

Borders, varieties and distribution costs: Evidence
from a US-Canada retail chain

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A Additional Figures and Tables (Online Appendix)

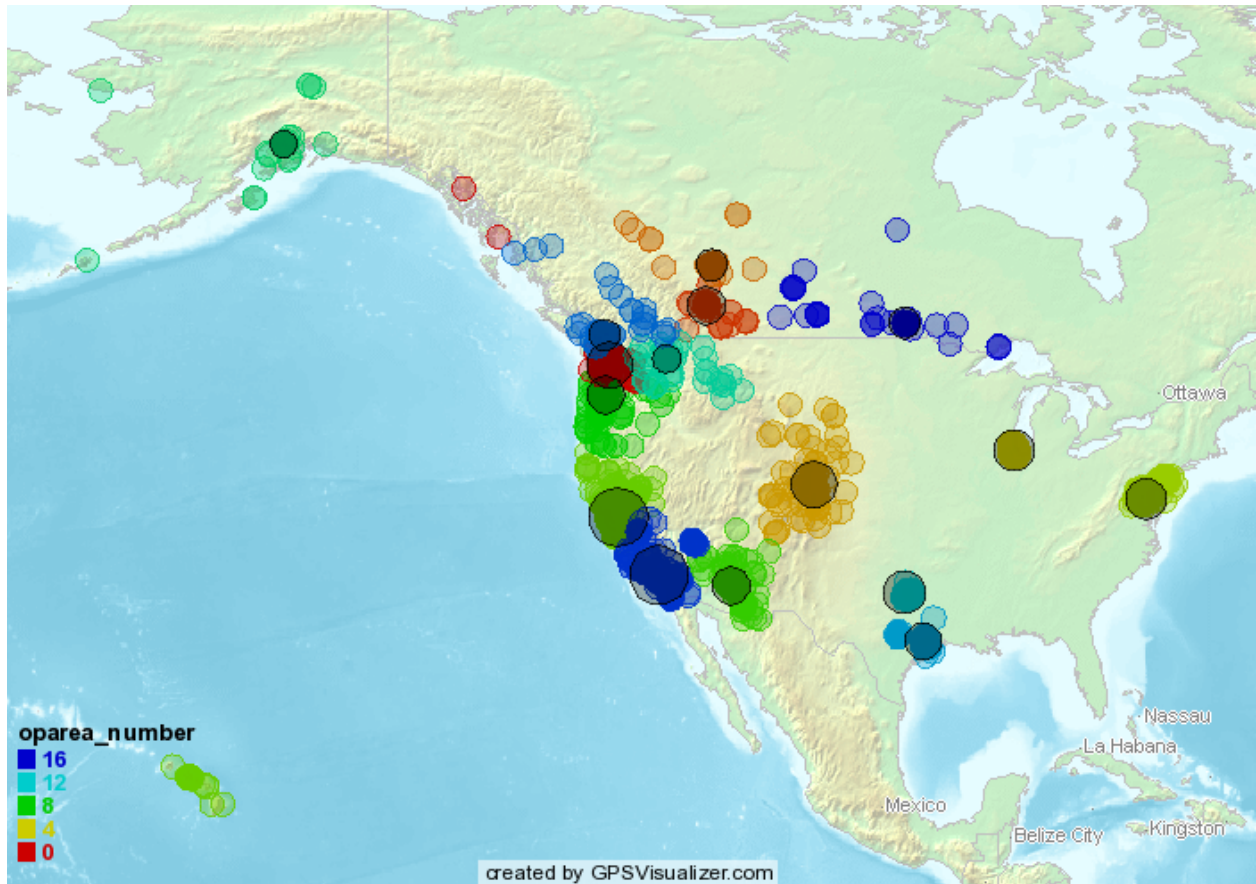


Figure 1: Retailer store locations in North America. Large circles indicate distribution centers.

