

Productivity in Ireland and Northern Ireland

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VENUE

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- **“Productivity isn’t everything, but in the long run it is almost everything. A country’s ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.” Krugman (1994)**
- Key driver of economic growth and living standards
 - Productivity in Northern Ireland lags the UK average (Johnston & Stewart, 2019)
 - Ireland often classified as a high productivity economy but FDI-related distortions complicate the measurement of Irish economic activity (Barry and Bergin, 2019)
- Limited comparative research on productivity, North and South
 - Existing evidence points to a substantial productivity gap that favours Ireland (FitzGerald and Morgenroth 2019; McGuinness and Bergin, 2020; Bergin and McGuinness, 2021, MacFlynn, 2016)
 - Suggested explanations: gaps in educational attainment, differences in FDI intensity, differences in export intensity.....

Research Project & Methods

- Examine productivity at a sectoral level in Ireland and Northern Ireland over time
- Formally model the determinants of productivity in Ireland and Northern Ireland to identify the key factors that drive productivity in each region
 - Fixed effects specification factors out biases related to unobserved factors that remain relatively constant over time that may impact productivity (e.g. infrastructural assets such as airports and ports)
- Carryout decomposition analysis and a simulation exercise
- Many of the drivers of productivity are potentially responsive to policy

Database Construction

- Key aspect of project is sectoral database construction
- Need granular data on productivity (at sectoral level) that is both consistent across jurisdictions and over time
- Measure of productivity: Output per worker (Gross Value Added per worker)
 - Constructed dataset includes 23 sectors and 23 years (>500 observations)
- Key Data Sources:
 - Ireland: National Accounts (Eurostat and CSO), Labour Force Survey (Eurostat and CSO), Trade data (Eurostat), Gross fixed capital formation (Eurostat)
 - Northern Ireland: Regional Accounts (ONS), Quarterly Employment Survey (NISRA), Workforce Jobs by Industry and Region (ONS), Experimental regional Gross Fixed Capital Formation estimates (ONS)
- Many of the explanatory variables are extracted at a sectoral level from micro level Labour Force Survey data e.g. education composition of the workforce as well as demographic factors related to gender and migration

