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Agribusiness and Applied Economics Report No. 800 - Appendix 1

CORN TRADE REPORT: APPENDIX Section I



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Acknowledgments

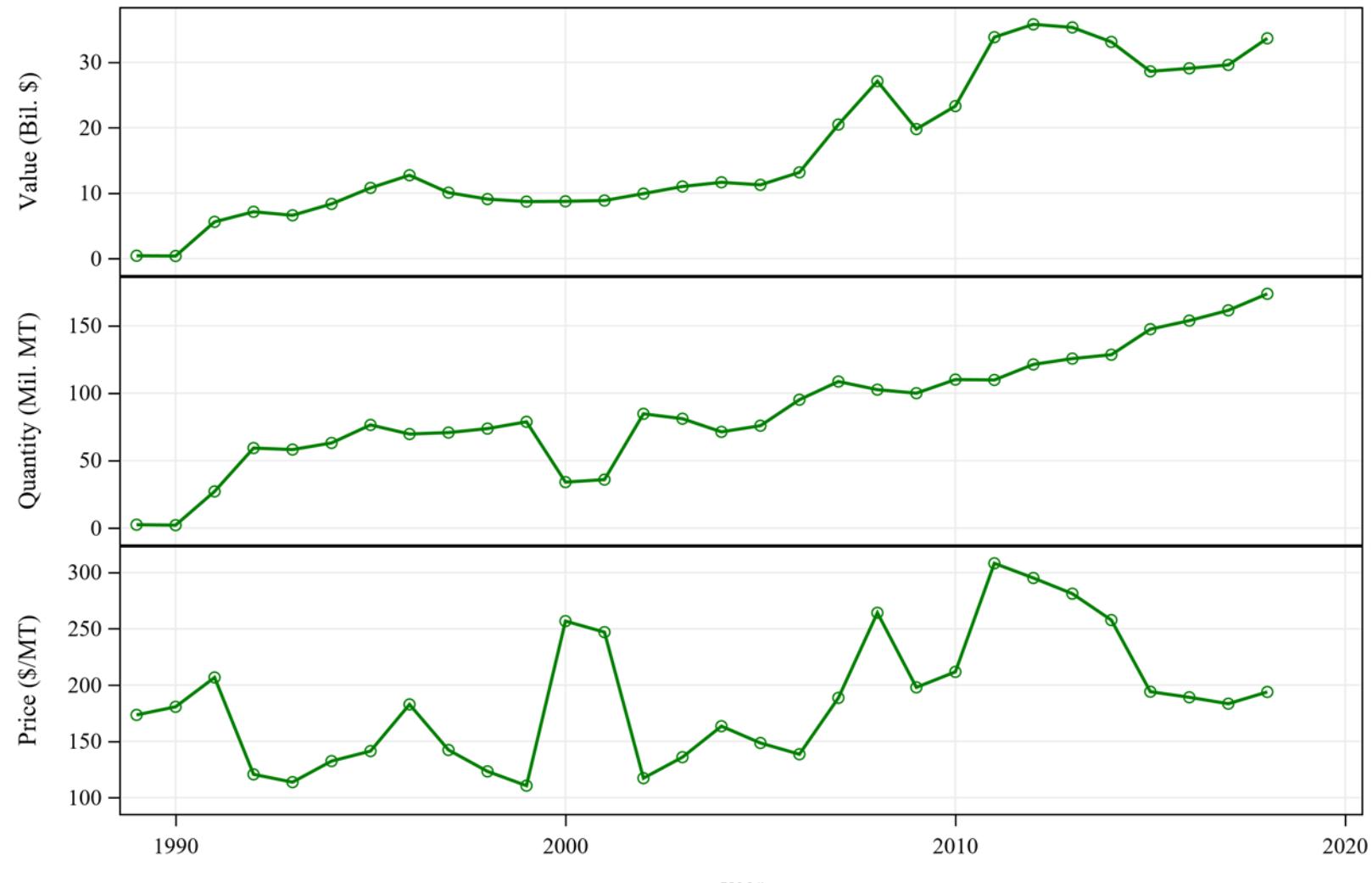
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Section I: Global Temporal Corn Trade

Figure 1: Global Corn Grain & Seed Exports, Annual Trends



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Figure 2: Global Corn Grain & Seed Exports, Periodic Changes

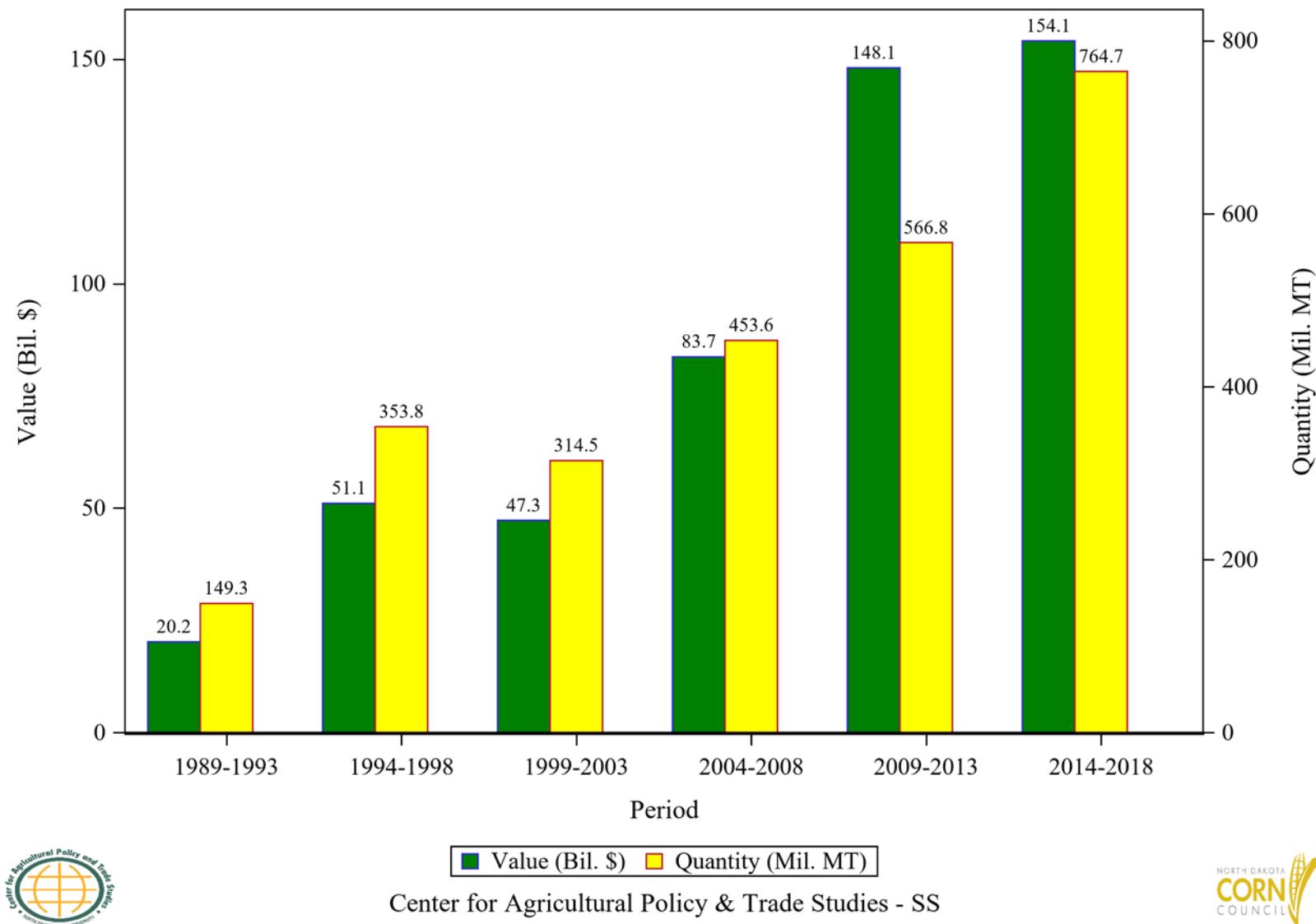


Table 1: Global Corn Grain & Seed Exports, Descriptive Statistics

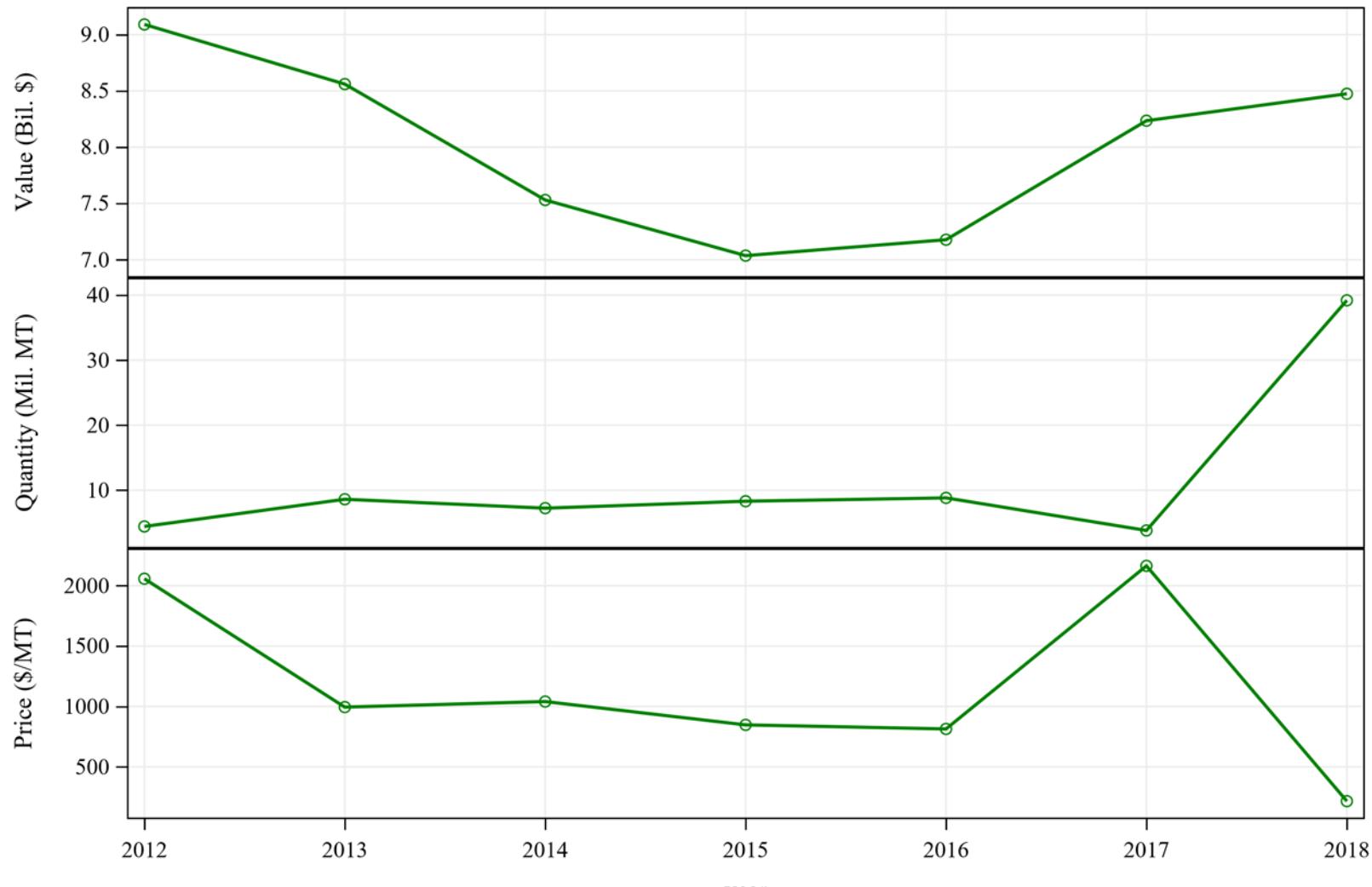
Period	Value (\$)			
	Sum	Mean	Risk	Coefficient of Variation
1989-1993	20,201,160,879	4,040,232,176	3,360,453,600	83.17
1994-1998	51,059,489,858	10,211,897,972	1,693,591,452	16.58
1999-2003	47,278,079,243	9,455,615,849	1,006,113,329	10.64
2004-2008	83,694,854,701	16,738,970,940	6,891,955,089	41.17
2009-2013	148,076,469,072	29,615,293,814	7,501,905,407	25.33
2014-2018	154,083,205,829	30,816,641,166	2,385,778,082	7.74

