

Appendix

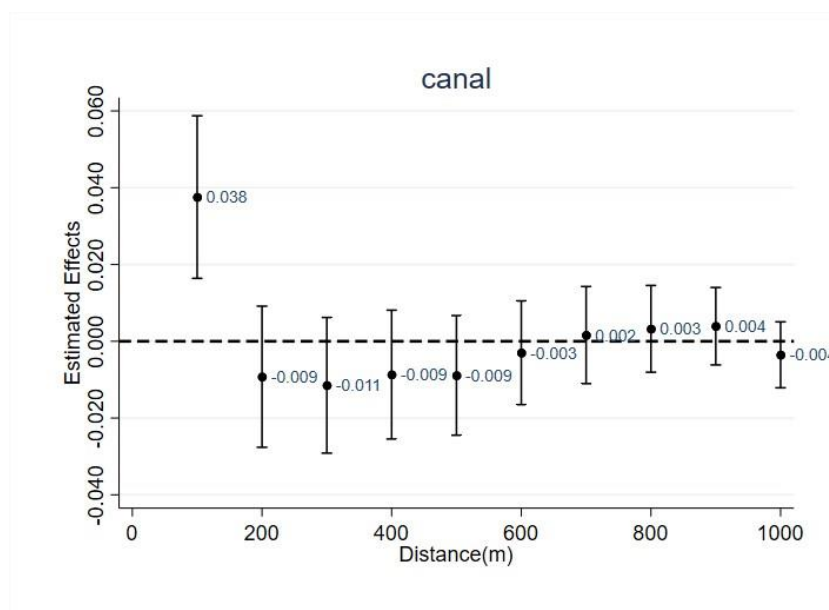


(a)

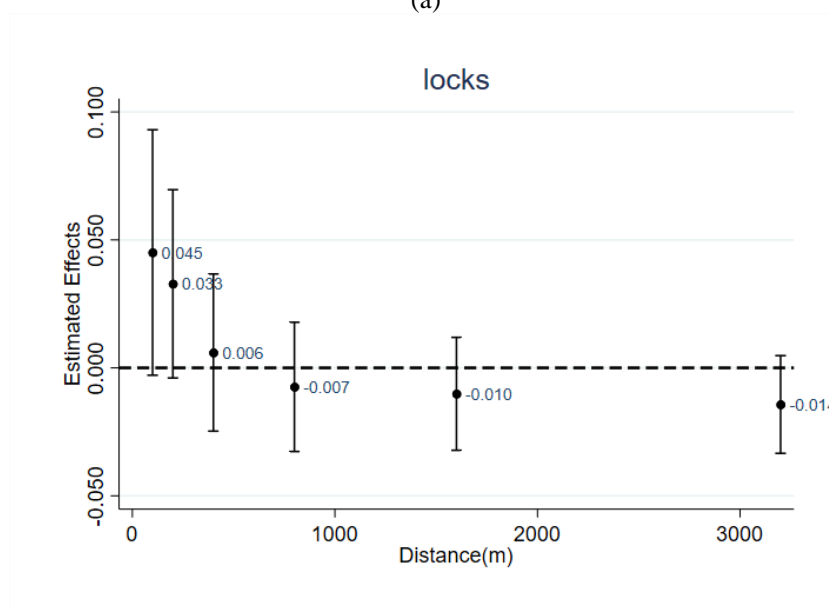


(b)

Figure A1: Droitwich canals before and after restoration



(a)



(b)

Figure A2: Effects of proximity to (a) Canals & (b) Locks on house prices

Note: These figures plots the estimated effects for proximity to (a) Canals and (b) Locks on house prices. The set of control variables includes house structure, location, land cover, employment characteristics, LADs \times Years \times Quarters fixed effects and MSOA fixed effects. Refer to Table A1 in Data Appendix for detailed description of the control variables. Standard errors are clustered at MSOA level. Tails denote 95% confidence intervals. Lock effects significant at 10% level from 0-200m. These regressions also control for distance to wharves and aqueducts, where no significant effects were found. Distance scale for locks differs from canals, because sample is restricted to 1500m from canals, but not 1500m from locks.

