# The Decline of British Manufacturing, 1973-2012: the Role of Total Factor Productivity

# Online appendix

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## A. Production function estimates by industry

Table U.1

*(Weighted) Long-run system-GMM estimates of production function, 1973-2012: High-tech manufacturing*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | SIC 257 | SIC 33 | SIC 344 | SIC 364 | SIC 37 |
| *ln* Intermediate Inputs | 0.510 | 0.471 | 0.565 | 0.714 | 0.635 |
|  | *2.776* | *3.037* | *4.545* | *7.097* | *5.211* |
| *ln* Employment | 0.431 | 0.359 | 0.393 | 0.192 | 0.396 |
|  | 2.363 | 2.707 | 3.252 | 1.827 | 3.143 |
| *ln* Capital | 0.337 | 0.314 | 0.156 | 0.125 | 0.193 |
|  | *1.709* | *2.199* | *1.775* | *2.479* | *2.626* |
| Time | 0.012 | 0.067 | 0.018 | -0.001 | 0.002 |
|  | *1.303* | *6.684* | *2.215* | *-0.213* | *0.332* |
| *ln* Age | -0.493 | -0.312 | -0.226 | -0.180 | -0.316 |
|  | *-1.666* | *-1.936* | *-1.899* | *-2.748* | *-3.240* |
| Single-Plant Enterprise | -0.056 | -0.084 | -0.079 | 0.076 | -0.102 |
|  | *-0.723* | *-0.742* | *-2.164* | *1.320* | *-1.856* |
| Multi-SIC | -0.241 | -0.157 | -0.080 | -0.028 | -0.114 |
|  | *-1.757* | *-1.967* | *-2.668* | *-0.625* | *-3.032* |
| Multi-Region Enterprise | -0.016 | 0.030 | 0.130 | -0.045 | 0.087 |
|  | *-0.185* | *0.359* | *3.488* | *-1.187* | *2.934* |
| Greenfield US-Owned | 0.333 | -0.086 | 0.108 | -0.045 | -0.042 |
|  | *1.853* | *-0.739* | *2.164* | *-0.630* | *-0.590* |
| Brownfield US-Owned | 0.336 | -0.463 | -0.172 | -0.057 | 0.007 |
|  | *0.907* | *-1.286* | *-1.130* | *-0.863* | *0.079* |
| Greenfield EU-Owned | 0.230 | -0.104 | 0.020 | 0.114 | -0.008 |
|  | *1.123* | *-0.952* | *0.274* | *1.357* | *-0.086* |
| Brownfield EU-Owned | 0.427 | -0.498 | 0.066 | 0.006 | 0.030 |
|  | *1.681* | *-1.746* | *0.501* | *0.053* | *0.181* |
| Greenfield Other Foreign-Owned | 0.172 | -0.254 | -0.117 | 0.018 | 0.013 |
|  | *0.665* | *-1.270* | *-0.810* | *0.271* | *0.127* |
| Brownfield Other Foreign-Owned | 0.017 | -0.762 | -0.224 | 0.105 | -0.126 |
|  | *0.070* | *-1.868* | *-1.755* | *0.560* | *-1.718* |
| *ln* Agglomeration | -0.116 | 0.021 | -0.021 | 0.012 | -0.041 |
|  | *-1.353* | *0.506* | *-1.699* | *0.457* | *-1.720* |
| *ln* Diversification | 0.258 | -0.048 | -0.051 | -0.073 | 0.097 |
|  | *1.235* | *-0.603* | *-1.262* | *-1.771* | *1.872* |
| *ln* Herfindahl Index | -0.145 | -0.273 | -0.023 | -0.030 | -0.081 |
|  | *-1.274* | *-3.775* | *-0.914* | *-0.635* | *-6.337* |
| Assisted Area | -0.001 | -0.011 | 0.018 | -0.013 | 0.026 |
|  | *-0.006* | *-0.189* | *0.741* | *-0.447* | *1.130* |
| Main Cities | 0.049 | 0.021 | 0.109 | 0.031 | 0.129 |
|  | *0.370* | *0.292* | *2.177* | *0.715* | *2.530* |
| North-East | 0.354 | 0.160 | -0.132 | 0.070 | -0.047 |
|  | *1.771* | *1.318* | *-2.909* | *1.446* | *-0.952* |
| Yorkshire-Humberside | 0.247 | 0.092 | -0.022 | -0.013 | -0.052 |
|  | *1.473* | *1.266* | *-0.693* | *-0.213* | *-1.486* |
| North-West | 0.366 | 0.146 | -0.007 | 0.032 | -0.004 |
|  | *1.255* | *2.092* | *-0.229* | *0.408* | *-0.107* |
| West Midlands | 0.185 | 0.295 | -0.115 | -0.088 | -0.085 |
|  | *0.821* | *1.712* | *-1.809* | *-0.782* | *-1.167* |
| East Midlands | 0.292 | 0.310 | -0.033 | -0.058 | -0.048 |
|  | *1.418* | *3.233* | *-0.767* | *-1.205* | *-1.064* |
| South-West | 0.278 | 0.184 | 0.013 | -0.043 | 0.002 |
|  | *1.129* | *1.659* | *0.312* | *-0.705* | *0.045* |
| East | 0.170 | 0.110 | 0.019 | -0.037 | -0.010 |
|  | *0.959* | *1.493* | *0.435* | *-0.560* | *-0.258* |
| London | 0.730 | -0.108 | -0.090 | -0.049 | 0.018 |
|  | *1.425* | *-0.972* | *-1.467* | *-0.603* | *0.397* |
| Scotland | 0.528 | 0.184 | -0.079 | -0.045 | -0.031 |
|  | *1.231* | *2.372* | *-1.644* | *-0.947* | *-0.709* |
| Wales | 0.201 | 0.212 | 0.030 | -0.073 | -0.005 |
|  | *0.883* | *2.377* | *0.493* | *-1.439* | *-0.092* |
| Dummy 1980-82 | -0.029 | -0.168 | -0.007 | -0.045 | -0.013 |
|  | *-0.448* | *-2.157* | *-0.301* | *-1.557* | *-0.391* |
| Dummy 1990-92 | 0.016 | -0.116 | -0.083 | 0.027 | 0.023 |
|  | *0.395* | *-3.340* | *-3.711* | *1.116* | *1.282* |
| Dummy 2008-12 | 0.110 | 0.146 | 0.465 | -0.014 | 0.106 |
|  | *0.659* | *1.027* | *3.359* | *-0.236* | *1.851* |
| Intercept | -0.670 | -2.018 | -0.638 | 0.627 | -0.013 |
|  | *-0.651* | *-2.702* | *-1.046* | *1.298* | *-0.014* |
|  |  |  |  |  |  |
| AR(1) z-statistic p-value | 0.006 | 0.009 | 0.000 | 0.000 | 0.004 |
| AR(2) z-statistic p-value | 0.860 | 0.197 | 0.937 | 0.314 | 0.657 |
| Hansen test p-value | 0.462 | 0.938 | 0.217 | 0.113 | 0.122 |
| RTS (returns-to-scale) | 0.278 | 0.145 | 0.114 | 0.032 | 0.224 |
|  | *2.391* | *1.765* | *2.314* | *0.795* | *3.493* |
| Observations | 5,825 | 4,400 | 17,328 | 8,927 | 11,039 |
| Number of plants | 907 | 1,219 | 3,360 | 1,654 | 2,427 |

