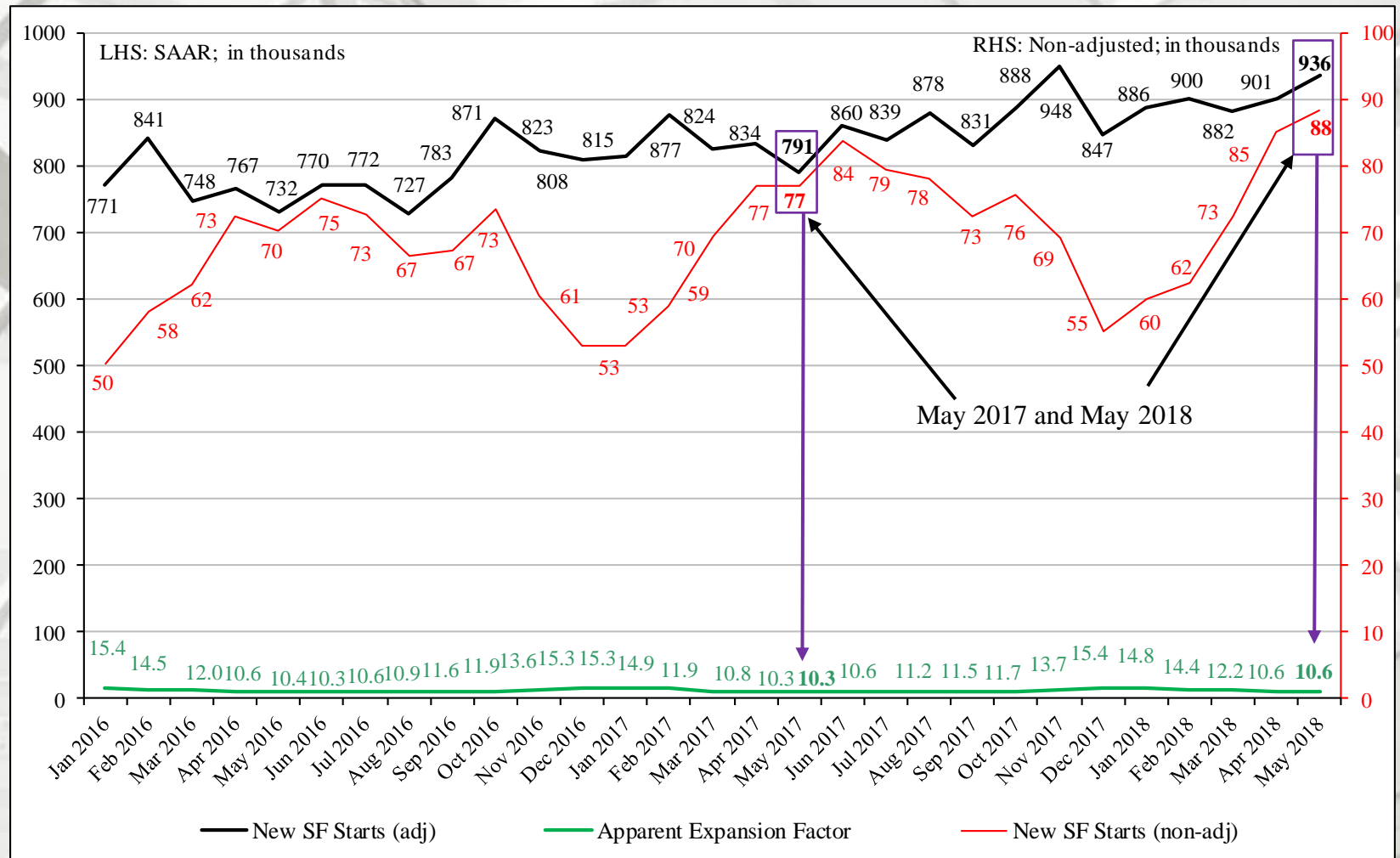


NE = Northeast, MW = Midwest, S = South, W = West

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

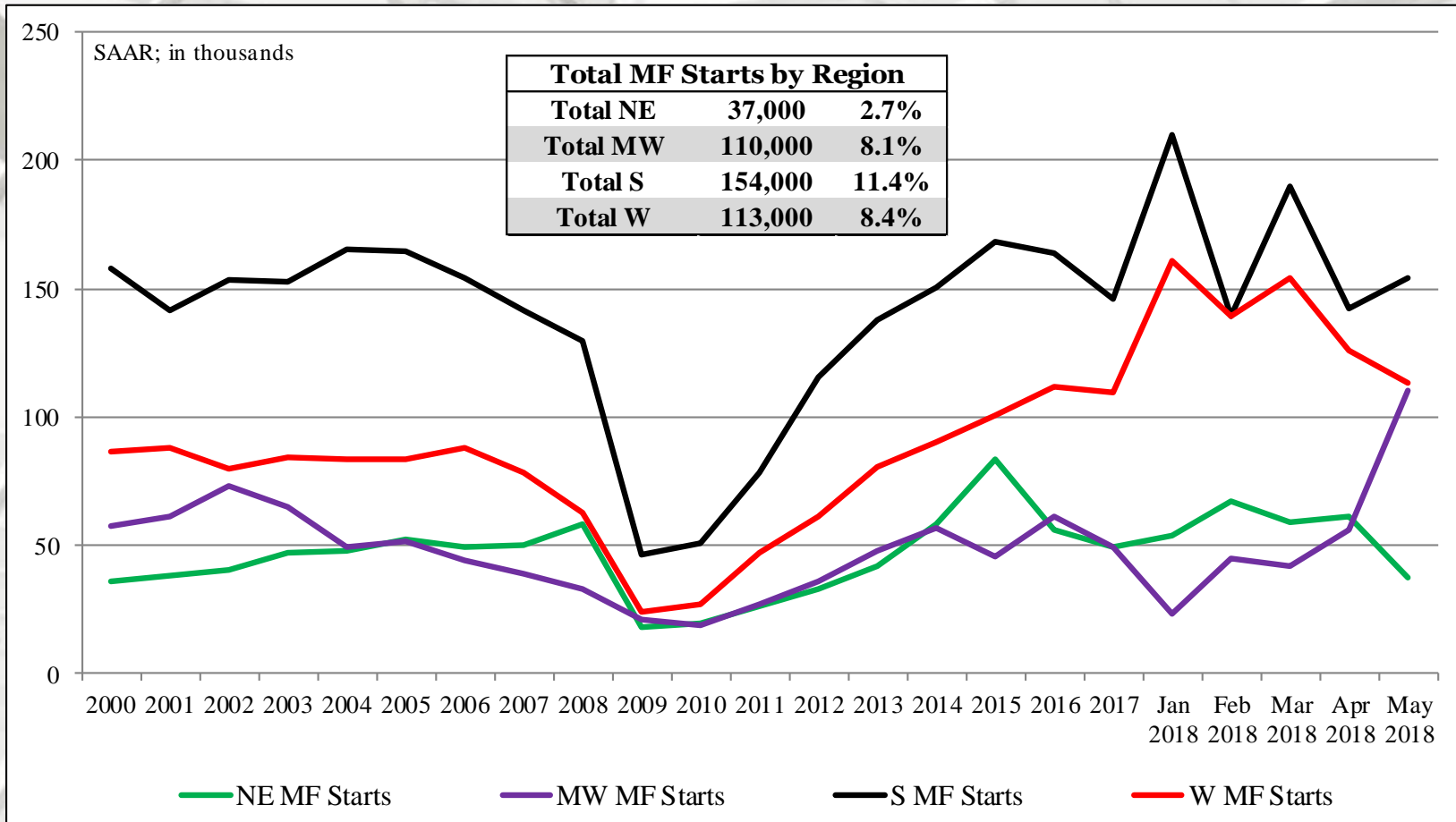


Nominal and Adjusted New SF Monthly Starts

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

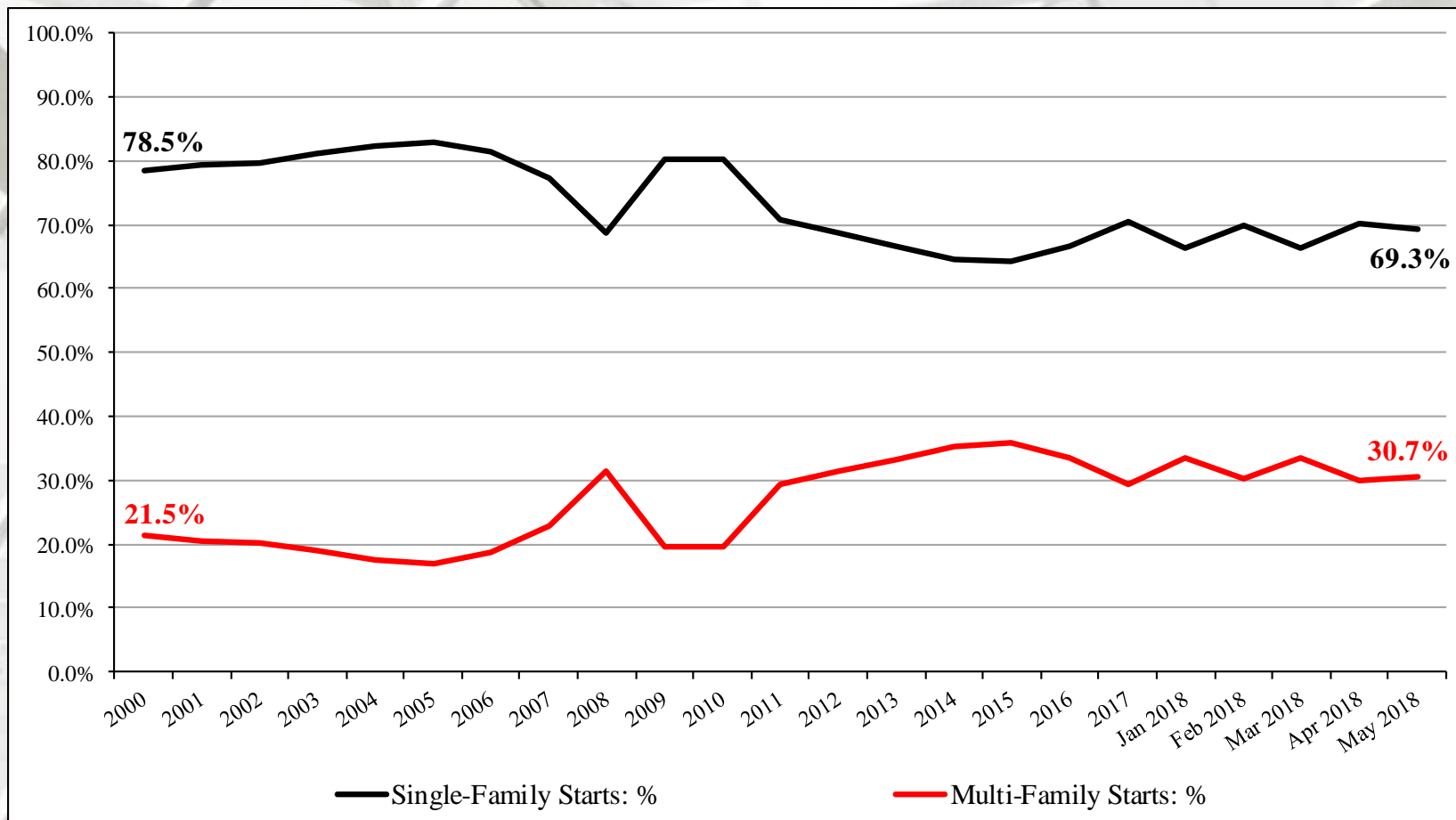


NE = Northeast, MW = Midwest, S = South, W = West

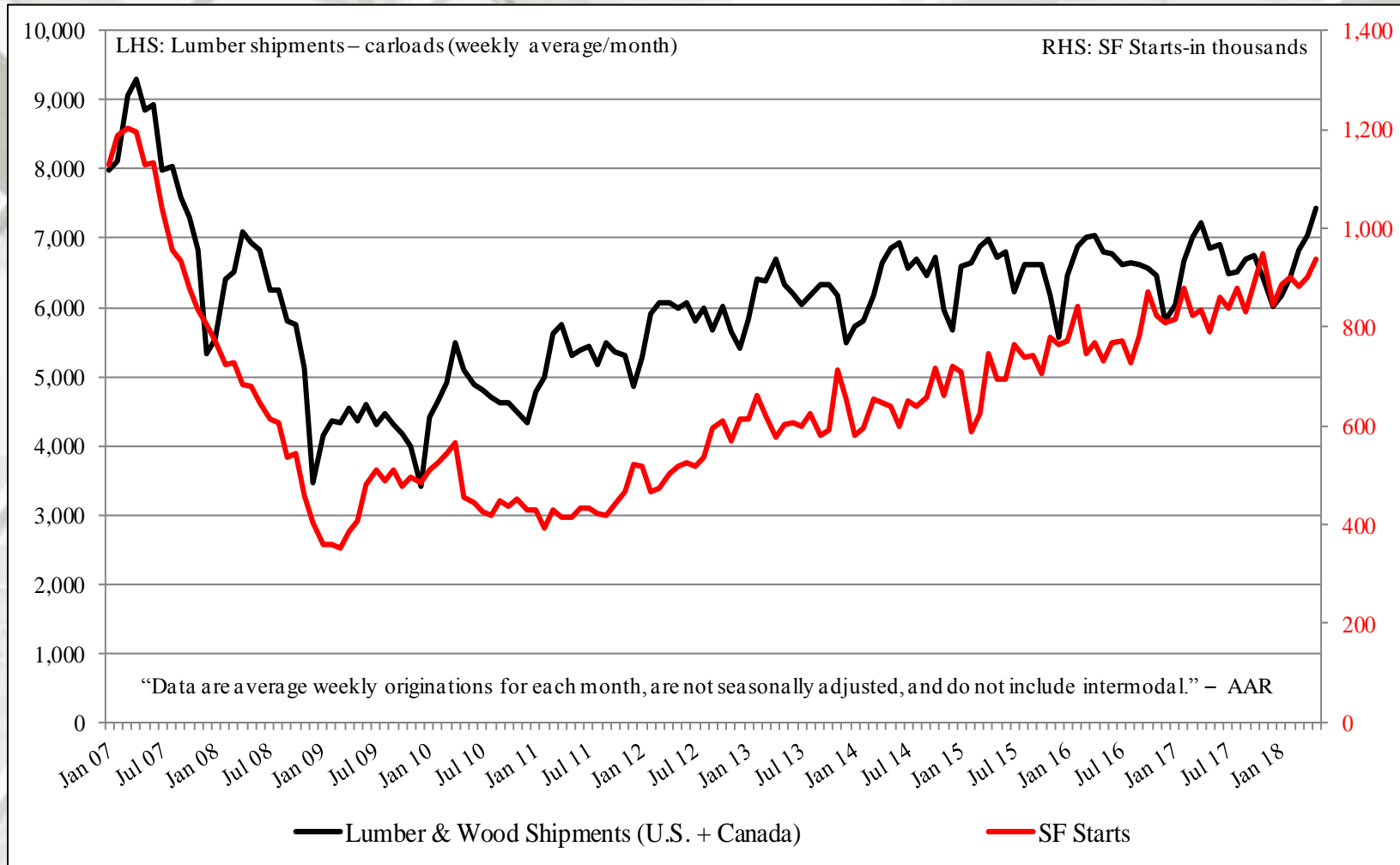
US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* Percentage of total starts.

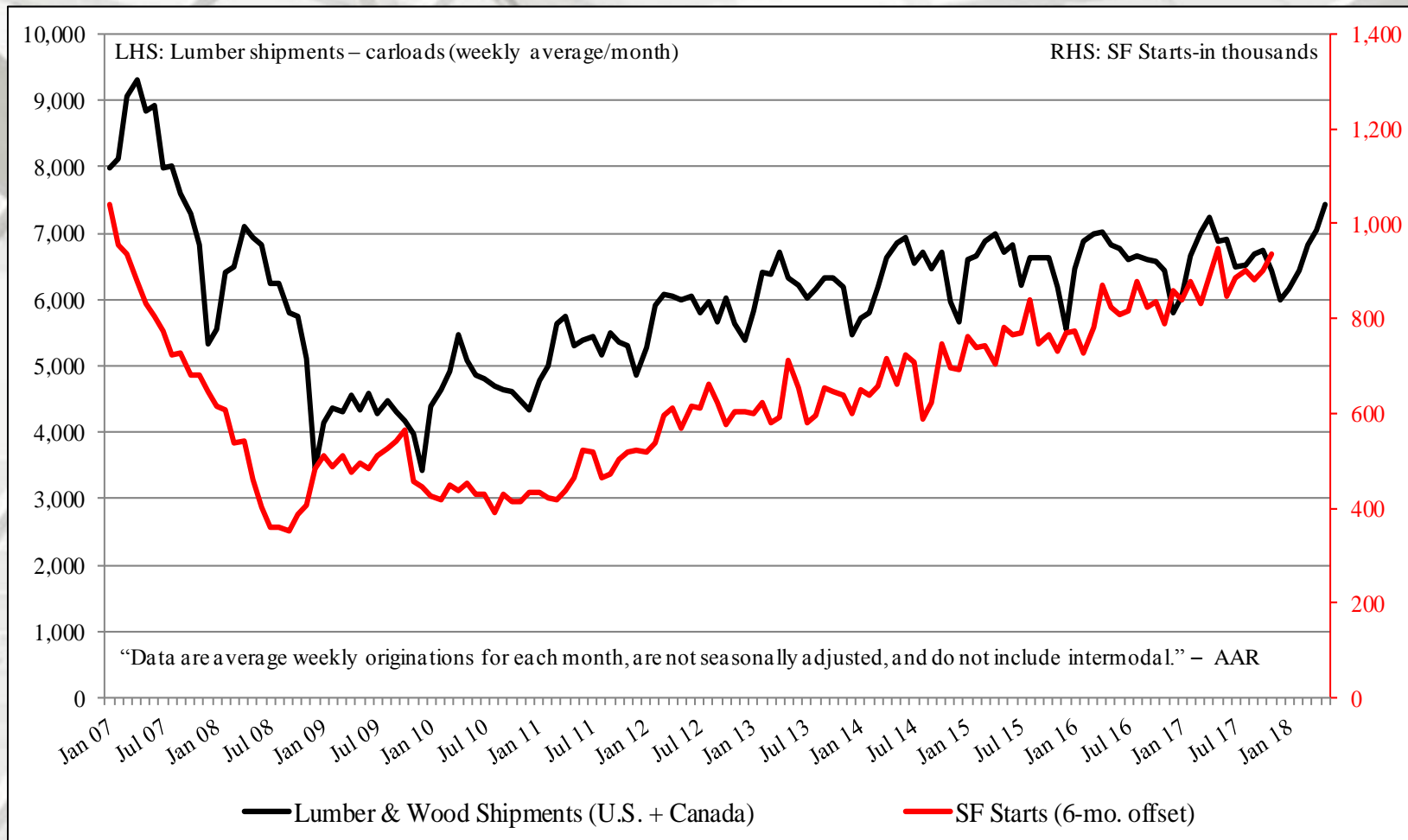
SF & MF Housing Starts (%)



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



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



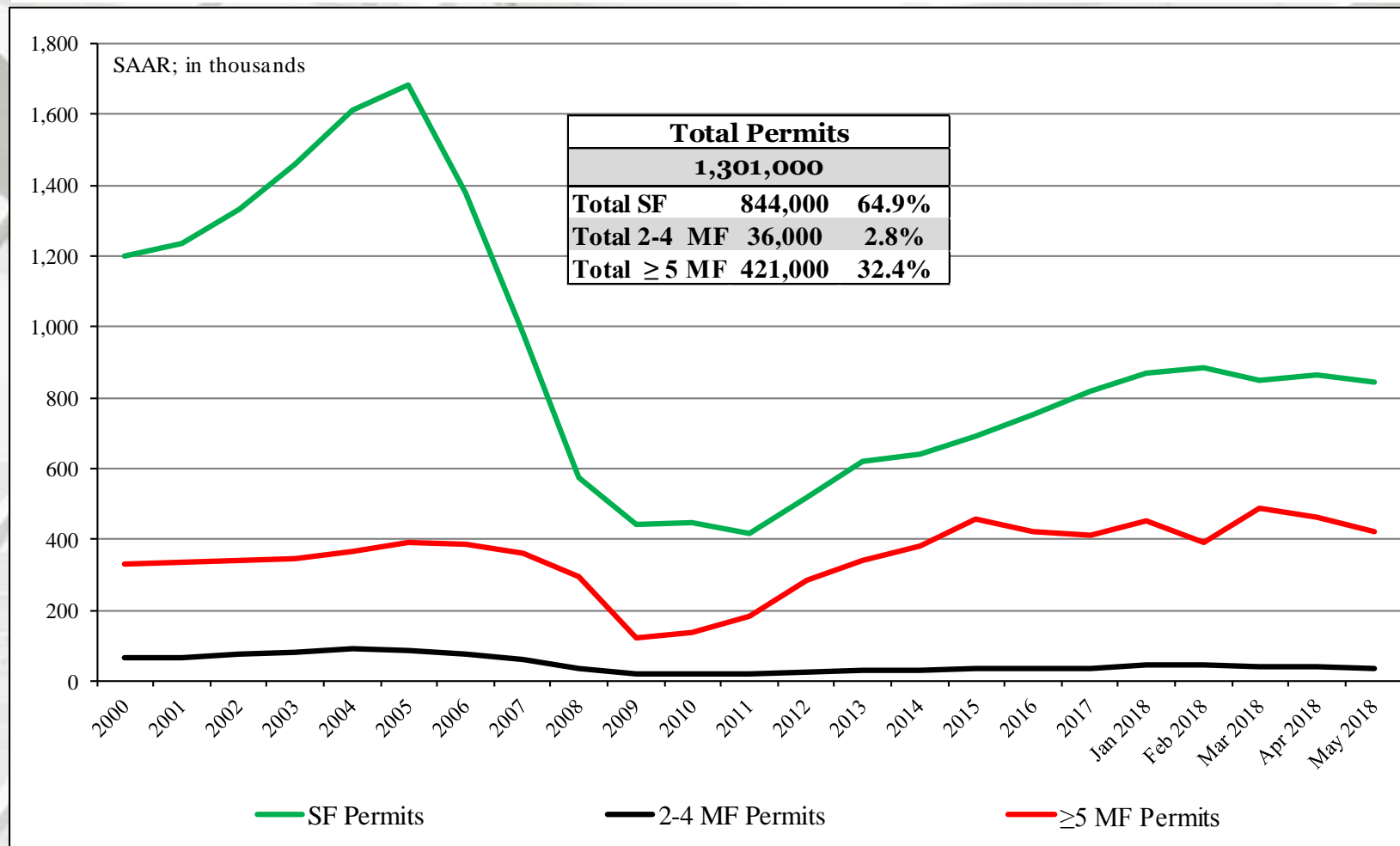
In this graph, January 2007 lumber shipments are contrasted with July 2007 SF starts, and continuing through May 2018 SF starts. The purpose is to discover if lumber shipments relate to future single-family starts. Also, it is realized that lumber and wood products are trucked; however, to our knowledge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

New Housing Permits

	Total Permits*	SF Permits	MF 2-4 unit Permits	MF ≥ 5 unit Permits
May	1,301,000	844,000	36,000	421,000
April	1,364,000	863,000	41,000	460,000
2017	1,205,000	784,000	35,000	386,000
M/M change	-4.6	-2.2	-12.2	-8.5
Y/Y change	8.0	7.7	2.9	9.1

