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TABEL 1. LABOUR PRODUCTIVITY GROWTH WHOLE ECONOMY 1998-2019

	$\Delta \ln (V/H)$	$\sum_i \bar{\omega}_i \Delta \ln (V_i/H_i)$	R
	(1)	(2)	(3)
# Whole Economy (20 Industries)	1.040%	0.792%	0.248%
# Whole Economy (Industry L excluded)	0.818%	1.020%	-0.202%
# Whole Economy (Industries O,P,Q excluded)	0.978%	0.810%	0.168%

Notes: Data are average growth rates per year for 1998-2019 based on Eq. (8). Industry L represents real estate activities, O represents public administration, P represents Education, and Q represents human health.

TABEL 2. LABOUR PRODUCTIVITY GROWTH WHOLE ECONOMY $\Delta \ln (V/H)$, $\sum_i \bar{\omega}_i \Delta \ln (V_i/H_i)$, R ; 1998-2008 VS. 2008-2019

	$\Delta \ln (V/H)$	$\sum_i \bar{\omega}_i \Delta \ln (V_i/H_i)$	R
	(1)	(2)	(3)
# Whole Economy (20 Industries)			
1998-2008	1.632%	1.222%	0.409%
2008-2019	0.350%	0.263%	0.086%
# Whole Economy (Industry L excluded)			
1998-2008	1.502%	1.738%	-0.236%
2008-2019	0.048%	0.216%	-0.168%
# Whole Economy (Industry O,P,Q excluded)			
1998-2008	1.719%	1.316%	0.403%
2008-2019	0.179%	0.233%	-0.053%

Notes: Data are average growth rates per year for 1998-2019 based on Eq. (8). Industry L represents real estate activities, O represents public administration, P represents Education, and Q represents human health.

TABLE 3. LABOUR PRODUCTIVITY GROWTH BY SECTOR

	$\Delta \ln (V_i/H_i)$		
	1998-2019 (1)	1998-2008 (2)	2008-2019 (3)
<i>Industry Breakdown A-T</i>			
A Agriculture	3.625%	8.112%	0.814%
B Mining and quarrying	-5.687%	-5.773%	-6.098%
C Manufacturing	3.845%	6.522%	1.311%
D Electricity, gas, steam and air conditioning supply	0.193%	1.152%	-1.275%
E Water supply; sewerage, waste management and remediation activities	-2.345%	-1.959%	-2.870%
F Construction	-0.394%	-1.233%	-0.070%
G Wholesale and retail trade and repair of motor vehicles and motorcycles	0.498%	0.449%	0.144%
H Transportation and storage	-0.002%	1.271%	-1.100%
I Accommodation and food service activities	-0.282%	-0.245%	-0.330%
J Information and communication	8.260%	11.460%	5.474%
K Financial and insurance activities	0.971%	3.005%	-1.200%
L Real estate activities	-1.663%	-3.808%	0.399%
M Professional, scientific and technical activities	0.158%	1.105%	-0.776%
N Administrative and support service activities	0.062%	-1.358%	1.150%
O Public administration and defence; compulsory social security	1.656%	0.991%	2.388%
P Education	-1.406%	-2.557%	-0.484%
Q Human health and social work activities	-0.292%	0.042%	-0.849%
R Arts, entertainment and recreation	-0.301%	0.635%	-1.232%
S Other service activities	-0.926%	-2.307%	0.253%
T Activities of households as employers	1.116%	-3.121%	4.806%

Notes: Data are average growth rates per year for 1998-2019.

Source: Authors' calculations.

