

Agricultural Commodity Price Impacts of Federal Reserve Stress Test Scenarios

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Summary

The Federal Reserve provides a set of macroeconomic assumptions for financial institutions to use in conducting stress tests under the Dodd-Frank Act. Working with CoBank, we examined the possible implications for agricultural commodity prices of a baseline and three scenarios:

- 1) The **baseline**, which assumes moderate rates of economic growth and a continuation of current agricultural policies.
- 2) The **adverse-macro only scenario**, which assumes a sharp reduction in economic growth rates and lower oil prices, but with no changes in agricultural policies.
- 3) The **adverse-with policy scenario**, which makes the same macroeconomic assumptions as the adverse-macro only scenario, but also includes changes in agricultural policies in China and Argentina that further depress commodity prices.
- 4) The **severely adverse** scenario, which assumes even sharper reductions in economic growth, but with smaller impacts on oil markets than in the adverse scenarios and with no changes in agricultural policies.

Models maintained by the Food and Agricultural Policy Research Institute at the University of Missouri (FAPRI-MU) and by collaborating researchers at the University of Missouri, the University of Nevada, Reno and the University of Arkansas are used to estimate possible impacts of these scenarios.

Agricultural commodity prices fall significantly below baseline values in the scenarios assuming sharply lower economic growth.

- Lower income levels in the United States and other countries reduce demand for high-value foods, such as meats and dairy products.
- Food demand for staple crops is generally less sensitive to income levels, but feed demand falls when livestock herds contract in response to reduced demand and lower prices.
- Production costs also decline in the scenarios, moderating reductions in the net income of crop and livestock producers.
- In the scenarios, livestock sector prices generally are reduced proportionally more than crop sector prices. In the first year of the severely adverse scenario, for example, fed cattle prices are reduced by an estimated 14 percent from baseline levels, while corn prices fall by 6 percent.

Factors beyond the health of the general economy influence farm commodity prices. Crop prices, for example, could easily fall below the levels reported here if favorable weather results in unusually high crop yields and abundant supplies. This is demonstrated by a comparison of scenario results to stochastic outcomes from the FAPRI-MU baseline.

Introduction

The Dodd-Frank Wall Street Reform and Consumer Protection Act requires annual stress tests of certain financial institutions. As part of the process, the Federal Reserve prepares three supervisory scenarios, a baseline that assumes continued moderate rates of economic growth and two scenarios that assume another severe recession.

CoBank approached the Food and Agricultural Policy Research Institute at the University of Missouri (FAPRI-MU) for estimates of the agricultural commodity market implications of the Federal Reserve scenarios. Working with CoBank, we agreed to compare a baseline and three scenarios:

- 1) The **baseline**, which assumes moderate rates of economic growth and a continuation of current agricultural policies.
- 2) The **adverse-macro only scenario**, which assumes a sharp reduction in economic growth rates and lower oil prices, but with no changes in agricultural policies.
- 3) The **adverse-with policy scenario**, which makes the same macroeconomic assumptions as the adverse-macro only scenario, but also includes changes in agricultural policies in China and Argentina that have the effect of reducing export demand for U.S. agricultural products
- 4) The **severely adverse** scenario, which assumes even sharper reductions in economic growth, but with smaller impacts on oil markets than in the adverse scenarios and with no changes in agricultural policies.

Models maintained by FAPRI-MU and by collaborating researchers at the University of Missouri, the University of Nevada, Reno and the University of Arkansas are used to estimate possible impacts of these scenarios.

U.S. macroeconomic assumptions

The Federal Reserve supplied quarterly estimates of real GDP growth rates, inflation rates, interest rates and several other macroeconomic indicators for a baseline and for the adverse and severely adverse scenarios. Simple averages of those quarterly estimates are reported in Table 1.

- In the adverse scenario, real GDP contracts in 2016, which means real GDP is 4.4 percent less than in the baseline. Growth continues to lag that in the baseline in 2017, and even with more rapid growth in 2018, the level of real GDP remains far below the baseline.
- Slower economic growth and other commodity market developments contribute to slower inflation in the adverse scenario. Interest rates drop and then remain steady in the adverse scenario, in sharp contrast to a baseline that assumed rising rates.
- The severely adverse scenario assumes an even sharper drop in real GDP and lower interest rates. Inflation also falls below baseline levels, but given a different set of commodity market assumptions, the drop is not as large as in the adverse scenario.