Ireland: MNE dominated sectors

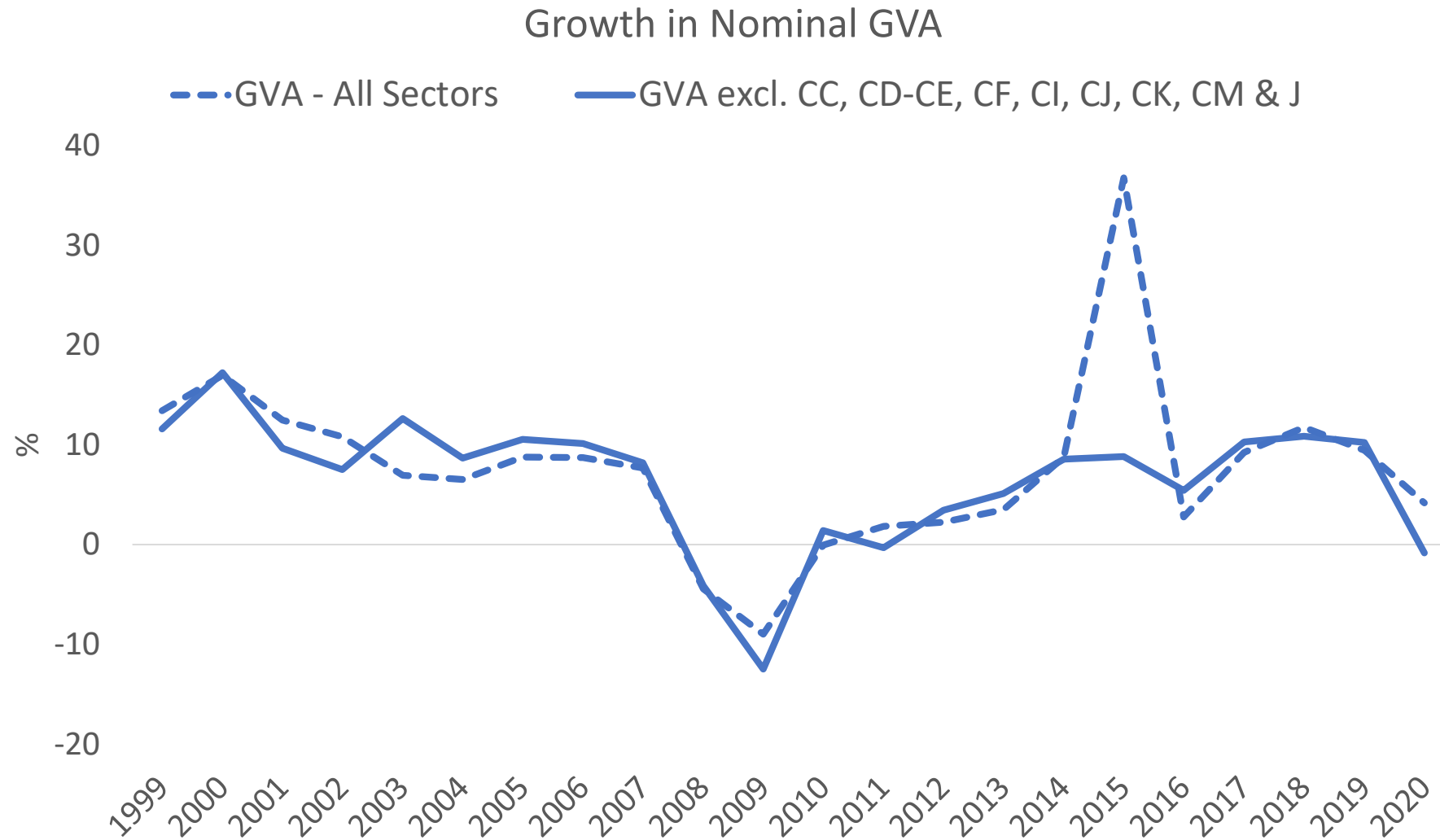
Table 3 Composition of Foreign-owned multinational enterprise dominated sector and Other sectors¹

Description	Nace code
Chemicals and chemical products	20
Software and communications sectors	58-63
Other NACE sectors dominated by Foreign-owned MNEs ² <i>(Reproduction of recorded media, Basic pharmaceutical products and pharmaceutical preparations, Computer, electronic and optical products, Electrical equipment, Medical and dental instruments and supplies)</i>	18.2, 21, 26, 27 and 32.5
Foreign-owned MNE dominated Total	

Exclude sectors CC (wood, paper and printing) CD-CE (chemicals), CF (pharma), CI (Computer, Elec and Optical Products), CJ (Elec. Equip), CM (Other manu.) & J (Info & Comm) from analysis
Sector CK (Machinery & Equipment n.e.c.) is also excluded because it is suppressed (for confidentially reasons) from 2015

**These sectors accounts for 45% of GVA and 10% of employment in 2019 in Ireland;
9% of GVA and 7% of employment in Northern Ireland**

