



Ag Decision Maker



A Business Newsletter for Agriculture

Vol. 19, No. 2

www.extension.iastate.edu/agdm

December 2014



Cooperative grain margins and implications of crop price movements and market inverses

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The last decade in crop production agriculture was characterized by a tremendous surge in production, pricing, and values. Those surges have magnified business and industrial relationships as the crops move throughout the supply chain. Within the last five years, farmers and agribusinesses have enjoyed the benefits of record farm income and crop prices. However, that profitability also created a movement to expand crop production, which grew enough to overwhelm strong crop demand and significantly lower prices over the past

year. There has been much discussion, particularly within in the agricultural press, about the impact of these swings in production and pricing have on farmers. Less attention has been paid to the impacts on cooperatives and agribusinesses. This article explores the price swings in grain products handled by cooperatives, highlighting how dramatic the changes have been and the impacts on cooperative grain margins.

The farm economy has experienced a significant increase in value since 2000. As shown Figure 1, net farm income reported by the USDA ERS in 2000 was approximately \$50 billion. Today, farm incomes are reported to be twice that level. It is no secret that the observed doubling of income was brought about largely because of strong crop prices driven by increasing crop demand, mainly via biofuel development for corn and exports for soybeans. However, the projections for 2014 and beyond show farm incomes declining as crop prices fall due to

record level production that has now surpassed demand.

Farmers during the same period took advantage of the surging income and reinvested it within the agricultural sector. Whether one considers land, seed, machinery, or other factors of production, crop producers returned a great deal of the profitability during this time to the farming business. The outcome was a major infusion of cash into the agribusiness value chain. A portion of that infusion manifested in terms of the grain sales and cost of goods (COGs) logged by cooperatives over the past five years. Figure 2 shows the average grain sales, COGs, and resulting gross margins – the difference between grain sales and COGs – for 38 local cooperatives participating in *CoopMetrics*, a financial benchmarking product used by cooperatives to gauge

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Handbook updates

For those of you subscribing to the handbook, the following new updates are included.

Crop Planning Prices - A1-10 (1 page)

2013 Iowa Farm Cost and Returns - C1-10 (12 pages)

Please add these files to your handbook and remove the out-of-date material.

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their financials over time and against peer cooperatives. Just as crop prices and net farm incomes surged since 2009, so too have grain sales and costs at local cooperatives. Throughout 2009, grain sales and costs declined at the cooperatives. After a slow start in 2010, these surged, and by the end of 2012 sales and costs averaged roughly \$275 million.

The increase in the value stream during this time highlighted the need for risk management and the increased capital both to support the grain movements and also the increased margin requirements on that grain. This forced cooperatives to maintain higher capital levels in order to comply with lending covenants and margin requirements. While the increased gross margins provided some of the funding for the increased capital needs, much of it was accessed through additional borrowings. As shown in Figure 2, the higher grain prices from 2010 – 2012 did not translate to sustained high margins during this entire time.

Figure 3 illustrates the same sales, costs, and margins data, instead depicting margins as a percentage of grain sales. Most notable in this graph is the inverse relationship between grain sales and the margin percentage. As grain sales increase (decrease), the grain margin percentage declines (rises). This is due to the relative stability of grain margins in absolute terms in comparison to grain sales as prices move higher. Recalling Figure 2, grain sales and margins tend to move together but the swings in grain sales are larger than the swings in margins causing the ratio of the two (the grain margin percentage) to be more affected by grain sales.

A closer look at these data reveals that the downward movement in the gross margin percentage tends to happen roughly a year after grain sales and costs begin to rise. Grain sales and costs reached relevant lows in the 4th quarter of 2009 followed by a peak in margin percentages a year later. Two years later, grain sales and costs reached relevant highs during the 4th quarter of 2012 with margin percentages still falling, bottoming out at the end of 2013 and the beginning of 2014. This begs the question, why don't margin percentages and sales and COGs move inversely in lock-step? The observed delay between the two series is likely due to the relative speed of adjustment among sales and costs and also the futures contract pricing at the time.