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

Total New Housing Permits

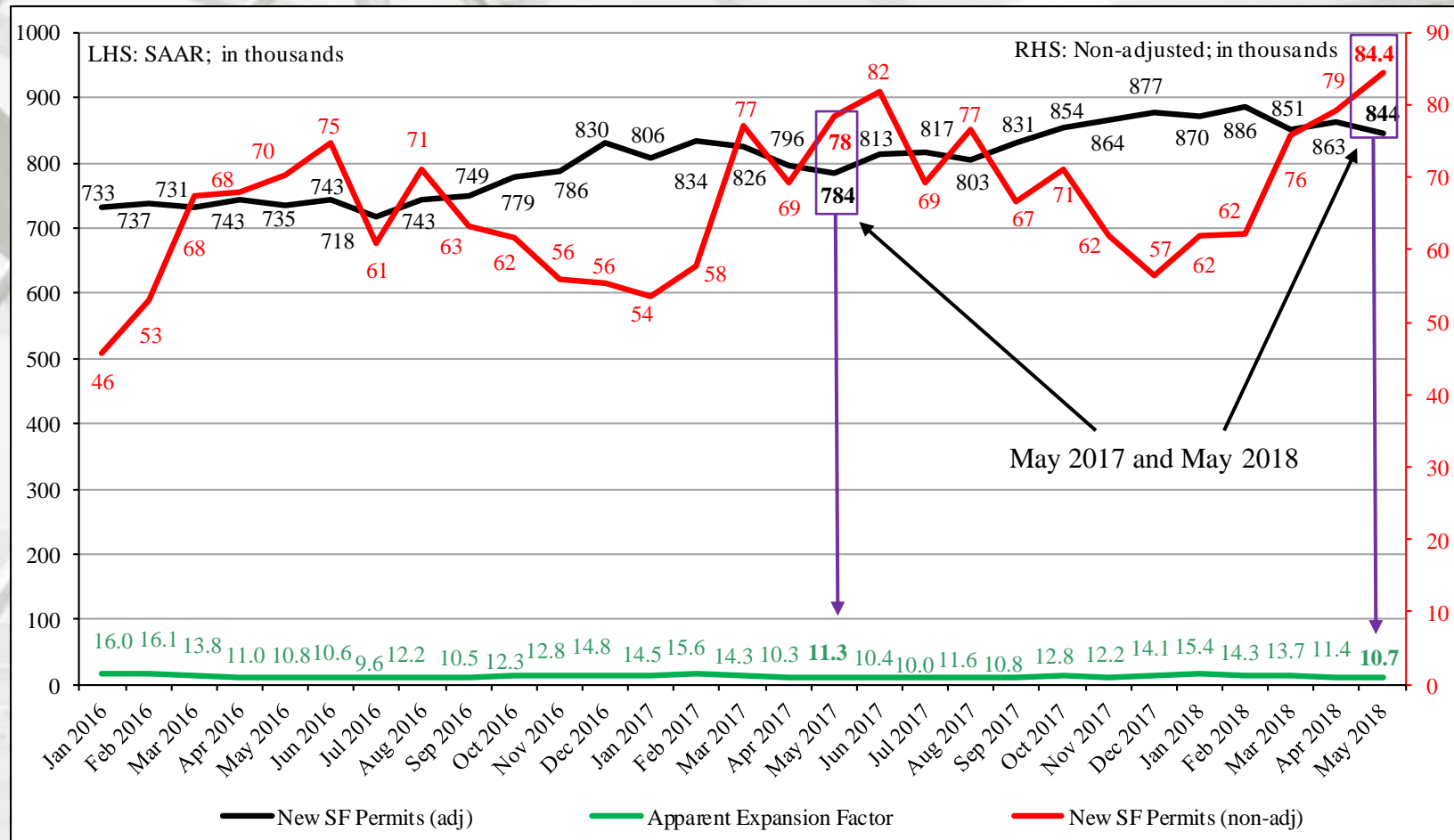


NE = Northeast, MW = Midwest, S = South, W = West

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**
May	135,000	57,000	78,000
April	95,000	51,000	44,000
2017	124,000	50,000	74,000
M/M change	42.1	11.8	77.3
Y/Y change	8.9	14.0	5.4
	MW Total*	MW SF	MW MF**
May	209,000	121,000	88,000
April	195,000	123,000	72,000
2017	178,000	109,000	69,000
M/M change	7.2	-1.6	22.2
Y/Y change	17.4	11.0	27.5

* All data are SAAR

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

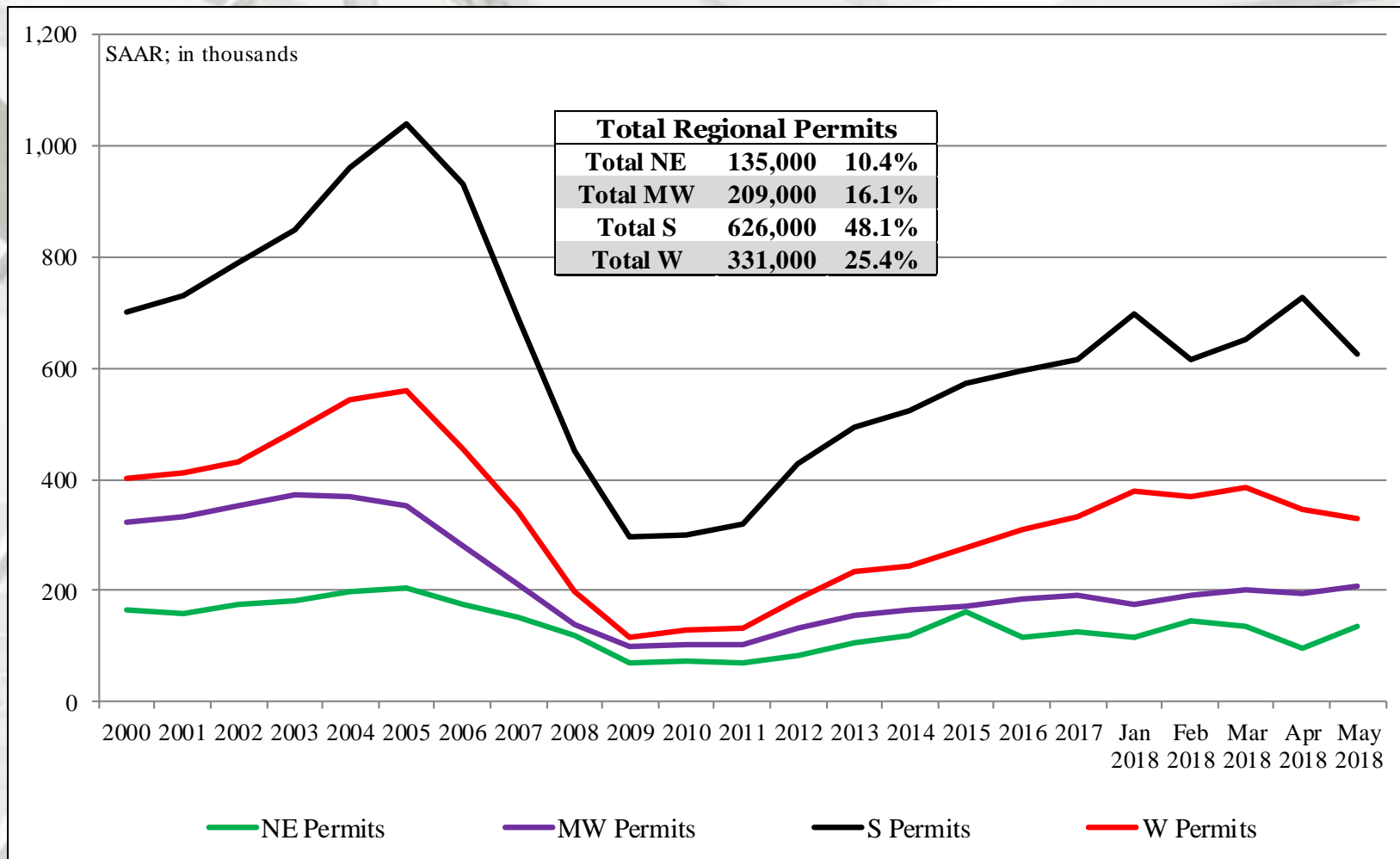
New Housing Permits by Region

	S Total*	S SF	S MF**
May	626,000	463,000	163,000
April	727,000	479,000	248,000
2017	597,000	439,000	158,000
M/M change	-13.9	-3.3	-34.3
Y/Y change	4.9	5.5	3.2
	W Total*	W SF	W MF**
May	331,000	203,000	128,000
April	347,000	210,000	137,000
2017	306,000	186,000	120,000
M/M change	-4.6	-3.3	-6.6
Y/Y change	8.2	9.1	6.7

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

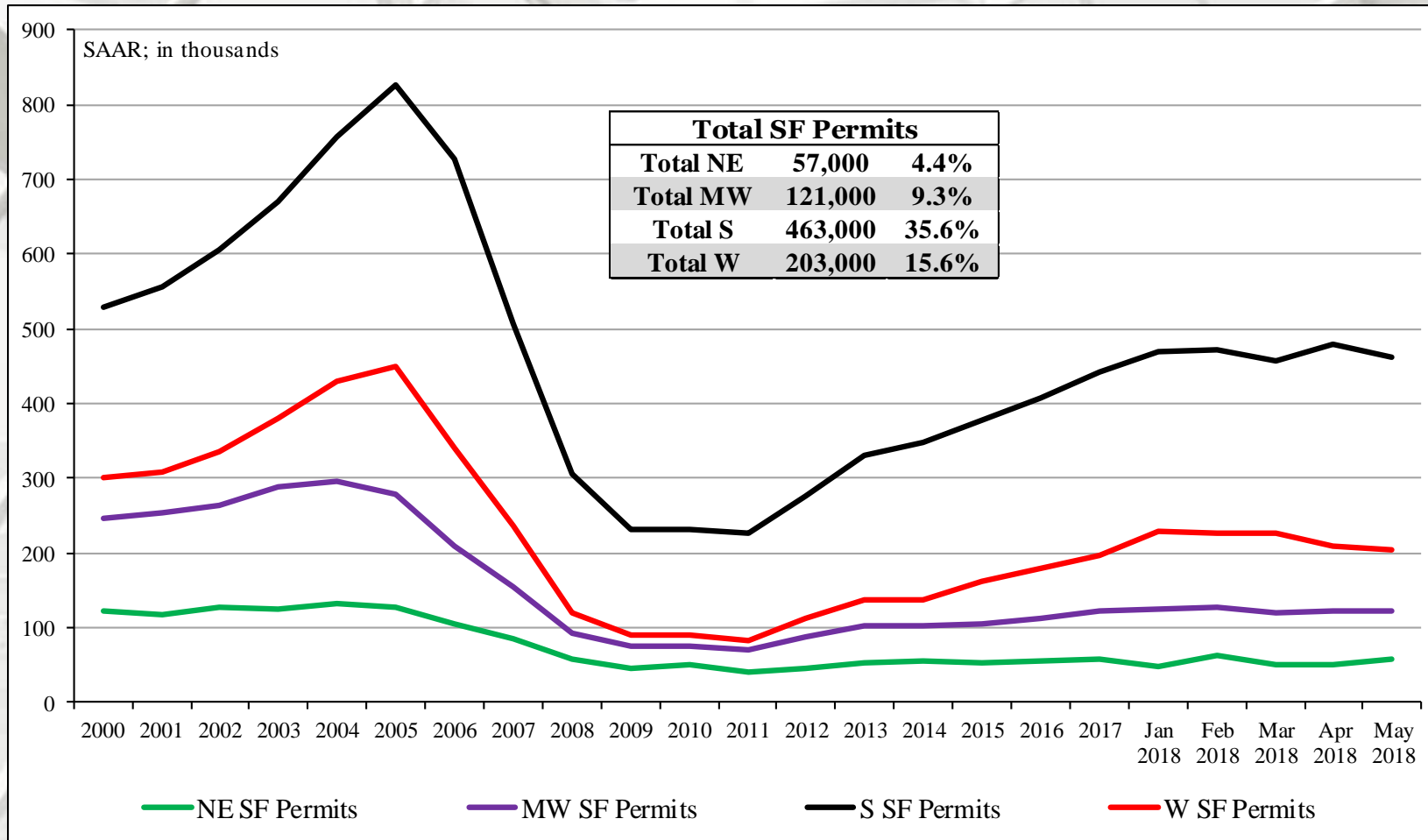


NE = Northeast, MW = Midwest, S = South, W = West

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

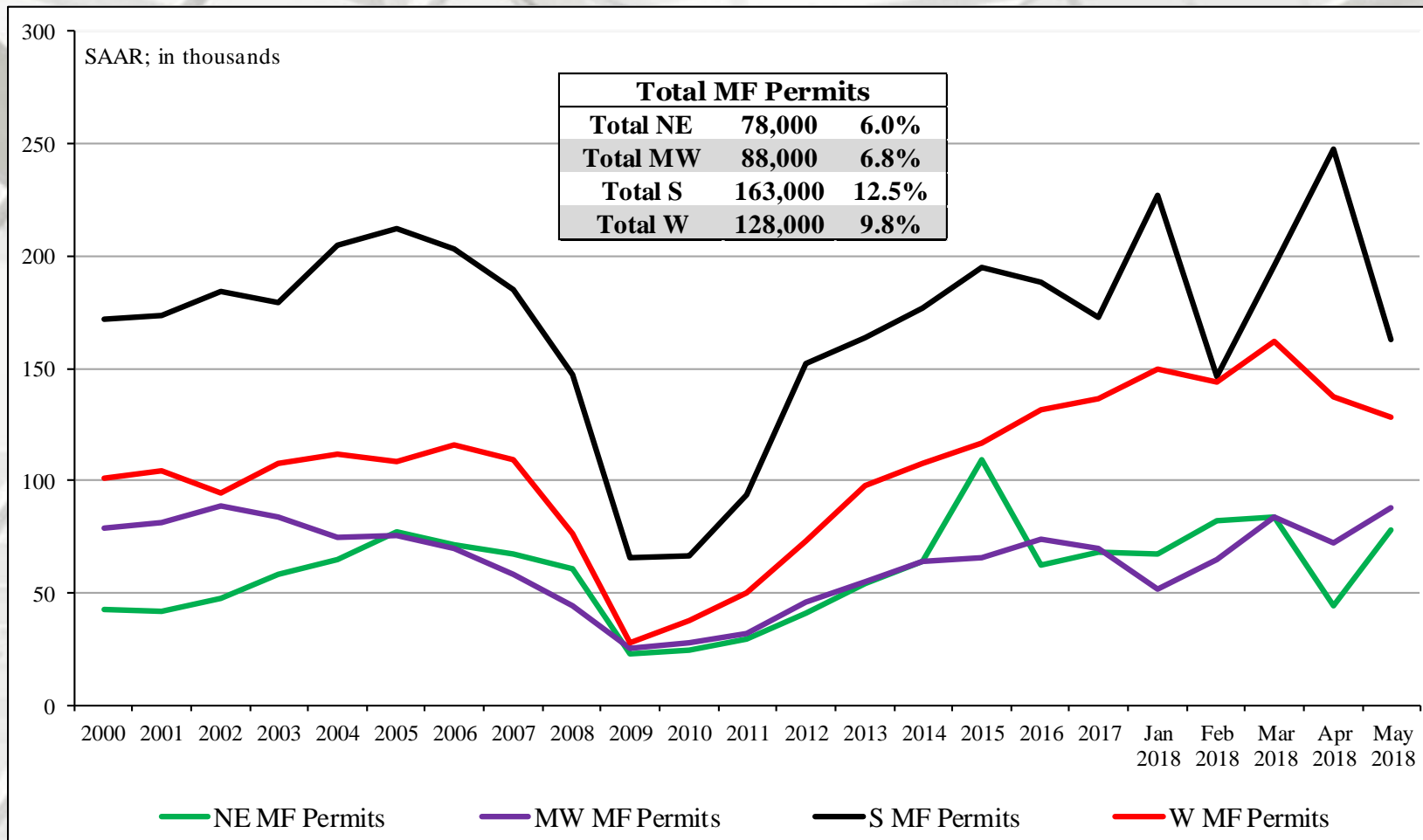


NE = Northeast, MW = Midwest, S = South, W = West

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

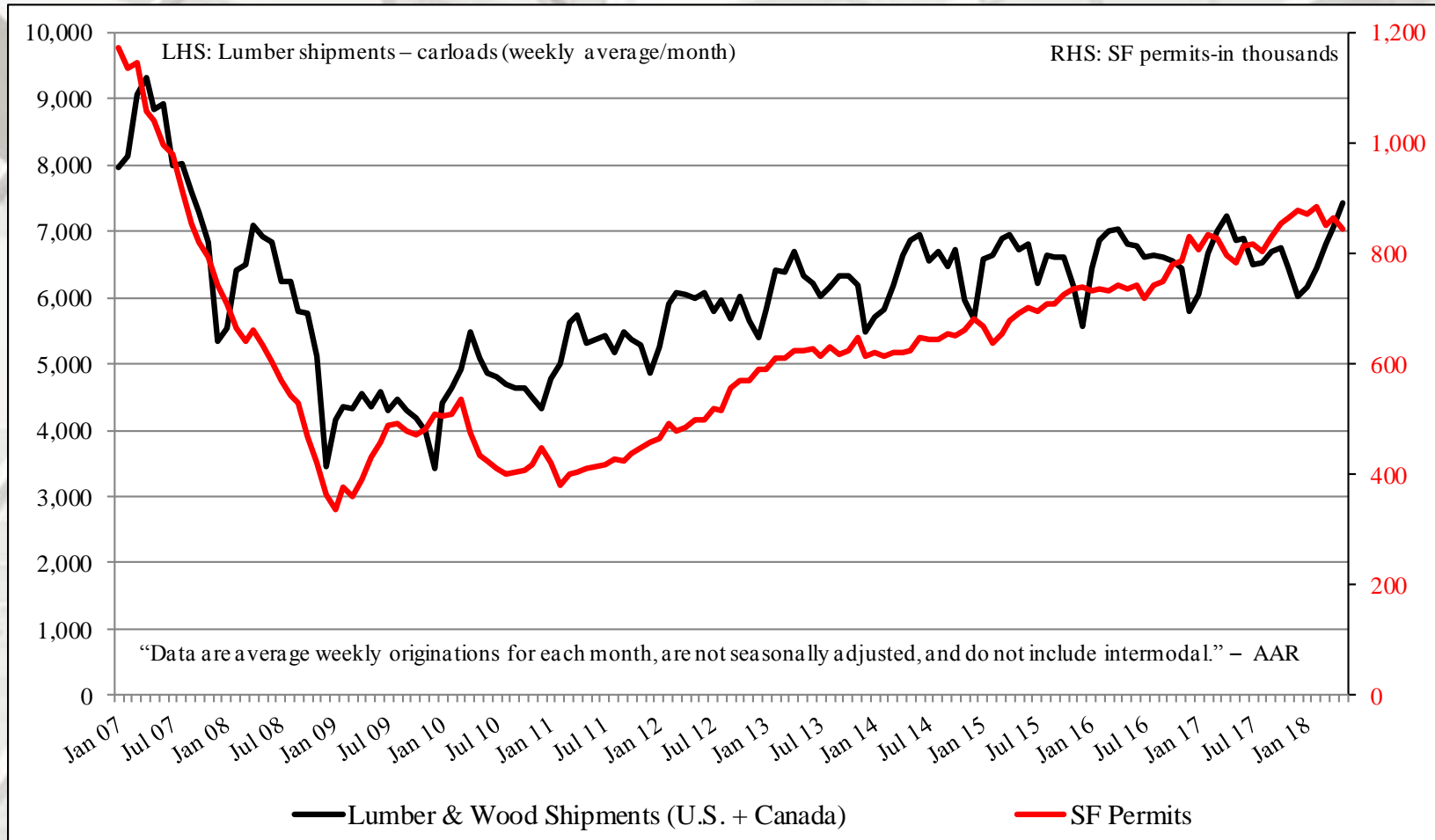


NE = Northeast, MW = Midwest, S = South, W = West

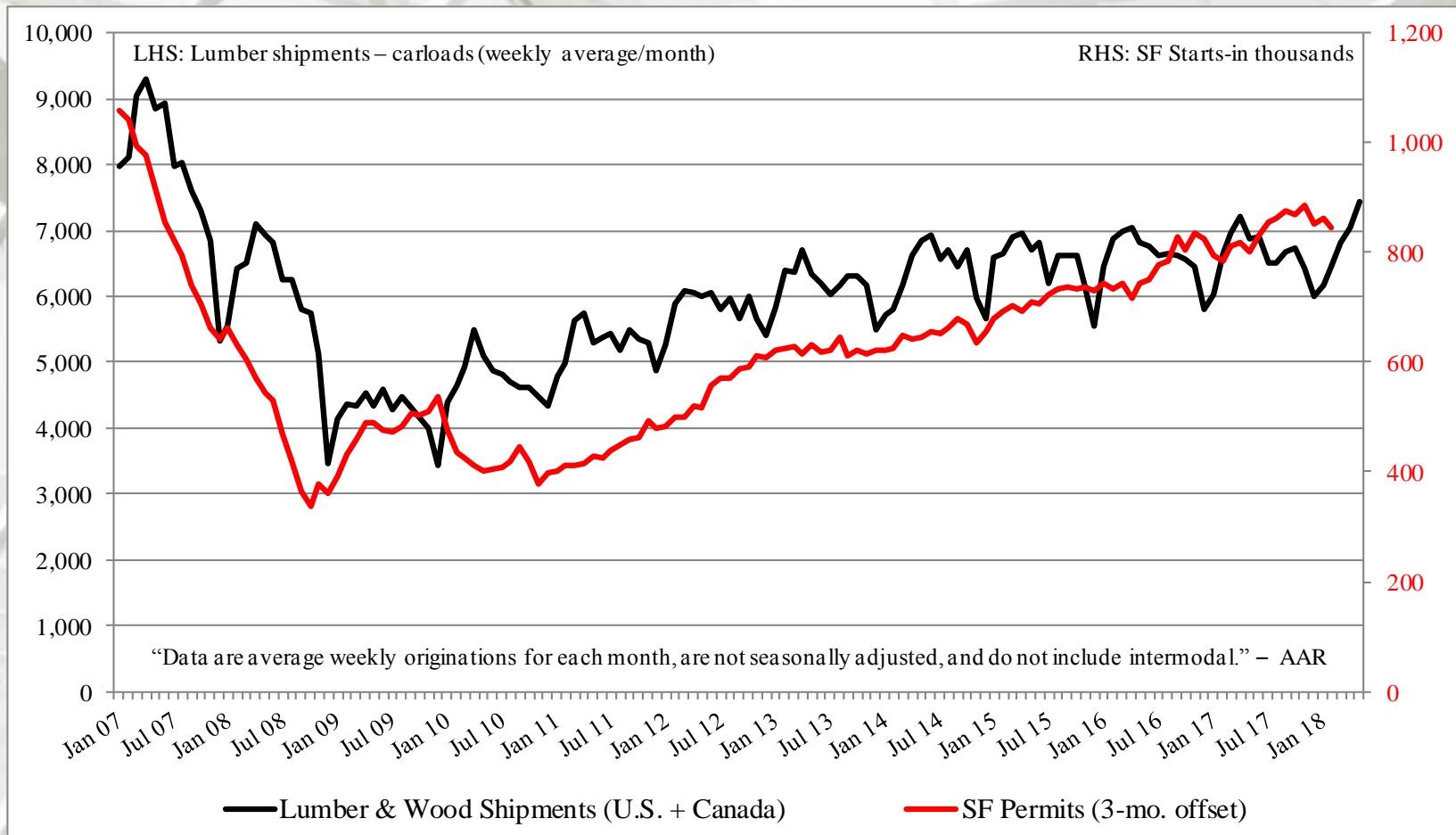
US DOC does not report 2 to 4 multi-family completions directly, this is an estimation (Total completions – SF completions).

* 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 May 2007 SF permits, continuing through May 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.

