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BUSINESS BASICS: NUDGING FIRMS TO IMPROVE PRODUCTIVTY

A rapid literature review of behavioural factors and best-practice business prompts

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Contents

Glossary

Concept	Definition
Achievement orientation	A mindset characterised by the need to perform tasks to a high level of excellence.
Complexity	The quality of having many parts (possibly interrelated) that are difficult to jointly comprehend.
Cognitive costs	The mental resources needed to engage in mental processes including reasoned decisions, focusing attention, and ignoring distractions.
Fixed mindset	A belief that abilities and skills are fixed and unchangeable.
Groupthink	When a group's desire for harmony and cohesion distorts its decision making.
Growth mindset	A belief that abilities and skills can be shaped by effort.
Information gaps	The difference between what is known and what is wanted to be known.
Loss aversion	The tendency to place a greater value on avoiding a loss compared to receiving an equivalent gain.
Mental bandwidth	The mental resources available to engage in mental processes including attention, cognition, and self-control. In humans, this capacity is finite and may become reduced or depleted.
Mindsets	Motivations for conducting activities and beliefs about the determinants of these activities' success.
Overconfidence	The quality of having too much faith in a process, outcome, or object (e.g. one's own abilities) relative to what is just objectively justified.
Peer effects	The influence on an organisation from what other organisations are doing.
Present bias	The tendency to place disproportionate weight on the present versus the future due to benefits and the costs in the future being more abstract, and less tangible than those in the present.
Salience	The quality of being noticeable or prominent relative to other features of the environment.

Executive Summary

Overview

Low take-up of proven technologies and management practices holds back the productivity of firms in the UK.[1] Reasons for this may include poor access to finance, skills barriers, and a shortage of external support, among others.[2] As well as these, behavioural factors (that is, those with psychological causes) also play a role in preventing businesses from making productivity-enhancing changes. Even the best-laid plans and policies seeking to raise productivity will fail if they do not induce businesses to act as intended.

This report is a rapid review of the existing evidence in these areas. It is written for policymakers and other interested stakeholders seeking to understand (a) how psychology affects the adoption of proven management practices and technologies, and (b) what is known about the best ways of prompting businesses to act in this area. Research from various sources and fields were drawn upon in its development. However, the review is not intended to be exhaustive.

The review was written for the Department for Business, Energy and Industrial Strategy (BEIS). It is part of the Business Basics Programme, which tests innovative ways of encouraging small and medium sized enterprises to adopt existing technologies and management practices.

Findings

Two broad findings emerge from the review.

Finding 1: Multiple behavioural factors are known to affect whether firms adopt technology and management practices

Behavioural factors affect whether businesses adopt proven management practices and technologies. Key barriers and enablers include:

Behavioural barriers

- **overconfidence** about a business's own performance relative to its peers
- mistakes in assessing a technology or management practice's expected benefits and costs (**expectation errors**)
- low levels of ambition about growth and commercially harmful beliefs (**mindsets unconducive to profit growth**)
- **information gaps** and **complexity** of technologies or management practice that make adopting them cognitively difficult due to **scarce mental resources**

[1] Department for Business, Energy and Industrial Strategy. (2018). Business Productivity Review: Government call for evidence. *Policy report.*
[2] Department for Business, Energy and Industrial Strategy. (2017). Made Smarter Review. *Policy report*.

Behavioural enablers

- encouragement and support from other businesses (**peer and network effects**)
- high levels of ambition about growth and beliefs that facilitate profit growth (**mindsets conducive to profit growth**)
- how noticeable the benefits of a given technology or management practice are (**salience of benefits**)
- **moments of change** that may trigger a firm into acting

These factors were selected as having the strongest impact based on evidence from the literature on management practices and technology adoption. However, other factors from the wider literature on decision-making are also likely to be relevant to decisions on management practices and technology adoption. Examples include loss aversion (preferring to avoid losses more than receiving an equivalent gain), groupthink (when a group's desire for harmony and cohesion distorts its decision making), and present bias (placing too much weight on the present compared to the future due to the present being more tangible than the future).

Finding 2: There is an opportunity to discover what works best to prompt businesses to act

In the second part of this report, we review the evidence about how businesses can be best prompted to adopt a technology or management practice. As there is little evidence on the specific question about prompting businesses to adopt proven technologies and management practices, this review's scope and conclusions are based on what works in prompting businesses to act. The existing evidence is examined in five categories:

- A prompt's **frame** (that is, the context it is presented in, e.g. an appeal to national pride). Many frames have been found to be effective in encouraging businesses to take some form of desired action. These include the use of social norms, loss aversion, reciprocity, and simplification, among others.
- Differences in **messengers**, for example a government or similar business. Existing evidence suggests that businesses are more receptive to trusted and familiar sources. However, it is not always clear who these may be.
- The **time** at which a prompt, or series of prompts such as reminders are sent. There may be occasions when a business is more susceptible to influence than others, such as when the organisation is young or undergoing change ('trigger points').
- The **mode** (form) a prompt takes, such as an email, phone call, or face-to-face communication. Modes involving two-way human interaction are more effective than those that do not, but rigorous evidence in this area is limited.
- The **recipient** of a prompt within an organisation, such as a chief executive officer (CEO). Reaching senior members of organisations may better propagate information throughout a firm, but rigorous evidence in this area is limited.

A large body of literature exists in the field of marketing about ways to increase survey response rates. Several studies in this area relates to several of the above categories. However, evidence about prompting businesses to do other activities is scarce. Studies and examples of prompts involving technology or management practice adoption are very rare.

In general, among the five categories, much more is known about the effects of different frames than the other four dimensions. Evidence is most limited about recipients and modes. An opportunity hence exists for future research to address gaps in all these areas.

Conclusion and next steps

The behavioural factors identified in this review influences businesses' decision to adopt a proven technology or management practice. Each will affect a business's decision through the four stages of recognising a need, identifying options, deciding on one, and acting to adopt.

A large body of research explores the frames that can be used for this purpose. However, less is known about the optimal form of other message dimensions such as a message's messenger, timing, mode, and recipient(s). Furthermore, few existing studies are set in the context of encouraging businesses to adopt proven technologies and management practices; investigate behaviours outside of responding to surveys; or explore the effects of prompts across low productivity firms or industries.

The findings from this review will be used to run five randomised controlled trials (RCTs; considered to be the gold standard of programme evaluation) to add to the evidence base in the above areas. Outside of the Business Basics Programme, findings from these trials will inform recommendations to policymakers and other relevant stakeholders seeking to encourage the adoption of proven technologies and management practices to improve productivity levels in the UK and abroad.

Introduction

Low take-up of proven technologies and management practices holds back the productivity of firms in the UK.[3] Reasons for this may include poor access to finance, skills barriers, and a shortage of external support, among others.[4] As well as these, behavioural factors (that is, those with psychological causes) also play a significant role in preventing businesses from making productivity-enhancing changes. And even the best-laid plans and policies seeking to raise productivity will fail if they do not inform and induce businesses to act as intended.

This report is a rapid literature review about existing evidence in these areas. It covers:

- **behavioural barriers and enablers** affecting businesses' adoption of existing technologies and management practices
- the features of effective messages encouraging businesses to do this: **frames**, **messengers**, **timing**, **modes**, and **recipients**.

The review was written for the Department for Business, Energy and Industrial Strategy (BEIS) as part of the **Business Basics Programme**, which tests innovative ways of encouraging small and medium sized enterprises to adopt existing technologies and management practices.

The review's findings aim to inform future research and policy recommendations to policymakers and other relevant stakeholders seeking to encourage the adoption of proven technologies and management practices in the UK and abroad. The target audience of the review comprises policy officials, delivery bodies, leaders of organisations, researchers, and other individuals interested in understanding (a) how psychology affects the adoption of proven management practices and technologies, and (b) what is known about the best ways of prompting businesses to act in this area.

The review is organised in two parts. The first describes behavioural barriers and enablers in the adoption of proven technologies and management practices. The second surveys the evidence base on what works best to prompt firms to act in these and other areas. It does this with a focus on five dimensions:

- a prompt's **frame** (that is, the context it is presented in, for example an appeal to national pride or social norms)
- differences in **messengers**, for example a government or similar business
- the **time** at which a prompt, or series of prompts is sent
- the **mode** (form) a prompt takes, such as an email or phone call
- a prompt's **recipient(s)** within an organisation, such as a CEO

[3] Department for Business, Energy and Industrial Strategy. (2018). Business Productivity Review: Government call for evidence. *Policy report.*
[4] Department for Business, Energy and Industrial Strategy. (2017). Made Smarter Review. *Policy report.*

Methodology and Scope

The central terms in this review are 'technology' and 'management practices'. They are defined as:

- **Technology** refers to the processes, methods, and techniques applied to an organisation's physical and digital assets to improve their effectiveness. Examples include software, machinery, and transactions infrastructure.[5]
- **Management practices** are the processes, methods, and techniques internal to an organisation used by and applied by its staff to administer its activities. Examples of these include performance monitoring, the setting of internal targets, and talent development policies.[6]

The review of evidence was conducted over ten days. This process drew on research about the adoption of technology and management practices spanning literatures in fields including, but not limited to, economics, psychology, innovation, and marketing. Materials examined include meta-analyses, peer-reviewed journals, and the grey literature of market research, working papers and government reports.

