

Supply Parameters

Table 1 lists the base solution parameters of supply activities based on average values for 2002-05. For each activity, its model acronym, base period acreage or quantity, percent excess capacity, and percent substitutable capital are listed. The base period acreages or quantities are endogenous to the model, but the user can re-calibrate them to customize the base situation to reflect his/her problem. The percent excess capacity and percent substitutable capital contribute to determining the responsiveness of the activity to endogenous changes in either quantity or price.

Unfortunately, we are not aware of any research that estimates the excess capacities and percent substitutable capital by commodity. In the absence of such producer data, we have assigned these parameters based on our own estimates. These parameters can be adjusted by the model user. These data could be collected from respondents to the ARMS surveys if carefully phrased. For example, an excess capacity question might ask: "How many acres of commodity x could you produce with your current complement of machinery and equipment without experiencing yield reductions, taking into consideration weather conditions and timeliness of planting and harvesting?" Questions related to proportion of substitutable capital might be phrased:

Table 1

Supply activity parameters: Base solution: U.S. aggregate EDMP model, 2002-2005 average

Activity name	Corn	Soybeans	Wheat	Rice	Barley	Oats	Sorghum
Symbol	CORNUS	SOYUS	WHEUS	RICUS	BARUS	OATUS	SRGUS
Acreage (mil. acres)	77.575	76.930	68.515	3.607	6.016	2.570	9.555
% Excess capacity	40	120	120	20	120	120	120
% Substitutable capital	100	100	100	50	100	100	100
Activity name	Cotton	Sugar beets	Sugar cane	Potatoes	Dry beans	Sunflower	Peanuts
Symbol	COTUS	SGBUS	SGCUS	POTUS	BENUS	SNFUS	PNTUS
Acreage (mil. acres)	14.788	1.477	0.575	1.320	1.741	2.059	1.380
% Excess capacity	20	20	20	20	120	120	20
% Substitutable capital	50	25	25	25	100	100	25
Activity name	Tobacco	Hay	Crops NEC	Fallow	Corn silage	Crop pasture	Range/ past.
Symbol	TBCUS	HAYUS	CNCUS	FALUS	CSILUS	CPASUS	RNGUS
Acreage (mil. acres)	0.660	55.159	23.360	34.081	6.730	66.800	481.000
% Excess capacity	20	120	40	120	32	120	120
% Substitutable capital	25	100	50	100	32	100	100
Activity name	Cow-calf	Fed beef	Ind. hog	Contract hog	Dairy	Sheep/lamb/wool	Broilers
Symbol	CCFUS	FBFUS	IHOGUS	CHOGUS	DAIRUS	SHBUS	CBRLUS
Quantity (mil. units)	33.930	381.642	146.703	96.669	1683.421	9.622	305.478
% Excess capacity	40	40	40	20	20	40	40
% Substitutable capital	50	50	50	50	50	50	50
Activity name	Ind. egg	Contract egg	Ind. turkey	Cont. turkey	Livestock NEC		
Symbol	IEGGUS	CEGGUS	ITRKUS	CTRKUS	LNCUS		
Quantity (mil. units)	390.403	331.612	13.235	37.569	3158.100		
% Excess capacity	40	40	40	20	40		
% Substitutable capital	50	50	50	50	50		

Source: Calculated from *USDA Agricultural Projections to 2016*.

“What is the total value of machinery and equipment you use in production of commodity x?” and “What is the value of machinery and equipment that is specialized to **only** the production of commodity x?”

Table 2 lists the process budgets for each activity including yields and dollar values of operator labor, hired labor, seeds/genetics, specialized technologies, fertilizer/lime, chemicals, fuel/lube/electricity, and other variable costs. These cost components make up the shortrun variable cost of the activities. Fixed cash costs and capital replacement costs are included in longrun variable costs. The values are the average ERS cost-of-production accounts at the national level for 1996-2000 and 2001-05.

Table 2

Supply activities: Yields, costs and supply responses: Base solution: U.S. aggregate EDMP model, 2002-2005 average