Figure 1. U.S. Net Farm Income (Source: USDA-ERS)

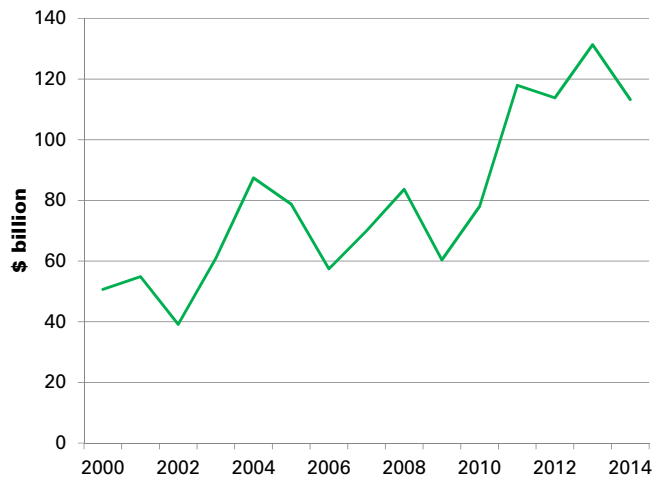


Figure 2. Average Cooperative Grain Sales, Costs, and Margins

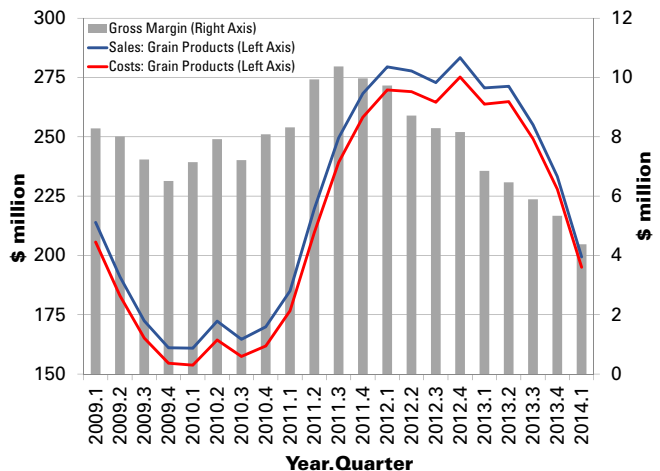
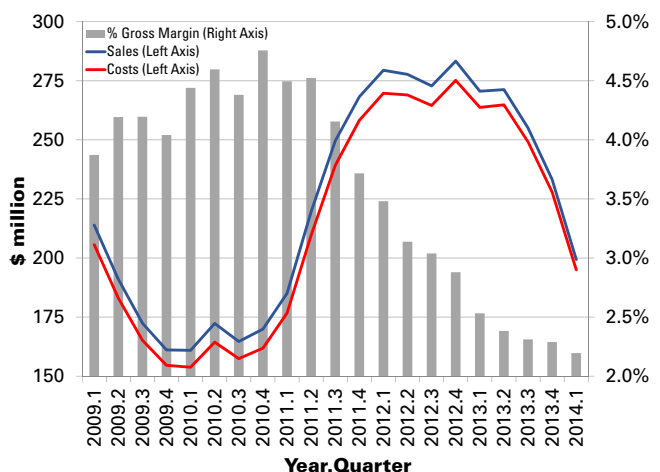


Figure 3. Average Cooperative Gross Margin Percentages, Grain



Cooperative grain margins and implications of crop price movements and market inverses, continued from page 2

Figure 4 plots for five years the monthly average cash prices – the futures price plus basis – received by Iowa farmers and Figure 5 shows their relative price movements. During this time corn had a \$5 trading range and soybeans an \$8 trading range – ranges that are greater than the average crop prices over the preceding decade. It is both the price levels and variability that contributed to the record high net farm incomes for farmers and grain sales and costs for cooperatives. It is interesting to note that while both crops had relatively low prices through 2009 and early 2010 and surging prices from late 2012 through early 2013, the significant price movements for corn and soybeans since then has differed. This divergence was due to the relative scarcity of soybean stocks. Corn stocks began to rebuild with the 2013 crop while soybean stocks are projected to rebuild with the 2014 crop.

