E-Companion to "Inventory Productivity and Carbon Emissions in Retailing" by Nikolay Osadchiy

EC.1. Supplementary Tables

Table EC.1 Relationship between high quality indicator (scope specific) and instrumented component of AIT.

	HighQS-AllS	HighQS-S1	HighQS-S2	HighQS-S3	HighQS-S3PGS	HighQS-S3W
$\widehat{\ln AIT}$	0.9576	0.5018	0.4025	0.5399	0.0908	-0.4478
	(0.5851)	(0.3667)	(0.2575)	(0.5547)	(0.2861)	(0.2999)
$\widehat{Scale}$	-1.0433	-0.4646*	-0.2048	-0.0099	0.4071	0.0753
	(0.9167)	(0.2657)	(0.2894)	(0.5024)	(0.3222)	(0.2253)
ln(Asset)	0.5066***	0.1341	0.1639**	0.1120	-0.0809	-0.0618
	(0.1627)	(0.0851)	(0.0778)	(0.1249)	(0.0863)	(0.0473)
Liquidity	-0.1427	0.0154	-0.0228	-0.1222*	-0.0580	0.0311
	(0.1277)	(0.0809)	(0.0775)	(0.0680)	(0.0382)	(0.0441)
Est. flag	-0.6025***	-1.0101***	-0.8809***	-0.7426***	-0.9085***	-0.9323***
	(0.1635)	(0.0664)	(0.0959)	(0.0693)	(0.0417)	(0.0385)
Inv. Mills	0.4028	0.0555	0.0577	0.0551	-0.2440*	0.0760
	(0.3274)	(0.1075)	(0.1013)	(0.1444)	(0.1342)	(0.0657)
Observations	3,488	3,488	3,488	2,474	2,470	2,462
# firms	230	230	230	219	219	219

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table EC.2 Stability in Scope 3 reported category counts. Firm FE included.

	S3 Category count	S3 Category count	S3 Category count
$\ln AIT$	-0.0372		0.0001
	(0.1271)		(0.1379)
Year		0.0446	0.0446
		(0.0355)	(0.0361)
Constant	8.0264***	-82.1065	-82.1082
	(0.0007)	(71.6380)	(72.9422)
Observations	2,522	2,522	2,522
R-squared	0.0000	0.0039	0.0039
Number of firms	227	227	227

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table EC.3 Estimate on the subsamples by CDP quality scores.

	AllS	S1	S2	S3	S3PGS	S3W
CDP Quality Score $[1,6)$*, Direct effect specification*						
$\widehat{\ln AIT}$	1.6738	-11.3307	-6.5140	2.7381	12.2792	11.8115*
	(2.3904)	(32.2389)	(5.6319)	(3.0319)	(25.1137)	(6.2920)
$\widehat{\text{Scale}}$	1.9546	10.8178	2.8680	0.8748	-10.4091	-1.4645
	(2.8628)	(36.8014)	(5.9392)	(3.7073)	(27.2696)	(7.0933)
CDP Quality Score $[1,6)$*, Combined channel specification*						
$\widehat{\ln AIT}$	2.9998***	-2.1187**	-4.0230***	3.1838**	3.0369*	10.9024**
	(1.1164)	(0.9156)	(1.4229)	(1.2557)	(1.5863)	(4.7691)
Observations	2,056	2,175	2,260	2,064	2,065	1,842
# firms	212	203	200	213	212	201
CDP Quality Score $[6,7]$						
$\widehat{\ln AIT}$	1.9700	-0.5737	-5.2972***	2.1792	1.2870	0.9941
	(3.3390)	(1.0350)	(2.0046)	(2.7321)	(1.9328)	(3.0605)
$\widehat{\text{Scale}}$	0.0933	0.5499	-0.8799	0.2987	0.4867	0.0777
	(2.1034)	(0.6130)	(1.0524)	(1.5494)	(2.1022)	(2.1092)
Observations	410	1,312	1,208	410	405	620
# firms	51	90	78	51	49	57

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Notes. On the quality score $[1,6)$ subsample, the instruments do not provide sufficient independent variation to *separately* identify the direct effects of AIT and scale. That should not be interpreted as evidence of a different economic relationship. The combined channel specification produces the results that are similar to the baseline and behaves better because it imposes a weaker rank requirement.

Table EC.4 Estimates on the overlapping windows of CDP Quality scores.