GVA Growth in Ireland



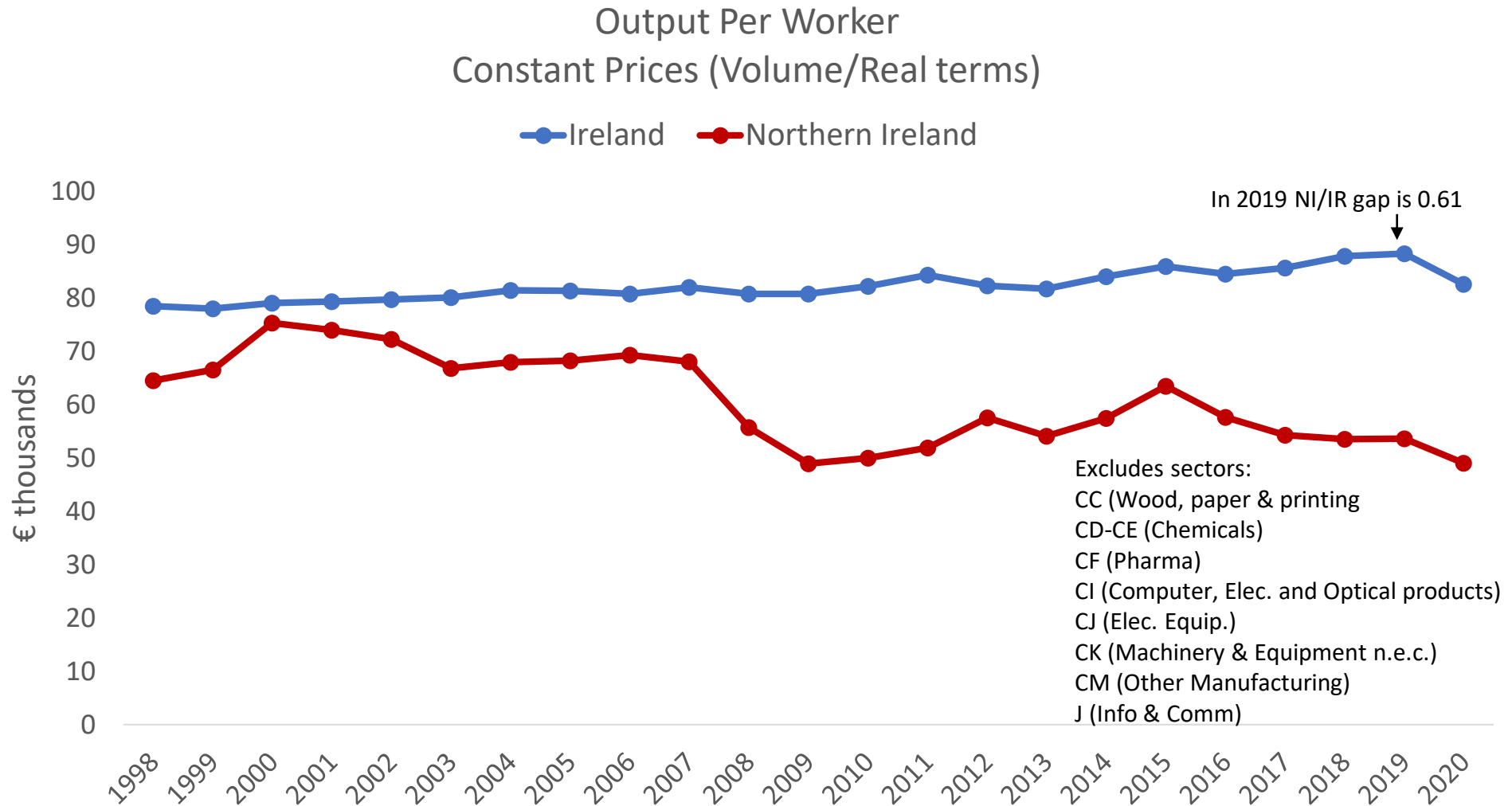
Productivity (Aggregate Data)

Output Per Worker

	Sectors	2019 € thousands	Growth (%) 1998-2020 real
IR	All Sectors	145.8	2.9
NI	All Sectors	55.1	-1.0
IR	Excl. CC, CD-CE, CF, CI, CJ, CK, CM & J	88.2	0.2
NI	Excl. CC, CD-CE, CF, CI, CJ, CK, CM & J	53.6	-1.2

- Excluding sectors that distort Ireland's output data dampens Irish productivity levels
- However gap in productivity levels between Ireland and Northern Ireland is substantial
- Stronger Irish relative growth over time indicates divergence in productivity levels between Ireland and Northern Ireland