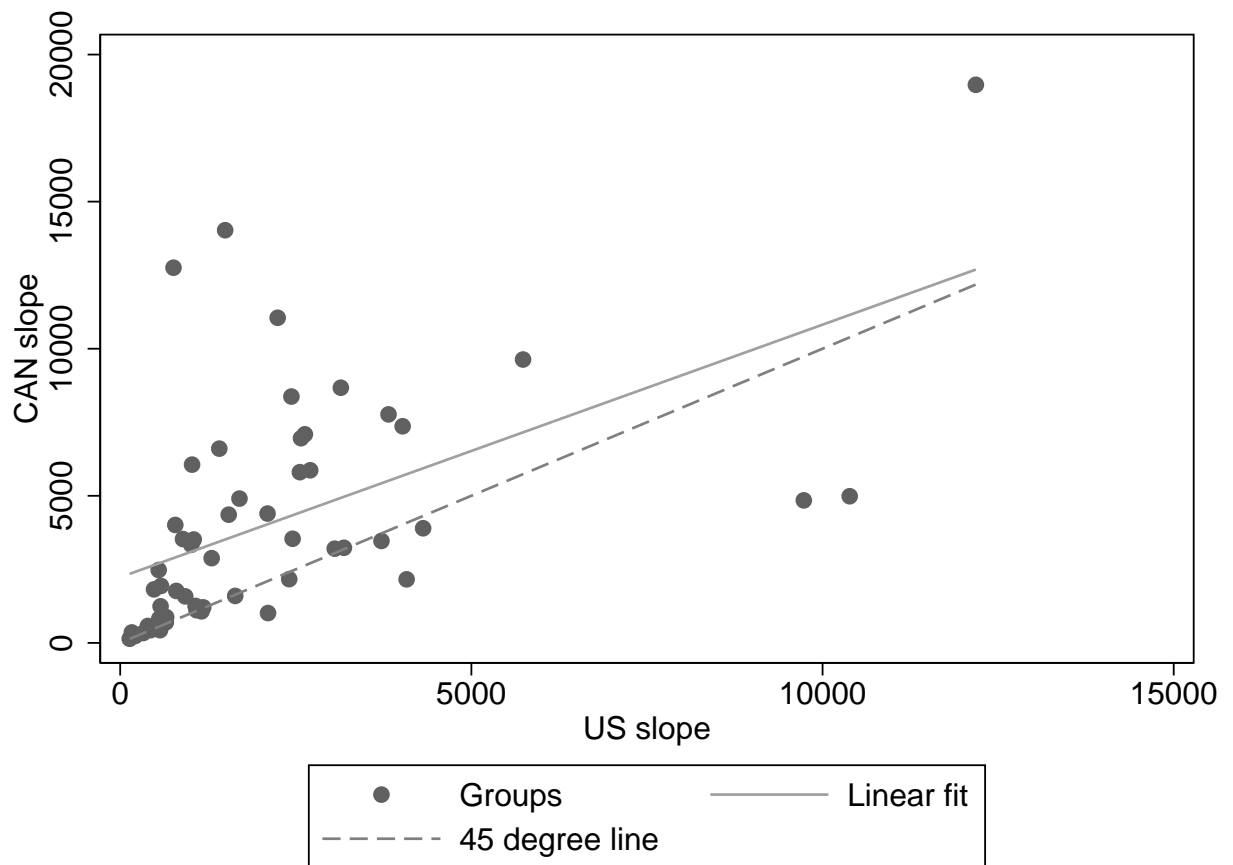


Figure 2: Group level distribution cost estimates (cross-sectional store revenue versus store UPC)