Due to the review's focus on businesses and as the fact that individuals may behave very differently to firms,[7] with few exceptions, only works related to organisations or senior individuals (e.g. managers) were included in examined evidence. An implication of this is that a large body of research about individuals' behavioural barriers and enablers, and what works to prompt them to act, is omitted.

To capture contemporary findings, the time coverage of this review was weighted heavily to material published since 2014.[8] This was also due to the availability of several meta-analyses that covered the pre-2014 period. Peer-reviewed sources were screened by quality (as measured by a score of 3-4 in the Association of Business Schools (ABS) 2018 Guide[9]), generalisability (on a five-point scale), and relevance (on a five-point scale) for inclusion. See the technical appendix for further details on the methodology.

Given the above, the review is not intended to be exhaustive in its coverage. Rather, it provides insights on selected evidence on the topics of behavioural factors and effective messaging.

[5] For further examples, see CBI. (2017). From ostrich to magpie: increasing business take-up of proven ideas and technologies. *Policy report*.
[6] For further examples, see Bloom, N., Lemos, R., Sadun, R., Scur, D., and Van Reenen, J. (2016). International data on measuring management practices. *American Economic Review 106(5),* 152-156.
[7] For example, see Sonderegger, S. and Wilson, S. (2016). Understanding the Behavioural Drivers of Organisational Decision-Making: Rapid Evidence Assessment. ORGANISER: A behavioural approach for influencing organisations. *Policy report.*
[8] The most recent of these and that most directly relevant to this review is Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[9] The Chartered Association of Business Schools. (2018). Academic Journal Guide 2018. Available at: https://charteredabs.org/academic-journal-guide-2018-view/ (accessed December 2018).

Behavioural barriers and enablers to technology and management practice adoption

Adoption of technologies and management practices: an organising framework

Key takeaways

- The evidence covered in this section of the review is organised into four stages required to adopt a technology or management practice: recognising a need, identifying options, deciding, and acting.
- Many factors that affect a business's likelihood of successful adoption interact with these and can be barriers or enablers. This evidence review will only focus on those that relate to behavioural science (behavioural factors).
- The behavioural barriers identified include overconfidence; expectation errors; mindsets unconducive to profit growth; information gaps, complexity, and scarce mental resources.
- The behavioural enablers are peer and network effects; mindsets conducive to profit growth; salience of benefits; and moments of change.

The process of adopting new technologies and management practices

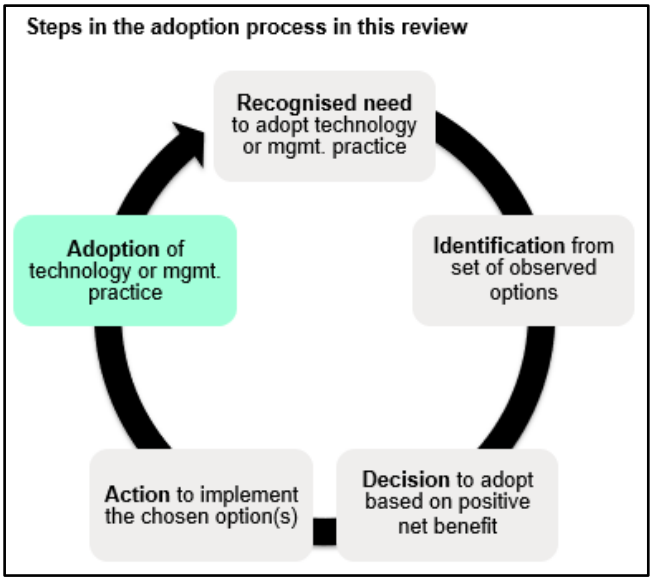
We position our key behavioural barriers and enablers according to the idea that adopting a technology or management practice requires completing four actions in sequence:

- **recognising** the need to adopt a new technology or management practice
- **identifying** a technology or management practice from a set of options
- **deciding** to adopt the technology or management practice, potentially after an assessment of its benefits and costs
- **acting** successfully upon a decision to adopt a technology or management practice, e.g. through a capital purchase or introduction of a process or policy

The likelihood of a business completing the process is influenced by a range of factors that may act as either **barriers** (that hinder) or **enablers** (that help) a business at a given step.

The technology and management practice adoption process is shown below in **Figure 1**.

Figure 1: The technology and management practice adoption process



Behavioural versus structural factors

This review focuses on behavioural factors affecting the take-up of best practice technologies and management practices. Behavioural factors are those relating to findings in psychology and behavioural science.

The review focuses only on barriers and enablers to adoption that are grounded in behavioural science (defined here as structural factors). Examples of these include financial constraints, firm size, industry competitiveness, and others known to affect uptake of technology and management practices by firms.[10]

Some behaviours may be explained by a mix of factors. For example, businesses with high costs of capital may appear impatient relative to their peers when undertaking investment due to differences in their relative cost of finance (as measured by discount rates).[11] Similarly, businesses and managers that do not adopt new technologies in favour of other activities may be acting rationally, for example due to information asymmetries.[12] Where multiple explanations exist for a given barrier or enabler, this review will discuss only the behavioural one(s).

[10] A recent review of these factors is in Department for Business, Energy, and Industrial Strategy. (2018). Business Productivity Review: Government call for evidence. *Policy report.*
[11] Harris, J. and Siebert, R. (2015). Driven by the Discount Factor: Impact of Mergers on Market Performance in the Semiconductor Industry. *Working Paper*.
[12] For example, as in Akerlof, G. A. (1978). The market for "lemons": Quality uncertainty and the market mechanism. In *Uncertainty in Economics*, 235-251.

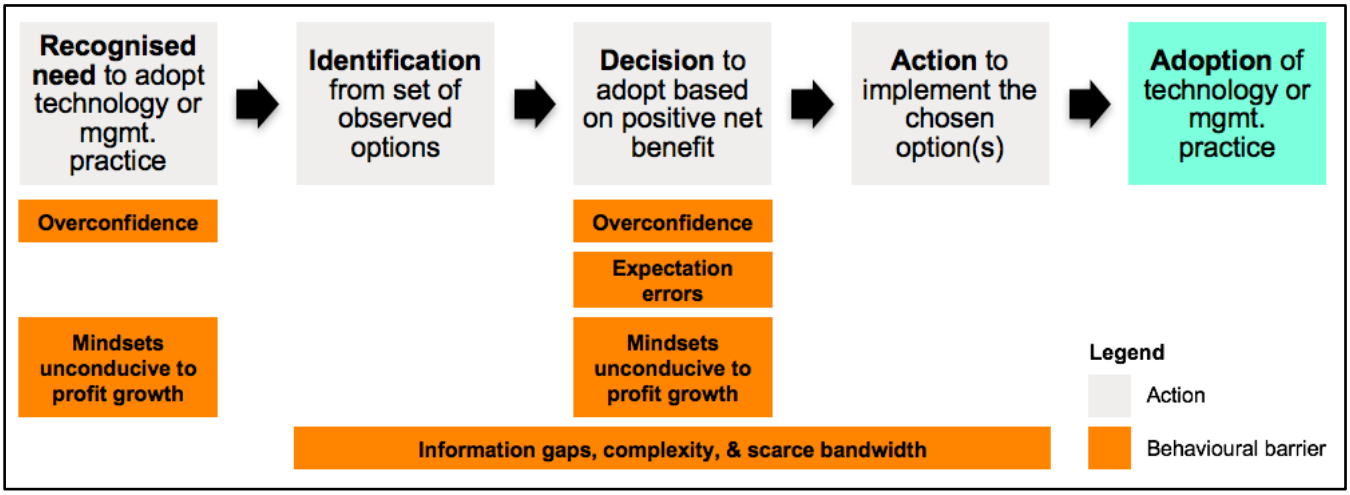
Behavioural barriers

Key takeaways

- At least four behavioural barriers impede the adoption of existing technologies and management practices.
- These are: overconfidence; expectation errors; mindsets unconducive to profit growth; and information gaps, complexity, and scarce mental resources.

Evidence suggests that at least four behavioural barriers impede the adoption of proven technologies and management practices. These are (1) overconfidence; (2) expectation errors; (3) mindsets unconducive to profit growth; and (4) information gaps, complexity, and scarce mental resources. **Figure 2** shows how these barriers relate to a business's adoption decision.

Figure 2: Behavioural barriers to technology and management practice adoption



Overconfidence

Overconfidence can take many forms and affect businesses' adoption of technology and management practices through multiple channels.[13] Evidence suggests that this can have meaningful effects and apply to a large proportion of firms.

Overconfidence among businesses about their productivity relative to their peers is widespread and may hamper the adoption of technologies and management practices. For example, a recent UK survey found 79 percent of businesses believed they were at least as productive as their peers,[14] suggesting that a large proportion of firms may be mistaken in their relative need to invest in productivity-enhancing technologies.[15] Similar empirical evidence exists that managers are systematically overconfident regarding the quality of management at their own

[13] For a recent review with respect to CEOs and managers, see Malmendier, U. and Tate, G. (2015). Behavioral CEOs: The Role of Managerial Overconfidence. *Journal of Economic Perspectives, 29(4),* 37-60.
[14] Be the Business. (2018) Overconfidence on productivity is hampering British performance.
[15] Ibid.

firms, relative to others across industries and countries, which leads to an undervaluation of these practices.[16]

Some literature shows that managerial overconfidence about the performance of their own firms may have positive effects on investment in certain contexts. In these cases, the net benefit to a firm can be unclear. For example, firms with overconfident CEOs have been shown to invest more in research and development than peers in innovative industries,[17] but this may lead to subsequent reversals in these investments over time.[18]

Errors in expectations about benefits and costs

Incorrect expectations by businesses about the realised benefits and costs of adopting new technologies and management practices may result in under-adoption of valuable technologies and management practices. This will occur if expected benefits are smaller than their actual level and / or expected costs are higher than would be realised.