TABLE 4. WITHIN LABOUR PRODUCTIVITY GROWTH $\bar{\omega}_j \Delta \ln(V_j/H_j)$ IN MANUFACTURING AND IT

	$\bar{\omega}_j \Delta \ln(V_j/H_j)$			$\Delta(\bar{\omega}_j \Delta \ln(V_j/H_j))$
	98-19 (1)	98-08 (2)	08-19 (3)	Slowdown (3)-(2)
<i>Manufacturing Sub-sectors</i>				
Food products, beverages and tobacco	0.272%	0.530 %	0.0487%	-0.4813
Textiles	0.373%	0.528 %	0.193%	-0.335
Wood and paper products	0.391%	0.595 %	0.267%	-0.328
Coke and refined petroleum products	0.021%	-0.048 %	0.083%	0.131
Chemicals and chemical products	0.369%	0.389%	0.384%	-0.005
Basic pharmaceutical products	0.108%	0.618 %	-0.188%	-0.811
Rubber and plastics products	0.271%	0.349 %	0.145%	-0.204
Basic metals and fabricated metal products	0.234%	0.306%	0.204%	-0.102
Computer, electronic and optical products	0.546%	0.850 %	0.263%	-0.587
Electrical equipment	0.142%	0.280 %	0.046%	-0.234
Machinery and equipment n.e.c.	0.286%	0.620 %	-0.117%	-0.737
Transport equipment	0.3718%	0.879 %	-0.138%	-1.017
Other manufacturing; repair	0.277%	0.459 %	0.069%	-0.390
<i>Information and Communication Sub-sectors</i>				
Publishing activities	0.650%	1.271%	0.065%	-1.206
Motion picture, video and TV programme	0.147%	0.349%	0.004%	-0.345
Programming and broadcasting activities	-0.057%	0.129%	0.065%	-0.064
Telecommunications	7.174%	8.313%	5.869%	-2.444
Computer programming	0.707%	1.643%	-0.316%	-1.959
Information service activities	-0.162%	-0.041%	-0.400%	-0.359

Source: Authors' calculations.

TABLE 5. LABOUR PRODUCTIVITY GROWTH WHOLE ECONOMY 1998-2019 USING TORNQVIST METHOD

	$\Delta \ln(V/H)$	$\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)$	R
	(1)	(2)	(3)
1998-2019			
# Whole Economy	1.040%	0.792%	0.248%
1998-2008			
# Whole Economy	1.632%	1.223%	0.409%
2008-2019			
# Whole Economy	0.350%	0.263%	0.086%
# Whole Economy Implied Productivity Gap	-1.282 p.p.	-0.96 p.p	-0.323 p.p

Notes: Data are average growth rates per year for 1998-2019 based on Eq. (8).

TABLE 6. LABOUR PRODUCTIVITY GROWTH WHOLE ECONOMY 1998-2019 USING OLLEY AND PAKES (1996)

	ϕ_t	$\bar{\rho}_t$	$cov(\rho_{it}, w_i)$
	(1)	(2)	(3)
1998-2019			
# Whole Economy	0.793%	0.416%	0.377%
1998-2008			
# Whole Economy	1.224%	0.689%	0.535%
2008-2019			
# Whole Economy	0.265%	0.079%	0.186%
# Whole Economy Implied Productivity Gap	-0.959 p.p.	-0.610 p.p	-0.349 p.p

Notes: Data are average growth rates per year for 1998-2019 based on Eqs. (12) and (13).

TABLE 7. ONS FIRM-LEVEL AGGREGATE PRODUCTIVITY VS. TORNQVIST SECTORAL-LEVEL AGGREGATE PRODUCTIVITY GROWTH WHOLE ECONOMY 1999-2007

	$\Delta \ln(V/H)$	$\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)$	R
	(1)	(2)	(3)
1999-2007			
# Tornqvist Eq. (8)	1.833%	1.355%	0.478%
# ONS Firm-level Aggregation	2.220%	1.420%	0.800%

Notes: Data are average growth rates per year for each period based on Eq. (8) and ONS calculations. We select the period 1999-2007 in order to be consistent with ONS report. Of 1.420% (the within-industry growth component from the firm-level aggregation), about 0.17% is attributed to small firms within industry contributes, and about 0.46% is attributed to the Within growth from net entry and exit inside industry based on the firm-level aggregation. We also find similar results for the post-period.