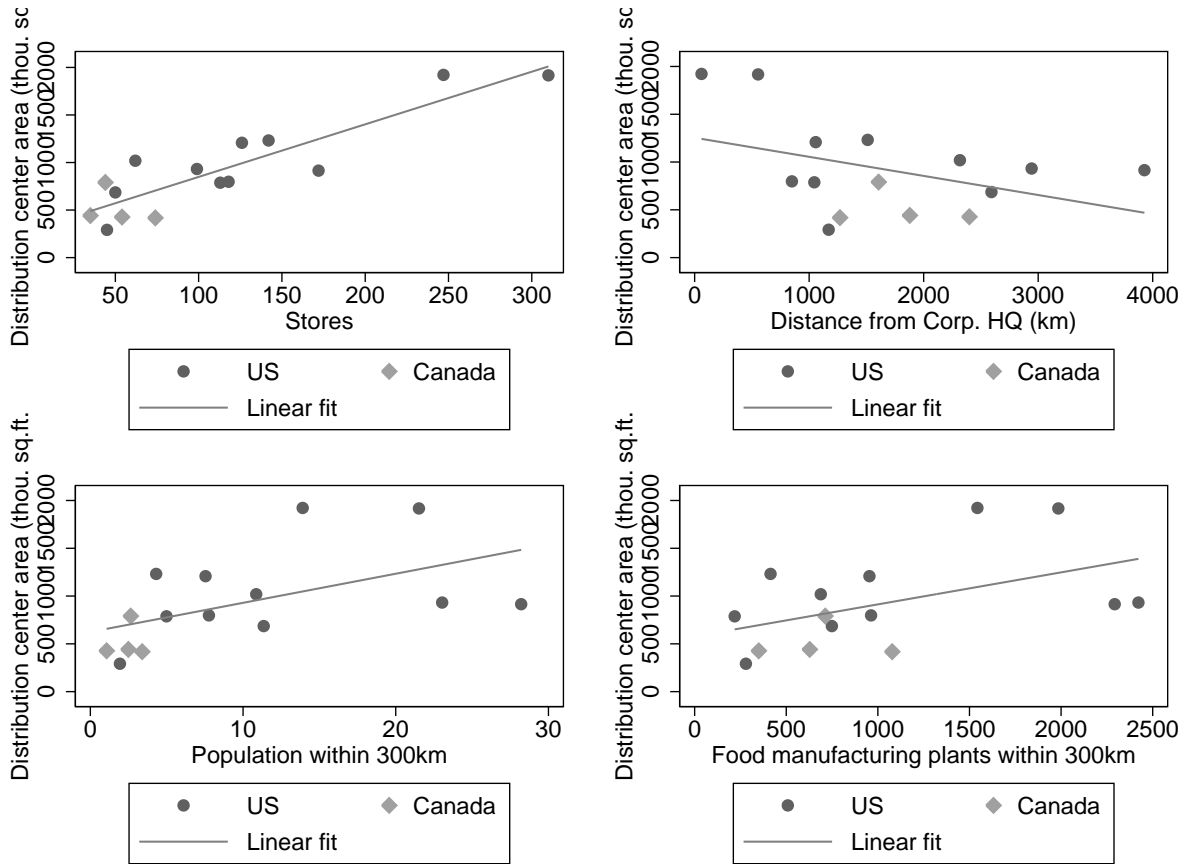


Figure 3: Correlates of distribution center area

Table 1: CAN-US UPC gap by product group

	Share of sample revenue	Total unique UPCs	Can-US UPC gap	Can-US firm gap
	(1)	(2)	(3)	(4)
CANNED FISH AND MEAT	0.005	582	-0.110	0.071
BATTERIES	0.002	79	-0.012	-0.323
SHELF STABLE JUICES AND DRINKS	0.013	964	0.000	0.346
DESSERT AND BAKING MIXES	0.004	344	0.031	0.398
HOUSEHOLD CLEANERS	0.013	1743	0.084	0.154
HAIR CARE	0.003	1003	0.088	0.830
JAMS, JELLIES AND SPREADS	0.006	858	0.113	0.366
TOBACCO AND SMOKING NEEDS	0.018	1454	0.114	-0.480
SALTY SNACKS	0.020	1617	0.124	0.610
ENHANCEMENTS	0.005	905	0.158	0.480
CANDY, GUM AND MINTS	0.011	2595	0.171	0.467
DETERGENTS AND LAUNDRY NEEDS	0.016	1084	0.181	-0.020
SHORTENING, COOKING OILS AND SPRAYS	0.004	423	0.185	0.341
REFRIGERATED DAIRY	0.066	2117	0.191	0.071
PHARMACEUTICALS	0.002	365	0.209	0.600
CANNED FRUITS	0.002	190	0.262	0.263
SKIN CARE	0.002	268	0.263	0.255
CSD,NEW AGE,MIXERS,BOTTLED WATER,ISOTONICS	0.059	3543	0.283	0.791
FLOUR/SUGAR/CORN MEAL	0.002	104	0.285	0.216
DIET FOODS AND NEEDS/ETHNIC AND GOURMET SPECIALTY	0.002	2468	0.317	0.286
COOKIES/CRACKERS AND MISC SNACKS	0.019	2051	0.341	0.860
PICKLES,PEPPERS, RELISH AND MARINATED VEGETABLES	0.003	739	0.363	0.620
FROZEN BREAKFAST ITEMS	0.003	224	0.381	1.426
HOUSEWARES	0.004	289	0.381	-0.121
PASTA AND PASTA SAUCE	0.009	1567	0.385	0.757
ORAL HYGIENE	0.004	700	0.404	0.073
SOUPS	0.012	1076	0.414	0.610
SALT/SEASONING/SPICES/CANNING SUPPLIES	0.003	1016	0.425	0.382
REFRIGERATED JUICE AND DRINKS	0.012	347	0.426	0.797
CHEESE	0.026	1012	0.432	0.564
RICE AND BEANS	0.007	987	0.447	0.510
CEREAL AND BREAKFAST	0.032	1775	0.448	0.716
FROZEN VEGETABLES	0.008	761	0.454	0.949
COFFEE/TEA/HOT COCOA/CREAM/FILTERS	0.016	2489	0.470	0.512