Some evidence documents scepticism among businesses about the perceived benefits of management practices via surveys and qualitative interviews across countries.[19] [20] In the UK, smaller firms reported that introducing management practices was best suited to large firms in a recent government survey,[21] despite broad evidence showing that higher quality management practices benefits small and large companies alike.[22] [23] [24] Small UK firms also reported that introducing new management practices may create undesirable cultural effects among their staff (for example, such as leading to a 'cold, corporate environment').[25]

Outside of recent qualitative research,[26] evidence about firms' beliefs about the benefits and costs of technology adoption remains limited. However, they are likely to differ depending on the specific form of technology in question and may vary by firm size. For example, survey evidence suggests that Customer-Relationship Management (CRM) systems may be viewed by small and medium sized enterprises (SMEs) as unnecessary for firms their size. [27]

Mindsets unconducive to profit growth

In this review, mindsets refer to key decision makers' motivations for conducting activities related to growing an organisation's profits (for example, hiring staff, undertaking capital

[16] Sadun, R., Bloom, N., and van Reenen, J. (2017). Why Do We Undervalue Competent Management? *Harvard Business Review, September-October 2017*.
[17] Hirshleifer, D., Low, A., and Toeh, S H. (2012). Are Overconfident CEOs Better Innovators? *The Journal of Finance, 67(4),* 1457-1498. Overconfidence was here measured using options and press-based proxies.
[18] Comin, D., Skinner, J., and Staiger, D. (2018). Misperception and Technology Adoption. *Working paper*.
[19] Bloom et al. (2012). Does Management Matter? Evidence From India. *The Quarterly Journal of Economics, 128(1)*, 1-51; Sadun, Bloom, and van Reenen (2017); *Unpublished.*
[20] For example, see Bloom et al. (2018). Do Management Interventions Last? Evidence from India. *NBER Working Paper No. 24249*, where some surveyed managers nominated a perceived negative benefit from management practices as a reason for not adopting them.
[21] *Kantar Public (2019). Business Basics: Attitudes to Adoption. Understanding the barriers and enablers to the adoption of best practice technologies and management practices by SMEs.*
[22] Bloom et al. (2016). International data on measuring management practices.
[23] Bryson, A. and Forth, J. (2018). The impact of management practices on SME performance. *NIESR Discussion Paper No. 488.*
[24] Omsa, S., Ridwan, M., and Jayadi, M. (2017). The Effect of Strategic Management Practices on SME Performances in Makassar, Indonesia. *American Journal of Theoretical and Applied Business*, 3(4), 71-80.
[25] *Kantar Public (2019). Business Basics: Attitudes to Adoption. Understanding the barriers and enablers to the adoption of best practice technologies and management practices by SMEs.*
[26] Ibid.
[27] Ibid.

investments, conducting R&D, engaging in marketing, etc.) and their beliefs[28] about the determinants of success in doing these.

Certain mindsets reduce an organisation's chances of successfully adopting proven technologies and management practices. These share the fact that they prevent businesses from growing and innovating. The effect on technology adoption is due to the mediating role that innovation plays in realising these intentions.[29]

For example, lower growth ambitions correlated with decreased adoption of digital technologies among small firms in the UK, Ireland, and United States;[30] a similar relationship was found in Norway.[31] Some qualitative work suggests this link may be causal and that these mindsets lower the adoption of technology and management adoption. For example, firms may fall into a 'reluctant innovator' typology, characterised by taking comfort in the status quo and relying on known procedures unless triggered to change.[32]

Firms' beliefs about the determinants of success can also meaningfully affect their adoption outcomes. For example, a 'fixed mindset'[33] — a belief in a fixed set of skills that are unchangeable — among decision makers was found to inhibit growth-related activities and the uptake of business advice.[34]

Information gaps, complexity, and scarce mental resources

Like all individuals, key decision makers within organisations possess limited cognitive resources, or 'bandwidth' to make reasoned judgements and decisions.[35] In the presence of information gaps and complexity, there may be insufficient resources available for firms to evaluate and adopt proven technologies and management practices.

Scarce mental bandwidth has been empirically documented, modelled, or otherwise proposed as a behavioural barrier to technology and management practice adoption in contexts including but not limited to small firms in developing countries,[36] qualitative interviews with UK SMEs

[28] For clarity, although several beliefs and motivations are discussed throughout this section of the review - for example, those about expected benefits and costs - the term 'mindsets' describes a set distinct from those in the other barriers.
[29] A meta-study exploring this relationship is Levie, J. and Autio, E. (2013). Growth and Growth Intentions: A meta-analysis of existing evidence. *ERC White Paper No. 1*.
[30] Roper, S. and Bourke, J. (2018). Industry 4.0 is coming: Is digital adoption a new mechanism linking entrepreneurial ambition to business performance? *ERC Research Paper 72.*
[31] Rypestol, J. O. and Aarstad, J. (2018). Entrepreneurial innovativeness and growth ambitions in thick vs. thin regional innovation systems. *Entrepreneurship and Regional Development 30(5),* 639-661.
[32] Ibid.
[33] Dweck, C. S. (2012). Mindsets and human nature: Promoting change in the Middle East, the schoolyard, the racial divide, and willpower. *American Psychologist, 67(8)*, 614.
[34] The Behavioural Insights Team. (2018). Evidence Report: Improving functioning of the business advice market and increasing the take-up of high-quality business advice amongst SMEs. *Policy report.*
[35] The use of the term bandwidth' in the economic context considered here first appears in Mullainathan, S., and Shafir, E. (2013). Scarcity: Why Having Too Little Means So Much, New York: Henry Holt and Company. However, the underlying concepts stem from a large body of research in psychology.
[36] Schilbach, F., Schofield, H., and Mullainathan, S. (2016). The Psychological Lives of the Poor. *American Economic Review: Papers & Proceedings 2016, 106(5):* 435–440.

seeking to innovate,[37] [38] strategic decisions in a large multinational organisational,[39] theoretical economic models,[40] and experimental games involving US farmers.[41]

For SMEs, mental bandwidth can act as a barrier as often decisions are made by individuals under time pressure and faced with multiple short-term operational decisions. These can crowd out longer term strategic decisions.[42] Additionally, information gaps[43] (the difference in the information held by an individual or a business and what they would like to know) and complexity (e.g. as measured by the cognitive requirements to implement a new technology) are two significant factors that contribute to this barrier's effect in the realm of technology and management practice adoption.[44] Interventions addressing information gaps may have surprising effects. For example, an RCT that provided information about the benefits of costs of exports to UK manufacturing firms found that the treatment improved the attitude of existing exporters but lowered the perceived benefits of exporting among non-exporters.[45]

Behavioural enablers

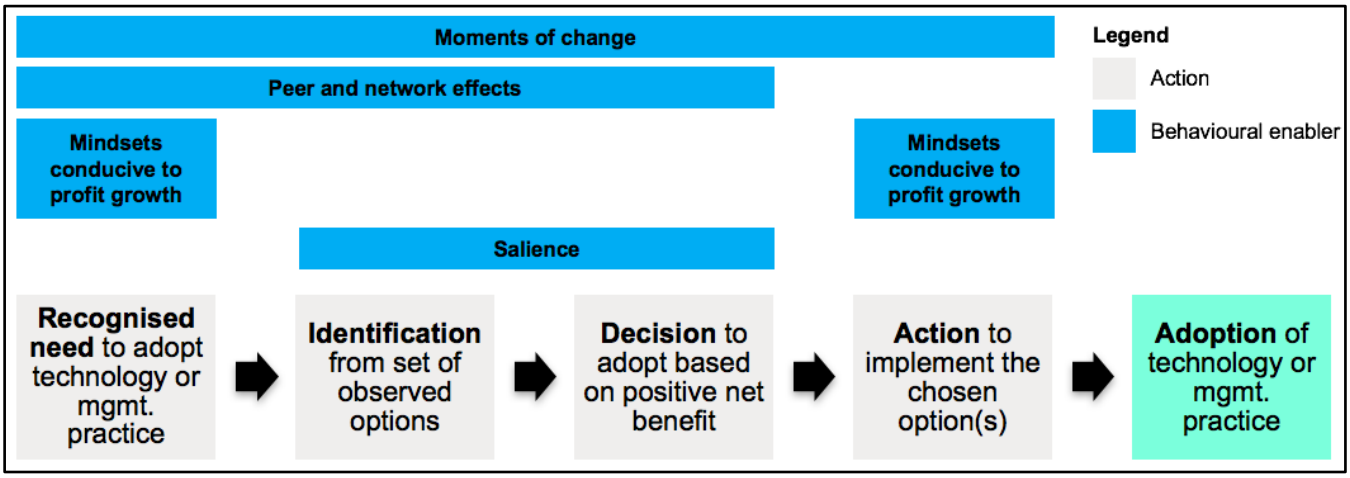
Key takeaways

- Several behavioural enablers facilitate the adoption of existing technologies and management practices.
- These are: peer and network effects; mindsets conducive to profit growth; salience of benefits; and moments of change.