Table A1: Definitions of variables used and the respective data sources

Variable	Source	Definition
<i>Dependent Variable</i>		
Ln Price	Land Registry	Natural Log of Transacted House Price
<i>Structure</i>		
Floor area (m2)	Land Registry	Size of transacted unit
Number rooms	Land Registry	Number of rooms in transacted unit
Number heated rms	Land Registry	Number of heated rooms in transacted unit
Fireplace	Land Registry	Binary variable =1 if transacted unit has a fireplace, = 0 otherwise
Energy efficiency	Land Registry	Overall Energy Efficiency (scaled from 1-100)
Leasehold	Land Registry	Binary variable =1 if transacted unit is leasehold, = 0 otherwise
Tenure missing	Land Registry	Binary variable =1 if tenure variable is missing, = 0 otherwise
New	Land Registry	Binary variable =1 if transacted unit is new build, = 0 otherwise
Terraced	Land Registry	Binary variable =1 if transacted unit is terrace house, = 0 otherwise
Flat	Land Registry	Binary variable =1 if transacted unit is flat, = 0 otherwise
Semi-detached	Land Registry	Binary variable =1 if transacted unit is semi-detached, = 0 otherwise
<i>Land cover</i>		
Arable	Ordnance Survey	Binary variable =1 if the centroid of the postcode is on arable land, = 0 otherwise
Freshwater	Ordnance Survey	Binary variable =1 if the centroid of the postcode is on freshwater, = 0 otherwise
Improved grass	Ordnance Survey	Binary variable =1 if the centroid of the postcode is on improved grassland, = 0 otherwise
Urban	Ordnance Survey	Binary variable =1 if the centroid of the postcode is urban land, = 0 otherwise
Heather, bog, rock	Ordnance Survey	Binary variable =1 if the centroid of the postcode is on heather, bog or rock land, = 0 otherwise
Grassland	Ordnance Survey	Binary variable =1 if the centroid of the postcode is on grassland, = 0 otherwise
Sediment/marsh	Ordnance Survey	Binary variable =1 if the centroid of the postcode is on sediment or marsh land, = 0 otherwise
Woodland	Ordnance Survey	Binary variable =1 if the centroid of the postcode is on woodland, = 0 otherwise
Distance to greenspace	UCL	Euclidean distance from the nearest green space
Green area	UCL	Size of nearest green space
Other river		
100m	Ordnance Survey	Binary variable =1 if the distance to the nearest other river is below 100m, = 0 otherwise
200m	Ordnance Survey	Binary variable =1 if the distance to the nearest other river is between 100m and 200m, = 0 otherwise
400m	Ordnance Survey	Binary variable =1 if the distance to the nearest other river is between 200m and 400m, = 0 otherwise
800m	Ordnance Survey	Binary variable =1 if the distance to the nearest other river is