Period	Quantity (MT)				Price (\$/MT)		
	Sum	Mean	Risk	Coefficient of Variation	Mean	Risk	Coefficient of Variation
1989-1993	149,266,458	29,853,292	28,257,669	94.66	159.04	40.26	25.31
1994-1998	353,766,336	70,753,267	5,029,041	7.11	144.41	22.79	15.78
1999-2003	314,516,582	62,903,316	25,570,657	40.65	173.51	72.27	41.65
2004-2008	453,550,346	90,710,069	16,409,265	18.09	180.65	50.39	27.89
2009-2013	566,783,082	113,356,616	10,196,579	9.00	258.86	50.46	19.49
2014-2018	764,710,932	152,942,186	16,802,543	10.99	203.66	30.56	15.01

Table 2: Global Corn Grain & Seed Exports, Annual Trends

Year	Value (\$)	Quantity (MT)	Price (\$/MT)
2010	23,307,218,130	110,075,289	211.74
2011	33,840,527,712	109,793,384	308.22
2012	35,806,187,924	121,303,667	295.18
2013	35,329,945,204	125,624,377	281.23
2014	33,119,252,802	128,486,858	257.76
2015	28,614,792,332	147,416,850	194.11
2016	29,080,290,257	153,772,262	189.11
2017	29,601,567,676	161,387,968	183.42
2018	33,667,302,762	173,646,994	193.88

Figure 3: Global Corn Ethyl Alcohol Exports, Annual Trends



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Figure 4: Global Corn Ethyl Alcohol Exports, Periodic Changes

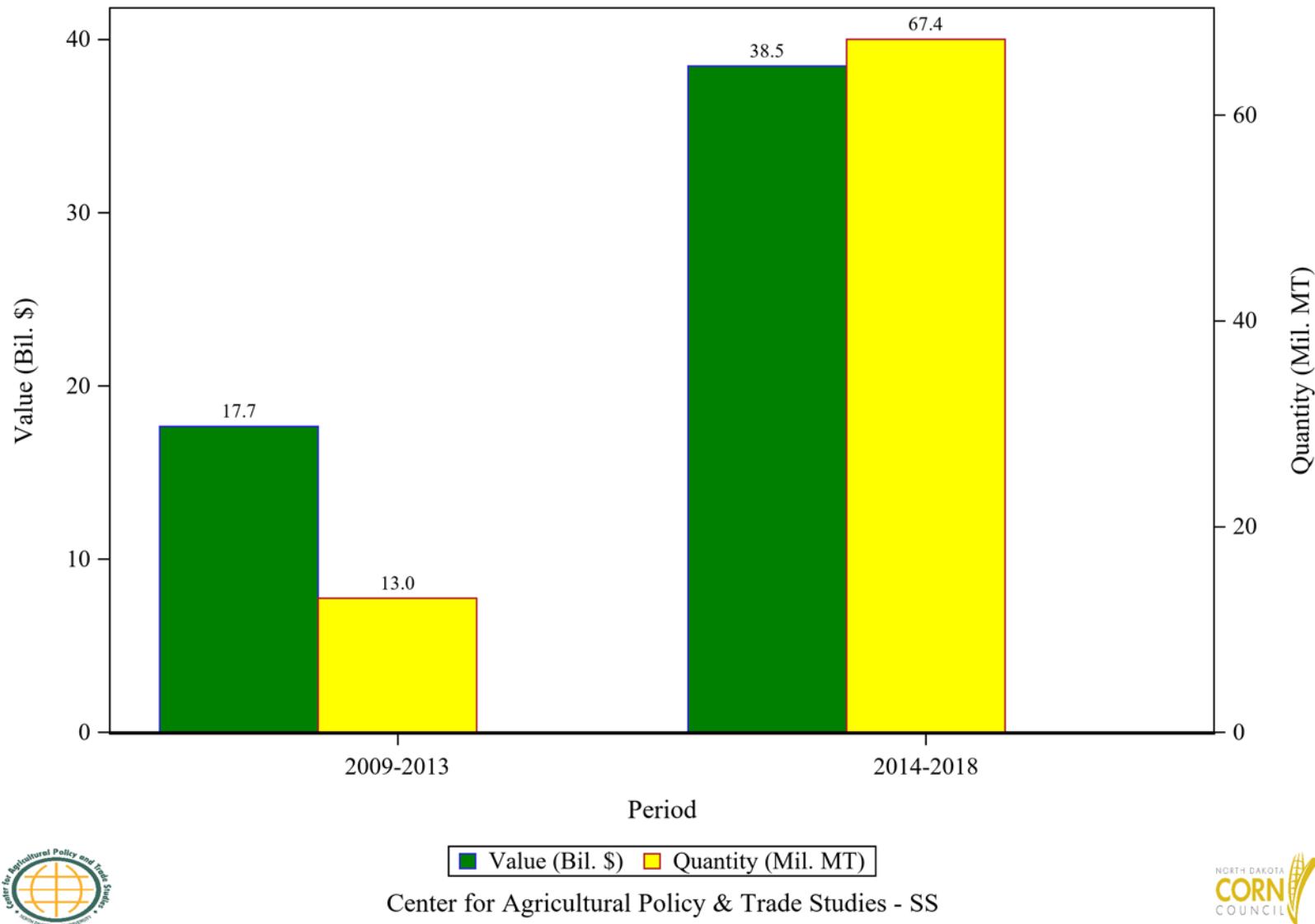


Table 3: Global Corn Ethyl Alcohol Exports, Descriptive Statistics

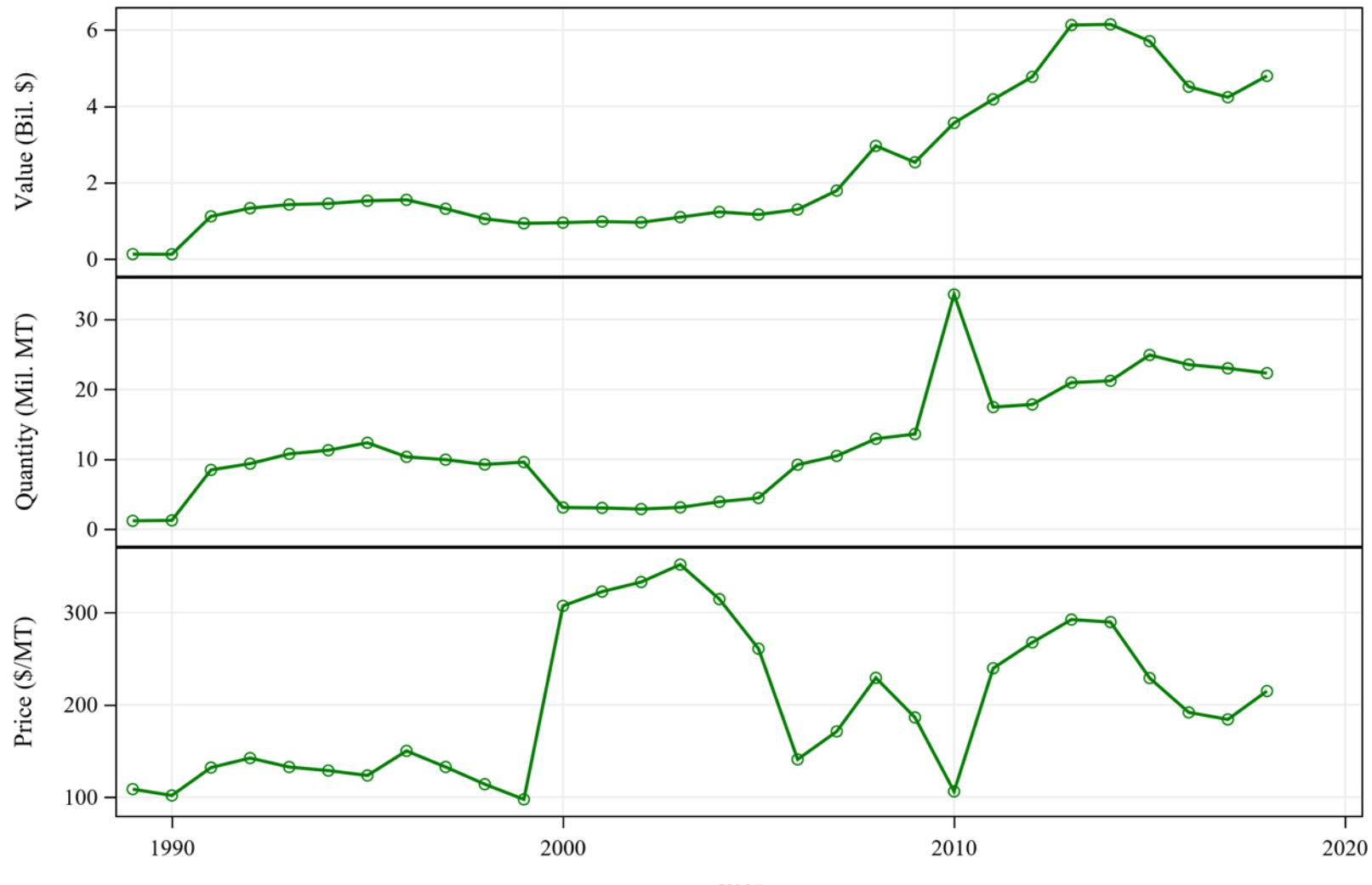
Period	Value (\$)				Coefficient of Variation
	Sum	Mean	Risk		
2009-2013	17,651,123,991	8,825,561,996	374,890,461		4.25
2014-2018	38,455,159,890	7,691,031,978	637,918,935		8.29

Period	Quantity (MT)				Price (\$/MT)		
	Sum	Mean	Risk	Coefficient of Variation	Mean	Risk	Coefficient of Variation
2009-2013	13,022,964	6,511,482	2,960,589	45.47	1526.2	751.51	49.24
2014-2018	67,358,767	13,471,753	14,515,726	107.7	1016.6	712.00	70.03

Table 4: Global Corn Ethyl Alcohol Exports, Annual Trends

Year	Value (\$)	Quantity (MT)	Price (\$/MT)
2012	9,090,649,583	4,418,030	2057.6
2013	8,560,474,408	8,604,934	994.83
2014	7,530,896,360	7,235,243	1040.9
2015	7,036,449,136	8,300,257	847.74
2016	7,177,864,742	8,815,707	814.21
2017	8,235,268,238	3,805,177	2164.2
2018	8,474,681,414	39,202,383	216.18

Figure 5: Global Corn Residue (BWC) Exports, Annual Trends



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Figure 6: Global Corn Residue (BWC) Exports, Periodic Changes