PAPER	0.023	950	0.490	0.519
BABY FOOD/DIAPERS/BABY CARE	0.006	821	0.512	0.131
COMMERCIAL FRESH BREAD	0.026	2675	0.515	0.760
MAYONNAISE, SALAD DRESSINGS AND TOPPINGS	0.007	931	0.525	0.820
CANNED VEGETABLES	0.003	420	0.574	0.541
PET FOOD AND PET NEEDS	0.013	1897	0.619	0.248
READY TO EAT PREPARED FOODS	0.002	367	0.621	0.971
SYRUPS AND PANCAKE/WAFFLE MIX	0.002	239	0.621	0.576
REFRIGERATED FOODS	0.026	944	0.660	0.595
ICE CREAM	0.023	1760	0.835	0.669
HEALTH SUPPLEMENTS	0.003	1011	1.164	1.121
HISPANIC	0.006	897	1.214	1.421
COMMERCIAL SWEET BAKED GOODS	0.004	734	1.237	-0.193
PREPARED FROZEN FOODS	0.031	2454	1.241	0.909

Table 2: International store revenue differences and market size. Dependent variable is Log store revenue for 2005 in 2005 US dollars. Each observation is a sample store.

	(1)	(2)	(3)	(4)	(5)	(6)
Canada	-0.054 (0.078)	-0.014 (0.063)	-0.017 (0.064)	0.056 (0.076)	0.084 (0.072)	0.781*** (0.123)
Pop. < 5km		0.034 (0.020)	0.065** (0.030)		-0.014 (0.052)	-0.056 (0.041)
Mean inc. < 5km		0.191* (0.105)	0.167 (0.105)		-0.008 (0.140)	-0.255** (0.097)
Grocery stores < 5km			-0.037 (0.026)		-0.022 (0.043)	0.026 (0.029)
Pop < 25km				0.143* (0.075)	0.151 (0.119)	0.031 (0.123)
Mean inc. < 25km				0.158 (0.167)	0.159 (0.200)	0.206 (0.190)
Grocery stores < 25km				-0.097 (0.073)	-0.077 (0.105)	0.023 (0.103)
Store UPCs						2.348*** (0.219)
Observations	308	308	308	308	308	308
Adj R-squared	0.000347	0.0380	0.0375	0.0488	0.0432	0.443

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses clustered by operating area.

Table 3: Estimates of marginal variety distribution costs based on regressing store variable profits on store variety (equation 6). Dependent variable is store variable profits for common groups.