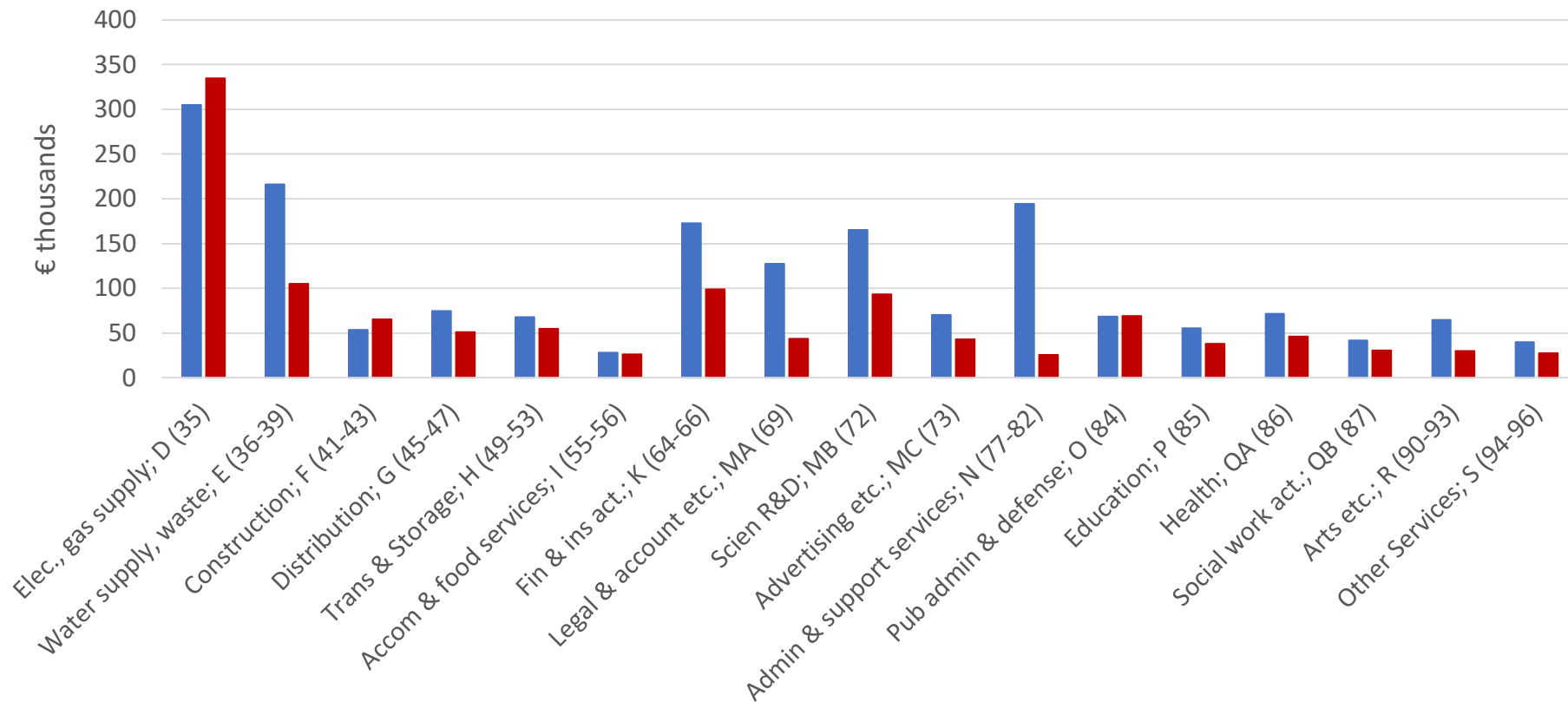
Productivity (Aggregate Data)