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Variable	Source	Definition
		between 400m and 800m, = 0 otherwise
1600m	Ordnance Survey	Binary variable =1 if the distance to the nearest other river is between 800m and 1600m, = 0 otherwise
3200m	Ordnance Survey	Binary variable =1 if the distance to the nearest other river is between 1600m and 3200m, = 0 otherwise
<i>Other distances (km)</i>		
Dist lakes	Ordnance Survey	Euclidean distance from the nearest lake
Lakes >10km	Ordnance Survey	Binary variable =1 if the distance to the nearest lake is above 10km, = 0 otherwise
Dist docks	Canal Trust	Euclidean distance from the nearest dock
Docks > 10km	Canal Trust	Binary variable =1 if the distance to the nearest dock is above 10km, = 0 otherwise
Dist bridges	Canal Trust	Euclidean distance from the nearest bridge
Bridges > 10km	Canal Trust	Binary variable =1 if the distance to the nearest bridge is above 10km, =0 otherwise
Dist embankments	Canal Trust	Euclidean distance from the nearest embankment
Embankments > 10km	Canal Trust	Binary variable =1 if the distance to the nearest embankment is above 10km, = 0 otherwise
Dist reservoirs	Canal Trust	Euclidean distance from the nearest reservoir
Reservoirs > 10km	Canal Trust	Binary variable =1 if the distance to the nearest reservoir is above 10km, = 0 otherwise
Dist rapid rail	Ordnance Survey	Euclidean distance from the nearest rapid rail line
Rapid rail > 10km	Ordnance Survey	Binary variable =1 if the distance to the nearest rapid rail lines above 10km, = 0 otherwise
Dist railways	Ordnance Survey	Euclidean distance from the nearest railway
Railways > 10km	Ordnance Survey	Binary variable =1 if the distance to the nearest railway is above 10km, = 0 otherwise
Dist town centre	UCL	Euclidean distance from the nearest town centre
Town centre > 10km	UCL	Binary variable =1 if the distance to the nearest town centre is above 10km, = 0 otherwise
Dist rail stations	Ordnance Survey	Euclidean distance from the nearest rail station
Rail stations > 10km	Ordnance Survey	Binary variable =1 if the distance to the nearest rail station is above 10km, = 0 otherwise
Dist rapid rail stat.	Ordnance Survey	Euclidean distance from the nearest rapid rail station
Rapid rail stat > 10km	Ordnance Survey	Binary variable =1 if the distance to the nearest rapid rail station is above 10km, = 0 otherwise
Dist outfall	Canal Trust	Euclidean distance from the nearest outfall
Outfall > 10km	Canal Trust	Binary variable =1 if the distance to the nearest outfall is above 10km, = 0 otherwise
<i>Employment</i>		
Total employment (1000s)	Nomis	Number of employment in thousands
No employment	Nomis	Number of unemployed

Table A1: Definitions of variables used and the respective data sources

Variable	Source	Definition
Agriculture share	Nomis	Share of employment in agriculture in LSOA
Mining utilities share	Nomis	Share of employment in mining utilities share in LSOA
Manufacturing share	Nomis	Share of employment in manufacturing in LSOA
Construction share	Nomis	Share of employment in construction in LSOA
Motor industry share	Nomis	Share of employment in motor industry in LSOA
Wholesale share	Nomis	Share of employment in wholesale in LSOA
Retail share	Nomis	Share of employment in retail in LSOA
Transport share	Nomis	Share of employment in transport in LSOA
Accom/food share	Nomis	Share of employment in accommodation and food services in LSOA
Financial services share	Nomis	Share of employment in financial service in LSOA
Property services share	Nomis	Share of employment in property service in LSOA
Prof, science, tech share	Nomis	Share of employment in professional, science and technical activities in LSOA
Business admin share	Nomis	Share of employment in business administration in LSOA
Public admin share	Nomis	Share of employment in public administration in LSOA
Education share	Nomis	Share of employment in education in LSOA
Health share	Nomis	Share of employment in health in LSOA
Arts entertainment share	Nomis	Share of employment in arts, entertainment and recreation in LSOA
IT share	Nomis	Share of employment in information and communication in LSOA
<i>Demographics</i>		
No education share	Census 2001	Share of residents with no education qualifications
No car share	Census 2001	Share of households without cars
Unemployment rate	Census 2001	Share of unemployed for the economically active
Lone parent household share	Census 2001	Share of single parent households
Non EU residents share	Census 2001	Share of non-EU residents
Social renters share	Census 2001	Share of households who are social renters
Owners share	Census 2001	Share of households who are property owners
Non-white share	Census 2001	Share of non-white residents
Population	Census 2001	Population size
Population density	Census 2001	Population size per unit area