*z*-values in italics. Industries are based on 1980 SIC

Table U.2

*(Weighted) Long-run system-GMM estimates of production function, 1973-2012: Medium high-tech manufacturing*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | SIC 25 rest | SIC 26 | SIC 32 | SIC 35 |
| *ln* Intermediate Inputs | 0.819 | 0.553 | 0.452 | 0.713 |
|  | *4.718* | *5.828* | *3.837* | *6.954* |
| *ln* Employment | 0.165 | 0.437 | 0.458 | 0.169 |
|  | 0.876 | 4.139 | 4.085 | 1.663 |
| *ln* Capital | 0.271 | 0.112 | 0.202 | 0.114 |
|  | *2.841* | *1.773* | *3.617* | *2.466* |
| Time | 0.001 | 0.036 | 0.011 | 0.005 |
|  | *0.124* | *4.384* | *2.745* | *0.939* |
| *ln* Age | -0.379 | -0.250 | -0.306 | -0.116 |
|  | *-2.730* | *-1.897* | *-4.272* | *-2.439* |
| Single-Plant Enterprise | -0.054 | -0.132 | 0.006 | 0.029 |
|  | *-0.862* | *-0.682* | *0.362* | *0.999* |
| Multi-SIC | -0.053 | 0.173 | -0.030 | -0.025 |
|  | *-1.545* | *0.959* | *-2.685* | *-0.854* |
| Multi-Region Enterprise | 0.037 | -0.118 | 0.039 | -0.035 |
|  | *0.588* | *-0.566* | *1.322* | *-1.147* |
| Greenfield US-Owned | 0.314 | -1.348 | 0.111 | 0.003 |
|  | *3.252* | *-4.151* | *3.380* | *0.036* |
| Brownfield US-Owned | 0.020 | -0.131 | 0.182 | -0.108 |
|  | *0.201* | *-0.371* | *2.563* | *-0.516* |
| Greenfield EU-Owned | 0.160 | 0.227 | 0.121 | 0.014 |
|  | *2.193* | *1.648* | *2.345* | *0.175* |
| Brownfield EU-Owned | -0.018 | -0.462 | 0.184 | -0.010 |
|  | *-0.243* | *-0.805* | *1.678* | *-0.098* |
| Greenfield Other Foreign-Owned | 0.286 |  | 0.037 | -0.071 |
|  | *2.681* |  | *0.374* | *-0.916* |
| Brownfield Other Foreign-Owned | 0.351 | 0.945 | 0.091 | 0.060 |
|  | *1.911* | *0.883* | *1.916* | *0.665* |
| *ln* Agglomeration | -0.090 | 0.101 | 0.028 | 0.034 |
|  | *-2.134* | *3.196* | *2.123* | *1.680* |
| *ln* Diversification | 0.208 | -0.045 | -0.003 | 0.000 |
|  | *2.171* | *-0.330* | *-0.179* | *0.010* |
| *ln* Herfindahl Index | -0.143 | 0.228 | -0.014 | 0.014 |
|  | *-3.046* | *2.153* | *-1.026* | *0.419* |
| Assisted Area | 0.046 | 0.139 | -0.005 | -0.004 |
|  | *1.484* | *1.628* | *-0.536* | *-0.260* |
| Main Cities | 0.019 | -0.082 | 0.010 | -0.032 |
|  | *0.545* | *-0.964* | *0.643* | *-1.172* |
| North-East | 0.089 | -0.189 | -0.046 | 0.005 |
|  | *0.974* | *-0.980* | *-3.020* | *0.224* |
| Yorkshire-Humberside | 0.172 | 0.096 | -0.001 | 0.035 |
|  | *1.376* | *0.342* | *-0.068* | *1.046* |
| North-West | 0.097 | 0.577 | 0.006 | 0.058 |
|  | *0.988* | *2.859* | *0.347* | *1.009* |
| West Midlands | 0.044 | -0.347 | -0.058 | -0.028 |
|  | *0.388* | *-1.355* | *-2.564* | *-0.657* |
| East Midlands | -0.028 | 0.194 | -0.043 | 0.007 |
|  | *-0.311* | *1.031* | *-2.487* | *0.213* |
| South-West | 0.074 | 0.050 | -0.040 | 0.082 |
|  | *0.752* | *0.299* | *-1.925* | *2.467* |
| East | 0.158 | 0.077 | -0.018 | 0.037 |
|  | *1.319* | *0.526* | *-1.214* | *1.412* |
| London | 0.015 | 0.007 | -0.043 | 0.022 |
|  | *0.145* | *0.032* | *-2.040* | *0.332* |
| Scotland | 0.103 | 0.204 | -0.047 | -0.038 |
|  | *1.022* | *1.074* | *-2.410* | *-0.950* |
| Wales | 0.083 | 0.003 | -0.105 | 0.013 |
|  | *0.765* | *0.018* | *-3.385* | *0.465* |
| Dummy 1980-82 | 0.027 | 0.047 | -0.142 | -0.079 |
|  | *0.556* | *1.153* | *-4.012* | *-5.594* |
| Dummy 1990-92 | 0.014 | 0.226 | 0.000 | -0.055 |
|  | *0.624* | *4.228* | *-0.027* | *-2.211* |
| Dummy 2008-12 | 0.273 | -0.309 | 0.060 | 0.077 |
|  | *2.191* | *-1.822* | *1.680* | *0.898* |
| Intercept | 0.448 | -1.051 | -0.310 | 0.402 |
|  | *0.600* | *-1.770* | *-0.707* | *1.004* |
|  |  |  |  |  |
| AR(1) z-statistic p-value | 0.000 | 0.005 | 0.000 | 0.000 |
| AR(2) z-statistic p-value | 0.738 | 0.976 | 0.441 | 0.166 |
| Hansen test p-value | 0.333 | 0.851 | 0.306 | 0.153 |
| RTS | 0.255 | 0.101 | 0.112 | -0.004 |
|  | 3.461 | 1.119 | 6.364 | -0.086 |
| Observations | 34,796 | 888 | 74,044 | 19,263 |
| Number of plants | 6,854 | 123 | 16,067 | 3,245 |

*z*-values in italics. Industries are based on 1980 SIC

Table U.3

*(Weighted) Long-run system-GMM estimates of production function, 1973-2012: Medium low-tech manufacturing*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | SIC 22 | SIC 23 | SIC 24 | SIC 31 | SIC 341-3 | SIC 345-8 | SIC 36 rest | SIC 48 |
| *ln* Intermediate Inputs | 0.763 | 0.688 | 0.473 | 0.528 | 0.528 | 0.650 | 0.439 | 0.481 |
| *9.417* | *4.970* | *8.283* | *6.905* | *6.881* | *4.747* | *2.996* | *5.686* |
| *ln* Employment | 0.277 | 0.299 | 0.346 | 0.443 | 0.465 | 0.282 | 0.414 | 0.472 |
| 3.318 | 2.003 | 5.566 | 5.259 | 6.757 | 1.693 | 2.788 | 5.208 |
| *ln* Capital | 0.123 | 0.196 | 0.192 | 0.185 | 0.065 | 0.197 | 0.055 | 0.159 |
| *3.109* | *1.381* | *3.740* | *2.937* | *2.149* | *2.162* | *1.777* | *5.186* |
| Time | 0.015 | -0.001 | 0.013 | 0.012 | 0.006 | 0.022 | 0.004 | 0.013 |
| *3.847* | *-0.098* | *4.746* | *3.012* | *1.826* | *3.726* | *0.942* | *4.820* |
| *ln* Age | -0.254 | -0.301 | -0.214 | -0.325 | -0.146 | -0.317 | -0.103 | -0.234 |
| *-4.754* | *-1.437* | *-3.387* | *-3.740* | *-3.603* | *-2.392* | *-1.977* | *-6.443* |
| Single-Plant Enterprise | -0.040 | -0.168 | 0.062 | -0.066 | 0.019 | -0.112 | 0.100 | -0.012 |
| *-0.919* | *-1.798* | *1.544* | *-2.334* | *0.690* | *-1.554* | *2.189* | *-0.637* |
| Multi-SIC | -0.064 | 0.053 | 0.030 | -0.118 | -0.023 | -0.196 | 0.123 | -0.038 |
