

**Business investment - drivers,  
barriers and economic impacts.  
A rapid literature review**

February 2024  
Final report

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## Executive summary

Scottish Enterprise (SE), Scotland's national economic development agency, commissioned the Enterprise Research Centre (ERC) to conduct an evidence review on the economic impacts of business investment and factors that affect it. Business investment is one of the drivers of productivity growth, which sharply declined and has been slow to recover in Scotland and the UK since the global financial crisis (GFC).

The evidence reported here is based on a rapid literature review of peer-reviewed academic literature and grey literature (e.g., working papers by research organisations). The selection criteria were evidence published in the last 10 years and limited to the UK and small open economies. We screened 1,310 academic papers and 92 papers from 17 grey literature sources. Overall, 120 documents were included in the analysis.

We find that business investment results in economic benefits at firm and aggregate levels, namely productivity and economic growth (GDP), as well as increased employment, profitability, sales, market value, energy and operational efficiency (from capital investments), innovation and export value (from R&D investments). We use a traffic light system to categorise the strength of evidence about factors that affect business investment based on the volume of literature and consistency of findings. The following factors constitute strong evidence: larger business size, exporter status (positive effects on business investment); positive assessment of return on investment (positive); public policy support and regulation (positive); firm-level uncertainty on ROI and macroeconomic uncertainty (negative); firms' financial resources and access to finance (positive if high and vice versa); fiscal and monetary policies (context-specific).

Medium strength evidence is: higher human capital (positive); considerations of indirect benefits of business investment (positive); various internal and external stakeholders (positive); specific firm contexts (e.g., high energy usage drives energy efficiency investments); decision-makers' perceptions, attitudes, ambitions and incentives (positive when favourable towards investment and vice versa); market demand (positive when high and vice versa). While we class the following factors as having weak and very weak evidence, they should not be disregarded as, depending on business contexts, they may still matter: competition (positive); older business age (negative); productivity and sector (unclear); public listing, importer status, inward/outward foreign direct investment, parent group (positive); family ownership, foreign-ownership (negative); managerial ownership (unclear).

Overall, the evidence indicates that the impacts of business investment and factors that affect it are heterogenous: depending on the combination of firms' contexts and characteristics, the same factors might work differently for different firms, influence to a different degree and produce different levels of impact.

The last section of the report includes lessons drawn from the evidence review and possible responses to them with regard to evidence base building and potential business support responses.

## 1. Introduction

Scottish Enterprise (SE) is Scotland's national economic development agency and a non-departmental public body of the Scottish Government. It supports businesses to innovate and scale to transform the Scottish economy by focusing on new market opportunities through targeted investment, innovation and internationalisation. SE recognises that productivity matters greatly for the wellbeing of people in Scotland, and is key to supporting high quality and rewarding jobs. In determining how to drive productivity growth in Scotland and where to place its focus, SE has considered the various drivers of productivity, which experienced a sharp decline and a slow recovery in Scotland and the UK since the global financial crisis (GFC) of 2008.<sup>1,2</sup> Scotland's productivity growth averaged at about 0.7% since 2011, which was the second slowest growth if compared to the G7 group of advanced countries.<sup>3</sup>

Productivity growth varies significantly between business sectors<sup>4,5</sup>: the service sector has traditionally experienced lower productivity growth than the manufacturing sector.<sup>6</sup> However, the UK's poor productivity performance cannot be fully explained by its industrial structure compared to that of other advanced countries.<sup>7</sup> This led to a phenomenon referred to as the "productivity puzzle" in the UK.

The exact causes of the productivity puzzle remain unclear,<sup>8</sup> although one of the frequently cited explanations is business investment levels due to their recognised link to productivity.<sup>9, 10, 11</sup> Business investment levels and their links to productivity are of particular interest to policy makers as a potential intervention for fixing market failures: the UK and Scotland have some of the lowest business investment rates among the OECD countries.<sup>12</sup> To help address this issue, SE is focusing on activities to increase business investment in Scotland, and to inform these activities SE commissioned the Enterprise Research Centre (ERC) to conduct a review of UK and international evidence on:

- Business investment drivers;
- Its barriers and market failures;
- Enablers;
- Economic impacts (at firm and aggregate levels); and
- Lessons for SE related to building and using the evidence base.

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<sup>1</sup> For example, see UK Government 2019; UK Parliament 2018; Institute of Directors 2018

<sup>2</sup> Rincon-Aznar et al 2022

<sup>3</sup> Tsoukalas 2021; PwC UK Productivity Tracker

<sup>4</sup> PwC UK Productivity Tracker

<sup>5</sup> Tenreyro et al. 2018

<sup>6</sup> Tsoukalas 2021

<sup>7</sup> PwC, "UK Economic Outlook November 2019"

<sup>8</sup> McCann and Vorley 2020

<sup>9</sup> E.g., see Bank of England 2021

<sup>10</sup> Luong and Hewitt-Dundas 2020

<sup>11</sup> Tsoukalas 2021

<sup>12</sup> Ibid

In this document, we differentiate between tangible and intangible investments:

- Tangible: physical assets such as machinery, equipment, buildings, plants etc.
- Intangible: non-monetary assets such as R&D, software, intellectual property, branding, marketing, training, organisational efficiency, service design etc.

This distinction is important for studying productivity. Despite low interest rates coupled with a higher rate of return on capital, British firms have not been investing as expected. This is known as the “missing investment puzzle”, something which can be explained partly by changing levels of intangible investments.<sup>13</sup>

## 2. Literature review methodology

Evidence collection is based on a rapid literature review. Compared to a systematic literature review, a rapid review “accelerates the process of conducting a traditional systematic review through streamlining or omitting specific methods to produce evidence for stakeholders in a resource-efficient manner”.<sup>14</sup> To be comprehensive, we use two sources of evidence: peer-reviewed academic literature, and the so-called grey literature produced by reputable research and industry organisations.

