

Research Bulletin 20/4 | Investment Levels in Northern Ireland

Economic Modelling Branch, NISRA

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Summary

Investment is an important component of the economy and highlights an aspect of long-term productive capacity. Investment can take many forms and include expenditure on items such as buildings, transport equipment, machinery and computers.

This article seeks to examine the level of investment within NI and analyse this within a national and international context. It will also attempt to draw out some of the reasons why NI appears to have a relatively low investment rate and, using results from a Computable General Equilibrium (CGE) model, explore some of the implications for Government intervention in this area.

Introduction

Economists will be familiar with the following equation that describes at a high level, the key components of total economic output:

$$Y = C + I + G + (X-M)$$

This equation states that total output (Y) is the sum total of consumption spending e.g. by households, Investment spending e.g. by firms, Government spending as well as Net Exports.

When viewed in this context, Investment represents an important source of demand or income within the economy. However investment is much more important than this, as it contributes to an economy's long term productive capacity through the accumulation of capital, which along with the available human capital is a key determinant of long term economic growth. This expansion of productive capacity is achieved when businesses and governments look to the future and defer current consumption in the expectation that an investment will lead to higher returns and therefore increased consumption in the future.

However does economic growth lead to increased levels of investment or does investment lead to increased economic growth? Although there is no clear cut answer to this question, it is important to bear this in mind when formulating any policy response or when seeking to promote investment and economic growth more generally.

What affects Investment levels?

Investment within the economy represents a broad category of expenditure and consequently there will be a wide variety of factors that influence investment in any one particular item e.g. investment in houses could be driven by population change, planning laws as well as the availability and cost of finance.

However economic theory suggests there are a number of factors that represent the main influence on investment, some of which are summarised as follows:

Interest Rates: This can be thought to relate to both the cost of finance for an investment as well as the expected return from the investment. An investment will generally only go ahead if it is anticipated that it will yield a positive return and outweigh the long term cost of making the investment.

Economic Demand: Often referred to as the "Accelerator Effect", it is thought that an increase in the rate of GDP growth can lead to an upsurge in investment. This is brought about as firms reach full productive capacity and need to invest in order to meet the increased demand. The *expected* level of future output/demand facing firms is also thought to heavily influence investment decisions.

Profitability: Higher profits may encourage firms to invest rather than pay higher returns to shareholders. Higher profits or productivity may also improve business confidence and increase the future expected return on any given investment.

Uncertainty: When businesses have less confidence in the future prospects for their business and wider economy, they will be reluctant to invest as they will be less certain on future returns that can be generated from a particular investment. Conversely when businesses are more confident about future trading prospects they will be more likely to invest.

Government Policy: Governments can make a significant contribution to investment, especially in areas such as infrastructure. However the extent to which this happens often depends on a Government's attitude to public finances/fiscal policy, and the extent to which it wants to intervene within the economy. Taxation policy, especially in relation to capital allowances can also have a big impact on investment levels within an economy.

Culture: The prevailing culture (including a country's political culture) can also influence levels of investment. Certain systems of government e.g. western democracies can have more focus on short term policies that will help them get re-elected, whereas single party governments e.g. China, can focus strategically on the longer term. In addition, some countries seem to have a more prevalent entrepreneurial culture e.g. USA, and seem able to constantly generate some of the world's leading businesses e.g. Apple, Microsoft, Facebook etc. In addition, some countries have a strong consumer culture, whereas others are more willing to save and invest.

How is Investment measured?

Investment levels within an economy are measured using a statistic called Gross Fixed Capital Formation (GFCF). GFCF is a net investment concept used within national accounts, which measures expenditure on non-financial assets from both the public and private sectors. More specifically, it measures the acquisitions less disposals of assets such as buildings, software, transport equipment and machinery used in the production process for more than one yearⁱ. GFCF is an internationally recognised standard that is comparable with other countries and is often recorded as a percentage of GDP.

Statistical Approach of NISRA & ONS

The GFCF data for NI can be sourced from NISRA's Economic Accounts Project that began in 2012. This data, which comprises of both Private and Public sector data, allows for a comparison of GFCF as a percentage of GDP at a UK and international level.

The main source of Private Sector GFCF is the Annual Business Inquiry (ABI) in Northern Ireland and from the Quarterly Acquisitions and Disposals of Capital Assets Survey (QCAS) for the UK. Other surveys used within NI include the DAERA Aggregate Agricultural Accounts which is similar to that used by the Department for Environment, Food and Rural Affairs (DEFRA) within the rest of the UK.

The data retrieved in NI for Private Sector GFCF is split by SUT product level, however for 17 of the SUT products there is not enough information available from the ABI to split the products specifically for NI, therefore the relationship between UK output and GFCF in the UK is used to estimate GFCF for these products.

Central Government data for both NI and UK is sourced from the Online System for Central Accounting and Reporting (OSCAR) database. Local Government data is sourced from the Department of Infrastructure within NI, whereas in the rest of the UK it is supplied by the Ministry of Housing, Communities and Local Government as well as both the Scottish and Welsh Governments.