Productivity by Sector

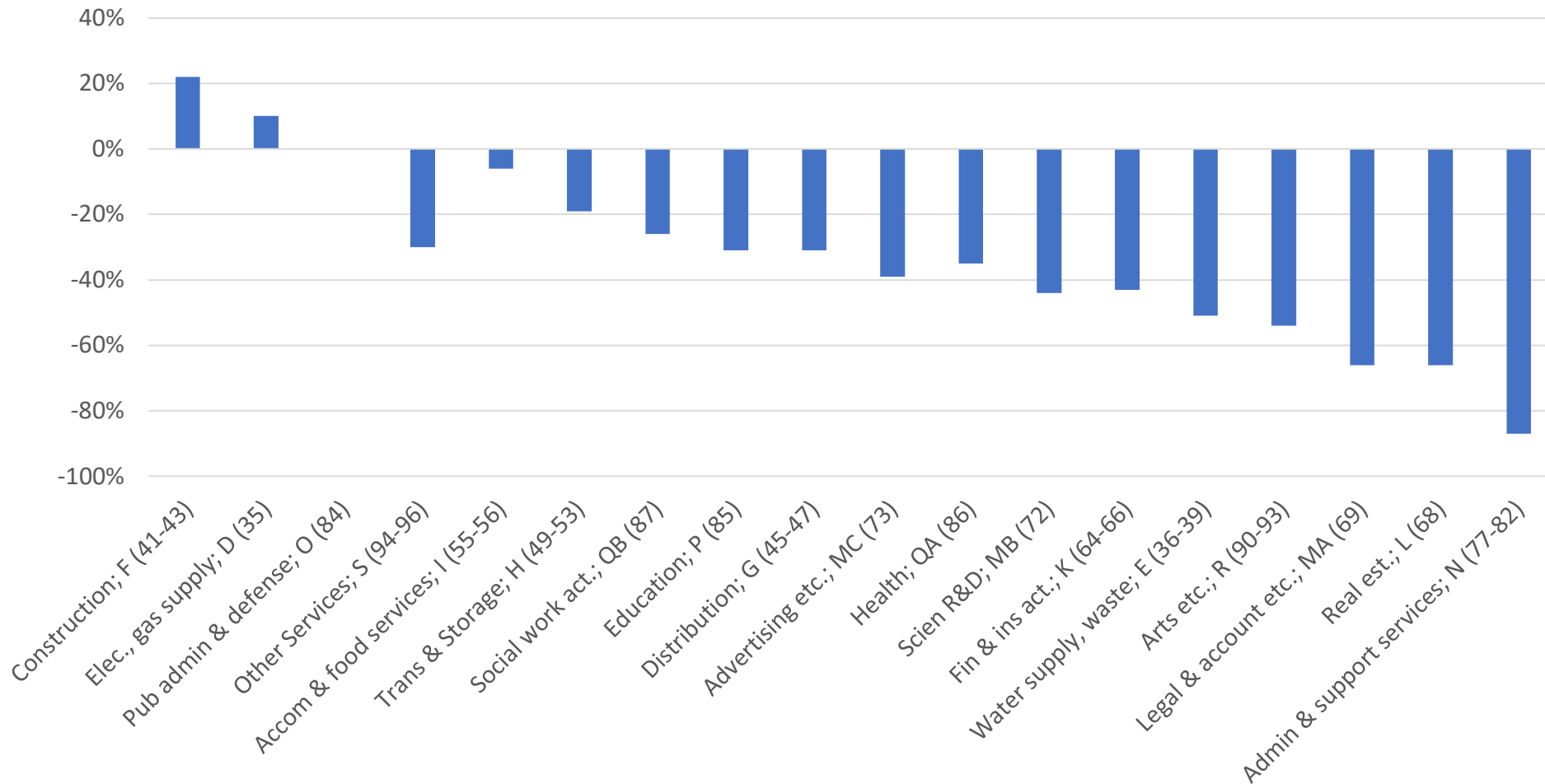
Output per worker
2019 constant prices

■ Ireland ■ Northern Ireland



Productivity Gap by Sector

NI Productivity Gap Relative to Ireland by Sector in 2019 (%), real



Sectoral Productivity Model Ireland (Fixed Effects)

	All Sectors	Exporting Sectors
Constant	2.004***	-1.044
Female share	-0.713	1.497*
Temporary contract share	0.242	1.203
Part-time share	1.303*	0.787
Migrant share	0.674	0.191
Education (reference primary)		
Lower secondary share	0.427	1.318
Upper Secondary education share	1.39***	2.750*
Post-secondary share	1.122**	4.528***
Tertiary share	0.986**	3.317**
Under-employed share	-0.507	1.824**
Overeducated share	-0.087	-0.664
Export sales (logged)		0.119**
Investment (logged)	0.205***	0.176***
N	321	67
R2 Overall	0.3207	0.4159
F statistic	15.81***	6.30***

Notes: ***, ** and * denotes significance at the 1%, 5% and 10% levels.