Source: ONS Experimental statistics on firm-level capital stocks, total factor productivity, and aggregate productivity decompositions based on the Annual Business Survey <https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/firmleveltotalfactorproductivitymeasuresfromtheannualbusinesssurveyuk1998to2019/august2022>

TABLE 8. NON-LINEAR SECTORAL-LEVEL AGGREGATE PRODUCTIVITY GROWTH WHOLE ECONOMY

	$\Delta \ln(V/H)$	$\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)$	$\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)^2$	R
	(1)	(2)	(3)	(4)
1998-2019				
# Linear	1.040%	0.792%	-	0.248%
# Non-linear	1.040%	0.792%	0.306%	-0.058%

Notes: Data are average growth rates per year for each period based on Eq. (8) and an inclusion of a quadric term $\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)^2$.

TABLE 9. UK GROWTH COMPONENTS and SECTORAL LEVEL VOLATILITY

	$\Delta \ln(V/H)$	$\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)$	R
	(1)	(2)	(3)
\hat{a} (Constant)	-1.379** (0.687)	-1.060 (0.761)	-0.318 (0.397)
\hat{b} (Sectoral Level Volatility)	1.403*** (0.369)	1.095*** (0.409)	0.308 (0.213)
R^2 (Fraction explained)	0.431	0.235	0.051

Notes: Regression of each labour productivity growth component on sectoral fundamental volatility: $y_t = a + b\sigma_{ft} + \eta_t$, where y_t refers to $\Delta \ln(V/H)$, $\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)$, and R .

TABLE 10. LABOUR PRODUCTIVITY GROWTH WHOLE ECONOMY 1998-2019

	$g(X_t)$	$\sum_i s_{t-1}^i g(X_t^i)$	$\sum_i s_{t-1}^i g(p_t^i)$	$\sum_i s_{t-1}^i g(l_t^i)$	Int. Terms
	Total	Within	Price	Labour	
	(1)	(2)	(3)	(4)	(5)
Panel A: Standard GEAD					
# Whole Economy	1.125	0.369	-	0.756	-
Panel B: Extension of GEAD					
# Whole Economy	1.125	0.369	0.460	0.406	-0.110

Notes: Data are average growth rates per year for 1998-2019 based on Eq. (1). Industry L is real estate activities, O is public administration, P is Education, and Q is human health. Columns (2) to (5) sum to column (1) for each row, subject to rounding. Column (5) reports the sum of the interaction terms; these are $-0.037 - 0.086 + 0.013 - 0.0002$ for 20 industries, and $-0.039 - 0.077 + 0.014 - 0.0001$ for 19 industries, and $-0.043 - 0.097 + 0.014 - 0.0001$ for 17 industries.

TABLE 11. GROWTH IN WHOLE ECONOMY $\Delta \ln(V/H)$, $\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)$, R , 1998-2015

	$\Delta \ln(V/H)$	$\sum_i \bar{\omega}_i \Delta \ln(V_i/H_i)$	R
	(1)	(2)	(3)
Whole Economy (20 sectors)			
UK	1.098%	0.778%	0.319%
US	1.549%	1.709%	-0.160%
Japan	0.616%	0.537%	0.079%
France	1.068%	1.150%	-0.081%
Belgium	0.781%	0.619%	0.161%
Netherland	1.242%	1.362%	-0.120%
Denmark	1.113%	1.009%	0.103%
Germany	0.888%	0.892%	-0.003%
Italy	0.060%	-0.065%	0.125%
Portugal	0.696%	0.625%	0.071%
Austria	1.308%	1.328%	-0.019%
Greece	0.127%	-0.576%	0.703%
Sweden	1.522%	1.626%	-0.103%
Whole Economy (Industry L Excluded)			
UK	0.863%	1.057%	-0.193%
US	1.504%	1.746%	-0.242%
Japan	0.556%	0.662%	-0.106%
France	1.067%	1.116%	-0.048%
Belgium	0.819%	0.822%	-0.003%
Netherland	1.262%	1.412%	-0.149%
Denmark	1.079%	1.011%	0.068%
Germany	0.912%	1.038%	-0.125%
Italy	0.005%	-0.062%	0.068%
Portugal	0.697%	0.641%	0.056%
Austria	1.297%	1.325%	-0.028%
Greece	-0.347%	-0.212%	-0.134%
Sweden	1.639%	1.776%	-0.137%