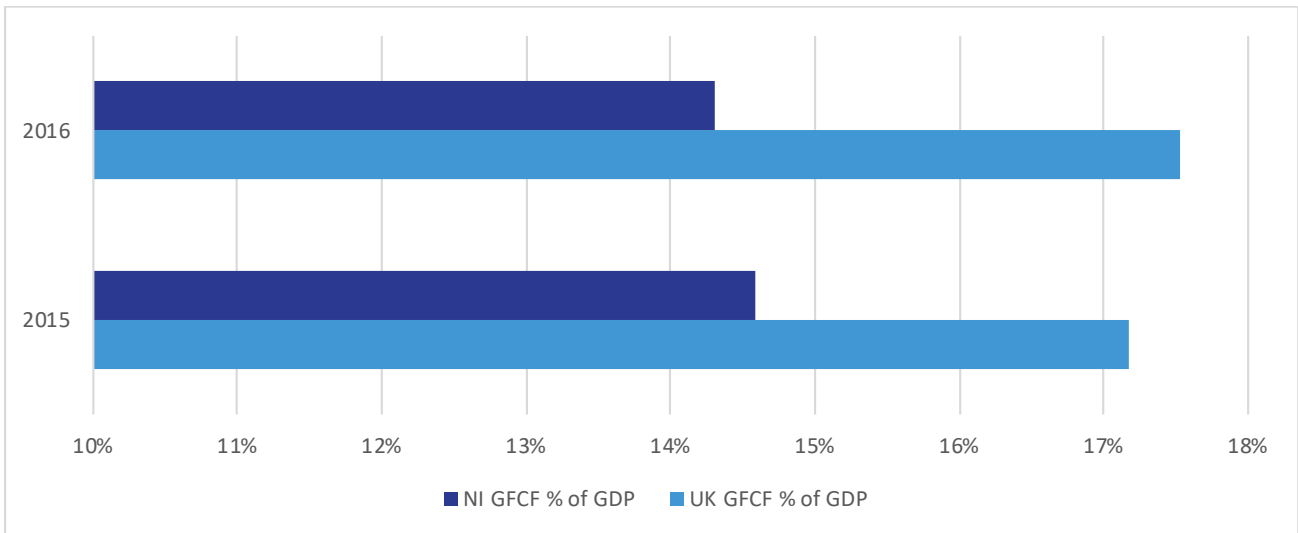
A detailed review of these sources for both the private and public sector suggests there is no material difference in the statistical approach adopted and it is unlikely that any significant difference between the levels of NI and UK GFCF can be accounted for by different statistical approaches adopted by NISRA and ONS.

NI Investment Levels compared with UK

GFCF data for NI is sourced from the Economic Accounts project and due to changes introduced in 2015, only data relating to GFCF from this date can be used to accurately compare and contrast with UK published data.

From Figure 1, it is evident that NI had a lower level of GFCF as a percentage of GDP in both 2015 (15%) and 2016 (14%) than there was in the UK 2015 (17%) and 2016 (18%).

Figure 1: GFCF % of GDP NI vs UK



Source: Supply Use Tables from NISRA and ONS

When comparing the absolute monetary values for the changes in GFCF between 2015 and 2016 in Table 1, it is evident that GFCF in NI fell by just under 1% from £6.289 billion to £6.278 billion. Conversely the UK’s GFCF increased by 5.9% from £324.6 billion to £343.7 billion during this same period.

Another way to analyse these GFCF figures is to relate a monetary value to what NI GFCF would be if it was the same as the UK GFCF percentage. Table 1 indicates that if NI GFCF was at the UK rate for both 2015 & 2016, the increase in NI GFCF would have been £1.115 billion and £1.420 billion respectively, which would represent an average increase of around 20% on current NI investment levels. Although this data only relates to two individual years, it suggests that NI is significantly behind the rest of the UK in relation to investment.

Table 2: GFCF in pounds sterling (£)

Year	UK GFCF (£m)	NI GFCF (£m)	NI GFCF (at UK GFCF rate) (£m)
2015	324,623	6,289	7,404
2016	343,694	6,278	7,698

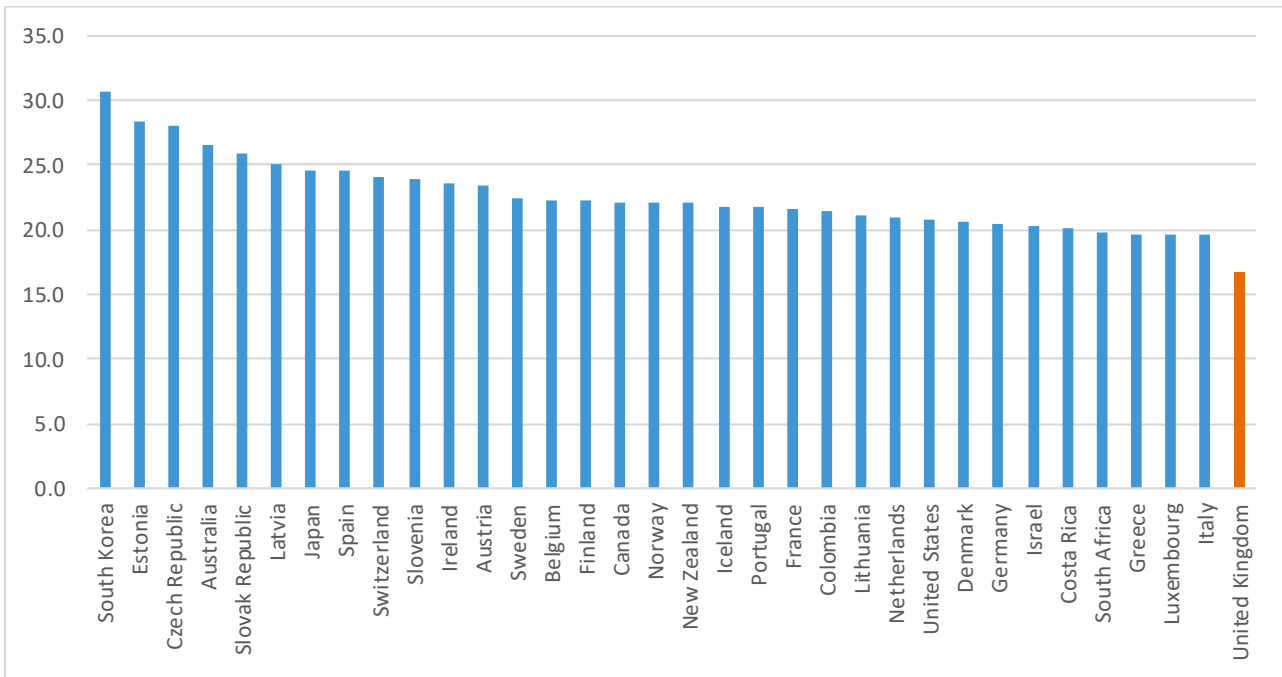
Source: Supply Use Tables from NISRA and ONS, DfE analysis

Note: Consumption at purchasers’ prices (£m)

UK comparison with other International countries

Comparing the UK to other OECD nations over a 20 year period from 1997 to 2017 (figure 2) it is evident that the UK has the lowest GFCF of all the OECD nations listed. Other OECD countries which are less economically advanced such Estonia, Czech Republic and Slovakia have averaged as much as 70% more GFCF than the UK over this period.