For this study, we adopt the FAPRI-MU baseline released in March 2016. The U.S. macroeconomic assumptions in that baseline were prepared by IHS Global Insight in January 2016 and differ slightly from the Federal Reserve baseline. For the scenarios, we adopt the changes from baseline implied by the Fed's macroeconomic assumptions, delayed one year (Table 2). Because of this one-year shift, the scenario assumptions differ from baseline levels for calendar years 2017-2019. This shift was made for practical reasons—it allows us to treat historical data as fixed and focus on how future market developments might be affected by a weaker economy.

Table 1 U.S. macroeconomic assumptions from the Federal Reserve (averages of quarterly figures)

Variable	Year	Units	Baseline value	Adverse scenario		Severely adverse scenario	
				Value	Change from baseline	Value	Change from baseline
Real GDP growth	2016	Percent	2.55	-1.85	-4.40	-5.68	-8.23
	2017		2.38	1.40	-0.98	0.63	-1.75
	2018		2.40	2.90	0.50	3.68	1.28
CPI inflation rate	2016	Percent	2.00	-0.55	-2.55	0.88	-1.13
	2017		2.33	0.80	-1.53	1.75	-0.58
	2018		2.08	1.45	-0.63	1.65	-0.43
Prime interest rate	2016	Percent	3.88	3.28	-0.60	2.85	-1.03
	2017		4.83	3.20	-1.63	2.60	-2.23
	2018		5.73	3.20	-2.53	2.60	-3.13

Source: Author calculations based on data provided by CoBank from the Board of Governors of the Federal Reserve System, "2016 Supervisory Scenarios for Annual Stress Tests Required under the Dodd-Frank Act Stress Testing Rules and the Capital Plan Rule," January 28, 2016.

Table 2. U.S. macroeconomic assumptions as implemented for the analysis

Variable	Year	Units	Baseline value	Adverse scenario		Severely adverse scenario	
				Value	Change from baseline	Value	Change from baseline
Real GDP growth	2017	Percent	2.94	-1.46	-4.40	-5.28	-8.23
	2018		2.63	1.65	-0.98	0.88	-1.75
	2019		2.43	2.93	0.50	3.71	1.28
CPI inflation rate	2017	Percent	2.56	0.01	-2.55	1.44	-1.13
	2018		2.68	1.16	-1.53	2.11	-0.58
	2019		2.54	1.91	-0.63	2.11	-0.43
Prime interest rate	2017	Percent	4.91	4.31	-0.60	3.89	-1.03
	2018		5.90	4.28	-1.63	3.68	-2.23
	2019		6.25	3.73	-2.53	3.13	-3.13

Note: Baseline assumptions are those used in the 2016 FAPRI-MU baseline, and are based on IHS Global Insight forecasts released in January 2016. For the scenarios, the changes from baseline values in the Federal Reserve assumptions are added to the FAPRI-MU baseline values for the subsequent calendar year.

Foreign macroeconomic assumptions

The Federal Reserve also supplied estimates of foreign macroeconomic indicators for the baseline and scenarios. For the Eurozone, developing Asia, Japan and the United Kingdom, the Fed provided estimates of quarterly real GDP growth, inflation and exchange rates relative to the U.S. dollar.

This analysis adopts the 2016 FAPRI-MU baseline as the reference point for the analysis of the alternative scenarios. The FAPRI-MU baseline utilizes foreign macroeconomic assumptions based on December 2015 forecasts by IHS Global Insight. As with the U.S. assumptions, these differ from the Fed assumptions, but are broadly consistent in showing moderate rates of economic growth.

For the countries explicitly included in the Fed scenarios, we follow the same rule used for U.S. macroeconomic assumptions: the annualized changes from baseline in the Fed scenarios are applied to the following calendar year (Table 3). For example, the Fed-reported changes for 2016 are applied to the 2017 baseline values. Because the Fed assumptions do not cover all countries, we also were forced to make our own assumptions about how the scenarios would affect economic growth rates, inflation and exchange rates in other countries.

Consistent with the U.S. assumptions, the adverse and severely adverse scenarios show sharply lower rates of economic growth in the initial year. European and Japanese economies experience recessions, and rates of economic growth in developing Asia are significantly reduced. As in the United States, inflation rates are reduced in all countries. In both scenarios, the dollar strengthens against the euro, but in the severely adverse scenario, it weakens against the yen.