The sources of evidence and selection criteria were agreed with SE. For the academic literature we collected evidence from the two largest multidisciplinary databases of peer-reviewed evidence - Scopus (by Elsevier) and Web of Science (by Clarivate) using the following criteria:

- Papers published in the last 10 years (with empirical data after the Global Financial Crisis);
- In English language;
- Limited to the UK (with Scotland emphasised) and to small open economies: Denmark, Sweden, the Netherlands, Belgium, Republic of Ireland, Switzerland, Norway, Iceland, New Zealand and Finland (in case of multi-country studies, we included results specific to the countries above);
- Inclusive of any methodology, investment type and firm type.

Key search terms were combinations of terms on the topic - investment, firms, factors, impact – and their semantically similar variations (e.g., driver, barrier, determinant, investment decision, investment outcome, benefit etc). We excluded foreign direct investment and angel investment terms. The literature review was conducted in three stages: title/abstract screening, full paper screening and full paper analysis.

For grey literature, we scoped sources from organisations that conduct research on business investment, e.g., Bank of England, OECD, International Monetary fund (IMF), The Productivity Institute (TPI), Enterprise Research Centre (ERC), UK Government, the Scottish Government, Institute for Government, Centre for Economic Performance (CEP),

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<sup>13</sup> Bailey et al 2022

<sup>14</sup> Garritty et al. 2020

Institute for Fiscal studies (IFS), Fraser of Allander Institute etc. The selection criteria for papers were the same as for the peer-reviewed studies.

We screened titles and abstracts of 1,310 papers from Web of Science and Scopus. Of them, 228 papers were selected and further screened in full. Additionally, 92 papers were screened in full from 17 grey literature sources. Overall, 120 documents were included in the final analysis.

### 3. Findings

This section summarises the findings of the rapid literature review. We start with the impacts of business investment, followed by factors that affect it.

UK studies make up a substantial share of the evidence (55 papers), followed by multi-country studies (16), Sweden (12) and Netherlands (7). Of note is also the predominance of quantitative papers, especially longitudinal panel studies: only about 10% of analysed empirical studies used qualitative or mixed methods. This provides us with rich generalisable evidence that identifies numerous factors and impacts of business investment. On the other hand, we often lack any explanation on mechanisms of why and how precisely different factors affect business investment.

The reviewed literature covers a variety of investment types and sub-types, sectors (mostly multi-sectoral) and firm types. While a few studies focus on SMEs or publicly listed firms specifically, their findings complement those of other studies. The summary of all analysed papers can be found in Appendix 1.

#### 3.1 Economic impacts of business investment

This section summarises the rapid literature review findings on the economic impacts of business investment at firm and at aggregate levels. This analysis consists of 34 mostly peer-reviewed papers.

The summary of findings is presented in Table 1. The evidence highlights the positive economic impacts of business investment at firm-level, especially on productivity growth (mainly measured as labour productivity). Other economic outcomes include increased sales, revenue, profitability, employment, innovation and export value (from R&D investments), as well as the more immediate outcomes of operational or energy efficiency (from capital investments). While fewer papers focus on capital investments specifically, overall, both investment types have been linked to economic benefits.

Evidence from aggregate-level studies is also positive and includes higher productivity (especially from intangible investments), and the contribution of any type of business investment to the economic growth (i.e., GDP growth). Aggregate level productivity is typically measured as total factor productivity (TFP), that is, using labour and capital inputs more efficiently.<sup>15</sup> Using our selection criteria, we find that few papers (two) study both firm-

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<sup>15</sup> Haskel and Dhingra 2023

level and aggregate-level impacts of investment. They offer differing findings on ICT investments: Dhyne et al. 2021 finds positive productivity returns on ICT investments at firm-level, but not at aggregate-level due to “underinvestment in ICT ... and misallocation of ICT investments” across sectors; Balsmeier & Woerter 2019, meanwhile, find a slight positive net employment effect from ICT investments at aggregate level, even though at firm-level they find an increase in high-skilled jobs at the cost of reducing low-skilled employment.

A few papers indicate that only specific investment types, or their combination produce positive returns. For example, investing in equipment but not buildings results in energy efficiency, or that intangible investments only affect TFP.<sup>16</sup> A few papers also find no impact across some measures of economic performance: for instance, two papers find that intangible investments do not affect productivity or profitability, though they do increase employment and revenues.<sup>17</sup> Despite several of these nuanced or contrasting results, overall, there is strong evidence that business investment produces economic benefits for firms and the wider economy.

Furthermore, the evidence highlights the **heterogeneous effects** of business investment based on business characteristics or contexts, that is to say that firm-level returns on investment differ among firms. Generally, more successful firms - larger, more productive, higher growth, financially better off – achieve better returns on their investment.<sup>18</sup> Two studies also identified differing outcomes from R&D investments on productivity and exports between manufacturing and services sectors.<sup>19</sup> Plus, a Swiss study found that green capital investments had productivity returns for high energy use firms only.<sup>20</sup> Lastly, several studies show that combining different types of intangible investments provides greater returns for firms.<sup>21</sup>

Table 1. Economic impacts of business investment

Type	Sub-type	Firm-level impacts	Aggregate-level impacts
Intangible investments	R&D	Higher sales; productivity*; increased employment; market value; innovation; net profit margin; export value	Productivity; economic growth (GDP)
	IT / ICT	Sales; productivity	Productivity
	Human capital	Productivity; economic sustainability	

<sup>16</sup> See Yang et al 2015; Brinkerink et al 2019; Karmakar et al 2022

<sup>17</sup> Jardak & Ben Hamad, 2022, Chappell & Jaffe, 2018; Nakatani, 2019

<sup>18</sup> Di Ubaldo & Siedschlag, 2021; Sheehan & Garavan, 2022; Siedschlag & Yan, 2023; Solomon, 2021; Nakatani, 2019; Hong et al 2016; Rizov et al 2022; Capasso et al. 2015; Rud et al. 2023

<sup>19</sup> Solomon, 2021; Rud et al. 2023

<sup>20</sup> Stucki, 2019

<sup>21</sup> Battisti & Stoneman, 2023; Di Ubaldo & Siedschlag, 2021; Solomon, 2021; Nemlioglu & Mallick, 2017

Type	Sub-type	Firm-level impacts	Aggregate-level impacts
	Other (e.g., brand, organisational)	Sales, productivity	
	Any	Increased employment; Revenue; productivity; net profit margin	Productivity; economic growth (GDP)
<b>Tangible investments</b>	Equipment and plants	Energy efficiency; operational efficiency; productivity; profitability; employment; value added;	
	IT / ICT	Sales; productivity; jobs (high-skilled); Tobin's Q	Employment; productivity
	Any	Profitability	Productivity; economic growth (GDP)

Prepared by authors on the basis of literature in the footnote.<sup>22</sup> Studies vary in how they measure productivity: mostly they use labour productivity (e.g., turnover per employee, turnover per hour) followed by total factor productivity (TFP).