Notes: Data are average growth rates per year for 1998-2015. Data are decomposition of labour productivity in per hour terms based on Eq. (8). We remove industries public administration, defence, education, human health and social work activities, arts, entertainment, recreation; other services and service activities; and activities of extraterritorial organizations and bodies from our aggregation exercise. Industries L represents real estate activities

Source: ONS, EU KLEMS National Account Data files, and authors' calculations.

TABLE 12. LABOUR PRODUCTIVITY GROWTH POST-2008

	Within industry labour productivity growth $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$					
	UK 98-07 vs. 08-19			Worldwide 98-07 vs. 08-15		
	(1)	(2)	(3)	(4)	(5)	(6)
MIT	9.420*** (1.997)		4.112*** (0.364)	4.169*** (0.479)		
Post	-0.002 (1.421)	-0.002 (1.419)	-0.0676 (0.598)	-0.233 (0.503)	-0.245 (0.504)	-0.233 (0.503)
MIT*Post	-5.699*** (0.823)	-5.699*** (0.822)	-2.227*** (0.481)	-1.975*** (0.598)	-1.967*** (0.599)	-2.268*** (0.605)
Constant	1.932 (1.658)	2.874* (1.420)	0.228 (0.375)	0.364 (0.352)	0.823** (0.321)	0.823** (0.320)
R-squared	0.104	0.052	0.018	0.037	0.017	0.018
Number of countries	1	1	21	13	13	13
Number of industries	20	20	19	19	19	19
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	No	No	No
Country-Industry FE	No	No	No	No	Yes	Yes
Regroup DK	No	No	No	No	No	Yes
Observations	440	440	8,034	3,952	3,952	3,952

Notes: This table reports the estimates based on the model specification in Eq. (14). The dependent variable is $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$. Columns (1), (3), and (4) are OLS; columns (2), (5), and (6) are the two-way fixed-effect estimates. Column 6 regroups manufacturing and information industries into control for Denmark since the slowdown in Denmark was not mainly caused by the two industries. See Figure AIII 1 in Appendix III for more details. Columns (3)-(6) combine “professional, scientific and technical activities” and “administrative and support service activities” into one industry, given by the EU KLEMS dataset. Robust standard errors are clustered at industry and country-industry pair, respectively, reported in parentheses. *, **, and *** represent significance levels at the 10%, 5% and 1% respectively.

TABLE 13. LABOUR PRODUCTIVITY GROWTH POST-2008 (MANUFACTURING vs OTHERS)

	Within industry labour productivity growth $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$					
	UK 98-07 vs. 08-19			Worldwide 98-07 vs. 08-15		
	(1)	(2)	(3)	(4)	(5)	(6)
M	6.910*** (0.702)		3.635*** (0.507)	3.219*** (0.540)		
Post	0.348 (1.442)	0.348 (1.440)	-0.0910 (0.618)	-0.348 (0.503)	-0.361 (0.504)	-0.355 (0.502)
M*Post	-5.489*** (0.810)	-5.489*** (0.809)	-1.897*** (0.499)	-1.751** (0.676)	-1.743** (0.676)	-1.998*** (0.679)
Constant	1.742 (1.715)	2.105 (1.482)	0.249 (0.387)	0.377 (0.359)	0.566* (0.330)	0.566* (0.329)
R-squared	0.052	0.042	0.013	0.021	0.015	0.015
Number of countries	1	1	21	13	13	13
Number of industries	19	19	18	18	18	18
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	No	No	No
Country-Industry FE	No	No	No	No	Yes	Yes
Regroup DK	No	No	No	No	No	Yes
Observations	418	418	7,614	3,736	3,736	3,736