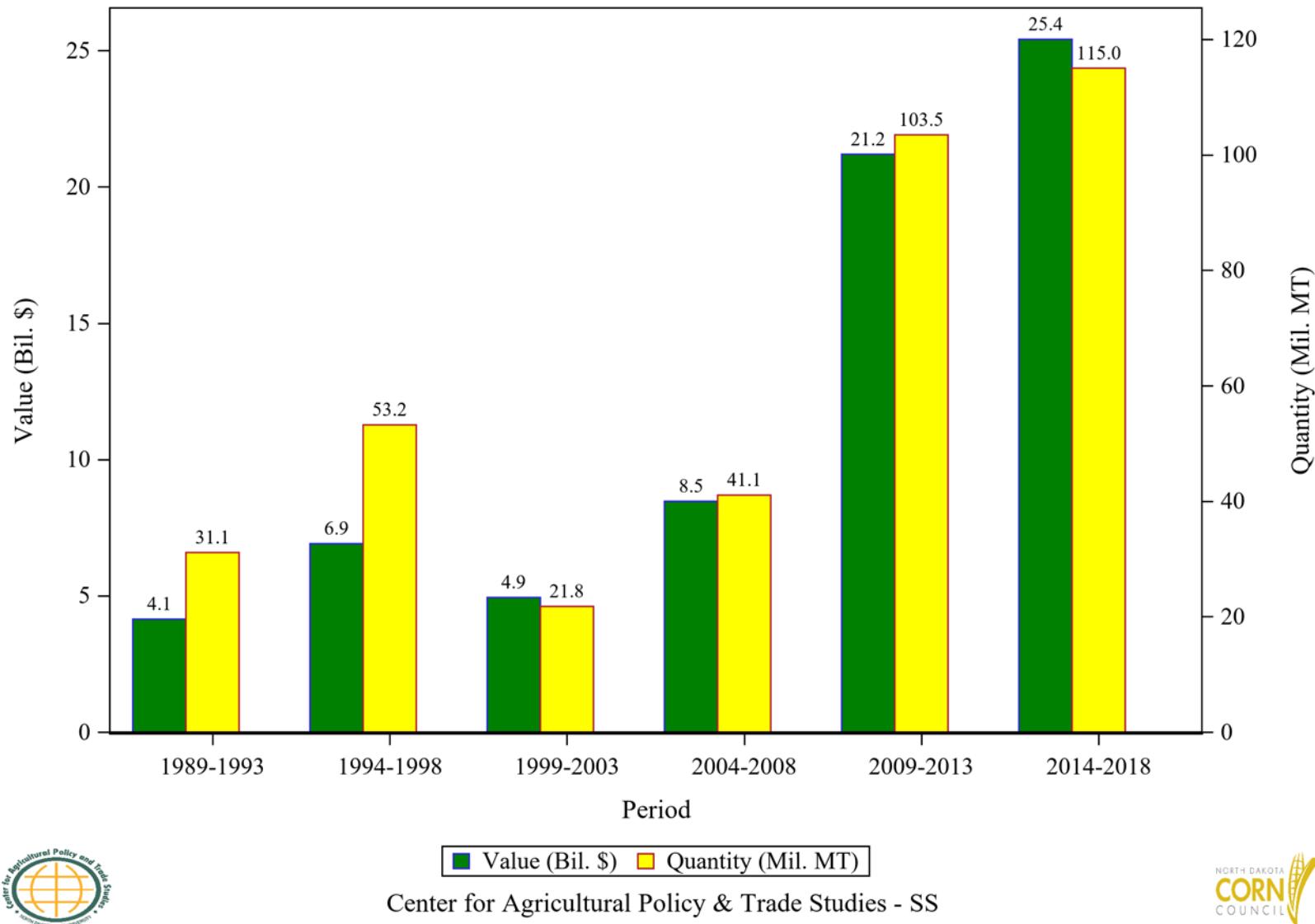


Table 5: Global Corn Residue (BWC) Exports, Descriptive Statistics

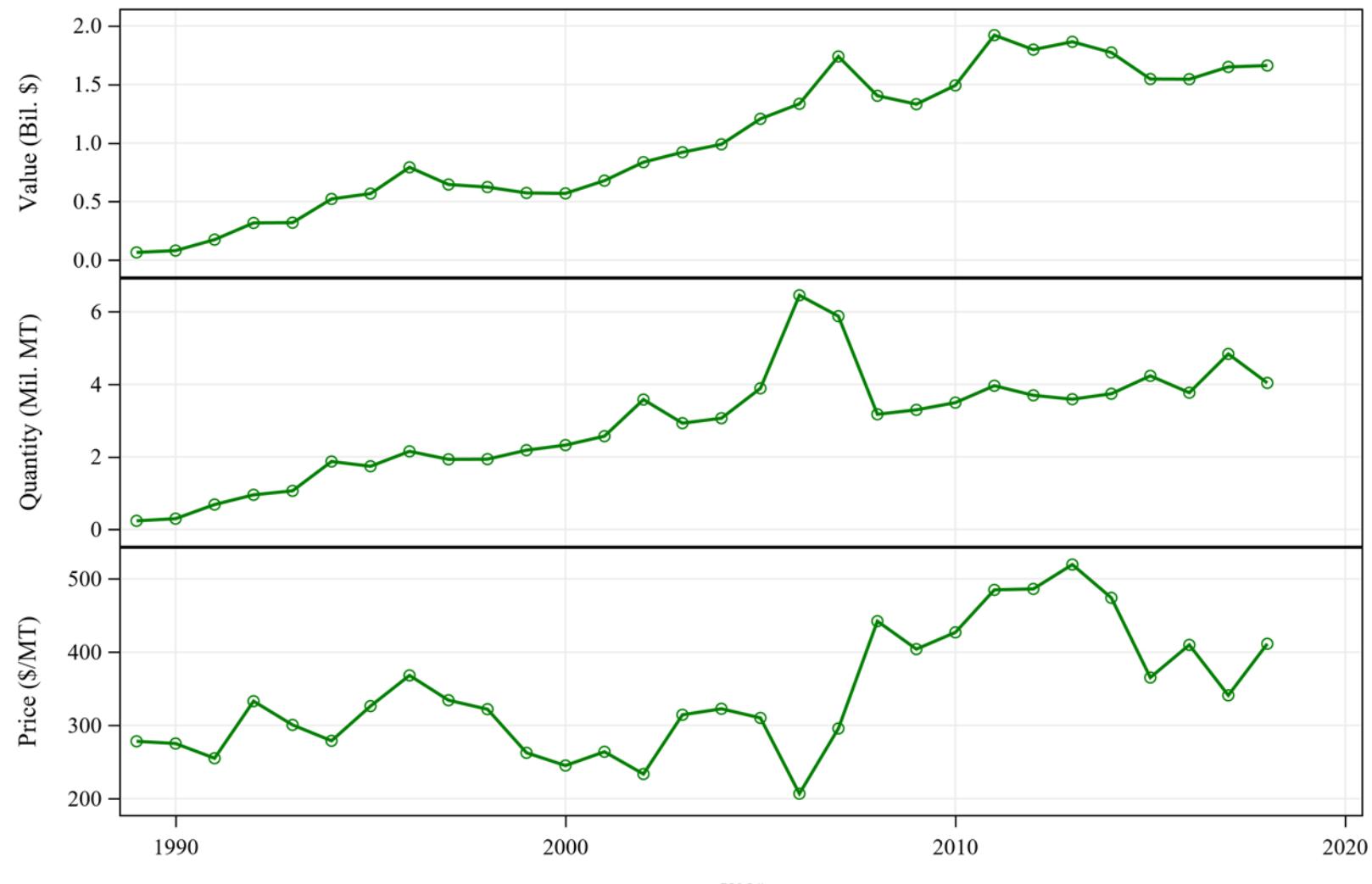
Period	Value (\$)				Coefficient of Variation
	Sum	Mean	Risk		
1989-1993	4,146,386,589	829,277,318	647,885,931		78.13
1994-1998	6,913,841,476	1,382,768,295	203,665,523		14.73
1999-2003	4,940,650,880	988,130,176	64,871,027		6.57
2004-2008	8,467,129,069	1,693,425,814	753,167,770		44.48
2009-2013	21,195,803,525	4,239,160,705	1,342,577,927		31.67
2014-2018	25,410,144,785	5,082,028,957	812,120,630		15.98

Period	Quantity (MT)				Price (\$/MT)		
	Sum	Mean	Risk	Coefficient of Variation	Mean	Risk	Coefficient of Variation
1989-1993	31,116,383	6,223,277	4,623,931	74.30	123.54	17.34	14.03
1994-1998	53,224,527	10,644,905	1,212,864	11.39	129.86	13.32	10.26
1999-2003	21,781,710	4,356,342	2,936,122	67.40	282.54	104.63	37.03
2004-2008	41,059,016	8,211,803	3,898,596	47.48	223.39	69.40	31.07
2009-2013	103,454,767	20,690,953	7,654,895	37.00	218.47	74.08	33.91
2014-2018	115,000,867	23,000,173	1,376,427	5.98	221.99	41.89	18.87

Table 6: Global Corn Residue (BWC) Exports, Annual Trends

Year	Value (\$)	Quantity (MT)	Price (\$/MT)
2010	3,567,041,772	33,566,060	106.27
2011	4,185,931,262	17,465,917	239.66
2012	4,774,963,401	17,839,597	267.66
2013	6,129,822,797	20,964,399	292.39
2014	6,148,324,868	21,221,011	289.73
2015	5,707,391,604	24,915,087	229.07
2016	4,515,626,921	23,533,094	191.88
2017	4,239,953,140	23,011,038	184.26
2018	4,798,848,252	22,320,637	215.00

Figure 7: Global Corn Flour (GHS) Exports, Annual Trends



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Figure 8: Global Corn Flour (GHS) Exports, Periodic Changes