	AllS	S1	S2	S3	S3PGS	S3W
Baseline (Table 10)						
$\widehat{\ln AIT}$	3.5784***	-0.9687	-3.2803***	3.8966***	5.5177***	6.2092**
	(1.2008)	(1.2232)	(1.2617)	(1.3196)	(1.9674)	(2.5979)
$\widehat{\text{Scale}}$	0.0718	1.4813	1.3583	-0.0967	-0.4804	-0.5865
	(1.3855)	(0.9081)	(1.0735)	(1.6319)	(2.5052)	(2.2867)
CDP Quality Score $[1,4]$						
$\widehat{\ln AIT}$	10.8359	-10.0864*	-2.7729	11.8246	8.6474	15.3137*
	(10.9154)	(5.6783)	(1.8363)	(11.8949)	(7.3835)	(9.2925)
$\widehat{\text{Scale}}$	-9.6109	8.4171	-0.6071	-10.4111	-5.3691	-4.0465
	(10.4550)	(6.1781)	(1.6062)	(11.3860)	(7.0528)	(9.2497)
Observations	1,657	1,950	1,791	1,665	1,912	1,822
# firms	186	196	191	187	210	201
CDP Quality Score $[2,5]$						
$\widehat{\ln AIT}$	-0.6634	9.0420	-4.0669	1.1477	13.0012	4.9810
	(5.7484)	(48.5402)	(3.3808)	(8.2768)	(28.8682)	(4.0592)
$\widehat{\text{Scale}}$	4.1375	-10.0880	0.0644	2.3898	-11.2918	-0.8660
	(5.8264)	(48.1022)	(3.0455)	(8.6438)	(30.4664)	(3.5846)
Observations	1,863	1,350	1,774	1,871	2,034	1,513
# firms	201	174	181	202	212	199
CDP Quality Score $[3,6]$						
$\widehat{\ln AIT}$	1.1410	5.2442	-3.7928	1.9053	12.5270	4.5974
	(2.2118)	(151.7864)	(2.4775)	(2.6641)	(27.4191)	(3.4330)
$\widehat{\text{Scale}}$	2.2210	-7.2579	-0.3439	1.6890	-9.0777	-1.1277
	(2.3712)	(162.0526)	(1.9407)	(2.9159)	(25.8624)	(3.4122)
Observations	2,046	1,331	1,451	2,054	1,970	1,505
# firms	214	171	176	215	208	198
CDP Quality Score $[3,7]$						
$\widehat{\ln AIT}$	3.5523***	-0.5890	-3.4812**	3.8509***	5.4086***	1.3777
	(1.2092)	(1.3762)	(1.4675)	(1.3170)	(2.0111)	(2.2868)
$\widehat{\text{Scale}}$	0.0201	1.5730	1.3455	-0.1624	-0.0191	-1.6591
	(1.4054)	(1.0573)	(1.1033)	(1.6493)	(2.4767)	(1.6501)
Observations	2,415	2,635	2,639	2,423	2,375	2,125
# firms	218	205	205	219	218	218
CDP Quality Score $[4,7]$						
$\widehat{\ln AIT}$	4.1854	-0.4024	-3.2246**	4.5973	6.5445**	1.2153
	(2.6012)	(1.2241)	(1.4488)	(3.0314)	(2.6399)	(2.1908)
$\widehat{\text{Scale}}$	-0.6424	1.3350	1.0891	-0.7951	-2.0164	-1.2856
	(1.4915)	(0.8200)	(1.1629)	(1.7421)	(3.1624)	(1.4447)
Observations	1,820	2,409	2,395	1,824	2,134	1,989
# firms	209	187	194	210	217	215
CDP Quality Score $[5,7]$						
$\widehat{\ln AIT}$	6.0039	0.7304	-2.4600	7.3008	1.1665	0.9029
	(5.3376)	(1.2541)	(1.9335)	(6.3952)	(2.7001)	(2.8244)
$\widehat{\text{Scale}}$	1.2867	1.0504	2.4609***	1.8399	-0.2894	0.1580
	(2.7511)	(0.8373)	(0.9200)	(3.3724)	(1.9223)	(2.0959)
Observations	623	1,538	1,677	623	558	640
# firms	61	104	139	61	82	59

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table EC.5 Piecewise linear specification with an AIT slope differential at the 75th percentile.

	AllScopes	S1	S2	S3	S3PGS	S3W
$\widehat{\ln AIT}$	2.6587*	-1.4188	-1.0748	2.8399*	2.8617	8.9498**
	(1.5074)	(1.6750)	(1.5290)	(1.6529)	(1.8726)	(4.5139)
$\widehat{\ln AIT_{high}}$	1.4297	-0.1641	-17.5019	1.2035	9.1842	-22.0468
	(4.2300)	(6.0141)	(12.0048)	(4.4992)	(7.6129)	(17.3077)
$\widehat{\text{Scale}}$	-0.8735*	0.9886	0.3847	-1.1428**	-1.7447**	1.0168
	(0.5279)	(0.9148)	(0.7722)	(0.4948)	(0.8585)	(2.3181)
ln(Asset)	0.4395*	-0.0235	-0.5053**	0.5069*	0.7628	-0.1283
	(0.2399)	(0.2402)	(0.2470)	(0.2667)	(0.4735)	(0.6058)
Liquidity	-0.2331	-0.2560	-0.0632	-0.2261	-0.0649	-0.2016
	(0.2130)	(0.2848)	(0.2673)	(0.2412)	(0.3253)	(0.6195)
Est. flag	Y	Y	Y	Y	Y	Y
Inv. Mills	0.4124	0.1346	-0.1256	0.4863*	0.6768*	-0.2247
	(0.2604)	(0.4265)	(0.4180)	(0.2882)	(0.4033)	(0.6734)
Observations	2,466	3,488	3,468	2,474	2,470	2,458
# firms	218	230	229	219	219	219

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table EC.6 First stage results using the disaster instrument with an additional exclusion of: (i) disasters affecting suppliers within 1000 km from the retailers' headquarters, or (ii) disasters in the retailers' home country.