Sectoral Productivity Model Northern Ireland (Fixed Effects)

	All Sectors	Exporting Sectors
Constant	4.385***	3.568***
Female share	0.107	-0.561
Temporary contract share	0.731	0.010
Part-time share	-0.818**	0.502
Migrant share	-0.504*	0.339
<i>Education (reference primary)</i>		
Lower secondary share	-0.262	-0.057
Upper Secondary education share	0.137	0.692*
Post-secondary share	-0.073	0.231
Tertiary share	-0.565**	0.505
Under-employed share	-0.632	-0.259
Overeducated share	-0.122	0.134
Export sales (logged)		-0.001
Investment (logged)	0.014	0.037
N	314	94
R2 Overall	0.1084	0.0046
F statistic	3.54***	1.05

Notes: ***, ** and * denotes significance at the 1%, 5% and 10% levels.

Model Estimates

- Our econometric model for Ireland performs well, with sectoral productivity **increasing with levels of investment and also the employment share of educated workers**. Productivity is also higher the greater the proportion of part-time workers employed. **We also find that export intensity is also an important factor in driving Irish productivity.**
- Despite using comparable data sources and applying the same estimation methods used for the Ireland model, **we find no evidence of a causal relationship between the range of factors captured (education, investment, exports) in the models and Northern Ireland productivity.**
- Such an outcome raises questions regarding the underlying competitiveness of the Northern Ireland economy and its responsiveness to changes in what are generally considered key policy levers.

Simulation Exercise

- We undertake a simulation exercise to measure the impact on Irish productivity if we assume that it has the same levels of investment and human capital in 2020 that firms in Northern Ireland currently employ. The level of productivity in Ireland would be around 50 per cent lower if Ireland had the same levels of investment and education as Northern Ireland.
- So all of the 40% gap in productivity that we observed between the two regions can be accounted for by differences in educational attainment and investment.
- If the Irish productivity model is re-estimated using Northern Ireland endowment levels, the analysis shows the gap in productivity can be explained by differences in investment and labour market related endowments (specifically the share of workers educated to post-secondary level) between the two regions.

Summary and Conclusions

- Productivity levels in the two regions were broadly equivalent in 2000. Over the period 2001 to 2020, productivity levels in Ireland have trended slightly upwards, while in Northern Ireland productivity levels have been trending downwards.
 - By 2020, productivity per worker was approximately 40 per cent higher in Ireland compared to Northern Ireland.
- Econometric model for Ireland performs well, with sectoral productivity increasing with levels of investment and also the employment share of educated workers. Productivity is also higher the greater the proportion of part-time workers employed. We also find that export intensity is also an important factor in driving Irish productivity.

Summary and Conclusions

- Despite using comparable data sources and the same estimation method, we find no evidence of a relationship between the range of factors captured in the model (education, investment, exports etc) and Northern Ireland productivity.
- No obvious explanations for the absence of a relationship between productivity and factors such as education, investment and export intensity in Northern Ireland.
 - Possible that potential factors explaining this relate to the impact of The Troubles, a relatively closed economy in terms of international trade, peripherality, limited results from regional policy and a historical reliance on public sector employment.
- Our results raise questions regarding the underlying competitiveness of the Northern Ireland economy and its responsiveness to changes in what are generally considered key policy levers.

Summary and Conclusions

- We find that all of the gap in productivity between the two regions can be explained by differences in educational attainment and investment.
- Analysis points to the need to rapidly expand investment and improve skills in Northern Ireland, particularly at the post-secondary level.
- However, our models also suggest that without a comprehensive strategy aimed at improving competitiveness among Northern Ireland firms, the reform of education and skills provision, and increasing investment, in isolation are not guaranteed to enhance Northern Ireland productivity. It may be the case that there are other economic, social and political factors that need to be considered in devising a policy response.