Several behavioural enablers facilitate the adoption of proven technologies and management practices. These are (1) peer and network effects; (2) mindsets conducive to profit growth; (3) salience of benefits; and (4) moments of change. **Figure 3** shows how these barriers relate to a business's decision to adopt a technology or management practice.

[37] The Behavioural Insights Team. (2018). Improving functioning of the business advice market. *Policy report.*
[38] The Behavioural Insights Team. (2018). Encouraging the uptake of Industry 4.0 solutions among Australian SMEs. *Policy report.*
[39] Laamanen, T., Maulab, M., Kajantob, M., and Kunnasc, P. (2018). The role of cognitive load in effective strategic issue management. *Long Range Planning, 51(4),* 625-639.
[40] Bradford, B. L., Chavasa, J., Fitz, D., and Schechtera, L. (2018). Receptiveness to advice, cognitive ability, and technology adoption. *Journal of Economic Behavior & Organization, 149,* 239-268.
[41] Ibid.
[42] The Behavioural Insights Team. (2018). Increasing private-sector innovation: evidence review. *Policy report.*
[43] For example, Jack, K. (2013). Market inefficiencies and the adoption of agricultural technologies in developing countries. *Literature review, Agricultural Technology Adoption Initiative, J-PAL*; Kurnia, S., Choudrie, J., Mahbubur, R., and Alzougoold, B. (2015). E-commerce technology adoption: A Malaysian grocery SME retail sector study. *Journal of Business Research, 68(9),* 1906-1918; and Magruder, J. (2018). An Assessment of Experimental Evidence on Agricultural Technology Adoption in Developing Countries. *Annual Review of Resource Economics, 10,* 299-316.
[44] Scarce mental bandwidth and information gaps were the two most prevalent behavioural barriers preventing the uptake of business advice among UK SMEs by BIT and BEIS in Behavioural Insights Team. (2018). Improving functioning of the business advice market. *Policy report.*
[45] Breinlich, H., Donaldson, D., Nolen, P., and Wright, G. (2017). Information, Perceptions and Exporting - Evidence from a Randomized Controlled Trial. *University of Essex Department of Economics Discussion Paper.*

Figure 3: Behavioural enablers of technology and management practice adoption



Peer and network effects

A large literature suggests that an organisation's peers and network can exert a powerful influence on its attempts and success in adopting both valuable technologies[46] and management practices.[47] This influence can arise through several channels including the provision of valuable information (either transmitted actively or passively, e.g. being learned through observation), encouragement, or social and industry norms.

Existing research in this area finds several stylised facts about the nature of this peer effect in various contexts. Specifically, treatment effects may be stronger when:

- peers are not direct competitors[48]
- peers possess a shared group identity or are similar to a given organisation[49]
- multiple peers are present for an organisation to learn from (as opposed to one)[50]
- the technology in question is unfamiliar or its benefits are difficult to observe[51]

Comparatively more research exists relating to the adoption of technologies rather than management practices. The existing literature is also somewhat skewed toward research in developing countries.[52] However, several recent studies, policy reports, and interviews relating

[46] Seminal research in this area includes Conley, T. G. and Udry, C. R. (2010). Learning about a New Technology: Pineapple in Ghana. *American Economic Review, 100(1),* 35-69; and Syverson, C. (2011). What Determines Productivity? *Journal of Economic Literature 49*, 326-365.
[47] For example, Cai, J. and Szeidl, A. (2017). Interfirm Relationships and Business Performance. *The Quarterly Journal of Economics, 133(3),* 1229–1282 as measured by management scores in an RCT.
[48] Cai, J. and Szeidl, A. (2017). Interfirm Relationships and Business Performance.
[49] BenYishay, A. and Mobarak, A. M. (2018). Social Learning and Incentives for Experimentation and Communication. *The Review of Economic Studies*.
[50] For example, Beaman, L., BenYishay, A., Magruder, J., and Mobarak, A. M. (2018). Can Network Theory-based Targeting Increase Technology Adoption? *NBER Working Paper No. 24912*; Dalton, P. Ruschenpoler, S., Uras, B., and Zia, B. (2018). Learning Business Practices from Peers: Experimental Evidence from Small-scale Retailers in an Emerging Market. *DFID Working Paper.*
[51] Ibid.
[52] For a recent survey of 'behavioural firms' in development economics, see Kremer, M., Rao, G., and Schilbach, F. (2019). 'Behavioral development economics' in *Handbook of Behavioral Economics – Foundations and Applications 2, Volume 2* (ed Bernheim, B. D, DellaVigna, S., and Laibson, D.). North Holland.

to UK SMEs suggest that network and peer effects remain relevant and potent behavioural enablers for both technology and management practice adoption.[53]

Mindsets conducive to profit growth

Certain mindsets among key decision makers within organisations are more conducive to profit growth than others. In turn, these facilitate the adoption of best practice technologies and management practices.

Many of these mindsets act through the same channels as those that were earlier identified as behavioural barriers. This means they can often be described in similar terms or interpreted as occurring on the other end of a spectrum. For example, high (rather than low) growth ambitions,[54] an achievement orientation,[55] and a 'growth mindset'[56] (a belief in a set of skills that are changeable with investment)[57] among business owners correlate positively with the adoption of new technologies and management practices.

Recent qualitative research also found that some firms in the UK can be grouped into two typologies that are associated with a higher proclivity for technology and management practice adoption.[58] These were businesses who have recently changed management ('recently taken the reins') as well as 'cutting edge innovators and growth-hungry start-ups'.[59] A variable that defined these typologies was a growth mindset for innovation activities (an 'innovation mindset'), which was high for both types relative to other firms.[60] Another was the idea of trigger points, which are discussed further below. An open and important question remains about how shifts in mindsets may occur among the typologies that do not typically adopt new technology and management practices (e.g. 'reluctant innovators') to ones that do.

Salience of benefits

When the benefits of a given technology or management practice are salient (that is, perceptually prominent in the environment), this increases of the probability of attracting a decision maker's attention and consequently, the likelihood of the technology or management practice's successful adoption.

Salience can promote the uptake of new technologies in numerous contexts.[61] In contrast, existing evidence about management practices is more mixed. Some research notes that a lack of salience may afflict the adoption of management practices given their intangible nature

[53] For example, Behavioural Insights Team. (2018). Increasing private-sector innovation: evidence review; Be the Business. (2018). How good is your business really? Raising our ambitions for business performance. Productivity Leadership Group. *Policy report*.; and Behavioural Insights Team. (2018). Improving functioning of the business advice market.
[54] Roper, S. and Bourke, J. (2018). Industry 4.0 is coming.
[55] Levie and Autio. (2013). Growth and growth intentions.
[56] Dweck, C. S. (2012). Mindsets and human nature.
[57] The Behavioural Insights Team. (2018). Evidence Report: Improving functioning of the business advice market.
[58] Similar findings among Australian SMEs are in Behavioural Insights Team. (2018). Encouraging the uptake of Industry 4.0 solutions among Australian SMEs. *Policy report.*
[59] *Kantar Public (2019). Business Basics: Attitudes to Adoption. Understanding the barriers and enablers to the adoption of best practice technologies and management practices by SMEs.*
[60] Ibid.
[61] For example, Hannah, R., Mullainathan, S., and Schwartzstein, J. (2014). Learning Through Noticing: Theory and Evidence from a Field Experiment. *The Quarterly Journal of Economics, 129(3)*, 1311-1353; Behavioural Insights Team. (2018). Evidence Report: Improving functioning of the business advice market; and Bergman, P., Lasky-Fink, J., and Rogers, T. (2018). Simplification and Defaults Affect Adoption and Impact of Technology, But Decision Makers Do Not Realize This. *Working paper*; among others.

and difficulty in defining them.[62] However, it is unclear to what extent increasing the salience of management practices would increase their adoption, and to what extent this is possible.

As a behavioural enabler, salience is a separate idea from the provision of new information to a decision maker as it acts via directing an individual's (scarce) attention to unusual features of the environment,[63] or to focusing the individual's attention on tangible information in the present at the expense of a more abstract future.[64]

Consistent with this mechanism, a body of existing evidence suggests that the existence or provision of valuable information to firms is often not enough to cause organisational behaviour change.[65] The evidence in this area spans both technologies[66] and management practices.[67] In this sense, salience can be viewed as a complementary means of encouraging technology adoption among firms to information provision.