Table A2: Descriptive statistics for the England and Wales sample

	0-100 metres		100-1000 metres		1000-1500 metres	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
<i>Dependent Variable</i>						
Natural log of price	11.867	0.618	11.815	0.673	11.886	0.667
Price	175685.1	236664.8	173885.9	245630.6	187898.7	273691.9
<i>House Structure Controls</i>						
Price per metre squared	2313.448	3251.735	2111.266	13422.470	2231.633	3303.369
Size(sq.m)	79.684	39.543	86.250	40.247	87.285	42.968
No.of Rooms	4.036	1.569	4.465	1.535	4.504	1.565
Fireplace	0.115	0.308	0.149	0.344	0.149	0.345
Energy Efficiency	64.070	13.801	59.564	13.157	59.870	12.827
Freehold	0.545	0.498	0.740	0.438	0.748	0.434
New Built	0.169	0.375	0.066	0.248	0.061	0.239
Terrace House	0.306	0.461	0.381	0.486	0.351	0.477
Flats	0.368	0.482	0.165	0.371	0.166	0.372
Semi-Detached	0.194	0.395	0.292	0.455	0.307	0.461
<i>Location Controls</i>						
Distance to rail (m)	785.977	1071.971	941.253	1135.310	1128.576	1167.526
Distance to town centre (m)	1582.133	1640.985	1665.240	1655.186	1653.508	1583.840
Distance to rail station (m)	1626.303	1800.961	1808.862	1870.892	1934.246	1835.618
Other river 100m	0.192	0.394	115577	0.065	0.246	1168074
Other river 200-100m	0.202	0.401	115577	0.096	0.295	1168074
Other river 200-400m	0.220	0.414	115577	0.219	0.414	1168074
Other river 400-800m	0.238	0.426	115577	0.370	0.483	1168074
Other river 800-1600m	0.120	0.325	115577	0.210	0.407	1168074
Other river 1600-3200m	0.027	0.163	115577	0.037	0.190	1168074
Arable	0.003	0.052	0.003	0.054	0.003	0.057
Freshwater	0.002	0.043	0.000	0.022	0.001	0.029
Improved grass	0.018	0.131	0.021	0.143	0.024	0.153
Suburban	0.516	0.500	0.653	0.476	0.686	0.464
Urban	0.448	0.497	0.317	0.465	0.280	0.449
Heather bog rock	0.000	0.000	0.000	0.004	0.000	0.004
Grassland	0.001	0.034	0.001	0.031	0.001	0.032
Sediment marsh	0.000	0.005	0.000	0.009	0.000	0.010
Woodland	0.012	0.110	0.005	0.071	0.005	0.070
Distance to green space	191.093	184.947	172.989	137.552	176.873	141.505
Area of nearest green space (m ²)	58174.780	262329.900	76117.790	574594.600	64821.440	346820.000
<i>Employment Controls</i>						
Total employment	1655.350	3172.158	1144.229	2852.941	1038.609	3386.612
No employment	0.000	0.013	0.001	0.027	0.002	0.046
Non-farm agriculture	0.002	0.012	0.001	0.011	0.001	0.009
Mining & utilities	0.010	0.038	0.008	0.037	0.007	0.035
Manufacturing	0.095	0.136	0.086	0.142	0.065	0.128
Construction	0.067	0.079	0.077	0.101	0.080	0.106
Motor	0.023	0.040	0.023	0.051	0.020	0.045

