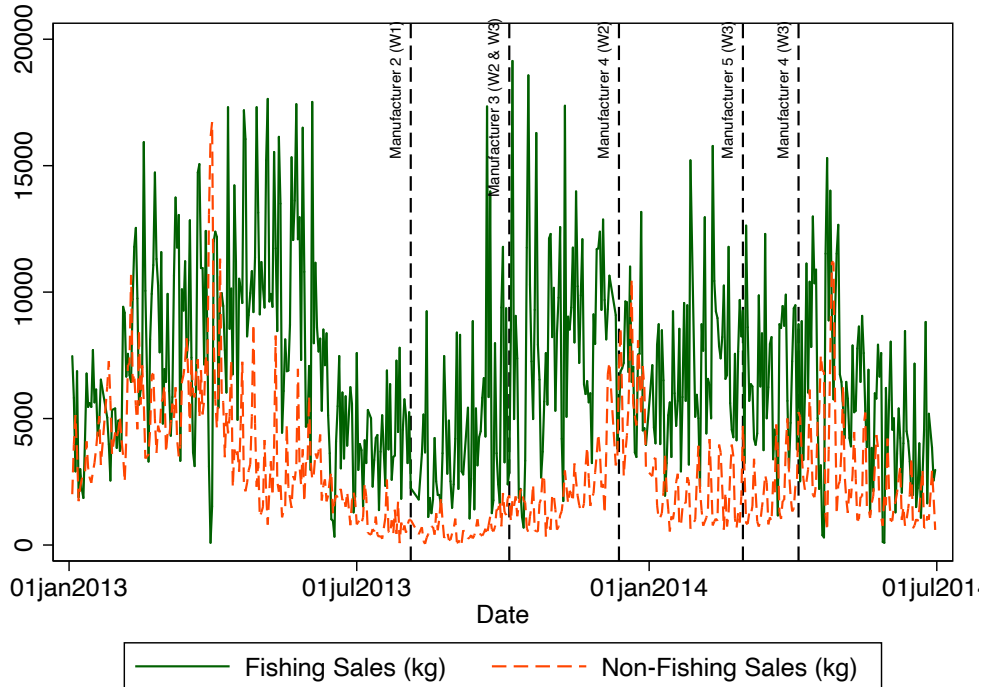


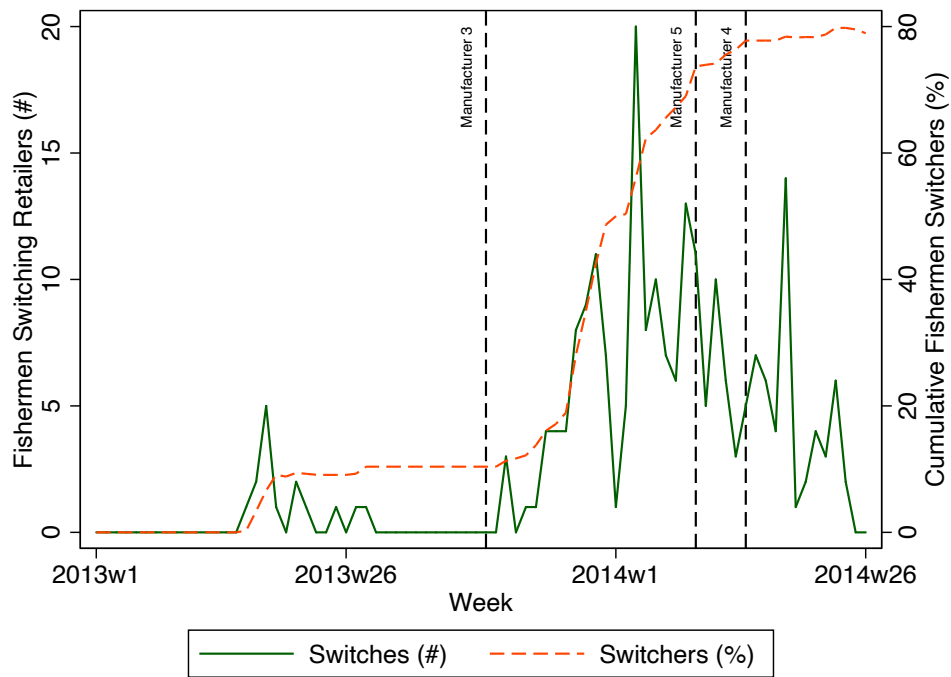
Online Appendix
Relationships on the Rocks: Contract Evolution in a Market for Ice
Tarek Ghani & Tristan Reed