Table 3. Foreign macroeconomic assumptions

Variable	Year	Units	Baseline value	Adverse scenario		Severely adverse scenario	
				Value	Change from baseline	Value	Change from baseline
Eurozone real GDP growth	2017	Percent	1.73	-2.28	-4.00	-4.40	-6.13
	2018		1.60	1.10	-0.50	0.18	-1.43
	2019		1.51	2.08	0.56	2.30	0.79
Japan real GDP growth	2017	Percent	0.70	-4.63	-5.33	-7.55	-8.25
	2018		0.93	-1.53	-2.45	-5.15	-6.08
	2019		1.22	1.00	-0.22	0.35	-0.87
Developing Asia real GDP growth	2017	Percent	5.98	2.15	-3.83	0.55	-5.43
	2018		6.03	6.28	0.25	6.00	-0.03
	2019		6.42	6.45	0.03	6.65	0.23
World real GDP growth	2017	Percent	3.22	-1.55	-4.77	-4.13	-7.35
	2018		3.30	2.29	-1.00	1.30	-1.99
	2019		3.34	3.26	-0.08	3.89	0.55
Dollar-euro exchange rate	2017	Dollars/euro	1.06	0.98	-0.08	0.96	-0.10
	2018		1.09	1.00	-0.09	0.96	-0.12
	2019		1.13	1.03	-0.10	1.00	-0.13
Yen-dollar exchange rate	2017	Yen/dollar	124	122	-2	115	-9
	2018		123	123	0	114	-9
	2019		124	121	-3	113	-11

Note: baseline assumptions are those used in the 2016 FAPRI-MU baseline, and are based on IHS Global Insight forecasts released in December 2015. The Federal Reserve provided estimates of some foreign macroeconomic variables, such as real GDP growth rates in the Eurozone and Japan. For the scenarios, the changes from baseline values in the Federal Reserve assumptions, where available, are added to FAPRI-MU baseline values for the subsequent calendar year. For variables not include in the Federal Reserve assumption set, scenario values are set based on analyst judgment.

Oil price assumptions and production expenses

The prices of oil and other energy sources can have important direct and indirect effects on the agricultural sector by affecting the costs of fuel and other inputs and the demand for biofuels. CoBank provided estimates of petroleum prices corresponding to each of the scenarios.

As with macroeconomic variables, we adopted the FAPRI-MU baseline values for petroleum prices, based on January 2016 forecasts by IHS Global Insight. For the adverse and severely adverse scenarios, we applied the CoBank changes from baseline to the FAPRI-MU baseline values (Table 4).

In both scenarios, oil prices fall well below baseline values in 2017 and then remain at similar levels in 2018 and 2019. The changes from baseline values increase in 2018 and 2019, as the baseline assumed an increase in oil prices.

Given scenario assumptions about global commodity markets, oil prices are actually lower in the adverse scenario than in the severely adverse scenario.

Based on these oil prices and the assumed changes in inflation rates, interest rates and other factors, we estimate impacts on farm production expenses. Crop production expenses generally are reduced more in the adverse scenario than in the severely adverse scenario. Fuel costs account for a portion of the reported changes, but fertilizer, chemical, and other costs are also affected.

Livestock producers would also experience lower production expenses, reflecting changes in fuel, feed and other costs.

All else equal, lower production expenses would increase net producer income and encourage increased production. This effect, of course, is offset by the lower commodity prices that result from weaker consumer and intermediate demand for farm products.

Table 4. Oil price assumptions and crop variable production expenses

Variable	Year	Units	Baseline value	Adverse scenario		Severely adverse scenario	
				Value	Change from baseline	Value	Change from baseline
W. Texas intermediate oil price	2017	Dollars	55	37	-18	43	-11
	2018	per barrel	66	35	-30	41	-25
	2019		74	36	-38	42	-32
Corn variable costs	2017	Dollars	318	305	-13	311	-7
	2018	per acre	325	302	-23	310	-15
	2019		336	307	-29	315	-21
Soybean variable costs	2017	Dollars	168	159	-10	163	-6
	2018	per acre	173	157	-16	162	-11
	2019		177	158	-20	163	-15
Wheat variable costs	2017	Dollars	114	107	-7	110	-4
	2018	per acre	118	106	-12	110	-8
	2019		123	107	-16	111	-12
Cotton variable costs	2017	Dollars	498	469	-29	481	-17
	2018	per acre	515	466	-50	480	-35
	2019		533	472	-62	487	-47