## 3.2 Factors that affect business investment

The following sections represent findings on factors that affect business investment positively or negatively. In total, 95 papers form the basis of this analysis with some minor overlap with the previous section on economic impacts.

### 3.2.1 Characteristics

The evidence reiterates that certain business characteristics that are known to be associated with better business performance are also associated with higher business investment of any type. Namely, these are a larger **business size** and **exporting status**.<sup>23</sup> Some studies also highlight other characteristics of relevance, but these vary, and thus conclusive evidence is hard to draw:

<sup>22</sup> Nakatani, 2019; Balsmeier & Woerter, 2019; Audretsch & Belitski, 2021; Jardak & Ben Hamad, 2022; Dhyne et al 2021; Brinkerink et al 2019; Kromann & Sorensen, 2019; Siedschlag & Yan, 2023; Stucki, 2019; Chappell & Jaffe, 2018; Di Ubaldo & Siedschlag, 2021; Nemlioglu & Mallick, 2017; Corrado et al. 2016; Karmakar et al. 2022; Battisti & Stoneman, 2023; Jerlström et al. 2022; Sheehan & Garavan, 2022; Backman, 2014; Tiberius et al. 2021; Rizov et al. 2022; Capasso et al. 2015; Colombelli et al. 2020; Dancaková et al. 2022; Hong et al. 2016; Rud et al. 2023; Yang et al 2015; Solomon, 2021; Oliveira Cunha et al 2021; David Hume Institute 2018; Haskel and Dhingra 2023; Pope et al 2022; Brandily et al 2023; Adarov et al 2022; Becker 2015

<sup>23</sup> European Investment Bank, 2020; Adu-Ameyaw et al., 2022; Chappell & Jaffe, 2018; Kärnä, 2021; Andersson et al., 2023 (1); Cooremans & Schonenberger, 2019; Siedschlag & Yan, 2021; Andersson et al., 2023 (2); Rud et al., 2023

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- older and foreign-owned firms invest less;<sup>24</sup>
- firms that import, are part of a company group, or engage in inward or outward foreign direct investment invest more;<sup>25</sup>
- publicly listed firms invest more in R&D;<sup>26</sup>
- firms with lower level of managerial ownership (i.e., percentage of shares held by executive management) in listed firms invest more;<sup>27</sup>
- family ownership structure can affect risk attitudes and thus investment.<sup>28</sup>

**Sectoral differences** are not evident as most papers do not examine or find differential effects in multi-sectoral samples. A minority of papers analyse sectoral differences, but their diverse findings are indicative rather than conclusive. To name a few sectoral differences, the IT sector is more likely to invest in software development; exporting increases R&D investment to a higher degree in service firms rather than manufacturing; financially distressed and exporting manufacturing firms invest more in R&D compared to service firms (potentially due to higher returns from their R&D in export markets); and, economic policy uncertainty does not affect R&D investment by Basic Material, Industrials, Oil & Gas sectors.<sup>29</sup>

### 3.2.2 Rationale

There appears to be a consensus in the literature that firms invest based on the **return on investment (ROI)** – perceived or historic - mostly understood as financial return or profitability (e.g., expectations of future demand or sales).<sup>30</sup> Firms are typically seen as prioritising quicker over longer returns though the exact length of return periods has not been extensively studied.<sup>31</sup>

Expected returns represent **uncertainty** for firms and can be coupled with a lack of information or capabilities to assess investments and their ROI. This typically prevents investing, especially in intangible assets, which are considered more risky and harder to assess in terms of ROI.<sup>32</sup>

Besides profitability, firms can also consider the **indirect benefits** of their investment, such as future learning or productivity growth. However, studies tend to focus on firms failing to consider these benefits, often due to a lack of information or knowledge and the associated costs to obtain such information: indirect benefits of investing in energy efficiency and novel

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<sup>24</sup> Chappell & Jaffe, 2018; Kärnä, 2021

<sup>25</sup> Rud et al., 2023; Siedschlag & Yan, 2021; Sheehan & Garavan, 2022

<sup>26</sup> BEIS 2022

<sup>27</sup> Hassanein et al., 2022

<sup>28</sup> Sekerci, 2020

<sup>29</sup> Rud et al., 2023; Nguyen & Trinh, 2023; Tori & Onaran, 2018; Andersson et al., 2023 (2)

<sup>30</sup> Nehler & Rasmussen, 2016; Feulefack & Sergi, 2015; Baddeley, 2023; Nabarro 2022; Bank of England, 2021; Carella et al. 2023; Venables et al 2024; Fraser of Allander Institute 2023; Brandily et al 2023; Adu-Ameyaw et al., 2022; Lefley, 2018; Matos et al., 2018; Sheehan & Garavan, 2022

<sup>31</sup> See Venables et al 2024

<sup>32</sup> Jones et al., 2021, Cagno et al., 2014, Knuutila & Vuorio, 2023, Venmans, 2014; Venables et al 2024; Fraser of Allander Institute 2023; Saukkonen et al., 2017; Kromann & Sorensen, 2019

less-known technologies are particularly hard for firms to consider and more risk-averse management might not want to invest in them.<sup>33</sup>

### 3.2.3 Resources

Another common theme explored in the literature is the link between **firms' financial resources** and their investment behaviour. To companies, investments represent costs.<sup>34</sup> Thus, generally speaking, financially stronger firms with better access to finance (internal or external) invest more in both tangible and intangible assets. Studies measure firms' financial strength in a variety of ways, including cashflow, liquidity, leverage, indebtedness, availability of collateral etc.<sup>35</sup> Naturally, this points at a link between investments and what sources of internal or external finance firms use: a rare British qualitative study indicates that productive investments are more likely to be funded internally. Considerations of funding sources in turn includes **access to finance**.<sup>36</sup> To illustrate, Belgian manufacturing firms decreased tangible investments in response to bank credit supply tightening, while financially constrained Swedish SMEs increased capital investment due to access to state bank loans.