Figure B1: M1 Sources of Ice Demand (kg)



Notes: This figure presents the aggregate ice sales in kilograms by the incumbent manufacturer, M1 (Ice Ice Baby), to two sources of demand: fishermen and non-fishermen sources. Vertical lines mark the first date of ice sales by a competitor manufacturer in one or more wharves.

Figure B2: Customer Switching - Goderich (W3) only



Notes: This figure presents the count of weekly customer-retailer switches and the cumulative percentage of fishing customers who are observed switching retailers within Goderich wharf during the 18-month data collection period with the 5 incumbent retailers. Vertical lines mark the first date of ice sales by a competitor manufacturer in one or more wharves.

Table B1: High Frequency Summary Statistics

	All	Before Manufacturer Entry			After Manufacturer Entry		
		W1	W2	W3	W1	W2	W3
Trip Length (Days)	2.90 (1.24)	2.44 (0.95)	2.83 (1.28)	1.85 (0.92)	2.79 (0.79)	3.33 (1.18)	3.48 (1.24)
Trip Without Ice (=1)	0.24 (0.43)	0.24 (0.43)	0.26 (0.44)	0.45 (0.50)	0.10 (0.30)	0.17 (0.37)	0.22 (0.41)
Ice Purchase (kg)	464.43 (353.59)	447.65 (275.05)	602.23 (472.73)	262.28 (299.82)	628.87 (262.70)	722.20 (486.15)	397.24 (274.91)
Late Ice (=1)	0.06 (0.25)	0.16 (0.37)	0.01 (0.10)	0.08 (0.28)	0.13 (0.34)	0.02 (0.15)	0.02 (0.14)
Trip Profits(\$)	108.54 (150.81)	33.59 (75.03)	126.81 (167.49)	135.29 (150.19)	113.40 (191.31)	127.16 (102.42)	96.80 (139.67)
Observations (Trips)	4743	307	269	936	929	490	1812
Ice Ordered (kg)	714.63 (470.54)	652.89 (226.55)	832.11 (364.02)	644.18 (332.95)	779.51 (533.19)	822.72 (440.67)	699.56 (622.87)
Ice Delivered (kg)	691.31 (481.30)	494.03 (306.37)	818.52 (371.05)	631.17 (332.96)	779.51 (533.19)	822.72 (440.67)	699.56 (622.87)
Late Delivery (=1)	0.11 (0.31)	0.28 (0.45)	0.16 (0.36)	0.16 (0.37)	0.09 (0.28)	0.00 (0.00)	0.01 (0.09)
Price per 30kg (Leones)	17447.26 (822.46)	18000.00 (0.00)	18000.00 (0.00)	18000.00 (0.00)	17235.68 (1148.10)	16852.87 (812.89)	16747.96 (681.25)
Paid Upfront (\$)	85.87 (62.46)	85.72 (34.47)	104.70 (55.67)	81.47 (47.66)	98.74 (65.54)	97.81 (59.44)	74.07 (79.12)
Total Credit (\$)	9.14 (29.92)	1.06 (7.99)	10.13 (30.04)	7.43 (25.20)	3.64 (16.54)	8.21 (29.38)	15.67 (40.07)
Credit Order (=1)	0.16 (0.37)	0.04 (0.19)	0.16 (0.37)	0.15 (0.35)	0.09 (0.29)	0.12 (0.32)	0.25 (0.43)
Share on Credit	0.10 (0.28)	0.01 (0.08)	0.09 (0.25)	0.08 (0.25)	0.04 (0.15)	0.07 (0.24)	0.19 (0.37)
Switch Agent (=1)	0.05 (0.22)	0.00 (0.00)	0.00 (0.00)	0.01 (0.10)	0.01 (0.08)	0.03 (0.17)	0.15 (0.36)
Fishing Firms (#)	155	36	29	78	39	33	96
Observations (Orders)	5281	603	662	1413	611	401	1591