Note: Baseline oil price assumptions are those used in the 2016 FAPRI-MU baseline, and are based on IHS Global Insight forecasts released in January 2016. CoBank provided a set of oil price assumptions. For the scenarios, the changes from baseline values in the CoBank assumptions are added to the FAPRI-MU baseline assumptions. Cost of production estimates are developed by FAPRI-MU, based on macroeconomic assumptions and commodity market results.

Policy assumptions

The baseline assumes a continuation of current U.S. farm, biofuel and trade policies. No policy assumptions are changed for the adverse-macro only or for the severely adverse scenario.

China has built large stocks of grain and cotton because of past government policies. Recent policy changes reduce the likelihood of further stock accumulation, and the baseline assumes relatively stable levels of grain and cotton stocks in China (Table 5). The same stockholding policy is assumed to apply in the adverse macro-only and severely adverse scenarios.

In the adverse-with policy scenario, modest annual reductions in grain stocks and larger proportional reductions in cotton stocks are assumed. It is easy to imagine policy choices in China that could cause stocks to fall even more rapidly or at a more moderate pace. The reductions in Chinese stocks make more grain and cotton available to users, and thus tend to reduce commodity prices in the short run.

Argentina's new government has eliminated some commodity export taxes and announced a plan to reduce future export taxes on soybeans. The 2016 FAPRI-MU baseline assumes soybean export taxes will be reduced 5 percentage points each year. In the adverse-with policy scenario, those reductions are accelerated, so no soybean export taxes remain for the 2019/20 marketing year. All else equal, this results in more Argentine soybean production and exports and lower soybean prices.

Table 5. China and Argentina policy assumptions

Variable	Year	Units	Baseline value	Adverse w/ policy scenario	
				Value	Change from baseline
China corn stocks	2016/17	million	121.9	120.1	-1.9
	2017/18	metric tons	129.2	125.8	-3.4
	2018/19	tons	133.6	128.9	-4.7
	2019/20		134.7	128.3	-6.4
China wheat stocks	2016/17	million	90.8	89.8	-1.0
	2017/18	metric tons	92.9	90.8	-2.1
	2018/19	tons	90.4	87.5	-2.8
	2019/20		88.7	85.4	-3.2
China cotton stocks	2016/17	million	62.4	60.3	-2.0
	2017/18	bales	61.3	57.2	-4.1
	2018/19		61.3	55.3	-6.0
	2019/20		62.4	54.5	-7.9
Argentina soybean export taxes	2016/17	Percent	30.0	25.0	-5.0
	2017/18		25.0	15.0	-10.0
	2018/19		20.0	5.0	-15.0
	2019/20		15.0	0.0	-15.0

Note: The same policy assumptions are used in all but one of the scenarios. In the adverse-with policy scenario, China is assumed to be more aggressive in reducing its stocks of grain and cotton, and Argentina reduces its export tax on soybeans more quickly.

Crop price results

Crop market impacts of these scenarios are summarized in Table 6. In the scenarios, reductions in consumer income reduce final demand for many agricultural commodities. Food demand for staple crops is generally not very responsive to changes in consumer income, but feed demand is sensitive to livestock production and prices, which may be strongly affected by a weaker global macroeconomic conditions

In the adverse-macro only scenario, all crop prices decline by less than 7 percent from baseline levels. The first-year impact on corn and soybean prices is slightly larger than that for other crops, as lower incomes reduce the demand for animal products and thus the demand for feed.

The story is more complicated in later years, in part because the scenario affects both crop demand and supply. Lower production costs offset part of the effect of lower commodity prices on crop producer income. As a result, changes in crop production in the scenarios are generally small—corn, soybean and wheat production are all within 1 percent of baseline levels for 2016/17-2019/20 in the adverse-macro only scenario, for example.

In the adverse-with policy scenario, lower Chinese grain and cotton stocks and reduced Argentine soybean export taxes both contribute to further reductions in crop prices. The marginal impacts on grain and oilseed prices are fairly small, but that should not be surprising given the modest changes in stock and export tax assumptions for those commodities.