Comparing the data for the cooperatives' average grain sales, costs, and margins with crop prices (Figures 2 and 4), the connection between the two becomes clearer. The prices that farmers receive are the bids that comprise grain costs. Thus, given the competitive nature of grain marketing in Iowa, grain sales track closely with COGs. This is intuitive. Corn at \$4/bu and \$10/bu soybeans translates to \$150 million grain sales and costs while \$7/bu corn and \$15/bu soybeans translate to \$275 million grain sales and costs. Taken together, Figures 4 and 5 show that, despite different magnitudes of movement, corn and soybean prices both moved dramatically beginning in 2010.

Corn and soybean price movements alone are unable to explain the drop-off in grain margins values during this time. Why were grain margin values declining during periods of relatively high prices? The explanation of these margin movements seems to lie with futures signals and the inversion that existed during this time. In a futures market for commodities where contracts have different maturity dates (months), the difference between the contracts prices for different delivery months is called the “carry.” In corn, for example, the futures price for December versus March represents the 3-month carry in the corn market – a premium for holding the crop from December through March. “Full carry” represents a situation where the difference in prices represents the full cost – interest, risk, insurance, storage – of holding the commodity to the next delivery month. It is not

Figure 4. Crop Prices (Source: USDA-NASS)

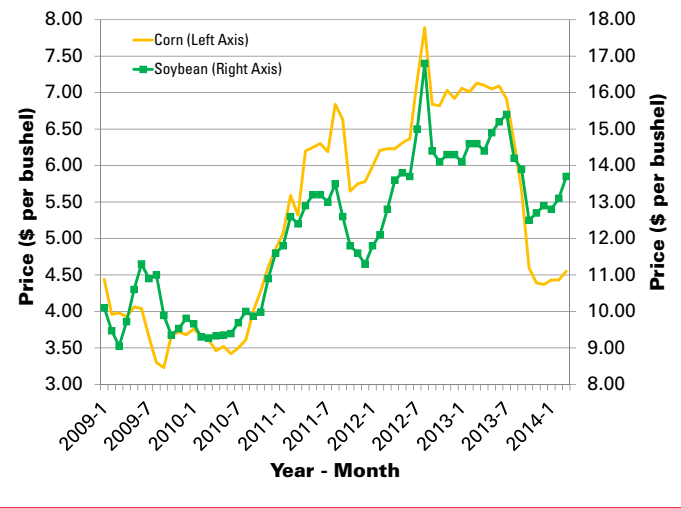
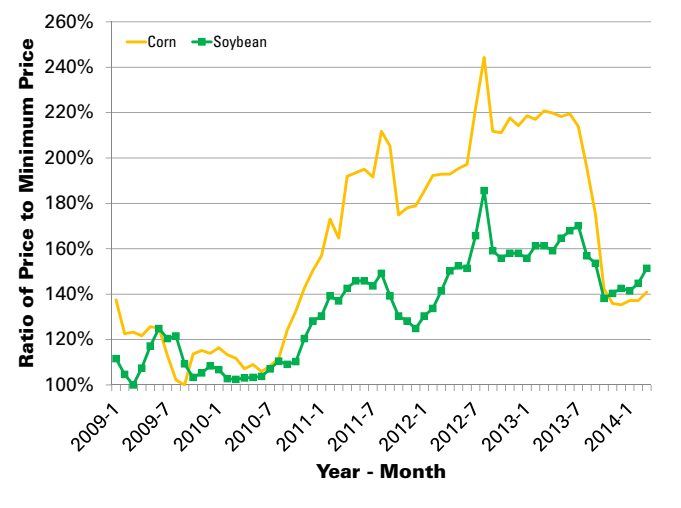


Figure 5. Relative Crop Prices



uncommon to see delivery month price differentials that, in fact, reflect something greater than or less than full carry, which is the market signal for excess corn supply or excess corn demand, respectively, in the nearby month. When the carry is negative, the market is referred to as “inverted.”

Tables 1 and 2 contain the average futures prices for the new crops, along with the computed carry/inverse for the new crops. Comparing the tables there are, here again, differences between corn and soybeans. While the corn market saw an inverse develop in the 3rd and 4th quarters of 2012, the soybean market experienced a number of inverses. The market was signaling that it was unwilling to pay producers and cooperatives to hold grain: the market wanted the product in the nearby month and discounted prices in the future to ensure delivery as soon as possible.