Notes: Standard deviations reported in parentheses. W1 refers to Tombo wharf, W2 refers to Aberdeen wharf, and W3 refers to Goderich wharf. Data above the midline is from surveys of fishing trip outcomes, and below the midline from ice retailer order and delivery records. Before (After) Manufacturer Entry period refers to prior (before) to the entry of new manufacturers in each fishing wharf (see paper text for details).

Table B2: Lateness and Alternative Relationship Measures

	Late Ice Delivery (=1)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Outside Sales (z-score)	0.093*** (0.028)	0.100*** (0.026)	0.162*** (0.051)	0.092*** (0.027)	0.093*** (0.028)	0.095*** (0.027)	0.095*** (0.030)	0.087** (0.042)	0.076* (0.046)	0.163*** (0.057)
Outside Sales X Loyal (=1)	-0.034** (0.016)	-0.029* (0.016)	-0.027 (0.038)	-0.038* (0.020)	-0.033* (0.017)	-0.029* (0.015)	-0.033** (0.016)	-0.017 (0.039)	-0.038 (0.039)	-0.035 (0.037)
Loyal (=1)	-0.003 (0.064)	-0.003 (0.065)	-0.013 (0.076)	-0.040 (0.032)	0.080* (0.048)	0.003 (0.064)	-0.004 (0.064)	-0.003 (0.078)	0.000 (0.080)	0.043 (0.072)
Outside Sales X Relationship Years		-0.003 (0.003)	-0.035*** (0.010)							-0.031*** (0.009)
Relationship Years		0.000 (0.000)	0.000 (0.000)							0.000 (0.000)
Outside Sales X Relationship Years ²			0.003*** (0.001)							0.003*** (0.001)
Relationship Years ²			0.000 (0.000)							0.000 (0.000)
Outside Sales X Close Friend (=1)				0.006 (0.020)						0.006 (0.019)
Close Friend (=1)				0.065 (0.102)						0.255*** (0.092)
Outside Sales X Coethnic (=1)					-0.004 (0.019)					0.015 (0.019)
Coethnic (=1)					0.349*** (0.077)					0.867* (0.449)
Outside Sales X More Ice (=1)						-0.021 (0.016)				-0.014 (0.017)
Outside Sales X Order Size							-0.010 (0.011)			-0.008 (0.011)
Outside Sales X Fishing Assets (\$1000)								-0.001* (0.001)		-0.001 (0.001)
Outside Sales X Risk Tolerance									0.031 (0.029)	0.001 (0.033)
Time Period	Pre-Entry									
Mean Dep Var	0.182	0.182	0.183	0.182	0.182	0.182	0.182	0.182	0.181	0.181
# Firms	141	141	140	141	141	141	141	139	137	136
# Observations	2648	2648	2514	2648	2648	2648	2648	2488	2452	2426
R-Squared	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Weather Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Retailer FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Notes: See Table 2 and Table 3 notes. All regressions include weather controls, retailer fixed effects, fishing firm fixed effects, and calendar month fixed effects. The variables Relationship Years, Close Friend (=1) and Coethnic (=1) are defined at the fishing firm-retailer dyad level; the variables More Ice (=1), Order Size, Fishing Assets (\$1000) and Risk Tolerance are defined at the fishing firm level and thus are colinear with the fishing firm fixed effect. Robust standard errors, two-way clustered by fishing firm and delivery date, in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B3: Credit Provision and Alternative Relationship Measures