Table A2: Descriptive statistics for the England and Wales sample

	0-100 metres		100-1000 metres		1000-1500 metres	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
Wholesale	0.047	0.069	0.041	0.075	0.036	0.073
Retail	0.107	0.121	0.101	0.125	0.100	0.132
Transport	0.046	0.087	0.046	0.093	0.039	0.093
Accommodation & food	0.083	0.094	0.075	0.096	0.070	0.095
Financial and insurance	0.019	0.057	0.013	0.052	0.013	0.052
Property	0.018	0.040	0.015	0.040	0.016	0.040
Prof science technical	0.079	0.088	0.077	0.096	0.081	0.099
Communications	0.036	0.051	0.034	0.065	0.035	0.063
Business admin	0.077	0.113	0.068	0.101	0.068	0.104
Public admin	0.024	0.072	0.021	0.071	0.021	0.077
Education	0.094	0.161	0.126	0.188	0.141	0.205
Health	0.117	0.145	0.134	0.173	0.147	0.185
Arts and entertainment	0.055	0.080	0.053	0.078	0.056	0.084
<i>Neighbourhood Controls</i>						
Low qualifications	0.275	0.133	0.296	0.130	0.289	0.128
Households no car	0.287	0.180	0.278	0.170	0.267	0.171
Unemployment Rate	0.055	0.047	0.055	0.044	0.052	0.042
Lone Parent HH	0.061	0.051	0.064	0.048	0.063	0.049
Non-EU Residents	0.078	0.099	0.071	0.098	0.077	0.102
Social Renters	0.155	0.193	0.146	0.184	0.143	0.184
Property Owners	0.679	0.247	0.724	0.222	0.738	0.219
Non-white Residents	0.112	0.168	0.106	0.164	0.109	0.162
Population	291.622	76.550	301.933	71.815	304.437	68.526
Pop Density	34.705	36.889	52.758	52.610	56.005	67.125

Table A3: Descriptive statistics for the Droitwich sample

	(a) 0-100 m Droit.		(b) 100-1000m Droit		(c) 1000-1500m Droit		(d)<1500m W & Birm.	
	Mean	s.d.	Mean	s.d	Mean	s.d.	Mean	s.d.
Natural log of price	11.928	0.475	11.954	0.485	12.265	0.456	11.932	0.449
Price	173564.9	130386.2	178095.9	150709.7	234656	111832	169158.4	123812.6
Price per m2	1984.42	804.16	2027.83	1223.39	2202.61	1010.34	2021.58	1890.03
Size(m2)	91.318	49.206	91.606	46.269	112.179	57.611	87.863	40.671
No. of Rooms	4.525	1.699	4.623	1.703	5.495	1.843	4.579	1.66
Fireplace	0.068	0.233	0.112	0.307	0.17	0.366	0.169	0.366
Energy Efficiency	63.88	12.284	62.91	12.152	59.219	11.578	58.935	13.478
Freehold	0.744	0.437	0.775	0.417	0.871	0.336	0.809	0.393
New Built	0.034	0.18	0.064	0.245	0.026	0.16	0.056	0.23
Terrace House	0.388	0.488	0.287	0.453	0.082	0.275	0.309	0.462
Flats	0.176	0.381	0.211	0.408	0.043	0.202	0.171	0.377
Semi-Detached	0.147	0.355	0.256	0.437	0.307	0.461	0.307	0.461
Low qualifications	0.325	0.072	0.307	0.119	0.199	0.077	0.251	0.111
Households no car	0.223	0.138	0.222	0.139	0.078	0.058	0.215	0.144
Unemployment Rate	0.05	0.029	0.041	0.033	0.029	0.013	0.038	0.029
Lone Parent HH	0.04	0.033	0.056	0.047	0.035	0.028	0.05	0.036
Non-EU Residents	0.019	0.02	0.026	0.032	0.02	0.011	0.035	0.033
Social Renters	0.146	0.138	0.209	0.198	0.037	0.08	0.099	0.154
Property Owners	0.743	0.146	0.724	0.188	0.918	0.093	0.774	0.193
Non-white	0.013	0.008	0.012	0.013	0.015	0.013	0.04	0.061
Population	275	66.561	282.672	55.054	304.461	43.953	291.599	53.937
Pop Density	24.128	18.375	38.827	25.857	35.302	18.31	45.577	26.077
Observations	387		310		2047		20427	

Note: Means and standard deviations are reported for three distance groups related to the Droitwich canal (<100m, 100-1000m and 1000-1500m) and for the overall sample for the Worcester and Birmingham control group (<1500m from the Worcester and Birmingham canal).