| *-2.331* | *1.116* | *1.003* | *-4.022* | *-1.311* | *-2.162* | *2.827* | *-3.253* |
| Multi-Region Enterprise | -0.031 | 0.011 | 0.147 | 0.091 | 0.097 | -0.075 | -0.095 | 0.059 |
| *-0.626* | *0.167* | *5.565* | *2.171* | *4.946* | *-2.465* | *-2.369* | *2.162* |
| Greenfield US-Owned | 0.142 |  | 0.243 | 0.009 | -0.052 | -0.032 | 0.112 | 0.095 |
| *1.929* |  | *2.900* | *0.132* | *-2.087* | *-0.293* | *0.835* | *2.625* |
| Brownfield US-Owned | -0.049 | -1.223 | -0.069 | -0.176 | 0.057 | -0.072 | 0.237 | -0.060 |
| *-0.179* | *-0.548* | *-0.480* | *-1.805* | *1.090* | *-0.194* | *1.765* | *-0.819* |
| Greenfield EU-Owned | -0.254 | -0.070 | -0.034 | 0.025 | 0.030 | -0.432 | 0.344 | 0.105 |
| *-3.584* | *-0.583* | *-1.129* | *0.370* | *0.659* | *-2.313* | *3.955* | *1.681* |
| Brownfield EU-Owned | -0.226 | -0.211 | -0.258 | 0.153 | 0.287 | -0.167 | 0.974 | -0.053 |
| *-2.134* | *-0.730* | *-6.917* | *0.707* | *3.596* | *-0.645* | *3.494* | *-0.681* |
| Greenfield Other Foreign-Owned | -0.151 | -0.327 | 0.093 | 0.012 | -0.267 | -0.299 | 0.357 | 0.036 |
| *-1.916* | *-4.336* | *2.581* | *0.061* | *-3.607* | *-1.082* | *2.428* | *0.535* |
| Brownfield Other Foreign-Owned | -0.064 |  | -0.488 | -0.425 | -0.805 | -0.224 | 0.567 | 0.019 |
| *-0.498* |  | *-3.670* | *-1.741* | *-1.690* | *-1.269* | *3.452* | *0.180* |
| *ln* Agglomeration | -0.024 | -0.042 | 0.052 | -0.006 | 0.017 | 0.065 | 0.167 | 0.029 |
| *-1.440* | *-1.762* | *3.658* | *-0.461* | *1.189* | *2.664* | *5.102* | *2.175* |
| *ln* Diversification | 0.039 | 0.069 | -0.070 | 0.042 | 0.000 | -0.023 | -0.119 | -0.011 |
| *0.851* | *1.150* | *-2.989* | *0.922* | *-0.006* | *-0.251* | *-2.166* | *-0.490* |
| *ln* Herfindahl Index | -0.097 | -0.070 | 0.089 | -0.012 | -0.023 | -0.081 | 0.007 | 0.001 |
| *-4.898* | *-1.365* | *3.810* | *-1.124* | *-1.727* | *-1.490* | *0.330* | *0.077* |
| Assisted Area | -0.030 | -0.044 | 0.030 | -0.007 | 0.024 | 0.056 | 0.025 | 0.004 |
| *-1.435* | *-1.035* | *3.141* | *-0.491* | *1.697* | *1.042* | *0.760* | *0.327* |
| Main Cities | 0.076 | 0.060 | 0.019 | 0.017 | 0.006 | 0.148 | 0.003 | -0.025 |
| *1.831* | *0.844* | *1.285* | *0.654* | *0.283* | *2.079* | *0.053* | *-0.998* |
| North-East | 0.028 | 0.178 | -0.036 | -0.075 | -0.028 | 0.016 | -0.122 | -0.024 |
| *0.259* | *2.998* | *-1.440* | *-1.838* | *-1.076* | *0.200* | *-2.104* | *-1.188* |
| Yorkshire-Humberside | -0.080 | 0.253 | 0.038 | -0.033 | 0.008 | 0.018 | 0.080 | -0.006 |
| *-1.494* | *3.235* | *1.481* | *-0.950* | *0.212* | *0.265* | *1.166* | *-0.314* |
| North-West | 0.048 | 0.224 | 0.081 | -0.045 | 0.010 | 0.160 | -0.002 | 0.028 |
| *0.918* | *2.177* | *2.939* | *-1.237* | *0.496* | *2.254* | *-0.015* | *1.219* |
| West Midlands | -0.058 | -0.416 | -0.016 | -0.028 | -0.030 | -0.072 | -0.079 | -0.069 |
| *-0.892* | *-3.181* | *-0.492* | *-0.730* | *-1.007* | *-0.806* | *-1.321* | *-2.147* |
| East Midlands | -0.023 | 0.159 | -0.029 | -0.058 | -0.028 | -0.008 | -0.036 | -0.012 |
| *-0.479* | *1.542* | *-1.249* | *-1.693* | *-0.951* | *-0.085* | *-0.539* | *-0.590* |
| South-West | 0.053 | 0.102 | -0.060 | -0.116 | -0.023 | -0.073 | 0.014 | 0.039 |
| *0.921* | *1.390* | *-2.369* | *-1.893* | *-0.863* | *-0.977* | *0.342* | *1.591* |
| East | 0.025 | 0.057 | -0.073 | -0.008 | -0.029 | -0.116 | -0.047 | -0.027 |
| *0.374* | *0.651* | *-2.935* | *-0.215* | *-1.074* | *-1.835* | *-0.893* | *-1.326* |
| London | -0.134 | -0.004 | -0.065 | -0.022 | -0.022 | -0.290 | 0.067 | -0.057 |
| *-2.385* | *-0.037* | *-2.591* | *-0.507* | *-0.650* | *-2.511* | *0.934* | *-1.509* |
| Scotland | -0.042 | 0.234 | -0.051 | -0.124 | -0.068 | -0.073 | -0.160 | -0.062 |
| *-0.987* | *3.411* | *-1.486* | *-3.110* | *-2.350* | *-1.071* | *-2.150* | *-2.534* |
| Wales | -0.038 | 0.065 | -0.040 | -0.068 | -0.003 | 0.054 | 0.064 | -0.019 |
| *-0.663* | *0.659* | *-1.771* | *-1.637* | *-0.133* | *0.440* | *1.157* | *-0.938* |
| Dummy 1980-82 | -0.088 | 0.034 | -0.125 | -0.062 | -0.085 | -0.130 | -0.037 | -0.072 |
| *-7.921* | *1.009* | *-5.334* | *-2.917* | *-3.474* | *-2.319* | *-1.662* | *-9.400* |
| Dummy 1990-92 | -0.024 | 0.011 | -0.055 | -0.024 | -0.033 | -0.060 | -0.032 | -0.004 |
| *-1.570* | *0.292* | *-4.958* | *-1.723* | *-2.596* | *-1.884* | *-1.665* | *-0.383* |
| Dummy 2008-12 | 0.021 | 0.336 | -0.282 | 0.098 | 0.189 | 0.132 | 0.008 | 0.133 |
| *0.318* | *1.771* | *-5.502* | *2.476* | *3.642* | *2.283* | *0.212* | *3.600* |
| Intercept | -0.077 | 0.424 | -0.077 | -0.170 | -0.832 | -0.086 | -0.841 | -0.661 |
|  | *-0.219* | *0.540* | *-0.285* | *-0.402* | *-2.996* | *-0.104* | *-1.237* | *-1.701* |
|  |  |  |  |  |  |  |  |  |
| AR(1) z-statistic p-value | 0.000 | 0.001 | 0.000 | 0.055 | 0.023 | 0.024 | 0.000 | 0.000 |
| AR(2) z-statistic p-value | 0.124 | 0.454 | 0.758 | 0.119 | 0.221 | 0.753 | 0.900 | 0.197 |
| Hansen test p-value | 0.163 | 0.853 | 0.391 | 0.137 | 0.603 | 0.216 | 0.162 | 0.483 |
| RTS | 0.164 | 0.184 | 0.011 | 0.155 | 0.057 | 0.129 | -0.092 | 0.112 |
|  | 5.826 | 1.746 | 0.309 | 4.054 | 3.207 | 2.052 | -1.697 | 5.688 |
| Observations | 22,205 | 3,004 | 65,942 | 41,099 | 19,169 | 9,944 | 10,561 | 46,730 |
| Number of plants | 4,235 | 651 | 10,850 | 8,370 | 3,726 | 2,199 | 2,534 | 10,976 |