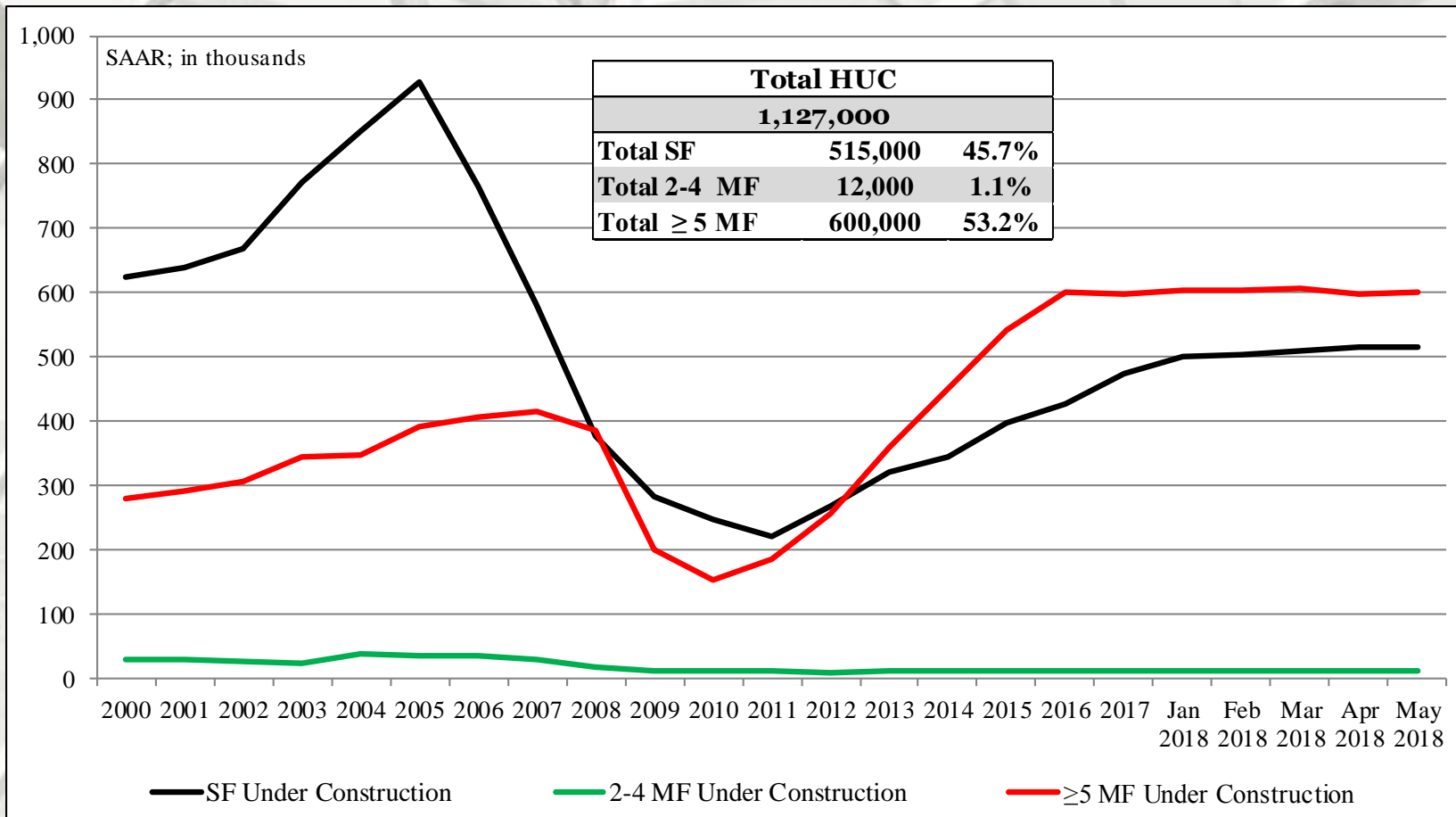
New Housing Under Construction (HUC)

	Total Under Construction*	SF Under Construction	Under Construction	MF ≥ 5 unit Under Construction
May	1,127,000	515,000	12,000	600,000
April	1,125,000	514,000	12,000	599,000
2017	1,070,000	460,000	10,000	600,000
M/M change	0.2	0.2	0.0	0.2
Y/Y change	5.3	12.0	20.0	0.0

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**
May	185,000	54,000	131,000
April	184,000	53,000	131,000
2017	184,000	51,000	133,000
M/M change	0.5	1.9	0.0
Y/Y change	0.5	5.9	-1.5
	MW Total	MW SF	MW MF
May	155,000	82,000	73,000
April	151,000	82,000	69,000
2017	154,000	76,000	78,000
M/M change	2.6	0.0	5.8
Y/Y change	0.6	7.9	-6.4

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).

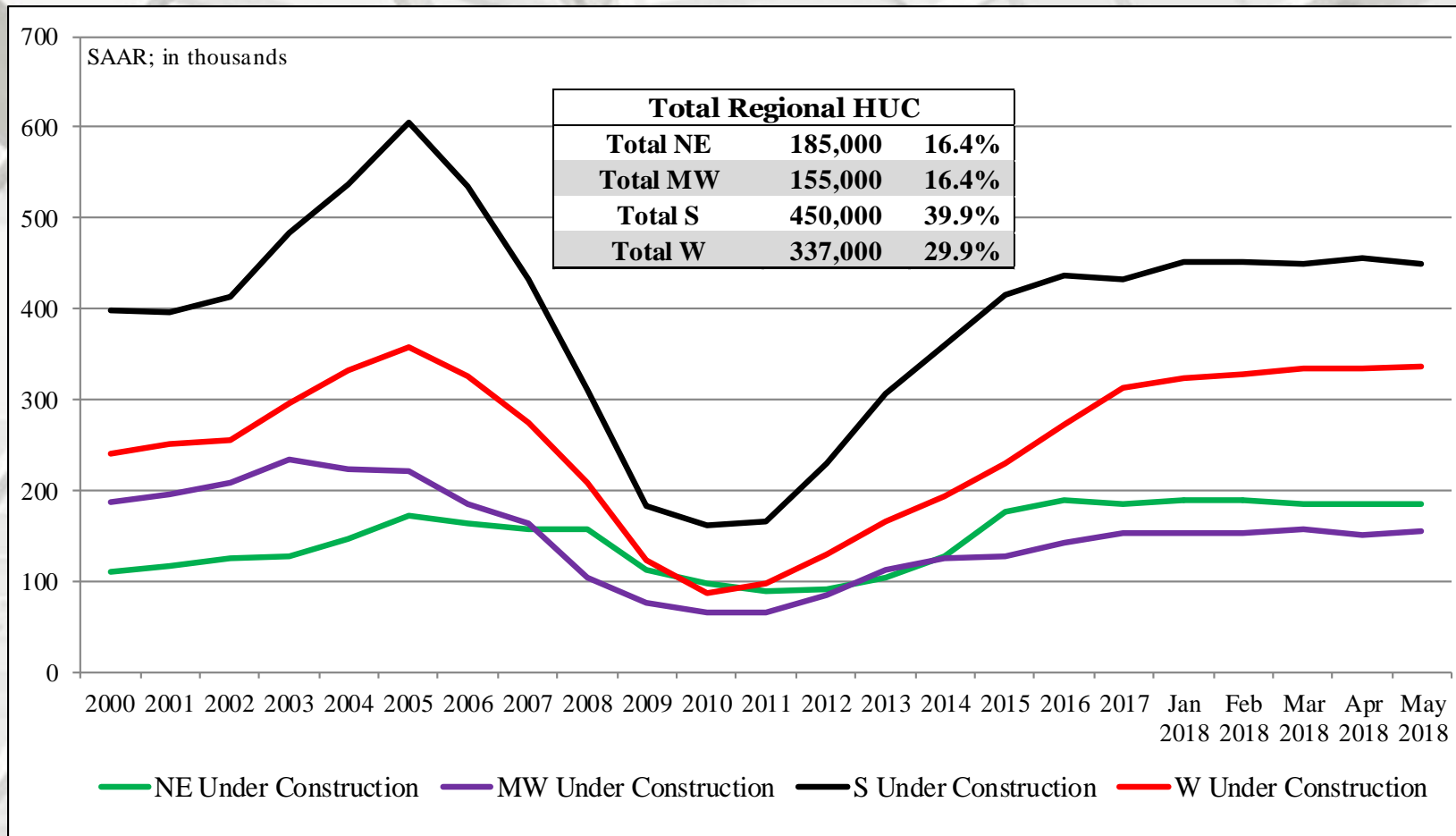
New Housing Under Construction by Region

	S Total	S SF	S MF**
May	450,000	239,000	211,000
April	455,000	240,000	215,000
2017	443,000	220,000	223,000
M/M change	-1.1	-0.4	-1.9
Y/Y change	1.6	8.6	-5.4
	W Total	W SF	W MF
May	337,000	140,000	197,000
April	335,000	139,000	196,000
2017	289,000	113,000	176,000
M/M change	0.6	0.7	0.5
Y/Y change	16.6	23.9	11.9

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

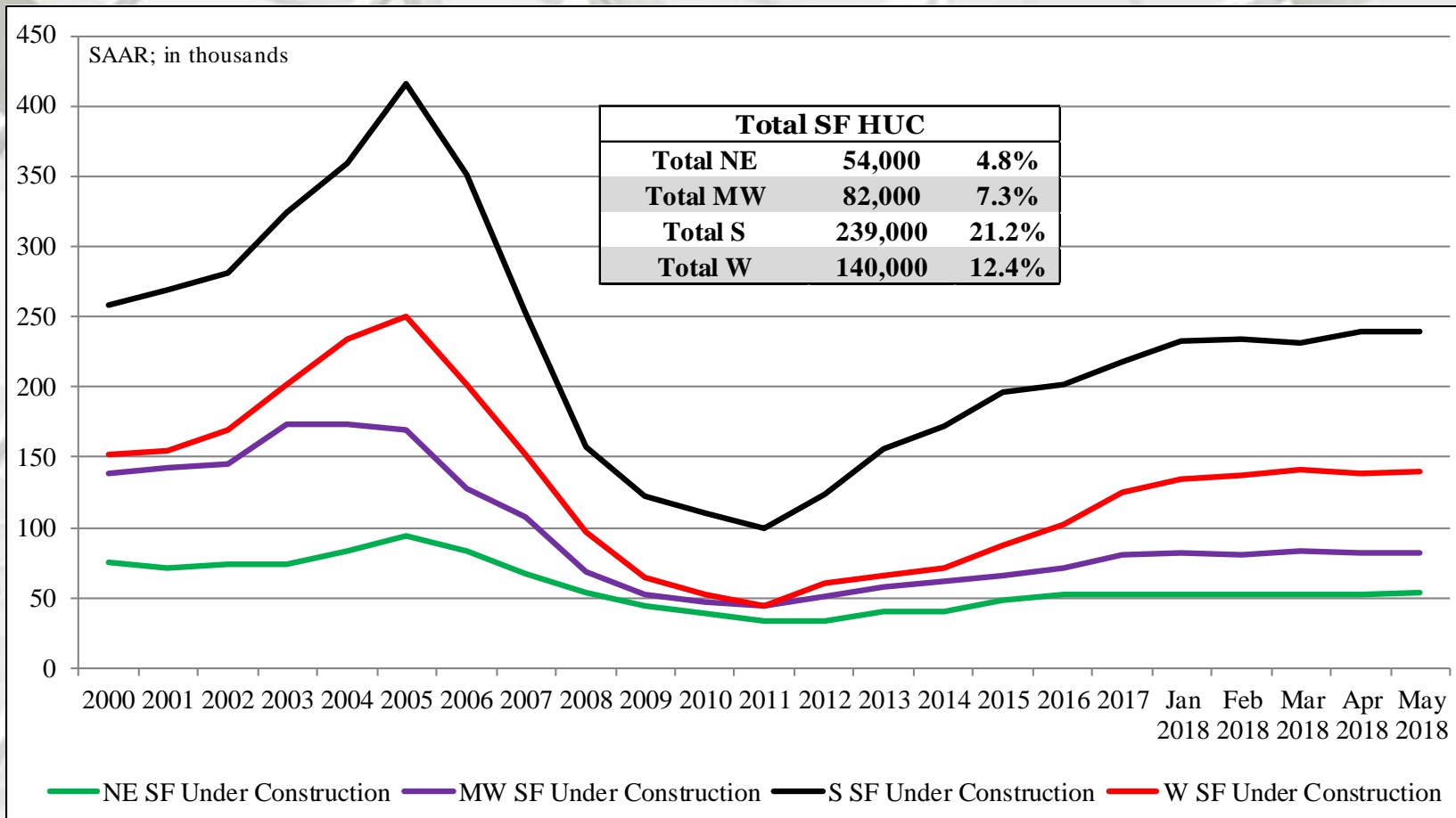


NE = Northeast, MW = Midwest, S = South, W = West

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

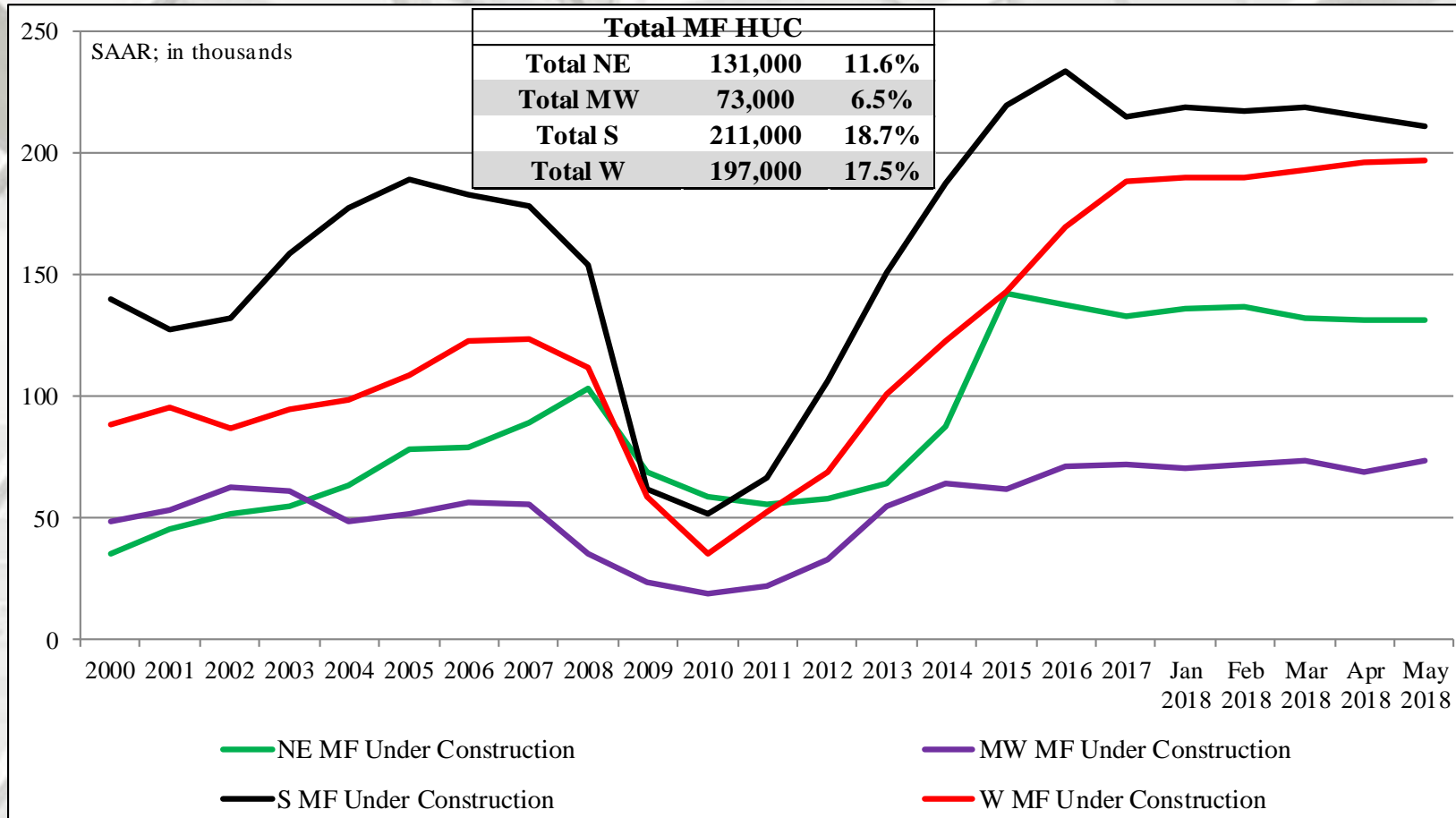


NE = Northeast, MW = Midwest, S = South, W = West

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.

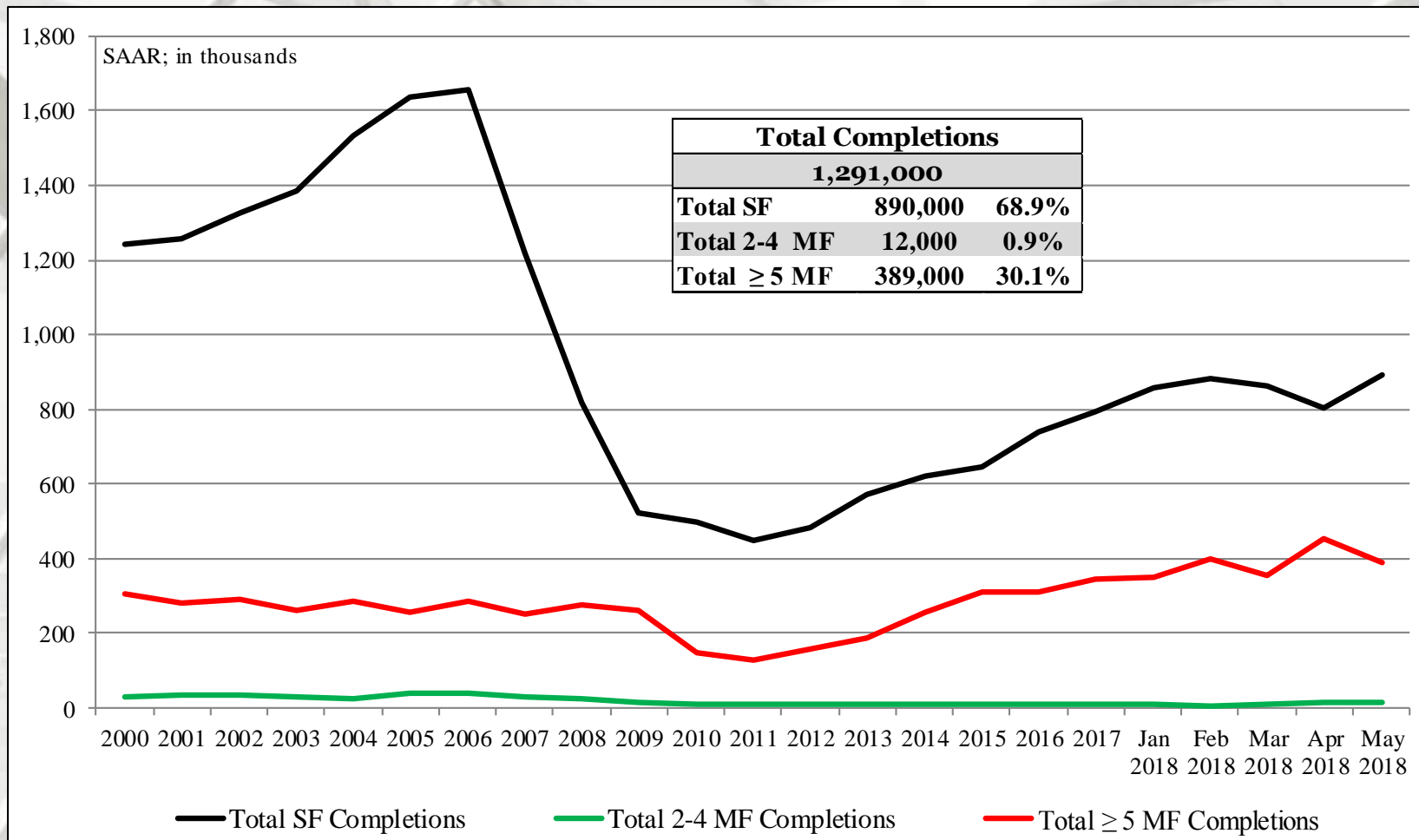
New Housing Completions

	Total Completions*	SF Completions	MF 2-4 unit**	MF ≥ 5 unit Completions
May	1,291,000	890,000	12,000	389,000
April	1,267,000	802,000	12,000	453,000
2017	1,169,000	798,000	11,000	360,000
M/M change	1.9%	11.0%	0.0%	-14.1%
Y/Y change	10.4%	11.5%	9.1%	8.1%

* 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)).

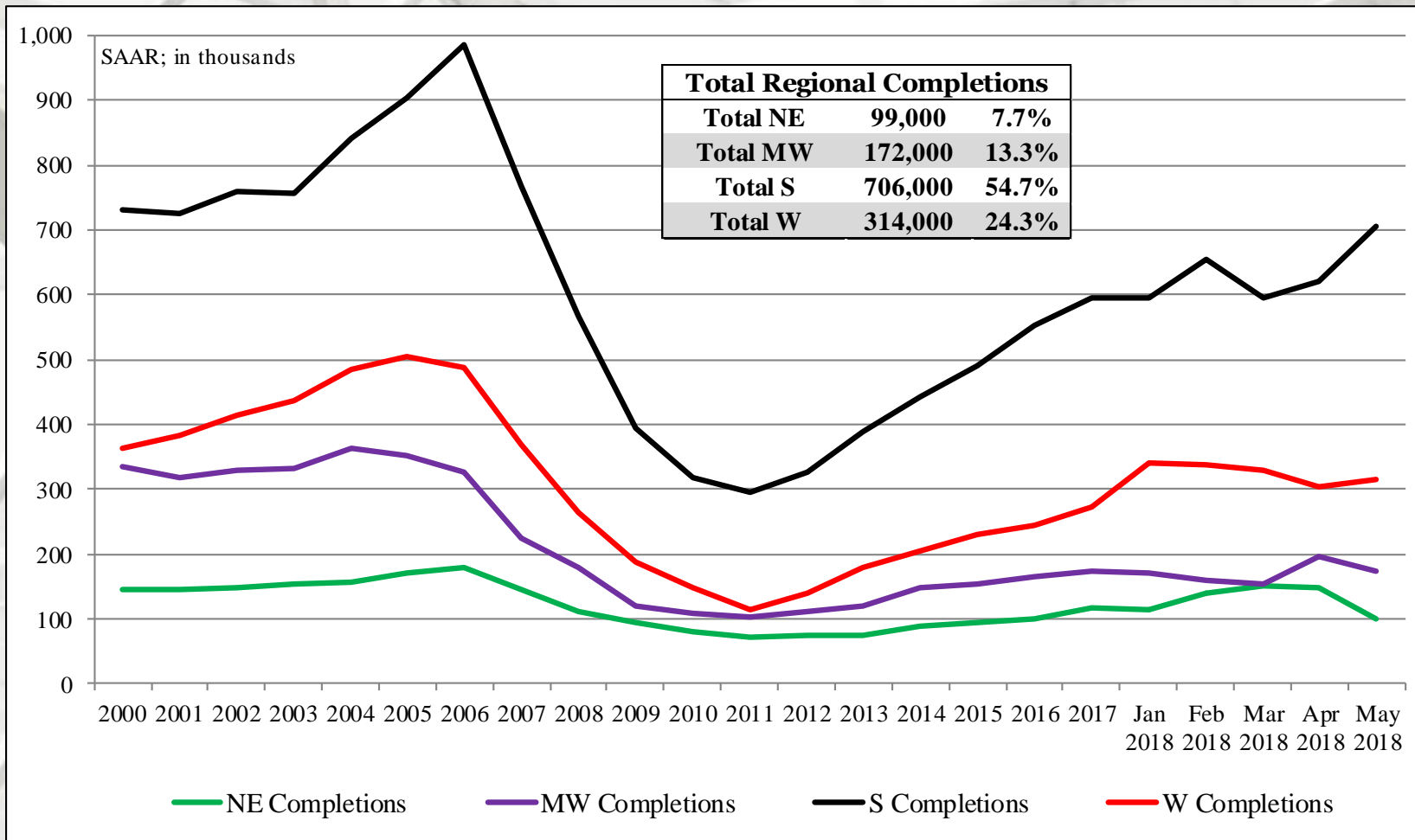
Total Housing Completions



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**
May	99,000	51,000	48,000
April	148,000	53,000	95,000
2017	135,000	54,000	81,000
M/M change	-33.1%	-3.8%	-49.5%
Y/Y change	-26.7%	-5.6%	-40.7%
	MW Total	MW SF	MW MF
May	172,000	142,000	30,000
April	196,000	124,000	72,000
2017	145,000	120,000	25,000
M/M change	-12.2%	14.5%	-58.3%
Y/Y change	18.6%	18.3%	20.0%