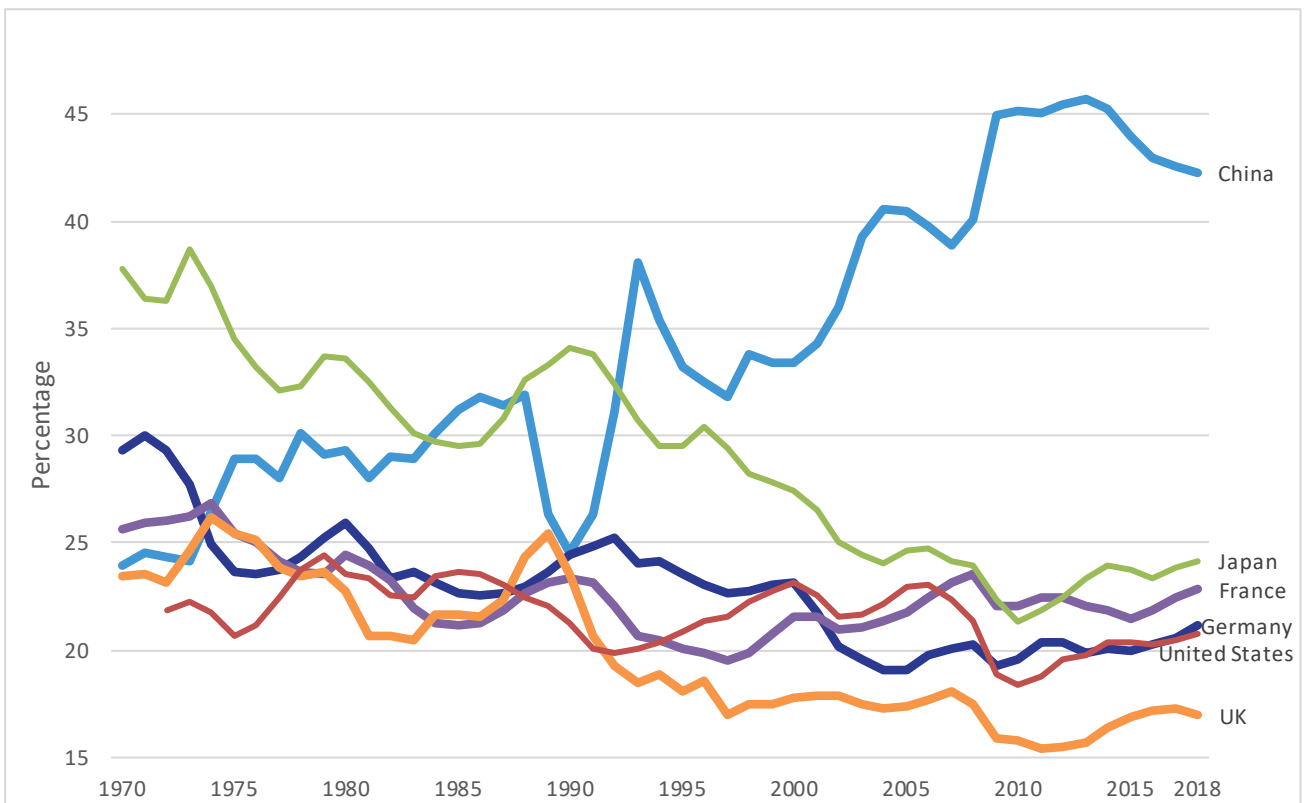
Figure 2: Average GFCF as a percentage of GDP, 1997 to 2017



Source: OECD

However, it is also important to consider the trend in levels of investment over time. Figure 3 compares the UK GFCF as a percentage of GDP with other selected G7 countries as well as China since the 1970s.

Figure 3: GFCF as percentage of GDP

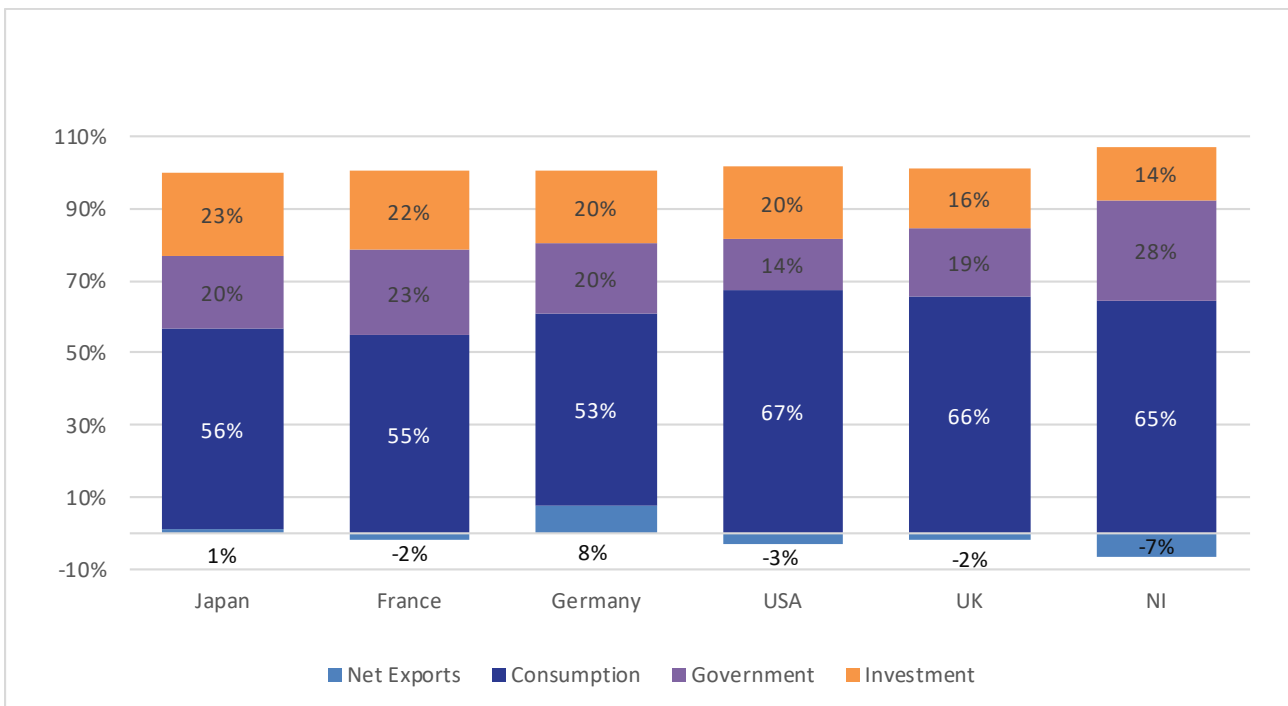


What is clear from this chart is that although the UK consistently has the lowest levels of GFCF, the actual level of investment has been steadily declining since the 1970s. This decline has also been experienced in other comparator countries such as Japan, France and Germany. This is in stark contrast to the experience of China, where investment as a percentage of GDP has steadily risen over time to reach a position where around 40 – 45% of its GDP is made up of GFCF.