*z*-values in italics. Industries are based on 1980 SIC

Table U.4

*(Weighted) Long-run system-GMM estimates of production function, 1973-2012: Low-tech manufacturing*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | SIC 41 | SIC 42 | SIC 43 | SIC 44 | SIC 45 | SIC 46 | SIC 47 | SIC 49 |
| *ln* Intermediate Inputs | 0.755 | 0.727 | 0.791 | 0.662 | 0.527 | 0.471 | 0.597 | 0.427 |
| *27.950* | *10.970* | *9.435* | *4.866* | *3.727* | *3.065* | *5.690* | *2.381* |
| *ln* Employment | 0.108 | 0.294 | 0.157 | 0.329 | 0.443 | 0.590 | 0.546 | 0.408 |
| 2.685 | 3.639 | 1.758 | 2.090 | 2.729 | 3.811 | 4.016 | 1.752 |
| *ln* Capital | 0.156 | 0.172 | 0.113 | 0.101 | 0.105 | 0.142 | 0.354 | 0.267 |
| *4.962* | *3.907* | *1.892* | *1.733* | *1.640* | *1.833* | *2.227* | *2.866* |
| Time | 0.012 | -0.004 | 0.008 | -0.010 | 0.014 | 0.016 | 0.019 | 0.001 |
| *2.555* | *-1.152* | *1.574* | *-1.702* | *2.264* | *2.970* | *3.572* | *0.147* |
| *ln* Age | -0.196 | -0.247 | -0.182 | -0.156 | -0.180 | -0.282 | -0.591 | -0.362 |
| *-4.971* | *-3.913* | *-2.016* | *-1.755* | *-2.365* | *-2.448* | *-2.876* | *-3.620* |
| Single-Plant Enterprise | -0.015 | -0.183 | -0.038 | -0.031 | -0.099 | -0.114 | -0.213 | 0.066 |
| *-0.903* | *-4.477* | *-1.976* | *-0.807* | *-1.966* | *-2.793* | *-3.467* | *1.271* |
| Multi-SIC | -0.006 | -0.022 | -0.049 | 0.003 | 0.005 | -0.089 | -0.013 | 0.096 |
| *-0.470* | *-0.592* | *-2.342* | *0.083* | *0.145* | *-3.211* | *-0.388* | *1.652* |
| Multi-Region Enterprise | -0.047 | -0.027 | -0.009 | 0.028 | -0.014 | 0.039 | 0.113 | -0.010 |
| *-3.243* | *-0.504* | *-0.555* | *0.519* | *-0.659* | *1.693* | *3.304* | *-0.257* |
| Greenfield US-Owned | -0.064 | -0.097 | -0.046 | 0.001 | 0.277 | 0.065 | 0.002 | 0.130 |
| *-1.177* | *-1.336* | *-1.018* | *0.006* | *3.937* | *0.410* | *0.015* | *1.662* |
| Brownfield US-Owned | 0.085 | -0.149 | -0.070 | 0.071 |  | -0.883 | -0.348 | 0.051 |
| *1.228* | *-1.318* | *-1.058* | *0.282* |  | *-1.998* | *-2.418* | *0.124* |
| Greenfield EU-Owned | -0.121 | 0.016 | -0.089 | -0.028 | -0.203 | 0.163 | -0.074 | 0.018 |
| *-2.461* | *0.218* | *-1.694* | *-0.344* | *-1.934* | *1.782* | *-0.735* | *0.089* |
| Brownfield EU-Owned | -0.145 | 0.224 | 0.262 | -0.154 | 0.103 | 0.099 | -0.278 | 0.306 |
| *-3.027* | *2.452* | *1.931* | *-0.105* | *0.801* | *0.605* | *-2.107* | *1.506* |
| Greenfield Other Foreign-Owned | -0.221 | 0.067 | -0.241 |  | -0.055 | -0.025 | 0.073 | 0.175 |
| *-4.488* | *1.040* | *-1.910* |  | *-1.681* | *-0.144* | *0.879* | *0.631* |
| Brownfield Other Foreign-Owned | -0.157 | -0.454 | -0.479 | -0.005 | 0.067 | -0.107 | -0.224 | 0.709 |
| *-1.757* | *-3.156* | *-1.723* | *-0.049* | *0.207* | *-0.452* | *-1.032* | *1.942* |
| *ln* Agglomeration | 0.008 | 0.004 | -0.020 | 0.046 | 0.021 | 0.021 | -0.121 | 0.089 |
| *1.065* | *0.160* | *-1.820* | *1.738* | *1.281* | *1.043* | *-2.426* | *2.189* |
| *ln* Diversification | 0.010 | -0.023 | -0.072 | -0.030 | -0.090 | -0.058 | 0.267 | 0.040 |
| *0.756* | *-0.722* | *-2.314* | *-0.518* | *-1.684* | *-1.701* | *2.212* | *0.795* |
| *ln* Herfindahl Index | 0.045 | 0.041 | -0.060 | 0.120 | 0.001 | -0.031 | 0.048 | -0.106 |
| *8.264* | *1.680* | *-4.256* | *1.703* | *0.055* | *-2.996* | *3.541* | *-2.493* |
| Assisted Area | 0.001 | 0.042 | 0.005 | 0.011 | -0.003 | 0.011 | -0.049 | 0.033 |
| *0.207* | *2.765* | *0.601* | *0.330* | *-0.228* | *0.667* | *-1.430* | *1.222* |
| Main Cities | 0.000 | -0.001 | 0.082 | 0.078 | 0.089 | 0.077 | 0.073 | 0.014 |
| *0.005* | *-0.026* | *3.369* | *1.689* | *2.214* | *2.823* | *1.715* | *0.260* |
| North-East | -0.037 | -0.119 | 0.063 | 0.010 | -0.014 | 0.012 | -0.220 | -0.029 |
| *-2.506* | *-1.874* | *1.353* | *0.143* | *-0.635* | *0.391* | *-3.180* | *-0.661* |
| Yorkshire-Humberside | 0.013 | -0.144 | 0.026 | 0.032 | 0.140 | 0.042 | -0.111 | 0.031 |
| *0.990* | *-2.295* | *0.612* | *0.348* | *3.304* | *1.431* | *-1.715* | *0.710* |
| North-West | 0.053 | -0.069 | 0.165 | 0.056 | 0.256 | 0.146 | 0.227 | 0.165 |
| *3.976* | *-1.138* | *2.819* | *0.732* | *3.363* | *4.482* | *2.878* | *2.837* |
| West Midlands | -0.049 | -0.106 | -0.048 | -0.184 | -0.072 | -0.093 | -0.133 | 0.067 |
| *-3.385* | *-1.552* | *-1.319* | *-1.379* | *-1.453* | *-2.129* | *-1.623* | *0.899* |
| East Midlands | -0.028 | -0.126 | 0.000 | -0.029 | -0.014 | -0.015 | -0.161 | -0.024 |
| *-2.033* | *-2.112* | *-0.011* | *-0.331* | *-0.504* | *-0.636* | *-2.283* | *-0.352* |
| South-West | -0.050 | -0.024 | 0.035 | 0.111 | 0.020 | -0.064 | 0.078 | -0.009 |
| *-3.888* | *-0.304* | *0.993* | *1.082* | *0.491* | *-2.052* | *1.201* | *-0.129* |
| East | -0.007 | -0.172 | 0.001 | 0.091 | 0.016 | 0.009 | -0.126 | 0.003 |
| *-0.502* | *-1.790* | *0.037* | *1.117* | *0.518* | *0.423* | *-2.163* | *0.067* |
| London | -0.001 | -0.058 | -0.082 | 0.044 | 0.035 | -0.053 | -0.176 | -0.111 |
| *-0.043* | *-0.935* | *-1.630* | *0.486* | *0.924* | *-1.770* | *-1.897* | *-2.357* |
| Scotland | -0.014 | -0.112 | 0.004 | -0.156 | 0.082 | 0.019 | -0.073 | -0.038 |
| *-1.044* | *-1.716* | *0.112* | *-1.131* | *1.725* | *0.738* | *-1.288* | *-0.706* |
| Wales | -0.056 | -0.116 | 0.038 | 0.055 | 0.014 | -0.013 | -0.108 | -0.089 |
| *-4.690* | *-1.828* | *1.472* | *0.711* | *0.538* | *-0.555* | *-1.419* | *-1.181* |
| Dummy 1980-82 | -0.042 | -0.035 | -0.025 | -0.142 | -0.056 | -0.032 | 0.038 | -0.205 |
| *-6.066* | *-1.712* | *-2.107* | *-3.826* | *-3.886* | *-1.872* | *0.908* | *-3.821* |
| Dummy 1990-92 | 0.000 | -0.040 | -0.015 | 0.014 | 0.014 | -0.027 | 0.011 | -0.013 |
| *-0.047* | *-3.014* | *-0.911* | *0.519* | *1.163* | *-1.359* | *0.288* | *-0.251* |
| Dummy 2008-12 | 0.019 | 0.313 | -0.011 | 0.060 | 0.204 | 0.016 | 0.393 | 0.581 |
| *1.422* | *4.576* | *-0.211* | *0.242* | *2.477* | *0.494* | *1.827* | *4.270* |
| Intercept | 0.875 | 0.578 | 0.191 | 0.385 | -0.856 | -1.049 | 0.363 | -0.112 |
| *3.849* | *1.665* | *0.463* | *0.931* | *-1.023* | *-2.091* | *0.424* | *-0.093* |
|  |  |  |  |  |  |  |  |  |
| AR(1) z-statistic p-value | 0.000 | 0.000 | 0.002 | 0.221 | 0.008 | 0.139 | 0.011 | 0.000 |
| AR(2) z-statistic p-value | 0.290 | 0.179 | 0.941 | 0.299 | 0.342 | 0.399 | 0.210 | 0.855 |
| Hansen test p-value | 0.103 | 0.287 | 0.323 | 0.158 | 0.870 | 0.200 | 0.293 | 0.294 |
| RTS | 0.019 | 0.192 | 0.061 | 0.092 | 0.074 | 0.203 | 0.497 | 0.103 |
|  | 1.768 | 5.043 | 1.732 | 1.421 | 3.184 | 3.180 | 4.077 | 2.548 |
| Observations | 74,948 | 35,841 | 33,499 | 3,536 | 39,823 | 30,940 | 72,547 | 11,483 |
| Number of plants | 16,136 | 5,145 | 4,915 | 622 | 6,985 | 6,880 | 12,517 | 3,284 |

*z*-values in italics. Industries are based on 1980 SIC

## B. TFP comparisons

Figure U.1. Comparisons of British manufacturing TFP and indices of production, 1973-2012

Source: Index of real gross output (ABS) – Figure 3 (main text); TFP (ABS) – Figure 3 (main text); Index of Production (ONS) – series K22A; TFP (growth accounting) - Figure 2 (main text). The ABS figures for 1997, 2001 and 2004 are interpolated since these years show large and unsustained jumps or falls in one or more of the series. These are likely due to inconsistencies in the data compilation methods.

## C. Sub-groupings of industries used in productivity growth decompositions

Table U.5

*Sub-groups of industries classified to high-to-low levels of the activities covered*

|  |  |
| --- | --- |
| Sub-groups | Industries (SIC80) |
| *Increase in Offshoring 1995-2010* |  |
| High level  | 224, 311-2; 2512/4/5, 2568, 26; 2511/3/6; 256, 259; 411; 2410, 247/8; 422; 481-3 |
| Medium-high | 46 (ex. 467); 34; 221-3; 255; 312-6, 320; 43, 455; 242-46; 4200, 4214, 4239; 361; 471-2; 321-328; 429 |
| Medium-low | 416, 418; 364; 3452, 475; 258-9; 257; 414-5; 4213, 413; 44, 451, 456; 412; 424-7 |
| Low level | 35; 419; 453; 329; 49; 467; 428; 33, 344, 37; 362-3, 365 |
|  |  |
| *Level of Openness 2000-2007* |  |
| High level  | 33; 44, 451, 456; 311, 344; 224; 453; 35 |
| Medium-high | 221-3; 364; 25 (ex. 257), 26; 43, 455; 34; 257; 321-9; 37 |
| Medium-low | 471-2; 362-3, 365; 48; 41, 420-28; 46 (ex. 467) |
| Low level | 429; 361; 24; 320, 312-6; 475 |
|  |  |
| *Level of labour composition 1994-2007* |  |
| High level  | 33, 34, 37; 22, 31; 48 |
| Medium-high | 43-45; 41-42 |
| Medium-low | 46; 47; 32; 24 |
| Low level | 49; 25, 26; 35-36 |
|  |  |
| *Innovation spending intensity 2004-2012* |  |
| High level  | 37; 48; 35-36; 33-34 |
| Medium-high | 32; 44-45; 47; 25-26; 43 |
| Medium-low | 24; 223-224, 31; 47; 467, 49 |
| Low level | 46 (ex. 467); 41-42; 221-222 |