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

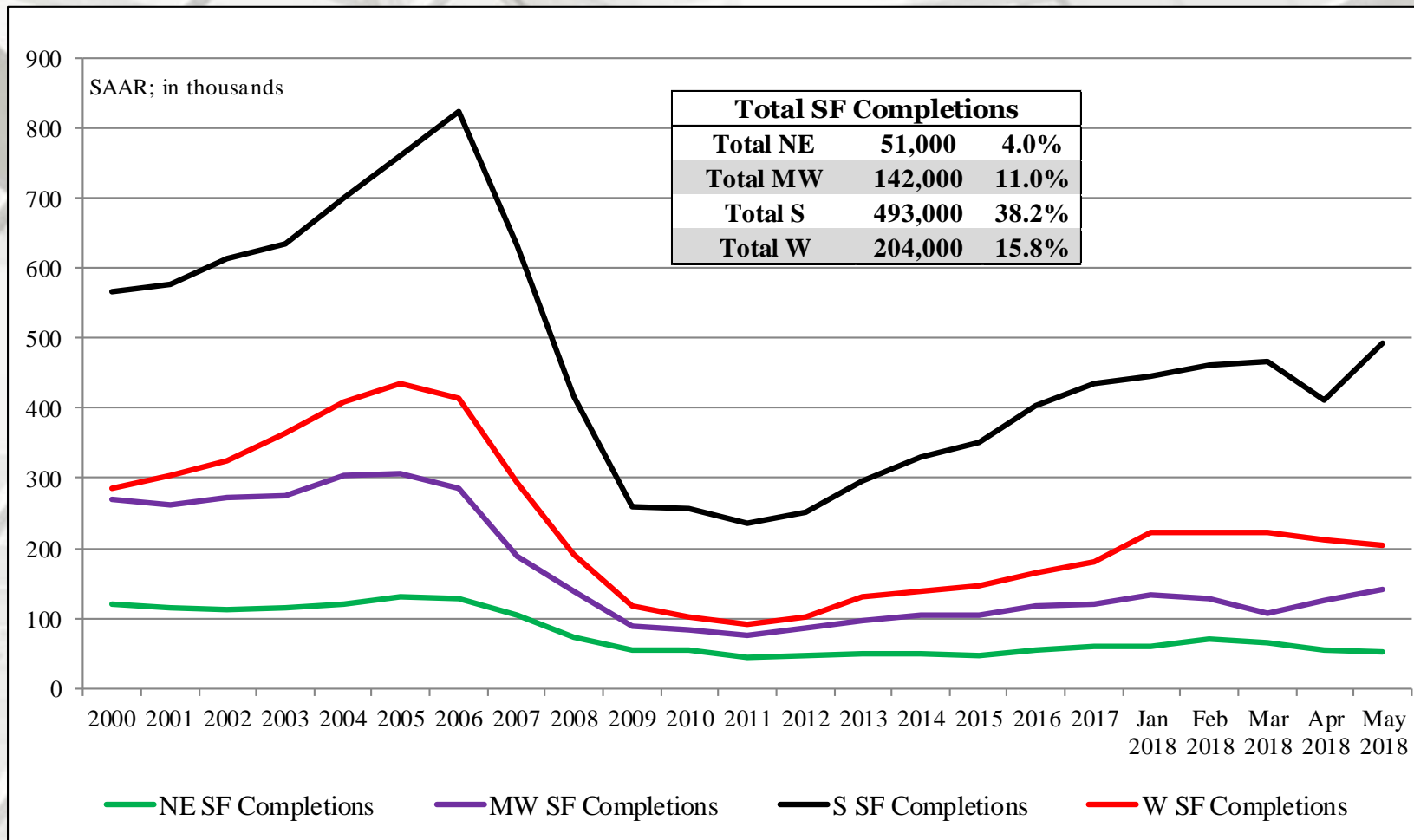
	S Total	S SF	S MF**
May	706,000	493,000	213,000
April	619,000	412,000	207,000
2017	595,000	425,000	170,000
M/M change	14.1%	19.7%	2.9%
Y/Y change	18.7%	16.0%	25.3%

	W Total	W SF	W MF
May	314,000	204,000	110,000
April	304,000	213,000	91,000
2017	294,000	199,000	95,000
M/M change	3.3%	-4.2%	20.9%
Y/Y change	6.8%	2.5%	15.8%

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

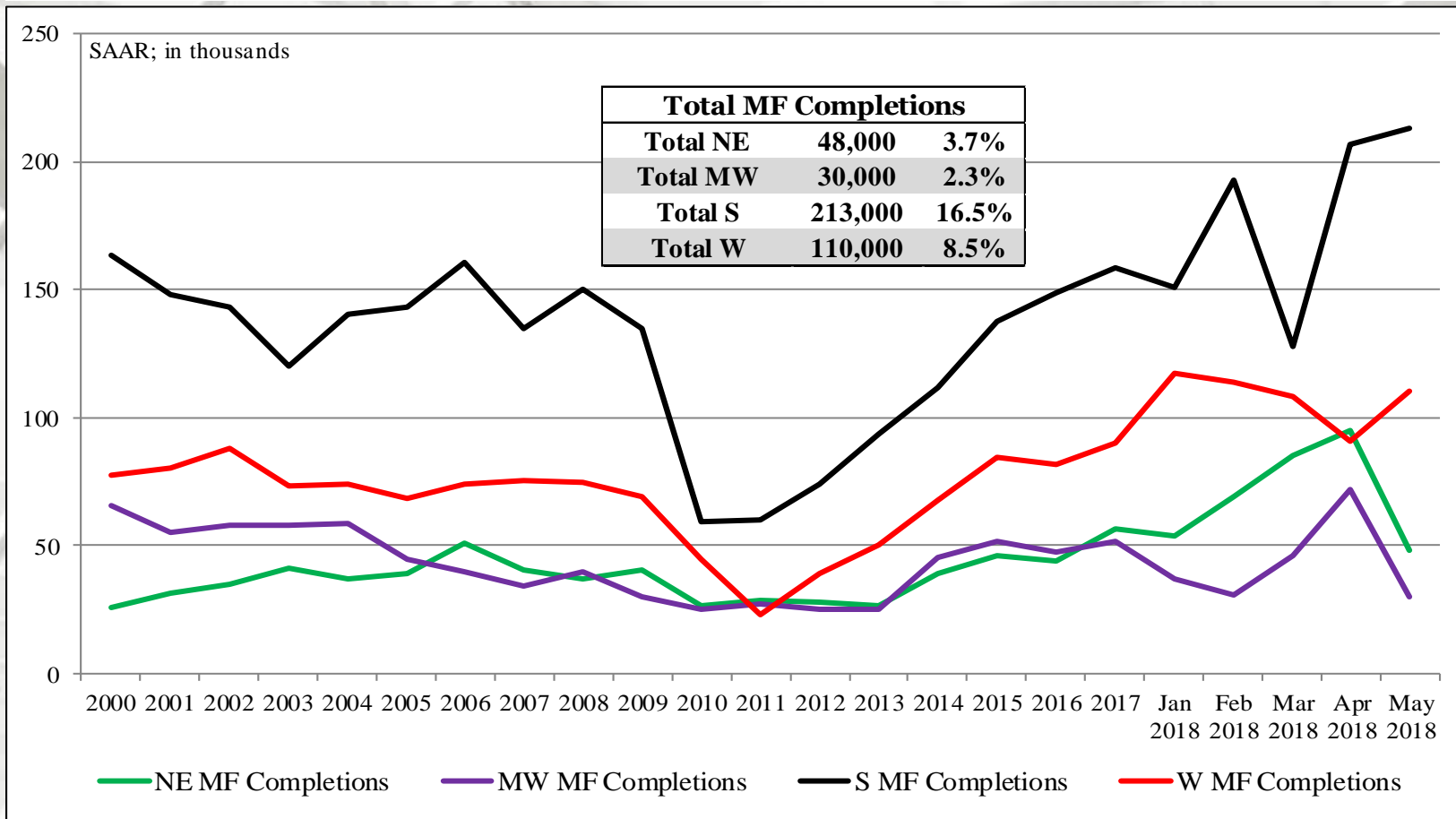


NE = Northeast, MW = Midwest, S = South, W = West

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

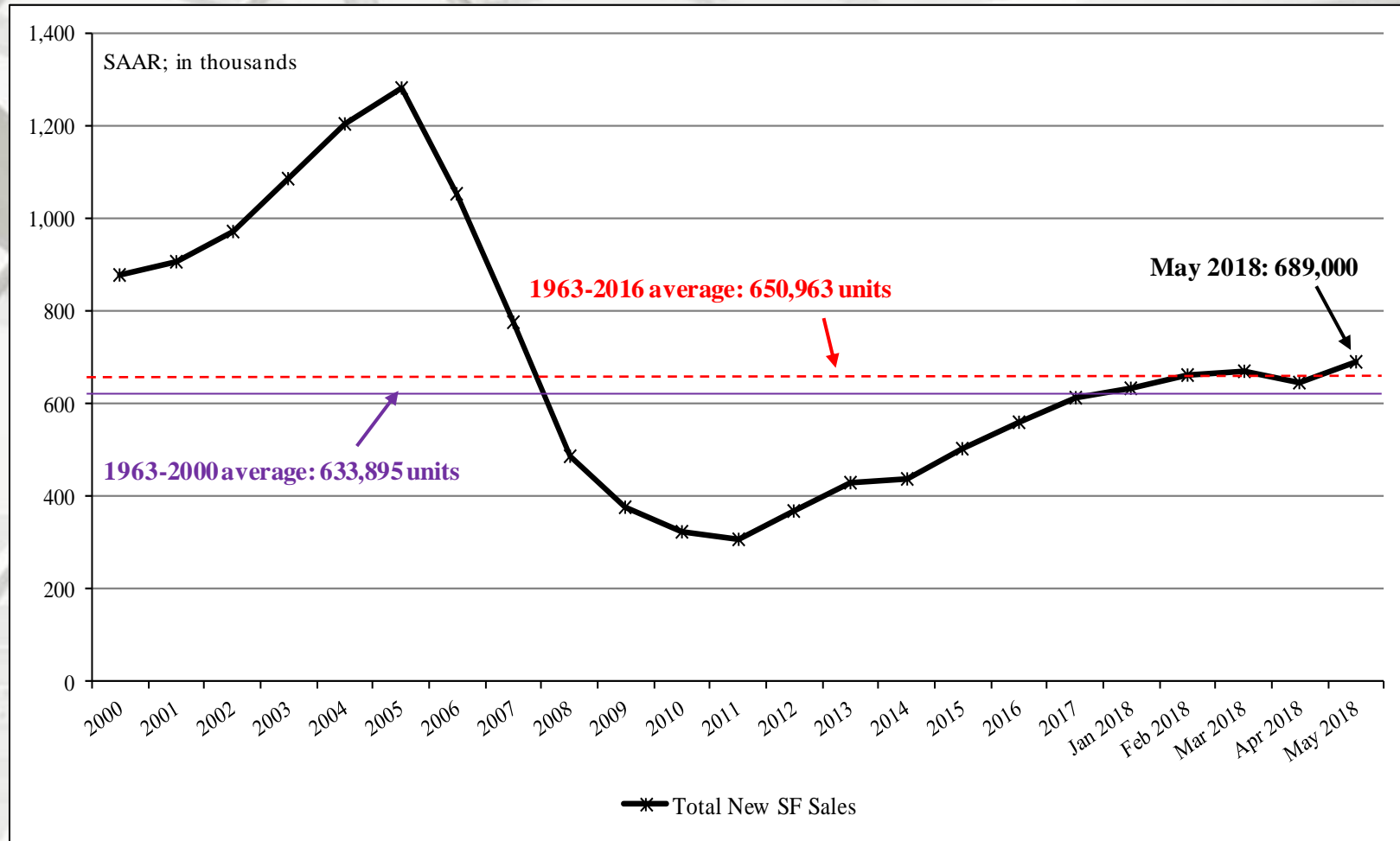
	New SF Sales*	Median Price	Mean Price	Month's Supply
May	689,000	\$313,000	\$368,500	5.2
April	646,000	\$318,500	\$394,600	5.5
2017	604,000	\$323,600	\$378,400	5.4
M/M change	6.7%	-1.7%	-6.6%	-5.5%
Y/Y change	14.1%	0.0%	-16.3%	-3.7%

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

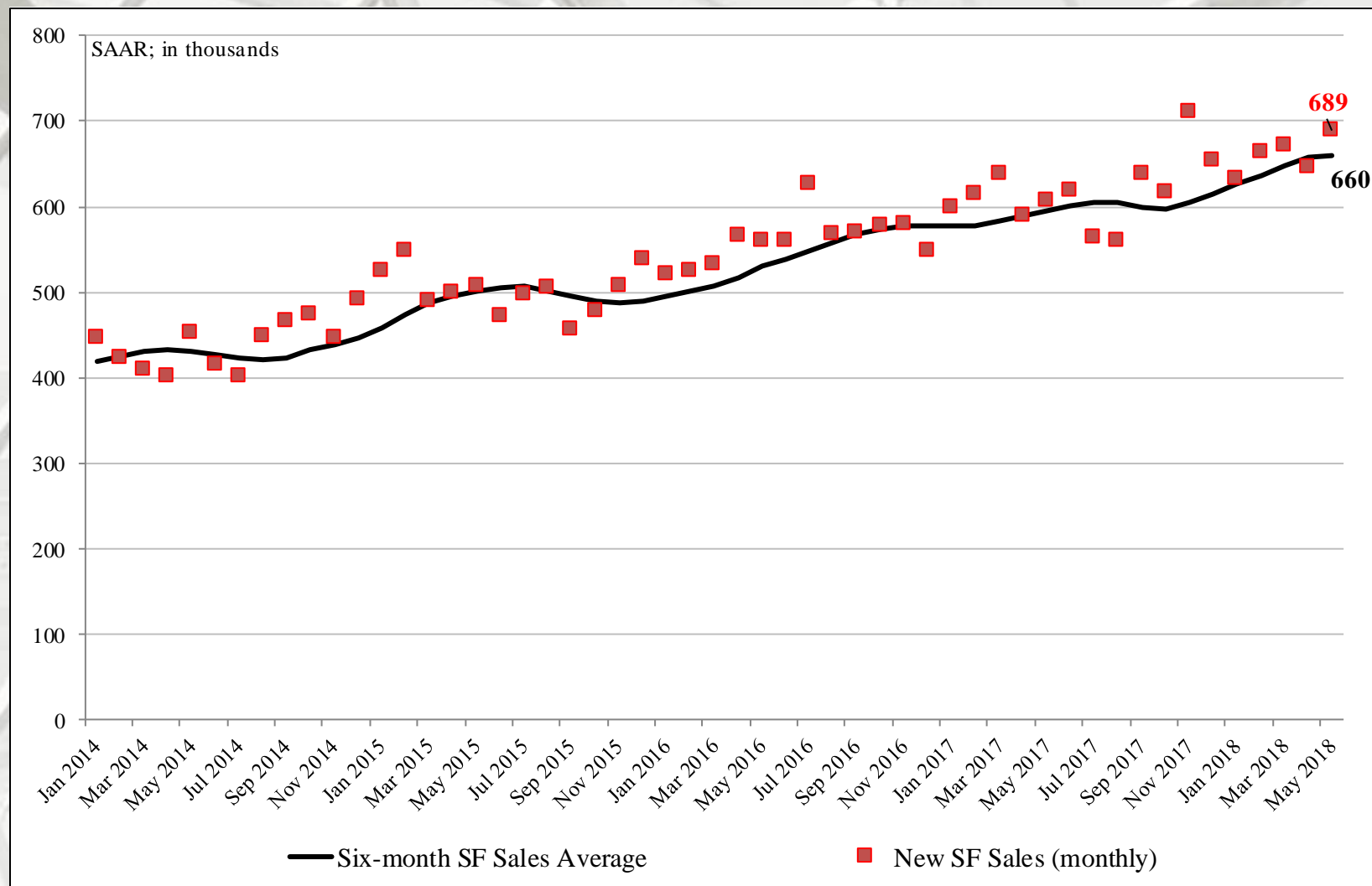
New SF sales were more than the consensus forecast (665 m)³. The past three month's new SF sales data were revised:

February initial: 618 m revised to 663 m;
 March initial: 694 m revised to 671 m.
 April initial: 662 m revised to 646 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			
May	36,000	87,000	409,000	157,000			
April	40,000	87,000	347,000	172,000			
2017	43,000	62,000	343,000	156,000			
M/M change	-10.0%	0.0%	17.9%	-8.7%			
Y/Y change	-16.3%	40.3%	19.2%	0.6%			
	≤ \$150m	\$150 - \$199.9m	\$200 - \$299.9m	\$300 - \$399.9m	\$400 - \$499.9m	\$500 - \$749.9m	≥ \$750m
May ^{1,2,3,4}	2,000	5,000	19,000	18,000	10,000	8,000	2,000
April	2,000	4,000	17,000	14,000	7,000	7,000	3,000
2017	3,000	6,000	17,000	16,000	8,000	8,000	3,000
M/M change	0.0%	25.0%	11.8%	28.6%	42.9%	14.3%	-33.3%
Y/Y change	-33.3%	-16.7%	11.8%	12.5%	25.0%	0.0%	-33.3%
New SF sales: %	3.1%	7.7%	29.2%	27.7%	15.4%	12.3%	3.1%

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;

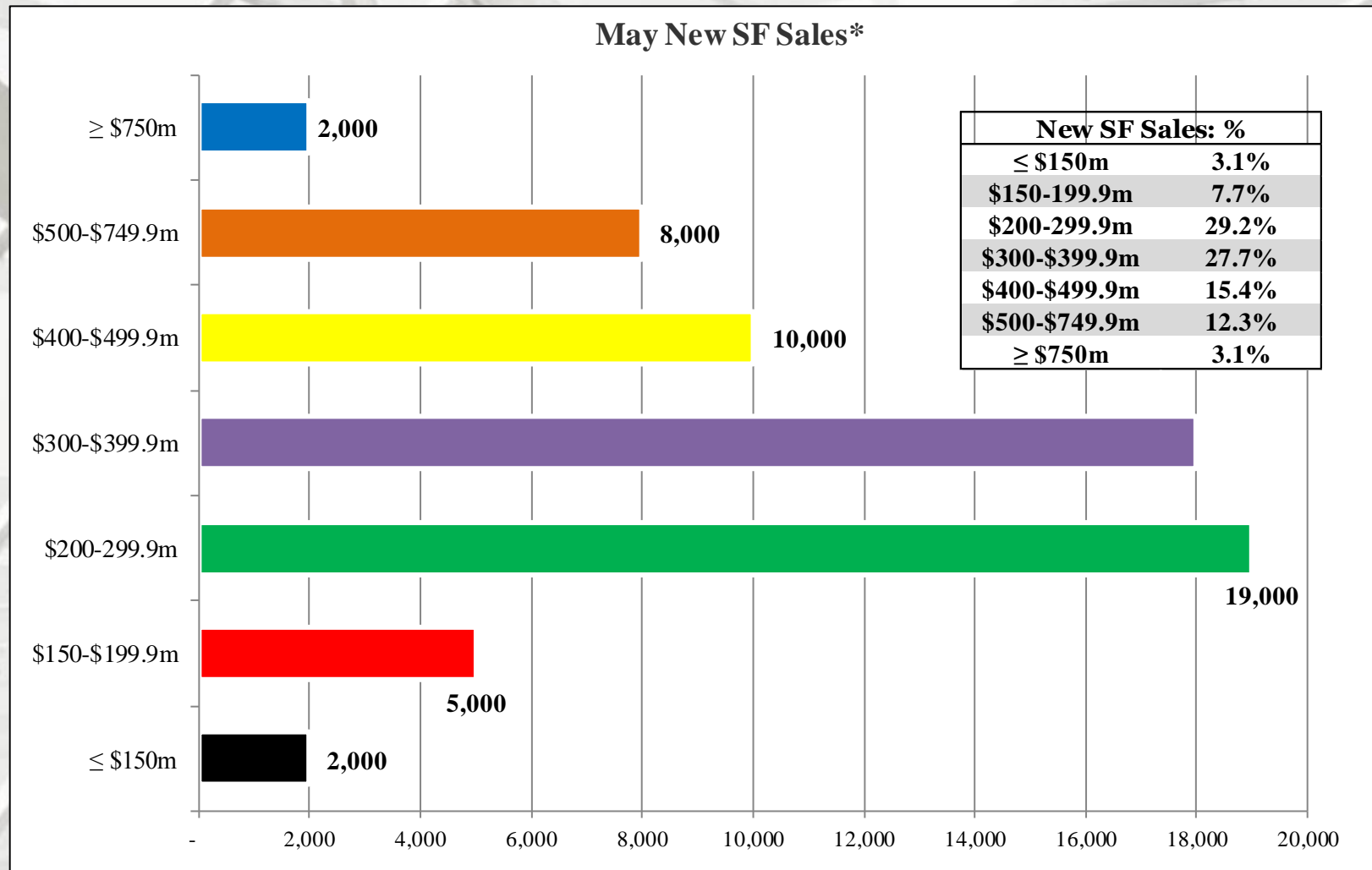
³ Detail may not add to total because of rounding.

⁴ Housing prices are adjusted at irregular intervals.