Unfortunately, similar data is not available to show the trend in GFCF for NI. However it is reasonable to assume that it has followed a similar trajectory as other western economies and has experienced a decline in investment over time.

This decline in the investment component of total GDP has been observed during a period when these advanced economies have continued to grow. It is therefore necessary to investigate what contributes to demand or total output within each of these countries. Figure 4 below attempts to do this at a very high level and shows that the UK (as well as USA) experiences significantly more consumption spending than other advanced economies at around 66% of GDP compared to around 55% for Japan, France and Germany. Furthermore, whilst the USA experiences similar levels of consumption, it has considerably more investment, albeit with less government spending. It should be noted that the situation represented in Figure 4 for the UK is significantly different from its position in 1970 when 61% of GDP came from consumption and 22% from Investment compared to 16% in 2016.

Figure 4: Breakdown of GDP 2016



The striking features of the NI economy are the significant levels of Government spending (28%) and consumption (65%), coupled with low investment and a considerable trade deficit. This could be interpreted as suggesting that the NI economy would more closely resemble international comparators if it had higher levels of investment as well as more exports.

NI Investment v GB Investment

Sectoral Comparison

In order to gain more insight as to why the NI and the GB economies have different levels of investment, it is useful to look at a sectoral breakdown to identify those sectors of the economy where there are large differences in GFCF.

Figure 5 and 6 outline the top 10 industrial activities that account for the largest share of each individual regions total GFCF as a percentage of GDP:

Figure 5: Top 10 NI Investment Activities

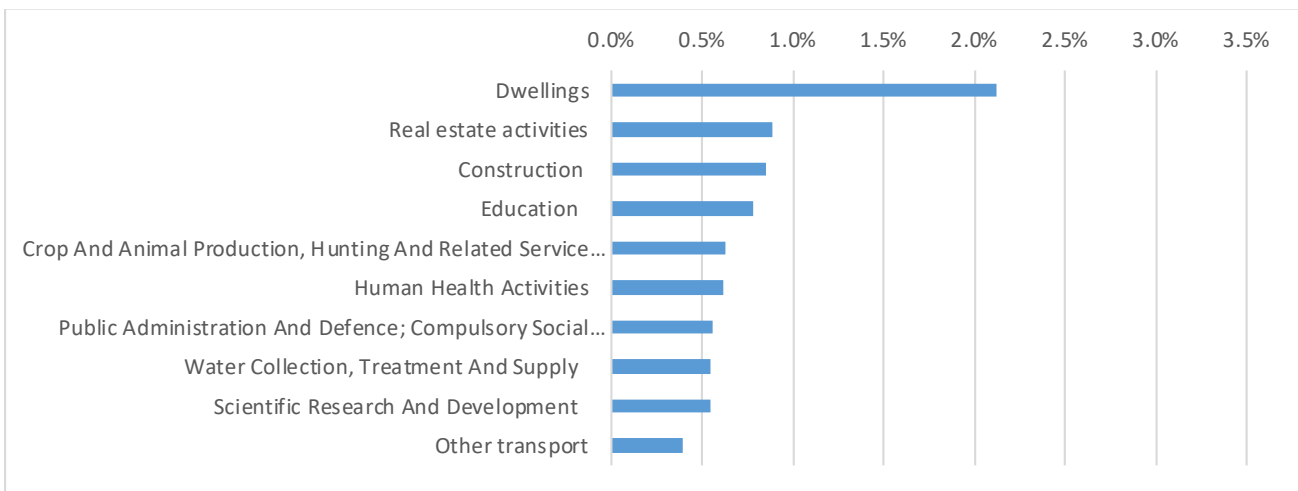
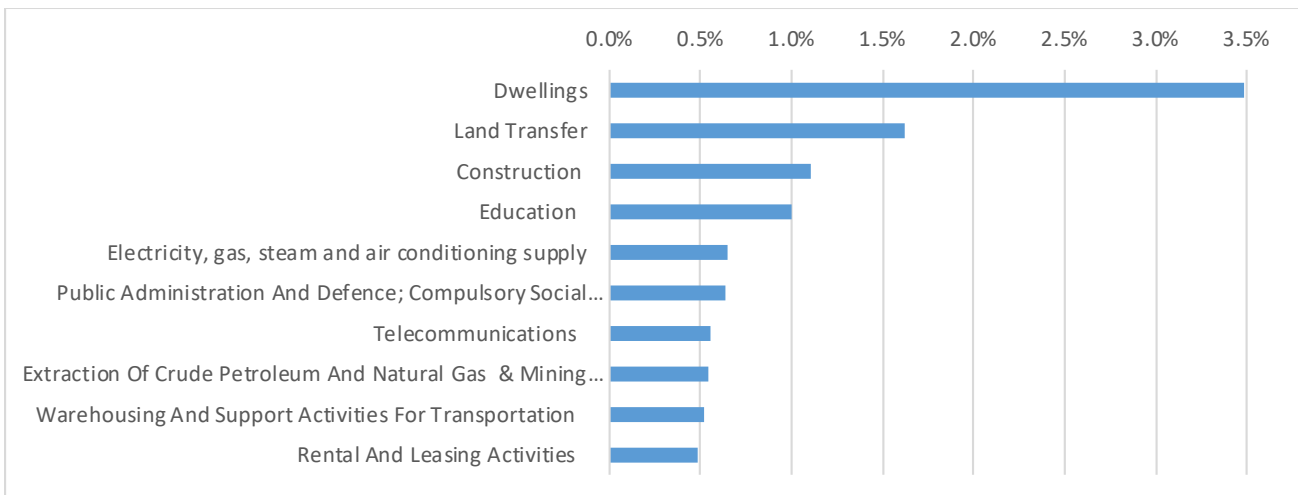


Figure 6: Top 10 GB Investment Activities



There are some notable similarities between the two regions within these top 10 activities accounting for around 60% of all investment, including investment in Dwellings, Construction, Education and Public Administration. Interestingly, Agriculture features in the top 10 for NI, which may be due to the capital intensive nature of a key sector such as Dairy, or perhaps due to the prevalence of smaller, owner occupier farms that may be more likely to invest in buildings etc, compared to more tenanted businesses operating in the UK.