For cotton, the marginal effect of the policy changes is larger, with U.S. upland cotton prices falling 14 percent below baseline levels in 2017/18. The assumed changes in Chinese cotton stocks represent a larger share of global cotton use and trade than the assumed changes in Chinese grain stocks. As noted previously, reasonable changes in these policy assumptions could yield considerably different commodity market impacts.

In the severely adverse scenario, impacts on grain and oilseed markets are generally larger than in the other scenarios. The effect of lower global incomes and feed demand results in significantly lower prices. This occurs even though the reductions in crop production expenses are smaller in the severely adverse scenario than in the adverse scenario.

Table 6. Marketing year average crop prices in the baseline and scenarios

Commodity	Year	Units	Baseline value	Adverse-macro only		Adverse-with policy		Severely adverse	
				Value	Change vs. baseline	Value	Change from baseline	Value	Change from baseline
Corn	2016/17	\$/bu	3.75	3.60	-3.9%	3.55	-5.2%	3.53	-6.0%
	2017/18		3.83	3.68	-4.1%	3.64	-5.1%	3.55	-7.5%
	2018/19		3.92	3.80	-3.0%	3.76	-4.2%	3.65	-7.0%
	2019/20		3.96	3.87	-2.2%	3.82	-3.4%	3.71	-6.3%
Soybeans	2016/17	\$/bu	8.76	8.29	-5.4%	8.20	-6.4%	7.81	-10.9%
	2017/18		9.38	9.03	-3.7%	8.93	-4.8%	8.44	-10.1%
	2018/19		9.41	9.18	-2.4%	9.07	-3.6%	8.42	-10.5%
	2019/20		9.71	9.59	-1.2%	9.44	-2.8%	8.79	-9.4%
Wheat	2016/17	\$/bu	4.96	4.84	-2.5%	4.78	-3.6%	4.77	-3.9%
	2017/18		5.00	4.65	-6.9%	4.61	-7.7%	4.45	-11.0%
	2018/19		5.22	4.96	-4.9%	4.91	-5.9%	4.67	-10.5%
	2019/20		5.33	5.06	-5.1%	5.01	-6.1%	4.77	-10.6%
Upland cotton	2016/17	cents/lb.	57.2	55.9	-2.2%	50.8	-11.1%	55.7	-2.5%
	2017/18		60.5	57.1	-5.6%	51.9	-14.2%	56.3	-6.8%
	2018/19		63.7	60.8	-4.6%	57.0	-10.6%	59.8	-6.2%
	2019/20		64.4	62.0	-3.7%	58.9	-8.5%	61.1	-5.1%
All rice	2016/17	\$/cwt	13.49	13.49	0.0%	13.49	0.0%	13.49	0.0%
	2017/18		13.59	13.27	-2.3%	13.27	-2.4%	13.25	-2.5%
	2018/19		13.95	13.63	-2.3%	13.61	-2.4%	13.52	-3.1%
	2019/20		14.19	13.87	-2.2%	13.85	-2.4%	13.73	-3.2%
Sorghum	2016/17	\$/bu	3.47	3.37	-2.7%	3.34	-3.6%	3.33	-3.9%
	2017/18		3.54	3.42	-3.2%	3.40	-3.9%	3.34	-5.6%
	2018/19		3.61	3.52	-2.6%	3.49	-3.5%	3.41	-5.6%
	2019/20		3.65	3.57	-2.2%	3.54	-3.2%	3.45	-5.4%

Livestock and milk price results

Lower incomes reduce demand for meat, milk and other high-value food products in the adverse and severely adverse scenarios. This not only affects U.S. consumer markets for beef, pork, chicken and dairy products, but also results in weaker export markets for livestock producers. Meat and milk prices fall sharply from baseline levels in response to weaker demand.

In the adverse-macro only scenario, the 2017 impacts on livestock sector prices range from a 7.9 percent reduction in milk prices to an 11.2 percent reduction in feeder steer prices. Lower prices for feed and other production inputs offset a small portion of these reductions in output prices, but the net income of livestock and milk producers is sharply reduced.

The adverse-with policy scenario does not include any changes in policies that directly impact the livestock sector. Thus the small differences relative to the adverse-macro only scenario can be explained by the further reduction in feed costs.