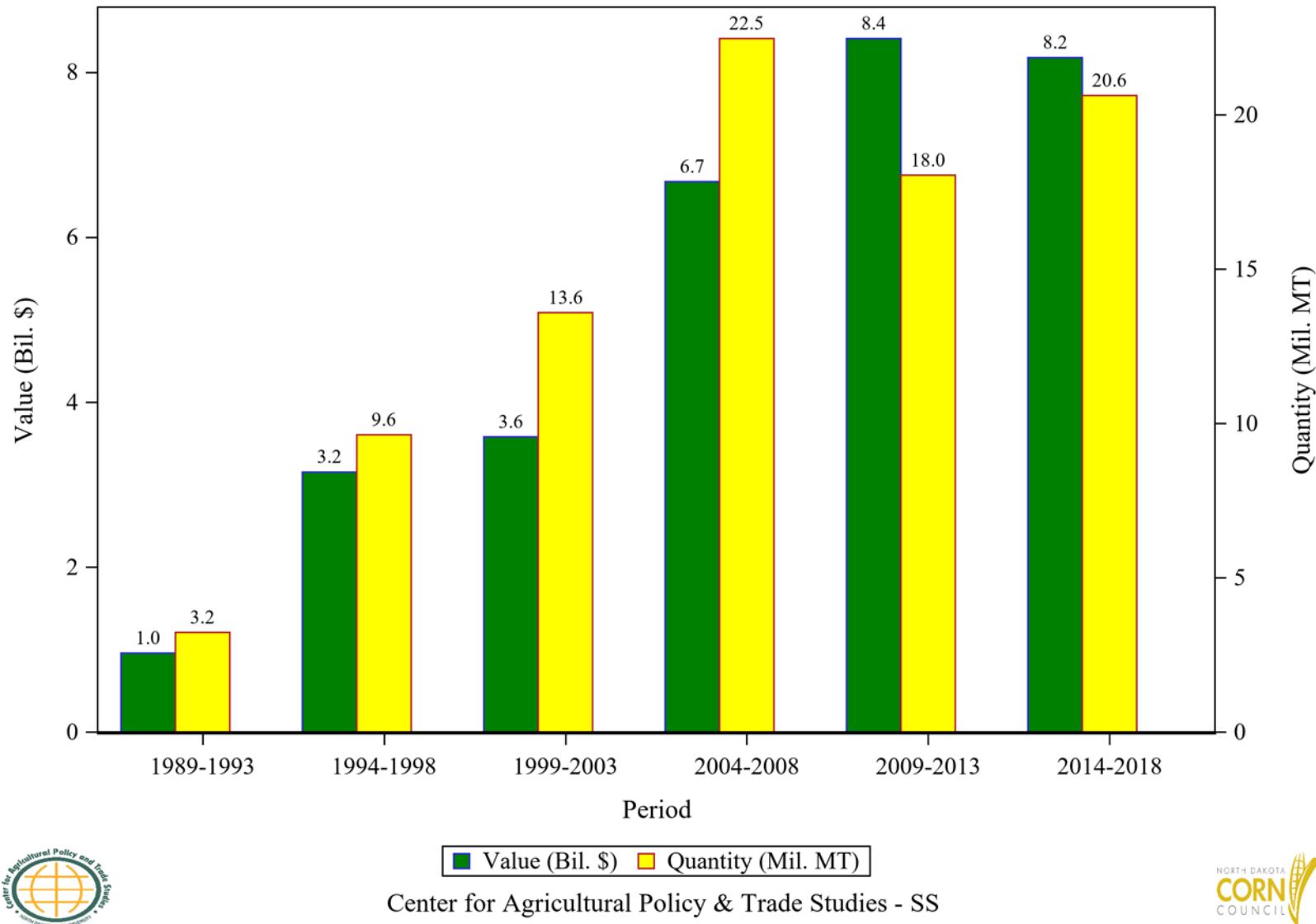


Table 7: Global Corn Flour (GHS) Exports, Descriptive Statistics

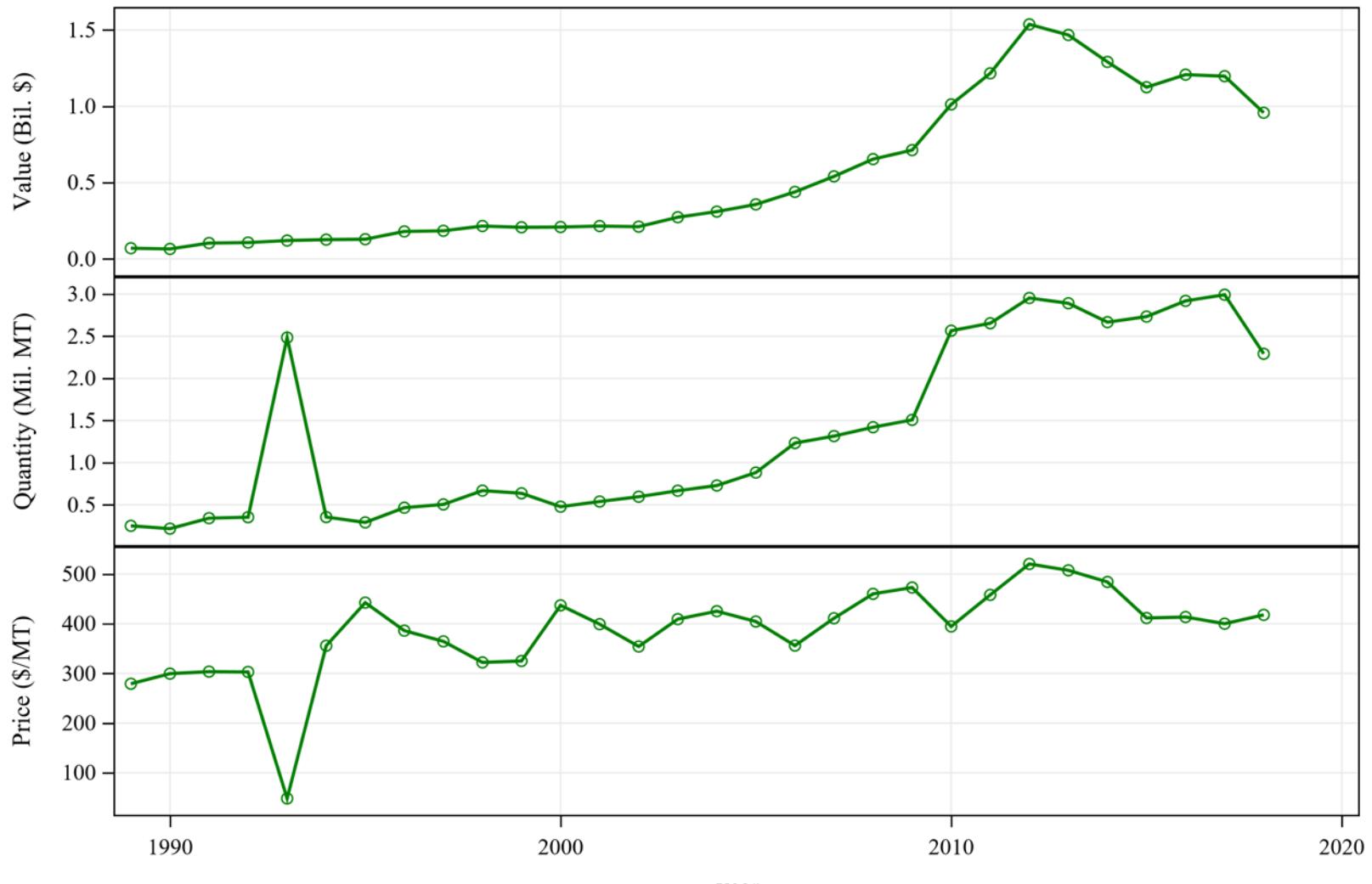
Period	Sum	Value (\$)			Coefficient of Variation
		Mean	Risk		
1989-1993	957,372,520	191,474,504	123,075,570		64.28
1994-1998	3,151,454,638	630,290,928	102,702,809		16.29
1999-2003	3,579,521,695	715,904,339	157,864,285		22.05
2004-2008	6,674,239,282	1,334,847,856	275,940,926		20.67
2009-2013	8,409,616,468	1,681,923,294	256,345,639		15.24
2014-2018	8,178,246,394	1,635,649,279	94,796,671		5.80

Period	Sum	Quantity (MT)			Price (\$/MT)		
		Mean	Risk	Coefficient of Variation	Mean	Risk	Coefficient of Variation
1989-1993	3,227,675	645,535	374,735	58.05	288.46	29.68	10.29
1994-1998	9,630,966	1,926,193	149,030	7.74	325.97	31.95	9.80
1999-2003	13,588,888	2,717,778	559,202	20.58	263.96	30.93	11.72
2004-2008	22,469,236	4,493,847	1,575,259	35.05	315.51	84.21	26.69
2009-2013	18,042,126	3,608,425	246,894	6.84	464.38	47.38	10.20
2014-2018	20,624,449	4,124,890	447,960	10.86	400.36	51.01	12.74

Table 8: Global Corn Flour (GHS) Exports, Annual Trends

Year	Value (\$)	Quantity (MT)	Price (\$/MT)
2010	1,492,556,887	3,495,831	426.95
2011	1,921,770,305	3,962,613	484.98
2012	1,798,043,644	3,697,408	486.30
2013	1,865,178,858	3,590,008	519.55
2014	1,773,575,573	3,740,602	474.14
2015	1,547,018,539	4,234,844	365.31
2016	1,545,348,869	3,770,048	409.90
2017	1,650,164,147	4,838,891	341.02
2018	1,662,139,266	4,040,063	411.41

Figure 9: Global Corn Sugars (GF) Exports, Annual Trends



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Figure 10: Global Corn Sugars (GF) Exports, Periodic Changes

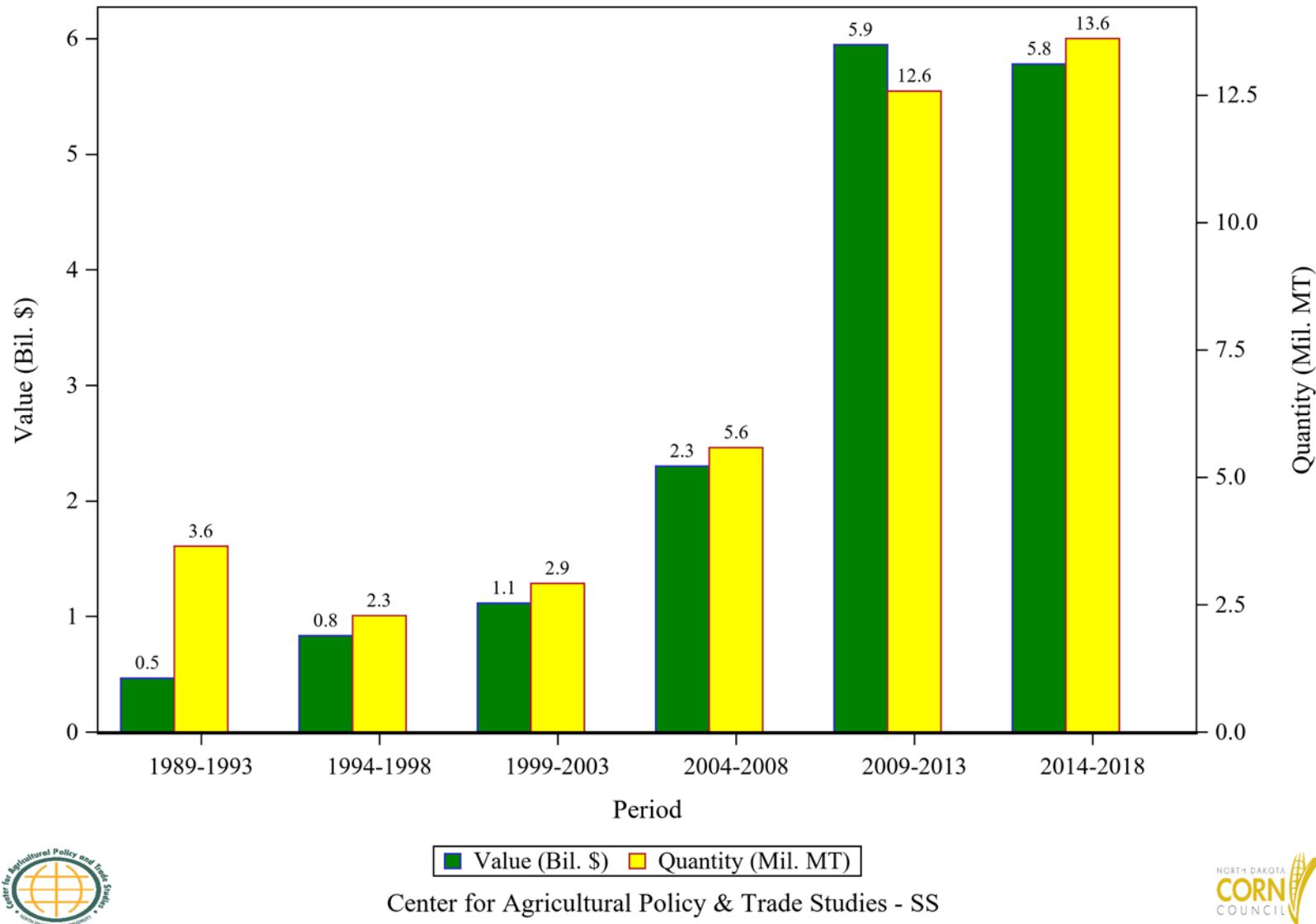


Table 9: Global Corn Sugars (GF) Exports, Descriptive Statistics

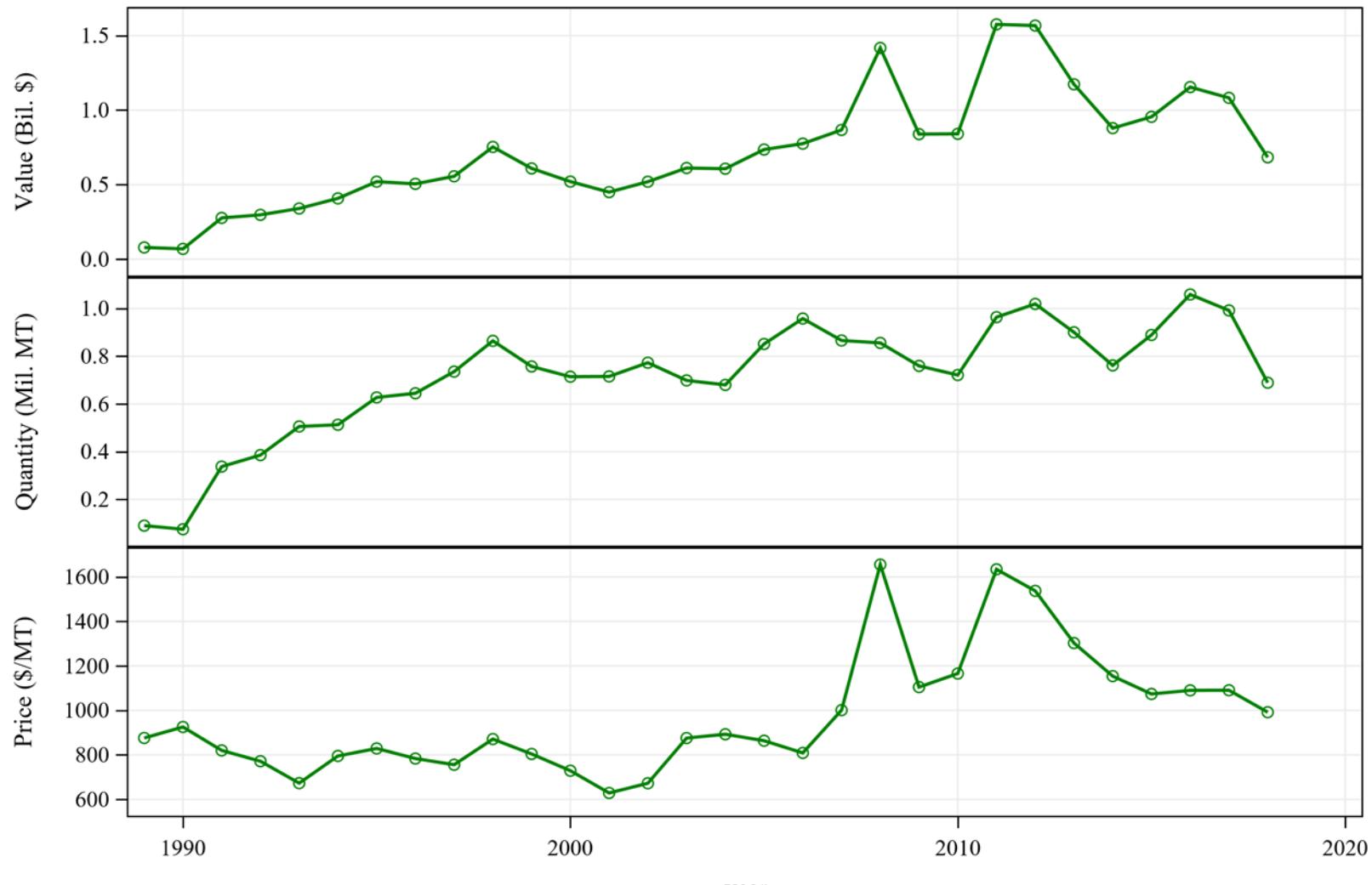
Period	Value (\$)				Coefficient of Variation
	Sum	Mean	Risk		
1989-1993	465,332,384	93,066,477	24,308,293		26.12
1994-1998	833,758,698	166,751,740	38,452,021		23.06
1999-2003	1,114,655,618	222,931,124	28,114,809		12.61
2004-2008	2,300,409,095	460,081,819	139,337,021		30.29
2009-2013	5,947,036,724	1,189,407,345	338,155,223		28.43
2014-2018	5,779,714,899	1,155,942,980	125,388,852		10.85