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Cooperative grain margins and implications of crop price movements and market inverses, continued from page 3

Given that gains from storage of crops is a major part of the cooperative business model, inverses in the markets usually imply declining returns to cooperatives.

Based on the contract price inversions, we might have expected to see gross margin percentages for corn drop during the 3rd and 4th quarters for 2012. However, as Figure 6 shows, gross margin percent-

ages for cooperatives began to decline before that, during 2011. The drop for soybeans aligns with the inverse that developed in the soybean market then, which basically persisted until this year. However, the beginning of the fall in the corn gross margin percentage does not align with the development of an inverse in the futures market. The story for corn seems more related to the movement in price levels.

Table 1. Corn Futures and Carry/Inverse

Year.Quarter	Average Futures				Carry/Inverse from Dec		
	Dec	Mar	May	July	Mar	May	July
2009.1	\$4.17	\$4.29	\$4.37	\$4.42	\$0.12	\$0.20	\$0.25
2009.2	\$4.31	\$4.43	\$4.50	\$4.57	\$0.11	\$0.19	\$0.26
2009.3	\$3.32	\$3.46	\$3.55	\$3.63	\$0.13	\$0.23	\$0.31
2009.4	\$3.80	\$3.97	\$4.06	\$4.15	\$0.16	\$0.26	\$0.34
2010.1	\$4.03	\$4.14	\$4.20	\$4.26	\$0.11	\$0.17	\$0.23
2010.2	\$3.78	\$3.91	\$4.00	\$4.07	\$0.13	\$0.21	\$0.29
2010.3	\$4.33	\$4.46	\$4.52	\$4.58	\$0.13	\$0.20	\$0.25
2010.4	\$5.51	\$5.72	\$5.79	\$5.82	\$0.21	\$0.28	\$0.32
2011.1	\$5.89	\$5.98	\$6.04	\$6.09	\$0.09	\$0.15	\$0.19
2011.2	\$6.61	\$6.72	\$6.79	\$6.84	\$0.11	\$0.18	\$0.23
2011.3	\$6.95	\$7.07	\$7.13	\$7.17	\$0.13	\$0.19	\$0.23
2011.4	\$6.21	\$6.29	\$6.36	\$6.40	\$0.07	\$0.15	\$0.19
2012.1	\$5.65	\$5.76	\$5.83	\$5.88	\$0.11	\$0.18	\$0.23
2012.2	\$5.39	\$5.50	\$5.58	\$5.65	\$0.11	\$0.19	\$0.26
2012.3	\$7.76	\$7.77	\$7.73	\$7.65	\$0.01	-\$0.03	-\$0.11
2012.4	\$7.43	\$7.39	\$7.37	\$7.30	-\$0.04	-\$0.06	-\$0.13
2013.1	\$5.70	\$5.80	\$5.87	\$5.91	\$0.10	\$0.17	\$0.21
2013.2	\$5.42	\$5.52	\$5.60	\$5.66	\$0.10	\$0.18	\$0.24
2013.3	\$4.76	\$4.89	\$4.97	\$5.03	\$0.13	\$0.20	\$0.27
2013.4	\$4.30	\$4.39	\$4.47	\$4.54	\$0.08	\$0.17	\$0.24
2014.1	\$4.66	\$4.75	\$4.81	\$4.83	\$0.09	\$0.15	\$0.18