Estimation	OLS (1)	OLS (2)	OLS (3)	IV (4)	Panel (5)	Panel (6)	IV-Panel ^a (7)
Variety	-27.8 (144.998)	162.5 (121.549)	-1.3 (361.697)	96.2 (181.591)	1,483.6** (635.453)	-3,595.2 (3,398.382)	0.2 (0.099)
Variety x Canada	774.1*** (164.204)	582.8*** (148.941)	1,077.0** (385.922)	657.3*** (159.313)	-1,042.5 (647.140)	3,972.8 (3,402.449)	
Canada	-9,222,446.4*** (2676609.104)	-19454755.2 (17711316.711)	-12990711.8* (6300836.814)				19,985.2** (8,954.172)
Pop. < 5km		5,403.6 (254,466.663)		2,326.4 (246,553.663)			158.6 (127.591)
Mean inc. < 5km		-589,250.8 (464,345.991)		-471,967.1 (540,023.600)			-185.5 (478.879)
Grocery stores < 5km		189,946.8 (225,884.000)		149,318.0 (217,367.124)			-294.7 (200.117)
Food man. plants < 5km		-271,890.8 (249,478.380)		-230,448.8 (270,524.699)			78.4 (120.680)
House prices		516,057.5 (316,295.272)		443,764.1 (262,842.140)			153.0 (509.926)
Common good price		3,249,461.8 (11902159.273)		4,505,777.0 (10987558.382)			16,427.7*** (3,332.170)
Common good price x Can.		12,285,486.2 (12323745.860)		11,094,379.0 (11359302.667)			-19,152.1*** (6,338.276)
Observations	308	308	78	308	918	220	616
Operating area FE	No	Yes	No	Yes	No	No	No
Store FE	No	No	No	No	Yes	Yes	No
Country-year FE	No	No	No	No	Yes	Yes	Yes
Adj R-squared	0.138	0.486	0.514	0.484	0.619	0.607	0.627
First-stage F				15.92			65.48

*** p<0.01, ** p<0.05, * p<0.10. Standard errors clustered by operating area in parentheses. All control variables are in logs. Columns 1 through 4 use UPCs and variable profits (in 2005 USD) sold in the store during 2005. Columns 4 and 7 use year of store opening (and for column 4, year of store opening x Canada) as instruments, with first-stage Kleibergen-Paap F statistics reported. Columns 5 and 6 use an unbalanced 3 year panel for 2004-2006. ^a: Column 7 uses the annual change in variable profit/annual change in UPCs as the dependent variable, so the Canada dummy directly measures differences in the slope and “variety” measures changes in the slope with respect to the initial number of UPCs.

Table 4: Revenue and year of store opening

Dep. variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log(store revenue 2005 USD)				Year opened		
Year open	0.011*** (0.002)	0.001 (0.001)	0.012*** (0.002)	0.001 (0.002)			
House price			0.104 (0.071)	0.144* (0.069)		-3.210** (1.209)	-5.122*** (1.402)
Pop < 5km			0.066 (0.056)	0.008 (0.033)		3.273*** (0.768)	2.121** (0.748)
Mean inc. < 5km			0.018 (0.092)	0.001 (0.064)		2.027 (1.662)	2.727 (1.809)
Grocery stores < 5km			-0.047** (0.021)	0.025 (0.023)		-4.586*** (0.651)	-4.146*** (0.731)
Food man. plants < 5km			0.028 (0.044)	0.012 (0.031)		-0.144 (0.615)	0.446 (0.594)
Distance to distr. center			0.061 (0.114)	0.173 (0.111)		-7.037 (5.258)	-6.961 (4.779)
Sell area		0.529*** (0.068)		0.693*** (0.074)			
Canada					-3.771* (2.055)	-1.053 (1.655)	
Distance to Corp. HQ					1.246*** (0.317)	0.461** (0.177)	
Observations	308	308	308	308	1,690	1,689	1,689
Operating area FE	No	No	Yes	Yes	No	No	Yes
Adj R-squared	0.119	0.262	0.205	0.407	0.0205	0.0960	0.121

*** p<0.01, ** p<0.05, * p<0.10. Standard errors in parentheses clustered by operating area.