	(i) Within 1000 km excluded		(ii) Same country excluded	
	lnAIT	Scale	lnAIT	Scale
Interest rate	0.0319***	-0.0078	0.0307**	-0.0091
	(0.0119)	(0.0170)	(0.0119)	(0.0171)
Covid1 restrictions (early)	-0.0109	-0.0950***	-0.0123	-0.0967***
	(0.0184)	(0.0246)	(0.0186)	(0.0248)
Covid2 restrictions (late)	0.0397**	-0.0537*	0.0394**	-0.0542*
	(0.0180)	(0.0300)	(0.0182)	(0.0301)
Persons affected	0.0053**	0.0052*	0.0033	0.0044
	(0.0026)	(0.0029)	(0.0024)	(0.0037)
ln(Asset)	-0.1129***	0.1636**	-0.1134***	0.1627**
	(0.0433)	(0.0828)	(0.0433)	(0.0827)
Liquidity	0.0776**	0.1366**	0.0777**	0.1365**
	(0.0335)	(0.0549)	(0.0336)	(0.0550)
Inv. Mills	-0.0782	0.0845	-0.0808	0.0800
	(0.0613)	(0.1012)	(0.0619)	(0.1010)
Observations	3,488	3,488	3,488	3,488
Number of firms	230	230	230	230
F-test excl. instr., p	0.0008	0.0007	0.0022	0.0010
SW underid. test, p	0.0004	0.0021	0.0008	0.0017

Robust standard errors clustered by firm in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table EC.7 IV 2 stage GMM estimates of the direct effect of AIT on carbon intensity (2nd stage), using the disaster instrument with an additional exclusion of: (i) disasters affecting suppliers within 1000 km from the retailers' headquarters, or (ii) disasters in the retailers' home country.

	AllS	S1	S2	S3	S3PGS	S3W
	(i) Within 1000 km excluded					
$\widehat{\ln AIT}$	3.5772***	-0.5725	-3.9823***	3.8897***	5.7089***	7.2398**
	(1.2652)	(1.2770)	(1.4788)	(1.3887)	(2.0638)	(2.8911)
$\widehat{\text{Scale}}$	-0.0737	1.6209*	1.2302	-0.1809	-0.5217	0.2914
	(1.3808)	(0.9526)	(1.1521)	(1.6106)	(2.3832)	(2.5969)
ln(Asset)	0.5424	-0.0055	-0.6280**	0.6355*	0.8419	0.4817
	(0.3339)	(0.2525)	(0.2737)	(0.3784)	(0.5802)	(0.4796)
Liquidity	-0.3461*	-0.4168	0.1394	-0.3724	-0.4421	-0.0354
	(0.2007)	(0.2720)	(0.2625)	(0.2322)	(0.3065)	(0.4512)
Inv. Mills	0.2725	0.0262	-0.4594	0.3277	0.4085	0.1501
	(0.3834)	(0.3833)	(0.4091)	(0.4425)	(0.6261)	(0.6580)
Anderson-Rubin, p	0.0000	0.0629	0.0000	0.0000	0.0003	0.0007
Kleibergen-Paap, p	0.0051	0.0012	0.0027	0.0048	0.0070	0.0273
Hansen-J, p	0.2340	0.2944	0.5631	0.3225	0.3274	0.0689
	(ii) Same country excluded					
$\widehat{\ln AIT}$	3.5587***	-0.2929	-4.4266***	3.8514***	5.8074***	7.5759**
	(1.2713)	(1.3567)	(1.6436)	(1.3799)	(2.1019)	(3.1883)
$\widehat{\text{Scale}}$	-0.2342	1.7705*	1.0382	-0.4466	-0.9100	0.3495
	(1.3949)	(1.0003)	(1.2431)	(1.5826)	(2.4205)	(2.9955)
ln(Asset)	0.5490	0.0103	-0.6534**	0.6530*	0.8906	0.5171
	(0.3381)	(0.2668)	(0.2860)	(0.3786)	(0.5878)	(0.5155)
Liquidity	-0.3373	-0.4822*	0.2137	-0.3561	-0.4267	-0.0910
	(0.2053)	(0.2744)	(0.2946)	(0.2341)	(0.3214)	(0.5240)
Inv. Mills	0.3266	0.0375	-0.4636	0.4056	0.5142	0.1574
	(0.3822)	(0.3966)	(0.4268)	(0.4318)	(0.6318)	(0.7253)
Anderson-Rubin, p	0.0000	0.0277	0.0000	0.0000	0.0003	0.0007
Kleibergen-Paap, p	0.0122	0.0020	0.0081	0.0120	0.0087	0.0719
Hansen-J, p	0.1801	0.2069	0.8043	0.2520	0.2752	0.1087
Observations	2,466	3,488	3,468	2,474	2,470	2,462
# firms	218	230	229	219	219	219

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1