Table 2. Soybean Futures and Carry/Inverse

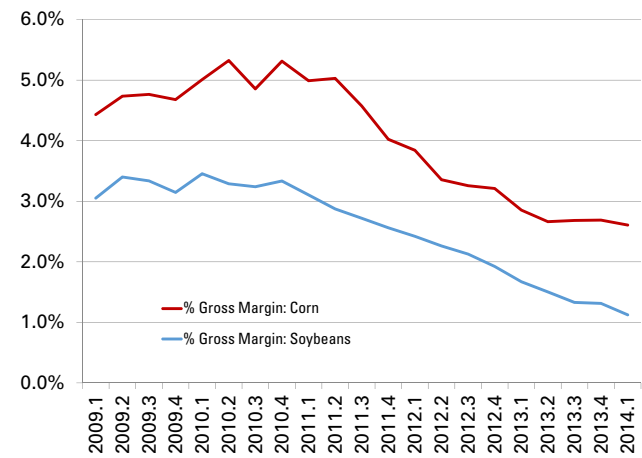
Year.Quarter	Average Futures					Carry/Inverse from Nov			
	Nov	Jan	Mar	May	July	Jan	Mar	May	July
2009.1	\$8.98	\$9.07	\$9.15	\$9.21	\$9.27	\$0.09	\$0.17	\$0.23	\$0.29
2009.2	\$9.87	\$9.93	\$9.91	\$9.83	\$9.84	\$0.05	\$0.04	-\$0.04	-\$0.03
2009.3	\$9.54	\$9.59	\$9.59	\$9.54	\$9.56	\$0.05	\$0.05	\$0.01	\$0.02
2009.4	\$9.69	\$10.04	\$10.09	\$10.10	\$10.13	\$0.35	\$0.39	\$0.40	\$0.44
2010.1	\$9.37	\$9.46	\$9.53	\$9.55	\$9.61	\$0.09	\$0.16	\$0.19	\$0.24
2010.2	\$9.31	\$9.40	\$9.46	\$9.49	\$9.58	\$0.09	\$0.15	\$0.18	\$0.27
2010.3	\$10.15	\$10.24	\$10.28	\$10.29	\$10.36	\$0.08	\$0.13	\$0.14	\$0.20
2010.4	\$11.97	\$12.50	\$12.58	\$12.61	\$12.64	\$0.53	\$0.61	\$0.64	\$0.67
2011.1	\$13.31	\$13.35	\$13.29	\$13.16	\$13.11	\$0.03	-\$0.02	-\$0.16	-\$0.20
2011.2	\$13.53	\$13.61	\$13.62	\$13.56	\$13.59	\$0.08	\$0.09	\$0.03	\$0.06
2011.3	\$13.59	\$13.69	\$13.74	\$13.74	\$13.79	\$0.10	\$0.15	\$0.16	\$0.20
2011.4	\$12.05	\$11.79	\$11.89	\$11.97	\$12.06	-\$0.26	-\$0.17	-\$0.08	\$0.01
2012.1	\$12.59	\$12.63	\$12.63	\$12.58	\$12.60	\$0.04	\$0.04	-\$0.01	\$0.01
2012.2	\$13.43	\$13.42	\$13.18	\$13.01	\$13.00	-\$0.01	-\$0.25	-\$0.42	-\$0.43
2012.3	\$16.37	\$16.32	\$15.62	\$14.92	\$14.73	-\$0.06	-\$0.75	-\$1.45	-\$1.64
2012.4	\$15.22	\$15.22	\$14.94	\$14.55	\$14.41	-\$0.01	-\$0.29	-\$0.67	-\$0.82
2013.1	\$12.84	\$12.88	\$12.91	\$12.91	\$12.96	\$0.05	\$0.08	\$0.08	\$0.12
2013.2	\$12.49	\$12.56	\$12.59	\$12.60	\$12.67	\$0.06	\$0.09	\$0.11	\$0.18
2013.3	\$12.86	\$12.89	\$12.78	\$12.64	\$12.64	\$0.03	-\$0.08	-\$0.22	-\$0.22
2013.4	\$12.88	\$12.83	\$12.67	\$12.51	\$12.47	-\$0.05	-\$0.21	-\$0.37	-\$0.41
2014.1	\$11.44	\$11.49	\$11.53	\$11.54	\$11.58	\$0.05	\$0.08	\$0.10	\$0.14

Cooperative grain margins and implications of crop price movements and market inverses, continued from page 4

Corn prices retreated significantly in the latter half of 2011. That retreat continued into 2012. The lowering prices had a similar effect as an inverse in the futures market, reducing the returns from storage. As corn prices surged in mid-2012, an inverse did develop, continuing the downward pressure on gross margin percentages for cooperatives.