Period	Quantity (MT)				Price (\$/MT)		
	Sum	Mean	Risk	Coefficient of Variation	Mean	Risk	Coefficient of Variation
1989-1993	3,645,482	729,096	983,079	134.8	246.74	111.37	45.14
1994-1998	2,283,500	456,700	145,764	31.92	374.23	44.58	11.91
1999-2003	2,915,439	583,088	76,136	13.06	384.97	44.85	11.65
2004-2008	5,580,011	1,116,002	296,077	26.53	411.44	37.72	9.17
2009-2013	12,574,754	2,514,951	585,498	23.28	470.72	49.45	10.50
2014-2018	13,606,199	2,721,240	274,077	10.07	425.47	33.44	7.86

Table 10: Global Corn Sugars (GF) Exports, Annual Trends

Year	Value (\$)	Quantity (MT)	Price (\$/MT)
2010	1,012,599,941	2,566,200	394.59
2011	1,216,327,629	2,654,596	458.20
2012	1,537,414,102	2,954,324	520.39
2013	1,467,624,520	2,891,713	507.53
2014	1,291,287,067	2,667,238	484.13
2015	1,125,232,859	2,733,536	411.64
2016	1,207,654,924	2,920,101	413.57
2017	1,197,628,642	2,993,027	400.14
2018	957,911,407	2,292,297	417.88

Figure 11: Global Corn Oil (CR) Exports, Annual Trends



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Figure 12: Global Corn Oil (CR) Exports, Periodic Changes

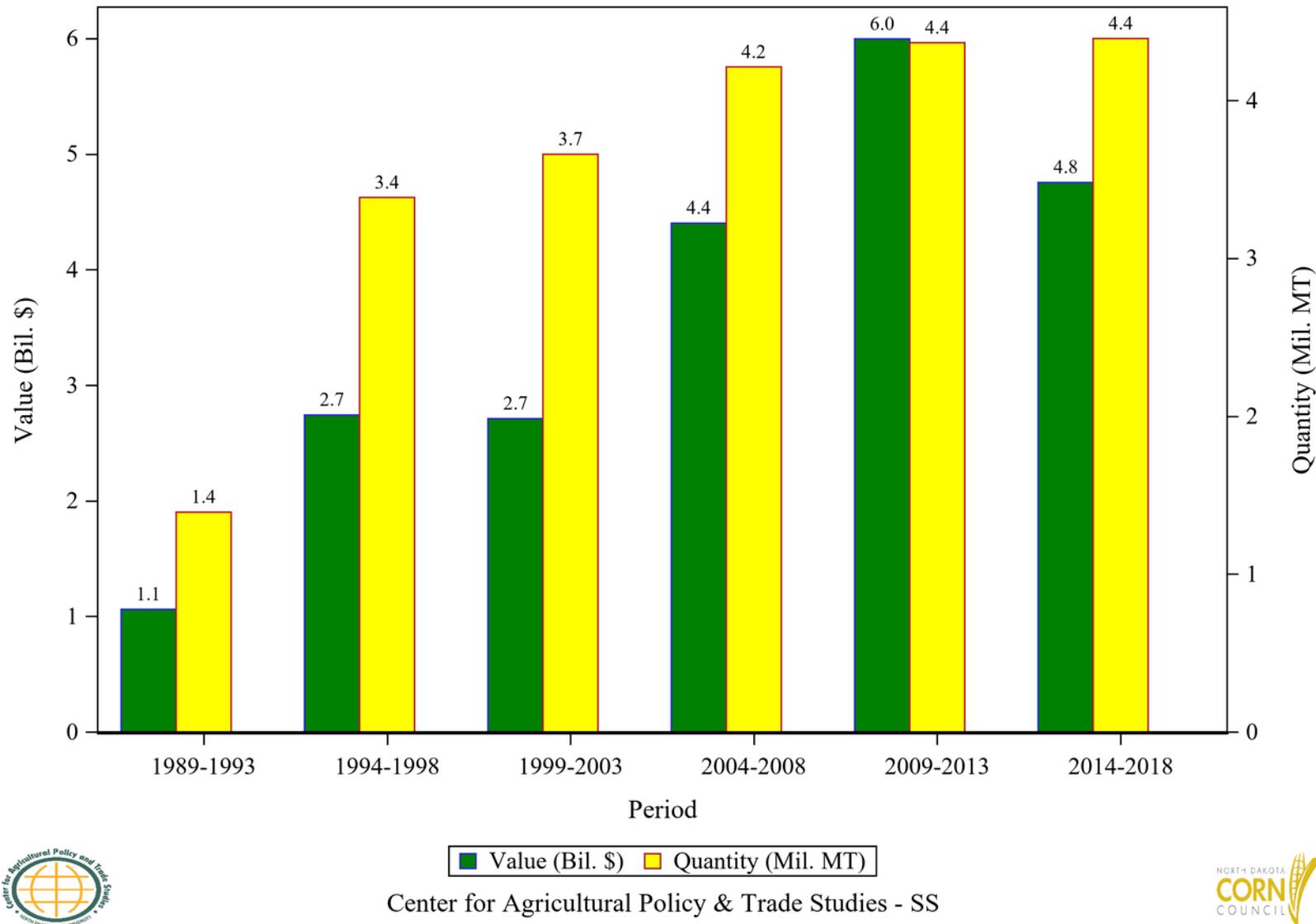


Table 11: Global Corn Oil (CR) Exports, Descriptive Statistics

Period	Value (\$)				Coefficient of Variation
	Sum	Mean	Risk		
1989-1993	1,061,659,011	212,331,802	128,617,154		60.57
1994-1998	2,742,310,807	548,462,161	126,868,335		23.13
1999-2003	2,711,144,580	542,228,916	68,570,833		12.65
2004-2008	4,402,386,817	880,477,363	314,336,761		35.70
2009-2013	5,996,807,018	1,199,361,404	366,051,532		30.52
2014-2018	4,754,816,519	950,963,304	184,027,174		19.35

Period	Quantity (MT)				Price (\$/MT)		
	Sum	Mean	Risk	Coefficient of Variation	Mean	Risk	Coefficient of Variation
1989-1993	1,392,517	278,503	189,552	68.06	813.14	97.47	11.99
1994-1998	3,385,509	677,102	131,416	19.41	806.88	44.41	5.50
1999-2003	3,659,055	731,811	31,710	4.33	741.93	99.43	13.40
2004-2008	4,212,487	842,497	100,786	11.96	1044.4	348.75	33.39
2009-2013	4,365,691	873,138	128,855	14.76	1348.9	230.34	17.08
2014-2018	4,392,103	878,421	154,308	17.57	1080.1	58.12	5.38

Table 12: Global Corn Oil (CR) Exports, Annual Trends

Year	Value (\$)	Quantity (MT)	Price (\$/MT)
2010	841,007,750	721,427	1165.8
2011	1,575,595,439	964,132	1634.2
2012	1,567,623,676	1,019,722	1537.3
2013	1,173,375,876	900,723	1302.7
2014	879,196,488	761,837	1154.0
2015	955,102,238	889,451	1073.8
2016	1,154,701,480	1,059,281	1090.1
2017	1,082,312,451	992,400	1090.6
2018	683,503,862	689,135	991.83