Sources: ^{1,2,3} <http://www.census.gov/construction/nrc/pdf/newresconst.pdf>; 5/23/18;

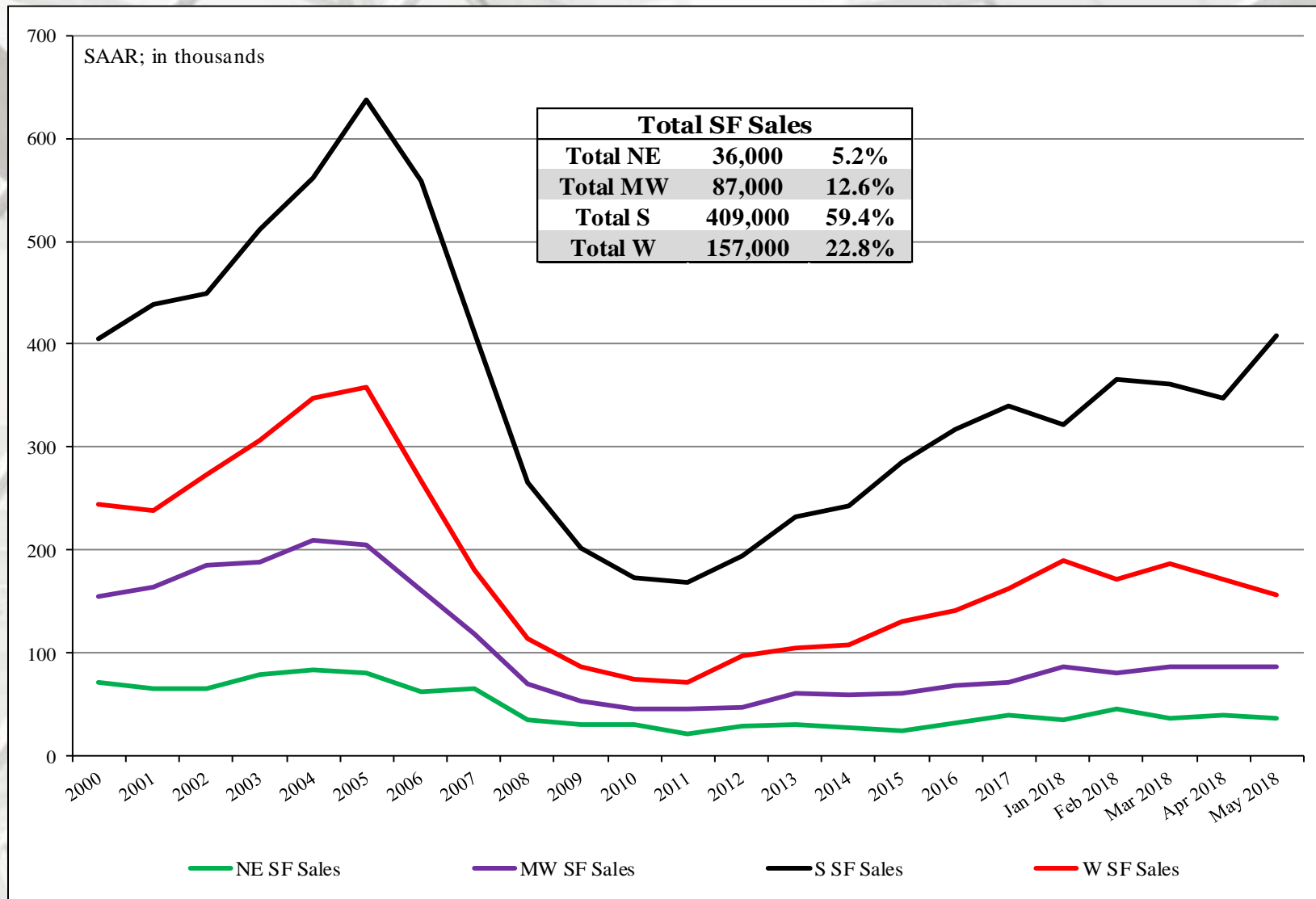
⁴ https://www.census.gov/construction/cpi/pdf/descpi_sold.pdf

New SF House Sales



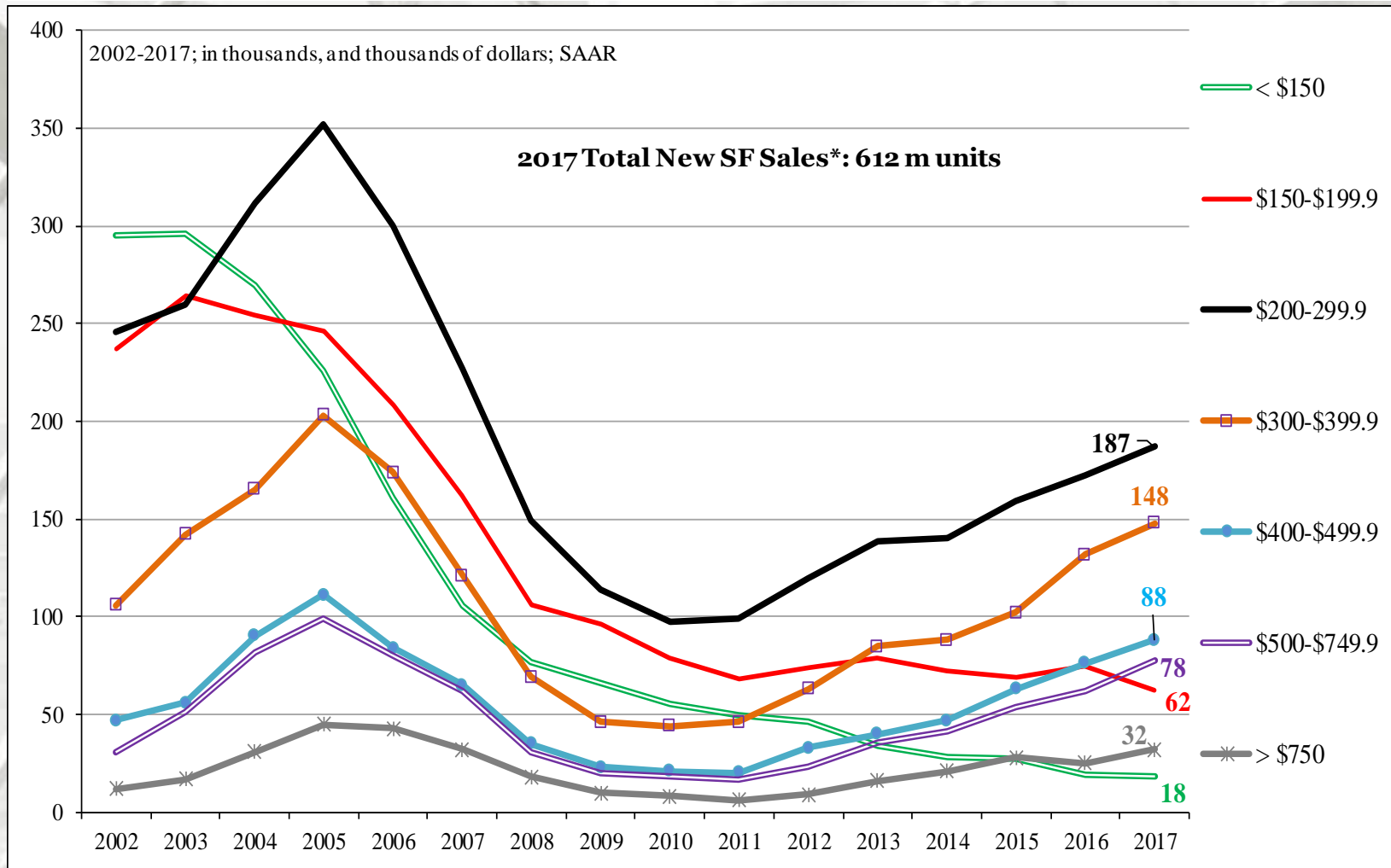
* Total new sales by price category and percent.

New SF House Sales by Region



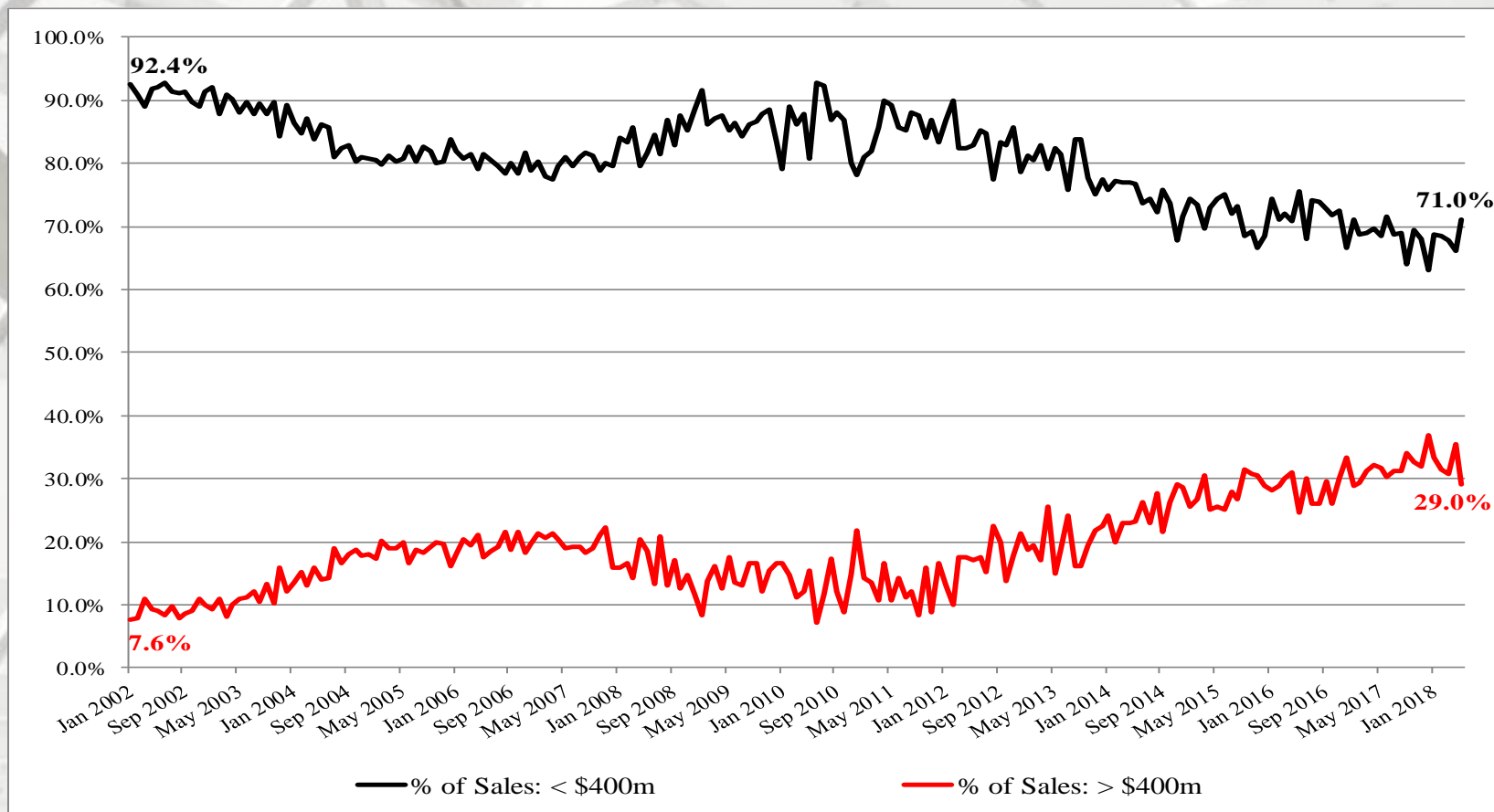
* Percentage of total new sales.

New SF House Sales by Price Category



* Sales tallied by price category.

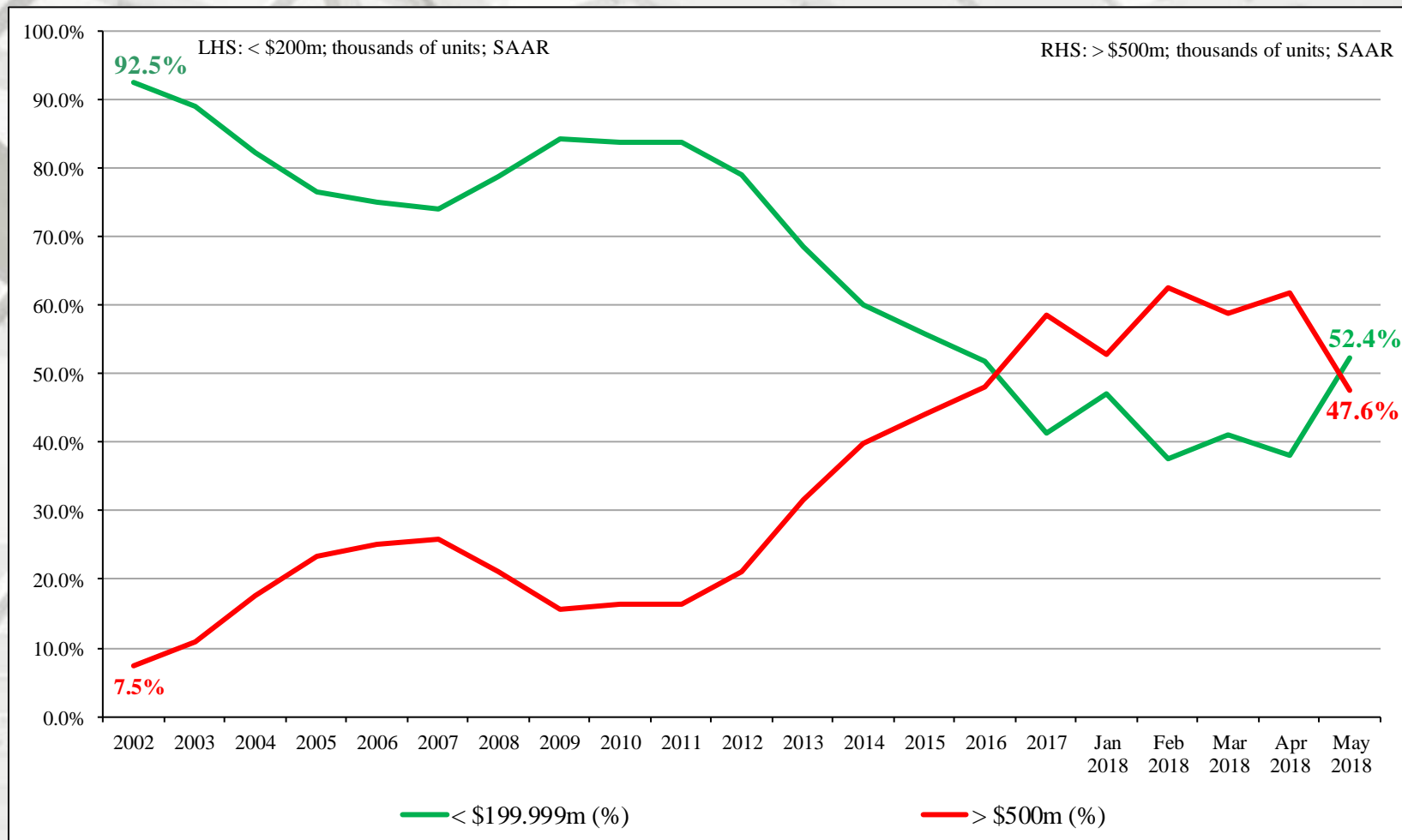
New SF House Sales



New SF Sales \$400m houses: 2002 – May 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.

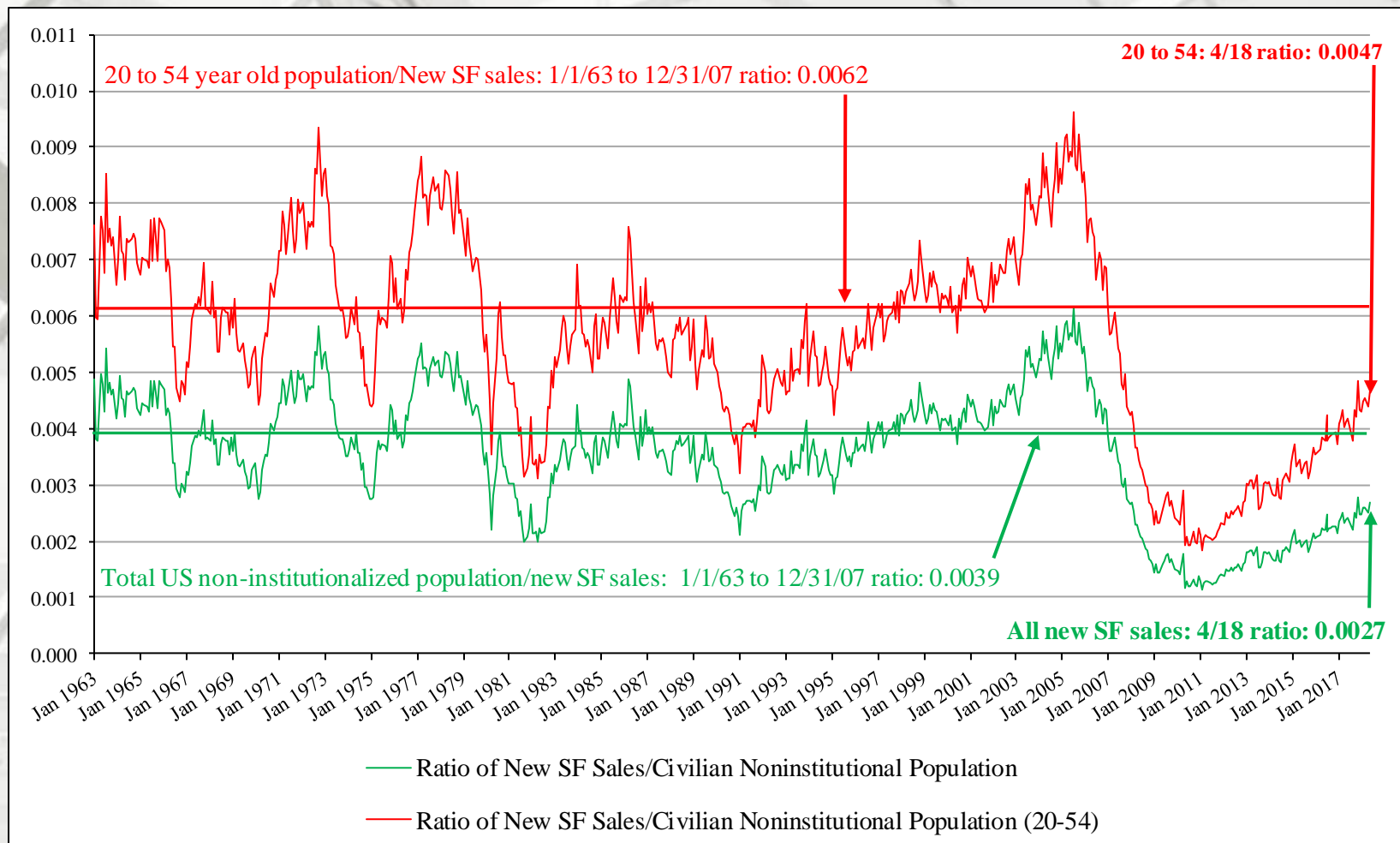
New SF House Sales



New SF Sales: < \$ 200m and > \$500m: 2002 to May 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 margins. Note: Sales values not adjusted for inflation.

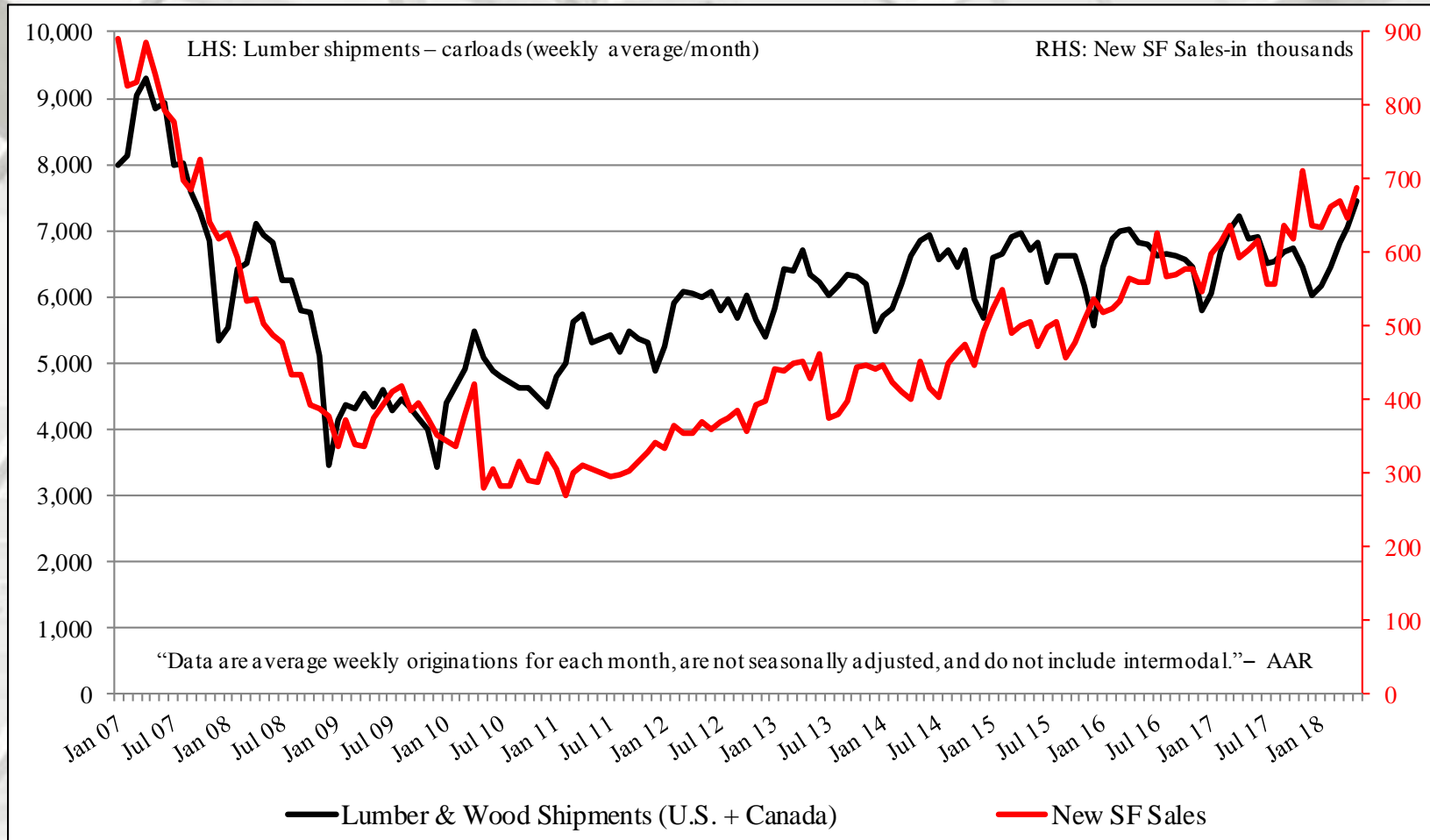
New SF House Sales



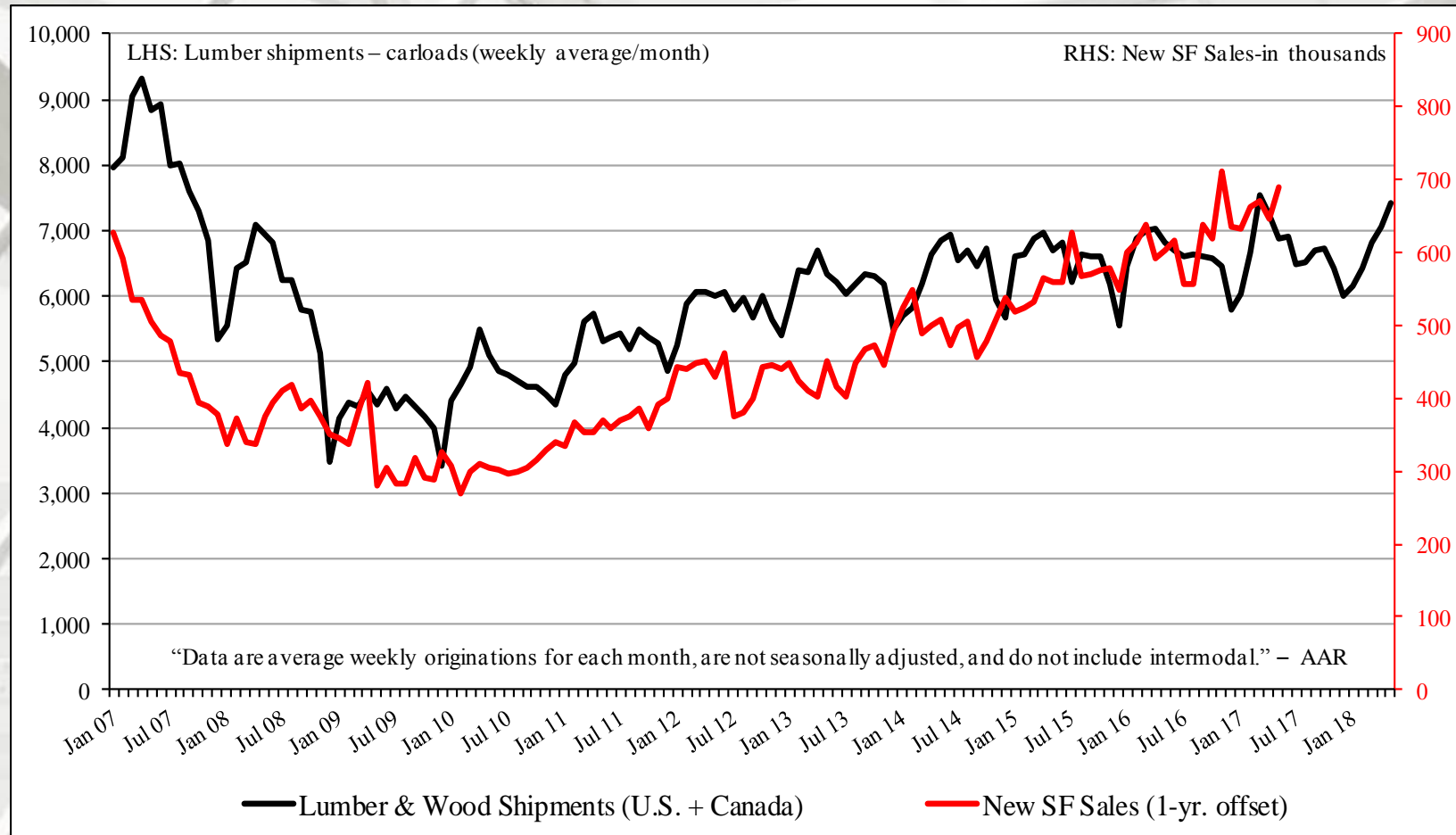
New SF sales adjusted for the US population

From May 1963 to November 2007, the long-term ratio of new house sales to the total US non-institutionalized population was 0.0039; in May 2018 it was 0.0027 – an increase from April (0.0025). The non-institutionalized population, aged 20 to 54 long-term ratio is 0.0062; in May 2018 it was 0.0047 – a slight increase from April (0.0045). 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