In summary, the grain side of the cooperative business model derives its returns from crop storage, services and sales. Typically, the market provides an incentive to store crops via higher forward prices. However, there are two situations which can reduce those returns to storage: declining prices over time and inverses in the futures market. Both of those situations have occurred in the corn and soybean markets over the past three years. Inverses can be especially perplexing as they tend to occur when futures prices are higher than usual, signaling a short-term excess demand that is expected to resolve itself within the marketing year or with the next production cycle. The crop price run up from 2010 – 2012 brought high returns and greater margins, but these were unsustainable when the market showed an inverse, accounting for near-term excess demand and expectations of a large upcoming crop supply that could satisfy the market demands. Thus, while crop

Figure 6. Average Cooperative Gross Margin Percentages by Crop



producers enjoyed the strong returns they derived from the high crop prices over the past several years, cooperatives dealt with a series of pricing events that limited their returns over the same time. As a major function of agricultural cooperatives is to store crops for future needs, it is not the price level that determines cooperative returns, but the price movement over time.

Research briefs from the ISU Department of Economics

Honors for the department at AAEA annual meeting

The AAEA annual meeting, held in Minneapolis, Minnesota, July 27-29, gave directed honors and recognitions to numerous members connected with the Department of Economics. The following is a list of these honorees:

- Emeritus Professor Mike Duffy was honored as the outgoing secretary-treasurer, AAEA Extension section.
- Associate Professor Chad Hart received the Distinguished Extension/Outreach Program Award for an individual with less than ten years of experience. He also received the Outstanding Crop Forecaster Award, AAEA section.
- Assistant Professor Lee Schulz received the Outstanding Livestock Forecaster Award, AAEA Extension section.

- Graduate student Matthew Clancy and Professor GianCarlo Moschini received the Outstanding Applied Economic Perspectives & Policy Article Award. The title of their work is: "Incentives for Innovation: Patents, Prizes, and Research Contracts."
- Graduate student Jonathan McFadden was awarded the Chester O. McCorkle Junior Student Scholarship.
- Jacob Strapp, undergraduate business economics major, received a third-place award in the Outstanding Paper Competition.
- The Agricultural Business Club received both the Outstanding Chapter Award, and the Creative Club Award (advisor, Georgeanne Artz).

A gallery of photos which include all AAEA award winners from the annual meeting in Minneapolis, Minnesota are available for download from the [2014 AAEA Annual Meeting Facebook page](#).

Research briefs from the ISU Department of Economics, continued from page 5

Iowa EPSCoR Energy Innovator now available online

Professor John Beghin and Assistant Professor Sebastien Pouliot are featured in the recent online edition of the Iowa EPSCoR Energy Innovator, a publication of the Iowa NSF EPSCoR project.

EPSCoR was made possible by a National Science Foundation (NSF) \$20 million, five-year grant to build Iowa's research capacity in renewable energy and energy efficiency. The Iowa Power Fund also granted the project \$2 million. The project provides support for key research areas at Iowa's Regents Institutions while establishing partnerships with the state's community colleges, private colleges, school districts, government agencies and industries.

Read the online newsletter.

Harkin credits CVC in Congressional Record

The Community Vitality Center (CVC) was recently credited by Senator Tom Harkin in the Senate Congressional Record. Harkin is touring Iowa counties within his jurisdiction, noting the accomplishments and changes which came about through the support of Congressional appropriations. In his remarks on Story County, and in particular Iowa State University, he credits the CVC with its impact on small and medium sized communities within the state.

Professor Mark Edelman, CVC director, said that he is "pleased the Senator thought enough of the CVC to include it in his language regarding Iowa State University." Read the full Congressional Record.

Updates, continued from page 1

Internet Updates

The following Information Files and Decision Tools have been updated on www.extension.iastate.edu/agdm.

2014 Farm Bill: Terms to Know – A1-30 (6 pages)

Techniques for Dealing with Difficult People – C6-50 (1 page)

Current Profitability

The following tools have been updated on www.extension.iastate.edu/agdm/info/outlook.html.

Corn Profitability – A1-85

Soybean Profitability – A1-86

Iowa Cash Corn and Soybean Prices – A2-11

Season Average Price Calculator – A2-15

Ethanol Profitability – D1-10

Biodiesel Profitability – D1-15

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Issued in furtherance of Cooperative Extension work, Acts of September 8 and December 30, 1914, in cooperation with the U.S. Department of Agriculture. Cathann A. Kress, director, Cooperative Extension Service, Iowa State University of Science and Technology, Ames, Iowa.

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