Source: the results from Tables U.7 – U.10

Table U.6

*Outsourcing and offshoring in UK 1995 and 2010 (based on IO and Supply-Use Tables and the 2007 SIC)a*

|  |  | 1995 | 2010 | change |
| --- | --- | --- | --- | --- |
|  |  | Domestic | Offshoring | Domestic | Offshoring | Domestic | Offshoring |
| SIC 2007 | Product | core | non-core | services  | core | non-core | services  | core | non-core | services  | core | non-core | services  | core | non-core | services  | core | non-core | services  | sum |
| 19 | Coke and refined petroleum | 0.025 | 0.445 | 0.113 | 0.004 | 0.150 | 0.005 | 0.070 | 0.069 | 0.074 | 0.011 | 0.595 | 0.007 | 0.045 | -0.376 | -0.039 | 0.007 | 0.445 | 0.002 | 0.454 |
| 24.4-5 | Other basic metals | 0.183 | 0.097 | 0.192 | 0.155 | 0.077 | 0.005 | 0.011 | 0.057 | 0.184 | 0.416 | 0.146 | 0.034 | -0.172 | -0.040 | -0.009 | 0.261 | 0.069 | 0.029 | 0.359 |
| 20pt | Petrochemicals, Dyestuffs, agrochemicals | 0.051 | 0.099 | 0.222 | 0.213 | 0.045 | 0.006 | 0.083 | 0.043 | 0.227 | 0.284 | 0.152 | 0.018 | 0.032 | -0.056 | 0.005 | 0.071 | 0.107 | 0.012 | 0.190 |
| 20.11/13/15 | Industrial gases, inorganics and fertilisers (all inorganic chemicals) | 0.082 | 0.087 | 0.265 | 0.049 | 0.140 | 0.007 | 0.012 | 0.159 | 0.236 | 0.020 | 0.299 | 0.022 | -0.070 | 0.072 | -0.029 | -0.029 | 0.160 | 0.015 | 0.146 |
| 20.5 | Other Chemical products | 0.033 | 0.125 | 0.225 | 0.071 | 0.182 | 0.008 | 0.000 | 0.121 | 0.244 | 0.134 | 0.246 | 0.025 | -0.032 | -0.003 | 0.019 | 0.063 | 0.064 | 0.017 | 0.144 |
| 10.4 | Vegetable and animal oils and fats  | 0.161 | 0.442 | 0.171 | 0.096 | 0.094 | 0.005 | 0.039 | 0.165 | 0.133 | 0.278 | 0.054 | 0.005 | -0.122 | -0.276 | -0.038 | 0.182 | -0.039 | 0.000 | 0.143 |
| 23.1-4/7-9 | Glass, refractory, Clay etc  | 0.090 | 0.105 | 0.246 | 0.029 | 0.058 | 0.008 | 0.008 | 0.105 | 0.290 | 0.069 | 0.152 | 0.016 | -0.082 | 0.000 | 0.044 | 0.040 | 0.094 | 0.008 | 0.142 |
| 10.9 | Prepared animal feeds | 0.096 | 0.308 | 0.179 | 0.028 | 0.092 | 0.006 | 0.005 | 0.401 | 0.152 | 0.006 | 0.251 | 0.008 | -0.091 | 0.093 | -0.027 | -0.022 | 0.159 | 0.001 | 0.139 |
| 22 | Rubber and plastic products | 0.077 | 0.183 | 0.184 | 0.023 | 0.144 | 0.006 | 0.034 | 0.125 | 0.155 | 0.063 | 0.208 | 0.026 | -0.043 | -0.058 | -0.029 | 0.040 | 0.065 | 0.020 | 0.125 |
| 16 | Wood and of products of wood and cork, etc. | 0.203 | 0.139 | 0.172 | 0.083 | 0.067 | 0.006 | 0.134 | 0.102 | 0.158 | 0.183 | 0.073 | 0.014 | -0.069 | -0.036 | -0.014 | 0.100 | 0.006 | 0.008 | 0.115 |
| 27 | Electrical equipment  | 0.073 | 0.178 | 0.199 | 0.048 | 0.114 | 0.008 | 0.046 | 0.162 | 0.158 | 0.038 | 0.218 | 0.020 | -0.026 | -0.017 | -0.041 | -0.010 | 0.103 | 0.011 | 0.105 |
| 24.1-3 | Basic iron and steel  | 0.138 | 0.130 | 0.278 | 0.095 | 0.064 | 0.011 | 0.178 | 0.078 | 0.233 | 0.067 | 0.149 | 0.058 | 0.041 | -0.052 | -0.045 | -0.028 | 0.085 | 0.047 | 0.104 |
| 20.3 | Paints, varnishes and similar coatings, printing ink and mastics  | 0.054 | 0.182 | 0.264 | 0.008 | 0.159 | 0.009 | 0.020 | 0.113 | 0.227 | 0.043 | 0.216 | 0.013 | -0.033 | -0.069 | -0.037 | 0.035 | 0.057 | 0.004 | 0.096 |
| 25.1-3/25.5-9 | Fabricated metal products,  | 0.086 | 0.177 | 0.186 | 0.013 | 0.105 | 0.007 | 0.079 | 0.102 | 0.174 | 0.024 | 0.165 | 0.017 | -0.007 | -0.075 | -0.012 | 0.011 | 0.059 | 0.010 | 0.080 |
| 13 | Textiles  | 0.117 | 0.074 | 0.213 | 0.118 | 0.086 | 0.006 | 0.063 | 0.047 | 0.179 | 0.158 | 0.104 | 0.026 | -0.054 | -0.027 | -0.034 | 0.039 | 0.017 | 0.019 | 0.076 |
| 23.5-6 | Manufacture of Cement, lime, plaster etc,  | 0.080 | 0.117 | 0.275 | 0.006 | 0.102 | 0.008 | 0.102 | 0.113 | 0.289 | 0.012 | 0.156 | 0.023 | 0.022 | -0.004 | 0.013 | 0.006 | 0.055 | 0.015 | 0.075 |
| 10.8 | Other food products  | 0.001 | 0.338 | 0.164 | 0.000 | 0.079 | 0.007 | 0.097 | 0.185 | 0.217 | 0.044 | 0.093 | 0.023 | 0.096 | -0.153 | 0.054 | 0.044 | 0.014 | 0.017 | 0.075 |
| 30.1+ 33.15 | Ships and boats + repairs | 0.061 | 0.202 | 0.168 | 0.004 | 0.105 | 0.011 | 0.031 | 0.190 | 0.166 | 0.044 | 0.127 | 0.007 | -0.030 | -0.012 | -0.002 | 0.041 | 0.022 | -0.004 | 0.059 |
| 28 | Machinery and equipment n.e.c.  | 0.054 | 0.228 | 0.176 | 0.054 | 0.081 | 0.007 | 0.052 | 0.187 | 0.168 | 0.035 | 0.151 | 0.011 | -0.002 | -0.041 | -0.008 | -0.018 | 0.070 | 0.004 | 0.055 |
| 17 | Paper and paper products | 0.146 | 0.087 | 0.186 | 0.190 | 0.049 | 0.007 | 0.055 | 0.059 | 0.253 | 0.199 | 0.082 | 0.019 | -0.091 | -0.028 | 0.066 | 0.009 | 0.033 | 0.013 | 0.055 |
| 12 | Tobacco products | 0.001 | 0.193 | 0.217 | 0.003 | 0.034 | 0.008 | 0.001 | 0.175 | 0.223 | 0.002 | 0.072 | 0.018 | 0.000 | -0.019 | 0.005 | -0.001 | 0.038 | 0.010 | 0.047 |
| 10.6 | Grain mill products, starches and starch products | 0.065 | 0.379 | 0.187 | 0.012 | 0.088 | 0.006 | 0.099 | 0.314 | 0.236 | 0.038 | 0.090 | 0.015 | 0.034 | -0.065 | 0.049 | 0.026 | 0.002 | 0.009 | 0.037 |
| 30.3+ 33.16 | Air and spacecraft and related machinery + repairs | 0.011 | 0.154 | 0.197 | 0.090 | 0.173 | 0.025 | 0.158 | 0.069 | 0.184 | 0.165 | 0.106 | 0.045 | 0.148 | -0.084 | -0.013 | 0.075 | -0.067 | 0.020 | 0.029 |
| 18 | Printing and recording services  | 0.132 | 0.109 | 0.154 | 0.008 | 0.102 | 0.011 | 0.058 | 0.136 | 0.177 | 0.001 | 0.127 | 0.022 | -0.074 | 0.026 | 0.023 | -0.008 | 0.025 | 0.011 | 0.028 |
| 20.4 | Soap and detergents, Cleaning etc.  | 0.085 | 0.201 | 0.297 | 0.013 | 0.103 | 0.011 | 0.108 | 0.131 | 0.259 | 0.020 | 0.118 | 0.014 | 0.023 | -0.070 | -0.038 | 0.007 | 0.015 | 0.003 | 0.025 |
| 21 | Basic pharmaceutical products and preparations | 0.094 | 0.094 | 0.269 | 0.074 | 0.062 | 0.012 | 0.040 | 0.030 | 0.203 | 0.128 | 0.026 | 0.014 | -0.054 | -0.064 | -0.066 | 0.054 | -0.036 | 0.002 | 0.020 |
| 10.2-3 | Processed and preserved fish, Crustaceans, molluscs, fruit and vegetables | 0.085 | 0.325 | 0.192 | 0.023 | 0.081 | 0.008 | 0.073 | 0.243 | 0.217 | 0.003 | 0.110 | 0.016 | -0.011 | -0.082 | 0.026 | -0.020 | 0.029 | 0.008 | 0.018 |
| 10.5 | Dairy products | 0.109 | 0.499 | 0.154 | 0.013 | 0.110 | 0.006 | 0.099 | 0.465 | 0.167 | 0.017 | 0.118 | 0.010 | -0.009 | -0.034 | 0.012 | 0.003 | 0.008 | 0.004 | 0.016 |
| 10.1 | Preserved meat and meat products | 0.185 | 0.377 | 0.134 | 0.029 | 0.083 | 0.005 | 0.194 | 0.311 | 0.148 | 0.017 | 0.098 | 0.016 | 0.010 | -0.066 | 0.014 | -0.012 | 0.015 | 0.012 | 0.015 |
| 15 | Leather and related products | 0.025 | 0.175 | 0.189 | 0.086 | 0.072 | 0.006 | 0.001 | 0.144 | 0.191 | 0.078 | 0.095 | 0.007 | -0.024 | -0.032 | 0.002 | -0.009 | 0.023 | 0.000 | 0.015 |
| 11.01-6 | Alcoholic beverages | 0.065 | 0.232 | 0.215 | 0.054 | 0.052 | 0.006 | 0.012 | 0.194 | 0.315 | 0.024 | 0.072 | 0.018 | -0.053 | -0.039 | 0.101 | -0.030 | 0.020 | 0.012 | 0.002 |
| 29 | Motor vehicles, trailers and semi-trailers  | 0.092 | 0.242 | 0.159 | 0.125 | 0.108 | 0.005 | 0.149 | 0.176 | 0.203 | 0.016 | 0.203 | 0.014 | 0.057 | -0.066 | 0.044 | -0.109 | 0.095 | 0.009 | -0.004 |
| 10.7 | Bakery and farinaceous products  | 0.002 | 0.494 | 0.211 | 0.000 | 0.137 | 0.007 | 0.006 | 0.285 | 0.168 | 0.000 | 0.090 | 0.011 | 0.004 | -0.209 | -0.043 | 0.000 | -0.047 | 0.004 | -0.043 |
| 14 | Wearing apparel  | 0.017 | 0.177 | 0.168 | 0.010 | 0.231 | 0.005 | 0.001 | 0.173 | 0.187 | 0.018 | 0.135 | 0.038 | -0.016 | -0.004 | 0.019 | 0.008 | -0.096 | 0.033 | -0.055 |
| 25.4 | Weapons and ammunition | 0.154 | 0.157 | 0.148 | 0.105 | 0.102 | 0.007 | 0.209 | 0.143 | 0.124 | 0.028 | 0.117 | 0.013 | 0.055 | -0.014 | -0.024 | -0.076 | 0.015 | 0.006 | -0.056 |
| 32 | Other manufactured goods | 0.010 | 0.258 | 0.211 | 0.010 | 0.154 | 0.009 | 0.032 | 0.252 | 0.179 | 0.004 | 0.065 | 0.023 | 0.022 | -0.006 | -0.032 | -0.006 | -0.088 | 0.015 | -0.080 |
| 31 | Furniture  | 0.053 | 0.241 | 0.171 | 0.007 | 0.150 | 0.006 | 0.061 | 0.309 | 0.161 | 0.002 | 0.039 | 0.018 | 0.008 | 0.068 | -0.010 | -0.006 | -0.110 | 0.012 | -0.104 |
| 11.07 | Soft drinks  | 0.003 | 0.351 | 0.243 | 0.000 | 0.134 | 0.010 | 0.004 | 0.455 | 0.228 | 0.001 | 0.016 | 0.010 | 0.001 | 0.105 | -0.015 | 0.001 | -0.118 | 0.000 | -0.117 |
| 26 | Computer, electronic and optical products | 0.050 | 0.130 | 0.214 | 0.200 | 0.057 | 0.007 | 0.137 | 0.128 | 0.164 | 0.068 | 0.044 | 0.034 | 0.087 | -0.002 | -0.050 | -0.132 | -0.014 | 0.027 | -0.120 |
| 30.2/4/9 | Other transport equipment | 0.152 | 0.202 | 0.144 | 0.103 | 0.108 | 0.006 | 0.036 | 0.350 | 0.233 | 0.005 | 0.030 | 0.037 | -0.116 | 0.149 | 0.089 | -0.098 | -0.078 | 0.031 | -0.146 |