In addition to financial resources, firms' higher **human capital**, proxied in different ways - e.g., staff training, knowledge, employee skills, managers' experience and technical expertise, etc. - has also been found to affect business investment, for instance because they have a better ability to forecast returns accurately or identify investment opportunities.<sup>37</sup> Financial literacy, especially in SMEs, is also tied to higher investment rates as it provides better funding for business investment including by obtaining external finance.<sup>38</sup> Two papers showed how a higher share of employees with specific skills increased relevant investment: creative skills to R&D investment, and STEM skills to software development.<sup>39</sup>

### 3.2.4 Decision-making

The literature has studied a variety of aspects of business decision-makers' perceptions, attitudes, incentives, ambitions and past decisions in relation to business investment.<sup>40</sup> The exact measures vary. To illustrate, Finnish managers that are climate sceptics are less

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<sup>33</sup> Cooremans & Schonenberger, 2019; Kalantzis & Niczyporuk 2022; Nehler & Rasmussen, 2016; Rasmussen, 2020; Nehler et al., 2014; Vecciolini 2019; Saukkonen et al., 2017

<sup>34</sup> Matos et al., 2018; Vissers et al., 2022; Fraser of Allander 2023; Venables et al 2024; Bank of England 2021; Melollina et al, 2018

<sup>35</sup> Moreno-Mondejar & Cuerva, 2020; TPI 2023; Carella et al. 2023; Daher and Kneer 2022; Venables et al 2024; Fraser of Allander Institute 2023; Chasiotis & Georgantopoulos, 2022; Kuchler, 2019; Rud et al., 2023; Tori & Onaran, 2018; Martinez-Cillero et al., 2020

<sup>36</sup> Buca & Vermeulen, 2017; Kärnä, 2021; Zubair et al., 2020; Kromann & Sorensen, 2019; Bacchini et al., 2018; Martinez-Cillero et al., 2020; Vithessonthi et al., 2017; Evemy et al., 2023, Andersson et al., 2023 (1); Bank of England 2021

<sup>37</sup> Moreno-Mondejar & Cuerva, 2020, Brandily et al. 2023, Roland 2020, TPI 2023; Brandily et al 2023 (2); Stojcic et al., 2018; Andersson et al., 2023 (2); Fernandez De Arroyabe et al., 2023; Asad et al. 2023

<sup>38</sup> TPI 2023

<sup>39</sup> Stojcic et al., 2018; Andersson et al., 2023

<sup>40</sup> Koryak et al., 2015; Knuutila & Vuorio, 2023; Jones et al., 2021; Lefley, 2018; Cooremans & Schonenberger, 2019; Saukkonen et al., 2017; Sheehan & Garavan, 2022; Elgebeily et al., 2021; Roper and Bourke 2018; Adu-Ameyaw et al., 2022; Adelopo et al. 2023

likely to invest in energy efficiency, while a Swiss mixed-methods study showed that such investments are more likely if they are seen as contributing to the core business. Similarly, those British SME managers that positively perceive a strategic value of HR are more likely to invest in high-performance work practices. Inter-personal and inter-department dynamics, conflict and status of the investment project proposer have also been studied with one UK qualitative study mentioning that one of a manager's considerations is how investing would impact staff. A literature review of SME decision-makers identified the perceived feasibility and desirability of (intangible) investments as factors. Among other attitudes and perceptions, one paper found that in British listed firms optimistic managers over-invest in capital, while a large-scale study of the UK and Ireland (and USA) finds that growth ambition is associated with digital technology investments. Two UK studies focused on incentives in listed UK firms showed that higher executive compensation and bonuses decreased investment, possibly because the individuals in question became more risk averse – though stock bonuses increased capital investment though not intangible investment.

In addition to decisions by business leaders and managers, several studies focus on positive influences by other internal or external stakeholders on business investment,<sup>41</sup> though these vary widely:

- Energy/sustainability or facilities management teams, top management support and external energy efficiency consultants, especially if they have greater involvement, encourage energy efficiency investment;<sup>42</sup>
- Internal or external champions who promote productivity growth, incl. through investment;<sup>43</sup>
- Institutional investors;<sup>44</sup>
- If industry peers invest in green equipment.<sup>45</sup>

### 3.2.5 Policy

One of the most common factors that affect business investment is **public policy and support**. In the grey literature especially there seems to be a broad consensus that government policies and industry strategies can impact business investment.<sup>46</sup> Typically studied factors are financial support mechanisms, such as public investment subsidies, R&D subsidies, tax credits or grants to promote R&D investment, human capital tax credits, furlough support during COVID-19 etc.<sup>47</sup> Environmental regulation and its various levers - e.g., carbon cap or taxation - have also been generally effective in promoting energy

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<sup>41</sup> For example, see Saukkonen et al., 2017

<sup>42</sup> Cooremans & Schonenberger, 2019

<sup>43</sup> Jones et al., 2021

<sup>44</sup> Hassanein et al., 2022

<sup>45</sup> Siedschlag & Yan, 2021

<sup>46</sup> van Ark et al. 2023; TPI 2023; Stern et al 2020; Wilkes 2022; Fraser of Allander Institute 2023; Brandily et al 2023 [2]