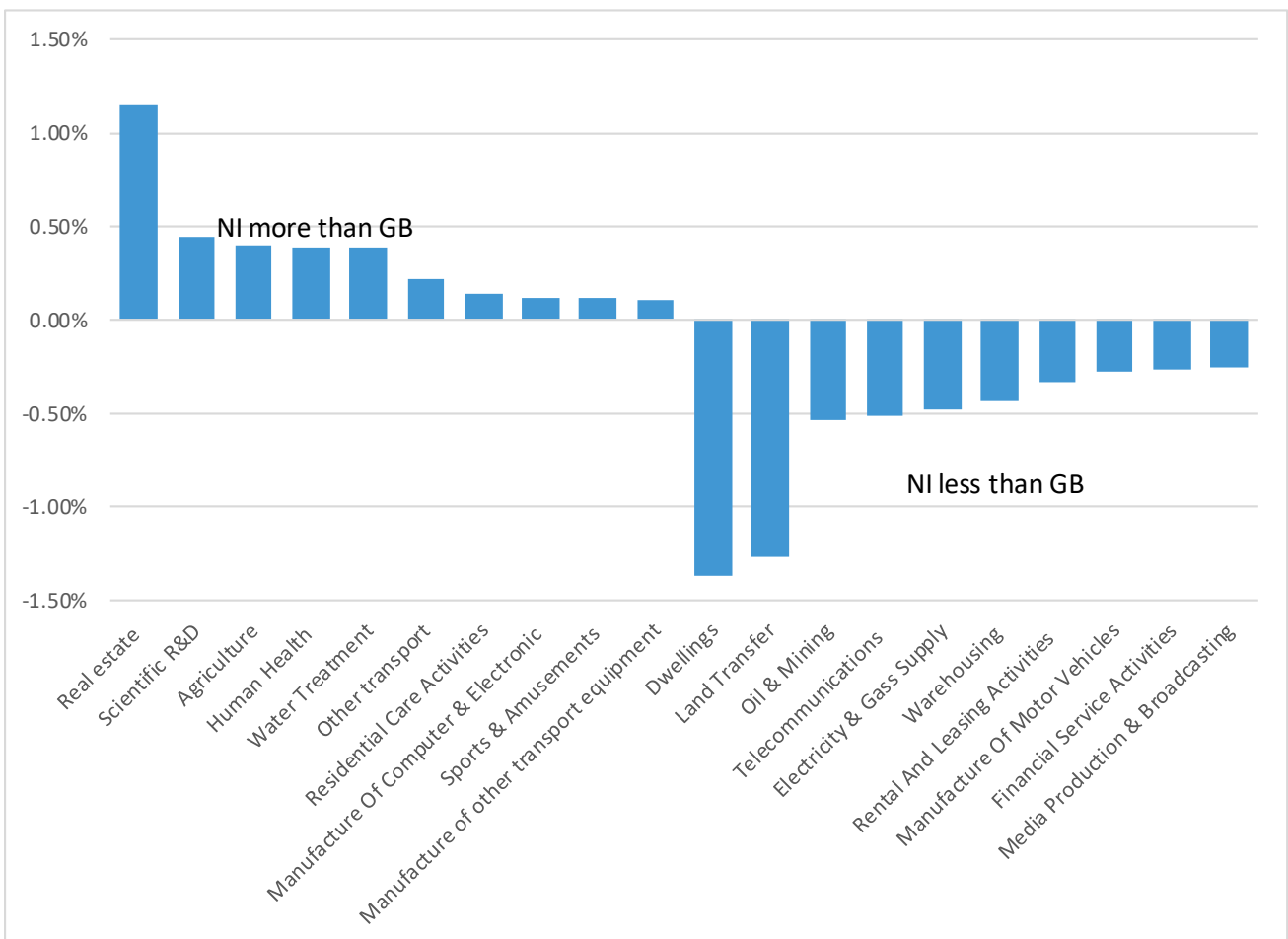
It is also interesting that investment by manufacturing businesses does not feature in the top 10 investment activities of either NI or GB. The precise reasons for this would merit further research, however it is likely that the declining share of manufacturing within the economy compared to services could be a contributory factor.

Furthermore there may be a willingness by firms to substitute labour for capital and use e.g. night shifts to expand output rather than invest in additional capital. This may have been a particularly relevant factor during recent times with the increased availability of labour from eastern European countries. There is also a question mark over NI's industrial incentive framework that is more geared towards creating employment and well paid jobs, rather than innovation and investment in new technology or capital.

Relative Differences in Investment

Another way to analyse the differences in GFCF, is to assess those industries where there is the greatest difference between NI and GB. These may not necessarily be the biggest investment areas (that are outlined above) but will provide an insight into different investment priorities between the two regions. These are set out in Figure 7 below and represent the key differences as a percentage of GDP:

Figure 7: Top Differences in GFCF as % of GDP



The above analysis demonstrates that there are a variety of reasons explaining why NI has a different rate of investment to the UK as a whole. Indeed there are important areas of the economy e.g. Scientific R&D where NI invests more as a percentage of GDP, whereas there are other important sectors where NI invests less e.g. telecommunications and financial services.

It is notable that a significant contribution to GFCF within GB relates to investment within the oil/gas and mining sector. This sector also makes a significant contribution to overall UK GDP, however if both these elements i.e. GFCF and GDP are removed from the UK data, it makes little difference to the overall ratio of GFCF to GDP. Therefore, the fact that NI does not have an oil and gas extraction sector cannot be a contributory factor as to why NI has lower levels of GFCF.