a Offshoringjt = ${\sum\_{k}^{}(Imported inputs from industry k by industry j)\_{t}}/{(Output of industry j)\_{t}}$;

Domestic sourcingjt = ${\sum\_{k}^{}(Domestic inputs from industry k by industry j)\_{t}}/{(Output of industry j)\_{t}}$;

Core activities (*k* = *j*); non-core (*k*≠*j*, non-services); services (SIC 36+).

Table U.7

*‘Openness’ in UK manufacturing (exports + imports)/value added (nominal prices), 2000-2007*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Industry** | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | average |
| C30 Office, accounting and Computing machinery | 13.164 | 12.263 | 11.035 | 10.664 | 10.889 | 7.833 | 7.603 | 7.559 | 10.126 |
| C19 Leather, leather products and footwear | 5.166 | 6.394 | 7.189 | 9.205 | 11.032 | 11.825 | 14.304 | 15.161 | 10.034 |
| C32 Radio, television and Communication equipment | 6.087 | 7.611 | 9.090 | 8.967 | 9.088 | 9.435 | 9.288 | 7.290 | 8.357 |
| C272T32 Non-ferrous metals | 5.180 | 4.710 | 5.205 | 5.950 | 7.072 | 6.924 | 11.384 | 13.755 | 7.523 |
| C18 Wearing apparel, dressing and dyeing of fur | 3.924 | 4.747 | 5.903 | 7.180 | 7.679 | 8.099 | 8.107 | 8.940 | 6.822 |
| C34 Motor vehicles, trailers and semi-trailers | 4.972 | 5.319 | 5.910 | 6.136 | 6.171 | 6.276 | 7.047 | 7.959 | 6.224 |
| C271T31 Iron and steel | 2.701 | 3.585 | 4.236 | 4.631 | 4.818 | 5.188 | 5.158 | 4.810 | 4.391 |
| C353 Aircraft and spacecraft | 3.876 | 4.335 | 4.229 | 4.360 | 4.102 | 4.117 | 4.175 | 4.536 | 4.216 |
| C24X Chemicals excluding pharmaceuticals | 3.303 | 3.348 | 3.316 | 3.557 | 3.841 | 3.947 | 4.054 | 4.062 | 3.679 |
| C17 Textiles | 2.611 | 2.865 | 3.106 | 3.541 | 3.812 | 3.972 | 4.058 | 3.851 | 3.477 |
| C31 Electrical machinery and apparatus, n.e.c. | 2.967 | 3.021 | 2.992 | 3.265 | 3.435 | 3.252 | 3.457 | 3.691 | 3.260 |
| C2423 Pharmaceuticals | 2.632 | 2.815 | 3.233 | 3.536 | 3.695 | 3.367 | 3.135 | 3.206 | 3.202 |
| C29 Machinery and equipment, n.e.c. | 2.643 | 2.742 | 2.752 | 2.840 | 2.867 | 3.150 | 3.135 | 3.636 | 2.971 |
| C33 Medical, precision and optical instruments | 2.680 | 2.815 | 2.778 | 2.811 | 2.865 | 3.048 | 3.230 | 3.003 | 2.904 |
| C21 Pulp, paper and paper products | 1.798 | 1.904 | 1.808 | 1.943 | 2.008 | 2.074 | 2.206 | 2.104 | 1.981 |
| C352A9 Railroad equipment and transport equipment n.e.c. | 2.107 | 1.853 | 1.674 | 1.760 | 1.939 | 2.272 | 1.612 | 1.776 | 1.874 |
| C25 Rubber and plastics products | 1.245 | 1.233 | 1.299 | 1.434 | 1.481 | 1.598 | 1.768 | 1.911 | 1.496 |
| C15 Food products and beverages | 1.144 | 1.154 | 1.187 | 1.267 | 1.272 | 1.340 | 1.412 | 1.476 | 1.281 |
| C20 Wood and products of wood and Cork | 1.258 | 1.257 | 1.280 | 1.275 | 1.283 | 1.218 | 1.254 | 1.347 | 1.271 |
| C16 Tobacco products | 1.029 | 1.034 | 1.148 | 1.090 | 0.954 | 0.808 | 0.675 | 0.560 | 0.912 |
| C351 Building and repairing of ships and boats | 0.924 | 0.608 | 0.577 | 0.820 | 0.764 | 0.977 | 0.801 | 1.825 | 0.912 |
| C26 Other non-metallic mineral products | 0.822 | 0.823 | 0.795 | 0.845 | 0.928 | 0.925 | 0.965 | 0.975 | 0.885 |
| C28 Fabricated metal products, except machinery and equipment | 0.665 | 0.720 | 0.732 | 0.773 | 0.799 | 0.798 | 0.853 | 0.900 | 0.780 |
| C22 Printing and publishing | 0.350 | 0.363 | 0.399 | 0.400 | 0.399 | 0.447 | 0.403 | 0.416 | 0.397 |

Source: STAN Database (OECD)