<sup>47</sup> Becker 2015; Carella et al 2023; Costa et al 2018; Brandily et al 2023 [2]; Rud et al. 2023; Vissers et al 2022; Blomquist & Waldo, 2022; Zhang & Xie, 2017; Matos et al., 2018; Nana-Cheraa 2023; Jibril et al. 2021

efficiency or green investments.<sup>48</sup> Public investment overall, especially on innovation, infrastructure and human capital, can also encourage capital investment.<sup>49</sup> On the other hand, The Scottish Government's evaluation of the Small Business Bonus Scheme, which offered business rates relief to non-domestic properties in Scotland, found that the evidence on the scheme affecting business investment was weak and had no clear pattern.<sup>50</sup>

In relation to capital investments in particular, studies find that **fiscal policy**, especially tax policy (capital tax, capital allowances, corporation tax, dividend tax etc.), and **monetary policy** (namely interest rates) affect business investment by affecting business finances and cost of capital. However, firms with a large share of intangible assets appear to be less sensitive to such policies.<sup>51</sup> Furthermore, a few studies indicate that monetary or fiscal policies might not work as intended, e.g., by failing to incentivise (capital) investments or crowding out productive investments by affecting access to external finance which firms predominantly use for expansionary investments.<sup>52</sup>

Lastly, **business support interventions** or programmes by public or private actors could affect firm-level investment. However, in this field the literature is very scarce, especially considering peer-reviewed studies. One example from the UK is that of the Cavendish Enterprise's Business Boost project, part of UK Government's Business Basics Programme, which aimed to enhance productivity in micro and small UK firms through a series of workshops designed to develop firms' management and leadership capabilities. The intervention did not increase firms' plans to introduce productivity enhancing investment compared to the control group in a randomised control trial.<sup>53</sup>

### 3.2.6 Other factors

The evidence review identified a number of other factors, often **macro-economic**, which affect business investment. These factors vary and affect both tangible and intangible investment, as summarised below:

- In the UK, business investment slowed down due to the EU-exit,<sup>54</sup> although, foreign-owned firms invested more because the pound sterling depreciated as a result;<sup>55</sup>
- The COVID-19 pandemic and subsequent increase in business debt negatively affected capital investment;<sup>56</sup>

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<sup>48</sup> Cagno et al., 2014; Zhou et al., 2023; Dorsey-Palmateer & Niu, 2020; Gong et al., 2019; Wilkes 2022

<sup>49</sup> Carella et al 2023

<sup>50</sup> The Scottish Government 2022

<sup>51</sup> Jacob, 2021; Bank of England 2021; Adam et al. 2022; Hanappi et al. 2023; Carella et al. 2023; Evemy et al., 2023; Brito et al. 2018; Brandily et al 2023 [2]; Binding & Dibiasi, 2017; Harju et al., 2022; Wielhouwer & Wiersma, 2017; Zhang, 2020; Zhang 2020; Binding & Dibiasi, 2017

<sup>52</sup> Harju et al., 2022; Wielhouwer & Wiersma, 2017; Evemy et al., 2023

<sup>53</sup> Roper et al 2020

<sup>54</sup> Bank of England, 2021; Carella et al 2023; Valero and Reenan 2019; Haskel and Dhingra 2023

<sup>55</sup> Gornicka 2018

<sup>56</sup> Bank of England, 2021; Bloom et al 2023

- Competition increases investment though specifics vary with studies finding that moderately-sized competition, competition from Chinese manufacturers and industry competition matters;<sup>57</sup>
- Market demand affects the need for investment, especially in capital;<sup>58</sup>
- Stock prices or their volatility distort firms' investment through mis-leading price signals;<sup>59</sup>
- High energy usage incentivises firms to invest in energy efficiency;<sup>60</sup>
- The frequency and severity of cyber-attacks incentivises to invest in cybersecurity;<sup>61</sup>
- Presence of listed public firms in the industry improves the investments of other firms, presumably because it decreases uncertainty within the industry by enhancing information that firms use to identify growth opportunities and invest accordingly.<sup>62</sup>

While some of these factors affect investment positively (e.g., competition), a common theme is that the **level of uncertainty** in policy and the economy discourages firms from investing, and vice versa.<sup>63</sup>

## 4. Conclusions

This report summarises findings from a rapid evidence review of academic and grey literature published in the last 10 years on business investment impacts and factors. With a focus on Scotland, UK and small open economies, we screened over 1,300 papers and analysed 120 relevant papers in depth. This review includes findings on tangible and intangible investments.

We find that there is strong evidence that business investment results in economic benefits for firms and the economy, namely productivity and economic growth, as well as employment, profitability, sales, market value, energy and operational efficiency (from capital investments), innovation and export value (from R&D investments). Furthermore, this evidence review identified internal and external factors that affect business investment. Of note is that business investment is strongly contextual in nature: various factors and how firms perceive them interact and change. Based on previous and ongoing ERC work, we know that findings from this literature review are in line with those from other countries outside of the scope of this review, which adds certainty to this report's findings.

The summary of factors that affect business investment is presented in Table 2. We use a traffic light system to indicate the strength of evidence for each factor, which is determined by the volume of literature and consistency of findings across studies. We note that some

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<sup>57</sup> Xin & Choudhary, 2019; Chappell & Jaffe, 2018; Kromann & Sorensen, 2019; Siedschlag & Yan, 2021

<sup>58</sup> TPI 2023, Wilkes 2022; Wilkes 2021

<sup>59</sup> Alaali, 2020; Melollina et al, 2018

<sup>60</sup> Cooremans & Schonenberger, 2019; Siedschlag & Yan, 2021

<sup>61</sup> Shaikh & Siponen, 2023; Fernandez De Arroyabe et al., 2023

<sup>62</sup> Danso et al 2023

<sup>63</sup> Nguyen & Trinh, 2023; Dibiasi et al., 2018; Kumar et al., 2023; Bacchini et al., 2018; Melollina et al, 2018; Melollina 2017; Smietanka et al., 2018; Bank of England, 2021, Valero and Reenan 2019; Venables et al 2024; Danso et al., 2023; Alaali, 2020

factors can either be a barrier to or a driver of investment: some factors are more self-explanatory than others (i.e., typically, financial constraints are a barrier and availability of finance is a driver, while managerial incentives work in a more nuanced way).