Figure 13: Global Export Share of Corn Products, 1989-1993

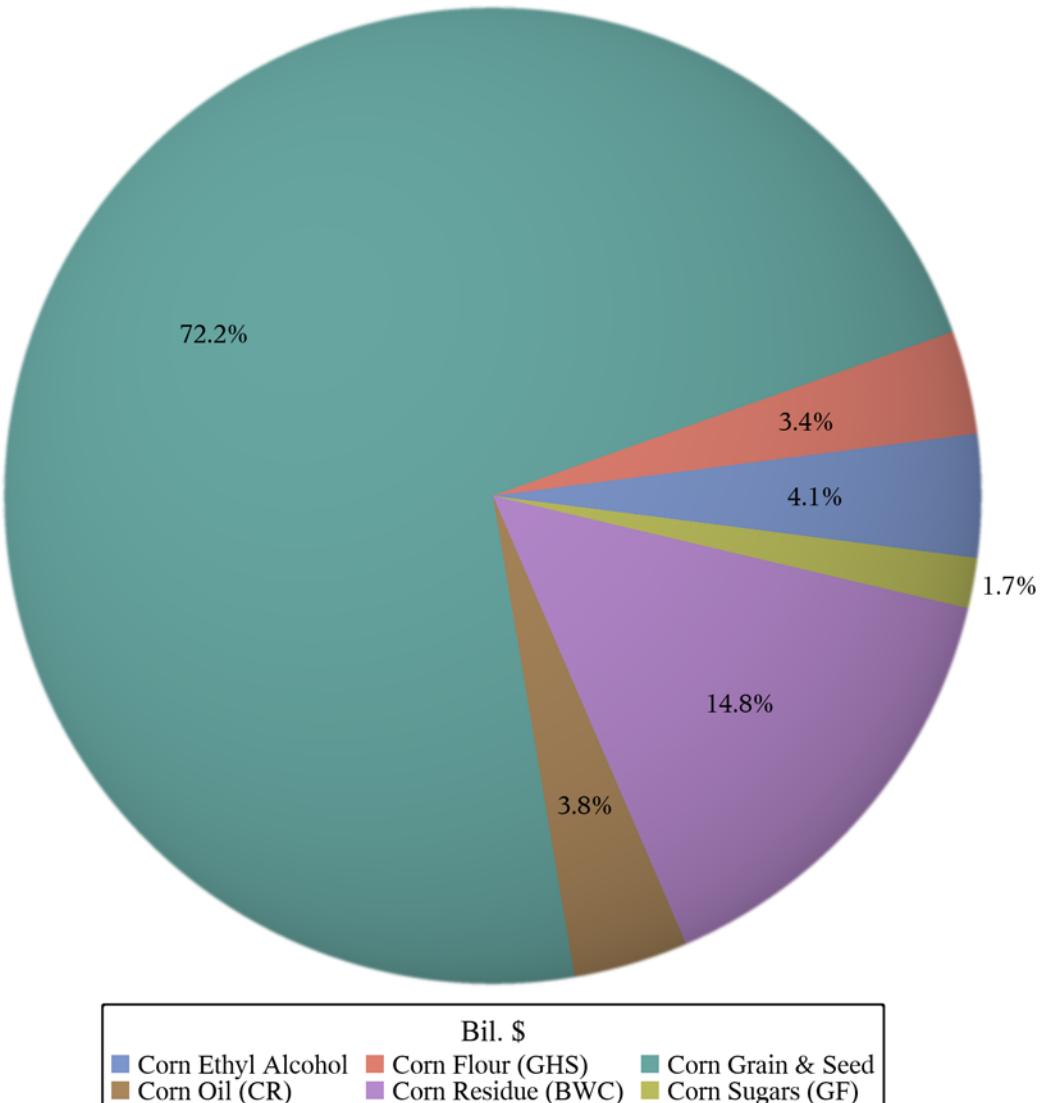


Figure 14: Global Export Share of Corn Products, 1994-1998

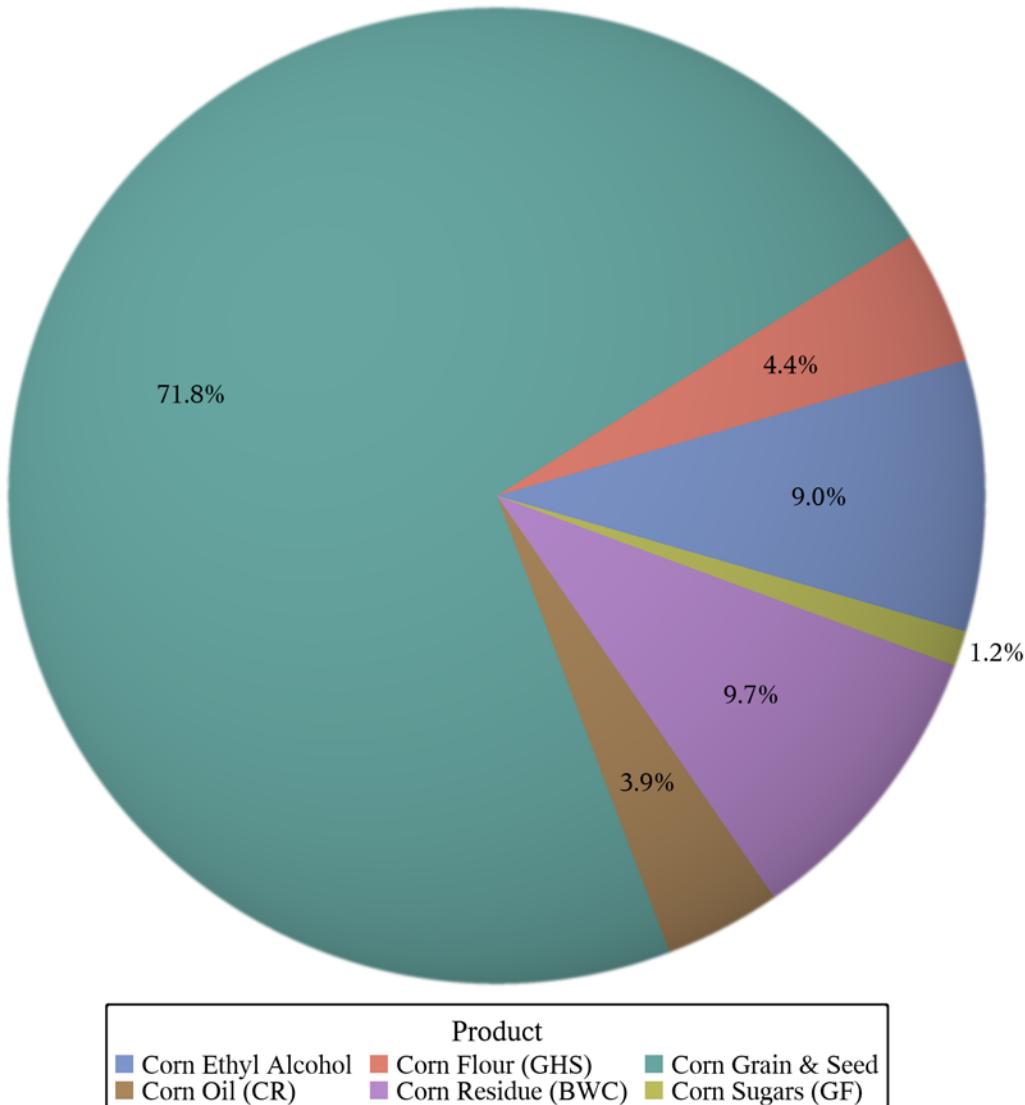


Figure 15: Global Export Share of Corn Products, 1999-2003

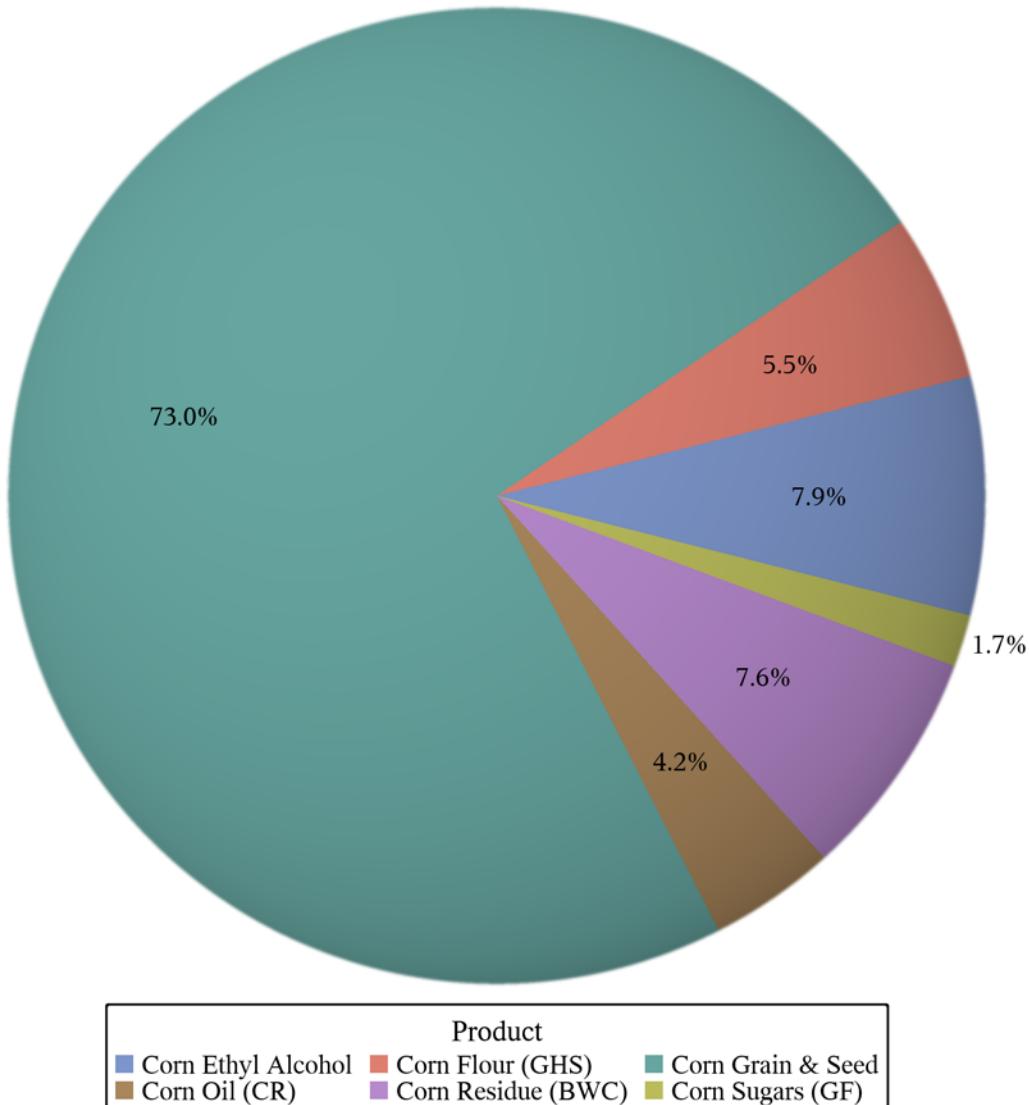


Figure 16: Global Export Share of Corn Products, 2004-2008

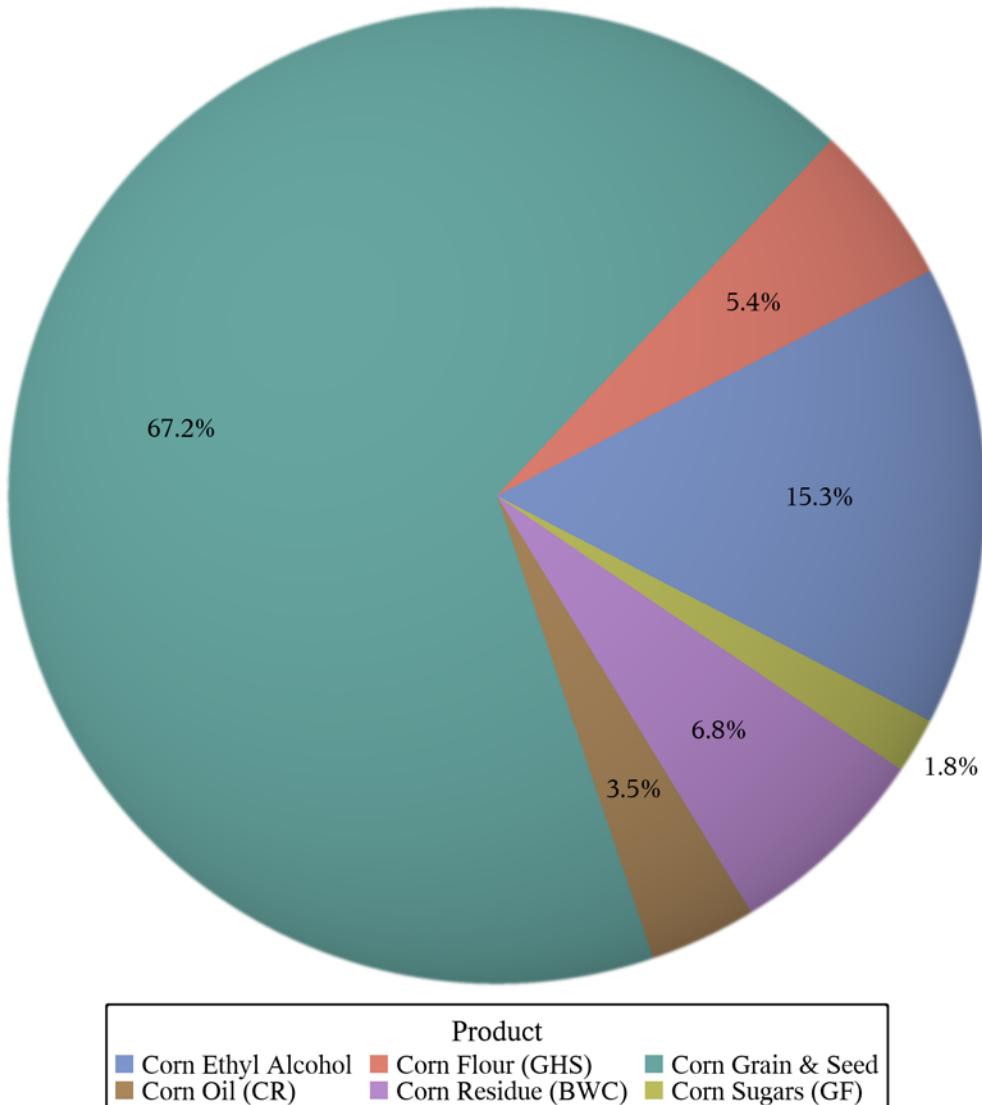


Figure 17: Global Export Share of Corn Products, 2009-2013

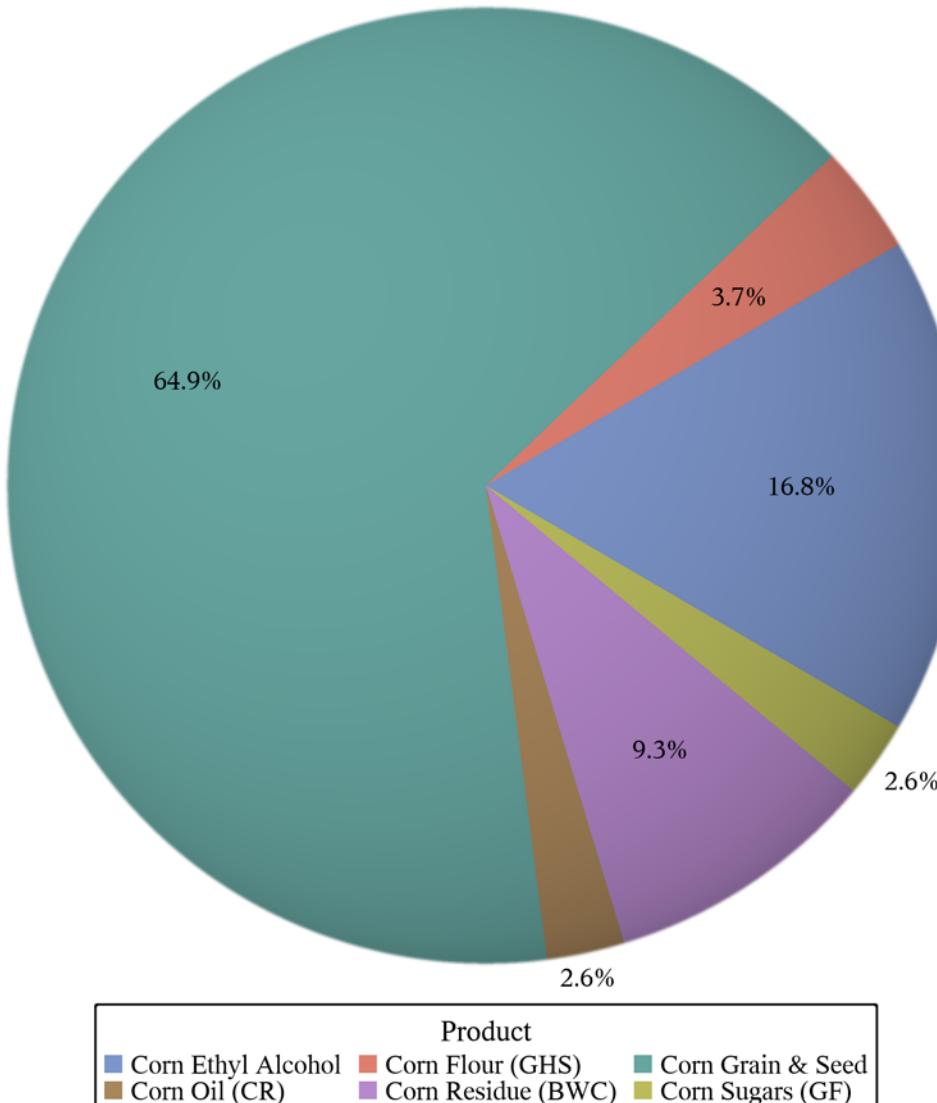


Figure 18: Global Export Share of Corn Products, 2014-2018

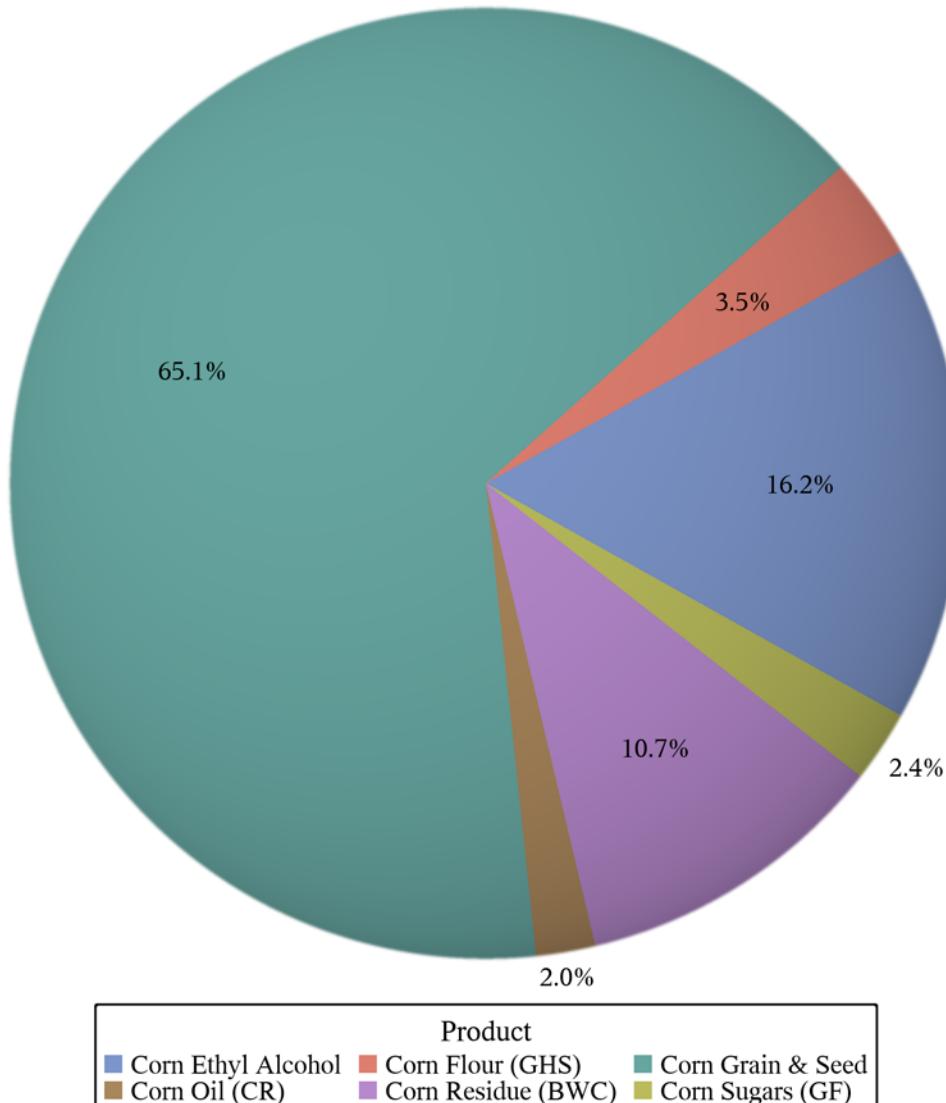


Table 13: Global Export Value of Corn Products, Periodic Changes

Period	Corn Ethyl Alcohol	Corn Flour (GHS)	Corn Grain & Seed	Corn Oil (CR)	Corn Residue (BWC)	Corn Sugars (GF)
1989-1993	1,139,728,908	957,372,520	20,201,160,879	1,061,659,011	4,146,386,589	465,332,384
1994-1998	6,376,441,993	3,151,454,638	51,059,489,858	2,742,310,807	6,913,841,476	833,758,698