Table U.8

*Labour composition in UK manufacturing, 1994-2007 (1997=1)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2003 SIC | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | Average | 2007 ÷1994 |
| Electrical & optical equipment | 30-33 | 1.106 | 1.095 | 1.036 | 1.000 | 1.013 | 0.962 | 0.968 | 1.007 | 1.046 | 1.099 | 1.186 | 1.188 | 1.208 | 1.253 | 1.083 | 1.133 |
| Coke, refined petroleum and nuclear fuel | 23 | 1.010 | 1.033 | 1.005 | 1.000 | 1.134 | 1.145 | 1.106 | 1.061 | 1.054 | 1.033 | 1.046 | 1.074 | 1.203 | 1.141 | 1.075 | 1.130 |
| Basic & fabricated metals | 27-28 | 1.067 | 1.004 | 0.970 | 1.000 | 1.002 | 1.028 | 1.084 | 1.071 | 1.106 | 1.148 | 1.153 | 1.092 | 1.097 | 1.166 | 1.071 | 1.093 |
| Rubber and plastics | 25 | 1.015 | 0.987 | 1.021 | 1.000 | 1.019 | 1.059 | 1.030 | 1.068 | 1.134 | 1.132 | 1.127 | 1.127 | 1.094 | 1.116 | 1.066 | 1.100 |
| Textiles, leather & footwear | 17-19 | 0.956 | 0.971 | 0.975 | 1.000 | 1.016 | 1.026 | 1.042 | 1.045 | 1.053 | 1.091 | 1.099 | 1.099 | 1.099 | 1.103 | 1.041 | 1.154 |
| Food, drink, tobacco | 15t16 | 0.956 | 0.971 | 0.975 | 1.000 | 1.016 | 1.026 | 1.042 | 1.045 | 1.053 | 1.091 | 1.099 | 1.099 | 1.099 | 1.103 | 1.041 | 1.154 |
| Wood products | 20 | 0.976 | 0.989 | 0.996 | 1.000 | 1.015 | 1.020 | 1.032 | 1.047 | 1.063 | 1.067 | 1.070 | 1.070 | 1.070 | 1.075 | 1.035 | 1.101 |
| Paper, printing, publishing | 21-22 | 0.976 | 0.989 | 0.996 | 1.000 | 1.015 | 1.020 | 1.032 | 1.047 | 1.063 | 1.067 | 1.070 | 1.070 | 1.070 | 1.075 | 1.035 | 1.101 |
| Machinery | 29 | 0.947 | 0.961 | 0.986 | 1.000 | 0.982 | 1.030 | 1.019 | 1.023 | 1.070 | 1.102 | 1.075 | 1.088 | 1.117 | 1.082 | 1.034 | 1.143 |
| Non-metallic minerals | 26 | 0.848 | 0.937 | 0.975 | 1.000 | 1.059 | 1.034 | 1.008 | 1.059 | 1.074 | 1.046 | 1.045 | 1.096 | 1.111 | 1.003 | 1.021 | 1.183 |
| Other manufacturing | 36-37 | 0.930 | 0.907 | 1.064 | 1.000 | 1.003 | 1.001 | 0.978 | 1.012 | 1.024 | 1.047 | 1.028 | 1.074 | 1.037 | 1.033 | 1.010 | 1.111 |
| Chemicals and chemical products | 24 | 0.927 | 0.942 | 0.976 | 1.000 | 0.895 | 0.884 | 0.956 | 1.022 | 1.046 | 1.082 | 1.076 | 1.044 | 0.928 | 0.989 | 0.983 | 1.066 |
| Transport | 34-35 | 1.018 | 1.055 | 0.982 | 1.000 | 0.961 | 1.010 | 1.044 | 0.990 | 0.944 | 0.882 | 0.856 | 0.841 | 0.841 | 0.829 | 0.947 | 0.814 |

Source: EUKLEMS (LAB\_QI/H\_EMP).

Table U.9

*UK R&D intensity (all R&D spendinga), 2004-2012*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sector  | 2003 SIC | 2004 | 2006 | 2008 | 2010 | 2012 | Average |
| Medical and instruments | 33 | 6.804 | 6.925 | 4.922 | 23.092 | 1.816 | 8.147 |
| Rubber and plastics | 25 | 4.019 | 2.731 | 1.692 | 25.822 | 1.215 | 7.246 |
| Motor vehicles and other transport | 34-35 | 6.623 | 5.210 | 1.632 | 3.357 | 2.163 | 3.727 |
| Electrical machinery | 30-32 | 4.663 | 3.838 | 4.010 | 3.159 | 1.757 | 3.436 |
| Machinery & equipment nes | 29 | 3.343 | 3.751 | 1.898 | 5.642 | 1.185 | 3.024 |
| Clothing, leather and footwear | 18-19 | 1.562 | 2.627 | 0.546 | 5.946 | 0.175 | 3.022 |
| Publishing and printing | 21 | 3.321 | 3.433 | 2.250 | 2.946 | 1.352 | 2.683 |
| Chemicals | 23-24 | 4.203 | 3.832 | 0.840 | 4.188 | 1.144 | 2.447 |
| Textiles | 17 | 4.401 | 3.801 | 0.778 | 1.294 | 1.452 | 2.230 |
| Non-metaliic minerals | 26 | 2.585 | 3.106 | 1.250 | 1.719 | 1.487 | 2.072 |
| Fabricated metals | 28 | 3.479 | 2.341 | 1.381 | 2.181 | 1.422 | 2.053 |
| Paper products | 21 | 2.709 | 3.248 | 1.179 | 1.128 | 0.918 | 1.978 |
| Furniture and other manufacturing nes | 36 | 3.411 | 2.609 | 1.452 | 1.291 | 0.742 | 1.894 |
| Wood products | 20 | 2.134 | 1.191 | 0.707 | 1.119 | 0.665 | 1.149 |
| Food and drink | 15 | 1.266 | 1.492 | 1.529 | 0.670 | 0.458 | 1.060 |
| Basic metals | 27 | 1.606 | 0.917 | 1.293 | 0.512 | 0.315 | 0.875 |
| Total manufacturing |  | 3.544 | 3.249 | 1.739 | 4.815 | 1.100 | 2.791 |

a Spending on internal & external R&D, purchase of external knowledge plus: acquisition of advanced machinery, equipment and software for innovation, plus training, design and spending on the market introduction of innovations. This spending was divided by total sales.

Source: (Weighted) UK Community Innovation Survey

## D. Data Appendix

The ARD has been discussed extensively elsewhere[[1]](#footnote-1) and basically comprises (mainly financial) information[[2]](#footnote-2) collected since 1973 from some 12-15,000 manufacturing establishments (or reporting units) each year. These establishments are selected from the population comprising the (VAT) register underlying the Annual Census of Production (1970-93) and since 1994, the Inter-departmental Business Register (which contains a limited amount of descriptive information including employment), and thus this information on the population of establishments can be used to weight the data to obtain population estimates. The sample selected each year is based on a stratified sampling frame (using employment size by 5-digit industry codes) that is heavily biased towards the largest establishments, and thus the need for weighting.[[3]](#footnote-3) Establishments (and the plants – or local units – comprising such establishments) can be linked through time to form a panel, and the ARD contains unique plant level identifiers that do not change over time.

The ARD data are available from the UK Office for National Statistics (ONS) but use is restricted. Full details about gaining access is provided by the ONS[[4]](#footnote-4); the most important issue is that access is only granted through a secure micro-data lab.[[5]](#footnote-5)

Data used

Plant-level panel data from the Annual Respondents Database (ARD)[[6]](#footnote-6) is used covering 1973-2012 (the 1980 Standard Industrial Classification is used and this dictates which plants are classified to manufacturing). This data are collected by the UK’s Official for National Statistics (ONS) each year as part of the Annual Business Inquiry, designed to obtain statistics for calculating the national income accounts. It is available for academic use via the UK Data Service, with stringent conditions attached to its use. In our econometric analysis we weight the data using sample weights to ensure that the distribution of plants for which there is financial data are representative of the population of plants operating each year in manufacturing in Great Britain. Weighting is necessary both to ensure that population parameters are estimated and because of the fact that one of the endogenous variables in the model (employment) is used by the ONS as part of the stratified sampling approach to collect the ARD data; thus leading to the problem of endogenous sampling or stratification (see the appendix in Harris, 2002).

ARD figures on gross output were deflated using the ONS’s MM22 producer price indices for output (PPI output), which are very detailed for manufacturing. Separate deflators were used for intermediate inputs in manufacturing – the PPI indices for inputs. Data on gross investment in plant and machinery is deflated using the ONS’s MM14 detailed series.

Capital stocks were estimated at the plant level, linked to a benchmark estimate based on 1969 for manufacturing. That is, annual 3-digit SIC real gross investment data dating from 1948 were used to calculate a benchmark capital stock for each industry, and this was then apportioned to each plant existing in the year following the benchmark year. Further information is provided below, and details on the methods used for manufacturing are set out in Harris and Drinkwater (2000) and Harris (2005b). We also added (deflated) spending on the hire of plant and machinery to obtain an estimate of the total capital stock available to each plant.

The age of the plant is obtained from whichever was oldest from either the year when the plant was first observed in the ARD (1970) or from information contained in the Business Structure Database (BSD) in the ONS. Harris et al. (2006) discuss these sources.

Single-plant status and whether the plant belonged to an enterprise operating in more than one region are obtained from using the enterprise group reference codes contained in the ARD; foreign-ownership is obtained from the ARD, and is aggregated into 3 sub-groups: US-owned, EU-owned and other foreign-owned. Using information on when the plant was acquired alongside its age, we can distinguish ‘brownfield’ versus ‘greenfield’ inward FDI. Attempts have been made to capture two types of spillover: agglomeration economies associated with localisation externalities due to industrial specialisation which are an intra-industry phenomenon (typically called Marshall, 1890, Arrow, 1962, and Romer, 1986, or MAR, externalities in the literature); and urbanisation economies (typically called Jacobian externalities after Jacobs, 1970 and 1986), representing diversification and therefore inter-industry spillovers.[[7]](#footnote-7) The Herfindahl (1950) index of industrial concentration was also computed to take into account entry (and exit) barriers that can impact on competition, with the expectation of a potentially negative influence of higher concentration on productivity. In addition, information is available on whether the plant was located in an Assisted Area, and to which Government Office region and industry it belonged.

