Online Appendix for "Demand Estimation Under Incomplete Product Availability"

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This appendix reports the full set of predicted weekly sales and the predicted weekly sales impacts of product removals, by product, as discussed in the coverage of the counterfactual exercises of the accompanying paper.

Table 1—Predicted Weekly Sales, Markets without Stock-out Events

	Random Coefficients Logit				Category-Specific Nested Logit			
	Full	Ignore	EM	Diff	Full	Ignore	EM	Diff
PopTart	5.17	6.06	5.93	0.76	6.17	6.56	6.46	0.29
Choc Donuts	4.62	6.92	7.20	2.58	5.71	7.96	8.38	2.67
Ding Dong	4.15	5.31	5.46	1.31	5.07	5.95	6.18	1.11
Banana Nut Muffin	4.88	5.57	5.74	0.86	4.52	4.80	4.80	0.27
Rice Krispies	2.69	2.97	2.90	0.21	3.35	3.31	3.24	-0.10
Gma Oatmeal Raisin	3.80	4.16	4.15	0.35	3.86	4.14	4.12	0.27
Chips Ahoy	3.28	3.54	3.53	0.25	3.36	3.56	3.56	0.19
Nutter Butter Bites	2.37	2.55	2.53	0.16	2.47	2.60	2.58	0.11
Knotts Raspberry Cookie	2.40	2.65	2.56	0.16	2.44	2.64	2.55	0.11
Gma Choc Chip	4.32	4.76	4.72	0.41	4.73	5.00	4.98	0.25
Rold Gold	5.19	6.03	6.21	1.02	4.77	5.44	5.55	0.78
Sunchip Harvest	5.00	5.68	5.80	0.80	4.63	5.17	5.23	0.59
Dorito Nacho	4.34	4.72	4.76	0.41	4.03	4.30	4.27	0.25
Cheeto Crunchy	4.33	4.80	4.82	0.49	4.00	4.35	4.33	0.33
Ruffles Cheddar	3.58	3.94	4.04	0.47	3.31	3.58	3.64	0.32
Fritos	2.45	2.63	2.65	0.20	2.27	2.39	2.38	0.11
Lays Potato Chip	2.16	2.34	2.35	0.19	2.00	2.12	2.11	0.11
Misc Chips 2	2.06	2.20	2.26	0.20	1.90	1.99	2.01	0.11
Munchies Hot	4.16	4.61	4.62	0.46	3.84	4.19	4.15	0.30
Munchies	3.25	3.52	3.71	0.46	3.01	3.20	3.33	0.32
Dorito Guacamole	2.62	2.80	2.89	0.27	2.37	2.50	2.53	0.16
Snickers	10.68	11.8	11.64	0.96	11.16	12.04	11.88	0.71
Twix	7.88	8.55	8.54	0.66	8.23	8.71	8.69	0.47
M&M Peanut	6.02	6.59	6.56	0.54	6.30	6.73	6.70	0.40
Reeses Cup	3.04	3.34	3.25	0.20	3.18	3.41	3.31	0.13
Kit Kat	2.81	3.04	2.99	0.19	2.93	3.09	3.04	0.11
Caramel Crunch	2.82	3.07	3.01	0.19	2.94	3.13	3.06	0.12
M&M	3.12	3.48	3.40	0.28	3.26	3.55	3.46	0.20
Hershey Almond	2.20	2.40	2.34	0.14	2.31	2.45	2.39	0.08
Starburst	4.78	5.33	5.35	0.57	4.53	4.95	4.98	0.45
Kar Nut Sweet/Salt	3.76	4.15	4.06	0.29	3.55	3.86	3.77	0.23
Snackwell	2.20	2.40	2.37	0.17	2.07	2.22	2.20	0.13
Skittles	4.37	4.78	4.75	0.39	4.22	4.49	4.46	0.24
Oreo	1.35	1.46	1.45	0.10	1.27	1.36	1.35	0.08
Peanuts	2.45	2.68	2.64	0.20	2.36	2.52	2.48	0.13
Totals	134.30	150.83	151.18	16.90	136.12	148.26	148.15	12.03

Note: Reports predicted weekly sales for the median market in which no stock-out event occurred in the data. Simulation includes each of the 35 most commonly-held products. Diff reports the difference in weekly sales between the EM-corrected and Full Availability estimates for each of the two specifications (Category-specific Nested Logit and Random Coefficients Logit).