However one important factor that could influence the relative investment rates between GB and NI is the closure of the tobacco manufacturing industry within NI. This made a large contribution to NI's overall GDP and it is likely that its removal from the official data will serve to improve NI's GFCF to GDP ratio. In addition, figure 7 above indicates that NI invests considerably less of its GDP in dwellings. Although it is difficult to understand the precise reasons for this, as NI's rate of house building per capita is higher than GB's, it could be due in part to houses being significantly more expensive to build in GB compared to NI. Consequently a higher proportion of expenditure within GB will be recorded as Investment within the National Accounts.

These two reasons i.e. loss of key manufacturing sector as well as cheaper dwellings could help to explain a significant part of the gap between NI and GB's GFCF as a percentage of GDP.

Differences between Public and Private Investment Levels

Investment levels between regions can also vary between the public and private sector. The following table demonstrates that investment by the public sector in NI is significantly higher as a percentage of total investment than investment by the public sector for the UK as a whole:

Table 2: Public/Private investment split

	NI GFCF (£ million)	Split	UK GFCF (£ million)	Split
Public	2,048	34%	66,368	19%
Private	4,059	66%	277,329	81%
Total GFCF	6,107		343,697	

It should be noted that due to slight methodological differences, the UK figure for the Public Sector includes that associated with public corporations, whereas the equivalent for NI is included within the Private sector total. However

even if this anomaly was augmented, it would only serve to widen the gap between NI public sector investment as a share of total GFCF compared to the UK as a whole.

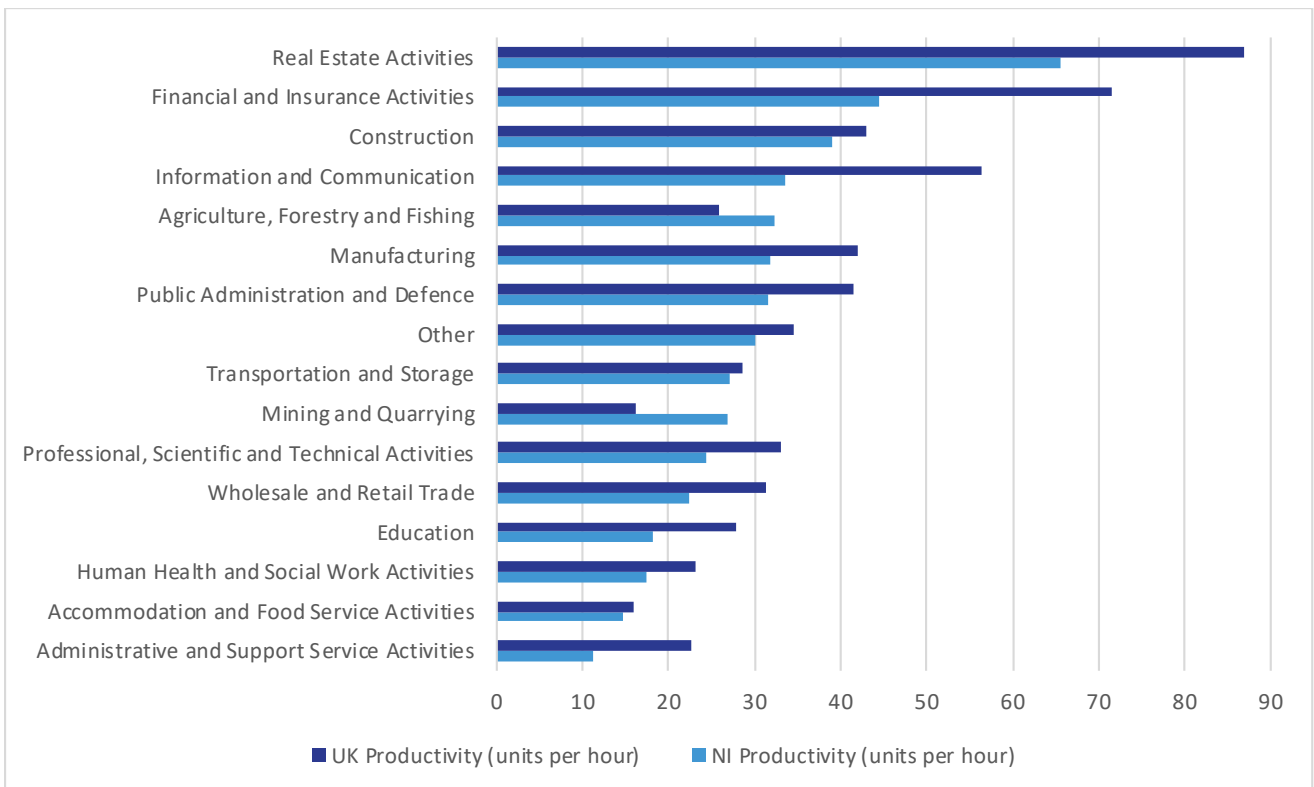
It is not immediately clear why the private sector contributes a lower share of GFCF in NI compared to the UK, however given the size of the difference in relative investment rates it is clearly apparent that there is an issue with the level of private sector investment in Northern Ireland.

Factors Affecting NI's Investment Rate

Lower Productivity in NI

As noted at the outset of this paper, there are numerous factors that can affect investment levels. However another well-known factor that may help to explain NI's relatively low rate of investment could be NI's low levels of productivity or output per hour worked. Indeed the University of Ulster's Economic Policy Centre (UUEPC) produced a publication on "Understanding productivity in NI", which showed that productivity levels in NI are 13% below the UK averageⁱⁱ. Indeed, if an economy is characterised by low levels of productivity, there will be fewer profits/incentives for investment and there is likely to be a lack of competitiveness when trying to attract investment from abroad.

Figure 8: Labour productivity by broad industry group for 2018, NI vs UK



Source: Regional GVA data from ONS, employee jobs data from BRES and QES. Hours worked data from ASHE survey (NISRA and ONS)

Note: Labour productivity for each Industry group has been measured by GVA/Total average hours worked per year. For Real Estate Activities, GVA owner-occupiers' imputed rental has been removed from NI and UK data.