The larger reductions in income in the severely adverse scenario result in even larger reductions in livestock and milk prices. The farm income implications would be even greater than in the other scenarios.

Table 7. Calendar year average livestock and milk prices in the baseline and scenarios

Commodity	Year	Units	Baseline value	Adverse-macro only		Adverse-with policy		Severely adverse	
				Value	Change vs. baseline	Value	Change from baseline	Value	Change from baseline
5-area direct steers	2017	\$/cwt	122.70	111.58	-9.1%	111.26	-9.3%	105.86	-13.7%
	2018		118.06	106.58	-9.7%	106.18	-10.1%	99.99	-15.3%
	2019		116.85	107.49	-8.0%	107.06	-8.4%	102.40	-12.4%
OK City 600-650 pound feeder steers	2017	\$/cwt	171.06	151.95	-11.2%	151.68	-11.3%	141.70	-17.2%
	2018		159.33	140.01	-12.1%	139.59	-12.4%	128.64	-19.3%
	2019		155.48	140.22	-9.8%	139.82	-10.1%	132.08	-15.0%
National 51-52% lean barrows, gilts	2017	\$/cwt	45.62	40.69	-10.8%	40.60	-11.0%	38.64	-15.3%
	2018		48.71	42.44	-12.9%	42.29	-13.2%	40.26	-17.3%
	2019		51.72	45.79	-11.5%	45.57	-11.9%	43.97	-15.0%
Nat'l comp. wholesale broiler	2017	cents/lb.	84.17	76.66	-8.9%	76.45	-9.2%	73.67	-12%
	2018		85.06	77.73	-8.6%	77.37	-9.0%	74.13	-12.9%
	2019		87.39	81.98	-6.2%	81.45	-6.8%	77.95	-10.8%
All milk	2017	\$/cwt	16.88	15.54	-7.9%	15.53	-8.0%	14.91	-11.7%
	2018		17.62	15.90	-9.8%	15.87	-9.9%	15.29	-13.2%
	2019		18.01	16.34	-9.3%	16.30	-9.5%	16.06	-10.9%

Putting the scenario prices in context

The reported commodity market impacts of these macroeconomic scenarios are significant, especially in the case of livestock sector prices. However, these results are not “worst-case scenarios” for agricultural commodity markets.

To illustrate the point, consider corn prices (Table 8). Each year, FAPRI-MU prepares a stochastic baseline for agricultural commodity markets, which provides estimated distributions of prices, production, farm income, government farm program outlays and other indicators. By construction, the mean corn prices from the 2016 stochastic baseline are close to the deterministic baseline values cited in this report.

However, the 10th percentile of that distribution indicates prices of less than \$3 per bushel, far lower than in any of the scenarios examined in this report. The severely adverse scenario examined here is indeed an “extreme” macroeconomic scenario, so these results may appear inconsistent. However, it is instead a reminder that the health of the general economy is not the only factor that drives agricultural commodity markets. Weather, disease, policies and other factors can also have important impacts on farm commodity prices.

The 2016 market situation is a prime example of this. As of early August, the U.S. and global economies are continuing to grow and the general macroeconomic outlook is not dramatically different than it appeared earlier this year. Nevertheless, prices for corn and other grains have fallen sharply in recent months, with December 2016 corn futures falling to \$3.31 per bushel on August 4, 2016. Among the factors contributing to this drop in prices is favorable weather that appeared likely to contribute to a larger 2016 corn crop than projected earlier.

The point is that the estimates provided in this report only consider a subset of the factors that could put severe negative pressure on agricultural commodity prices. More extreme outcomes are possible.

Table 8. Corn prices in the scenarios and in the FAPRI-MU 2016 stochastic baseline

Marketing year	2016/17	2017/18	2018/19	2019/20
Results from this analysis	(dollars per bushel)			
Baseline	3.75	3.83	3.92	3.96
Adverse-macro only scenario	3.60	3.68	3.80	3.87
Adverse-with policy scenario	3.55	3.64	3.76	3.82
Severely adverse scenario	3.53	3.55	3.65	3.71
FAPRI-MU 2016 stochastic baseline				
90th percentile	4.79	5.06	5.19	5.15
Mean	3.75	3.87	3.94	4.00
10th percentile	2.85	2.73	2.92	2.90
CME December futures, Aug. 4, 2016	3.31	3.70	3.87	3.95