Notes: This table reports the estimates based on the model specification in Eq. (14). The dependent variable is $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$. Columns (1), (3), and (4) are OLS; columns (2), (5), and (6) are the two-way fixed-effect estimates. Column 6 regroups manufacturing and information industries into control for Denmark since the slowdown in Denmark was not mainly caused by the two industries. See Figure AIII 1 in Appendix III for more details. Columns (3)-(6) combine “professional, scientific and technical activities” and “administrative and support service activities” into one industry, given by the EU KLEMS dataset. Robust standard errors are clustered at industry and country-industry pair, respectively, reported in parentheses. *, **, and *** represent significance levels at the 10%, 5% and 1% respectively.

TABLE 14. LABOUR PRODUCTIVITY GROWTH POST-2008 (ICT vs OTHERS)

	Within industry labour productivity growth $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$					
	UK 98-07 vs. 08-19			Worldwide 98-07 vs. 08-15		
	(1)	(2)	(3)	(4)	(5)	(6)
IT	11.93*** (0.702)		4.590*** (0.446)	5.120*** (0.642)		
Post	-0.206 (1.475)	-0.206 (1.473)	-0.0695 (0.626)	-0.247 (0.523)	-0.260 (0.524)	-0.252 (0.524)
IT*Post	-5.910*** (0.810)	-5.910*** (0.809)	-2.557*** (0.768)	-2.199** (0.913)	-2.191** (0.913)	-2.526*** (0.927)
Constant	2.217 (1.700)	2.845* (1.464)	0.242 (0.391)	0.433 (0.366)	0.733** (0.337)	0.733** (0.337)
R-squared	0.100	0.046	0.014	0.032	0.014	0.015
Number of countries	1	1	21	13	13	13
Number of industries	19	19	18	18	18	18
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	Yes	No	No	No	No
Country-Industry FE	No	No	No	No	Yes	Yes
Regroup DK	No	No	No	No	No	Yes
Observations	418	418	7,614	3,736	3,736	3,736

Notes: This table reports the estimates based on the model specification in Eq. (14). The dependent variable is $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$. Columns (1), (3), and (4) are OLS; columns (2), (5), and (6) are the two-way fixed-effect estimates. Column 6 regroups manufacturing and information industries into control for Denmark since the slowdown in Denmark was not mainly caused by the two industries. See Figure AIII 1 in Appendix III for more details. Columns (3)-(6) combine “professional, scientific and technical activities” and “administrative and support service activities” into one industry, given by the EU KLEMS dataset. Robust standard errors are clustered at industry and country-industry pair, respectively, reported in parentheses. *, **, and *** represent significance levels at the 10%, 5% and 1% respectively.

TABLE 15. WITHIN COMPONENT $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$ VARIANCE DECOMPOSITION by UK INDUSTRY

	UK % (1)
A Agriculture	2.310
B Mining and quarrying	1.896
C Manufacturing	0.156
D Electricity, gas, steam and air conditioning supply	1.951
E Water supply; sewerage, waste management and remediation activities	0.328
F Construction	0.240
G Wholesale and retail trade and repair of motor vehicles and motorcycles	0.187
H Transportation and storage	0.274
I Accommodation and food service activities	0.154
J Information and communication	0.277
K Financial and insurance activities	0.415
L Real estate activities	0.163
M Professional, scientific and technical activities	0.096
N Administrative and support service activities	0.156
O Public administration and defence; compulsory social security	0.195
P Education	0.102
Q Human health and social work activities	0.083
R Arts, entertainment and recreation	0.290
S Other service activities	0.189
T Activities of households as employers	2.048

Notes: Data are variance of within component $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$ obtained through the specification $within_{it} = \alpha + Treat + Post + Treat * Post + F_i + F_t + \varepsilon_{it}$, where F_i and F_t are the industry and time fixed-effects, and $within_{it}$ refers to the within component $\sum_{j \in i} \bar{\omega}_j \Delta \ln(V_j/H_j)$ through 1998-2019. We extract the residual from the regression and then collect the variance afterward.

Source: Authors' calculations.