Activity name	Corn	Soybeans	Wheat	Rice	Barley	Oats	Sorghum
Yield per acre	143.685 bu	40.872 bu	44.3848 bu	65.02 cwt	62.54 bu	48.19 bu	38.46 bu
Operator labor \$	29.69	16.01	14.75	31.29	8.59	17.16	17.75
Hired labor \$	3.10	1.76	2.11	39.88	6.41	2.06	3.10
Seed/genetics \$	29.10	18.09	7.48	26.68	8.41	7.62	3.87
Specialized tech \$	3.63	3.31	0.00	0.00	0.00	0.00	0.00
Fert/lime/etc \$	40.17	7.87	18.30	48.79	18.96	15.09	9.45
Chemicals \$	26.52	23.57	7.24	72.48	10.09	1.77	7.16
Fuel/lube/elect. \$	22.25	5.28	6.04	61.79	12.10	9.38	11.73
Other variable \$	27.94	13.69	16.09	121.22	25.31	15.78	28.14
Fixed cash \$	17.95	17.53	10.12	73.80	18.94	19.37	10.43
Capital repl. \$	64.42	44.80	42.29	63.73	31.17	18.82	37.34
Implicit acreage response	0.333%	0.539	0.344	0.199	0.013	0.361	0.000
Implicit supply response	1.246%	1.402	1.265	1.222	2.345	1.508	3.100
Implicit price response	0.273%	0.224	0.347	0.334	0.014	0.137	0.003
	Cotton	Sugar beets	Sugar cane	Potatoes	Dry beans	Sunflower	Peanuts
Yield per acre	580.0 lb	21.1 ton	33.1 ton	337.9 cwt	14.6 cwt	16.8 cwt	2644 lb
Operator labor \$	30.99	51.96	15.50	57.22	12.00	7.28	89.52
Hired labor \$	36.56	112.66	330.75	58.03	6.48	2.12	37.63
Seed/genetics \$	19.83	43.71	50.36	9.83	24.94	7.82	75.48
Specialized tech \$	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Fert/lime/etc \$	35.25	61.00	103.90	52.71	13.73	2.84	39.52
Chemicals \$	64.97	71.68	89.13	48.66	26.56	8.75	97.96
Fuel/lube/elect. \$	29.18	36.52	60.23	17.03	6.47	3.58	34.60
Other variable \$	101.01	105.98	312.16	60.82	18.00	7.88	144.04
Fixed cash \$	31.53	78.97	106.99	40.55	20.87	15.48	37.48
Capital repl. \$	103.41	55.86	54.68	83.38	53.19	24.35	120.89
Implicit acreage response	0.042	0.761	1.279	1.032	0.985	1.241	0.477
Implicit supply response	1.063	0.957	0.957	1.032	1.481	1.946	0.866
Implicit price response	0.381	1.086	1.086	0.934	0.175	0.182	1.939

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Table 2

**Supply activities: Yields, costs and supply responses: Base solution: U.S. aggregate
EDMP model, 2002-2005 average—Continued**

Activity name	Tobacco	Hay	Crops NEC	Fallow	Corn silage	Crop pasture	Range/pasture
Yield per acre	2120 lb	2.5 ton	1721.4 \$	0.0	15.81 ton	35.4 cwt HE	7.50 cwt HE
Operator labor \$	215.09	3.83	188.81	1.35	25.23	2.05	0.45
Hired labor \$	530.11	3.83	125.87	1.50	16.06	1.35	0.45
Seed/genetics \$	61.27	2.97	36.71	0.00	22.51	3.40	0.85
Specialized tech \$	0.00	0.00	25.17	0.00	2.81	0.00	0.00
Fert/lime/etc \$	345.59	2.55	62.94	1.80	31.08	2.91	0.73
Chemicals \$	228.28	0.42	62.94	0.30	20.52	0.49	0.11
Fuel/lube/elect. \$	61.75	6.36	62.94	4.50	17.22	7.28	1.82
Other variable \$	432.15	7.64	330.41	5.00	21.23	8.74	2.18
Fixed cash \$	334.22	9.76	125.87	6.90	13.89	11.17	2.79
Capital repl. \$	294.14	5.35	368.17	3.84	51.91	3.67	0.92
Implicit acreage response	0.453	0.896	1.034	N/A	N/A	N/A	N/A
Implicit supply response	1.087	1.432	1.034	N/A	N/A	N/A	N/A
Implicit price response	0.645	0.202	1.132	N/A	N/A	N/A	N/A
	Cow-calf	Fed beef	Ind. hog	Cont. hog	Dairy	Sheep/lamb/wool	Broilers
Yield & units	5.5 +2.0 cwt	1.0 cwt	1.0 cwt	1.0 cwt	1.0 cwt	82.57 \$	1.0 cwt
Operator labor \$	229.58	0.58	3.52	1.54	1.73	6.81	3.00
Hired labor \$	3.12	0.83	0.45	3.86	0.59	7.20	0.90
Fuel/lube/elect. \$	19.14	2.00	1.33	0.94	0.53	1.91	1.00
Other variable \$	84.63	5.08	2.08	3.64	2.95	8.46	4.35
Fixed cash \$	87.95	1.25	1.98	2.21	0.92	8.79	8.40
Capital repl. \$	122.54	1.21	15.15	8.11	2.15	12.25	8.40
Implicit production response	0.982	0.960	0.661	0.618	0.863	0.000	0.937
Implicit supply response	1.069	1.069	0.785	0.785	0.886	0.000	1.148
Implicit price response	0.887	0.887	1.511	1.511	1.376	2.708	0.758
	Ind. egg	Cont. egg	Ind. turkey	Cont. turkey	Livestock NEC		
Yield & units	1.0 doz	1.0 doz	1.0 cwt	1.0 cwt	1.0 \$		
Operator labor \$	0.06	0.06	2.50	2.00	0.09		
Hired labor \$	0.06	0.06	2.00	2.50	0.09		
Fuel/lube/elect. \$	0.03	0.03	1.00	1.00	0.12		
Other variable \$	0.12	0.12	8.00	8.00	0.31		
Fixed cash \$	0.1425	0.1425	13.00	13.00	0.05		
Capital repl. \$	0.1525	0.1625	13.00	13.50	0.10		
Implicit production response	1.035	1.055	1.173	0.599	0.000		
Implicit supply response	1.044	1.044	0.974	0.974	0.000		
Implicit price response	0.788	0.788	1.033	1.033	2.138		

Source: Calculated from *USDA Agricultural Projections to 2016*.