Figure 8 shows a measure of labour productivity at broad industry group level for NI and the UK. From the data there is a clear disparity between NI and the rest of the UK in relation to the Information and Communication (ICT) sector. Indeed the ICT sector in NI produces 34 units of GVA per hour whereas the UK produces 56 units of GVA per hour. The same pattern is evident within the Financial and Insurance Activities sector, where productivity in the UK is much higher at 71 units of GVA per hour than in NI that only produce 44 units of GVA per hour.

Agriculture, Forestry and Fishing has higher productivity in NI than in the rest of the UK, with dairy and meat production making up the majority of agricultural output in NI.

All of this data seems to correlate with the GFCF data outlined above and suggests that there is a link between the overall level of productivity and level of investment within a sector.

Government Priorities

The Draft Programme for Government has an outcome of connecting people and opportunities through infrastructure. This mainly relates to improving our transportation and broadband infrastructure and also has a focus on housing and seeking to reduce the gap between the numbers of houses we need and the number we have. These initiatives all concern investment in NI's fixed capital, however it is unclear whether this will represent a step increase in investment and whether the overall level of investment as a percentage of GDP will increase over time.

It is notable that the Draft Programme for Government also includes a specific outcome related to having more people working in better jobs, with one of the indicators relating to professional and management jobs. Whilst this is a valuable objective, it is not entirely clear how this will be achieved and what contribution investment can make towards this i.e. should there be investment in new school buildings/universities/Grade A offices? Or would this be better achieved by taking a more "demand led" approach and e.g. by help businesses to export more and enter new markets, who in turn be able to offer more professional and management jobs?

Labour Market

Governments indirectly contribute to business investment by ensuring that the workforce has the correct skillset and can meet the demands of business, something that is particularly relevant when trying to attracting FDI.

The most recent Pearson/CBI education and skills survey for NI identified that "almost three-quarters of businesses lack confidence that they can fill highly skilled roles."^{iv} Businesses in some instances are employing labour with skills mismatches and this could have knock on impacts for productivity, competitiveness and hence investment.

The University of Ulster Skills Barometer report highlights STEM subjects as an area of strong demand growth in the future. Sectors of the NI Economy such as ICT, professional services and advanced manufacturing are projected for substantial growth and they require skilled graduates from STEM subjects. However currently there is an under supply of students taking these STEM subjects and as a result employers are finding it difficult to recruit employees with the

required skills. The largest skills gaps are recorded for NI in computer science, civil engineering and information systems^{iv}.

Taxation Policy

Government can influence investment directly through its policies related to tax and spending. Indeed, incentives around investment within the UK are influenced directly by the availability of capital reliefs within the taxation system. These will allow a business to write off the cost of some items of expenditure e.g. new buildings/plant from their overall tax bill. Therefore the extent to which this can be done will have a direct bearing on the willingness of a business to invest as the availability of capital allowances will ultimately impact on an investment's overall return. In addition the level of Corporation tax can also be an important factor in altering the incentive framework in relation to investment and in particular attracting FDI, as the experience in the Republic of Ireland demonstrates.

The rating system is also a route through which policy makers can influence the level of investment within the economy. Rates are in essence a property tax that depend on the value of a property. Although this "value" can be influenced by a number of issues e.g. location, it will also depend on the state of repair of the building as well as its size. Therefore the level of rates payable can be a factor to influence decisions on what gets built where, as well as the overall purpose and size of buildings.

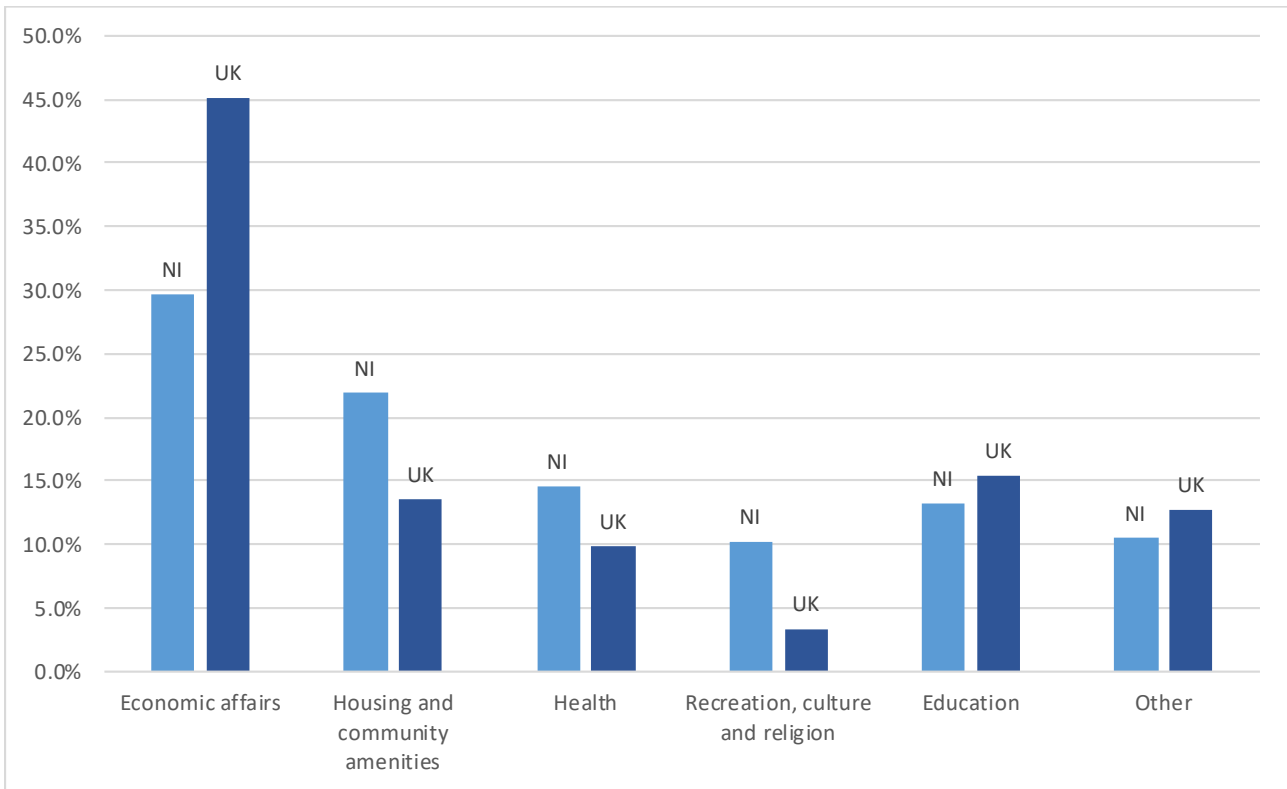
It is also notable that NI operates a system of Industrial Derating whereby a property occupied for manufacturing purposes receives 70% relief on their rates bill. This is a considerable benefit for some firms locally, and should act as an incentive for manufacturing businesses to grow and develop, especially compared to other regions of the UK that do not receive this relief.