Moments of change

A mounting body of evidence suggests that firms' likelihoods of undergoing organisational change are greater at some times than others.[68] Such moments or events are hence a promising behavioural enabler to adopting tried-and-true technologies and management practices. Distinguishing factors of the moments when organisations may be most likely to be amenable to adopting new technologies or management practices include:

- adverse firm or industry-level shocks such as the entrant of a new competitor or loss of a major contract which force them to do so[69]
- changes in a firm's leadership[70]
- the end of a financial year[71]
- communications from government bodies[72]

[62] *Kantar Public (2019). Business Basics: Attitudes to Adoption. Understanding the barriers and enablers to the adoption of best practice technologies and management practices by SMEs.*
[63] Taylor, S. and Thompson, S. (1982). Stalking the Elusive Vividness Effect. *Psychological Review, 89*, 155–181 and Kahneman, D. (2011). Thinking Fast and Slow, New York: Farrar, Strauss, Giroux, 324.
[64] The Behavioural Insights Team. (2015). EAST: four simple ways to apply behavioural insights. *Policy report.*
[65] For example, Karlan, D., Knight, R. and Udry, C. R. (2015). Consulting and capital experiments with microenterprise tailors in Ghana. *Journal of Economic Behavior and Organization 118*, 281– 302; in the context of individuals, Handel, B. and Schwartzstein, J. (2018). Frictions or Mental Gaps: What's Behind the Information We (Don't) Use and When Do We Care? *Journal of Economic Perspectives, 32(1)*, 155-178.
[66] Hannah et al. (2014). Learning Through Noticing: Theory and Evidence from a Field Experiment.
[67] Bloom et al. (2012). Does Management Matter? However, a recent exception using an RCT where the provision of information about the benefits of management practices did work is in Nguyen, Q. and Kim, T.H., (2018). Promoting adoption of management practices from the outside: Insights from a randomized field experiment. *Journal of Operations Management*.
[68] For a recent review of this evidence, see Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[69] *Kantar Public (2019). Business Basics: Attitudes to Adoption. Understanding the barriers and enablers to the adoption of best practice technologies and management practices by SMEs.*
[70] Be the Business. (2018). Response to the Business Productivity Review, *Submission to Government*.
[71] Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[72] For example, Algate, F. (2015). You have been selected: Driving uptake of Government schemes. *Research report.* Many other examples are surveyed in Behavioural Insights Team. (2018). Increasing private-sector innovation: evidence review; and Behavioural Insights Team. (2018). Evidence Report: Improving functioning of the business advice market.

Further evidence on moments of change is in the review's next section in the context of optimal prompts to firms.

Other behavioural barriers and enablers

The eight barriers and enablers discussed were selected based on the evidence specific to management practice and technology adoption being the strongest and widest relative to others. Further behavioural barriers and enablers not outlined in the body of the review, but which are supported by evidence, include but are not limited to:

- **Loss aversion**: individuals tend to value avoiding losses more than the equivalent gain.[73] As a result of this, managers and firms may be resistant to being exposed to the risks associated with organisational change.[74] [75]
- **Groupthink:** that is, the tendency for a desire for conformity or group harmony among members of an organisation to cause or perpetuate an irrational decision.[76] In the context of technology and management practice adoption, this may take the form of an unwillingness to consider new ideas and perspectives.[77]
- **Present bias:** the tendency of people to give stronger weight to payoffs that are closer to the present time when considering trade-offs between two future moments.[78] This may occur within businesses due to factors including the salience of upfront costs and time or attitudes such as preferring to maintain cash inflows ('cash is king') that may prevent long-term investments.[79]

Additionally, all our factors can be defined equivalently as either barriers or enablers. For example, a *lack* of salience, peer network, or moments of change would comprise behavioural barriers. Similarly, adopting an inventory management system may free up mental bandwidth and increase the likelihood of other opportunities being taken by the firm.

The decision to assign a given factor as a barrier, enabler, or both (as in the case of mindsets) was driven by the body of evidence underlying it. Nevertheless, policymakers should know each barrier is associated with its own enabler, and vice versa.

[73] Kahneman, D., and Amos T. (1984). Choices, Values and Frames. *American Psychologist, 39,* 341–350.
[74] For example, Ryan, S. (2016). How Loss Aversion and Conformity Threaten Organizational Change. *Harvard Business Review*; Chrisman, J. and Patel, C. P. (2012). Variations in R&D Investments of Family and Nonfamily Firms: Behavioral Agency and Myopic Loss Aversion Perspectives. *Academy of Management Journal, 55(4),* 976-997.
[75] The Behavioural Insights Team. (2018). Encouraging the uptake of Industry 4.0 solutions among Australian SMEs.
[76] Janis, I. L. (1971). Groupthink. *Psychology Today, 5 (6),* 43–46; 74–76.
[77] See for example Bénabou, R. (2012). Groupthink: Collective delusions in organizations and markets. *Review of Economic Studies, 80(2)*, 429-462; and Coles, J. L., Daniel, N. D., and Naveen, L. (2015). Board groupthink. *Working paper.*
[78] O'Donoghue, T., & Rabin, M. (1999). Doing it now or later. *American Economic Review, 89(1),* 103-124.
[79] The Behavioural Insights Team. (2018). Improving functioning of the business advice market.

Target points for intervention design

The set of key barriers and enablers, and potential intervention target points are displayed in **Figure 4** and **Table 2** below.

Figure 4: Behavioural barriers and enablers of technology and management practice adoption

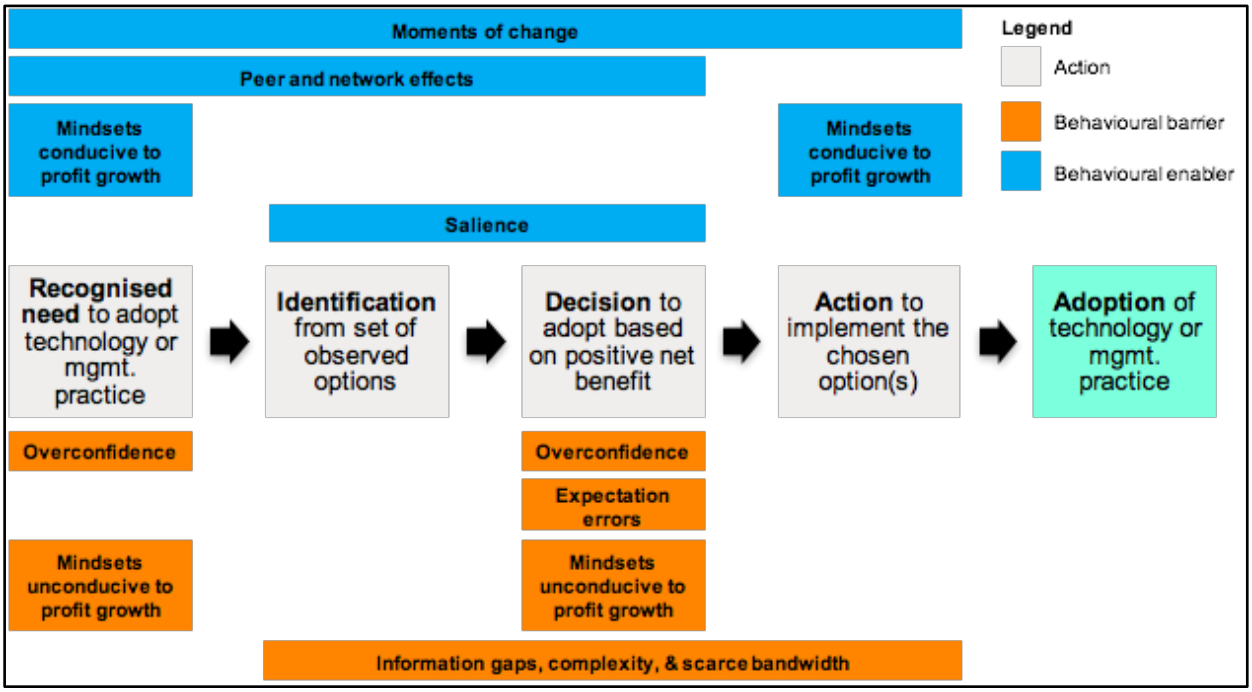


Table 2: Intervention target points organised by behavioural factors

Stage of a business's adoption decision targeted by an intervention	Potentially addressable behavioural factors
1. Recognising the need to adopt a technology or management practice	**Barriers** Overconfidence Mindsets unconducive to profit growth **Enablers** Peer and network effects Mindsets conducive to profit growth Moments of change
2. Identifying a suitable technology or management practice from a set of options	**Barriers** Information gaps, complexity, and scarce mental bandwidth **Enablers** Peer and network effects Salience of benefits Moments of change

Stage of a business's adoption decision targeted by an intervention	Potentially addressable behavioural factors
3. Deciding to adopt a technology or management practice	**Barriers** Overconfidence Expectation errors Mindsets unconducive to profit growth Information gaps, complexity, and scarce mental bandwidth **Enablers** Peer and network effects Salience of benefits Moments of change
4. Acting to implement a technology or management practice	**Barriers** Information gaps, complexity, and scarce mental bandwidth **Enablers** Mindsets conducive to profit growth Moments of change

Behaviourally-informed prompts are one such intervention that may increase the adoption of tried-and-tested technologies and management practices. Best practice for the design of these prompts is discussed in the next section; these prompts will in turn form the interventions of a series of messaging trials run by BEIS and The Behavioural Insights Team (BIT).

What is known about best practice business prompts?

Overview of the existing evidence base

Most existing evidence about prompting businesses to act comes from three sources: (1) a large body of RCTs that typically vary the framing of prompts to recipient firms in public policy contexts; (2) studies from a large marketing literature about increasing survey response rates;[80] and (3) the ORGANISER evidence review published in 2016.[81] These sources mean the existing evidence base's insights are recent, span many relevant contexts, are frequently targeted to policymakers, and often underpinned by rigorous evaluation methods.

However, the existing evidence suffers from several limitations. First, few studies examine prompting firms in the context of technology and management practice adoption. Insights from the marketing literature are also often limited to the specific action of responding to surveys. Given this, this section of the review examines research about prompting businesses' general behaviours, with evidence about management practice and technology adoption highlighted where it exists. Second, apart from framing, there are significant evidence gaps in each of the research areas. Most RCTs focus on varying message frames in their arms. Qualitative and relevant non-RCT studies provide some insights about prompting businesses with different messengers and timing. However, little is known about optimal modes or recipients within a firm to prompt.

The current evidence base is detailed below by five research areas of interest.