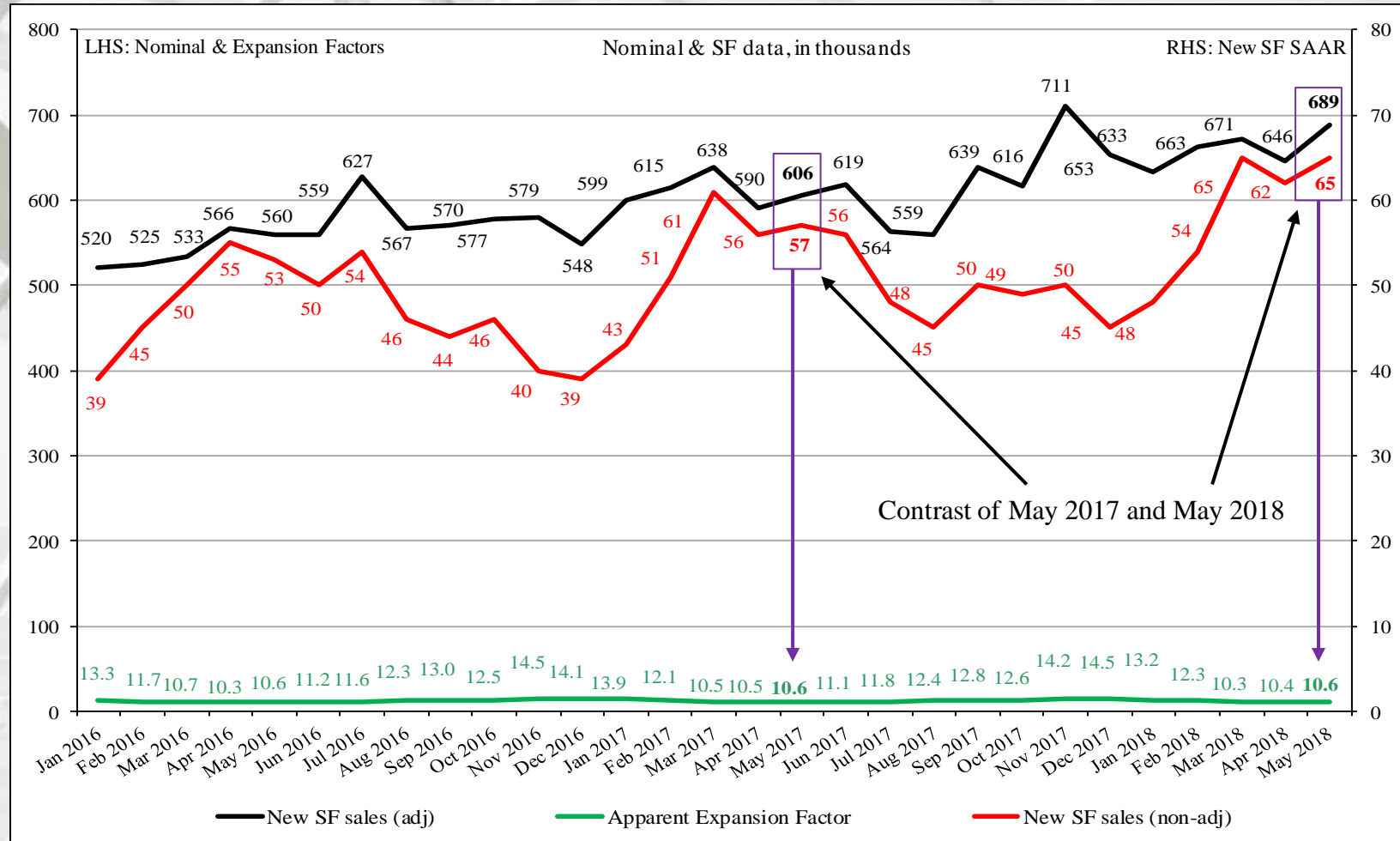


Railroad Lumber & Wood Shipments vs. U.S. SF Housing Sales: 1-year Offset



In this graph, January 2007 lumber shipments are contrasted with January 2008 SF sales, and continuing through May 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

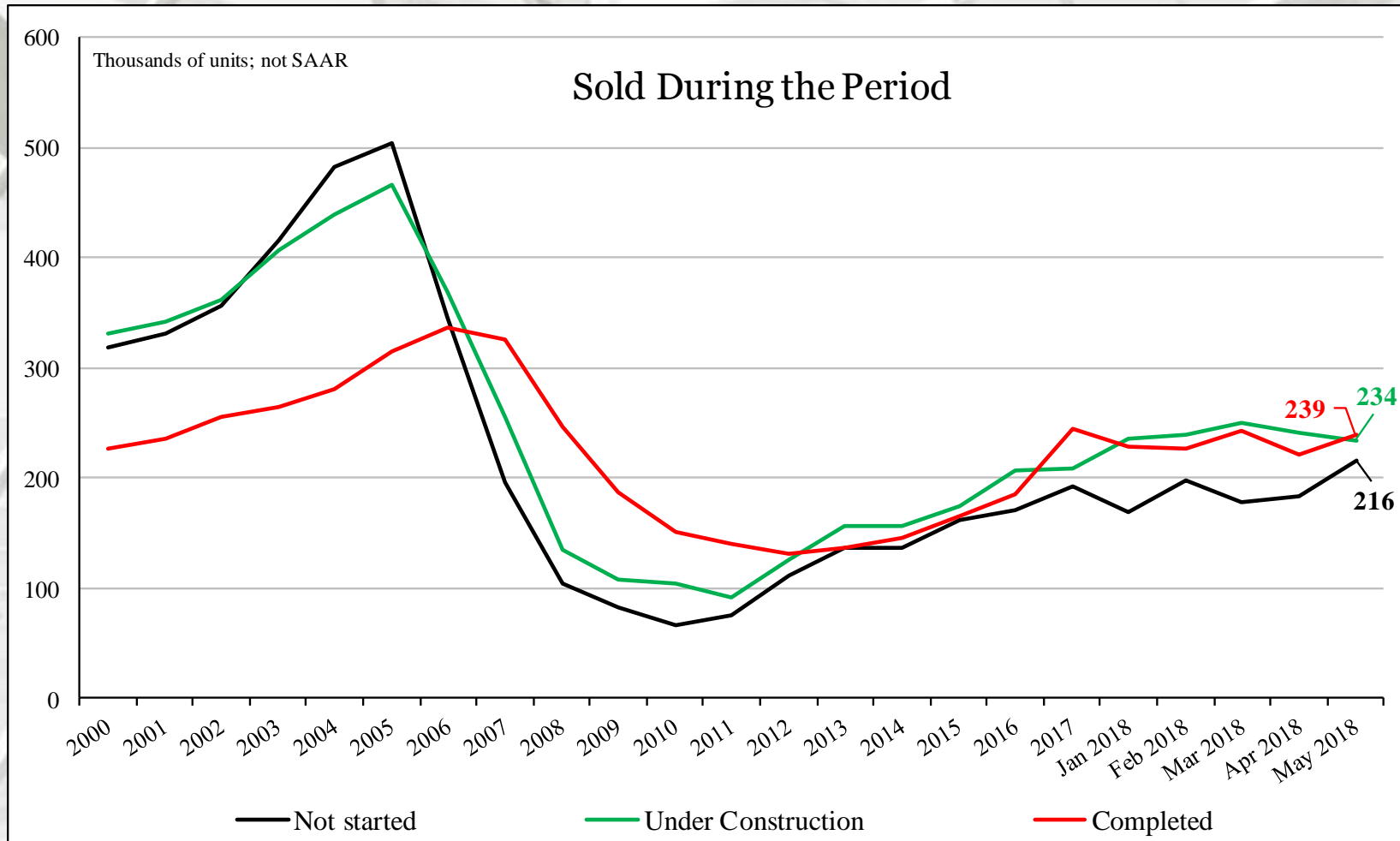
	Total	Not started	Under Construction	Completed
May	689,000	216,000	234,000	239,000
April	646,000	184,000	241,000	221,000
2017	604,000	211,000	196,000	197,000
M/M change	6.7%	17.4%	-2.9%	8.1%
Y/Y change	14.1%	2.4%	19.4%	21.3%
Total percentage		31.3%	34.0%	34.7%

New SF Houses Sold During Period

In May 2018, a substantial portion of new sales – 31.3% – have not been started.

* Not SAAR

New SF House Sales



Not SAAR

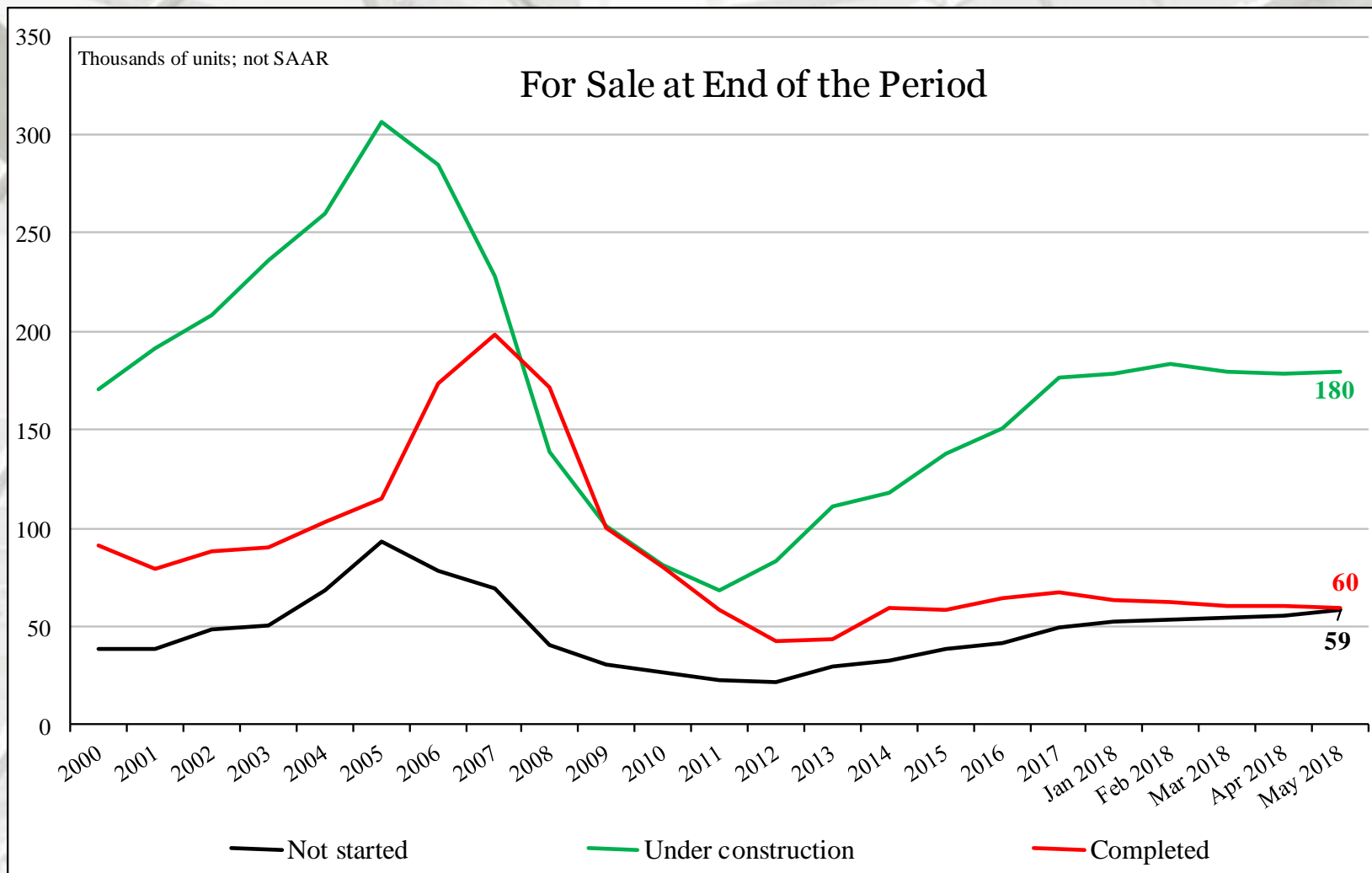
New SF House Sales

New SF Houses for Sale at the end of the Period

	Total	Not started	Under Construction	Completed
May	299,000	59,000	180,000	60,000
April	296,000	56,000	179,000	61,000
2017	269,000	49,000	160,000	60,000
M/M change	1.0%	5.4%	0.6%	-1.6%
Y/Y change	11.2%	20.4%	12.5%	0.0%
Total percentage		19.7%	60.2%	20.1%

Not SAAR

New SF House Sales



Not SAAR

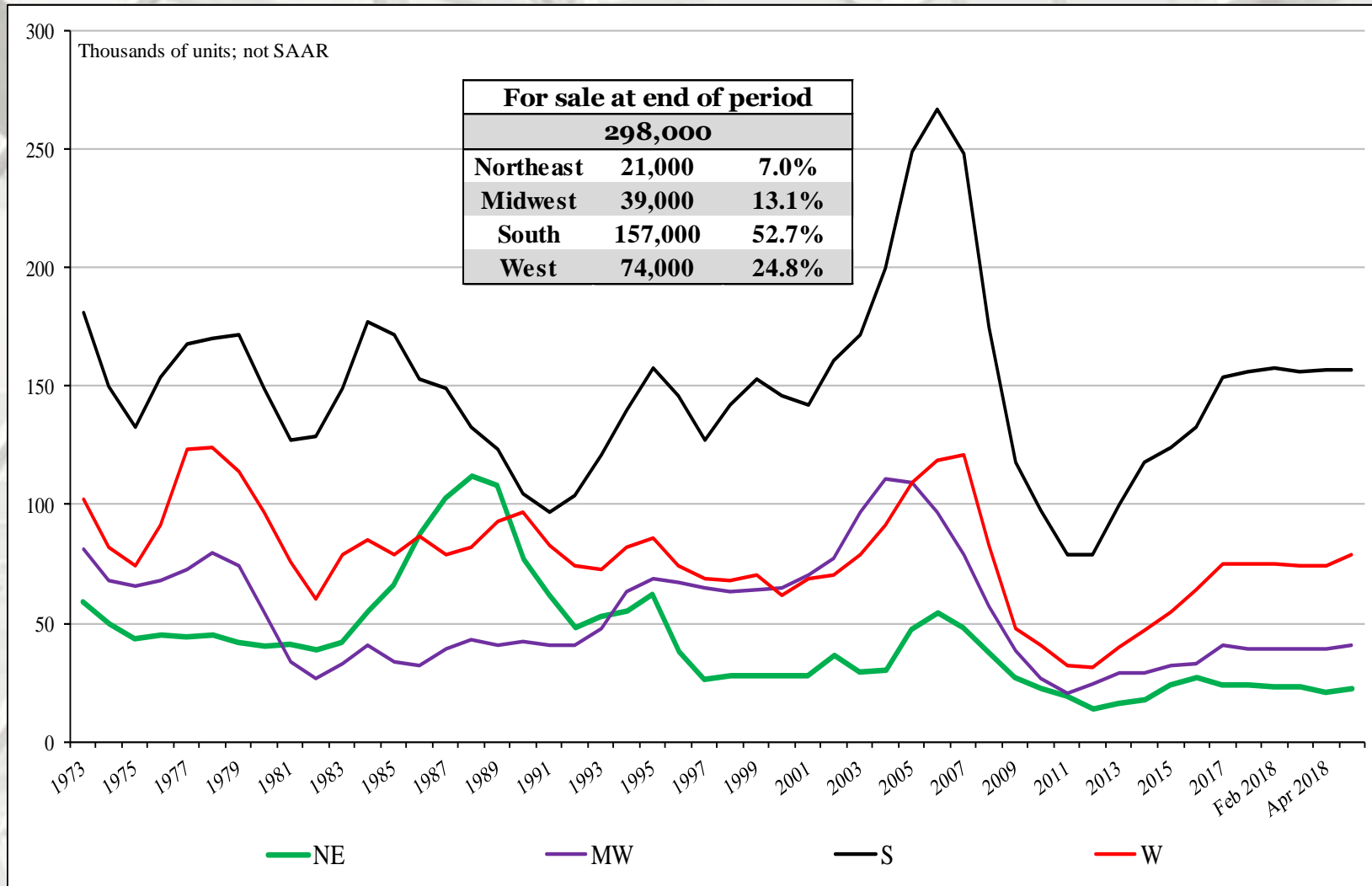
New SF House Sales

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

	Total	NE	MW	S	W
May	298,000	21,000	39,000	157,000	74,000
April	291,000	23,000	39,000	156,000	74,000
2017	269,000	25,000	35,000	139,000	63,000
M/M change	2.4%	-8.7%	0.0%	0.6%	0.0%
Y/Y change	10.8%	-16.0%	11.4%	12.9%	17.5%

* Not SAAR

New SF Houses Sale at End of Period by Region



May 2018 Construction Spending

	Total Private Residential*	SF	MF	Improvement**
May	\$553,809	\$288,281	\$61,864	\$203,664
April	\$549,306	\$286,608	\$60,864	\$201,834
2017	\$519,556	\$266,513	\$59,375	\$193,668
M/M change	0.8%	0.6%	1.6%	0.9%
Y/Y change	6.6%	8.2%	4.2%	5.2%

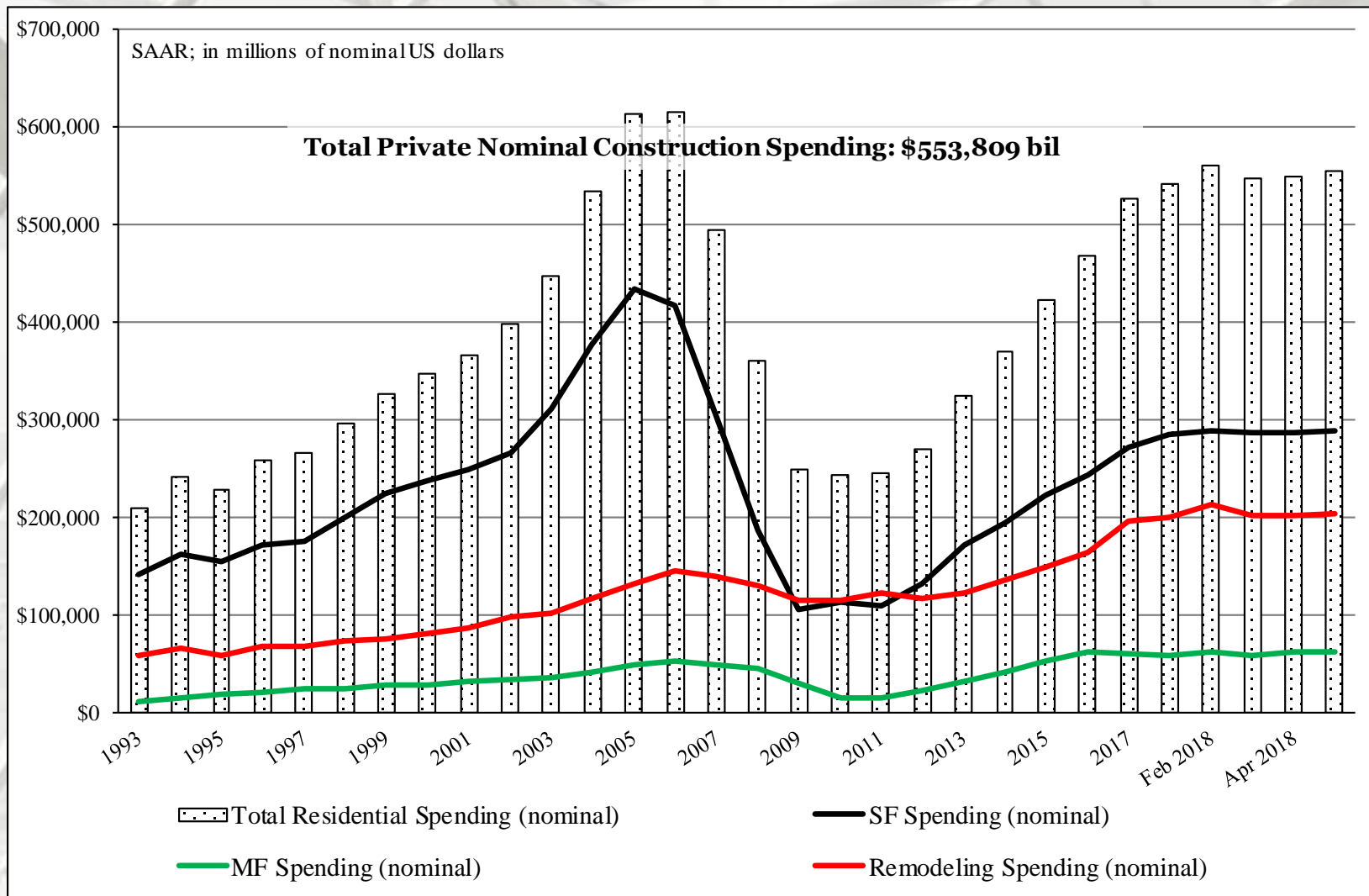
* Millions

** The US DOC does not report improvement spending directly, this is a monthly estimation for 2017:

((Total Private Spending – (SF spending + MF spending)).

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

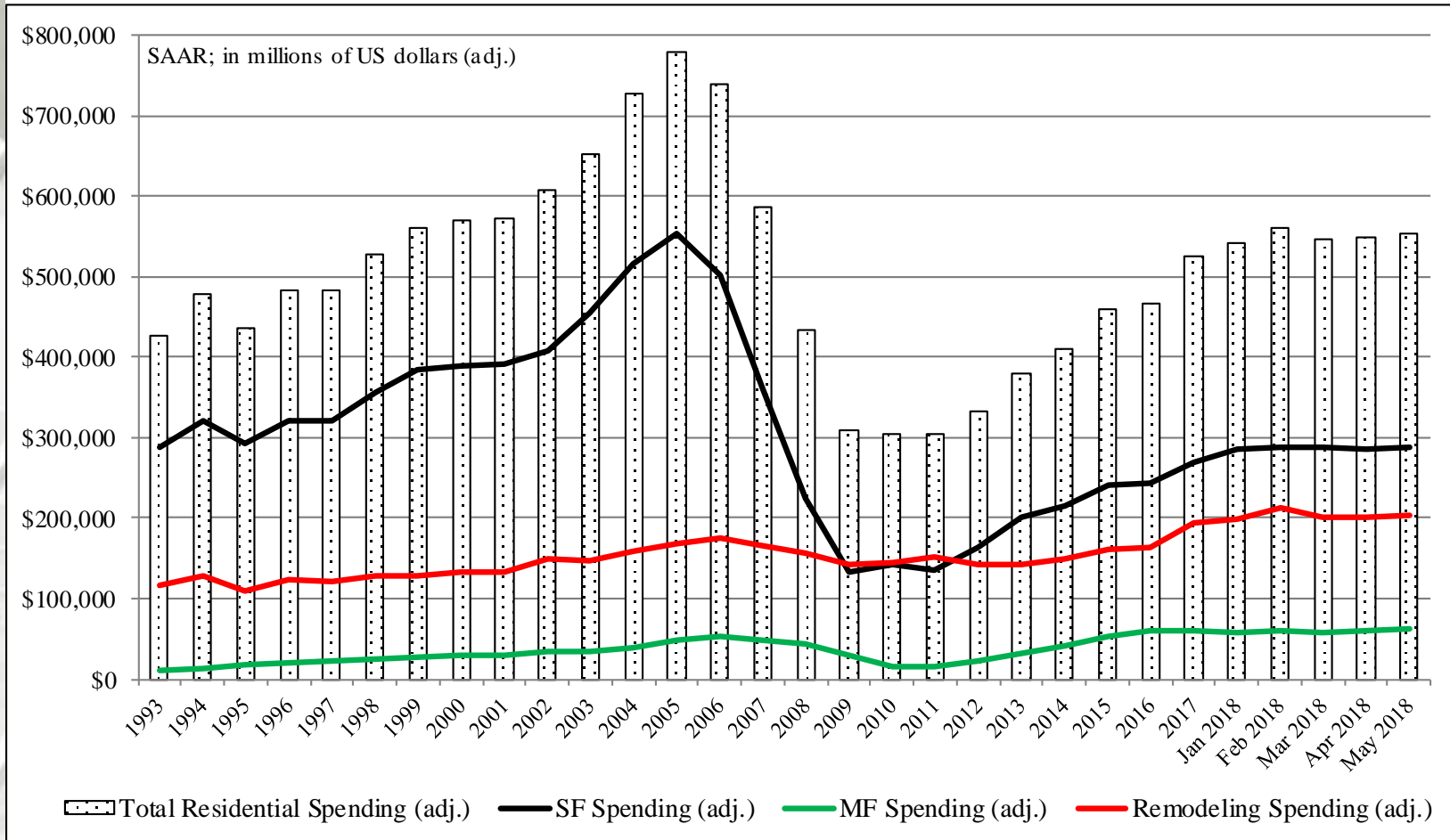
Total Construction Spending (nominal): 1993 – May 2018



Reported in nominal US\$.