Table 2. Summary of factors that affect business investment

Strength of evidence	Strong	Medium	Weak	Very weak
Driver / enabler	Barrier / market failure	Either		
Size; Exporting; Public policy support & regulation; Return on investment (ROI)	Uncertainty of ROI; Macroeconomic uncertainty & shocks	Financial resources; Access to finance; Monetary & fiscal policies		
Human resources; Indirect benefits; Firm's specific context; Internal & external stakeholders		Decision-makers' perceptions, attitudes, incentives; Market demand		
Competition	Higher age	Prior productivity; sector		
Public listing; Importing; Inward/outward FDI; Parent group	Family ownership; Foreign ownership	Managerial ownership; Business support programmes		

To conclude:

- There is strong evidence that larger firms and those firms that export are more likely to invest. The primary driver of investment across any firm appears to be a **positive assessment of return on investment (ROI)**, mainly financial returns and profit. There is also strong evidence that public policy support, in essence financial support such as R&D subsidies, and environmental regulation (for green and energy efficiency investments) increases business investment.
- The key barriers to business investment are **uncertainty at firm-level on ROI, as well as wider macroeconomic uncertainty** in market demand and the economy which can be caused by various shocks. This barrier has a stronger negative impact on intangible investments and novel technologies that have higher associated risks and often require greater expertise and knowledge to assess them and their returns.
- Another strong piece of evidence is that **firms' financial resources** and, linked to that, their **access to finance**, is an influencing factor. Firms' financial situation, of course, depends on other factors, e.g., SMEs or rural firms tend to be more financially constrained, and have worse access to external funding to fund their investments.

- There is also strong evidence that **fiscal and monetary policies** influence business investment. Whether they incentivise, disincentivise or have unintended consequences, such as crowding out certain investment types, depends on policy specifics. However, intangible investments are less sensitive to such policies because the latter primarily influence the cost of capital.
- There is a substantial number of papers that show that **higher human capital** increases business investment. However, since papers vary in the way they measure human capital, we consider this to be evidence of medium strength. Among measures to consider are business leaders' experience, expertise and knowledge, management practices, financial literacy, staff skills and training.
- Other medium-strength factors that drive investment are considerations of its **indirect benefits, various internal and external stakeholder and specific firm contexts**. Examples of the latter are high energy usage driving energy efficiency investments and immigration controls disproportionately affecting firms with higher shares of foreign workers.
- There is medium strength evidence that the **perceptions, attitudes, ambitions and incentives of individuals** who make investment decisions in the firm affect the likelihood of business investments. The literature highlights a variety of these measures, which could be summarised in saying that a positive attitude towards business growth and specific investments make decision-makers more likely to invest and vice versa. Impact of the company's incentive structure and its impact on decision-makers risk averseness is more nuanced.
- The reviewed literature also presents medium strength evidence that **market demand** affects business investments (i.e., high market demand affects it positively and vice versa), though the exact mechanisms of how firms perceive and translate markets signals into business investment are not clear.
- **Competition, business age, productivity and sector** are all classed as weak evidence. There are few papers each that studied them using different measures and results are not consistent enough to be more conclusive. Plus, we consider the following to have only very weak evidence as one paper each studied each issue: **public listing, importing, inward/outward FDI, parent group, family ownership, foreign-ownership, managerial ownership**. Weak and very weak evidence does not mean that these factors can be disregarded, rather they are not well studied using our evidence selection criteria. Together with other business contexts and characteristics these factors are also likely to matter.

Finally, in the literature we find plenty of evidence that the impacts of business investment and factors that affect it are **heterogenous**. That is to say, that depending on the firm's context and characteristics and their combination, the same factors might work differently for different firms, might influence different firms to different degrees, and produce different levels of impact.

## 5. Lessons and possible responses

In this section we present lessons and responses stemming from the evidence review.

Lesson	Responses
<p>We found only few documents specific to Scotland of which none were peer-reviewed. While findings from Scottish documents seem to be in line with that from other sources, this constitutes a research gap as very little is known about how Scottish businesses make investment decisions.</p>	<p>Keep building the evidence base by routinely searching academic and grey literature databases for Scottish studies. If possible, commission Scotland-specific research.</p>
<p>There is strong evidence that both tangible and intangible investments result in better business and economic performance, especially productivity growth. Intangible investments are more frequently associated with productivity growth and can be used as a proxy for productive investment.<sup>64</sup> That said, all types and sub-types of investment have been linked to economic benefits, so we cannot definitively identify specific investments that would have the biggest returns for firms and the economy.</p>	<p>Research and business support on business investment should include and differentiate between tangible and intangible investments, and, ideally, their sub-types (e.g., energy efficiency, R&amp;D, machinery etc.). For intangible investments, a broader definition than that used by national accounts should be used: inclusive of human capital, organisational, reputation and brand investments.</p>
<p>Available evidence on business support promoting business investment is very scarce and constitutes a research gap. The strongest available evidence shows that financial instruments (such as investment subsidies and grants), regulatory frameworks and policy instruments that decrease costs of acquiring assets increase business investment. On the other hand, the impact of the Scottish Government's business rates relief scheme on business investment was inconclusive; while the only known programme that aimed to increase (productive) business investment in a UK randomised control trial found no evidence of impact. This implies there is more fine-tuning to the design, delivery and targeting of financial instruments and business support if they are to work in raising business investment.</p>	<p>Continue gathering evidence on support activities that promote business investment: these are more likely to come from the grey literature rather than peer-reviewed evidence. Design in robust and proportional evaluations into business activities by SE aimed at increasing business investment. If undertaken, financial support should be targeted at firms depending on their financial situation to avoid deadweight effects (i.e., when a firm would have invested privately anyway but instead chose to use public funding).</p>