Table 3: Strengths and weaknesses of the current evidence base

Strengths	Weaknesses

• The existing research is:
  ○ New (broadly reviewed in 2016)
  ○ Span multiple relevant contexts (industries, countries, outcome measures, subgroups, etc.)
	• Few studies focused exclusively on the adoption of technology and management practices or actions outside of responding to surveys.
	• Gaps exist in the research areas of interest, with existing evidence being unevenly spread between them:
	  ○ Most RCTs focused on framing

[80] Relevant reviews and meta-analyses of this large literature include: Snijkers, G., Haraldsen, G., Jones J., and Willimack D. (2013). Designing and conducting business surveys. John Wiley & Sons; Anseel, F., Lievens, F., Schollaert, E., and Choragwicka, B. (2010). Response Rates in Organizational Science, 1995–2008: A Meta-analytic Review and Guidelines for Survey Researchers. *Journal of Business and Psychology, 25(3)*, 335-349; Baruch, Y. and Holtom B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations 61(8)*, 1139-1160; Bednar, M. K., Westphal, J.D. (2006); and Chidlow, A., Ghauri, P. N., Yeniyurt, S., and Cavusgil, S.T. (2015). Establishing rigor in mail-survey procedures in international business research. *Journal of World Business 50(1)*, 26-35; among many others.

[81] Sonderegger, S. and Wilson, S. (2016). ORGANISER.

Strengths	Weaknesses
○ Often directly relevant to policymakers ○ Often underpinned by rigorous evaluation methods (e.g. RCTs) ○ Supported by a related literature in marketing about improving survey response rates	○ Most qualitative and non-RCT quantitative research insights limited to messengers and timing ○ Very little is known about optimal modes or **recipients of prompts**

Framing

Key takeaways

- **What works:** Many frames have been effective relative to a default or control, such as social norms, reciprocity, loss aversion, among others.
- **Promising interventions:** Multiple effective frames simultaneously; reducing textual complexity, and personalisation (e.g. telling a business it has 'been chosen') may outperform some other individual frames.
- **Type of evidence available:** Mostly randomised controlled trials (RCTs) – a robust and gold-standard evaluation method – involving messages sent to businesses.

Existing evidence suggests that how messages are framed can meaningfully affect how businesses respond to their content. Most high-quality evidence in this area comes from RCTs run (or in progress at the time of writing) by government departments and other organisations in partnership with evaluation and behavioural science bodies like BIT. These were run across a diverse set contexts and participants. Most aimed to improve the uptake of a given policy outcome such as registrations for a government service. Almost all the trials tested different frames to do this. Examples include loss aversion, peer effects, and textual simplification.

These trials demonstrate that behaviourally-informed framing can meaningfully affect how businesses react to messages. Statistically significant improvements in measured outcomes were found from framing interventions designed to simplify text, leverage loss aversion, social norms, and reciprocity. However, among existing trials, no single frame has been shown to consistently outperform others. Moreover, similar interventions also varied in their effectiveness depending upon the experimental context.

One frame with a consistent underlying body of evidence underpinning it is reducing message complexity. Some studies suggest that reducing a message's complexity (e.g. by increasing its readability) may increase a message's desired impact among organisations.[82] Another frame

[82] For example, on an investment research platform for investors with an audience including institutional investors and entrepreneurs, a one standard deviation increase in headline length led to 12% fewer views, with complexity mattering more for less-surprising news on quieter days. See Umar, T., (2018). Complexity Aversion When Seeking Alpha. *Working Paper.*

found to be effective is a 'personalisation' frame,[83] such as the telling a business that it has been chosen to receive a government grant because of its individual qualities. These findings are consistent with findings from the marketing literature about improving survey response rates which find that short and easy-to-complete questionnaires result in a higher response rates among managers.[84]

An overview of framing interventions trialled with businesses and studied elsewhere is at **Table 4** below. Further details about these frames, such as their underlying evidence and effect sizes, are in **Appendix A**.

Table 4: Summary of selected framing interventions by effect sizes

Outperformed control	Sometimes outperformed	Did not outperform or results pending
• Multiple frames[85] • Simplification[86] [87] [88] [89] [90] • Prevention and promotion[91] • Personalisation[92]	• Social norms[97] [98] [99] [100] [101] • Loss aversion[102] [103] [104] [105] • Use of the word 'free'[106] [107]	• Did not outperform control • Money[111] • Results pending (RCT in progress) • Peer testimonial[112]

[83] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.
[84] Frohlich, M. T. (2002). Techniques for improving response rates in OM survey research. *Journal of Operations Management, 20(1),* 53-62.
[85] Brockmeyer, A., Hernandez, M., Kettle, S. and Smith, S. (2019). Casting a wider tax net: Experimental evidence from Costa Rica, *American Economic Journal: Economic Policy,* forthcoming.
[86] Umar, T., (2018). Complexity Aversion When Seeking Alpha.
[87] The Behavioural Insights Team. (2017). Encouraging fast growing companies or "scaleups" to access business support programmes. *Unpublished.*
[88] The Behavioural Insights Team. (2017). Trial with Skills Funding Agency. *Unpublished.*
[89] Frohlich, M. T. (2002). Techniques for improving response rates in OM survey research.
[90] Ibid.
[91] Department for Business, Innovation, and Skills. (2013). SMEs: The Key Enablers of Business Success.
[92] Algate, F. (2015). You have been selected: Driving uptake of Government schemes
[97] Likki, T., Londakova, K., and Sweeney, M. (2017). Encouraging flexible recruitment: an email trial. *Equality and Human Rights Commission report*.
[98] The Behavioural Insights Team. (2016). Behavioural Insights for Cities. *Report for the Bloomberg Philanthropies' What Works Cities initiative*.
[99] The Behavioural Insights Team. (2014). Connection Vouchers: brief analysis report. *Unpublished*.
[100] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.
[101] Kettle et al. (2016). Behavioral interventions in tax compliance: evidence from Guatemala.
[102] Likki and Sweeney. (2017). Encouraging flexible recruitment: an email trial.
[103] The Behavioural Insights Team. (2016). Behavioural Insights for Cities.
[104] The Behavioural Insights Team. (2014). Connection Vouchers: brief analysis report. *Policy report.*
[105] Department for Business, Innovation, and Skills. (2013). SMEs: The Key Enablers of Business Success and the Economic Rationale for Government Intervention. *Policy report*.
[106] The Behavioural Insights Team. (2014). Connection Vouchers: brief analysis report.
[107] Department for Business, Innovation, and Skills. (2013). SMEs: The Key Enablers of Business Success.
[111] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.
[112] The Behavioural Insights Team. (2018). Supporting Turkish exporters: preliminary results. *Unpublished*.

Outperformed control	Sometimes outperformed	Did not outperform or results pending
• Deterrence[93] • Limited time[94] • Reciprocity[95] • National pride[96]	• Entrepreneur identity priming[108] • Altruism / emphasis on extrinsic incentives[109] [110]	• Honesty frame[113]

Messengers

Key takeaways

- **What works:** Trusted and familiar organisations as messengers.
- **Promising interventions:** Organisations ex-ante identified as trustworthy; similar business peers (along measurable characteristics); further RCTs to build the evidence base.
- **Type of evidence available:** Qualitative interviews and laboratory experiments; marketing studies about survey response rates.

The source from which a prompt comes from can influence its interpretation and subsequent and impact. For example, individuals are more likely to discount advice given by someone we dislike and are also influenced by the perceived authority of the sender.[114] [115]

Evidence regarding the impact of different messengers on businesses is scarce but reflects similar insights. In some contexts, businesses who receive information from trusted sources or those who are perceived to be experts about new technologies (or sources of information and insight) show higher take-up rates of those technologies.[116] [117] However, some laboratory experiments show organisations may trust and reciprocate less than individuals do, which

[93] Kettle, S., Wills-Silva, M., Garnelo, M. Litvine, L., and Kaplan, D. (2019). Formal in practice, not just in name: Nudges to encourage business formalisation in Mexico. *Working paper*; Kettle, S., Hernandez, H., Antonio, M., Ruda, S., and Sanders, M. (2016). Behavioral interventions in tax compliance: evidence from Guatemala. *World Bank Policy Research Working Paper WPS7690.*
[94] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.
[95] Kettle et al. (2019). Formal in practice, not just in name: Nudges to encourage business formalisation in Mexico.
[96] Kettle et al. (2016). Behavioral interventions in tax compliance: evidence from Guatemala.
[108] Ibid.
[109] Ibid.
[110] Ganguli, I., Le Coq, C., and Huysentruyt, M. (2018). How Do Nascent Social Entrepreneurs Respond to Rewards? A Field Experiment on Motivations in a Grant Competition. *SITE Working paper Series No. 46.*
[113] Ibid.
[114] Cialdini, R. B. (2007). Influence: The psychology of persuasion. New York: HarperBusiness, Revised Edition.
[115] Dolan, P., Hallsworth, M., Halpern, D., King, D., & Vlaev, I. (2010). MINDSPACE: influencing behaviour for public policy. *Policy report*.
[116] The Behavioural Insights Team. (2018). Increasing private-sector innovation: evidence review.
[117] Jack, K. (2013). Market inefficiencies and the adoption of agricultural technologies in developing countries.

imply that this trust may be more costly to engender than for the case of individuals.[118] In a study about survey response rates in the marketing literature, trade association endorsement and the messenger's regional affiliation boosted the response rates of messages sent to small firms.[119]

Aside from these examples, little is known about the difference between businesses' reactions to messengers across sectors (e.g. government vs. private sector bodies), those within a given sector (e.g. a supplier vs. an industry peer), or other characteristics such as whether a message comes from an individual or group. Empirical evidence in this domain outside of developing countries is also limited.