1999-2003	5,116,318,015	3,579,521,695	47,278,079,243	2,711,144,580	4,940,650,880	1,114,655,618
2004-2008	19,017,479,772	6,674,239,282	83,694,854,701	4,402,386,817	8,467,129,069	2,300,409,095
2009-2013	38,416,449,759	8,409,616,468	148,076,469,072	5,996,807,018	21,195,803,525	5,947,036,724
2014-2018	38,455,159,890	8,178,246,394	154,083,205,829	4,754,816,519	25,410,144,785	5,779,714,899

Table 14: Global Export Value Share of Corn Products, Periodic Changes

Period	Corn Ethyl Alcohol	Corn Flour (GHS)	Corn Grain & Seed	Corn Oil (CR)	Corn Residue (BWC)	Corn Sugars (GF)	Sum
1989-1993	4.07	3.42	72.22	3.80	14.82	1.66	27,971,640,291
1994-1998	8.97	4.43	71.84	3.86	9.73	1.17	71,077,297,470
1999-2003	7.90	5.53	73.03	4.19	7.63	1.72	64,740,370,031
2004-2008	15.27	5.36	67.19	3.53	6.80	1.85	124,556,498,736
2009-2013	16.85	3.69	64.93	2.63	9.29	2.61	228,042,182,566
2014-2018	16.25	3.46	65.11	2.01	10.74	2.44	236,661,288,316

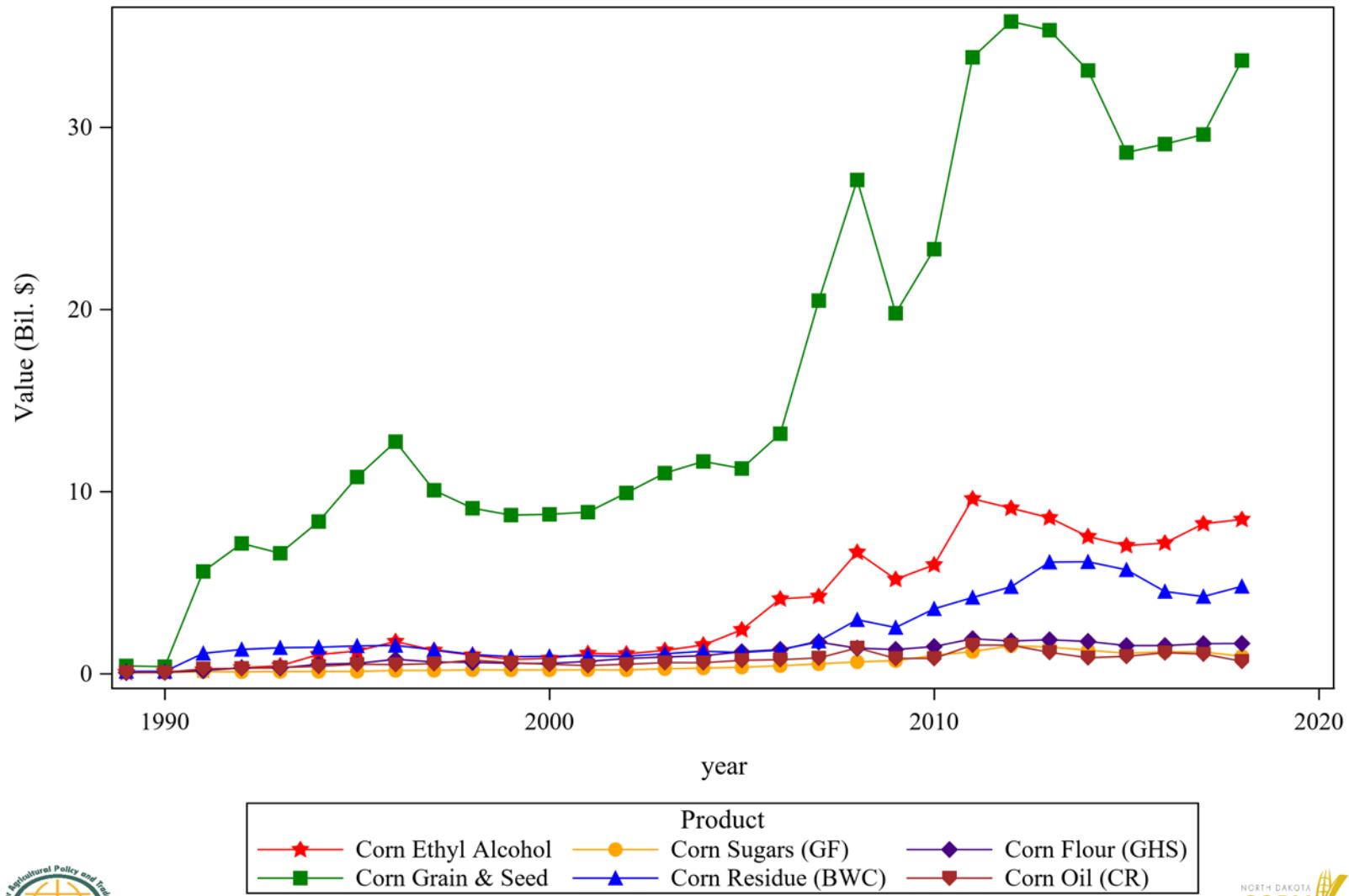
Table 15: Global Export Quantity of Corn Products, Periodic Changes