Capital Stock

The perpetual inventory measure is often the only viable approach; this requires long time series of real gross investment data, plus adequate measures of economic deterioration. Harris and Drinkwater (2000) note that an accurate measure of the capital stock that is intended for use in estimating production relations should represent the total amount of capital services available for producing output. This means taking into account efficiency losses because of deterioration (including obsolescence). However, there is a second ‘economic accounts’ measure of the capital stock that takes into account capital that is ‘used up’ in production; that is, depreciation. Triplett (1996) provides a comprehensive account of the differences between these two concepts of the wealth and productive capital stock, which has been the source of much debate in the literature.

Ideally, we require empirical estimates of the level of known deterioration to enable us to calculate both the rate (or pattern) of deterioration and the value of the actual length of life of a capital good. Unfortunately, this information is not available and therefore some other technique must be used to estimate the expected life of a capital good, which provides an indication of the period over which deterioration must take place. Typically, the perpetual inventory method is used based on assuming that the rate of deterioration follows some simple pattern such as straight-line or exponential decline over the lifetime of an asset, the latter having been obtained from various sources including surveys or insurance data (see, for example, Griffen, 1976). As to the discussion over the appropriate rate of deterioration, it was argued by Denison (1972) that the expected time pattern of deterioration of a capital good is expected to exhibit a slow rate of deterioration at the beginning, becoming more rapid as the expected length of life of the good approaches. The reasons for this are that firms typically undertake maintenance and repair in order to maintain the same performance level as when the machine was new (Jefferson, 1971), with this activity increasing with the age of the capital goods, while the effect of obsolescence on the rate of deterioration is probably small (Barna, 1962).[[8]](#footnote-8)

Once gross and net stock figures[[9]](#footnote-9) have been calculated, the approach used by Denison (1972) of weighting these in the ratio of three to one is adopted by Harris and Drinkwater (2000) to obtain net stock figures which incorporate the desired pattern of deterioration, at first slow, followed by more rapid deterioration. Other authors have advocated different deterioration and/or depreciation patterns. For instance, Oulton and O’Mahony (1994) use an exponential rate of depreciation (which is equivalent to exponential deterioration) together with the ONS length of life assumptions. They justify the use of the exponential distribution with reference to Hulten and Wykoff (1981), in which the prices of second-hand assets were found to decline geometrically with an asset’s age in the US.[[10]](#footnote-10) Oulton and O’Mahony (1994) nevertheless argue that the rise in efficiency of new assets (or equivalently the increased obsolescence of older ones) leads to an overall geometrically declining deterioration pattern even though they accept that for plant and machinery, physical deterioration is unlikely to follow such a pattern (the ‘light bulb’ or one-hoss shay pattern being more likely). Advocates of the exponential distribution usually favour its use for reasons other than just to take account of obsolescence; e.g. because its is consistent with the economic accounts definition of the capital stock; it is implied by second-hand US capital price data; and it also incorporates various factors that can lead to a wide-band distribution of retirements in practice (e.g. the loss of assets because of fires, explosions, pre-mature scrapping). However, the latter implies that a number of assets are pre-maturely scrapped, destroyed or ‘lost’. That is, many assets have to be short-lived in order to produce an exponential deterioration rate, especially if pre-mature scrapping because of closure is accounted for separately (as is the case when using the ARD).

A simple example demonstrates the implications of using the exponential distribution. If an asset has an average service life of 20 years, then after 5 years it will typically offer only 33% of the capital services that would be available from a new asset. After 10 years, only 11% of the asset’s initial services are available, falling to 3% in year 15. In other words, when deterioration is assumed to be very high in the first few years after installation, a new asset is three times more productive than an asset that is one-quarter of the way through its life. This implies a far higher rate of capital-embodied technical progress than those typically found in the empirical literature (e.g. Kalt (1978) estimated capital-embodied technical progress at 0.01% per annum for the USA over the 1929–1967 period, while Hulten (1992), reports a figure of 0.3% per annum for 1949–1983).

Thus, when using the ARD, we prefer to calculate a perpetual inventory measure of the capital stock that utilises ONS length-of-life assumptions and a deterioration rate that is at first slow and advances more rapidly as an asset ages.

In terms of the data available from the ARD, we have plant-level real investment data (which includes pre-production investment for most years) on expenditure on plant and machinery, starting in 1970 for manufacturing and 1997 for services.[[11]](#footnote-11) This is used to obtain capital stock estimates at the plant level, which are then linked to a benchmark estimate based on 1969 for manufacturing and 1996 for services. That is, annual 3-digit SIC real gross investment data dating from 1948 was used to calculate a benchmark capital stock for each industry, and this was then apportioned to each plant existing in the year following the benchmark year. Details on the methods used for manufacturing are set out in Harris and Drinkwater (2000) and Harris (2005b); a similar approach was used for services and based on the length-of-life of plant and machinery in each service sector as estimated by the ONS.

For manufacturing by 1997 (the first year used in the study), capital stocks are almost entirely based on ARD plant level data; for services initial estimates for plant in existence before 1997 are dominated by apportioned industry estimates (although the importance of the latter diminishes over time). Of course the capital stocks for plants that opened in 1997 (and after) are entirely based on ARD plant level data.

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1. A general overview was provided by Robjohns (2006) (see <http://www.ons.gov.uk/ons/rel/elmr/economic-trends--discontinued-/no--630--may-2006/ard2--the-new-annual-respondents-database.pdf>). For a detailed description of theARD and discussion of several issues concerning its appropriate use, see especially Harris (2002, 2005a). The counterpart to the ARD in the US is the Longitudinal Research Database – or LRD - for US manufacturing provided through the US Bureau of Census. [↑](#footnote-ref-1)
2. Such as sales, purchases of inputs, investment undertaken, as well as the characteristics of respondents in terms of ownership and location. Capital stock estimates at the plant level have been computed (and updated) based on Harris and Drinkwater (2000) – see below for more details. [↑](#footnote-ref-2)
3. Data also need to be weighted because of the issue of endogenous sampling (one of the variables used in the production function – employment) is used to select the sample. This issue, and its importance, is explained in the appendix to Harris (2002). [↑](#footnote-ref-3)
4. See <http://www.ons.gov.uk/ons/about-ons/business-transparency/freedom-of-information/what-can-i-request/virtual-microdata-laboratory--vml-/index.html>. [↑](#footnote-ref-4)
5. Since summer 2011, access has also been granted through the Secure Data Service – details are provided at: <http://securedata.data-archive.ac.uk/>. [↑](#footnote-ref-5)
6. For a detailed description of the ARD and discussion of several issues concerning its appropriate use, see Oulton (1997), Griffith (1999), and Harris (2002, 2005a). [↑](#footnote-ref-6)
7. We have experimented with different agglomeration and diversification measures (but note unlike the literature covered in Kominers, 2008, we are not measuring whether an industry is agglomerated spatially by using an aggregated *industrial* agglomeration measure; rather we are trying to capture MAR-spillovers by measuring the percentage of output located in each local authority district for each 5-digit industry). With regard to agglomeration Devereux et al. (2007) used a variable measuring the number of plants in each industry in each county-year, which is significantly correlated with our measure but which we believe to be inferior (as it ignores plant size and thus the relative amount of output produced by an industry at a particular location). For diversification, there are also several different approaches, from the simple measure used by Baldwin et al. (2010) of the population size of an area, to using a locational Herfindahl index, calculated using employment shares for disaggregated industries for each area in each year, excluding a plant’s own industry (e.g. Devereux et al., 2007). These two alternative measures of diversification were strongly correlated with the one used here; the correlation with population density (we prefer this to actual population numbers to allow for the spatial size of the district) is 0.55, and with the locational Herfindahl index we had an overall correlation of 0.67 (it differs by year, but never falls below 0.48). We also believe our diversification index is ‘better’ since using 5-digit industries and 650 local authorities, the mean of the locational H-index (subtracted from 1) was 0.98 with a standard deviation of 0.012 (i.e., most local authorities are very disaggregated); our measure has a mean of 55.3 (standard deviation of 8.1). [↑](#footnote-ref-7)
8. Note obsolescence not only affects the length of life of an asset but it also makes older vintages less productive than newer ones. Thus, when obsolescence is high during periods of more rapid technical change, the usual approach with the perpetual inventory model is to lower the length of life of assets. [↑](#footnote-ref-8)
9. The gross stock does not deteriorate; while net stocks are based on straight-line deterioration. [↑](#footnote-ref-9)
10. Such data are not available for the UK, and we would argue that it would not necessarily reflect accurately both wear and tear and obsolescence. This is because second-hand asset price data reflect the impact of depreciation and not just deterioration (the former taking account of deterioration over the entire life of an asset), and it has been argued that using used-asset market price data as an indicator of in-use asset values is problematic if the relatively small number of assets resold in second-hand markets are not of as ‘good quality’ as those assets that remain with the plants that undertook the initial investment. [↑](#footnote-ref-10)
11. Full details on how plant level data for every year the plant is in operation is obtained is set out in Harris (2005b). [↑](#footnote-ref-11)