Key insights about messengers are detailed in **Table 5**.

Table 5: Insights about messengers

Insight	Evidence type
Trusted sources are effective messengers for businesses[120] [121] [122]	Qualitative interviews
Expert sources are effective messengers for businesses[123]	Qualitative interviews
Organisations geographically close to a business are effective messengers for business[124] [125]	Qualitative interviews and a survey response study in marketing
Organisations may trust and reciprocate less than individuals do[126]	Laboratory experiments based on groups / teams vs. individuals

Timing

Key takeaways

- **What works:** Reminders; certain 'windows of opportunity' (e.g. shortly after incorporation).
- **Promising interventions:** Messages sent at the end of financial year; after a change in management; regulatory / legislative changes or during a time of crisis; further RCTs to build the evidence base.

[118] Ibid.
[119] Bartholomew, S. and Smith, A. D. (2006). Improving Survey Response Rates from Chief Executive Officers in Small Firms: The Importance of Social Networks. *Entrepreneurship Theory and Practice 30(1)*, 83-96.
[120] The Behavioural Insights Team. (2018). Increasing private-sector innovation: evidence review.
[121] Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[122] Cole, S., X. Giné, et al. (2013). Barriers to household risk management: Evidence from India." *American Economic Journal: Applied Economics, 5(1),* 104–135.
[123] Jack, K. (2013). Market inefficiencies and the adoption of agricultural technologies in developing countries.
[124] Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[125] Bartholomew, S. and Smith, A. D. (2006). Improving Survey Response Rates from Chief Executive Officers in Small Firms: The Importance of Social Networks.
[126] Ibid.

- **Type of evidence available:** Qualitative interviews, conclusions from evidence reviews, and one RCT.

Optimal times, or 'windows of opportunity', likely exist to prompt firms to adopt technologies and management practices. This may be because decision making within young firms is observed to often rely on intuition and hunches.[127] Other windows, as outlined in an earlier section, include but are not limited to:

- when a business is young or newly incorporated
- adverse shocks such as the entrant of a new competitor or loss of a major contract[128]
- changes in a firm's leadership[129]
- the end of a financial year[130]

As well as naturally occurring windows, reminders and proactive messaging have also been effective in improving take-up rates of a desired outcome.[131] However, there is some evidence that altering the timing of reminders along short time horizons may not have a large effect on businesses. Moreover, few studies in this area employ RCTs (the gold standard of programme evaluation). A summary of the evidence and key insights relating to messengers are outlined in **Table 6**.

Table 6: Insights about timing

Insight	Evidence type
Advantageous windows of opportunity exist to communicate with firms[132] [133] [134]	Evidence review, qualitative interviews, and single RCT
Reminders and proactive messaging are effective in improving take-up among businesses of desired outcomes[135] [136]	Qualitative interviews and two RCTs
Altering the timing of reminders along short horizons (e.g. messages sent 2, 3, and 4 weeks	Single RCT and theoretical economic model

[127] Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[128] *Kantar Public (2019). Business Basics: Attitudes to Adoption. Understanding the barriers and enablers to the adoption of best practice technologies and management practices by SMEs.*
[129] Be the Business. (2018). Response to the Business Productivity Review, *Submission to Government*.
[130] Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[131] See for example Brockmeyer et al. (2019). Casting a wider tax net: Experimental evidence from Costa Rica and Gillitzer, C., & Sinning, M. (2018). Nudging Businesses to Pay Their Taxes: Does Timing Matter?. Institute for the Study of Labor (IZA) Discussion Paper No. 11599. However, this may not apply in all contexts. For example, in marketing, reminders were associated with lower survey response rates in Baruch, Y. and Holton, B.C. (2008). Survey response rate levels and trends in organizational research.
[132] Ibid.
[133] Be the Business. (2018). Response to the Business Productivity Review, *Submission to Government*
[134] The Behavioural Insights Team. (2018). Increasing private-sector innovation: evidence review.
[135] Ibid.
[136] Brockmeyer et al. (2019). Casting a wider tax net: Experimental evidence from Costa Rica.

Insight	Evidence type
after each other) does not have a large effect on firms' behaviour[137]	

Mode

Key takeaways

- **What works:** Letters, text messages, and emails work in isolation and may differ in their effects depending on the frame used. Modes involving real-time human interaction may outperform those that do not.
- **Promising interventions:** Social media, low-cost digital channels (e.g. Skype and Facetime), face-to-face, and mixed-mode interventions; further RCTs to build the evidence base.
- **Type of evidence available:** Some RCTs involving businesses; marketing evidence reviews; limited otherwise.

Most existing research examine prompts delivered via email, text messages or physical mail. Few mixed-mode interventions have been studied.[138] Modes including social media, videos, and other digital channels are also relatively unexplored. However, there is some evidence that modes featuring real-time human interaction (e.g. telephone, Skype, face-to-face) may be more effective than those that do not.[139] [140] There is also suggestive evidence that businesses may be receptive to messages on social media in some setting, perhaps more so than consumers.[141]

A further limitation of existing research is that most prompting studies conducted to date, the prompt's mode is typically not altered. In these situations, it is not possible to identify the contribution of a given mode toward an estimated effect. An exception is in the marketing literature about improving survey response rates, where electronic modes produce similar or higher response rates than physical mail.[142]

[137] Gillitzer, C., & Sinning, M. (2018). Nudging Businesses to Pay Their Taxes: Does Timing Matter?

[138] An exception is Dalton, P.S., Pamuk, H., Ramrattan, R., van Soest, D., and Uras, B. (2018). Payment technology adoption and finance: a randomized controlled trial with SMEs. *CentER Discussion Paper; Vol. 2018-042*, who designed a mixed-mode intervention comprising information leaflets and a short video aiming to encourage adoption of a mobile payment technology (Lipa Na M-Pesa) among restaurants and pharmacies in Nairobi.

[139] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.

[140] Dalton et al. (2018). Learning Business Practices from Peers: Experimental Evidence from Small-scale Retailers in an Emerging Market.

[141] Swani, K., Milne, G. R., Brown, B. P., Assaf, A. G., & Donthu, N. (2017). What messages to post? Evaluating the popularity of social media communications in business versus consumer markets. *Industrial Marketing Management*, 62, 77-87. The authors analysed the reactions to brand posts of Fortune 500 companies from both business-to-business (B2B) and business-to-consumer (B2C) posts. They found that relative to consumers, viewers of B2B content exhibited a higher like rate and were more responsive (in terms of likes and comments) to brand names and emotion and functional appeals.

[142] Baruch, Y. and Holton, B.C. (2008). Survey response rate levels and trends in organizational research.

Cross-study comparisons are also difficult to conduct, as other factors could be responsible for the effectiveness of a given mode. Given this and the above, further studies that deliberately vary the mode of a message would be valuable contribution to the evidence base in this area. Existing insights relating to message modes are at **Table 7**.

Table 7: Insights about mode

Insight	Evidence type
The effect of modes (e.g. email versus letters) interacts with the frame used[143]	One RCT
Modes featuring real-time human interaction (e.g. telephone and face-to-face) may be more effective than those that do not (e.g. an online diagnostic page)[144] [145]	Two RCTs
Electronic modes may result in equal or greater response rates than traditional mail.[146]	Meta-analysis in the survey response literature

Recipients

Key takeaways

- **What works:** Messages to the individuals at the board or CEO level, although this is not supported by dedicated RCTs or correlational studies.
- **Promising interventions:** Messages to other key decision makers (e.g. General Counsels, CFOs, directors); individuals responsible for technology implementation; RCTs to build the evidence base.
- **Type of evidence available:** Limited: some qualitative interviews and conclusions from existing evidence reviews.

A recent evidence review concluded that successful persuasion at the board or chief executive level could have larger effects across an organisation than those at lowers levels of seniority.[147] The review noted that in general, those with influence and decision-making authority over more than one person may be well-placed to transmit a change in behaviour to members of a group.[148]

[143] Ibid.
[144] Ibid.
[145] Algate, F. (2015). You have been selected: Driving uptake of Government schemes
[146] Baruch, Y. and Holton, B.C. (2008). Survey response rate levels and trends in organizational research.
[147] Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[148] Ibid.

However, few studies have targeted specific individuals within a firm to implement or learn about the size or nature of these effects.[149] Most empirical trials instead identify messaging targets based on registered addresses or contact email addresses in databases. As a result of this, it is often unclear who exactly the recipient within a firm is, and / or the extent to which a message is received by the intended individual(s) within it.[150] Furthermore, in marketing studies about survey response rates, one review found that response rates were lowest for executives and highest for non-managerial employees;[151] while another study found executives were not sensitive to reminders and personalization.[152] Studying these outcomes and their causes in future research would add valuable insights in this area. Insights relating to recipients of prompts are at **Table 8**.