Government Spending

Public spending plays a crucial role in investment and Departments have considerable capital budgets to invest in vital infrastructure such as roads, railways, water, sewerage and telecoms.

The following graph compares public spending on capital expenditure in NI with the UK for 2018 and provides a snapshot of the different priorities in important areas such as economic affairs and housing.

Figure 9: Capital Expenditure on public services 2018



Economic affairs accounted for 45.2% of capital expenditure in the UK compared to 29.7% in NI. Economic affairs is made up of various sub categories, one of which is Transport (includes national roads, local roads, public transport and railways etc.) which accounted for considerably less capital expenditure in NI at 19% compared to 34% in the UK. The precise reasons for this are not entirely clear, however research^v (by Johnston, Ruane and Heery 2019) suggests that NI does compare poorly against both Ireland and the rest of the UK for provision of motorways, air routes, shipping routes and railways.

Capital spend on Housing and Community Amenities is 22% of total capital spend in NI, which is significantly higher than the equivalent 14% figure for the UK. Housing and Community Amenities includes spend on areas such as social housing, community development and water supply. The high level of capital spend on social housing etc. could reflect the fact that NI has higher economic inactivity than any other UK region, and Investment in social housing is needed in order to address higher levels of disadvantage and deprivation.

Another notable difference in the investment priorities between NI and the UK relates to Recreation, Culture and religion, which accounts for 10.4% in NI compared to only 3.4% in the UK. Closer examination of this data reveals that NI places greater emphasis on investment in recreation and sport (52%) whereas in England greater emphasis is placed on spend on cultural services (55%).

Modelling Changes to the level of Investment

A Computable General Equilibrium model applies a complex set of equations to economic data in order to determine the impact of various shocks/scenarios on the macro-economy. Within this context investment is linked to the level of capital within the economy, and it is this along with labour that are the main determinants of total economic output. Other important factors to consider within this modelling framework include the tax on investment, cost of capital as well as the price of value added.

In order to see what insights can be gleaned from this model, it has been decided to use a stylised example to consider what the economic impact would be of an increase of investment of £100m, which would represent an increase of approximately 1.6% on 2016 investment levels.

This could be achieved by reducing the tax on investment in order to incentivise a higher level of investment, however this comes with a trade-off, as it means there will be a reduced level of revenue associated with this lower tax rate and consequently government spending will be less than would otherwise be the case.

The results from modelling this scenario demonstrate that it would add approximately 0.13% to long term GDP¹, and whilst this could be described as modest, it does suggest that the economy is marginally better off by reducing the tax burden on businesses, even if this results in less public spending.

Given the nature of the model, this stylised example only includes the increased output associated with the response from domestic firms and does not take account of external demand e.g. FDI, which could be incentivised to take advantage of the improved investment opportunity.

However, using this example, if it is matched with an assumed 5% increase in external sales, long term GDP can be expected to increase by approximately 1.44%, with investment increasing by 3.23%. Although some of this increase in investment will be directly related to the increase in external sales, it nevertheless demonstrates the importance of the demand side response to the supply side policy of lowering the tax on investment.

The out workings of this exercise highlight that whilst government policies to increase the level of investment can produce economic benefits, the benefits will only be maximised if there is sufficient demand to take advantage of this improved business environment. Whilst this may occur automatically through the “invisible hand” of market forces, governments should be mindful of this when developing policy and try to assist this increase in demand where possible e.g. by attracting FDI or assisting firms to access new export markets.

¹ Long term is assumed to be 15 years.

Conclusion – Investment in Northern Ireland

This research paper was inspired by a desire to better understand fixed capital investment within NI and in particular the reasons for the seemingly low levels of investment compared to the rest of the UK. Although the investment rate within NI does appear low relative to the UK, it is unclear to what extent this is a persistent trend given that any comparison can only be made with two years of data. Notwithstanding any issues regarding the availability of data, there does not appear to be any obvious reason as to why NI's investment rate is lower or how investment in NI could be significantly improved.

This research has also revealed that there are many reasons that influence investment within an economy, however the deindustrialisation of the local economy and rise of the service sector seem to be significant factors in explaining the apparent paradoxical position of declining investment over time, with continuing economic growth. It could also be the case that part of this conundrum can be explained by the fact that western economies have benefited from globalisation and the growth of economies such as China, who in essence have been investing on our behalf i.e. western countries have been able to enjoy increased consumption due to cheaper products being produced in Asian economies.

It is unclear to what extent this can continue into the future, especially in light of the Covid19 pandemic that may result in greater protectionism for certain industries. However investment in physical buildings and infrastructure will continue to play an important role in NI's future economic growth prospects, and it is this coupled with investment in our human capital in areas such as health, education as well as the knowledge economy that will be the foundation of economic growth for years to come.

Economic Modelling Branch, NISRA

For further information or queries please contact analyticalservices@economy-ni.gov.uk

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- ⁱ [An international comparison of gross fixed capital formation - Office for National Statistics \(ons.gov.uk\)](#)
 - ⁱⁱ [Understanding productivity in Northern Ireland \(ulster.ac.uk\)](#)
 - ⁱⁱⁱ [NI Skills Barometer 2019 summary report \(economy-ni.gov.uk\)](#)
 - ^{iv} [The Northern Ireland Economy: Problems and Prospects \(tcd.ie\)](#)
 - ^v [Competitiveness-and-Policy-Making-on-the-island-of-Ireland-final-28-May-2019.pdf \(ulster.ac.uk\)](#)