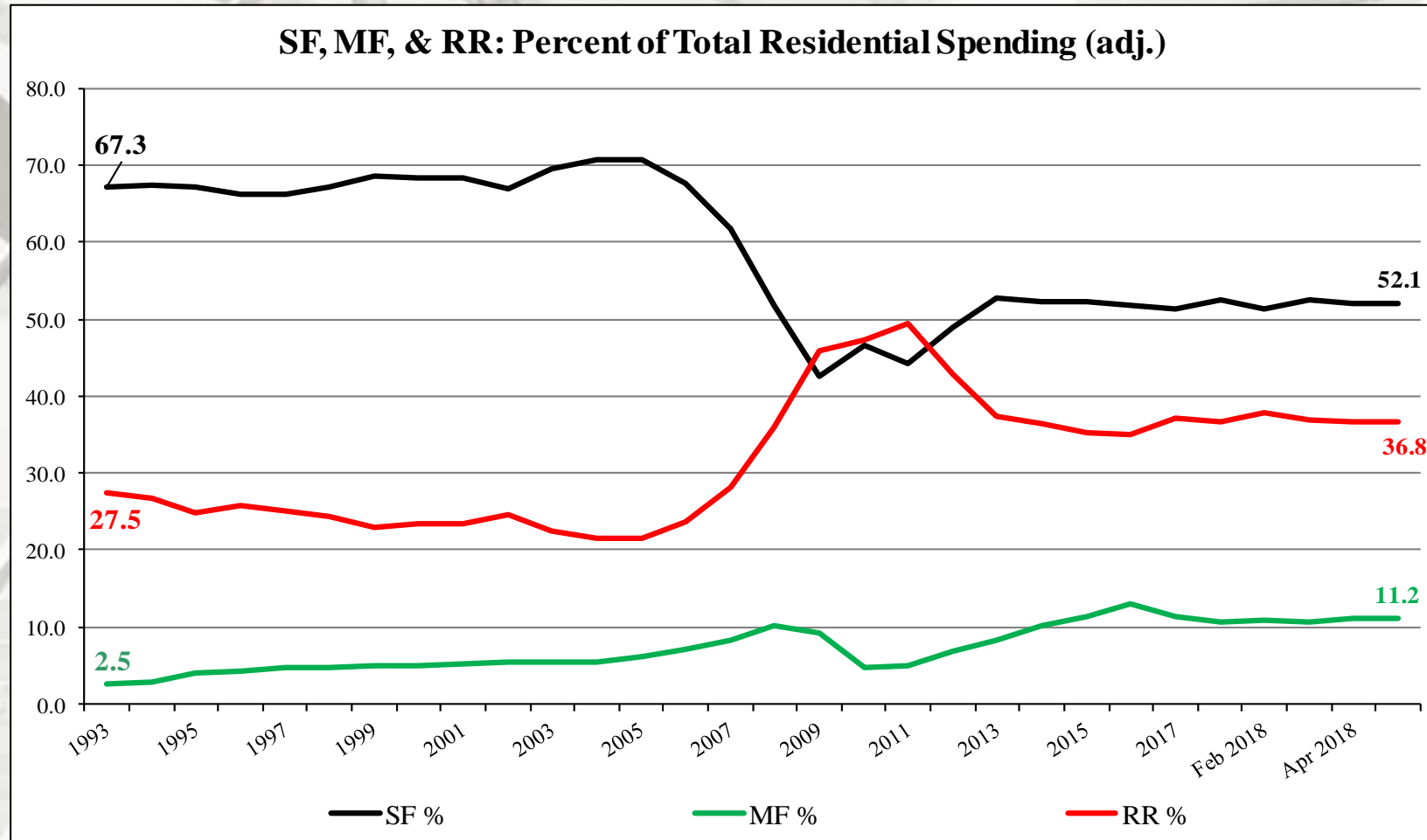
The US DOC does not report improvement spending directly, this is a monthly estimation for 2018.

Total Construction Spending (adjusted): 1993-2018*



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

Construction Spending Shares: 1993 to May 2018



Total Residential Spending: 1993 through 2006

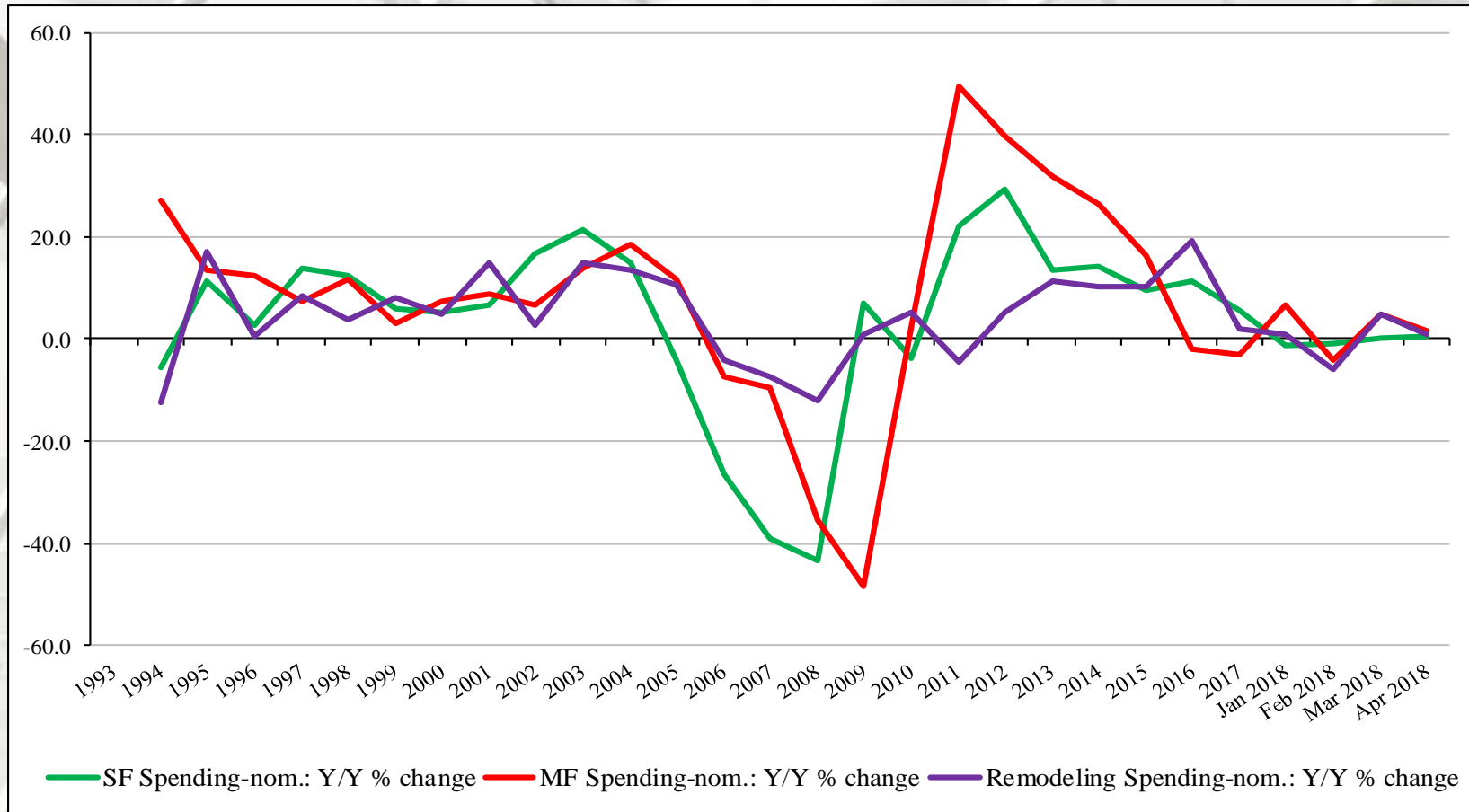
SF spending average: 69.2%

MF spending average: 7.5%

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

Note: 1993 to 2016 (adjusted for inflation, BEA Table 1.1.9); May-May 2017 reported in nominal US\$.

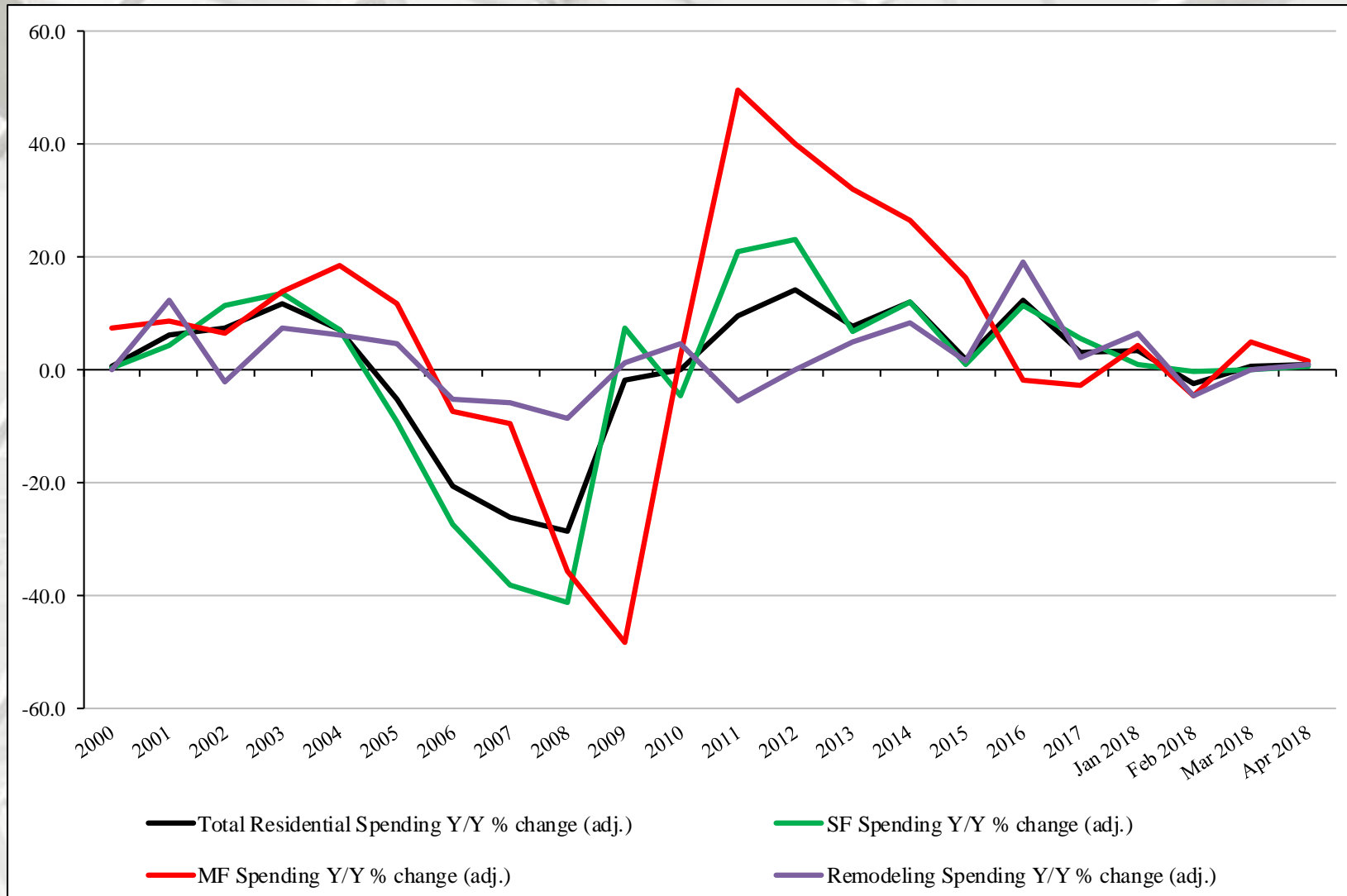
Adjusted Construction Spending: Y/Y Percentage Change, 1993 to May 2018



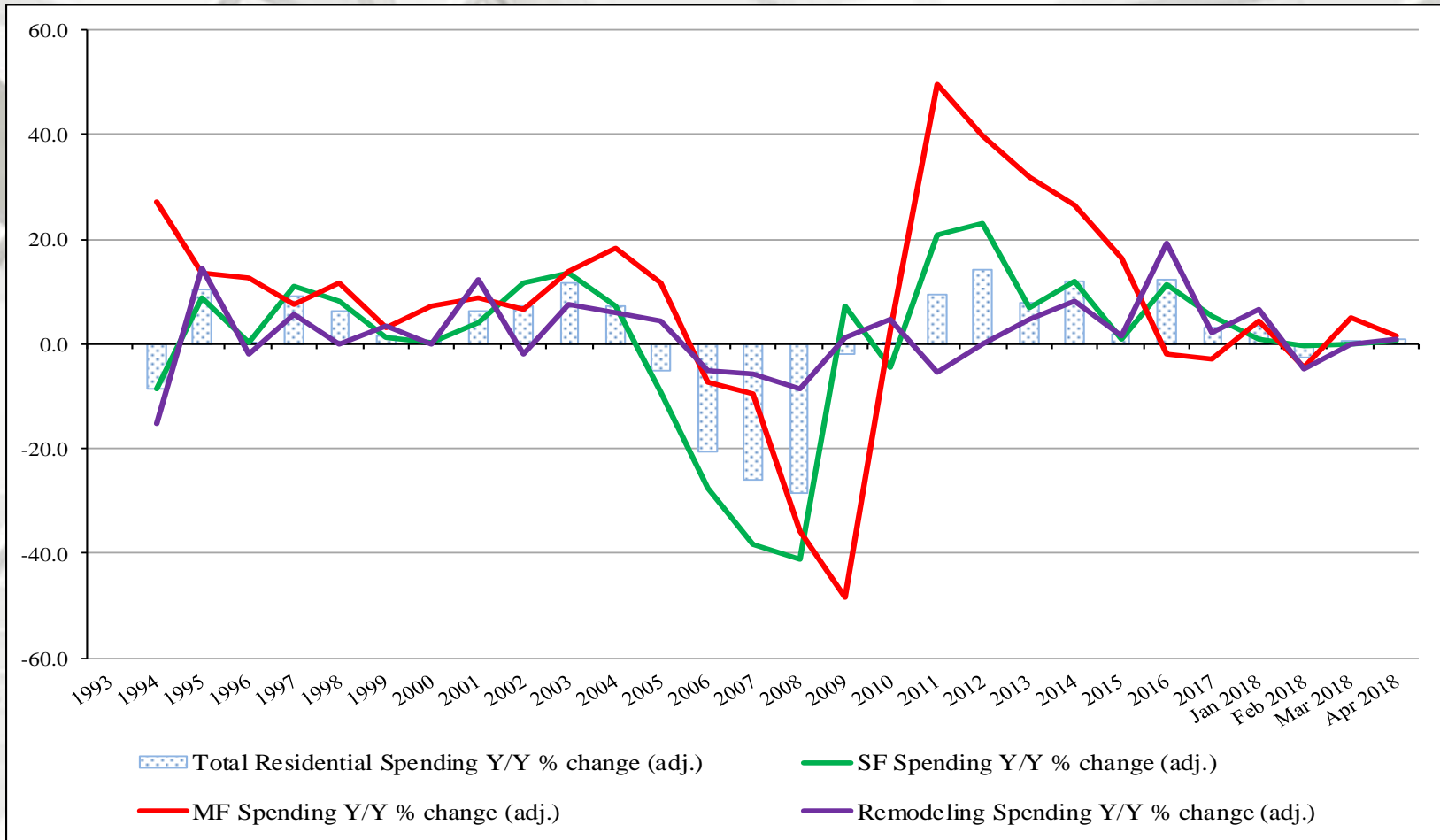
Residential Construction Spending: Percentage Change, 1993 to May 2018

Presented above is the percentage change of inflation adjusted Y/Y construction spending. All spending measures declined, on a percentage basis, year-over-year.

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



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



Residential Construction Spending: Percentage Change, 1993 to May 2018

Total, MF, and remodeling spending rebounded strongly – however, SF appears to have leveled-off.

Remodeling

Metrostudy

Quarterly Swimming Pool Construction Stats Show Continued Growth Metrostudy's New Pool Index depicts moderate growth in 2018's first quarter, despite weather challenges.

“While Metrostudy's quarterly report on inground swimming pool construction continues the moderate-growth trend seen in the last couple years, it has hit some high marks not seen since 2013/2014.

The market intelligence firm, owned by PSN parent company Hanley Wood, said Q1's New Pool Index rose 9.2% over the same period in 2017 and 2.3% over the quarter before. The year-over-year gain was the highest since the first quarter of 2014, the company said, while the quarter-to-quarter increase was the highest since the third quarter of 2013.

“First quarter measures of the New Pool Index were very positive, but the pool industry was somewhat restrained in first quarter 2018 due to inclement weather in seasonal markets, creating some backlog that will be deferred to second quarter,” said Metrostudy Chief Economist Mark Boud.

He added that this growth follows the same trajectory as that of the home-remodeling industry, which also continues to benefit from low unemployment and increasing home values. “We expect steady improvement in new pool activity in 2018, with renovation and repair continuing to capture a large portion of business,” he said.

Recent tax cuts may help the market grow even more, he added.

The analysts expect inground swimming pool construction to increase 9.3% for the whole year. For next year, however, the firm expects growth to moderate.” – Rebecca Robledo, Deputy Editor, *Pool & Spa News*

Existing House Sales

National Association of Realtors

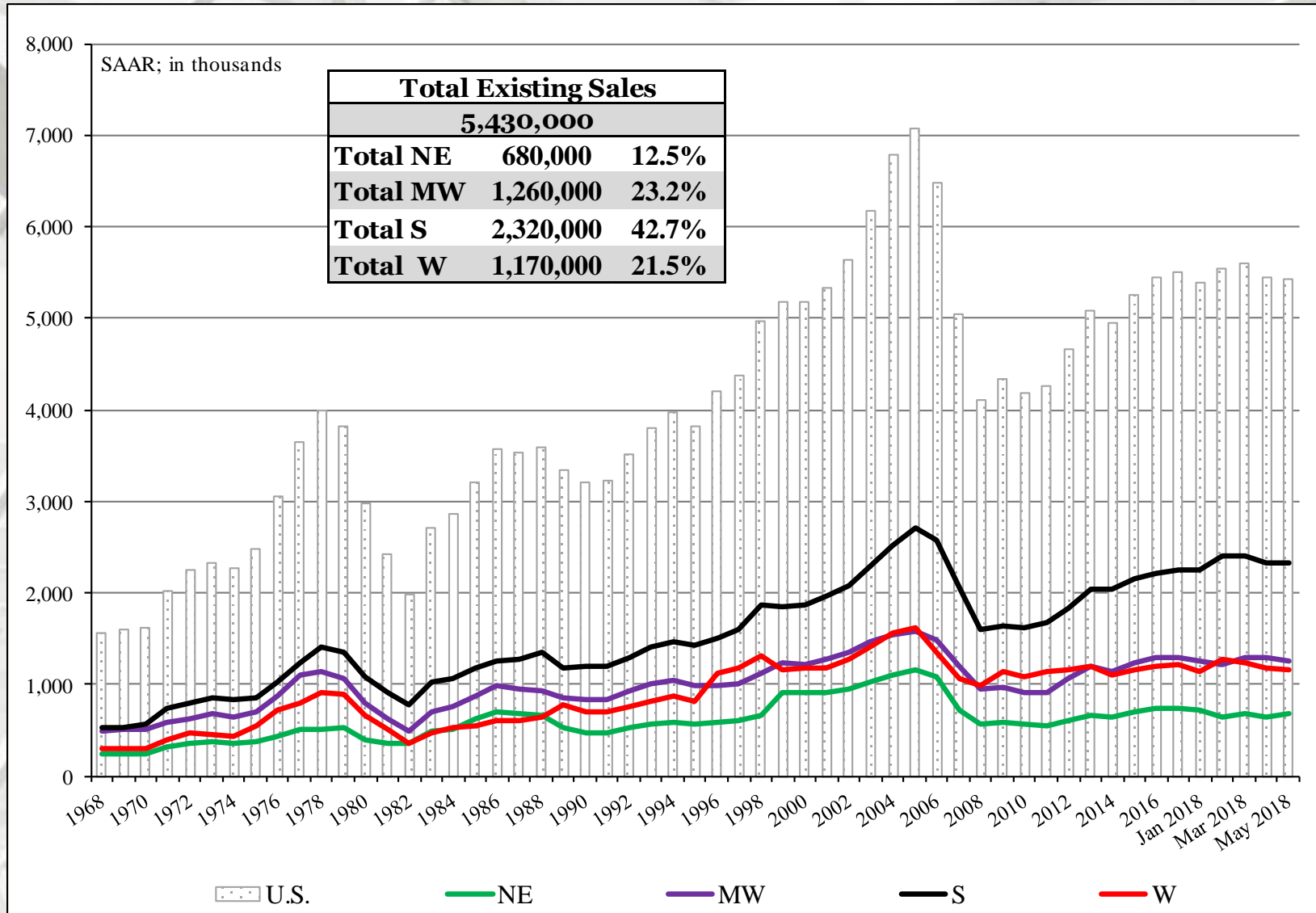
May 2018 sales: 5.430 thousand

	Existing Sales*	Median Price	Mean Price	Month's Supply
May	5,430,000	\$264,800	\$303,500	4.1
April	5,450,000	\$257,900	\$297,800	4.0
2017	5,600,000	\$252,500	\$294,300	4.2
M/M	-0.4%	2.7%	1.9%	2.5%
Y/Y change	-3.0%	4.9%	3.1%	-2.4%

	NE Sales	MW Sales	S Sales	W Sales
May	680,000	1,260,000	2,320,000	1,170,000
April	650,000	1,290,000	2,330,000	1,180,000
2017	770,000	1,290,000	2,320,000	1,220,000
M/M change	4.6%	-2.3%	-0.4%	-0.8%
Y/Y change	-11.7%	-2.3%	0.0%	-4.1%