<sup>64</sup> Karmakar et al. 2022

Lesson	Responses
<p>The evidence shows that firm leaders' expertise, knowledge, experience as well as positive attitudes towards investment and business growth increase business investment. The mechanism of change appears to be related to a better ability to identify investment opportunities, assess return on investment, risk and uncertainty. This in particular might be relevant to intangible investments and novel technology (e.g., automation) as these are perceived as riskier and harder to assess.</p>	<p>While the evidence on interventions is scarce (see the point above), focusing on business leaders' knowledge, expertise and attitudes towards business investment, especially with regard to assessing return on investment including indirect benefits, could be an area for a business intervention. Interventions need to consider that there is a network of internal and external stakeholders who feed into investment decision-making processes, so schemes need to identify and target the key people, especially when targeting larger businesses.</p>
<p>Evidence from firm-level to aggregate-level business investment impacts, though limited, indicates that supporting businesses to increase investment might not automatically translate into increased business investment and its benefits at aggregate level. This can be due to an insufficient number of businesses increasing investment, increasing it insufficiently, investment misallocation and potential trade-offs between different economic outcomes (e.g., quality of jobs).</p>	<p>The complexity of a change from firm-level impacts to aggregate-level should be recognised. The first step is to design business support activities that will prove to work at increasing business investment prior to rolling them out at a scale that would make an impact at the aggregate level.</p>
<p>We did not find conclusive evidence on sectoral differences in factors that affect business investments. There is indicative evidence of differences between the manufacturing and the services sectors.</p>	<p>Business sectors are not an ideal area for an intervention as their market demand and size are difficult to affect.<sup>65</sup> Instead, sectors should be considered as part of a firm's context that affects the type and level of investment it might need.</p>
<p>The evidence from both business investment impacts and factors shows that there is heterogeneity of firm contexts and markets, which has implications for how investments are made, the range of factors which are considered in making investment decisions, who the decision maker(s) actually are, and how investments affect the firms. Understanding similar firms' decisions in different locations may also be important given differences in the availability of employees,</p>	<p>Simple one-size-fits-all narratives are unlikely to be helpful in the context of this heterogeneity, which is likely to require an understanding of both the diversity of the business base but also firms' appetite for risk and level of ambition. Standard sectoral/size band differentiation is unlikely to be sufficient too given the marked differences in productivity within sectors –</p>

<sup>65</sup> Wilkes et al 2021

Lesson	Responses
differences in regional market opportunities and the availability of finance.	an understanding of firms' position in the existing productivity distribution.
This review provided some evidence of how different investments interact within the business. From wider ERC work we know more that a firm's decision to invest happens by considering other investment options, previous investments and business decisions, and aims of investment. <sup>66</sup> International evidence shows that investment interaction might also lead to crowding out effects: e.g., green investment has been found to crowd out some types of other investments incl. productive investment. <sup>67</sup>	It is imperative for any business support aimed at increasing business investment to be mindful of potential investment interactions and potential crowding-out effects, especially on productive investments. We thus recommend measuring and assessing impact of business support on different investment types and their interactions.
From a methodology point of view, firm-level studies tend to use several measures of business investment: probability of making the investment in a given year (Yes/No) and investment expenditure as a measure of intensity. Most common investment impacts are standard measures of business performance: turnover, number of staff, Tobin's Q, labour productivity (e.g., turnover per employee).	SE can employ two business investment measures: investing Yes/No and the level of investment in £ which, to account for business size differences, could be expressed as percentage of company turnover. A distinction should be made between investment types (intangible or tangible) and sub-types where relevant (e.g., equipment and buildings, R&D, employee training) as there might be differential impacts and interaction effects – this would allow for a comprehensive assessment on if and how business support works.  Outcome and impact measures of investment would depend on intervention objectives, but we recommend using a temporal framework from immediate to medium-term to long-term outcomes. For example, the immediate outcome would be increased business investment, medium-term being business turnover or employment growth, followed by productivity growth.

<sup>66</sup> Ikonnikova et al., 2022; Klemick et al., 2019; Sakai 2020; Manez et al., 2015; Zhang & Islam, 2020; Knuutila & Vuorio, 2023; Teresa Costa-Campi et al., 2019

<sup>67</sup> Hrovatin et al., 2016; Weche, 2019

## Appendix 1

Table 3. Analysed evidence by country, study methodology and firm type (when limited to a specific sample).

<b>Paper</b>	<b>Country</b>	<b>Study type</b>	<b>Firm type</b>
Adam et al 2022	UK	Quantitative	
Adarov et al 2022	Multi (incl. Belgium, Denmark, Finland, UK)	Quantitative	
Adelopo et al 2023	UK	Quantitative	Listed
Adu-Ameyaw et al 2022	UK	Quantitative	
Alaali, 2020	UK	Quantitative	
Andersson et al 2023 (1)	Sweden	Quantitative	SME
Andersson et al 2023 (2)	Sweden	Quantitative	
Asad et al 2023	UK	Quantitative	Non-financial
Audretsch & Belitski, 2021	Multi (incl. Belgium, Denmark, UK)	Quantitative	SME
Bacchini et al 2018	UK	Quantitative	
Backman, 2014	Sweden	Quantitative	
Baddeley, 2023		Model	Listed
Balsmeier & Woerter, 2019	Switzerland	Quantitative	
Bank of England 2021	UK	Quantitative	
Battisti & Stoneman, 2023	UK	Quantitative	
Becker, 2015		Literature review	
BEIS 2022	UK	Quantitative	
Binding & Dibiasi, 2017	Switzerland	Quantitative	
Blomquist & Waldo, 2022	Sweden	Quantitative	Aquaculture and fish processing
Bloom et al 2023	UK	Quantitative	
Brandily et al 2023 (1)	UK	Quantitative	
Brandily et al 2023 (2)	UK	Quantitative	
Brinkerink et al 2019	Netherlands	Quantitative	Manufacturing
Brito et al 2018	Multi (incl. multiple)	Quantitative	
Buca & Vermeulen, 2017	Multi (incl. Belgium)	Quantitative	Manufacturing
Cagno et al 2014	Netherlands	Qualitative	SME, metalwork manufacturing
Capasso et al 2015	Netherlands	Quantitative	
Carella et al 2023	UK	Quantitative	
Chappell & Jaffe, 2018	New Zealand	Quantitative	
Chasiotis & Georgantopoulos, 2022	UK	Quantitative	Listed
Colombelli et al 2020	Multi (incl. Netherlands, UK)	Quantitative	Listed