	Ice Credit Order (=1)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Manufacturer Entry (=1)	-0.016 (0.026)	-0.027 (0.028)	-0.074 (0.048)	-0.021 (0.032)	-0.018 (0.029)	-0.013 (0.027)	-0.017 (0.024)	0.017 (0.031)	0.019 (0.053)	-0.070 (0.064)	
Entry X Goderich (=1)	0.060 (0.051)	0.059 (0.052)	0.001 (0.058)	0.059 (0.050)	0.062 (0.051)	0.057 (0.051)	0.049 (0.059)	-0.008 (0.058)	0.009 (0.061)	-0.041 (0.049)	
Entry X Loyal (=1)	0.020 (0.032)	0.015 (0.033)	-0.008 (0.037)	0.018 (0.035)	0.018 (0.032)	0.026 (0.034)	0.039 (0.029)	0.001 (0.034)	0.012 (0.039)	0.047 (0.037)	
Loyal (=1)	0.016 (0.059)	0.025 (0.061)	-0.005 (0.153)	0.027 (0.061)	0.025 (0.076)	0.010 (0.061)	-0.003 (0.062)	-0.009 (0.155)	-0.022 (0.150)	-0.184 (0.204)	
Goderich X Loyal (=1)	-0.079 (0.075)	-0.083 (0.076)	-0.103 (0.159)	-0.065 (0.082)	-0.087 (0.091)	-0.076 (0.076)	-0.077 (0.074)	-0.102 (0.163)	-0.083 (0.158)	0.051 (0.199)	
Entry X Goderich X Loyal x Q4 2013 (=1)	-0.087 (0.054)	-0.086 (0.056)	-0.029 (0.065)	-0.090 (0.054)	-0.086 (0.055)	-0.090 (0.055)	-0.090 (0.058)	-0.032 (0.065)	-0.050 (0.067)	-0.022 (0.062)	
Entry X Goderich X Loyal x Q1 2014 (=1)	0.047 (0.075)	0.049 (0.076)	0.124 (0.081)	0.045 (0.075)	0.048 (0.075)	0.044 (0.076)	0.041 (0.079)	0.114 (0.080)	0.099 (0.082)	0.123 (0.075)	
Entry X Goderich X Loyal x Q2 2014 (=1)	0.200*** (0.069)	0.202*** (0.070)	0.282*** (0.071)	0.198*** (0.069)	0.201*** (0.069)	0.197*** (0.069)	0.198*** (0.074)	0.269*** (0.070)	0.251*** (0.072)	0.276*** (0.069)	
Entry X Relationship Years		0.004 (0.004)	0.029* (0.017)							0.033** (0.017)	
Relationship Years		0.000 (0.000)	0.000 (0.000)							0.000 (0.000)	
Entry X Relationship Years ²			-0.002 (0.001)							-0.003* (0.001)	
Relationship Years ²			0.000 (0.000)							0.000 (0.000)	
Entry X Close Friend (=1)				0.010 (0.035)						0.018 (0.037)	
Close Friend (=1)				-0.031 (0.065)						-0.050 (0.063)	
Entry X Coethnic (=1)					0.005 (0.028)					-0.016 (0.029)	
Coethnic (=1)					-0.015 (0.064)					-0.041 (0.063)	
Entry X More Ice (=1)						-0.016 (0.027)				-0.008 (0.026)	
Entry X Order Size							-0.044*** (0.015)			-0.054*** (0.017)	
Entry X Fishing Assets (\$1000)								-0.002 (0.001)		-0.001 (0.001)	
Entry X Risk Tolerance									-0.056 (0.067)	-0.044 (0.063)	
Time Period					All Months						
Mean Dep Var	0.158	0.158	0.157	0.158	0.158	0.158	0.159	0.157	0.158	0.158	
# Firms	154	154	152	154	154	154	142	148	148	137	
# Observations	5280	5280	4931	5280	5280	5280	5196	4878	4840	4721	
R-Squared	0.11	0.11	0.12	0.11	0.11	0.11	0.12	0.12	0.12	0.12	
Weather Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Month FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Retailer FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	

Notes: See Table 2, Table 5 and Table B2 notes. *** p<0.01, ** p<0.05, * p<0.1.