Table 2—Predicted Weekly Sales, Markets with Stock-out Events

	Random Coefficients			Category Nested Logit		
	Full	EM	Diff	Full	EM	Diff
PopTart	14.97	16.86	1.89	15.20	15.90	0.71
Choc Donuts	13.69	21.07	7.38	14.05	20.62	6.58
Ding Dong	12.25	15.89	3.65	12.47	15.20	2.73
Banana Nut Muffin	11.51	12.88	1.37	11.14	11.81	0.67
Rice Krispies	7.99	8.52	0.54	8.24	7.98	-0.25
Gma Oatmeal Raisin	11.23	12.09	0.86	11.07	11.89	0.81
Chips Ahoy	9.82	10.47	0.65	9.65	10.25	0.60
Nutter Butter Bites	7.11	7.53	0.42	7.08	7.43	0.35
Knotts Raspberry Cookie	7.10	7.49	0.39	7.01	7.36	0.35
Gma Choc Chip	12.94	14.03	1.09	13.59	14.36	0.77
Rold Gold	15.47	18.32	2.84	15.25	17.78	2.53
Sunchip Harvest	15.00	17.23	2.23	14.81	16.75	1.94
Dorito Nacho	13.02	14.13	1.10	12.86	13.69	0.83
Cheeto Crunchy	12.97	14.30	1.33	12.78	13.86	1.08
Ruffles Cheddar	10.73	12.01	1.29	10.59	11.66	1.07
Fritos	7.35	7.89	0.54	7.25	7.64	0.39
Lays Potato Chip	6.48	6.98	0.50	6.39	6.75	0.36
Misc Chips 2	6.14	6.66	0.52	6.06	6.44	0.38
Munchies Hot	12.48	13.72	1.24	12.28	13.29	1.00
Munchies	9.74	11.01	1.27	9.61	10.68	1.07
Dorito Guacamole	7.75	8.43	0.68	7.58	8.11	0.53
Snickers	32.00	34.56	2.56	32.37	34.48	2.11
Twix	23.60	25.33	1.72	23.86	25.24	1.39
M&M Peanut	18.05	19.49	1.45	18.27	19.45	1.18
Reeses Cup	9.11	9.64	0.53	9.23	9.60	0.38
Kit Kat	8.40	8.87	0.47	8.49	8.82	0.33
Caramel Crunch	8.43	8.92	0.49	8.53	8.88	0.35
M&M	9.35	10.10	0.74	9.46	10.05	0.59
Hershey Almond	6.60	6.96	0.36	6.69	6.93	0.24
Starburst	14.31	15.85	1.55	13.94	15.38	1.44
Kar Nut Sweet/Salt	11.28	12.06	0.78	10.93	11.67	0.74
Snackwell	6.58	7.04	0.46	6.37	6.81	0.44
Skittles	13.06	14.03	0.97	13.00	13.79	0.79
Oreo	4.04	4.31	0.27	3.91	4.17	0.25
Peanuts	7.27	7.77	0.49	7.26	7.68	0.42
Totals	397.82	442.44	44.62	397.27	432.4	35.15

Note: Reports predicted weekly sales for the median market in which at least one stock-out event occurred in the data. Diff reports the difference in weekly sales between the EM-corrected and Full Availability estimates for each of the two specifications (Category-specific Nested Logit and Random Coefficients Logit). Predicted sales impose no capacity constraints, and thus predict demand for a fully-stocked machine.

Table 3—Weekly Sales Impact of Product Removal, Markets without Stock-out Events

	Random Coefficients			Category Nested Logit		
	Full	Ignore	EM	Full	Ignore	EM
PopTart	-5.17	-6.06	-5.93	-6.17	-6.56	-6.46
Choc Donuts	-4.62	-6.92	-7.20	-5.71	-7.96	-8.38
Ding Dong	0.09	0.13	0.14	1.85	1.71	1.88
Banana Nut Muffin	0.20	0.29	0.30	1.65	1.38	1.46
Rice Krispies	0.04	0.05	0.05	1.22	0.95	0.99
Gma Oatmeal Raisin	-3.80	-4.16	-4.15	-3.86	-4.14	-4.12
Chips Ahoy	-3.28	-3.54	-3.53	-3.36	-3.56	-3.56
Nutter Butter Bites	0.04	0.05	0.05	0.61	0.41	0.43
Knotts Raspberry Cookie	0.05	0.06	0.06	0.60	0.41	0.43
Gma Choc Chip	0.07	0.09	0.09	1.17	0.79	0.83
Rold Gold	-5.19	-6.03	-6.21	-4.77	-5.44	-5.55
Sunchip Harvest	-5.00	-5.68	-5.80	-4.63	-5.17	-5.23
Dorito Nacho	0.07	0.08	0.08	0.45	0.29	0.32
Cheeto Crunchy	0.07	0.09	0.09	0.45	0.30	0.32
Ruffles Cheddar	0.06	0.07	0.07	0.37	0.24	0.27
Fritos	0.04	0.05	0.05	0.26	0.16	0.18
Lays Potato Chip	0.03	0.04	0.04	0.23	0.14	0.16
Misc Chips 2	0.03	0.04	0.04	0.21	0.14	0.15
Munchies Hot	0.06	0.08	0.08	0.43	0.28	0.31
Munchies	0.05	0.06	0.07	0.34	0.22	0.25
Dorito Guacamole	0.04	0.05	0.05	0.27	0.17	0.19
Snickers	-10.68	-11.8	-11.64	-11.16	-12.04	-11.88
Twix	-7.88	-8.55	-8.54	-8.23	-8.71	-8.69
M&M Peanut	0.10	0.13	0.13	1.82	1.22	1.28
Reeses Cup	0.05	0.06	0.06	0.92	0.62	0.63
Kit Kat	0.05	0.06	0.06	0.85	0.56	0.58
Caramel Crunch	0.05	0.06	0.06	0.85	0.57	0.59
M&M	0.05	0.07	0.07	0.94	0.64	0.66
Hershey Almond	0.04	0.04	0.04	0.67	0.44	0.46
Starburst	-4.78	-5.33	-5.35	-4.53	-4.95	-4.98
Kar Nut Sweet/Salt	-3.76	-4.15	-4.06	-3.55	-3.86	-3.77
Snackwell	0.03	0.04	0.04	0.49	0.29	0.32
Skittles	0.08	0.10	0.10	1.00	0.59	0.65
Oreo	0.02	0.03	0.03	0.30	0.18	0.20
Peanuts	0.04	0.05	0.05	0.56	0.33	0.36
Total	-52.71	-60.35	-60.51	-37.46	-49.36	-48.72