Table A4: Robustness to price effects for new build homes

	(1)	(2)	(3)	(4)	(5)
Distance to canal					
<= 100 meters	0.0469*** (0.0072)	0.0501*** (0.0073)	0.0218*** (0.0058)	0.0249*** (0.0058)	0.0245*** (0.0056)
<= 100 meters × New	0.0659*** (0.0176)		0.0525*** (0.0168)	0.0352** (0.0160)	0.0398*** (0.0142)
<= 100 meters × Urban			0.0649*** (0.0162)	0.0602*** (0.0160)	0.0612*** (0.0162)
New × Urban				0.0820*** (0.0109)	0.0829*** (0.0110)
<= 100 meters × New × Urban					-0.0078 (0.0285)
Observations	2048723	1901466	2048723	2048723	2048723
R-squared	0.78	0.78	0.78	0.78	0.78
Absolute Price Change (Non New)	11275.58	12093.00	5186.04	5924.15	5818.91
Absolute Price Change (New)	28061.37		18139.17	14540.93	15585.62
Absolute Price Change (Urban)			21287.82	20854.80	21020.16
Absolute Price Change (Urban New)					29334.48

Note: Dependent variable is the natural logarithm of transacted house prices. In Column (1), we allow the canal premium to vary for new builds. In Column (2), we remove any new builds in our analysis. In Column (3), we allow the canal premium to vary between new builds and urban area. In Column (4), we include the interaction of new build × urban area to partial out the price premium for new build properties in urban area. In Column (5), we further include the three-way interaction of <= 100 meters from canal × new build × urban area. Specification controls for structural characteristics, distances to other water features, rail and town centres, land cover categories, employment variables at LSOA level, MSOA fixed effects, LAD × year × quarter fixed effects. See Table A1 for the exact list of variables included for each set of controls. Absolute price change is calculated by multiplying the average transacted prices on the estimated premium (main effect plus interaction effect) for properties within 100 meters from canal. Average transacted price for regression sample is £234,908. Standard errors are clustered at LSOA level. *, **, *** denotes significance level at 10%, 5% and 1% respectively.

Table A5: Estimated effects of Droitwich Canal restoration on house prices

	(1)	(2)	(3)
Distance to canal			
<= 100 meters	0.1131*** (0.0412)	-0.0708** (0.0333)	0.0728* (0.0394)
101 to 200 meters	0.0023 (0.0225)	0.0269 (0.0270)	0.0167 (0.0227)
201 to 300 meters	-0.0145 (0.0331)	-0.0597* (0.0309)	-0.0533 (0.0345)
301 to 400 meters	0.0046 (0.0359)	0.0026 (0.0390)	0.0060 (0.0385)
401 to 500 meters	0.0153 (0.0291)	-0.0041 (0.0330)	0.0121 (0.0271)
501 to 600 meters	0.0335 (0.0288)	0.0152 (0.0316)	0.0426* (0.0228)
601 to 700 meters	0.0246 (0.0430)	0.0182 (0.0352)	0.0388 (0.0393)
701 to 800 meters	0.0220 (0.0341)	0.0289 (0.0276)	0.0404 (0.0305)
801 to 900 meters	-0.0006 (0.0398)	0.0185 (0.0344)	0.0090 (0.0395)
901 to 1000 meters	-0.0018 (0.0450)	0.0909 (0.0575)	0.0574 (0.0366)
Observations	25792	25792	25792
Mean House Prices	200736.44	200736.44	200736.44

Note: This table summarises the effects of Droitwich Canal restoration on house prices across distance at 100 meters distance bands. Dependent variable is natural logarithm of transacted house prices. Corresponding regression results are reported in Figure 9. Column (1) presents the effects from the restoration date in 2007 till 2011 before the Droitwich Canal is reopened. Column (2) presents the effects after the Droitwich Canal is reopened after 2011. Column (3) presents the effects from the restoration date in 2007 till 2011 before the Droitwich Canal is reopened without controlling for re-opening effects. All regressions control for house structure controls, neighbourhood controls interacted with post intervention indicator, and postcode fixed effects. Standard errors are clustered at post-code level. *, **, *** denotes significance level at 10%, 5% and 1% respectively.