Period	Corn Ethyl Alcohol	Corn Flour (GHS)	Corn Grain & Seed	Corn Oil (CR)	Corn Residue (BWC)	Corn Sugars (GF)
1989-1993	9,143	3,227,675	149,266,458	1,392,517	31,116,383	3,645,482
1994-1998	54,477	9,630,966	353,766,336	3,385,509	53,224,527	2,283,500
1999-2003	10,995,509	13,588,888	314,516,582	3,659,055	21,781,710	2,915,439
2004-2008	29,261,630	22,469,236	453,550,346	4,212,487	41,059,016	5,580,011
2009-2013	35,001,870	18,042,126	566,783,082	4,365,691	103,454,767	12,574,754
2014-2018	67,358,767	20,624,449	764,710,932	4,392,103	115,000,867	13,606,199

Table 16: Global Export Quantity Share of Corn Products, Periodic Changes

Period	Corn Ethyl Alcohol	Corn Flour (GHS)	Corn Grain & Seed	Corn Oil (CR)	Corn Residue (BWC)	Corn Sugars (GF)	Sum
1989-1993	0.00	1.71	79.12	0.74	16.49	1.93	188,657,656
1994-1998	0.01	2.28	83.76	0.80	12.60	0.54	422,345,314
1999-2003	2.99	3.70	85.59	1.00	5.93	0.79	367,457,182
2004-2008	5.26	4.04	81.55	0.76	7.38	1.00	556,132,725
2009-2013	4.73	2.44	76.57	0.59	13.98	1.70	740,222,289
2014-2018	6.83	2.09	77.58	0.45	11.67	1.38	985,693,317

Figure 19: Global Export Value of Corn Products, Annual Trends



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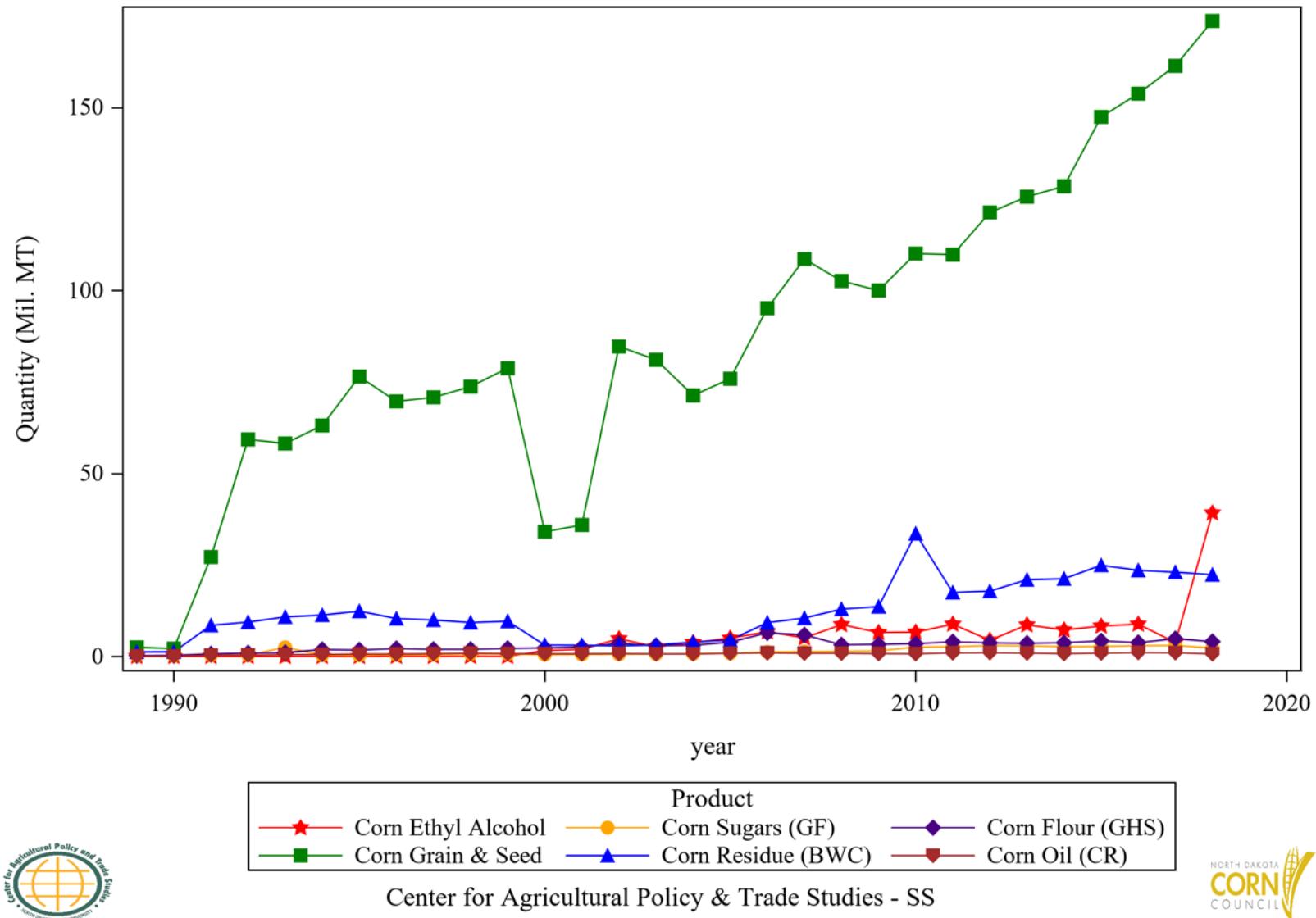


Table 17: Global Export Value of Corn Products, Annual Trends

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018
Corn Ethyl Alcohol	5,977,833,209	9,602,390,739	9,090,649,583	8,560,474,408	7,530,896,360	7,036,449,136	7,177,864,742	8,235,268,238	8,474,681,414
Corn Sugars (GF)	1,012,599,941	1,216,327,629	1,537,414,102	1,467,624,520	1,291,287,067	1,125,232,859	1,207,654,924	1,197,628,642	957,911,407
Corn Flour (GHS)	1,492,556,887	1,921,770,305	1,798,043,644	1,865,178,858	1,773,575,573	1,547,018,539	1,545,348,869	1,650,164,147	1,662,139,266
Corn Grain & Seed	23,307,218,130	33,840,527,712	35,806,187,924	35,329,945,204	33,119,252,802	28,614,792,332	29,080,290,257	29,601,567,676	33,667,302,762
Corn Residue (BWC)	3,567,041,772	4,185,931,262	4,774,963,401	6,129,822,797	6,148,324,868	5,707,391,604	4,515,626,921	4,239,953,140	4,798,848,252
Corn Oil (CR)	841,007,750	1,575,595,439	1,567,623,676	1,173,375,876	879,196,488	955,102,238	1,154,701,480	1,082,312,451	683,503,862

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Figure 20: Global Export Quantity of Corn Products, Annual Trends



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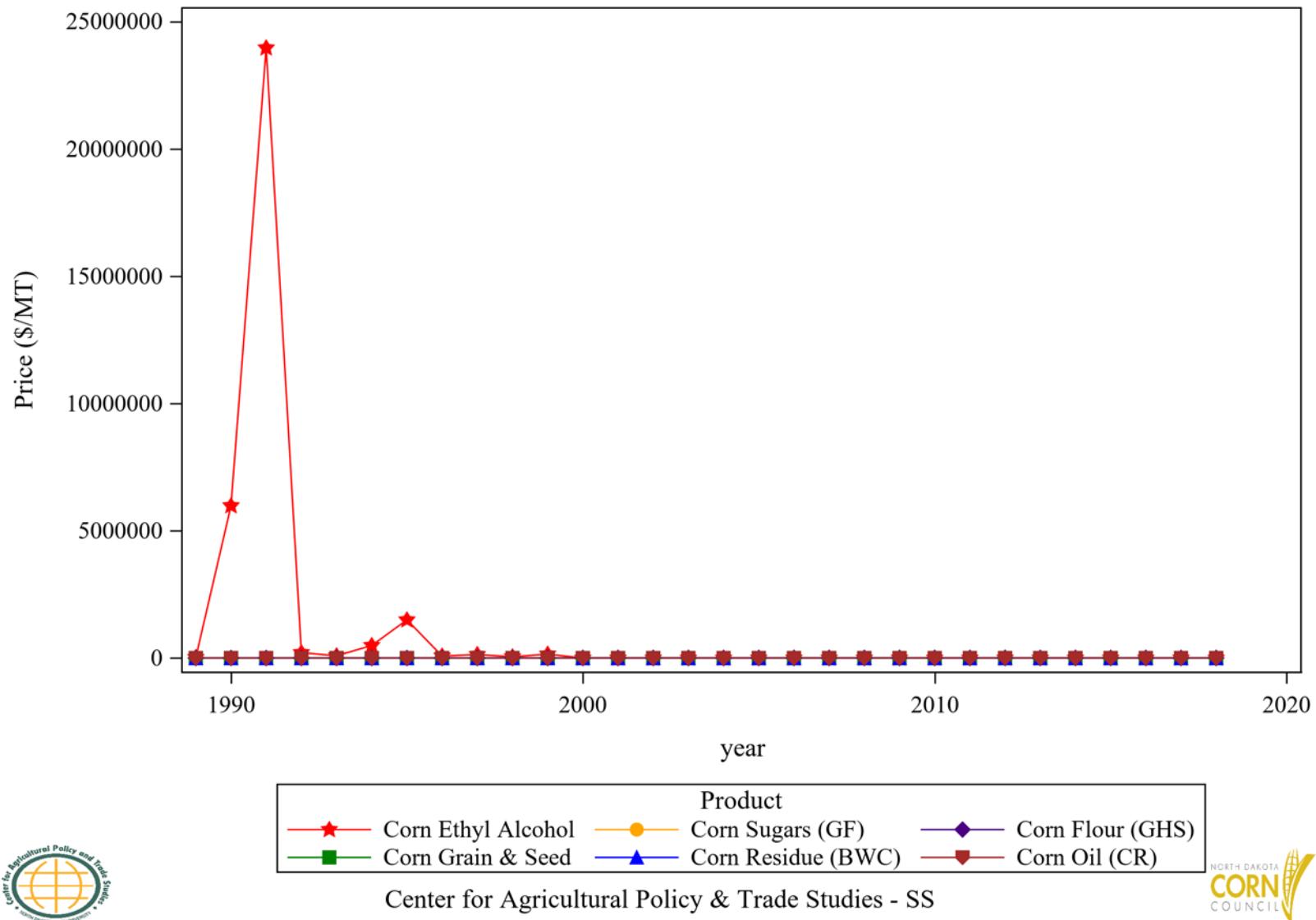


Table 18: Global Export Quantity of Corn Products, Annual Trends

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018
Corn Ethyl Alcohol	6,637,951	8,803,194	4,418,030	8,604,934	7,235,243	8,300,257	8,815,707	3,805,177	39,202,383
Corn Sugars (GF)	2,566,200	2,654,596	2,954,324	2,891,713	2,667,238	2,733,536	2,920,101	2,993,027	2,292,297
Corn Flour (GHS)	3,495,831	3,962,613	3,697,408	3,590,008	3,740,602	4,234,844	3,770,048	4,838,891	4,040,063
Corn Grain & Seed	110,075,289	109,793,384	121,303,667	125,624,377	128,486,858	147,416,850	153,772,262	161,387,968	173,646,994
Corn Residue (BWC)	33,566,060	17,465,917	17,839,597	20,964,399	21,221,011	24,915,087	23,533,094	23,011,038	22,320,637
Corn Oil (CR)	721,427	964,132	1,019,722	900,723	761,837	889,451	1,059,281	992,400	689,135

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Figure 21: Global Export Price of Corn Products, Annual Trends



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Table 19: Global Export Price of Corn Products, Annual Trends

Product	2010	2011	2012	2013	2014	2015	2016	2017	2018
Corn Ethyl Alcohol	901	1,091	2,058	995	1,041	848	814	2,164	216
Corn Sugars (GF)	395	458	520	508	484	412	414	400	418
Corn Flour (GHS)	427	485	486	520	474	365	410	341	411
Corn Grain & Seed	212	308	295	281	258	194	189	183	194
Corn Residue (BWC)	106	240	268	292	290	229	192	184	215
Corn Oil (CR)	1,166	1,634	1,537	1,303	1,154	1,074	1,090	1,091	992

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