Note: Reports predicted weekly sales impact of simulated removals of the top two selling products in each category for the median market in which no product stocked out in the data. Products removed are: Chocolate Donuts, Strawberry Frosted PopTarts, Grandma's Oatmeal Raisin Cookie, Chips Ahoy Cookies, Rold Gold Pretzels, Sunchips Harvest Cheddar, Snickers, Twix, Starburst, and Kar Nut's Sweet & Salty Mix.

Table 4—Weekly Sales Impact of Product Removal, Markets with Stock-out Events

	Random Coefficients		Nested Logit	
	Full	EM	Full	EM
PopTart	-14.97	-16.86	-15.20	-15.90
Choc Donuts	-13.69	-21.07	-14.05	-20.62
Ding Dong	0.75	1.17	4.93	5.21
Banana Nut Muffin	1.15	1.53	4.41	4.04
Rice Krispies	0.39	0.48	3.26	2.73
Gma Oatmeal Raisin	-11.23	-12.09	-11.07	-11.89
Chips Ahoy	-9.82	-10.47	-9.65	-10.25
Nutter Butter Bites	0.35	0.42	1.95	1.50
Knotts Raspberry Cookie	0.42	0.51	1.93	1.48
Gma Choc Chip	0.66	0.83	3.75	2.90
Rold Gold	-15.47	-18.32	-15.25	-17.78
Sunchip Harvest	-15.00	-17.23	-14.81	-16.75
Dorito Nacho	0.62	0.76	1.78	1.45
Cheeto Crunchy	0.65	0.82	1.76	1.47
Ruffles Cheddar	0.52	0.66	1.46	1.23
Fritos	0.35	0.43	1.00	0.81
Lays Potato Chip	0.31	0.38	0.88	0.71
Misc Chips 2	0.29	0.36	0.84	0.68
Munchies Hot	0.59	0.74	1.70	1.41
Munchies	0.46	0.59	1.33	1.13
Dorito Guacamole	0.38	0.48	1.05	0.86
Snickers	-32.00	-34.56	-32.37	-34.48
Twix	-23.6	-25.33	-23.86	-25.24
M&M Peanut	0.92	1.14	5.82	4.40
Reeses Cup	0.45	0.55	2.94	2.17
Kit Kat	0.45	0.56	2.70	2.00
Caramel Crunch	0.42	0.51	2.72	2.01
M&M	0.48	0.60	3.01	2.28
Hershey Almond	0.32	0.39	2.13	1.57
Starburst	-14.31	-15.85	-13.94	-15.38
Kar Nut Sweet/Salt	-11.28	-12.06	-10.93	-11.67
Snackwell	0.32	0.39	1.68	1.23
Skittles	0.72	0.94	3.43	2.49
Oreo	0.21	0.25	1.03	0.75
Peanuts	0.35	0.43	1.92	1.39
Total	-148.84	-167.92	-101.72	-132.06

Note: Reports predicted weekly sales impact of simulated removals of the top two selling products in each category for the median market in which no product stocked out in the data. Products removed are: Chocolate Donuts, Strawberry Frosted PopTarts, Grandma's Oatmeal Raisin Cookie, Chips Ahoy Cookies, Rold Gold Pretzels, Sunchips Harvest Cheddar, Snickers, Twix, Starburst, and Kar Nut's Sweet