* All sales data: SAAR

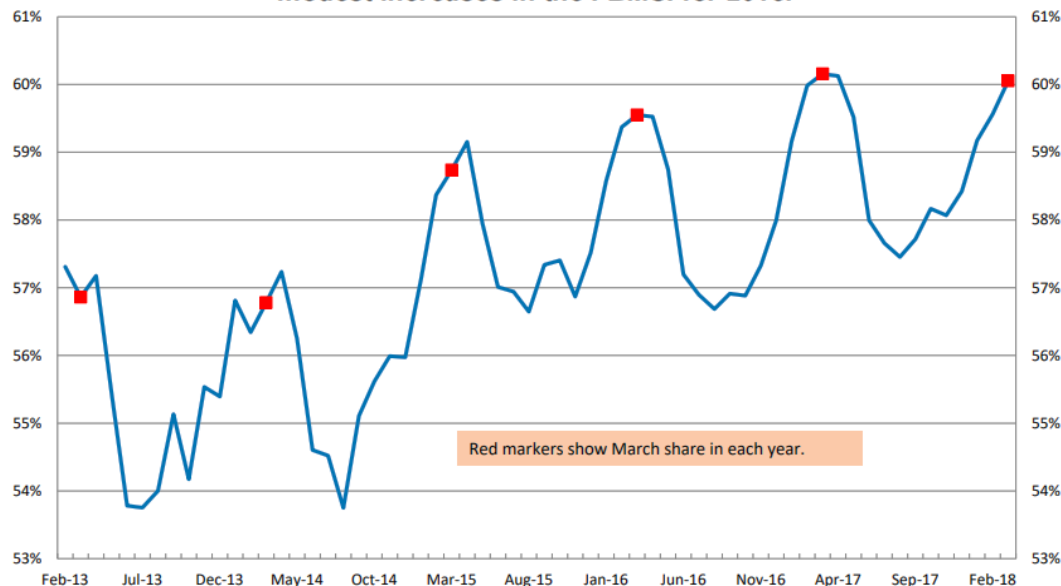
Total Existing House Sales



First-Time Purchasers

Agency First-Time Buyer Mortgage Share Flat at High Level

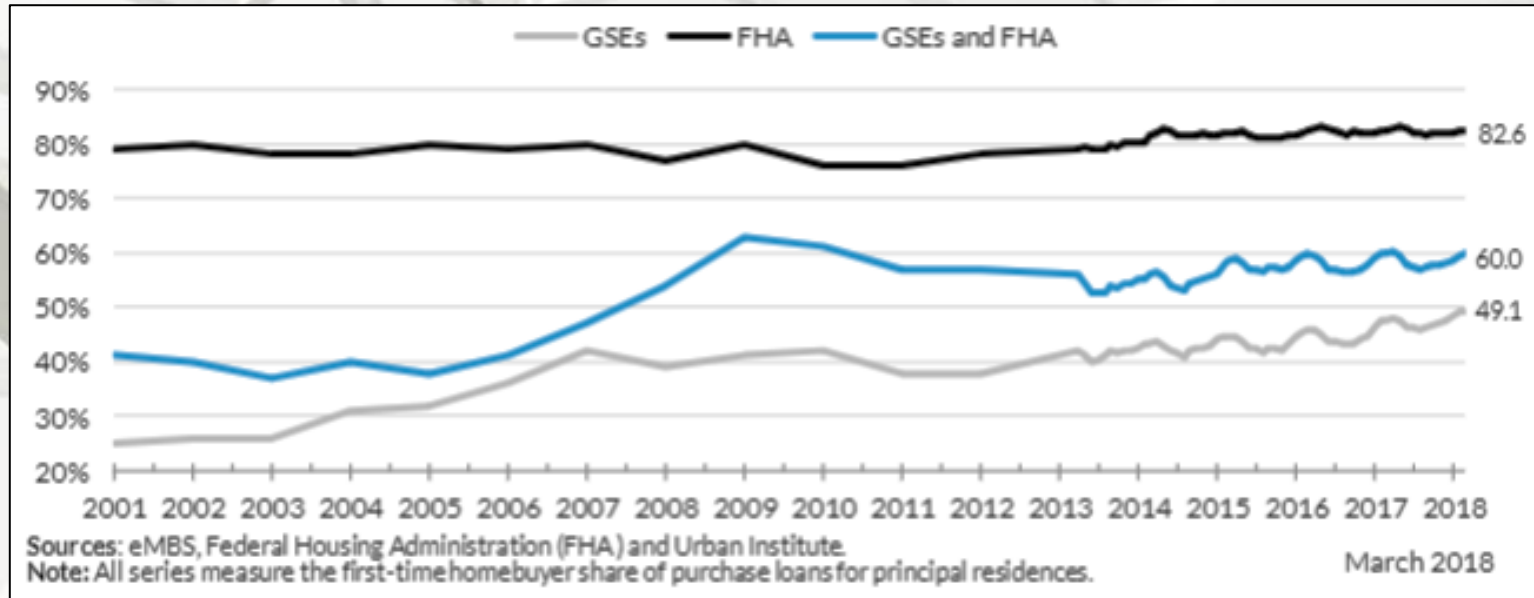
The Agency First-Time Buyer Mortgage Share Index (FBMSI) for March was just slightly below its series' high from March 2017. The index stood at 60.0%, down from 60.2% a year ago but up from 56.8% four years ago. Given its current high level, we expect only modest increases in the FBMSI for 2018.



AEI Center on Housing Markets and Finance Mortgage Risk Index release of January 2018 data

“The Agency First-Time Buyer Mortgage Share Index (FBMSI) for March was just slightly below its series' high from March 2017. The index stood at 60.0%, down from 60.2% a year ago but up from 56.8% four years ago. Given its current high level, we expect only modest increases in the FBMSI for 2018. Fannie and FHA have been competing with each other for first-time buyers. Worryingly, the pace of credit easing by FHA and Fannie is increasing. (Note that the apparent dip in 2015 was due to share shifts between FHA and Fannie following FHA's January 2015 mortgage insurance premium drop.) Over the past 9 months, Freddie has largely resisted this trend, but will likely eventually have to compete as well.” – Edward Pinto and Tobias Peter, AEI International Center on Housing Risk

First-Time Purchasers

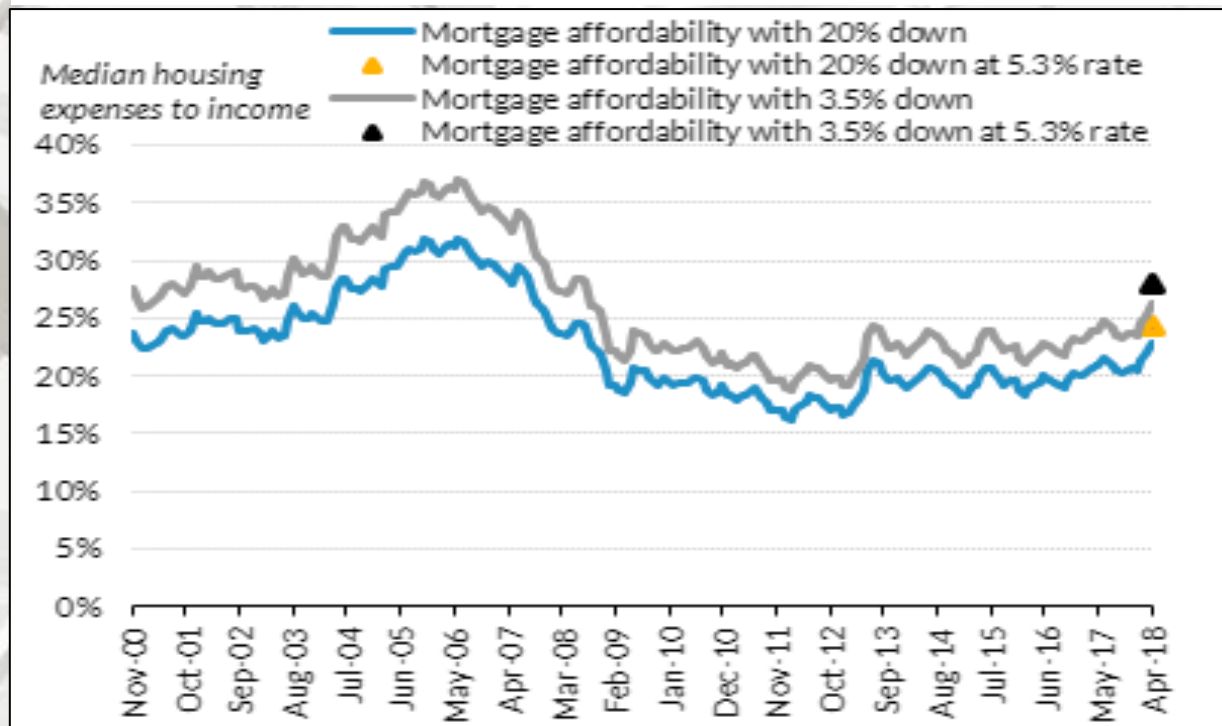


Urban Institute

“In March 2018, the first-time homebuyer share of GSE purchase loans was 49.1 percent, its highest level in recent history. The FHA has always been more focused on first-time homebuyers, with its first-time homebuyer share hovering around 80 percent; it stood at 82.6 percent in March 2018. The bottom table shows that based on mortgages originated in February 2018, the average first-time homebuyer was more likely than an average repeat buyer to take out a smaller loan and have a lower credit score and higher LTV and DTI, thus requiring a higher interest rate.” – Laurie Goodman, *et al.*, Co-director, Housing Finance Policy Center

Housing Affordability

National Housing Affordability Over Time



Urban Institute

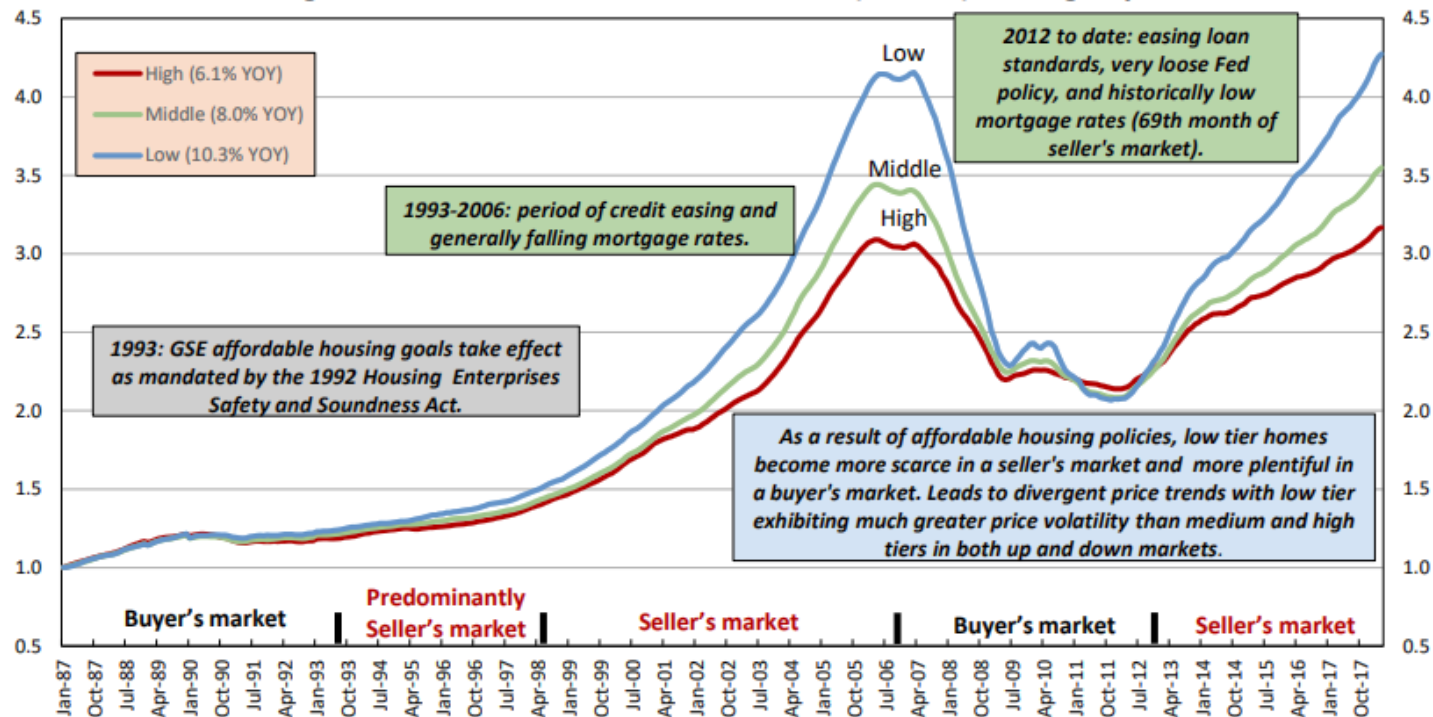
“Home prices remain affordable by historic standards, despite increases over the last five years and the recent interest rate hikes. As of April 2018, the share of median income needed for the monthly mortgage payment with a 20% down payment stood at 23 percent. With a 3.5% down payment, the share of income is higher, at 26 percent in April 2018. If interest rates rise to 5.3%, the housing expenses to income share with both a 20 percent and a 3.5 percent down payment would be the same as the 2001-03 averages (24 and 28 percent, respectively). ...” – Bing Lai, Research Associate, Housing Finance Policy Center

Housing Affordability

Greater House Price Volatility at the Lower End

The current seller's market is 69 months old. Prior to the Great Recession a seller's market lasted for 99 months. Since the advent of expanded "affordable housing" efforts, these trends have become stronger at the lower end of the market, as indicated by higher peaks and deeper troughs. Increasing leverage fuels unsustainable house price trends. The Low Price Tier is up 10.3% y-o-y and 105% since 2012 trough, while High Price Tier is up 6.1% y-o-y and 48% since 2012 trough.

CoreLogic Case-Shiller Tiered Home Price Index (1987=1), through April 2018



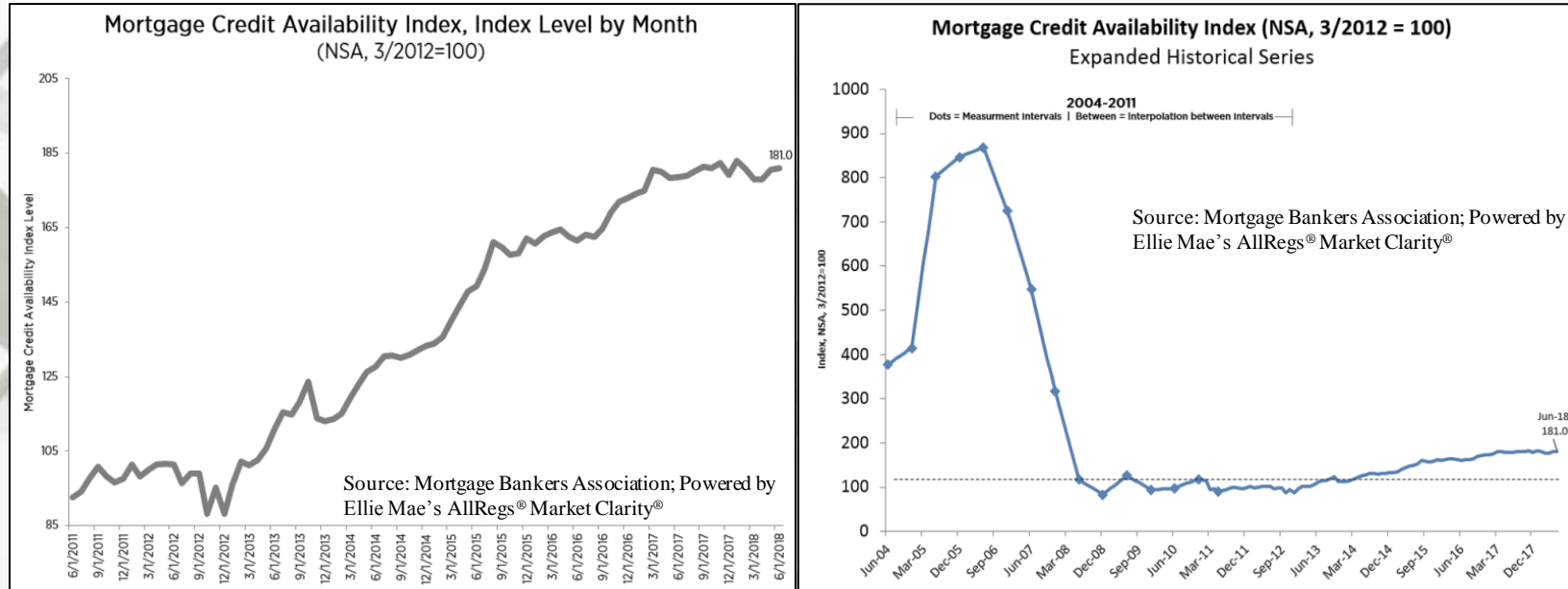
Tiers price breakouts are calculated by breaking up all sales for each period, so that there are the same number of sales, after accounting for exclusions, in each of the three tiers. These 16 metro areas are used to derive the Tiered HPI: Boston, NYC, DC, Chicago, Denver, Las Vegas, Los Angeles, San Diego, San Francisco, Miami, Atlanta, Minneapolis, Phoenix, Portland, Seattle, and Tampa. Only 8 metro areas included at beginning of series. This number grows until 1993, when 16 metro areas are consistently reported.

* A seller's market: an economic situation in which goods are scarce and sellers can keep prices high. (Google.com)

**A buyer's market: an economic situation in which goods are plentiful and buyers can keep prices down. (Google.com)

Source: CoreLogic Case-Shiller (Data: Apr-18, Pub: Jun-18), compiled by John Burns Consulting and AEI Center on Housing Markets and Finance (www.HousingRisk.org)

Mortgage Credit Availability



Mortgage Credit Availability Increased in June

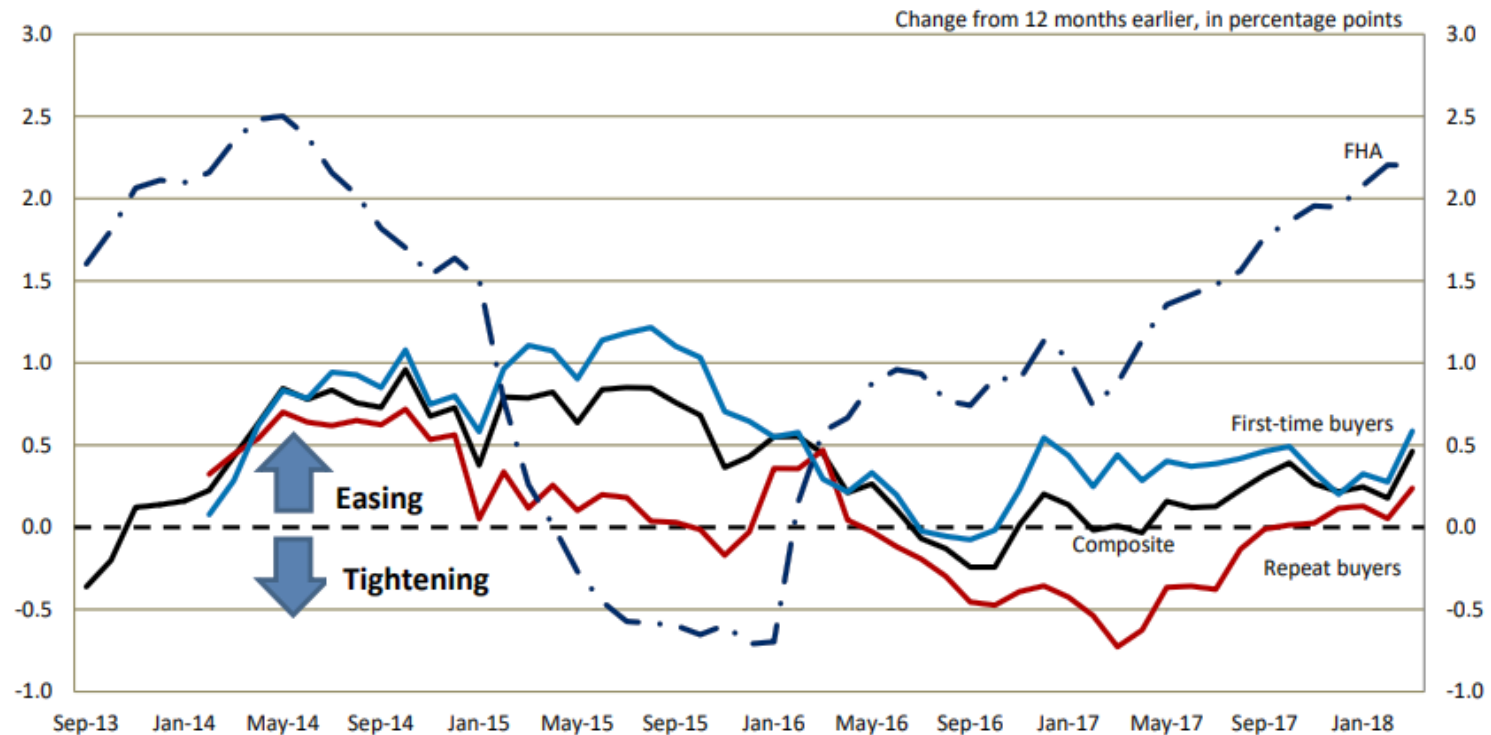
“Mortgage credit availability increased in June according to the Mortgage Credit Availability Index (MCAI), a report from the Mortgage Bankers Association (MBA) which analyzes data from Ellie Mae's AllRegs® Market Clarity® business information tool. The MCAI increased 0.2 percent to 181.0 in June. A 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 (up 5.5 percent) and the Government MCAI decreased (down 3.9 percent). Of the component indices of the Conventional MCAI, the Jumbo MCAI increased by 9.3 percent while the Conforming MCAI increased by 1.0 percent.

Mortgage credit loosened slightly, led mainly by an increase in the jumbo MCAI which represented fierce competition among lenders for prime jumbo borrowers. However, this loosening was almost completely offset by a decline in credit for government loan programs. The Government MCAI has tightened in recent months, driven largely by policy actions to reduce churning in the Veterans Administration's Interest Rate Reduction Refinance Loan program.” – Mike Fratantoni, Senior Vice President of Research and Industry Technology, MBA

Mortgage Credit

Update: Credit Easing Trend Continues, Led by FHA

Composite NMRI for purchase increased from already elevated levels a year ago. The index now rising at over 2% year-over-year for FHA and was slightly higher for first-time buyers and repeat buyers. First-time buyers in particular have been taking on greater leverage. For 2018 we expect continued easing for first-time buyers and FHA, helping fuel accelerating house price growth for entry-level homes. Entry-level homes will be less affordable and first-time buyers will be faced with a higher risk of default.



Note: Includes all types of NMRI purchase loans (primary owner-occupied, second home, and investor loans).
 Source: AEI, Center on Housing Markets and Finance, www.AEI.org/housing.

Summary

In summary:

The U.S. housing construction market was mostly robust in May, with the exception of existing house sales. New single-family starts, under construction, completions, and sales improved on a month-over-month basis and were fairly robust on a year-over-year basis. New single-family construction spending indicated a minimal positive change on a monthly basis. Regionally, data were mixed across all sectors. Once again, new SF lower-priced tier house sales were less than historical averages. The new SF construction market needs consistent improvement in this category to influence the housing construction market upward.

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 (future Fed actions may cause *i*-rates to rise);
- 2) As a result, housing affordability is good for many in the U.S. – but not all of the U.S.;
- 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) Household formations are still lagging historical averages;
- 4) Changing attitudes towards SF ownership;
- 5) Job creation is improving and consistent but some economists question the quantity and types of jobs being created;
- 6) Debt: Corporate, personal, government – United States and globally;
- 7) Other global uncertainties.

Virginia Tech Disclaimer

Disclaimer of Non-endorsement

Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not constitute or imply its endorsement, recommendation, or favoring by Virginia Tech. The views and opinions of authors expressed herein do not necessarily state or reflect those of Virginia Tech, and shall not be used for advertising or product endorsement purposes.

Disclaimer of Liability

With respect to documents sent out or made available from this server, neither Virginia Tech nor any of its employees, makes any warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

Disclaimer for External Links

The appearance of external hyperlinks does not constitute endorsement by Virginia Tech of the linked web sites, or the information, products or services contained therein. Unless otherwise specified, Virginia Tech does not exercise any editorial control over the information you November find at these locations. All links are provided with the intent of meeting the mission of Virginia Tech's web site. Please let us know about existing external links you believe are inappropriate and about specific additional external links you believe ought to be included.

Nondiscrimination Notice

Virginia Tech prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the author. Virginia Tech is an equal opportunity provider and employer.

U.S. Department of Agriculture Disclaimer

Disclaimer of Non-endorsement

Reference herein to any specific commercial products, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government, and shall not be used for advertising or product endorsement purposes.

Disclaimer of Liability

With respect to documents available from this server, neither the United States Government nor any of its employees, makes any warranty, express or implied, including the warranties of merchantability and fitness for a particular purpose, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

Disclaimer for External Links

The appearance of external hyperlinks does not constitute endorsement by the U.S. Department of Agriculture of the linked web sites, or the information, products or services contained therein. Unless otherwise specified, the Department does not exercise any editorial control over the information you November find at these locations. All links are provided with the intent of meeting the mission of the Department and the Forest Service web site. Please let us know about existing external links you believe are inappropriate and about specific additional external links you believe ought to be included.

Nondiscrimination Notice

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202.720.2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call 800.795.3272 (voice) or 202.720.6382 (TDD). The USDA is an equal opportunity provider and employer.