<b>Paper</b>	<b>Country</b>	<b>Study type</b>	<b>Firm type</b>
Cooremans & Schonenberger, 2019	Switzerland	Mixed	
Corrado et al 2016	Multi (incl. Finland, Netherlands, UK)	Quantitative	
Costa et al 2018	UK	Literature review	
Daher and Kneer 2022	UK	Quantitative	
Dancakova et al 2022	Multi (incl. Switzerland)	Quantitative	Listed
Danso et al 2023	UK	Quantitative	
David Hume Institute 2018	UK (Scotland)	Literature review	
Dhyne et al 2021	Belgium	Quantitative	
Di Ubaldo & Siedschlag, 2021	Ireland	Quantitative	
Dibiasi et al 2018	Switzerland	Quantitative	
Dorsey-Palmateer & Niu, 2020		Model	
Elgebeily et al 2021	UK	Quantitative	Listed
European Investment Bank, 2020	Multi (incl. multiple)	Quantitative	
Evemy et al 2023	UK	Qualitative	
Fernandez De Arroyabe et al 2023	UK	Quantitative	
Feulefack & Sergi, 2015		Literature review	
Fraser of Allander Institute 2023	UK (Scotland)	Literature review	
Gong 2019		Model	
Gornicka 2018	UK	Quantitative	
Hanappi et al. 2023	Multi (incl. multiple)	Quantitative	
Harju et al 2022	Finland	Quantitative	
Haskel and Dhingra 2023	UK	Quantitative	
Hassanein et al 2022	UK	Quantitative	Listed
Hong et al 2016	New Zealand	Quantitative	
Jacob, 2021	Sweden	Quantitative	
Jardak & Ben Hamad, 2022	Sweden	Quantitative	Listed
Jerlstrom et al 2022	Sweden	Qualitative	
Jibril et al. 2021	UK	Quantitative	
Jones et al 2021	UK	Qualitative	SME
Kalantzis & Niczyporuk, 2022	Multi (incl. UK)	Quantitative	
Karmakar et al 2022	UK	Quantitative	
Karna, 2021	Sweden	Quantitative	SME
Knuutila & Vuorio, 2023	Finland	Quantitative	
Koryak et al 2015		Literature review	SME
Kromann & Sorensen, 2019	Denmark	Quantitative	Manufacturing
Kuchler, 2019	Denmark	Quantitative	

<b>Paper</b>	<b>Country</b>	<b>Study type</b>	<b>Firm type</b>
Kumar et al 2023	New Zealand	Quantitative	
Lefley, 2018	UK	Mixed	Large
Martinez-Cillero et al 2020	Ireland	Quantitative	SME
Matos et al 2018	Multi (incl. Sweden, Denmark, Finland)	Quantitative	
Melollina 2017	UK	Quantitative	
Melollina et al, 2018	UK	Quantitative	
Moreno-Mondejar & Cuerva, 2020	Multi (incl. relevant EU)	Quantitative	SME
Nabarro 2022	UK	Quantitative	
Nakatani, 2019	New Zealand	Quantitative	
Nana-Cheraa 2023		Literature review	
Nehler & Rasmussen, 2016	Sweden	Mixed	
Nehler et al 2014	Sweden	Qualitative	
Nemlioglu & Mallick, 2017	UK	Quantitative	
Nguyen & Trinh, 2023	UK	Quantitative	Large listed non-financial
Oliveira Cunha et al 2021		Literature review	
Pope et al 2022	UK	Quantitative	
Rasmussen, 2020	Sweden	Qualitative	Pulp and paper
Rizov et al 2022	Multi (incl. UK)	Quantitative	
Roland 2020,		Literature review	
Roper and Bourke 2018	UK	Quantitative	
Roper et al 2020	UK	Mixed	SME
Rud et al 2023	Netherlands	Quantitative	
Saukkonen et al 2017	Finland	Qualitative	
Sekerci, 2020	Sweden	Quantitative	Family-owned
Shaikh & Siponen, 2023	UK	Quantitative	
Sheehan & Garavan, 2022	UK	Quantitative	SME
Siedschlag & Yan, 2021	Ireland	Quantitative	
Siedschlag & Yan, 2023	Ireland	Quantitative	
Smietanka et al., 2018	UK	Quantitative	
Solomon, 2021	UK	Quantitative	
Stern et al 2020	UK	Literature review	
Stojcic et al 2018	UK	Quantitative	
Stucki, 2019	Multi (incl. Switzerland)	Quantitative	
The Scottish Government 2022	UK	Quantitative	
Tiberius et al 2021	Multi (incl. Switzerland)	Qualitative	Family-owned
Tori & Onaran, 2018	UK	Quantitative	Listed non-financial
TPI 2023	UK	Literature review	
Valero and Reenan 2019;	UK	Literature review	
van Ark et al. 2023	UK	Literature review	
Veccioli 2019	UK	Literature review	

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<b>Paper</b>	<b>Country</b>	<b>Study type</b>	<b>Firm type</b>
Venables et al 2024	UK	Literature review	
Venmans, 2014	Belgium	Quantitative	Energy intensive
Vissers et al 2022	Netherlands	Quantitative	
Vithessonthi et al 2017	Multi (incl. Switzerland)	Quantitative	
Wielhouwer & Wiersma, 2017	Netherlands	Quantitative	Agricultural
Xin & Choudhary, 2019		Model	
Wilkes 2021	UK	Quantitative	
Wilkes 2022	UK	Quantitative	
Yang et al 2015	UK	Mixed	SME
Zhang & Xie, 2017	Norway	Quantitative	
Zhang, 2020	UK	Quantitative	
Zhou et al 2023		Model	
Zubair et al 2020	Netherlands	Quantitative	SME

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