Table 8: Insights about recipients

Insight	Evidence type
Prompting the most senior individuals in an organisation may result in larger treatment effects than prompting junior employees[153]	Qualitative interviews
Response rates among senior executives may be lower than that of junior employees within organisations.[154]	Meta-analysis in the survey response literature

[149] An exception is Likki and Sweeney (2017). Encouraging flexible recruitment: an email trial, who targeted HR professionals: senior employees, managers, and junior employees at mid-large organisations. They found a message effect that was positively associated with seniority.
[150] For example, this limitation is explicitly identified in Brockmeyer et al. (2019). Casting a wider tax net: Experimental evidence from Costa Rica.
[151] Anseel et al. (2010). Response Rates in Organizational Science, 1995–2008: A Meta-analytic Review and Guidelines for Survey Researchers. This may be consistent with executives being more cognitively constrained than non-managerial employees (see Section 1 of this review).
[152] Cycyota, C. S. and Harrison, D. A. (2002). Enhancing Survey Response Rates at the Executive Level: Are Employee- or Consumer-Level Techniques Effective? *Journal of Management 28(2)*, 151-176.
[153] Sonderegger, S. and Wilson, S. (2016). ORGANISER.
[154] Anseel et al. (2010). Response Rates in Organizational Science, 1995–2008: A Meta-analytic Review and Guidelines for Survey Researchers

Conclusion

Key findings

Behavioural barriers and enablers

Several behavioural factors interact with a business's decision to adopt a proven technology or management practice. Each will affect a business's decision through on the four stages of recognising a need, identifying options, deciding on one, and acting to adopt.

Table 9: Summary of behavioural barriers and enablers affecting firms' adoption of proven technologies and management practices

Behavioural barriers	Behavioural enablers
Overconfidence	Peer and network effects
Expectation errors	Mindsets conducive to profit growth
Mindsets unconducive to profit growth	Salience of benefits
Information gaps, complexity, and scarce mental bandwidth	Moments of change

Evidence about the best ways to prompt businesses

A large body of research explores frames that can be used to prompt businesses to take action. However, less is known about the optimal form of other message dimensions such as a message's messenger, timing, mode, and recipient(s). Furthermore, few existing studies are set in the context of encouraging businesses to adopt proven technologies and management practices; investigate business's behaviours outside of responding to surveys; or investigate the effects of prompts across low productivity firms or industries.

Coverage and gaps in the evidence base are outlined at **Table 10**.

Table 10: Evidence coverage and effect size estimates for key research areas

Research area	Level of evidence	Quality of evidence	Expected effect on take-up
Intervention type			
Technology adoption	Low	Medium	Not applicable
Management practice adoption	**Very low**	Low	Not applicable

Research area	Level of evidence	Quality of evidence	Expected effect on take-up
Message dimensions*			
Framing	High	High	Medium
Messengers	Low	Medium	Medium
Timing	Medium	Medium	High (reminders only)
Mode	Low	Medium	Unclear
Recipients	**Very low**	Low	Unclear
Combinations of the five dimensions (interaction effects)	**Very low**	Not applicable	Unclear
Subgroups			
Low productivity firms and industries	**Very low**	Medium	Not applicable

*Ratings reflect effect sizes relative to other dimensions rather than an external benchmark.

Recommendations for further research and next steps

The gaps in **Table 10** suggest research in the following areas would be valuable additions to the evidence about prompting businesses:

the effects of varying **recipients** within firms, **modes**, **messengers**, and **timing** in prompts sent to businesses; among these, the evidence base about **recipients** is the sparsest and of the lowest quality

interaction effects from combinations of prompt dimensions (for example, prompting a CEOs and non-managerial stuff at the end of the financial year would test both timing and recipients)

studies involving **technology and management practice adoption**

studies involving **low productivity firms and industries**

The next step of the Business Basics messaging trials (of which this review is the first stage) is to use these findings to run five RCTs to add to the evidence base in the above areas. As well as the results from this evidence review, other factors will be considered in the trial design stage. These include the expected benefits, feasibility, and scalability of interventions.

The findings from these trials will inform recommendations to policymakers and other relevant stakeholders seeking to encourage the adoption of proven technologies and management practices in the UK and abroad.

Appendices

Appendix A: Framing Interventions

Table A1 contains a list of different frames used in studies seeking to prompt businesses to act in a given context. A summary of each frame's effectiveness relative to a control arm, the type of study (or studies) underlying it, and quantitative effect size of the primary outcome variable are also presented.

The list of studies in **Table A1** were identified through a rapid (10 day) evidence review about what is known in prompting businesses. The time coverage of the review was weighted heavily to material published since 2014, and only works related to organisations or employees (e.g. managers) are included in examined evidence. For more information about the methodology used to prepare this list, see the 'Methodology and Scope' section of the main report.

Table A1: Selected framing interventions

Frame	Effectiveness	Evidence	Effect size(s) relative to control
Simplification [155] [156] [157] [158]	Outperformed control	Multiple RCTs	12-60% increase in various outcome measures
Prevention and promotion[159]	Outperformed control	Structured telephone interviews and single RCT	30% increase in email click-through rate
Multiple frames (simplification + social norm + info provision + personalisation)[160]	Outperformed control	Single RCT	Approximate tripling of tax payment rates relative to firms that received no email
Personalisation[161]	Outperformed control	Single RCT	50% increase in email click-through rate

[155] Umar, T., (2018). Complexity Aversion When Seeking Alpha. *Working Paper.*
[156] The Behavioural Insights Team. (2017). Encouraging fast growing companies or "scaleups" to access business support programmes. *Unpublished.*
[157] The Behavioural Insights Team. (2017). Trial with Skills Funding Agency. *Unpublished.*
[158] Frohlich, M. T. (2002). Techniques for improving response rates in OM survey research.
[159] Department for Business, Innovation, and Skills. (2013). SMEs: The Key Enablers of Business Success.
[160] Brockmeyer, A, M Hernandez, S Kettle and S Smith (2019), Casting a wider tax net: Experimental evidence from Costa Rica, *American Economic Journal: Economic Policy*, forthcoming.
[161] Algate, F. (2015). You have been selected: Driving uptake of Government schemes

Frame	Effectiveness	Evidence	Effect size(s) relative to control
Deterrence[162]	Outperformed control	Two RCTs	23% increase in tax payment rate
Limited time[163]	Outperformed control	Single RCT	19% increase in email click-through rate
Reciprocity[164]	Outperformed control	Single RCT	9% increase in tax payment rate
Easy (web link + mobile number provided)[165]	Outperformed control	Single RCT	8% increase in tax payment rate
National pride[166]	Outperformed control	Single RCT	32% increase in tax payment rate
Social norms[167][168][169][170][171]	Sometimes outperformed control	Multiple RCTs	0-250% increase in various outcome measures
Loss aversion[172][173][174][175]	Sometimes outperformed control	Multiple RCTs	0-40% increase in various outcome measures

[162] Kettle et al. (2019). Formal in practice, not just in name: Nudges to encourage business formalisation in Mexico.
[163] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.
[164] Kettle, S., Wills-Silva, M., Garnelo, M. Litvine, L., and Kaplan, D. (2019). Formal in practice, not just in name: Nudges to encourage business formalisation in Mexico. *Working Paper.*
[165] Ibid.
[166] Kettle, S., Hernandez, H., Antonio, M., Ruda, S., and Sanders, M. (2016). Behavioral interventions in tax compliance: evidence from Guatemala. *World Bank Policy Research Working Paper WPS7690.*
[167] Likki, T., Londakova, K., and Sweeney, M. (2017). Encouraging flexible recruitment: an email trial. *Equality and Human Rights Commission report*.
[168] The Behavioural Insights Team. (2016). Behavioural Insights for Cities. *Report for the Bloomberg Philanthropies' What Works Cities initiative*.
[169] The Behavioural Insights Team. (2014). Connection Vouchers: brief analysis report. *Unpublished*.
[170] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.
[171] Kettle et al. (2016). Behavioral interventions in tax compliance: evidence from Guatemala.
[172] Likki and Sweeney. (2017). Encouraging flexible recruitment: an email trial.
[173] The Behavioural Insights Team. (2016). Behavioural Insights for Cities.
[174] The Behavioural Insights Team. (2014). Connection Vouchers: brief analysis report. *Policy report.*
[175] Department for Business, Innovation, and Skills. (2013). SMEs: The Key Enablers of Business Success and the Economic Rationale for Government Intervention. *Policy report*.

Frame	Effectiveness	Evidence	Effect size(s) relative to control
Use of 'free'[176][177]	Sometimes outperformed control	Two RCTs	0-10% increase in email click-through rate
Entrepreneur identity priming[178]	Sometimes outperformed control	Single RCT	0-20% increase in email open rate
Altruism / emphasis on extrinsic incentives[179][180]	Sometimes outperformed control	Single RCT	0-18% increase in various outcome measures
Money[181]	Did not outperform control	Single RCT	No increase in email click-through rate
Peer testimonial[182]	Results pending (RCT in progress)	Single RCT	Results pending
Honesty frame[183]	Results pending (RCT in progress)	Single RCT	Results pending

[176] The Behavioural Insights Team. (2014). Connection Vouchers: brief analysis report.
[177] Department for Business, Innovation, and Skills. (2013). SMEs: The Key Enablers of Business Success.
[178] Ibid.
[179] Ibid.
[180] Ganguli, I., Le Coq, C., and Huysentruyt, M. (2018). How Do Nascent Social Entrepreneurs Respond to Rewards? A Field Experiment on Motivations in a Grant Competition. *SITE Working paper Series No. 46.*
[181] Algate, F. (2015). You have been selected: Driving uptake of Government schemes.
[182] The Behavioural Insights Team. (2018). Supporting Turkish exporters: preliminary results.
[183] Ibid.

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